ECONOMIC REVIEW
National Bank of the Republic of Kazakhstan

No. 3, 2020

Nur-Sultan, 2020

ECONOMIC REVIEW
National Bank of the Republic of Kazakhstan

Published by: National Bank of the Republic of Kazakhstan

Editorial Board

ISSN 2789-3308

ECONOMIC REVIEW
of the National Bank of the Republic of Kazakhstan

No. 3, 2020

CONTENTS

RELATIONSHIP BETWEEN THE ECONOMIC GROWTH AND THE BALANCE OF PAYMENTS

Kuratova A.A. – Chief Specialist, External Sector Analysis Division, Balance of Payments Department, National Bank of the Republic of Kazakhstan

The paper is devoted to an empirical analysis of the relationship between the economic growth and the trade balance of Kazakhstan based on a growth model constrained by the balance of payments (Thirlwall's Law, 1979). One of the main objectives of the study is to assess the equilibrium long-term GDP growth rates as defined by Thirlwall's law and to compare the estimated growth rates with the actual data for 2001-2019. Vector error correction models (VECM) are used in this study to assess the elasticities of exports to external demand and imports to the country's revenues.

Key Words: balance of payments, exports, imports, economic growth, Thirlwall's Law, VECM

JEL-classification: E20, E27, E61

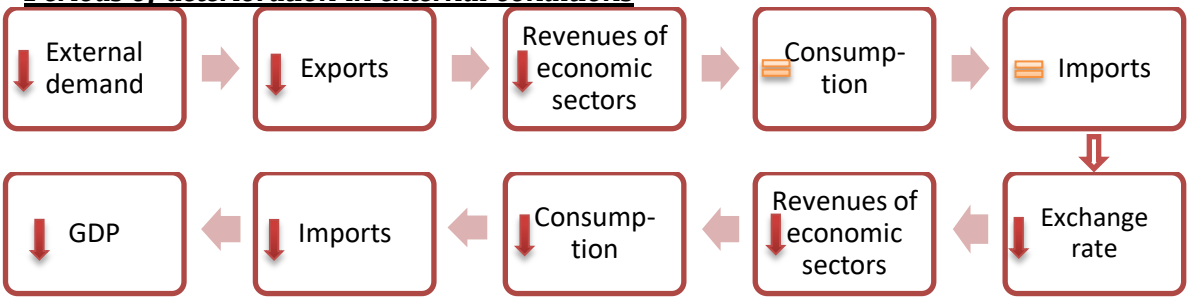
Preamble

The main objective of this study is to determine the limits for a long-term economic growth in Kazakhstan in accordance with Thirlwall's Law (1979) or a theory known as the balance of payments constrained growth. Based on the demand-side approach, Thirlwall's Law states that growth is restrained over the long term by the balance of payments, especially in developing countries. The income elasticity of demand for exports to the rest of the world must be higher than the income elasticity of demand for imports[1], in order to grow faster than the limit imposed by the demand for exports. For example, since imports are a positive function of income, an increase in imports with an increase in income will lead to deterioration in the current account, other things being equal. If the current account deficit is persisting, external debt will increase, reducing the potential for economic growth. Thus, the growth rates of exports as well as the response of imports to changes in income are the key variables that determine the long-term rate of economic growth.

Schematically, Thirlwall's Law may be expressed as follows:

I. ***Periods of favorable external conditions***

II. ***Periods of deterioration in external conditions***



[1] Gross domestic product (GDP) will be used as a proxy for revenue in this study.

Conclusion: a slowdown in the GDP growth due to a drop in external demand for exports of domestically produced goods indicates the limited opportunities for stimulation of economic growth by expanding the domestic demand in developing economies.

Consequence: countries with a sufficiently large domestic market can reorient themselves to the domestic demand in order to compensate for the decrease in export demand by increasing household spending, which leads to import substitution.

The Model of Economic Growth Constrained by the Balance of Payments

In his background paper, Thirlwall designed a model (1979) in which a long-term GDP growth is constrained by the balance of payments. Since then, many studies have tested a simple rule derived from the Keynesian growth model. Within the framework of this rule, the condition of the equilibrium balance of payments is determined by the following expression:

$$P_d X = P_f M \quad (1)$$

where P_d and $P_{df} -$ are export and import prices expressed in the domestic currency and M and $X -$ are the import and export volumes, respectively. Thirlwall uses two standard functions of imports and exports:

$$M = \left({}^{P_f}\!/_{P_d} \right)^{g} Y^h \quad (2)$$

$$X = \left({}^{P_d}\!/_{P_f} \right)^{v} Y^{*w} \quad (3)$$

where $Y$and $Y^* -$ internal and external revenue, g and $v -$ price elasticities for imports and exports and h and $w -$ the income elasticities of demand for imports and exports, respectively. When the logarithm of equations (2) and (3) is taken, the growth rates of imports and exports may be expressed as:

$$m = g(p_f - p_d) + hy \quad (4)$$

$$x = v(p_d - p_f) + wy* \quad (5)$$

The following is deduced from equation (1):

$$p_d + x = p_f + m \quad (6)$$

Plugging equations (4) and (5) in equation (6) gives an equilibrium growth rate of the balance of payments (y_b) as:

$$y_b = \left[(1 + v + g)(p_d - p_f) + wy*\right] \quad (7)$$

Thirlwall (1979) and McCombie and Thirlwall (1994) argue that there is substantial evidence that the rate of change in relative prices has little effect on the growth of imports and exports. This may be due to the low price elasticity of demand, whereby the Marshall-Lerner condition[2] is practically not met. In this case, the following condition is true: $(1 + v + g)(p_d - p_f) = 0$.

Therefore,

$$y_{bp} = {}^{wy*}\!/_{h} \quad (8)$$

The equation (8) is known as the growth model constrained by balance of payments or Thirlwall's law. According to this law, the economic growth of a country in the long term is determined by the growth rate of its exports.

[2] In accordance with the Marshall-Lerner condition, a decrease in the value of the domestic currency leads to an improvement in the trade balance if the sum of the absolute elasticities of domestic demand for imports and foreign demand for national exports is greater than one.

Literature Review

A large number of studies conducted by foreign economists are devoted to the application of Thirlwall's law in different countries; these studies can be conventionally classified into two groups: the analysis of time series for a particular country and analysis of panel data, which allows comparisons between countries.

Ateşoğlu (1993) applied Thirlwall's Law to the US figures for 1955-1990s. According to the results of the study, Thirlwall's Law is valid, and this result supports the Keynesian theory of demand-driven growth and does not support the theory of supply-driven neoclassical growth. In a later paper (1994), the author argues that there is a high correlation between the limited growth rate of the balance of payments and real growth rates according to Thirlwall's law based on the example of Germany in 1960-1990s.

M. Holland, F. Vieira, O. Canuto (2004) have tested Tyrwall's law for a number of Latin American countries from 1950 to 2000. The main purpose of the study was to assess the equilibrium long-term growth rates of the balance of payments and to compare the calculated growth rates with the actual data. The authors argue that the economic growth in conditions of an equilibrium of the balance of payments requires that the government policy is aimed at overcoming constraints from the external sector, mainly by increasing the growth rate of exports and reducing the income elasticity of imports.

Elitok and Campbel (2008) concluded that Thirlwall's Law was valid for the Turkish economy during the period of 1960-2004, according to the results obtained using the OLS method. On the other hand, Kula (2008) argued that Thirlwall's Law was not valid for the Turkish economy during the 1980-2006 period because there were significant differences between the estimated economic growth and real growth rates.

In 2019, E.Tovar-García1, C.Carrasco assessed the export and import functions using the data on mutual trade between Russia and its main trading partners (53 countries). The study empirically tested the validity of Thirlwall's law for the 1996–2016 period. The results of the study obtained by using the dynamic panel data models showed that generally the Russian economy is growing faster than Thirlwall's law predicts. This is because the industry-based structure of the Russian external sector has weakened external constraints to growth. Russian exports still largely consist of oil and gas, commodities with inelastic prices, which had a positive effect on the trade balance during the reviewed period.

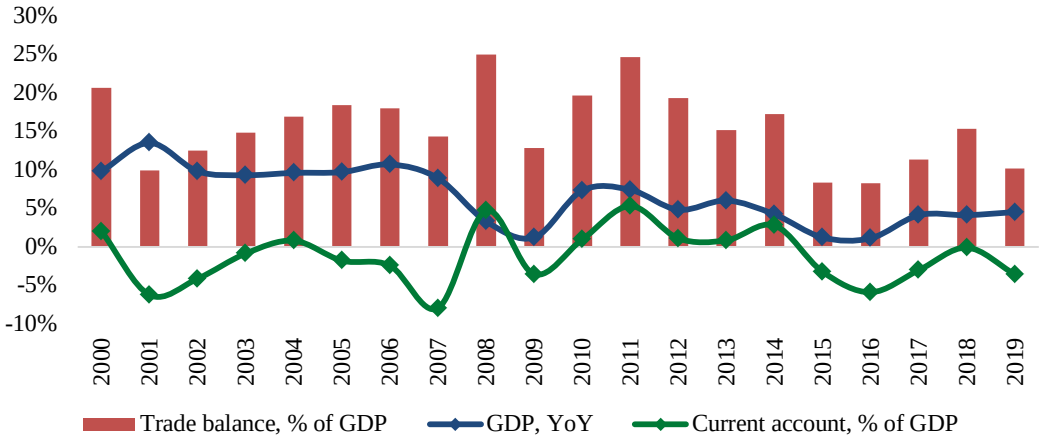
Kazakhstan's Economy

Kazakhstan's economy was demonstrating relatively high growth rates of 6.5% on average during 2000-2019. Before 2008, the country's economy was characterized by an accelerated growth given a cheap foreign funding and the growing oil price. After the global financial crisis, the GDP growth rate was gradually recovering, which was associated with the increase in oil price above 100 US Dollars per barrel on average in 2011-2014. Following the start of oil production in the Kashagan oil field accompanied by the increasing domestic demand, the GDP growth had stabilized at above 4%. Average rates of GDP growth, excluding the periods of the 2008-2009 and 2015-2016 crises, were at the levels of 7.7%.

As for the foreign economic activity, the current account was mainly still showing deficit while the trade balance was positive (Figure 1). This is a consequence of a large volume of payouts of returns to foreign investors in the primary sector. The current account surplus was observed during the periods of high oil prices (100 US Dollars per barrel) due to the outstripping growth of commodity exports compared to commodity imports.

Figure 1

Dynamics of GDP, Trade Balance and Current Account

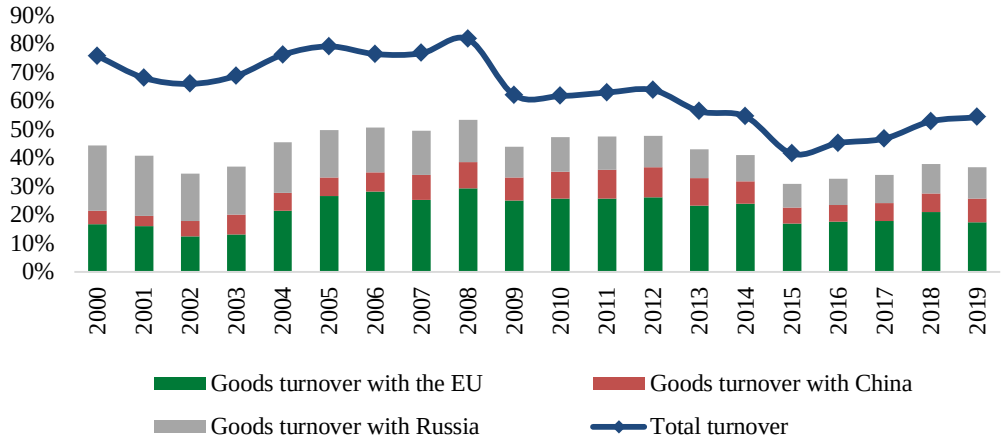


Source: CS MNE, National Bank of Kazakhstan

The share of goods turnover in GDP over the recent 20 years accounted for 63.5%, however, it started to decrease after the global financial crisis in 2009 (Figure 2). This being said, the Russian Federation, China and the EU are the main trading partners of Kazakhstan, with their share accounting for 67.5% of the total turnover in the reviewed period.

Figure 2

Dynamics of Kazakhstan's Goods Turnover with Main Trading Partners, % of GDP



Source: CS MNE, State Revenue Committee of Kazakhstan's Ministry of Finance

As known, the mining industry is prevailing in the structure of exports of goods, specifically, of oil and gas condensate (59% on average during 2000-2019), non-ferrous (9.5%) and ferrous metals (7.8%). Within imports of goods, interim goods account for the largest portion (38.4%), the share of investment goods accounts for 36.9%, and consumer goods – 23.2%.

Empiric Analysis

Data and Methodology. A largest part of the "classical" economics is based on the assumption that the observed data are derived from a stationary process, implying a process with a constant mean and variance over time (Clements and Henry, 1998). However, already at the stage of data visualization it turns out that most of the time series show the inconsistency of this assumption: economies develop, grow and change over time both in nominal and real terms. Taking into account the presence of a trend in the time series of the studied variables, an attempt

was made to conduct a co-integration test[3] and then build a VECM model in order to analyze the long-term relationship between the indicators. The use of the co-integration method is explained by the inability, for example, of the least squares method to identify the long-term relationship between the analyzed variables.

VECM is a constrained vector autoregression (VAR) model in differences. The VECM specification, given the short-term dynamics of endogenous variables, limits their behavior so that they converge towards their long-term equilibrium. This process is carried out by including the error correction mechanism into the model (ECM).

In this study, two models were built with an estimate of the income elasticities of imports of the country and exports to the income of the rest of the world. GDP in constant prices, real effective exchange rate of the tenge (REER) were selected as explanatory indicators of imports. The explanatory variables for exports under this item are aggregate external demand and the commodity price index. (Table 1).

Table 1

List of Variables Used in the Computations

Model	Variables	Source
EXPORT (VECM)	Kazakhstan's exports of goods and services in constant prices	CS MNE of the Republic of Kazakhstan
	Aggregate external demand: weighted by the share of exports in GDP of Russia, China and the Eurozone in constant prices	Thomson Reuters CS MNE of Kazakhstan SRC with the MoF of the Republic of Kazakhstan
	All Commodity Price Index	IMF
IMPORT (VECM)	Kazakhstan's imports of goods and services in constant prices	CS MNE of the Republic of Kazakhstan
	Kazakhstan's GDP in constant prices	CS MNE of the Republic of
	Real effective exchange rate of the tenge	NBK

Source: the author's computations

The initial data used to calculate the income elasticities of exports and imports are presented in Table 1. Sample length: from Q1 2000 to Q4 2019. The variables were transformed by taking the logarithm multiplied by 100 and brought to the base of the 1st quarter of 2000. The seasonality of the time series was eliminated using the Census X-12-ARIMA procedure. The hypothesis about the presence of a trend in the reviewed variables was tested and confirmed by using the extended Dickey-Fuller test (Table 2).

Table 2

Results of the ADF Tests for the Presence of the Unit Root with the Inclusion of the Constant into Regression in Testing the Hypothesis

Indicator	**P-value of the ADF Test**	
	Level	**First Difference**
Logarithm of Kazakhstan's real GDP index	0.1553	0.0000
Logarithm of the index of real exports of goods and services	0.3182	0.0001

[3] The stationary nature of a linear combination of two or more non-stationary variables assumes the presence of co-integration, which, in turn, can be interpreted as the presence of a long-term dynamic relationship between the studied indicators.

Logarithm of the index of real imports of goods and services	0.6304	0.0001
Logarithm of the index of commodity prices in real terms	0.2771	0.0000
Logarithm of the REER index	0.3593	0.0000
Logarithm of the index of real aggregate external demand	0.9340	0.0000

Source: the author's computations

Assessing the elasticity of imports in terms of GDP. To assess the income elasticity of imports, the sample was divided into two periods:

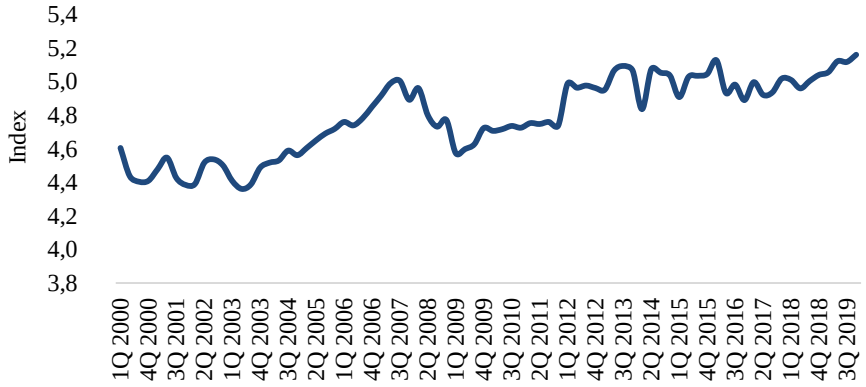
1) from 2000 to 2008;
2) from 2009 to 2019.

The division of the sample into two periods is associated with a structural shift in the economy that was observed after the global financial crisis, accompanied by lower GDP growth rates.

The VECM-based approach used satisfies such requirements for the fulfillment of the model consistency conditions as normal distribution, homoscedasticity, and the absence of autocorrelation of residuals. In addition, due to high volatility in the statistics of imports of goods and services, dummy variables were added for the first period (2Q 2003 and 1Q 2005) and for the second period (1Q 2009 and 1Q 2014) (Figure 3).

Figure 3

Dynamics of Imports of Goods and Services,
1Q 2000 = 100



Source: CS MNE RK, Eviews

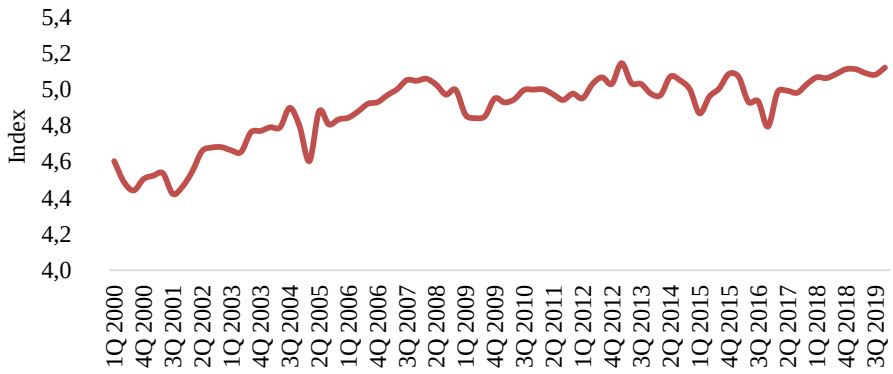
According to the estimates obtained for 2000-2008, the 1% growth of Kazakhstan's GDP results in a 0.69% increase in imports. However, the country's income elasticity of imports for the 2009-2019 period is somewhat higher and makes up 1.28%.

Assessment of the export elasticity of external demand. When assessing the export elasticity of external demand, as in the case of imports, the time series was divided into two periods associated with structural changes in the domestic economy. To account for periods of significant drop in exports, dummy variables were added for the first period (Q1 2005 and Q4 2007) and the second period (Q1 2015 and Q4 2016).

It should be noted that the inclusion of the REER in the reviewed model as an indicator of relative prices had low elasticity and an incorrect sign. This is an indirect indication that depreciation of the exchange rate has a limited effect on the increase in exports, which is associated with a high share of primary goods in exports that have low elasticities to the exchange rate and inflation.

Figure 4

Dynamics of Exports of Goods and Services,
1Q 2000 = 100



Source: CS MNE RK, Eviews

Based on the results obtained, it was identified that a 1% increase in aggregate external demand on the part of the country's three large trading partners leads to a 4.08% rise in real exports, if we estimate the elasticity of exports for 2000-2008. Evaluation of the model for the second period showed that the world income elasticity of exports for this period significantly differs from the first period and amounts to 0.58%.

The economic growth model of Kazakhstan according to Thirlwall's law. To calculate the economic growth of Kazakhstan, formula (8) was used. The estimated values obtained from the calculation results, as well as Kazakhstan's GDP based on Thirlwall's law, are presented in Table 3. It should be noted that the calculation results are compared with the actual GDP data of Kazakhstan, which were transformed by logarithm to obtain consistent elasticity estimates and to smooth the periods of high volatility. In this regard, there is some difference in the presented actual GDP data from the traditionally used values of the economic growth rates.

The period before the onset of the global crisis was characterized by high real exports elasticity to external demand, while the income elasticity of imports was low. Consequently, the estimated GDP for this period turned out to be higher than the actual values: 3.88% versus 1.39%. This difference is explained by the fact that the trade balance of Kazakhstan during the reviewed period was in a high surplus and the average percentage of GDP was 16.7%.

The estimated values for the second evaluation period differ significantly. During this period, exports become inelastic to world income, while imports become more elastic. This leads to the fact that the estimated values of long-term economic growth constrained by the balance of payments are lower than the actual ones.

Table 3

Model Assessment Results

Periods	***w***	***h***	***y ∗***	***y_{bp}***	***y***
2000-2008	4.08%	0.69%	0.65%	***3.88%***	***1.39%***
2009-2019	0.58%	1.28%	0.55%	***0.25%***	***0.73%***

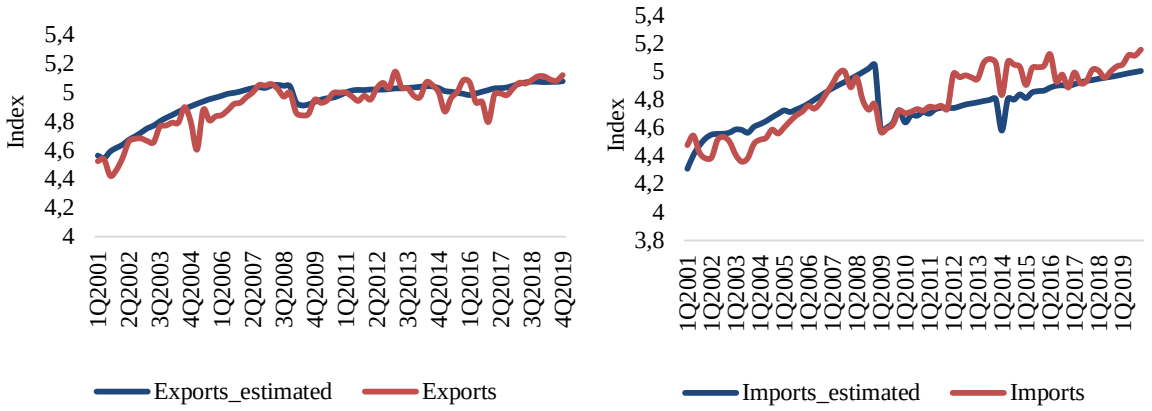
w – elasticity of exports to world income;
h – elasticity of imports to the country's income;
$y*$ – average growth rates of world income, in logarithmic form;
y_{bp} – assessment of the country's income according to Thirlwall's law;
y – actual average growth rates of the country's income, in logarithmic form.

Similar results were obtained when assessing the Russian economy, where raw materials also dominate in the structure of exports, in the period from 1996 to 2016.[4] With an actual average economic growth rate of 4.82%, the estimate of economic growth according to Thirlwall's law had been from 0.52% to 1.86% under four different equations.

The consistency of estimating the elasticities of variables can be checked by comparing the actual values of exports and imports with the estimated ones (Figure 5).

Figure 5

Dynamics of Estimated and Actual Growth Rates of Exports and Imports,
1Q 2000 = 100



Source: CS MNE, the author's computations

The decrease in the elasticity of exports to external demand, which was observed after the global financial crisis, is explained by the high share of raw materials in the structure of exports, with the global demand for raw materials growing several times slower than for other goods. In addition, developing countries tend to have higher income elasticities of imports. This is true for Kazakhstan. An active implementation of government initiatives and infrastructure programs, along with the implementation of large projects in the oil and gas sector (for example, the TCO future expansion project), inevitably leads to an increase in imports of investment and intermediate goods as well as architectural and consulting services.

Thus, in an open economy, an increase in exports can act as a stimulus for long-term economic growth. However, in the case of Kazakhstan, the expansion of real export volumes is hindered by a large portion of raw materials, the global demand for which is slowing down with the development of renewable energy sources. At the same time, the growth of exports of non-resource sectors has limitations associated with a relatively low external competitiveness of domestic producers. On the other hand, the income elasticity of demand for imports in Kazakhstan is very high, and its decrease is hampered by the low internal competitiveness of the manufacturing sector.

Therefore, the main constraints for the domestic economy are associated with a low diversification of the economy as well as with weak internal and external competitiveness.

Conclusions

The elasticities of imports to the country's income and of exports to income of the rest of the world were estimated in the course of the study. According to the estimation results, after the global financial crisis, the elasticity of exports to external demand decreased, while the elasticity of imports to GDP increased. This indicates that Kazakhstan's long-term economic growth is constrained by the country's external sector under the Thirlwall law.

[4] E. D.Tovar-García, C.A. Carrasco, "The Balance of Payments and Russian Economic Growth"// HSE Economic Journal No.4, 2019.

The findings of this empirical analysis can be used as a starting point for future research on long-term growth policies for developing countries facing external constraints. For economic growth in the environment of the balance of payments equilibrium, the government policy should be aimed at overcoming the constraints of the external sector, mainly by increasing the elasticity of exports to external demand and reducing the income elasticity of imports. An increase in the elasticity of exports is possible through an increase in the exports of goods of a higher value added, which will be competitive in foreign markets. Nonetheless, to bring this paradigm closer to the reality prevailing in developing countries, new explanatory factors such as capital flows and changes in debt service payments need to be considered (Thirlwall and Hussain, 1982; McCombie and Thirlwall, 1997). Capital flows are very important in developing countries because they allow temporary current account deficits. This means that the economies of countries with trade deficits can grow, provided that the current account deficit is financed by inflows of foreign investments.

At the same time, capital inflows also create liabilities that can limit the GDP growth. Thus, the inclusion of capital inflows and interest on the payment of external debt into the model can be a further subject of research.

List of References:

1. Bykov A. A., Khaustovich N. A., Shablinskaya T. V., “The Industry-Based Analysis of the Balanced Economic Growth” // A Series of Reports “Economic Development Trends of the 21st Century”, Section 2. Analytical Economics and Forecasting, 2019.
2. F. Sönmez, Y. Sağlam, “Examination of Thirlwall’s Law for BRIC-T Countries” //UİİİD-IJEAS, 2019.
3. M.Holland, F. Vieira, O. Canuto, “Economic Growth and the Balance-of-Payments Constraint in Latin America”// Investigación Económica, Vol. LXIII, 247, 2004, pp. 45-74.
4. E. D.Tovar-García, C.A. Carrasco, “The Balance of Payments and Russian Economic Growth”// HSE Economic Journal No.4, 2019.
5. M.Lelis, E.Silveira, “Economic growth and balance-of-payments constraint in Brazil: An analysis of the 1996-2016 period”//EconomiA 19, 2018, pp. 38-56.
6. E. Aricioglu, O. Ucan, T. Bahadır Sarac. “Thirlwall’s Law: The Case of Turkey, 1987–2011”// International Journal of Economics and Finance; Vol. 5, No. 9; 2013.
7. Gustavo Britto, “Thirlwall’s Law and the Long-Term Equilibrium Growth Rate: an Application for Brazil (1951-2006)”// Cambridge Centre for Economic and Public Policy, CCEPP WP01-08, June, 2008.

CENTRAL BANK'S ASPECTS IN MANAGING OPERATIONAL RISKS: EVOLUTION AND PROSPECTS

Akhmatolla A.M. –Head, Operational Risk Analysis and Assessment Division, Risk Department, National Bank of the Republic of Kazakhstan

Izbassarov A.O. – Director, Risk Department, National Bank of the Republic of Kazakhstan

The paper describes the evolution in the development of operational risks and their management in the world and at the National Bank of the Republic of Kazakhstan, showing the applicability and effectiveness of individual operational risk management tools. In addition, the paper identifies the factors contributing to the effective and high-quality construction of approaches in terms of their management.

Additionally, the paper points to the fundamental differences in operational risk management in non-profit and commercial organizations, as well as the impact of these differences on the construction of the entire operational risk management process.

Key Words: operational risk, risk appetite, operational risk quantification; key risk indicators, business process register, risk map, business process assessment, the second line of defense

JEL-classification: G32, E58, E59, D73

Preamble

Both in Kazakhstan and internationally, operational risk management is often underestimated. Underestimation is expressed in the absence of appropriate powers of a business unit engaged in the operational risk management, the lack of human and other resources, and in some cases, the absence of both the regulatory framework for operational risk management and the relevant personnel. Two facets of the adequacy of operational risk management completely depend on the governance of an organization, and this element is of primary importance, which is also reflected in all standards and practices for the implementation of internal control and risk management.

From the earliest years of the emergence of the term "operational risk" and until present, operational risk management has taken root in many organizations, and new tools for minimizing operational risks are being disseminated and developed. Of particular note is that if financial risk management tools have certain limitations (historical values, model limitations), then operational risk management should identify any events that could previously be called "improbable" and "impossible".

For this reason, departments (or responsible persons), in addition to managing operational risks, create a system that ensures the continuity of the organization's activities. It is precisely ensuring the continuity of activities that has acquired high importance during the pandemic, the transfer of workers to online working.

1. Creation and Evolution of the Operational Risk Management System

Operational risk management is a relatively new discipline in the financial sphere. Despite the fact that the rudiments of operational risk management have been present in life since time immemorial (hunting, construction), however, consistency, approaches, tools, along with prevalence, have been developed only in the last 20 years.

The term "operational risk" itself was introduced by the Committee of Sponsoring Organizations of the Treadway Commission in 1991, but was not very common. The need for independent development of operational risk management, along with gaining the popularity of this term, was obtained after a series of major incidents related to bankruptcies of large

organizations (often financial ones) bearing systemic risk (Bankers Trust, Barings, Daiwa, Long-Term Capital Management and others). These events became a trigger for discussions – what risk these incidents relate to and how to regulate them.

Thus, articles issued by the Basel Committee on Banking Supervision introduced the conceptual framework and tools for managing operational risk, which were later reflected in the Basel II standard.

Prior to the introduction of the definitions, everyone understood operational risk differently, and it was often defined on a residual basis – as a risk not related to market risk or credit risk.

Since the introduction of the conceptual framework, the definition of operational risk has remained unchanged – it is the risk of losses as a result of inadequate or erroneous internal processes, actions of employees and information systems, or external events.

At the same time, over the decade from 1990 to 2000, there was a significant development in the management of operational risks. Large foreign periodicals such as the Risk Water Group began to publish notes on operational risks. The profession of "operational risk manager" appeared, and discussions and conferences began to be held. In commercial banks, operational risks have become a separate line of business, and their management has become more complicated.

It should be noted that, despite the rapid development of the concept of operational risks, the assessment of operational risks remains an ambiguous topic of discussion. For example, the Basel Committee initially proposed three methods for assessing operational risks.

1. Basic indicator approach. The basic indicator approach is regarded as a simplified approach to assessing operational risk, where the basis for calculation is the average gross income of a bank:

$$K_{BIA} = \left[\sum (GI_{1\ldots n} \times a)\right] \div n$$

where K_{BIA} – the level of capital, according to the basic indicator approach;

GI – gross annual income (is used only in case of a positive sign);

n – the number of years taken into account in assessing operational risk (3 years);

a – 15%, ratio set by the Basel Committee.

2. Standardized approach. According to the standardized approach, the Basel Committee divides the bank's activities into eight main lines, and gross income is calculated for them. A beta indicator is applied to each income from the bank's activities:

$$K_{TSA} = \frac{1}{n}\sum_{i=1}^{n} \max(0; \sum_{j=1}^{8} \beta_i GI_{ij})$$

where K_{TSA} – the level of capital, according to the standardized approach;

n – the number of years taken into account in assessing operational risk (3 years);

GI_{ij} – the magnitude of risk indicator (gross income) по j-line of business (j=1..8) in i-year;

β_j – the set "beta" coefficient of operational risk for i-line of business.

It should be noted that this approach had a significant flaw. For example, when assessing the activity of each line of the bank, only positive gross income was used in the calculation, and in case of losses in any line of the bank's activity, these values were ignored. That is, the accumulation of losses, on the contrary, could be a factor in the accumulation of operational risks.

In March 2016, the Basel Committee revised this approach and introduced an updated standardized approach, which is based on information in financial statements as well as information on incidents of operational risks.

3. Advanced approach. The advanced approach involves the use of Monte Carlo simulation method with a specified probability level of 99%, while, as in the approaches applied above, simulations are used at each line of the bank's activities.

However, while the Basel Committee was informed that the advanced approach should be used by large organizations, often transnational, the advanced approach was suspended in 2016. The advanced approach turned out to be overly complex, with a wide range of internal simulation methods that were otherwise either insensitive to external events or lacked a direct link to operational risks.

2. Operational Risk Management at the National Bank

Evolution of operational risk management at the National Bank. Traditionally, government agencies, including central banks, are more conservative in their approaches and in the implementation of certain innovations. However, despite the conservatism, the National Bank first created the risk management in 2003 on the basis of the monetary operations division.

In 2004, in order to develop a unified approach to risk management at the National Bank, requirements to describing business processes, and create and improve the risk assessment methodology, a separate risk department was established, which was later reorganized into the risk management department on the basis of internal audit function in 2007. It is worth mentioning that such a structure is currently in operation at the Bank of Russia, that is, the second line of defense (risk management) is combined with the third line (audit).

In 2008, the risk management function was strengthened again and was transformed into a separate risk management division, which performed the function of integrated risk management and additionally was involved in the development of a methodology to ensure business continuity. However, from 2011 to 2017, the risk management function existed as a sub-function of separate divisions.

The year 2017 may be defined as a milestone in the development of operational risk management in the activities of National Bank, when risk management was separated into an independent division. Since that time, the functionality of operational risks has been significantly revised: new operational risk management tools have been introduced; the role of operational risks in the National Bank's activities has been radically revised; the scope of the addressed issues has been expanded and their depth has been increased.

The introduction of new approaches resulted in the strengthening of functions that were not actively handled before: anti-corruption activities, compliance function, information security, including the protection of personal data.

Moreover, most of the issues initiated within the framework of the National Bank's activities began to undergo a mandatory scrutiny of the risk division.

The operational risk management approaches themselves were continuously reviewed and improved, including in the course of international cooperation. Thus, in 2018 the National Bank of the Republic of Kazakhstan became a member of the International Operational Risk Working Group (IORWG, http://www.iorwg.org/), whose membership included more than 100 central banks around the world in 2020. Under the leadership of the National Bank, an international study was carried out in terms of the application of selected operational risk management tools. This working group was created in 2005 at the initiative of the Bank of Spain and supported by 17 central banks. Up to date, it has accumulated a significant amount of information regarding the operational risk management in central banks.

Quantification of operational risks and creation of provisions for operational risks. An obvious difference between commercial organizations and non-profit organizations is the purpose of the activity, which is to make profit. The obvious difference leads to unobvious consequences that complicate the assessment of the organization's operational risks.

In non-profit organizations, central banks in particular, reputational risk is hypertrophied, and its quantitative assessment may not always be objective. For the same reason, the above approaches to risk assessment can be useless, diluting responsibility for reputational risk.

So, if the calculation of operational risks of commercial banks in future leads to the need to reserve a certain share of equity to protect the financial service consumers, then the creation of the central bank's capital buffer does not make a significant sense.

The analysis of the use of operational risk quantification in other central banks as well as creation of capital buffers for operational risks showed that about half of central banks perform quantification and no more than 5% reserve capital for operational risks.

In recent years, the National Bank has made significant progress in applying the operational risk management tools, including in the analysis and assessment of operational risks, where the operational risk quantification proceeds from basic actions – procedures and, when consolidated, gives an overall assessment of the risk for the business process in the context of four risk categories: personnel, technology, regulation and external risk.

Operational risk management tools. The basic tools include documentation that serves as the basis for the primary identification and assessment of operational risks – the register of business processes and the register of risks (also referred to as Risk Control Self-Assessment). In the case of the National Bank, this tool is applied to both the first line of defense (business units) and the second line of defense (risks).

In the business process registers, business units describe in detail all the steps of their business process and, on the basis of such description, identify and assess operational risks, which are further reflected in the risk register.

This tool shows its effectiveness in case of a developed risk culture in the organization. Business units, when analyzing their business process in detail and with high quality and identifying risks, take appropriate control measures themselves.

The most common tool that shows efficiency at all levels of the organization's risk culture is a database of realized operational risks. In addition to the realized risks, the database can be formed from potentially dangerous incidents. These are incidents, which resulted in no loss, business interruption or other types of damage, but under other circumstances, damage may take place. Each organization can adapt its own standards with regard to the reporting on incidents of operational risks, but when implementing it is recommended to use existing best practices, for example, Operational Riskdata eXchange Association (http://orx.org/).

A separate instrument used by the National Bank is an independent assessment of operational risks (the so-called Risk Control Self-Assessment by a third party). This assessment is carried out by risk managers of the risk department and is divided into three main stages: a step-by-step detailing of the business process, identification of risks and provision of recommendations. Analysis of international experience shows that, if possible, many central banks would use this instrument. Its critical drawback is resource intensity – both in terms of labor resources and time. However, its application shows the fundamental nature of the approach and a deep insight into the business process, including at the level of its owners, and, as a result, high-quality independent identification of risks.

In addition to the above, the National Bank uses key risk indicators. It is a tool for monitoring the accumulation of risks in individual business processes that can lead to a failure in achieving the goal of the business process. Its use involves the development of key performance indicators. The development of KPIs in the absence of clear and quantitative KPIs can be significantly complicated.

Each operational risk management tool has its own functionality and has both advantages and disadvantages. Any tool implies active work of business units of the organization; therefore, an important condition for effective management of operational risks is their facilitation of the processes. In some organizations, there are cases in which business units fill out a large amount of unrelated information on a weekly and monthly basis and the filling becomes formal.

The fundamental conditions for the use of tools are the maximum return with minimum diversion of resources and a clear understanding of the purpose among business units.

3. Trends and Tools for a Further Development of Operational Risk Management

In August 2020, the Basel Committee issued a consultation document on the revision of Principles for Sound Management of the Operational Risk, which mentioned that certain principles were not properly implemented in the following areas:

— risk identification and monitoring tools;

— implementation of the three lines of defense, especially with regard to the segregation of roles and responsibility;

— top management oversight;

— formulation of risk appetite;

— information disclosure on operational risks.

Thus, trends in management of operational risks remain basic, and by improving the quality of their management, the organization further expands its risk coverage (for example, in the field of information and communication technologies).

The realization of contingent risks, such as the COVID-19 pandemic, dictates new conditions for the functioning of operational risk management, when (1) it is necessary to strengthen competencies in the field of information risks, given that some employees are switching to an online working, and (2) to analyze and model critical scenarios, which, if implemented, could lead to the termination of activities.

Conclusion

Summarizing the National Bank's experience and comparing it with the international practice, the following key points for an effective and high-quality function in managing operational risks can be pointed out:

1) involvement and understanding by the management of the need to manage operational risks;

2) a proactive approach on the part of the risk department, which consists in involving the risk function in all processes of the organization, in particular in introducing new products/ processes;

3) deep understanding of goals and objectives of the organization, its business processes and risks;

4) continuous improvement in all lines of business, especially in information technologies – more than half of the realized risks in many organizations are risks related to software and/or hardware, and risks in information technologies take leading positions according to the rating of operational risks prepared by the Risk.net portal.

List of References:

1. COSO (2009): "Internal Control — Integrated Framework" (Fundamentals of Effective Monitoring).

2. Basel Committee on Banking Supervision (2004): "International Convergence of Capital Measurement and Capital Standards".

3. Maike Sundmacher and Guy Ford (2004): "Leading Indicators for Operational Risk: Case Studies in Financial Services".

4. Risk Waters Group (2014): "Advances in Operational Risk: Firm-Wide Issues for Financial Institutions".

5. Basel Committee on Banking Supervision (2016): "Standardized Measurement Approach for Operational Risk".

6. Jan Lubbe and Flippie Snyman, 2010: "The advanced measurement approach for banks", IFC Bulletin No 33.

7. Basel Committee on Banking Supervision (2020): "Revisions to the principles for the sound management of operational risk".

BIGTECH: OPPORTUNITIES AND RISKS

Igenbekova S.Sh. – Chief Specialist-Analyst, Strategy Division, Monetary Policy Department, National Bank Republic of Kazakhstan

The paper describes the opportunities and risks of large technology companies (BigTech) entering the financial services industry. BigTechs have grown rapidly over the past decade and are, in some respects, comparable in size or superior to the largest financial institutions in the world. With their technological advantages, BigTechs can use these factors to quickly scale various businesses, including financial services. BigTech's activities in the financial services sector have many benefits. However, it can also pose risks to financial stability that require new approaches from regulators.

Key Words: BigTech, financial stability, financial system
JEL-classification: G20, G21, G28

Preamble

Technology companies, such as Alibaba, Amazon, Facebook, Google and Tencent (BigTech), demonstrated a rapid growth over the last two decades. BigTech's business model is based on providing direct interaction for a large number of users. An important by-product of their business is the massive user data that is used as input to offer a range of network-based services, generating further user activity. Increased user activity leads to even more data, creating advanced client profiles.

Basing on the benefits of this online data generation, some large technology companies have begun to provide financial services, including payments, money management, insurance, and lending. So far, financial services are only a small part of their global business. Given their size and customer reach, BigTech's entry into the finance could bring about rapid changes in the industry.

BigTechs offer many potential benefits. BigTech's low-cost business expands easily to provide basic financial services, especially where most of the population is unbanked.

At the same time, the emergence of BigTech in the financial arena brings new elements of risk. Some of them relate to existing issues of financial stability and consumer protection. In areas such as, for example, the payment system, BigTechs have the potential to become systemically important financial institutions very quickly. Given importance of the financial system in the economy, BigTech's activities are of broad public interest, going beyond the immediate circle of users and stakeholders.

BigTech in the Financial Sphere

BigTech's financial business is one of the versions of a broader financial technology innovation model. Fintech refers to technological innovation in the financial services industry, including new business models, applications, processes, and products. Fintech companies are set up to operate primarily in the financial services industry, with BigTechs offering financial services as part of a much broader range of activities.

The main areas of BigTech's activity are information technology and consulting, which, according to the performance in 2018, account for about 46% of their revenues, and financial services make up about 11% (Figure 1).

Figure 1

Income by Sectors, %

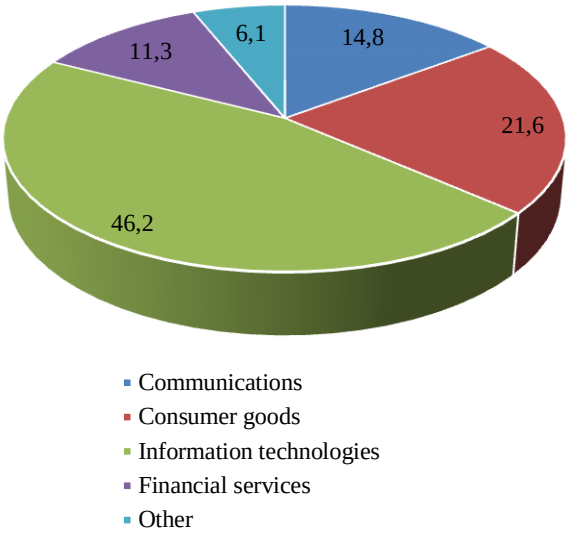
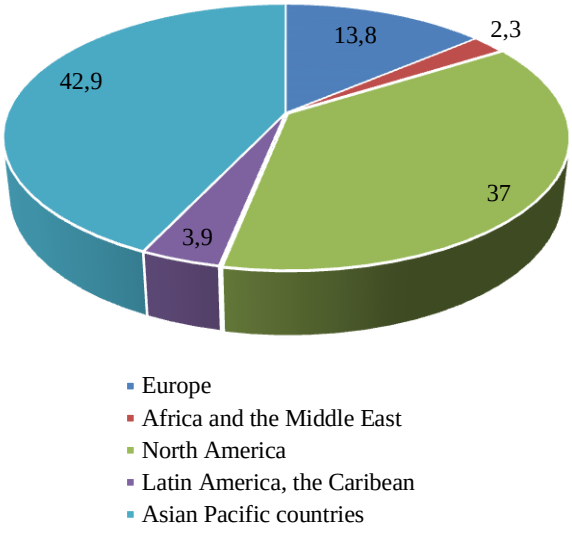


Figure 2

Regional Distribution of Business, %



Source: S&P Capital IQ

Although BigTech companies provide services to users around the globe, their operations are mainly widespread in Asia and Pacific Region, and in the North America (Figure 2).

In total, BigTechs offer about 50 financial services. Most BigTech companies offer payment services, many provide loans, and some also offer insurance and capital management products.

Payment services were the first financial services offered by BigTechs, mainly for trading between buyers and sellers on e-commerce platforms. Payment services like those provided by Alipay or PayPal provide guaranteed settlement on delivery or return of goods and are fully integrated into e-commerce platforms [1].

Some BigTechs offer lending, a service that, like payments, was partly designed to improve e-commerce platforms. A number of factors give BigTech companies a potential advantage over banks, or at least diminish the advantages that traditional financial institutions have traditionally enjoyed. By using its large customer base and technology infrastructure, BigTechs can make loans without the cost of running a bank branch network. BigTechs' access to big data and its use for credit scoring and monitoring of borrowers' transactions allows them to reduce costs, increase efficiency and expand access to finance. Advanced data analytics allows BigTech companies to use large amounts of data from e-commerce and social media to compensate for the lack of credit history, collateral, and other factors that usually limit the provision of loans. Technology allows them to attract customers, open user accounts, enabling secure transactions without the need for face-to-face communication with customers.

In addition, big data resources open the opportunity for BigTechs to finance borrowers for whom the formal market of bank loans was previously closed due to the fact that borrowers often do not meet the minimum requirements for approving a loan application. BigTechs can leverage information from their core business (such as e-commerce transaction data) and combine transaction data with machine learning algorithms to expand lending. Such broadening of the client base promotes financial inclusion in niches where financing is limited or where the lending process is complicated for the borrower.

The volume of loans provided by BigTech companies varies considerably depending on the region. Per capita loans provided by FinTech companies (including BigTech) are the largest in China, Korea, UK and the USA [2].

However, despite the observed growth in loans issued, the total volume of loans provided by BigTech companies constitutes a small share in the total loan portfolio. In China, for

example, new loans provided by BigTech companies in 2017 amounted to about 1.5% of total loans [2]. This may in part be due to regulatory requirements that increase the cost of lending.

In a number of countries, BigTechs also offer insurance products through their platforms. These range from health insurance to car insurance and can provide synergies with other products and services offered by BigTech platforms.

It is worth mentioning that in the innovation development model at BigTech financial services do not represent a key element and rather play a role similar to other segments of the BigTech eco system.

Advantages of BigTech Companies Entering the Financial Services Market

The entry by BigTech companies into the financial services market usually takes place after the established customer base and brand recognition are built and, as a rule, is determined by the following factors:

– diversification of income flows. Provision of access to new financial services is a way to diversify earnings, via the BigTech e-commerce in particular;

– access to new data sources. The provision of financial services allows BigTech to collect additional data on consumption habits and financial standing of its customers. This information, which has traditionally been the prerogative of banks, can now be combined with the data from other customer activities, such as user searches on the Internet, social media accounts or e-commerce activity, to become a good source of valuable information;

– complementing and strengthening their core business activities, increasing customer base and loyalty. BigTech can offer a higher level of convenience and speed of customer service by integrating financial services into existing platforms, thereby increasing revenues from their core business. For example, some BigTechs have integrated payment systems into their platforms; others provide a set of additional financial services for merchants and consumers on their trading platform [3].

The emergence of technology companies in financial services has many potential benefits. These include the possible reduction in the cost of financial services for consumers at both the retail and institutional levels due to the fact that products or services are usually delivered via a platform already widely used by customers, and economies of scale allow the provision of services relatively efficiently.

Competitive pressure from BigTechs using new technologies can also provide a positive impetus for innovation and wider user access to financial services. Customers can access cheaper, more convenient financial products. In addition, these can be personalized services.

Deploying the BigTech cloud computing services can be beneficial for financial service providers. These benefits can include cost savings, flexibility, scalability, standardization, and increased security and resiliency. As a consequence, competition for these financial services is likely to increase, eliciting similar responses from existing financial institutions and contributing to increased financial inclusion [4].

The services offered by BigTech companies can also provide access to technologies previously unavailable to the wide market, such as artificial intelligence, data analysis capabilities.

Potential Risks Associated with the Appearance of BigTechs in the Financial Services Industry

The expansion of BigTech in the financial services industry can be accompanied by potential risks in several areas: the impact of increased competition on the viability of business models of traditional financial institutions; operational relationships between BigTech companies and financial institutions; risks associated with the expansion of BigTech in the field of lending; potential anti-competitive behavior due to the scale of BigTech companies.

Competition on the part of BigTech companies can reduce soundness of financial institutions, affecting their profitability or reducing the stability of their financing. Questions also

arise regarding significant amounts of resources (e.g. mobile wallets) controlled outside the banking system (although often these funds are ultimately deposited with banks). The greater mobility of this pool of funds relative to customer deposits can also reduce the stability of bank funding. Given that these funds remain outside the banking system, transparency of the financial system is also decreasing [5].

BigTechs often develop the business within an ecosystem, where the client receives a single, holistic product provided by various participants. Participants standing in the center of the ecosystem receive a privileged position, since their systems, products and services act as pillars, while other products and services are integrated into the proposals of this participant. Such privileged position may mean that the customer receives products and services provided under the brand of these participants, or that these market participants establish criteria whereby a further integration of the elements of the offer from other market participants takes place.

In case if a closed ecosystem is created in which a BigTech company rounds out the user and offers services of partner companies, there are few opportunities for potential competitors to create competing platforms. Dominant platforms can strengthen their position by increasing barriers to entry. They can use their market power and network advantages to increase user switching costs or eliminate potential competitors.

Platforms often serve as the primary sales infrastructure for financial service providers, while BigTechs compete with these providers. BigTechs are prioritizing their own products and trying to generate higher margins by making it more expensive for financial institutions to reach potential clients via their platforms.

Anti-competitive practices can include “bundling of products” and cross-subsidization of activities. Another new type of risk is anti-competitive use of data. Given its scale and technology, BigTech can collect massive amounts of data at almost zero cost. This creates “digital monopolies” or “data monopolies”. When establishing a dominant position in the data arena, BigTechs can engage in price discrimination and extract rents. They can use their data not only to assess the creditworthiness of a potential borrower, but also to impose a maximum rate for the borrower or the price of a product for customers [6].

Price discrimination not only increases BigTech’s profits at the expense of customers without changing overall production but also has adverse economic consequences. The use of personal data may lead to the exclusion of high-risk groups from the insurance market. There are also some indications that BigTech’s sophisticated algorithms used to process personal data could lead to bias against minorities.

Government Policy in Respect of Big Financial Technologies

Traditionally, financial regulation is aimed at ensuring the reliability of financial institutions and the financial system soundness as a whole, as well as ensuring consumer protection. The policy instruments used to achieve these goals are well understood, ranging from capital and liquidity requirements in the case of banks to consumer protection policies. When BigTechs’ activities come under traditional financial regulation, the same principles should apply to them.

However, two additional factors make the formulation of regulatory policies more difficult for BigTechs.

First, BigTechs’ financial activities may require an integrated approach that encompasses not only financial regulation but also competition and data privacy.

Second, even when the policy goals are clearly articulated, specific tools should be demonstrated to achieve those goals as the relationship between instruments and outcomes is more complex in the case of BigTech. In particular, policy instruments that aim for traditional financial regulation objectives may violate competition and data privacy objectives. This creates complex trade-offs that traditional financial regulation lacks.

When BigTechs do banking, they rightfully fall under the same rules that apply to banks. The goal is to close regulatory gaps between BigTechs and regulated financial institutions in

order to limit the scope for regulatory arbitrage through shadow banking. Consequently, regulators have extended existing banking rules to BigTech. Examples include extending the "know-your-customer" rule designed to prevent money laundering and other financial crime, to include BigTechs' payment transactions.

The basic principle is "the same activity, the same regulation". If BigTechs are engaged in activities that are virtually identical to banking, then such activities should be regulated by the rules of bank regulation.

Understanding the risks of BigTech's activities in the field of finance and the threat of concentration of resources in the hands of a small number of large non-financial organizations, supervisors around the world, especially in Europe and the United States, began to actively monitor and propose separate regulatory initiatives to ensure more stable development of financial innovations and financial services taking into account the strategy of BigTech companies.

Regulators in Europe and the United States primarily view BigTechs in the financial services market as a threat to traditional banking and to the stability of the financial system. Therefore, some regulatory initiatives have been introduced in these countries: in the United States, the Federal Trade is studying the anti-competitive behavior of some BigTechs. In Europe, the GDPR came into force in 2018; it is one of the most comprehensive data privacy laws. The Regulation provides for the right of customers to receive their personal digital data unhindered in a structured form ("right to data portability"). In addition, the law requires that data holders obtain the consent of their customers before using or transferring their personal data.

Some countries (Luxembourg, Hong Kong, South Korea) have begun issuing licenses to BigTechs when these companies are entering the financial services market in the country. In India, universal payment interface standards must be followed by any service provider. In 2019, the German Competition Authority prohibited Facebook from aggregating user data from different sources (WhatsApp and Instagram) [1, 2].

In China and a number of Asian countries, the regulatory requirements are much broader than the standard procedures inherent in banking. For example, China strictly regulates non-bank payment operators with additional clearing requirements through a centralized clearing agency, as well as reserves held with BigTech accounts.

All of these initiatives aim at ensuring the competitiveness of traditional financial services and bringing the BigTech financial services providers closer to the traditional banking.

In a dynamic and global digital economy, policymakers need institutional mechanisms to effectively regulate the market. Hubs, boosters, and sandboxes can help provide a dynamic financial landscape. Regulatory sandboxes (for example, in Hong Kong, Singapore and the United Kingdom) allow innovators to test products under the regulatory oversight. At the same time, their customization requires careful design to avoid regulatory arbitrage and not provide support for new, but still speculative projects [7].

Coordination between authorities is critical both nationally and internationally. The mandates and practices of three different national authorities – competition authorities, financial regulators and data protection authorities – may not always be compatible. Financial regulators focus on the specifics of the financial sector, while competition and data privacy laws often set general standards that apply to a wide range of businesses. As the boundaries of the digital economy expand, international coordination of rules and standards is needed, as well as a balance of public policy instruments.

Conclusion

The rapid growth of BigTech's financial services is undoubtedly driving both positive and negative changes in the market. On the one hand, BigTechs are helping to increase competition as well as improve the overall efficiency of the financial services sector. BigTechs demonstrated an ability to facilitate access to financial services for non-financial users while increasing financial inclusion.

On the other hand, their penetration into the financial services market leads to an even greater concentration of market power in a small number of companies, which may introduce new risks to the financial system, although BigTech's financial services are not a key component of their business model.

BigTechs' financial operations represent a new and challenging trade-off between the financial stability, competition and the use of personal data. Regulators need to ensure a level playing field between BigTechs and formal financial institutions, given BigTech's large customer bases, broad access to information and BigTech's diversified business models.

List of References

1. Financial Stability Board, Financial stability implications from fintech: regulatory and supervisory issues that merit authorities' attention, June 2017.

2. J Frost, L Gambacorta, Y Huang, H S Shin and P Zbinden, "BigTech and the changing structure of financial intermediation", BIS Working Papers, no 779, April 2019.

3. L. Hornuf, M. Klus, T. Lohwasser and A. Schwienbacher, "How do banks interact with Fintechs? Forms of alliances and their impact on bank value", CESifo Working Papers, no 7170, July 2018.

4. S. Claessens, J. Frost, G. Turner and F. Zhu, "Fintech credit markets around the world: size, driversand policy issues", BIS Quarterly Review, September 2018, pp 29–49.

5. C. Borio and R. Filosa, "The changing borders of banking: trends and implications", BIS Economic Papers, no. 43, December 1994.

6. G. Bazot, "Financial intermediation cost, rents, and productivity: An international comparison", European Historical Economics Society Working Papers, no 141, Novemb.er 2018.

7. H.Hau, Y.Huang, H.Shan and Z.Sheng, "Fintech credit, financial inclusion and entrepreneurial growth", 2018.

CHALLENGING ISSUES IN THE GLOBAL PRACTICE OF THE DEPOSIT INSURANCE SYSTEM

Mambetova A.T. – Chief Specialist, Public Relations and International Affairs Section, "Kazakhstan Deposit Insurance Fund" JSC

Khassanov T.Z. – Deputy Head, Problem Banks Division, "Kazakhstan Deposit Insurance Fund" JSC

The financial crisis of 2008 served as an impetus in strengthening the role of the deposit insurance system and increasing the public confidence in the financial system by raising insurance coverage of deposits and shortening the period for commencement of payouts. However, despite significant progress in the development of the deposit insurance system, deposit insurers around the world still face various challenges. The purpose of this paper is to address the main problems faced by deposit insurers, as well as highlight the ways to solve them available in the international practice.

Key Words: deposit insurance, deposit insurance systems, unclaimed (dormant) accounts, P&A transaction, financial crisis, moral hazard

JEL-classification: E58, G33, G21

Introduction

The need for a deposit insurance system became apparent at the beginning of the last century in the United States of America, with the decreasing public confidence in banks against the backdrop of the Great Depression of the 1930s serving as a prerequisite. Later, other countries adopted the experience of the American deposit insurance system and currently 146 countries have their own deposit insurance system, both as a separate independent organization and as part of the central bank.

Before the establishment of the deposit insurance system, in case of bankruptcy, the bank's liabilities often got wiped out, and in rare cases, the government assumed the liability. For example, during the bankruptcy of the Moscow Commercial Loan Bank in 1875, the bank's liabilities amounted to about 18.8 million rubles, and 75 kopecks were allocated from the state treasury for 1 ruble of liabilities to repay them [1].

Today, the deposit insurance system is one of the components of the financial safety net, which indicates its important role in ensuring the stability of the financial system and in maintaining the public confidence in the banking system. The 2008 financial crisis highlighted the importance of deposit insurers and the need to strengthen their role in the financial system. The International Association of Deposit Insurers (IADI) issued the Core Principles for Effective Deposit Insurance Systems in 2009, which were updated in 2014. This document still serves as the benchmark for deposit insurers around the world.

In addition to this document, the 2008 crisis gave impetus for a significant improvement of the deposit insurance system in general and raising the standards of deposit insurers to a new level: in most countries, insurance coverage of deposits increased, the timing of the commencement of payouts was significantly reduced, and coinsurance, when only a certain portion of the deposits is guaranteed, was excluded. For example, the 1994 European Union Directive on Deposit Guarantee Schemes provided for a minimum level of harmonization of legislation among the EU member states, as well as rather low standards. Nonetheless, the European Union Directive on Deposit Guarantee Schemes remained practically unchanged from 1994 to 2009 (Table 1).

Table 1

The European Union Directive on Deposit Guarantee Schemes before and after the 2008 Financial Crisis

	EU Directive 1994	EU Directive 2009	EU Directive 2014
Insurance coverage	€ 20 000	€ 50 000 (stage-by-stage up to € 100 000)	€ 100 000
Commencement of payouts	3 months (with a possibility of extension up to 9 months)	20 working days	A stage-by-stage reduction to 7 working days by 2024

Source: the official Internet resource of the European Union laws EUR-Lex [2].

Also, in some countries, the powers of the deposit insurer have grown significantly, up to the functions of insolvency resolution. All this made it possible to take into account the rights and interests of depositors at a new level and increase the public confidence in the financial system.

At the same time, deposit insurers still face challenges and problematic issues that require further action to address them. This paper presents some challenging issues for the deposit insurance system and ways to solve them available in the international practice.

I. Depositors Who Failed to Claim for the Reimbursement (Unclaimed/Dormant Accounts)

One of the pressing problems in the international practice of deposit insurance is the problem of unclaimed reimbursement amounts, or "dormant accounts" (unclaimed accounts).

There is currently no single international definition for unclaimed accounts. In general, this term usually means the accounts with no transactions conducted for a long period of time. At the same time, for the account to be recognized as unclaimed, the period of such inactivity varies in different countries, depending on their legislation, on average from 5 to 15 years. As a rule, in most developed countries there is legislation regarding such accounts, which determines how to handle them.

Unclaimed accounts can be divided into two types: "insignificant" and "force majeure" [3]. In the first case, the account holder deliberately does not withdraw money due to the small balance on the account. In the second case, the account becomes unclaimed for reasons independent of its owner (death, illness, etc.) [3].

Unclaimed accounts pose a problem not only for banks due to the need to maintain them but also for deposit insurers after the occurrence of an insured event. Holders of unclaimed accounts often do not apply for payout due to the small account balance, which significantly delays the process of completing the reimbursement.

Thus, the "Kazakhstan Deposit Insurance Fund" JSC (KDIF) currently has obligations to pay the reimbursement for six banks undergoing liquidation[5] (Table 2).

Table 2

Information on Banks Undergoing the Liquidation Process as at December 1, 2020

No.	Bank Name	The date of the court's resolution	Total number of depositors	Number of depositors who claimed for reimbursement	Depositors who claimed for reimbursement/total number of depositors
1.	Valut-Transit Bank	01.03.2007	267 285	63 230	24%

[5]Not including the "Tengri Bank" JSC (its banking license was revoked on September 18, 2020), since the bank had not yet been undergoing the liquidation process

2.	Kazinvestbank	24.01.2018	293	11	4%
3.	Delta Bank	25.04.2018	2 668	327	12%
4.	Eximbank Kazakhstan	16.01.2019	299	120	40%
5.	Qazaq Banki	12.12.2018	18 001	5 956	33%
6.	Bank of Astana	09.01.2019	268 457	60 842	23%

Source: KDIF's Internet resource [4].

In order to solve this problem, the KDIF is making an effort to provide depositors with the opportunity to submit an application electronically and receive a payout by transferring money to the applicant's bank account without being physically present. This option is aimed at simplifying the procedure for obtaining a reimbursement and should motivate depositors with a small amount of money to withdraw their money.

The KDIF is working to improve the legislation of the Republic of Kazakhstan with regard to the transfer of unclaimed reimbursement to the pension accounts of depositors in the form of voluntary pension contributions to the Unified Accumulative Pension Fund JSC (UAPF) in case the depositor does not apply for reimbursement after one year from the time when the KDIF started to pay out the guaranteed reimbursement. This innovation will enable the KDIF to fully discharge its obligations to depositors and increase the retirement savings of depositors, based on the accrued investment income.

Other countries are finding various ways of solving this problem. For example, in the United Arab Emirates (UAE), the new Dormant Accounts Regulation requires that banks should transfer unclaimed account balances to a special account at the Central Bank of the UAE for their safety and provide customer access to them at any time. In this case, the account is considered unclaimed after the expiration of 5 years from the moment of the last transaction and such account is closed after its transfer to the Central Bank of the UAE. The accrual of interest on these accounts is also terminated.

A similar scheme for storing unclaimed accounts exists in Canada. The Bank of Canada assumes the role of custodian of unclaimed accounts after 10 years' absence of active account movements. Statistics on unclaimed accounts with the Bank of Canada are presented in Table 3.

Table 3

Information on Unclaimed Accounts at the Bank of Canada as at end-2019

The quantity of unclaimed accounts stored	2.1 million
The amount of unclaimed accounts stored	$ 888 million
Percentage of accounts with the amount less than $ 1 000	93%
The amount paid out to holders in 2019	$ 8.5 million
Resources paid out in 2019/total amount held	0.96 %

Source: compiled by the authors on the basis of the data from the Bank of Canada's web site [5].

The Bank of Canada holds unclaimed balances of less than 1,000 Canadian Dollars for 30 years, and balances of C $ 1,000 or more are held for 100 years. After the expiration of the term, the money is transferred to the Receiver General for Canada.

A slightly different system exists in France, where after 10 years of inactivity on unclaimed accounts, the money is transferred to the Deposits and Consignments Fund. After the expiration of 20 years from the date of transfer to the Deposits and Consignments Fund, the money passes into the possession of the state, and the owner loses the right to recover this money.

In addition, in a number of developed countries there is common experience of creating special funds for managing unclaimed accounts, where all balances of unclaimed accounts are transferred. Such funds exist in Ireland, the United Kingdom and Japan; they distribute resources for social needs and various charitable programs (Table 4).

Table 4

International Experience in Creating Funds for Managing Unclaimed Accounts

Country	Name of Fund	When an Account is Recognized as Unclaimed	Year of Establishment	Depositor's Right to Claim Monies at Any Moment in Time
United Kingdom	Reclaim Fund Ltd	15 years	2011	yes
Ireland	Dormant Accounts Fund	15 years	2001	yes
Japan	Dormant Deposits Management Account (DICJ)	10 years	2017	yes

Source: compiled by the authors on the basis of the data from web sites of the funds.

At the same time, the rights of account holders (or their heirs) remain intact even after the transfer of money to such funds, and the owners can recover their money at any time, including the interest accrued. For example, in the United Kingdom, banks transfer unclaimed accounts to a specially created Reclaim Fund, which then directs excess cash (amounts in excess of what is required to satisfy future claims) to the National Lottery Community Fund, which distributes the money to charity throughout the UK [6] (Table 5).

Table 5

Statistics of the Reclaim Fund (United Kingdom) as at end-2019 (Pounds Sterling)

Total amount of transferred unclaimed accounts (since 2011)	1.35 billion
Monies returned to account holders (since 2011)	93 million
Monies received during 2019	147 million
Monies transferred to the National Lottery Community Fund during 2019	72 million
Monies returned to account holders in 2019	13 million
Returned monies/amount of monies received in 2019	9%

Source: compiled by the authors on the basis of the data from the Reclaim Fund's annual report [6].

In Ireland, the unclaimed account fund is managed by the National Treasury Management Agency, the asset and liability management authority of the Government. The means from this fund are allocated to programs designed to help socially vulnerable groups of the population. In 2019, the unclaimed accounts fund distributed resources totaling 37.4 million euros among 10 ministries [7].

An important role in the fight against unclaimed accounts is played by the awareness of customers about the existence of such accounts. In the UK, there is a search service (Internet resource www.mylostaccount.org.uk), where a client can fill out a special form, after which information about his/her unclaimed accounts will be sent to the client's email address. There are similar services in Canada (Unclaimed Balances Portal) and in France (Ciclade).

In general, one may note that developed countries are trying to solve the problem of dormant accounts by using balances of unclaimed accounts for social needs of the population or by keeping money on a special account at the central bank. In most cases, the depositor's right to apply for his/her money is retained. However, the amount of resources returned at the request of depositors is much less than the total amount of unclaimed accounts in such funds.

II. Challenging Issues in Conducting Purchase and Assumption

In the international practice, the procedure for the transfer of assets and liabilities of an insolvent bank to the acquiring bank ("the P&A") is common as one of the methods of resolving an insolvent bank. According to the IADI glossary, a P&A transaction refers to an insolvency

resolution where a healthy bank or a group of investors assume some or all of the obligations and purchase some or all of the assets of the failed bank [8].

Competent authorities usually resort to the principle of the least-cost resolution of an insolvent bank that requires from the competent authority to use the method, which is least costly compared to all other methods for the competent authority, financial system or deposit insurance system in resolving insolvency, including liquidation of the failed bank [8].

There are six main types of P&A transactions (Table 6), which can also be combined with each other. The choice of P&A depends on the jurisdiction of the country and on the current economic conditions. For example, a loss share P&A is usually used during an overall market crisis when the value of assets remains uncertain [9].

Table 6

Types of P&A Transaction

No.	Type	Description
1.	Basic P&A	Only limited assets are purchased, usually cash and cash equivalents
2.	Whole Bank P&A	The whole portfolio of an insolvent bank is purchased "as it is" without any guarantees
3.	Loan Purchase P&A/Modified P&A	A loan portfolio of an insolvent bank is purchased in addition to cash and cash equivalents or a loan portfolio and a mortgage loan portfolio
4.	P&A with "Put" Option	With a view to encourage potential buyers, the resolution authority may provide a put option on some of the assets to be transferred for a certain period of time
5.	P&A with Asset Pools	An asset pool is purchased, and loans from an insolvent bank's portfolio are divided into individual pools of similar loans (for instance, loans in the same geographic location or loans with the same payment terms)
6.	Loss Share P&A	An acquirer and the resolution authority enter into the agreement to share any future losses on a defined set of assets. By limiting the risk for the acquirer, the resolution authority has an opportunity to attract more bidders for purchasing the bank's assets

Source: McGuire [10].

In Kazakhstan, the possibility of conducting a P&A at the legislative level appeared only in 2008. At the same time, Kazakhstan has rather little experience in conducting a P&A transaction: there was only one forced P&A transaction (between the "Kazinvestbank" JSC and the subsidiary of "Alfa Bank" JSC). Given such little experience, there were certain challenges such as the presence of arrests imposed by the government authorities on the property of the transferred bank; the continuity of mutual claims when the depositor and the creditor were one and the same entity; the transmission of data from the information system of one bank to the information system of the acquiring bank, and others [11].

Generally, due to the lack of huge experience in conducting P&A transactions among financial regulators of the Republic of Kazakhstan, it is rather difficult to measure the success or failure of a conducted P&A transaction. However, there is a necessary legal framework governing the P&A process.

In the world practice, a P&A transaction ranks second after liquidation, which indicates its popularity and common use in the toolkit for resolving problem banks [12]. Countries with the largest experience in conducting P&A transactions are shown in Table 7.

Table 7

Global Experience with P&A

Jurisdiction	Year of Foundation	P&A *(not involving a bridge bank[6])*	Number of Bridge Banks	Total
USA (FDIC)	1933	1 911	569	2 480

[6] An entity established to temporarily take over and maintain certain assets, liabilities and operations of a failed bank as part of the resolution process [13].

USA (NCUA)	1970	1 837	4	1 841
Japan (DICJ)	1971	179	3	182
Republic of Korea (KDIC)	1996	64	24	88
Chinese Taipei (CDIC)	1985	57	0	57
Poland (BFG)	1995	32	0	32

Source: IADI [12].

This type of transaction has a number of advantages, such as convenience for bank depositors, their uninterrupted service, minimization of the cost of resolutionprocedures and the absence of the need to reimburse depositors [12]. At the same time, there are certain challenges such as the lack of potential acquirer banks as well as the difficulty of assessing assets and liabilities within short timeframes. [12].

One of the factors hindering the conduct of a P&A transaction is the lack of potential acquirers due to a low quality of the problem bank's assets to be transferred. This factor impels to resort to additional incentive measures, which include financial support, loss-sharing agreements, the acquirer's right to adjust deposit rates, put options on certain assets, tax breaks, and guarantees and loans [12]. Due to the fact that the insolvent bank's liabilities usually exceed its assets, the competent authority makes up for this difference. In most countries, including the Republic of Kazakhstan, this function is performed by the deposit insurer.

In addition, some countries conduct marketing activities that include exploringsales options, identifying the needs of potential bidders, as well as looking for possible support options to increase the number of potential buyers [12]. For example, in the Republic of Korea (KDIC), a company (accounting firm or securities firm) is selected for such purposes and plays the role of a sales manager and draws up a list of potential bidders, taking into account general market conditions and the state of the sector [12].

The second problem is the due diligence of the assets and liabilities of an insolvent bank. As a rule, the value of assets and liabilities can be quite volatile, which requires their regular revaluation. Countries that are more experienced in conducting P&A transactions (the Republic of Korea, USA) outsource specialists for due diligence, and the competent authority provides specific instructions for such hired specialists to follow [12]. Some countries provide an opportunity for potential acquirers to conduct due diligence themselves before starting the process, subject to the signing of a confidentiality agreement.

It is worth mentioning that countries using this resolution method most often have different incentive measures and often outsource external companies for due diligence and marketing efforts.

III. Faster Time for Commencement of Payouts

The commencement date for payouts is one of the most pressing issues in the system of deposit insurance. Most countries seek to shorten the commencement date of payouts in order to take into account the interest of depositors and ensure that they have access to their own money as soon as possible.

In Kazakhstan, one can see significant progress in this direction. From January 1, 2020, the commencement date for payouts is 35 working days from the date of the revocation of a member bank's license for conducting all banking operations. At the same time, before January 1, 2020, the payout of reimbursement began no later than 14 working days from the date of entry into force of the court's decision about the forced liquidation of a bank. Given that the entry into force of the court's decision may take several months due to possible appeals and lengthy timeframes of consideration of a case by the court, these changes enable to reduce the period for the commencement of payouts significantly.

It should be noted that 35 working days also include 20 working days for consideration of a P&A transaction, that is, the scenario of 35 working days is applicable only if it is necessary for the competent authority to approve the decision made by the temporary administration to conduct a P&A transaction. The commencement of reimbursement payouts to depositors in

practice occurs in a shorter period, unless the temporary administration decides to conduct a P&A transaction.

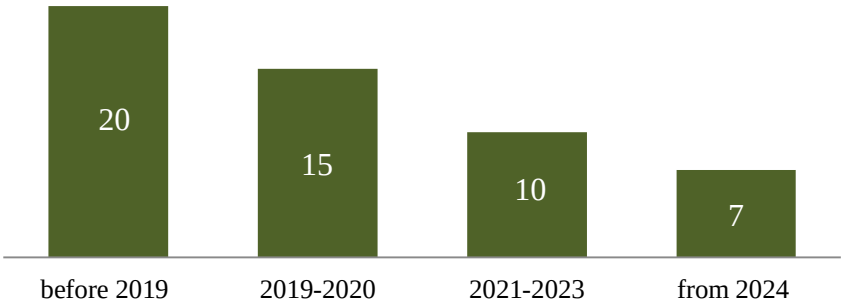
The recent payouts to the depositors of the "Tengri Bank" JSC, where only 8 working days had passed since the license had been revoked, serve as a vivid example of the shortening of the payout commencement date.

Despite a significant progress of the Republic of Kazakhstan in shortening the commencement period for payouts, the insurance system requires further improvement in order to comply with the IADI recommendations. According to the IADI Core Principles for Effective Deposit Insurance Systems (Principle 15 "Reimbursing Depositors"), a deposit insurer is able to reimburse most insured depositors within seven working days [13].

The European Union member countries have defined a transition period until 2024 (Figure 1) followed by a gradual shortening of the payout commencement date.

Figure 1

Transition Period in the EU Member Countries



Source: compiled by the authors on the basis of the data from the EU Directive on Deposit Guarantee Schemes [14].

At the same time, each EU country can determine its own internal timeframes independently. Some countries are transitioning to the recommended IADI standard at a time, while others are adopting a transitional period with a gradual shortening of the commencement date of payouts. For example, the Netherlands Bank has chosen to reach the 7-day commencement date for payouts by 2019 by making one-off changes, because making permanent changes to legislation within a short period of time is costly [15]. It also allows depositors to receive the guaranteed reimbursement in a shorter timeframe even before 2024. In addition to the Netherlands, out of the EU countries, Denmark and Norway moved to the 7-day commencement date for payouts.

An important factor in determining the commencement date for payouts is also the concept of an insured event itself since it is the occurrence of an insured event that is the starting point for the commencement of payouts. According to the European Union Directive on Deposit Guarantee Schemes, the fact of unavailability of deposits is considered an insured event. In most countries of the Eurasian Economic Union (EAEU)[7] the revocation of a bank's license for conducting all banking operations is regarded as an insured event.

IV. Other Problems of Deposit Insurers

Moral hazard. In the presence of a deposit insurance system, potential risks both from the side of depositors and from the side of banks increase. Thus, banks tend to take significant risks, and depositors do not monitor the financial position of banks. That is why the government guarantee usually covers the reimbursement amount within certain limits and not the full amount.

[7] Five countries are the EAEU members: Republic of Armenia, Republic of Belarus, Republic of Kazakhstan, Kyrgyz Republic, and the Russian Federation

According to the IADI Core Principles for Effective Deposit Insurance Systems, moral hazard is minimized through limited coverage, differential premiums, and timely intervention and insolvency resolution [13].

For example, in the Russian Federation there is a problem of "serial depositors". These are the people who deliberately deposit their money at maximum interest rates with unreliable banks due to their conviction in the insurance of their deposits. Moreover, the size of their deposits is within the insured amount. After the collapse of such bank, the depositor is usually directed to another bank with a high risk of default. At the same time, these facts do not contradict the legislation, since the number of requests for the payout by one depositor is not limited.

Mandates of deposit insurers. Mandates of deposit insurers can be divided into four categories (Table 8).

Table 8

Mandates of Deposit Insurers

Name	Powers
Pay box	reimbursement of insured deposits
Pay box plus	certain resolution functions (for example, providing financial support)
Loss minimiser	participation in the selection of a least costly way of resolution
Risk minimiser	risk assessment and management, full set of powers on early intervention and resolution and responsibilities in respect of prudential oversight

Source: IADI [13].

The KDIF does not take a direct participation in the resolution procedures and only acts as a subsidiary payer of the P&A transaction.

At the same time, since the beginning of 2020, the KDIF executive body has been a member of the Bank Resolution Committee of the Agency of the Republic of Kazakhstan for Regulation and Development of Financial Market[8], where recommendations for the problem bank resolutions are developed. Also, a bank classified as a bank with an unstable financial position is obliged to provide, at the request of the KDIF, information on deposits of individuals, and information on their obligations if the creditor and the debtor is one and the same entity.

In most countries (44% of 110 countries surveyed by the IADI), deposit insurers classify themselves as pay box plus [16]. However, it is difficult to speak about the connection between the mandate of the deposit insurer and the level of development of the country's economy. Rather, individual factors and characteristics of the financial system as a whole play an important role.

The consequences of the 2008 financial crisis allowed many deposit insurers to gain broader mandate and move from pay box to a mandate with greater powers, including the insolvency resolution functions [12].

Conclusion

In general, the deposit insurance system in Kazakhstan strives for the best practices and uses the best world standards such as differential premiums of member banks of the deposit insurance system, the formation of its own special reserve for the reimbursement, reduction of the period for commencement of payouts, etc. At the same time, the KDIF also uses in-house developments such as transferring unclaimed reimbursement to depositors' pension accounts.

The 2008 financial crisis forced us to reconsider the role of the deposit insurance system in the global financial safety net, and we can say that this crisis served as an impetus for its further improvement and development.

[8]The Committee is a corporate advisory Board of the Agency

Moreover, the current situation in the world related to the coronavirus infection has had a negative effect on the economic development of countries and the financial situation of ordinary people, which once again proves the essential role of the deposit insurance system in the global financial safety net.

Nevertheless, there are certain challenges faced by the global deposit insurance system. The ways of solving the problems of some countries are of particular interest. For instance, such an innovation as the creation of funds to manage unclaimed accounts can serve as an excellent example for other countries in solving the problem of unclaimed accounts. As for the insolvency resolution, the countries with rich experience in conducting P&A transactions as regards to incentives, marketing activities and outsourcing represent an interesting example. It is worth mentioning that the success in solving these problems depends not only on the choice of the solution itself but also on the specifics of the financial system in each individual country.

List of References

1. Pachkalov, A. (2020). The Day of (Loan) Judgment. The History of the First Bank Failure in Russia. www.finpronews.ru/ссудный-день-история-первого-в-россии/.

2. EUR-Lex (2020), https://eur-lex.europa.eu/.

3. Novik V., Makarov M., "Unclaimed Accounts of Individuals in the Banking System of Belarus", Bankauskiy Vestnik, May 2011.

4. "Kazakhstan Deposit Insurance Fund" JSC (2020), https://www.kdif.kz/likvidiruemye-banki/table/.

5. Bank of Canada (2020), https://www.bankofcanada.ca/unclaimed-balances/.

6. Reclaim Fund's Annual Report & Accounts 2019,https://www.reclaimfund.co.uk/financial-reports/.

7. Dormant Accounts Fund Annual Report 2019, https://www.gov.ie/en/collection/769773-dormant-accounts-fund-annual-action-plans-and-reports/.

8. IADI Glossary (2020), https://www.iadi.org/en/core-principles-and-research/publications/glossary/.

9. Patrizia Baudino, Ryan Defina, José María Fernández Real, Kumudini Hajra and Ruth Walters, Bank failure management—the role of deposit insurance, Bank for International Settlement, Financial Stability Institute, FSI Insights No 17, 2019.

10. McGuire, Claire L., Simple Tools to Assist in the Resolution of Troubled Bank, World Bank, Washington DC, 2012.

11. Kogulov B.B., "P&A as an Instrument of Problem Bank Resolutions in Kazakhstan", NBK's Economic Review No.2, 2018.

12. IADI (2019), Purchase and Assumption Research Paper.

13. IADI (2014), Core Principles for Effective Deposit Insurance Systems.

14. The European Union Directive on Deposit Guarantee Schemes of April 16, 2014 No. 2014/49/EC.

15. De Nederlandsche Bank (2017), Policy Rules for the Deposit Guarantee Scheme Consultation Paper, March 2017.

16. IADI Annual Survey 2019, https://www.iadi.org/en/core-principles-and-research/deposit-insurance-surveys/.

MODELING THE REAL EFFECTIVE EXCHANGE RATE OF UK ON THE BASIS OF THEORY OF BEER (BEHAVIORAL EQUILIBRIUM EXCHANGE RATE) USING VECM

Zhantuleuova A.K. – Chief Specialist-Analyst, Monetary Policy Division, Monetary Policy Department, National Bank of the Republic of Kazakhstan.

Обменный курс, или, точнее, покупательная способность национальной валюты, играет решающую роль в благосостоянии нации. Вот почему на его динамике сфокусировано внимание большинства экономистов. Существуют различные способы и попытки разработать модель, способную объяснить колебания и, возможно, помочь предсказать их будущую динамику. Модель BEER – одна из них.

Ключевые слова: реальный эффективный обменный курс, модель поведенческого обменного курса, VECM (модель коррекции векторной ошибки)

Классификация JEL: C32, E37, F31, F41

Айырбастау бағамы, дәлірек айтсақ ұлттық валютаның сатып алу қабілеті ұлттың әл-ауқатында шешуші рөл атқарады. Сондықтан көптеген экономистердің назары оның динамикасына бағытталған. Ауытқуыны түсіндіретін және, мүмкін, олардың болашақ динамикасын болжауға көмектесетін модель жасаудың әртүрлі тәсілдері мен әрекеттері бар. BEER моделі – солардың бірі.

Негізгі сөздер: нақты тиімді айырбас бағамы, мінез-құлық айырбастау бағамы моделі, VECM (векторы қателерді түзету моделі)

JEL жіктемесі: C32, E37, F31, F41

The exchange rate, or precisely the purchasing power of the national currency, plays a crucial role in the well-being of the nation. That is why the dynamic of it is one of the main focus of majority economists. There are various ways and attempts to develop the model that are capable to explain the fluctuations and possible help to predict its future dynamics. BEER model is one of them.

Keywords: real effective exchange rate, BEER model, VECM

JEL Classification: C32, E37, F31, F41

Abstract

The paper demonstrates the VECM model built on the basis of the BEER (behavioral equilibrium exchange rate) model first introduced by Peter B. Clark ad Ronald MacDonald in the working paper of International Monetary Fund in 1998. The purpose of the model is to explain the behavior of the exchange rate by considering the origins of cyclical and temporary movements of the real exchange rate and the fundamental factors that causes the fluctuations. The basis of the model, which is introduced in this paper, are the uncovered interest rate parity and the difference between the foreign and domestic price levels. In the original version of the model Clark and MacDonald (1998) assumed three long-run determinant variables, namely terms of trade (tot), Balassa-Samuelson effect, i.e. the relative price of non-traded to traded goods (tnt), and net foreign asset. The original model was adjusted to fit the economy of UK.

Data and their stochastic properties

This model includes all the variables mentioned in the original BEER model. Six variables were included to explain the fluctuations of the real effective exchange rate: price differential (price difference between the domestic (UK) and foreign (USA) countries, interest rate differential (difference between

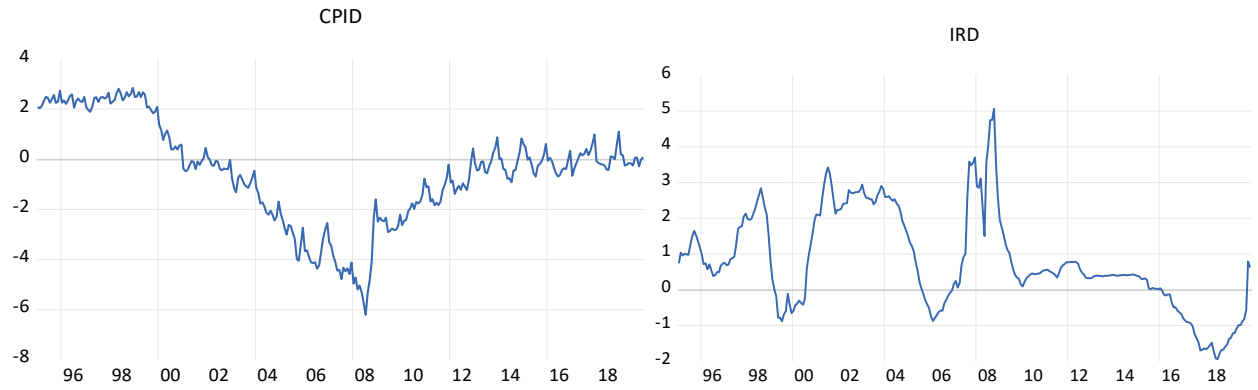
interbank rates of domestic and foreign countries), time-varying risk premium component (the ratio of national debt to the foreign national debt), productivity, net foreign assets and terms of trade (ratio of export to import). The individual data in levels is illustrated in Graph 1.

- Real Effective Exchange Rate – the weighted averages of bilateral exchange rates adjusted by relative consumer prices. Upwards trend – appreciation of the national currency (i.e. British pound).
- Price differential – if the domestic country's relative price level is higher relative to other countries, it makes the domestic goods more expensive, which eventually decreases the export from the domestic country since imported goods are cheaper. This leads to a decrease in the demand for the foreign currency, and therefore a depreciation of the national currency.
- Real interest differential – this is the difference between the real interbank rate of a domestic country and that of the foreign country. Higher interest rates in the domestic country offer lenders in an economy a higher return relative to other countries, which attracts the foreign capital and causes appreciation of the national currency. In case of the opposite scenario when the foreign country increases their interest rates, the national currency depreciates due to the foreign capital outflow.
- Risk premium component – the ratio of national debt to the foreign national debt. Higher national debt can increase the uncertainty and limit the value of its currency. Traditionally if the market predicts the increase of the government debt the investors sell their securities (i.e. bonds) in the open market causing the foreign currency outflow. As a result, a decrease in the value of its exchange rate will follow
- Productivity – GDP Per capita – higher GDP implies either higher export, investment, or government expenditure, which means that there is either a high demand for the national economy or a higher foreign capital inflow. As it was mentioned earlier, both of them lead to the appreciation of the national currency.
- Net foreign assets can also cause the changes in exchange rate, since chronic current account deficits can prove unsustainable over time.
- Terms of trade is defined as the ratio of the domestic export unit value to the import unit value relative to the equivalent effective foreign ratio. Higher export leads to the higher foreign currency inflow; lower import fosters the lower foreign capital outflow. These two factors can be a reason for the appreciation of the national currency.

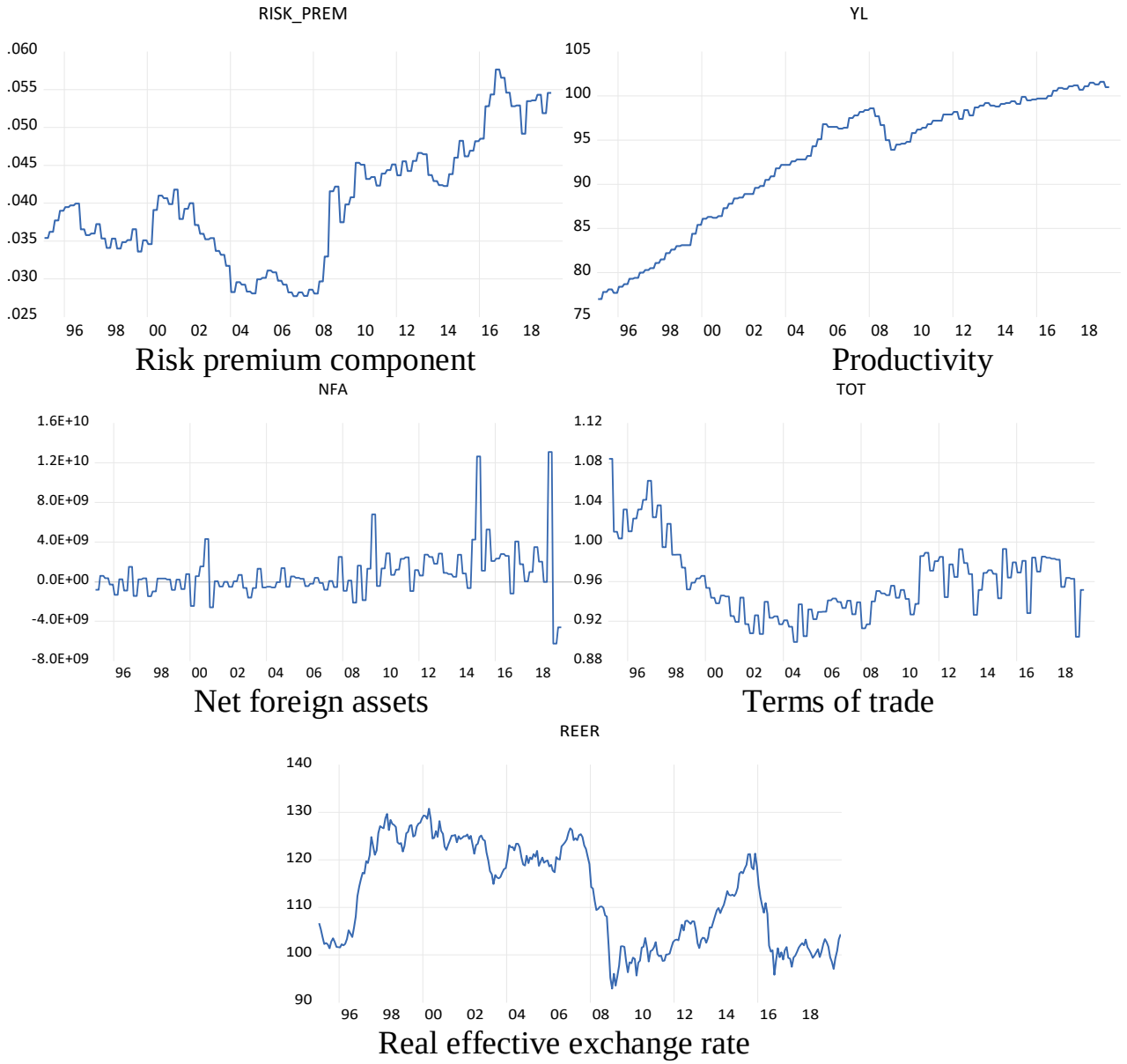
The data is quarterly from 1975 to first half of 2019 and was retrieved from FRED, Federal Reserve Bank of St. Louis, and OECD database. The original data can be represented as the graphs on the real values of variables as following:

Graph 1

Variables included in the model



Price differential Interbank rate differential



Source: Author's calculations

Model

The model was built using the VECM due to the presence of one cointegration equation. The Johansen cointegration test was conducted based on the result of the lag selection criteria. As the result the VECM was specified with only one lag and one cointegrated relationship.

Original BEER model:

$$q = f\left((r - r^*), tot, tnt, nfa, \left(\frac{Gdebt}{Gdebt^*}\right)\right)$$

Modified BEER model:

$$q = f((r - r^*), (p - p^*), tot, nfa, \left(\frac{GDP}{LF}\right), \left(\frac{Gdebt}{Gdebt^*}\right))$$

where $r - r^*$ is an interbank differential (IRD), $p - p^*$ is price differential (CPID), nfa – net foreign assets, tot – terms of trade, $\frac{GDP}{LF}$ is productivity (YL) and $\frac{Gdebt}{Gdebt^*}$ is a time-varying risk premium.

All the variables were checked for the unit root. Those that appeared to be non-stationary were verified to be integrated of order 1. Only nonstationary variables were considered during the Johansen test to correctly identify the number of cointegration equations. However, both stationary and nonstationary were included in the final model imposing the corresponding restrictions.

Estimation

Due to the lag order selection criteria and the Johansen cointegration test results, VECM was specified with 1 lag.

Deterministic components: option 3 (intercept, no trend in CE and VAR)

Number of cointegrated relationships: 1

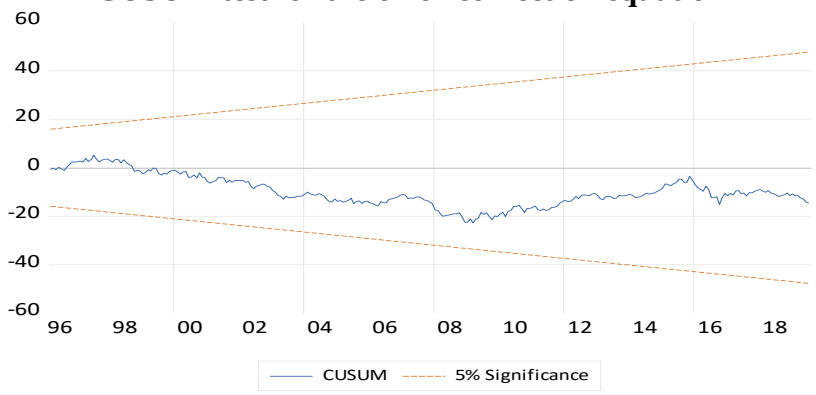
The unrestricted and restricted VECM are illustrated in Appendix A.

The restrictions were imposed due to the stationarity of NFA and IRD:

B(1,1)=1, A(3,1)=0, A(6,1)=0

Graph 2

CUSUM test for the error correction equation



Source: Author's calculations

Stability of the model was tested by CUSUM test. If plots of CUSUM statistics stay within critical bounds of 5 % significance level, the null hypothesis of coefficients' stability in the error correction model cannot be rejected, which is demonstrated in graph 2. Also it was verified that there is no serial correlation between residuals.

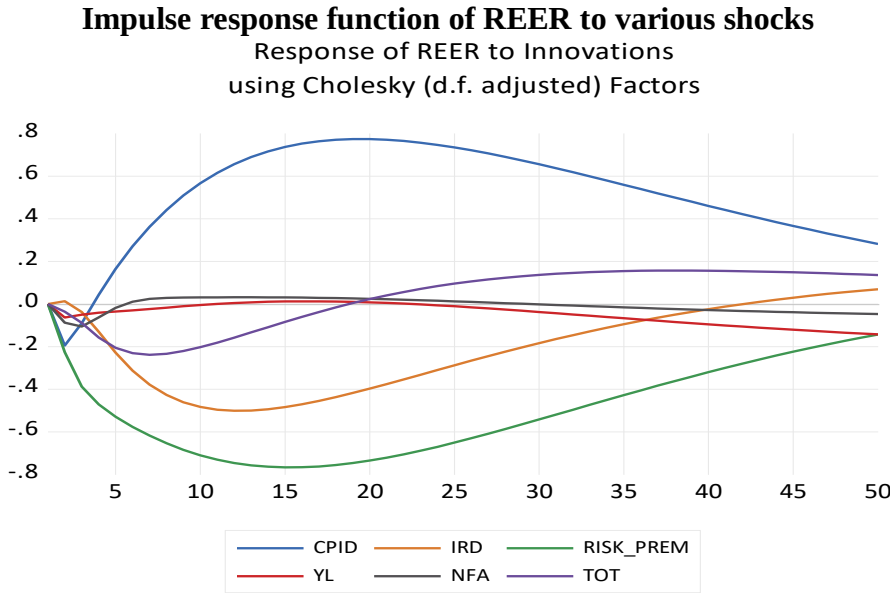
Impulse response function of reer

The response of REER to various shocks is shown in the graph 3. It shows the response that lasts for 50 periods to see the long run behavior.

The impulse response function focuses on short-run adjustment back to long-run equilibrium, which can be verified by the graph below. It also can be seen from the graph that the real effective exchange rate is more sensitive to the shocks in the price differential (price difference between the domestic (UK) and foreign (USA) countries), the risk premium (the ratio of national debt to the foreign national debt) and in smaller extent to the interest rate differential (difference between interbank rates of domestic and foreign countries).

The response of the REER dynamics after the shocks is a long process. For example, the expected appreciation of the national currency after the shock in the interest rate differential takes place only after 35 periods, after the shock in terms of trade – 20 periods. It is interesting to observe that the expected depreciation to the shock in the price level happens only after a significant appreciation for about 18 periods with an initial reaction of depreciation. This matter should be researched further.

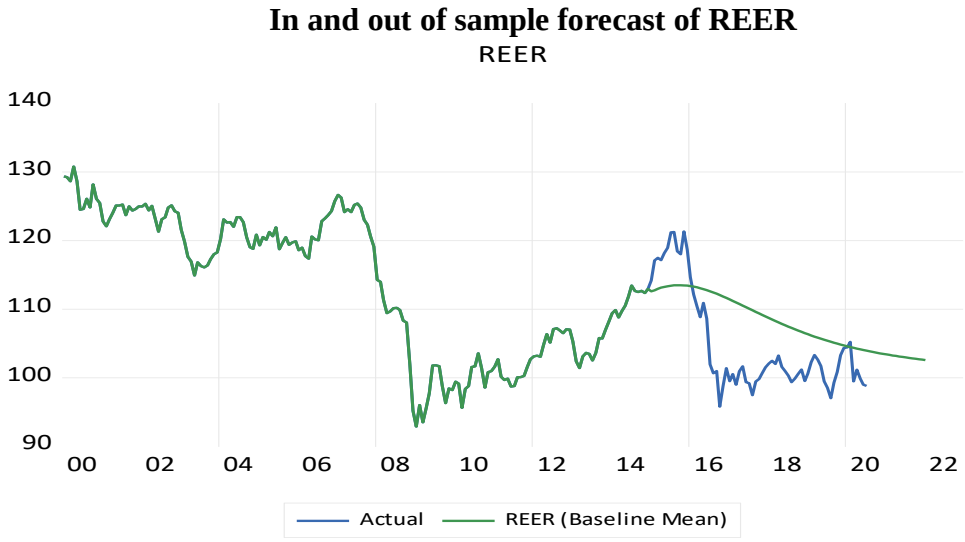
Graph 3



Source: Author's calculations

Forecast

Graph 4



Source: Author's calculations

In sample forecast of the REER dynamics corresponds to the actual trends. However, the forecast out of sample shows that the depreciation trend is not over yet and the national currency is still overvalued.

The following graph was extracted from the FRED database using the data collected by Bank for International Settlements to see the dynamics of 2020 since the model includes the data only until mid-2019. As it can be seen from the graph, it corresponds to the forecasted dynamics.

Graph 5

Dynamics of real narrow effective exchange rate forUnited Kingdom

Source: Bank for International Settlements, Real Narrow Effective Exchange Rate for UK

Conclusion

This paper is based on UK data set, which has been compiled for the period from 1995 to the July of 2020. The selection of the main determinants of the pound real effective exchange rate follows the most relevant theoretical assumptions. This model consists of the effects of price and interest rate differentials, risk premium represented as the ratio of domestic government expenditure to that of foreign, net foreign assets, terms of trade (ratio of export to import), and productivity.

Based on the Johansen cointegration test results, VECM was built. To enhance the model few adjustment restrictions were introduced. These restrictions were based on the fact that the stationary variables cannot be cointegrated. The rest of the variables, which are nonstationary, were included in the model as significant. The resulting model turned out to be sound and stable.

The impulse response function of REER to the rest of the variables was built to demonstrate the behavior of the exchange rate dynamics when different shocks were introduced. Most importantly it was verified that the expected reaction takes place with a significant delay, which confirms the significance of the sound monetary policy forecasting prior to making decisions. It was also shown that the exchange rate dynamics is most sensitive to the shock of price level and the level of interest rates in the domestic or foreign economies.

While the in sample forecast showed not precisely consistent results in comparison to the actual data, it still was in compliance with the actual dynamics. Out of sample forecast showed that in spite of the prolonged depreciation, the British pound remains overvalued and further depreciation should be expected.

References:

1. B. Clark, Peter, and Ronald MacDonald. “Exchange Rates and Economic Fundamentals: A Methodological Comparison of BEERs and FEERs.” IMF Working Paper, 1998. IMF, www.imf.org/external/pubs/ft/wp/wp9867.pdf.

2. Bank of England, Consumer Price Index in the United Kingdom [CPIUKQ], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CPIUKQ.

3. Bank for International Settlements, Real Narrow Effective Exchange Rate for United Kingdom [RNGBBIS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/RNGBBIS, September 15, 2020.

4. Organization for Economic Co-operation and Development, Consumer Price Index: All Items for the United States [USACPIALLMINMEI], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/USACPIALLMINMEI, September 15, 2020.

5. Organization for Economic Co-operation and Development, 3-Month or 90-day Rates and Yields: Interbank Rates for the United Kingdom [IR3TIB01GBM156N], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/IR3TIB01GBM156N, September 15, 2020.

6. Organization for Economic Co-operation and Development, 3-Month or 90-day Rates and Yields: Interbank Rates for the United States [IR3TIB01USM156N], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/IR3TIB01USM156N, September 15, 2020.

7. Organization for Economic Co-operation and Development, US Dollar to National Currency Spot Exchange Rate for the United Kingdom [CCUSSP01GBQ650N], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CCUSSP01GBQ650N, September 14, 2020.

8. Bank for International Settlements, Real Narrow Effective Exchange Rate for United Kingdom [RNGBBIS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/RNGBBIS, November 1, 2020.

Appendix

Unrestricted VECM:

Vector Error Correction Estimates
Date: 10/01/20 Time: 05:23
Sample (adjusted): 1995M03 2019M06
Included observations: 292 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
REER(-1)	1.000000
CPID(-1)	-7.813881 (2.82587) [-2.76512]
IRD(-1)	5.566734 (2.50785) [2.21973]
RISK_PREM(-1)	2435.772 (657.183) [3.70639]
YL(-1)	0.734913 (0.91402) [0.80405]
NFA(-1)	-1.05E-08 (1.2E-09) [-8.50338]
TOT(-1)	394.1119 (101.210) [3.89401]
C	-657.0469

Error Correction:	D(REER)	D(CPID)	D(IRD)	D(RISK_PREM)	D(YL)	D(NFA)	D(TOT)
CointEq1	-0.004516 (0.00412) [-1.09655]	0.002521 (0.00084) [2.98496]	0.000209 (0.00063) [0.33349]	6.19E-06 (2.9E-06) [2.15979]	-0.002348 (0.00078) [-3.02085]	37614993 (4508346) [8.34341]	-2.30E-05 (3.3E-05) [-0.70526]
D(REER(-1))	0.154170 (0.05955) [2.58886]	-0.002359 (0.01222) [-0.19309]	0.013987 (0.00904) [1.54686]	-2.75E-05 (4.1E-05) [-0.66291]	0.015790 (0.01124) [1.40473]	1.56E+08 (6.5E+07) [2.38652]	0.000198 (0.00047) [0.41844]
D(CPID(-1))	-0.780477 (0.28922) [-2.69859]	-0.011193 (0.05933) [-0.18868]	-0.078627 (0.04392) [-1.79043]	-0.000125 (0.00020) [-0.62311]	-0.036535 (0.05459) [-0.66925]	-2.53E+08 (3.2E+08) [-0.79784]	-0.002495 (0.00229) [-1.08790]
D(IRD(-1))	-0.093354 (0.36675) [-0.25454]	-0.018947 (0.07523) [-0.25186]	0.338645 (0.05569) [6.08108]	0.000106 (0.00026) [0.41590]	-0.051205 (0.06923) [-0.73969]	-5.75E+08 (4.0E+08) [-1.43267]	0.003267 (0.00291) [1.12318]

D(RISK_PREM(-1))	-159.0221	44.72290	-30.70594	-0.025220	1.673670	-5.37E+10	0.168744
	(90.3856)	(18.5402)	(13.7244)	(0.06293)	(17.0605)	(9.9E+10)	(0.71686)
	[-1.75937]	[2.41221]	[-2.23733]	[-0.40075]	[0.09810]	[-0.54234]	[0.23539]
D(YL(-1))	-0.150816	0.002323	0.069062	-5.64E-05	-0.088658	2.19E+08	-0.000154
	(0.32423)	(0.06651)	(0.04923)	(0.00023)	(0.06120)	(3.5E+08)	(0.00257)
	[-0.46516]	[0.03493]	[1.40281]	[-0.24997]	[-1.44869]	[0.61801]	[-0.05980]
D(NFA(-1))	-6.88E-11	2.32E-11	2.52E-12	3.92E-14	-1.52E-11	0.197591	-1.04E-13
	(5.6E-11)	(1.1E-11)	(8.4E-12)	(3.9E-14)	(1.0E-11)	(0.06081)	(4.4E-13)
	[-1.23796]	[2.03973]	[0.29911]	[1.01257]	[-1.44553]	[3.24942]	[-0.23624]
D(TOT(-1))	-1.046934	-1.978704	-0.806716	-0.001770	0.911280	-1.15E+10	0.002476
	(7.57465)	(1.55374)	(1.15015)	(0.00527)	(1.42973)	(8.3E+09)	(0.06008)
	[-0.13822]	[-1.27351]	[-0.70140]	[-0.33559]	[0.63738]	[-1.38647]	[0.04121]
C	-0.002798	-0.011510	-0.009184	7.08E-05	0.089254	-33024540	-0.000448
	(0.10211)	(0.02095)	(0.01551)	(7.1E-05)	(0.01927)	(1.1E+08)	(0.00081)
	[-0.02740]	[-0.54949]	[-0.59229]	[0.99641]	[4.63070]	[-0.29541]	[-0.55284]
R-squared	0.075075	0.066833	0.180746	0.021403	0.047088	0.209346	0.011477
Adj. R-squared	0.048929	0.040454	0.157587	-0.006260	0.020150	0.186996	-0.016467
Sum sq. resids	794.5703	33.43198	18.31968	0.000385	28.30855	9.52E+20	0.049981
S.E. equation	1.675610	0.343707	0.254428	0.001167	0.316276	1.83E+09	0.013289
F-statistic	2.871350	2.533547	7.804531	0.773695	1.748035	9.366466	0.410718
Log likelihood	-560.4830	-97.91291	-10.08849	1562.290	-73.62591	-6638.119	851.9092
Akaike AIC	3.900569	0.732280	0.130743	-10.63897	0.565931	45.52821	-5.773351
Schwarz SC	4.013893	0.845605	0.244068	-10.52565	0.679255	45.64154	-5.660026
Mean dependent	-0.020308	-0.007545	-0.006931	6.56E-05	0.082192	-12976027	-0.000454
S.D. dependent	1.718171	0.350877	0.277206	0.001163	0.319511	2.03E+09	0.013181

Determinant resid covariance (dof adj.)	1377123.
Determinant resid covariance	1106109.
Log likelihood	-4932.099
Akaike information criterion	34.26095
Schwarz criterion	35.14236
Number of coefficients	70

Restricted VECM:

Vector Error Correction Estimates
Date: 10/09/20 Time: 09:58
Sample (adjusted): 1995M03 2019M06
Included observations: 292 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegration Restrictions:
B(1,1)=1, A(3,1)=0, A(6,1)=0
Convergence achieved after 45 iterations.
Restrictions identify all cointegrating vectors
LR test for binding restrictions (rank = 1):
Chi-square(2) 22.45740
Probability 0.000013

Cointegrating Eq:	CointEq1
REER(-1)	1.000000
CPID(-1)	-9.838747 (1.50228) [-6.54923]
IRD(-1)	4.607976 (1.33321) [3.45631]
RISK_PREM(-1)	2311.961 (349.368) [6.61756]
YL(-1)	-0.916716 (0.48590) [-1.88662]
NFA(-1)	-4.30E-10 (6.6E-10) [-0.65345]
TOT(-1)	313.3937 (53.8046) [5.82466]
C	-429.4916

Error Correction:	D(REER)	D(CPID)	D(IRD)	D(RISK_PREM)	D(YL)	D(NFA)	D(TOT)
CointEq1	-0.035425 (0.00890) [-3.98134]	0.008869 (0.00185) [4.80674]	0.000000 (0.00000) [NA]	4.79E-06 (6.3E-06) [0.75540]	-0.003406 (0.00174) [-1.95848]	0.000000 (0.00000) [NA]	-0.000226 (7.3E-05) [-3.11163]
D(REER(-1))	0.124670 (0.05904) [2.11165]	0.005291 (0.01204) [0.43927]	0.015173 (0.00913) [1.66183]	-2.39E-05 (4.2E-05) [-0.56589]	0.013294 (0.01145) [1.16058]	1.50E+08 (7.3E+07) [2.05124]	-7.25E-06 (0.00047) [-0.01541]
D(CPID(-1))	-0.782167 (0.28346)	-0.013515 (0.05782)	-0.078614 (0.04384)	-0.000137 (0.00020)	-0.032660 (0.05500)	-3.31E+08 (3.5E+08)	-0.002524 (0.00226)

	[-2.75937]	[-0.23372]	[-1.79332]	[-0.67543]	[-0.59385]	[-0.94080]	[-1.11771]
D(IRD(-1))	0.193162	-0.084407	0.327303	0.000108	-0.039826	-2.75E+08	0.005311
	(0.36900)	(0.07527)	(0.05707)	(0.00026)	(0.07159)	(4.6E+08)	(0.00294)
	[0.52348]	[-1.12132]	[5.73551]	[0.40950]	[-0.55628]	[-0.59873]	[1.80666]
D(RISK_PREM(-1))	-101.4983	31.49800	-32.98474	-0.025212	4.078601	4.36E+09	0.578676
	(90.1783)	(18.3961)	(13.9462)	(0.06443)	(17.4966)	(1.1E+11)	(0.71847)
	[-1.12553]	[1.71221]	[-2.36514]	[-0.39129]	[0.23311]	[0.03888]	[0.80543]
D(YL(-1))	-0.256479	0.024409	0.073204	-6.57E-05	-0.089863	50062091	-0.000920
	(0.31917)	(0.06511)	(0.04936)	(0.00023)	(0.06193)	(4.0E+08)	(0.00254)
	[-0.80359]	[0.37489]	[1.48307]	[-0.28792]	[-1.45115]	[0.12623]	[-0.36193]
D(NFA(-1))	-4.93E-11	1.09E-11	1.59E-12	6.24E-15	-2.86E-12	-0.006965	-1.40E-14
	(5.0E-11)	(1.0E-11)	(7.7E-12)	(3.6E-14)	(9.7E-12)	(0.06181)	(4.0E-13)
	[-0.99108]	[1.07215]	[0.20722]	[0.17549]	[-0.29654]	[-0.11268]	[-0.03535]
D(TOT(-1))	3.698451	-2.945707	-0.992226	-0.001252	0.929194	-3.19E+09	0.037057
	(7.52835)	(1.53576)	(1.16427)	(0.00538)	(1.46067)	(9.4E+09)	(0.05998)
	[0.49127]	[-1.91808]	[-0.85223]	[-0.23268]	[0.63614]	[-0.34060]	[0.61782]
C	0.005791	-0.013352	-0.009521	7.14E-05	0.089421	-20616824	-0.000386
	(0.10015)	(0.02043)	(0.01549)	(7.2E-05)	(0.01943)	(1.2E+08)	(0.00080)
	[0.05782]	[-0.65354]	[-0.61471]	[0.99771]	[4.60174]	[-0.16566]	[-0.48339]
R-squared	0.110757	0.112656	0.182938	0.009262	0.031973	0.020707	0.040942
Adj. R-squared	0.085619	0.087572	0.159841	-0.018745	0.004609	-0.006976	0.013830
Sum sq. resids	763.9176	31.79031	18.27067	0.000390	28.75755	1.18E+21	0.048491
S.E. equation	1.642971	0.335162	0.254088	0.001174	0.318774	2.04E+09	0.013090
F-statistic	4.406011	4.491169	7.920365	0.330703	1.168416	0.748007	1.510140
Log likelihood	-554.7391	-90.56159	-9.697357	1560.490	-75.92346	-6669.359	856.3272
Akaike AIC	3.861227	0.681929	0.128064	-10.62664	0.581668	45.74218	-5.803611
Schwarz SC	3.974552	0.795253	0.241389	-10.51332	0.694992	45.85551	-5.690286
Mean dependent	-0.020308	-0.007545	-0.006931	6.56E-05	0.082192	-12976027	-0.000454
S.D. dependent	1.718171	0.350877	0.277206	0.001163	0.319511	2.03E+09	0.013181

Determinant resid covariance (dof adj.)	1473640.
Determinant resid covariance	1183631.
Log likelihood	-4943.327
Akaike information criterion	34.33786
Schwarz criterion	35.21927
Number of coefficients	70

THE ROLE OF CENTRAL BANK IN CASH CIRCULARTION: CUT BACK WITHOUT INCREASING OR INCREASE WITHOUT CUTBACK

Bektassova Zh.Zh. – Chief Specialist-Analyst, Division of Funds Analysis and Planning, Cash Circulation Department, National Bank of the Republic of Kazakhstan

The paper presents the results of an expert assessment of the existing and possible models of cash circulation. The models of the central bank's participation in cash circulation, the advantages /disadvantages of models and the experience of foreign countries in the implementation of decentralized models of cash circulation have been studied.

This study is the starting point in determining the prerequisites for reengineering of the existing model of cash circulation in the Republic of Kazakhstan.

Key Words: a centralized model, a partially decentralized model, a decentralized model, re-engineering, cash center

Classification JEL: E40, E42, E47, E49

Preamble

The dynamic development of the payment systems market, namely electronic means of payment, enables to view them as a possible alternative to cash but, despite the upward trend in the quantity of transactions conducted by using non-cash payments, there is no complete change in the payment preferences of consumers, especially in the current environment, namely during the spread of COVID-19.

As a result of quarantine measures announced in some countries, in March 2020 there was a change in attitudes towards the use of banknotes and a drop in the number of cash transactions around the world. However, despite the decrease in the number of cash transactions, in March 2020 the US Federal Reserve had faced a demand for cash that was 3-5 times higher than the volume of March 2019 [1]. A similar trend was observed in the Eurozone: banknotes in circulation increased by 10% [2]. The reason, according to the international non-governmental organization IACA (International Association of Currency Affairs), may be a higher level of consumer confidence in banknotes and uncertainty in the stability of financial institutions. [3]. An additional reason for the demand for cash, according to the head of the Bank of Canada, is the attempt by many companies to protect themselves from a drop in liquidity as a result of the financial crisis [4]. Such activity on the part of companies and individuals was previously noticed after the beginning of the financial crisis in 2008 [5].

Given all the trends and changes in the consumer behavior, the IACA suggests that cash will remain the main payment method for most of the world for the next 10-15 years [6].

The dominant position of cash in the structure of payment instruments is explained by its advantage over other means of payment:

1) anonymity of use;
2) acceptance for payments as a legal tender under any conditions;
3) instant settlement;
4) no need in a special and online technology infrastructure;
5) easy to use by all users, irrespective of their age category.

As the European Central Bank reports, about 75% of consumer transactions in the Eurozone are conducted with cash, in particular among citizens over the age of 55 [7].

At the same time, according to projections of the Swiss company SIX regarding the future of cash, in the most probable scenario, digital payments will displace cash as a medium of exchange, at the same time, cash will be in demand and widely used as a store of value. Overall, the amount of cash will decline by 40-60%, due to a decrease in the volume of cash used as the means of payment. In this regard, special attention will be paid to improving efficiency, reducing costs and optimizing the infrastructure of cash circulation [8].

The experience of Sweden, a country with one of the highest rates of non-cash payments, shows that the policy of the Central Bank of Sweden in respect of cash is undergoing changes towards encouraging the use of cash to restore the infrastructure of cash circulation in connection with the risks of power outages, potential threats of cyber attacks [9].

Based on the opinions and surveys of foreign private and public institutions, it can be expected that cash in the foreseeable future will remain a key reliable instrument of payment for most participants in the global economy, effectively coexisting with non-cash forms of payments.

Thus, cash circulation remains the most important component of the country's economy, and its efficient organization is one of the important and urgent tasks for central banks. Consequently, central banks are interested in ensuring high quality of cash, efficient distribution of functions in the field of cash circulation and optimization of their expenses. In these conditions, one of the ways to improve the management of cash circulation is a partial or complete transfer of certain functions by the central bank to third organizations, that is, outsourcing.

Over the last decade, with the development of digitalization and automation, there have been significant changes in cash circulation (in cash handling technologies, cash storage, etc.). In many countries, new participants began to play an important role in the circulation of cash – companies specializing in storage, transportation and handling of cash[9] (hereinafter – CIT, cash in transit). The details of building a model for organizing and regulating cash circulation differ for each individual country, depending on the implemented strategy and communication between the central bank and participants of cash circulation. According to the Currency Research methodology[10], there are three main types of models of cash circulation – centralized, partially decentralized and decentralized [10].

The general trend in optimizing cash circulation is the gradual transition of central banks from rigid centralization of cash circulation to the use of a decentralized model, which shows the desire of central banks to cut back their costs by reducing the extent of their involvement in the current cycle of money circulation by transferring functions to the commercial sector [11]. Its advantages lie in a clear organization of cash flows, the increased speed of banknote handling as well as high economic efficiency. However, this model also contains certain risks associated with reliability of counterparties.

This paper is devoted to the study of foreign models of cash circulation and determination of the presence of presumptions for a change in the current model of cash circulation in Kazakhstan. The theoretical and methodological basis of the study included academic papers and practical work of foreign researchers, experts in the field of organization of cash circulation.

[9] Cash handling includes counting, sorting, cancellation, authentication and payment verification, packing and destruction of cash.

[10] Currency Research (CR) is an international organization that is a worldwide resource for knowledge about cash. CR has over 250 years of overall experience in handling cash and provides professional advice and research for government and business.

1. Methodological Research

According to the methodology of Currency Research, there are three main types of models of cash circulation – centralized, partially decentralized and decentralized, whereby the functions of the main participants of cash circulation differ depending on the degree of delegation of their functions by the central bank (Table 1).

Table 1

Key Models of a Central Bank's Participation in Cash Circulation

	Manufacturers of currency notes	Central Bank	The second-tier banks	CIT	Retailers
Classical/centralized model					
Cash manufacturing	×	*			
Cash storage and distribution		×			
Cash handling		×			
Cash destruction		×			
Partially decentralized model					
Cash manufacturing	×	*			
Cash storage and distribution		*	*	*	
Cash handling		*	*	*	*
Cash destruction		*			
Decentralized model					
Cash manufacturing	×				
Cash storage and distribution		*	*	×	
Cash handling		*	*	×	*
Cash destruction			×		

× main function

* ancillary function

Source: compiled by the author on the basis of Source [10].

The table for each of the models shows which of the partners is responsible for performing the basic functions inherent in the central bank.

Under the centralized (classical) model, the central bank exercises complete control over cash circulation. The central bank bears responsibility from the moment when cash is manufactured to its destruction.

It should be noted that cash manufacturing in the above three models is the main function of the manufacturers of banknotes, namely public or private banknote factories and mints.

A partially decentralized model refers to central banks that have started the reengineering process and transferred some of the functions of cash storage, distribution and handling to the commercial sector: either to the second-tier banks or organizations established specifically for cash distribution, handling and storage. The central bank retains partial control over the management of cash circulation in certain areas. At present, most countries in the world with different degrees of decentralization use this model. The degree of decentralization varies depending on the availability

of third-party organizations set up to distribute, handle and store cash, the central bank's policies and strategies, and costs and security issues.

In a decentralized model, the central bank outsources the bulk of its cash management functions and leaves the auxiliary function for storing, distributing and handling cash. The commercial sector handles cash in accordance with the established central bank standards and also accepts central bank cash for safekeeping. Custody involves keeping cash that belongs to the central bank in the vaults of second-tier banks or CIT companies. The main advantage of this type of storage is the availability of cash for large participants of cash circulation, and the disadvantage is a relative deterioration of the quality of banknotes in circulation [12]. The earliest examples of this kind of cooperation are the United Kingdom and Australia, which have been highly decentralized since the early 1990s, with the responsibility for handling banknotes transferred to the commercial sector. According to this model, the destruction of cash is carried out by the second-tier banks (for example, in Norway); however, most central banks do not resort to full outsourcing and, in particular, retain the cash destruction function.

The Bank of England introduced a fiduciary system in 1982 that evolved into a scheme called the NCS (Note Circulation Scheme) in 2001, with tighter central bank oversight. The NCS also regulates the distribution and handling of banknotes. Currently, the NCS members are National Westminster Bank, Post Office and two CIT companies (G4S Cash Solutions, Vaultex UK). Vaultex UK was established in 2007 as a joint venture between HSBC and Barclays. The NCS members can also receive banknotes from vaults of other members [13].

Currency Research conducted a study on the implementation of decentralized models of cash circulation in 11 countries and published indicators before and after reengineering of the cash circulation model broken down by country (Table 2). The key factor for reengineering of cash circulation in many central banks has been the intention of central banks to focus on their core functions [10].

Table 2

Performance Indicators before and after Reengineering of Cash Circulation Models, Broken Down by Countries

No.	Country	The number of central bank's cash centers		The number of machines for handling the central bank's banknotes		Operating staff numbers for cash handling at a central bank		% of handling of central bank's banknotes		Frequency rate of banknote return to the central bank (a year)		Quantity of forged notes (per a million of banknotes)	
1	Netherlands	10	1	8	6	150	100	100%	25%	3	1	(-)	(-)
2	New Zealand	3	1	7	1	75	6	80%	30%	8	0.3	11.5	3.5
3	Norway	10	1	12	1	390	18	(-)	95%	5.3	0.5	35	2
4	South African Republic	7	6	21	12	(-)	(-)	100%	35%	(-)	(-)	(-)	(-)
5	Sweden	14	2	(-)	4	(-)	15	100%	0%	(-)	(-)	(-)	3
6	Thailand	87	10	51	24	(-)	-30%	100%	0%	(-)	(-)	Low before and after	
7	The UK	7	2	10	3	(-)	66	100%	5%	(-)	1	(-)	(-)
8	Australia	7	2	21	4	36	17	100%	0%	5	0.08	(-)	(-)
9	Austria	8	1	21	1	42	2	100%	10%	3-4	1-2	2.2	3.7
10	Malaysia	12	6	16	0	883	218	100%	10%	(-)	1	(-)	(-)
11	Belgium	6	4	11	8	(-)	(-)	100%	100%	3	2	(-)	(-)

Note: compiled by the author on the basis of Source [8].

In most countries, reengineering of the cash circulation model has led to a change in the function of participants of cash circulation (the central bank is responsible for issuing and destroying banknotes, while the handling and storage of cash is carried out by commercial cash centers), a reduction in the branch network of the central bank, and, as a consequence, reduction of staff and cash register equipment of the central bank.

As the experience of foreign countries shows, the main disadvantage of this model is the deterioration of the condition of cash in circulation. In order to control the quality of cash, central banks are introducing various methods of assessing the banknote quality (regular quality checks of the sorting of banknotes by the commercial sector, provision of banknote samples for calibrating banknote sorters, population surveys, etc.) with appropriate measures of influence and encouragement [10].

2. The Existing Model of Cash Circulation in the Republic of Kazakhstan

According to the Currency Research methodology, the existing model of cash circulation in the Republic of Kazakhstan belongs to the centralized model type, where the National Bank bears full responsibility for the management of cash in the country from the moment of planning the manufacturing of banknotes and coins to their destruction, as well as for the timely provision of cash in required denominations to the economy.

Based on the experience of foreign countries and taking into account the specifics of cash circulation in the Republic of Kazakhstan (a relatively low population; large territory of the country; growth of cash in circulation; a high degree of the central bank's involvement in the management of cash circulation), the primary objectives of participants of cash circulation in the Republic of Kazakhstan have been determined. Compliance of the model with the below listed goals is the basis for effective cash circulation in the country (Table 3).

Currently, the second-tier banks are interested in outsourcing the function of cash handling and storage to CIT companies, which can become a prototype for commercial cash centers in future. At the same time, the regulatory framework of the Republic of Kazakhstan allows CIT companies to engage in recounting, sorting, packing, storing of banknotes, coins and valuables.

Thus, outsourcing of certain functions in dealing with cash by the second-tier banks may become the beginning of decentralization of cash circulation in the Republic of Kazakhstan, which in future will create the basis for outsourcing some functions of cash circulation of the National Bank of the Republic of Kazakhstan.

Table 3

Primary Objectives of Participants of Cash Circulation

National Bank of the Republic of Kazakhstan	The Second-Tier Banks	Cash Collection Companies	Clients (the Population)
1) timely and uninterrupted supply of banknotes and coins of the national currency of all denominations to the economic entities *2) ensuring a high quality level of banknotes in order to:* • *increase confidence in the*	*1) profit generation:* • *reduction of costs;* • *increasing effectiveness of operations;* • *automation of operations* *2) cash supply:* • *satisfying a regular and heightened demand for cash (seasonality, holidays, critical situations)*	*1) profit generation:* • *reduction of costs;* • *increasing effectiveness of operations;* • *automation of operations.* *2) ensuring the safeguarding of cash (storage,*	*1) any-time and any-place possibility to withdraw and use cash;* *2) a low service fee on operations with cash;* 3) personal safety during the cash service; 4) quality of cash.

national currency; • *fight counterfeiting;* • *make the cash handling process better automated* *3) ensure the safeguarding of cash (storage, transportation, disbursement/acceptance, handling, destruction)* 4) effectiveness: • speed of cash handling operations; • reducing costs on operations; • automation of operations	• *competitive advantages* • *attracting new clients* 3) ensuring the safeguarding of cash (storage, transportation, disbursement/acceptance, handling) *4)* ensuring a high quality level of banknotes; *5)* migration of traditional banking services related to the use of cash to a new digital format with the use of non-cash payments.	*transportation).*	
• *very important* • important			

Note: compiled by the author on the basis of peer review by the staff of the National Bank of the Republic of Kazakhstan and the Deutsche Bundesbank.

3. Conclusion

The key factors for reengineering of cash circulation in many foreign central banks had been:

– revising key functions of the central banks in the area of cash circulation;

– cutting back expenses associated with organization of cash circulation;

– focusing on the core central bank operations;

– automating the cash handling;

– the need in replacement/modernization of technological equipment;

– ensuring safety in delivering cash;

– optimizing the cash circulation cycle.

In general, according to the results of the study, representatives of Currency Research came to the following conclusions. Given the different levels of development, geographical conditions and socioeconomic characteristics of different countries, it is impossible to find a single, unique and suitable solution for everyone: each country will have different models of cash circulation, and the process of reorganization and development is iterative, repetitive, and it needs to be managed on a permanent and ongoing basis [10].

To date, there is an interest on the part of participants of cash circulation in the Republic of Kazakhstan in outsourcing and establishing commercial cash centers. At the same time, the legal framework of the Republic of Kazakhstan and the regulatory framework of the National Bank of the Republic of Kazakhstan in respect of cash collection activities provide for the possibility of transferring a part of the functions of organizing cash circulation to CIT companies.

In the long term, on the lines of international practice, cash circulation in the Republic of Kazakhstan can move to a decentralized model. Immediate optimization of the supply chain and improvement of the current model of cash circulation provide for the introduction of an appropriate technological infrastructure (automatic identification of packages with cash, electronic interchange of data between participants in the supply process, uniform criteria for machine sorting of banknotes, etc.).

Thus, there are prerequisites for reengineering the cash circulation model in the long term, which may change the functions of the National Bank in terms of participation in cash circulation. However, regardless of the implemented model of cash circulation, the National Bank will bear the

main responsibility from the cash manufacturing to its destruction as well as will perform a control and supervisory function in order to ensure the high quality of cash in circulation and to deter counterfeiting.

List of References:

1. Auer, R., Cornelli, G., & Frost, J. (2020, April 3). Covid-19, cash, and the future of payments (Publication).

2. COVID-19 and the Ups and Downs of Cash Demand (Rep.). (2020, June). .

3. The Impact of COVID-19 on Cash and Payments: A Confused Picture (Rep.). (2020, April). https://currencyaffairs.org/download/covid-19/Currency-News-The-Impact-of-Covid-19-on-Cash-Pmnts.-Expert-views-from-the-front-line-part-1.pdf.

4. Macklem, T. (2020, June 16). Opening Statement by Tiff Macklem Governor of the Bank of Canada Appearance before the House of Commons (Opening Statement). https://currencyaffairs.org/download/covid-19/Governor-Bank-of-Canada-Covid-Currency.pdf.

5. European Central Bank. (2020, April 28). Beyond monetary policy – protecting the continuity and safety of payments during the coronavirus crisis. https://www.ecb.europa.eu/press/blog/date/2020/html/ecb.blog200428~328d7ca065.en.html.

6. Protecting Cash, Safeguarding the Public Against COVID-19 – Part 1 (Rep.). (2020, May). https://currencyaffairs.org/download/covid-19/Currency-News-Covid-19-Supplement-Part-1.pdf.

7. Central Bank Survey (May 2020) (Rep.). (2020, May). https://currencyaffairs.org/download/covid-19/BIN_DScholz_Webinar-Currency-Research-result-of-Central-Bank-survey.pdf.

8. SIX, Future of Money, 2019. https://www.six-group.com/en/company/innovation/research-reports/picture-of-the-future-money.html.

9. If crisis or war comes, Important information for the population of Sweden, 2018. https://www.dinsakerhet.se/siteassets/dinsakerhet.se/broschyren-om-krisen-eller-kriget-kommer/om-krisen-eller-kriget-kommer---engelska-2.pdf.

10. Currency Research. Re-engineering currency circulation: An international study of cash handling models, 2015.

11. Ionov V.M. Reorganization of Cash Circulation: International Experience, 2014, p. 39-43.

12. Titov R. Outsourcing the Central Bank Functions in the Sphere of Cash Circulation, National Bank of the Republic of Belarus, 2014.

13. https://www.bankofengland.co.uk/banknotes/note-circulation-scheme#.

14. Europe Cash Cycle Seminar, Special report, 2019.

15. European Payments Council. Improving the efficiency of the handling of cash - Cash Cycle Models, 2013.

16. European Payments Council. Improving the Efficiency of the Handling of Cash – Recirculation Paper, 2019.

17. G+D Currency Technology, Dividing up the Cash Cycle Cake, 2020.