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Assessing Capital Adequacy of the Kazakh Banking Sector using the Gaussian Credit Risk Model

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This paper demonstrates a methodology for measuring the credit risk in the loan portfolio of the banking system with due regard to the effects of diversification. This methodology is an analytical approach based on Monte Carlo simulations, which enables assessing the capital adequacy of the banking system and individual banks to cover credit risk. Default correlations between individual sub-portfolios were modeled using the Gaussian copula method; traditional risk measures such as Value at Risk (VaR) and Unexpected Loss (UL) were calculated to assess credit risk. For this purpose, credit registry data were used for the period from 2014 to 2023. The loan portfolio of banks was divided into 6 sub-portfolios, with 3 sub-portfolios for retail and corporate loans. The results of the analysis showed that the Kazakh banking sector has a sufficient capital buffer to absorb unexpected credit losses.

1. Preamble

Credit risk is the failure of a counter-party or debtor to fulfill their obligations. For a bank, issuing a loan is associated with the expectation of receiving income, while credit risk for a bank is considered to be the deviation of the actual outcome from the expected one. Risk management involves assessing the possible volume of losses in the event of counter-parties failing to fulfill their obligations (Bellini, 2016). To do this, it is necessary to calculate the distribution of losses for the loan portfolio, with the main objective being to calculate unfavorable deviations from the expected result. Figure 1 illustrates an example of the distribution of bank losses.

The X axis shows the amount of losses in the event of borrower default, and the Y axis shows the frequency of possible losses. Each amount of loss corresponds to a certain frequency of their occurrence. The average expected loss, denoted as EL (Expected Loss), is the main initial value for determining the price of credit risk, since expected losses are included in the price of financial instruments as a risk premium. Value at Risk (VaR) is a measure of the tail of the distribution and is calculated as the amount of loss at a selected confidence interval, this indicator is used to estimate extreme and worst-case losses for a bank (Bolder, 2018). For example, at a confidence interval of 99%, a bank's losses will exceed VaR only in 1% of cases. The difference between VaR and EL is called Unexpected Loss (UL), or economic capital. The idea is that a bank needs to allocate certain reserves to absorb unexpected losses in unfavorable situations. Due to the fact that these reserves cannot be used to originate other loans and make a profit, calculating economic capital is of great importance for formulating a bank's business strategy. Financial regulators, for their part, are also interested in ensuring that banking institutions have a sufficient capital buffer to cover external shocks.

Figure 1

Loan loss distribution
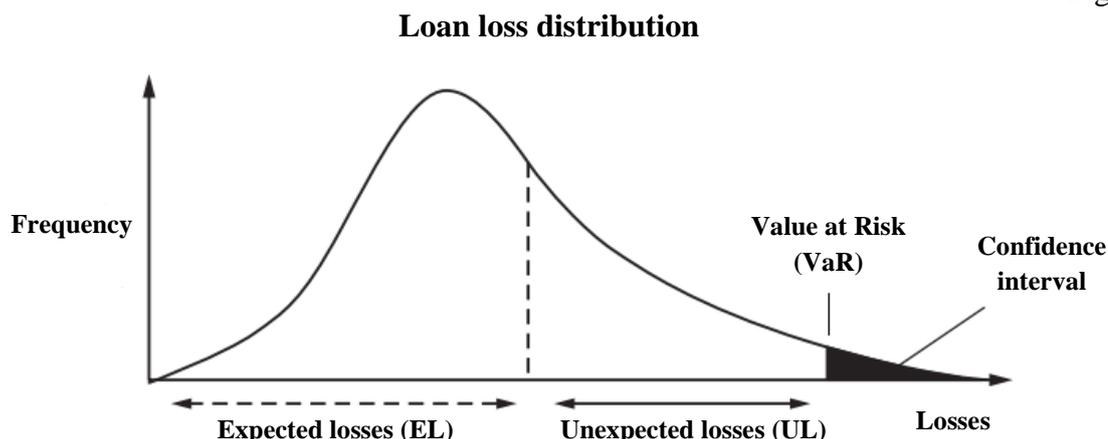
Source: Bellini (2016).

The loan loss distribution is calculated using Monte Carlo simulations as the product of the default $I_{D,i}$, indicator, the debt at risk EAD_i and the default fraction given default LGD_i for all loans i and simulations g (Bellini, 2016):

$$LOSS_g = \sum_{i=1}^{n} I_{D,i} * EAD_i * LGD_i$$

The default indicator, in turn, is a binomial variable that takes the value of 1 in the event of a borrower default, and the value of 0 otherwise.

The structure of this paper is as follows. Section 2 reviews the relevant literature. Section 3 describes the methodology of the credit risk model. Section 4 describes the data used for the study, and briefly presents additional indicators of the credit register that can be used to assess the dynamics of the status of each loan. Section 5 presents the results of the exercise and an assessment of capital adequacy of the banking system, and Section 6 summarizes the results.

2. Literature Review

Structural models of credit risks are widely used in the international practice, where the probability of a company's default is calculated based on the value of its assets and liabilities. The basic idea is that a company is recognized as defaulting if the total value of its assets is less than the company's debt. One of the first models of this type is the Merton model (Merton, 1974), which is based on the premise that the price of a company's assets follows geometric Brownian motion, and default occurs when the value of the company's assets falls below a certain threshold. The key equation of the Merton model is the probability of default (PD), which can be expressed as a function of the value of the company's assets, the amount of the company's debt, the interest rate volatility, and other parameters.

In the years to follow, many modifications and improvements to Merton's work have been proposed. Vasicek (1991, 2002) in his works, using Merton's credit risk model as a basis, showed that the distribution of aggregate losses of a large loan portfolio with a large number of borrowers and homogeneous loans can be described by the inverse Gaussian distribution function. The convenience of Vasicek model is that it allows calculating the distribution of credit losses in a closed analytical form without the use of simulations and obtaining quick results. This approach is also often called the asymptotic risk factor model (ASRF). Gordy (2002) demonstrated in his work that the ASRF model requires two important assumptions: the number of borrowers in the portfolio must be very large and only one systematic risk factor must be used. As a result of these assumptions, the loan portfolio is assumed to be structure-invariant. In other words, this means that the risk of the portfolio depends only on the characteristics of individual loans and does not depend on the bank's total portfolio.

The assumption of loan portfolio invariance is used by the Basel Committee on Banking Supervision (BCBS) in its recommendations for calculating capital requirements using the Internal Ratings Based Approach (IRB) (BIS, 2006). The ASRF model proposed by BCBS is also based on the inverse Gaussian distribution function, but idiosyncratic factors are ignored. Therefore, the IRB model is more suitable for banks with diversified portfolios. Razumovsky and Pomazanov (2010) note in their work that the use of the IRB model can lead to an underestimation of capital requirements with a high concentration of large loans in the loan portfolio. On the other hand, the IRB specification is a convenient tool for regulators and encourages banks to converge towards common approaches and standards.

One of the key limitations of the ASRF model is its inability to adequately account for the increase in defaults and the change in correlations under stress conditions (Meissner, 2019). During periods of economic crises or systemic shocks, correlations between borrowers typically increase as many borrowers experience deteriorating macroeconomic conditions at the same time. The ASRF model is based on the assumption of stable correlations and cannot capture these changes, which may lead to underestimation of risk under stress conditions. Under stress conditions, borrowers' behavior typically changes, leading to a disproportionate increase in default rates in certain sectors of the economy, which the ASRF cannot adequately model. In general, these models assume the presence of an unobserved systematic risk factor that follows a normal distribution, but which is not a real macroeconomic variable. Therefore, the assumption that this factor follows a normal distribution has no empirical justification. Second, the reliance on quantile calculations to estimate the portfolio's VaR makes it difficult to verify the accuracy of the models (Razumovsky, 2010).

3. Gaussian Credit Risk Model

3.1. Model Specification. The main idea of this model is the presence of some unobservable variable that determines the capacity to pay the loan i, for example, this variable may reflect the income of a company or an individual. Let's denote this variable as y_i : $y_i = Capacity\ to\ repay\ the\ loan\ i$.

A borrower's capacity to pay depends on systemic and idiosyncratic factors (Bolder, 2018):

$$y_i = \alpha_i * G + \beta_i * \varepsilon_i,$$

where G – is a global macroeconomic variable that affects the capacity to pay of all borrowers and ε_i is an individual idiosyncratic factor. Thus, α and β are coefficients that determine the impact of systematic and idiosyncratic factors on the possible default of a debtor. It is assumed that G and ε_i follow a standard normal distribution (Bolder, 2018):

$$G, \varepsilon_i \sim N\ (0,1),$$

then the mathematical expectation y_i will be zero, and the variance y_i will be equal to:

$$\sigma_{y_i}^2 = \alpha_i{}^2 + \beta_i{}^2;$$

to simplify further calculations it is assumed that it also follows the standard normal distribution, then it follows:

$$\alpha_i{}^2 + \beta_i{}^2 = 1 \text{ and } \beta_i = \sqrt{1 - \alpha_i{}^2};$$

let $\alpha_i{}^2 = \rho_i$, then the solvency variable may be rewritten as follows:

$$y_i = \sqrt{\rho_i}G + \sqrt{1 - \rho_i}\varepsilon_i, \text{ for } i \in [1, \ldots, N],$$

then the correlation and covariance between solvency variables i and j equals:

$$cov(y_i, y_j) = E(y_i * y_j) = \sqrt{\rho_i \rho_j}.$$

Changes in the global variable G have a different effect on all loans in the loan portfolio, and the correlation between the solvency variables for each loan is also unique for each loan. The distribution of the vector of solvency variables takes the following form:

$$\begin{bmatrix} y_i \\ y_j \\ \dots \\ y_N \end{bmatrix} \sim \left(\begin{bmatrix} 0 \\ 0 \\ \dots \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \sqrt{\rho_i \rho_j} & \dots & \sqrt{\rho_i \rho_N} \\ \sqrt{\rho_j \rho_i} & 1 & \dots & \sqrt{\rho_j \rho_N} \\ \dots & \dots & \dots & \dots \\ \sqrt{\rho_N \rho_i} & \sqrt{\rho_N \rho_j} & \dots & 1 \end{bmatrix} \right).$$

The borrower is expected to default if the variable y_i that determines its solvency reaches or falls below a certain level K_i (Bolder, 2018):

$$I_{D,i} = \begin{cases} 1, if \ y_i \leq K_i \\ 0, otherwise \end{cases},$$

then the probability of default PD_i is calculated as the mathematical expectation of the default indicator $I_{D,i}$:

$$PD_i = E(I_{D,i}) = P(y_i \leq K_i) = F(K_i),$$

where F is the distribution function for a standard normal distribution. Therefore, the default threshold K_i is the function of the probability of default:

$$K_i = F^{-1}(PD_i),$$

where F^{-1} is the inverse of the standard normal distribution, so loans with a high probability of borrower default will have a lower threshold for going into default.

Therefore, negative realizations of the global variable G will have a negative impact on credit solvency, thereby increasing the probability of borrowers default:

$$PD_i | G = P(y_i \leq F^{-1}(PD_i)|G) = P(\sqrt{\rho_i}G + \sqrt{1-\rho_i}\varepsilon_i \leq F^{-1}(PD_i)|G)$$
$$= F(\frac{F^{-1}(PD_i) - \sqrt{\rho_i}G}{\sqrt{1-\rho_i}}).$$

The presence of a correlation between the solvency variables implies the presence of a correlation between the default variables. The correlation of variables of the default indicator for loans i and j is equal to:

$$\rho(I_{D,i}, I_{D,j}) = \frac{cov(I_{D,i}, I_{D,j})}{\sqrt{\sigma^2_{I_{D,i}}} \sqrt{\sigma^2_{I_{D,j}}}} = \frac{P(D_i \cap D_j) - PD_i PD_j}{\sqrt{PD_i PD_j (1-PD_i)(1-PD_j)}},$$

where $P(D_i \cap D_j)$ is the probability of a joint default on the loan i and loan j. Coming back to the definition of the default indicator, we consider the probability of joint default, which can be represented as follows (Bolder, 2018):

$$P(D_i \cap D_j) = P(y_i \leq F^{-1}(PD_i), y_j \leq F^{-1}(PD_j)) = F(F^{-1}(PD_i), F^{-1}(PD_j); \sqrt{\rho_i \rho_j}).$$

The expression $F(F^{-1}(PD_i), F^{-1}(PD_j); \sqrt{\rho_i \rho_j})$ is a two-dimensional probability distribution function equivalent to the definition of the Gaussian copula (Meissner, 2019) (a brief description of the definition of the Gaussian copula is provided in Annex 1). In the case of determining the probability of joint default for all loans in a loan portfolio, a multivariate normal distribution with a given correlation matrix (Ω) between solvency variables is used:

$$P(y_i \leq F^{-1}(PD_i), \dots, y_N \leq F^{-1}(PD_N)) = F(F^{-1}(PD_i), \dots, F^{-1}(PD_N); \Omega), for \ i \in [1, \dots, N].$$

Given the large number of loans in the loan portfolio, this specification requires estimating a correlation matrix of $N*N$ size, which is inconvenient from a technical perspective. The simplest and crudest solution is to fix a single correlation coefficient, so that the variable G has the same effect ($\sqrt{\rho}$) on all loans in the loan portfolio. A more economically sound solution is to organize loans into subgroups based on external features such as region or economic sector and then use different correlation coefficients ρ for each of the subgroups (Di Clemente, 2020). In this case, all loans belonging to a particular subgroup are assumed to have identical idiosyncratic shocks and sensitivities to the global variable G.

3.2. Optimizing the Correlation Coefficient by Using the Maximum Likelihood Method. The maximum likelihood method described by Bolder (2018) was used to determine the correlation coefficient for each of the subgroups. Coming back to the definition of the default indicator variable, it can be noted that default is a binomial variable, while depending on the implementation of the global variable G.

$$I_{D,i} = \begin{cases} 1, if\ y_i \le K_i \\ 0, otherwise \end{cases} = \begin{cases} 1, if\ \sqrt{\rho_i}G + \sqrt{1-\rho_i}\varepsilon_i \le K_i \\ 0, otherwise \end{cases}.$$

Then we can assume that the probability of default on k loans from the total number of loans N in the sub-portfolio i at the beginning of the period t follows the binomial distribution law subject to G and has the following probability function:

$$f_t\left(N_{i,t}, k_{i,t}, \rho_i | G\right) = \binom{N_{i,t}}{k_{i,t}} (PD_{i,t}|G)^{k_{i,t}} (1 - PD_{i,t}|G)^{N_{i,t}-k_{i,t}},$$

where conditional probability of default at time t depends on the unconditional probability of default or the probability of default $\overline{PD_i}$ *through the cycle* (TTC) and variable G:

$$PD_{i,t}|G = F\left(\frac{F^{-1}(\overline{PD_i}) - \sqrt{\rho_i}G}{\sqrt{1-\rho_i}}\right).$$

The probability of default through the cycle was calculated as the average annual default rate in the corresponding sub-portfolio over the observed period:

$$\overline{PD_i} = \frac{\sum_{i=1}^{n} DR_{i,t}}{n}.$$

Given that the default probabilities in each of the sub-portfolios depend on G but are conditionally independent of each other, the overall probability function for all portfolios $i \in [1, \dots, I]$ will be equal to the product of all probability functions:

$$f_t\left(N_{i,t}, k_{i,t}, \rho | G\right) = \prod_{i=1}^{I} \binom{N_{i,t}}{k_{i,t}} (PD_{i,t}|G)^{k_{i,t}} (1 - PD_{i,t}|G)^{N_{i,t}-k_{i,t}}.$$

According to the Law of Total Expectation, the mathematical expectation of the default probability function can be obtained by integrating the default probability function for G (Bolder, 2018):

$$E\left(f_t\left(N_{i,t}, k_{i,t}; \rho | G\right)\right) = \int_{-\infty}^{+\infty} \prod_{i=1}^{I} \binom{N_{i,t}}{k_{i,t}} (PD_{i,t}|G)^{k_{i,t}} (1 - PD_{i,t}|G)^{N_{i,t}-k_{i,t}} f(G)_G dG,$$

where f_G is the probability density for the standard normal distribution while $-\infty$ and $+\infty$ are the boundaries for the values of the standard normal distribution.

Assuming that the annual default observations are independent, the probability function for a period $t \in [1, \dots, T]$ will be the product of the probability functions for all periods, which is equivalent to the sum of the logarithms of these functions:

$$f_{t,\dots,T}\left(N_{i,t}, k_{i,t}; \rho\right) = \prod_{t=1}^{T} \int_{-\infty}^{+\infty} \prod_{i=1}^{I} \binom{N_{i,t}}{k_{i,t}} (PD_{i,t}|G)^{k_{i,t}} (1 - PD_{i,t}|G)^{N_{i,t}-k_{i,t}} f(G)_G dG =$$

$$\sum_{t=1}^{T} ln(\int_{-\infty}^{+\infty} \prod_{i=1}^{I} \binom{N_{i,t}}{k_{i,t}} (PD_{i,t}|G)^{k_{i,t}} (1 - PD_{i,t}|G)^{N_{i,t}-k_{i,t}} f(G)_G dG).$$

If we interpret this expression not as a function of observations $N_{i,t}$ and $k_{i,t}$ with a fixed correlation vector ρ but as a function of ρ with fixed observations $N_{i,t}$ and $k_{i,t}$, we obtain the following likelihood function:

$$L\left(\rho | N_{i,t}, k_{i,t}\right) = \sum_{t=1}^{T} ln(\int_{-\infty}^{+\infty} \prod_{i=1}^{I} \binom{N_{i,t}}{k_{i,t}} (PD_{i,t}|G)^{k_{i,t}} (1 - PD_{i,t}|G)^{N_{i,t}-k_{i,t}} f(G)_G dG).$$

By maximizing this function for all sub-portfolios i, we obtain optimal correlation values, which will allow determining the correlation matrix for variables y and obtain the distribution of credit losses through simulations. Since each of the sub-portfolios may contain a large number of loans, calculating factorials for $\binom{N_{i,t}}{k_{i,t}}$ becomes technically problematic. To solve this problem, the bootstrapping technique was used:

1) a random sampling of 100 loans ($N_{i,t}$=100) was performed for each of the sub-portfolios,

2) out of 100 selected loans, the number of loans that went into default ($k_{i,t}$) at the end of the year was counted,

3) to maximize the function of L, optimal values of ρ_i have been selected,

4) this procedure was iterated 200 times,

5) mean values of optimal ρ_i were calculated.

4. The Data Used and the Definition of Default

To assess the performance of the banks' loan portfolio, data from the credit register was used. In the corporate loan portfolio, using the company's BIN and the statistical business register of the Office for National Statistics, loans were grouped into three separate groups depending on the size of the staff: 1) large business loans; 2) medium-sized business loans; 3) small business loans. In the retail loan portfolio, based on the purpose of lending, loans were grouped into three separate groups: 1) consumer loans; 2) mortgage loans; 3) car loans.

Given the potential problems of using NPL90+, the methodology for assessing each loan (loan-level data) developed by the National Bank of Kazakhstan (Konurbaeva et al., 2021) was used to calculate the average default rate in this paper. According to it, the change in the principal balance and interest repayment is assessed for each loan (a brief description of the methodology is presented in Annex 1) and additional categories of loans are identified for which there is no repayment of the principal debt, on this basis, the loans are classified as doubtful loans of categories 1 and 2[1], and are also combined together with NPL90+ into one group of problem loans[2]. In order to increase conservatism, the default condition was supplemented by the presence of a delinquency of more than 60 days:

$$D_{i,t} = \begin{cases} 1, if\ the\ loan\ is\ distressed\ OR\ past\ due > 60\ days \\ 0, otherwise \end{cases}.$$

The period for calculating the default rate was 10 years, from August 2014 to August 2023. The start date for the analysis of the distribution of credit losses was August 2023. Loans classified as stage 3 under IFRS and NPL90+ loans were excluded from the total loan portfolio of banks. The loss assessment horizon was 1 year. For the probabilities of default, the values calculated by banks in the credit register were used. Due to the fact that for the stage 2 loans, the probability of default is calculated for the entire loan period (for stage 1 loans, the probability of default is determined for 1 year), the probabilities of default were recalculated in an annual equivalent using the following formula:

$$PD_{annualized} = 1 - \sqrt[TTM]{(1 - PD_{lifetime})},$$

where TTM is the annualized remaining maturity of a loan. The debt at risk was defined as the sum of the principal debt and accrued interest for each loan, and credit register data was also used. The number of loans in the portfolio was 28.5 million, the total volume was 24.5 trillion tenge (Table 1).

Table 1

Statistical Indicators of the Portfolio

Portfolio	The number of loans (in thousands)	Portfolio volume (in bln tenge) (EAD)	ρ_i	$\overline{PD_i}$
Large business loans	270	2,949	0,117	9,3%
Medium-sized business loans	473	2,605	0,114	8,8%
Small business loans	1 029	4,958	0,126	7,5%
Consumer loans	26 689	7,760	0,137	7,8%
Residential mortgage loans	473	4,934	0,116	1,2%
Car loans	270	1,309	0,212	4,4%

[1] Doubtful loans of category 1 include loans with a consistent failure to reduce the principal debt within 3 months for loans to individuals and 6 months for loans to legal entities and the absence of repayment of accrued interest, as well as a consistent failure to reduce the principal debt within 12 months upon repayment of interest.

[2] Problem loans are loans 90+ days past due according to the bank's assessment, plus doubtful loans of categories 1 and 2 according to the methodology.

The highest values are observed in the portfolio of car loans and consumer loans, the lowest in the portfolio of medium-sized business loans and mortgage loans.

5. Results

The results of the analysis showed that the Kazakh banking sector has a sufficient capital buffer to absorb unexpected credit losses. Unexpected losses were calculated as the difference between VaR 99 and EL. As a result of the calculation, it was concluded that unexpected losses could amount to approximately 13% (3.1 trillion tenge) of the loan portfolio, or 54% of the tier 1 capital.

Table 2

Capital adequacy in all STBs

Bank	Loan portfolio (EAD) in bln tenge	Expected loan losses (EL) in bln tenge	Value at risk (VaR 99) in bln tenge	Unexpected losses (UL) in bln tenge	Tier 1 capital (OK1) in bln tenge	A share of UL in EAD	A share of UL in OK1	Does the OK1 cover unexpected losses?
All STBs	24 518,4	401.3	3 533.1	3 131.8	5 756 .4	12.8%	54.4%	yes

Figure 2

Distribution of loan losses across the entire banking system
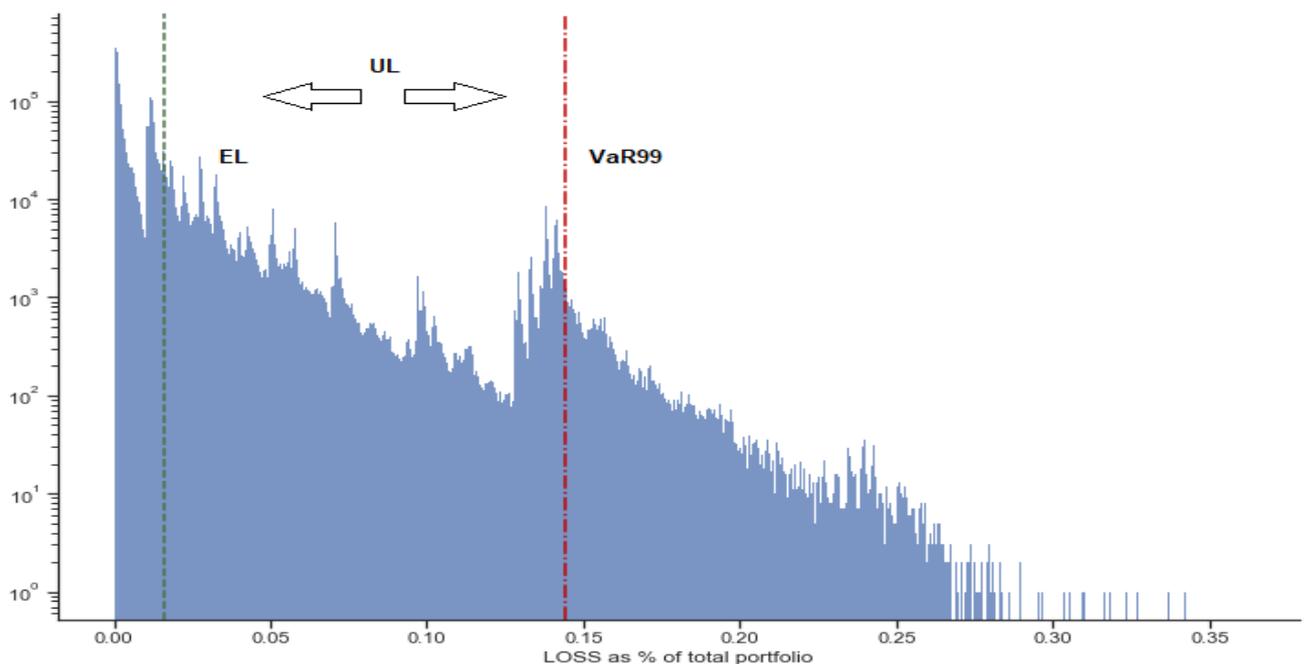
Note: X axis – the amount of loan losses (as % of total loans), and Y axis – frequency of potential losses (a logarithmic scale).

6. Conclusion

The results of the analysis showed that the Kazakh banking sector has a sufficient capital buffer to absorb unexpected loan losses. This model allows for a quick assessment of the stability of the financial system and individual banks.

It is noteworthy that this methodology has a certain number of limiting assumptions. First, the input data is the default probabilities and default rates calculated using the banks' own models, which cannot guarantee sufficient conservatism of the results obtained. Second, the presence of an unobservable systematic risk factor following a normal distribution is allowed, which is not a real

macroeconomic variable. Another important point is the fixed probabilities of default and correlations between assets. During the implementation of negative economic shocks, the initial probabilities of default can increase and lengthen the right tail of the distribution of credit losses. During periods of stress for the economy, default correlations between assets also usually increase.

In the financial literature, the Gaussian copula is not considered as the most conservative method for modeling credit risks. The reason is that the weakness of the Gaussian copula is its inability to fully capture the tail dependence of financial data. In this regard, the Student's *t*-copula model is very popular in constructing credit risk models. Methodological aspects and assumptions should be carefully considered when evaluating the results of the model.

Literature

1. Bellini, Tiziano. (2016). "Stress Testing and Risk Integration in Banks." Elsevier Monographs, Elsevier, edition 1, number 9780128035900.

2. BIS, (2006). "Basel II International Convergence of Capital Measurement and Capital Standards: A Revised Framework." Bank for International Settlements, Basel.

3. David Jamieson Bolder. (2018). "Credit-Risk Modelling." Springer Books, Springer, number 978-3-319-94688-7, August.

4. Di Clemente, Annalisa. (2020). "Modeling Portfolio Credit Risk Taking into Account the Default Correlations Using a Copula Approach: Implementation to an Italian Loan Portfolio" Journal of Risk and Financial Management 13, no. 6: 129.

5. Gordy, M. B. (2002). "A risk-factor model foundation for ratings-based bank capital rules." Board of Governors of the Federal Reserve System.

6. Meissner, G. (2019) "Correlation Risk Modeling and Management." RISK Books.

7. Merton, R. C. (1974). "On the pricing of corporate debt: The risk structure of interest rates". The Journal of Finance, 29(2), 449-470.

8. Sklar, A. (1959). "Fonctions de répartition à n dimensions et leurs marges." Publications de l'Institut de Statistique de L'Université de Paris, 8, 229–231.

9. Vasicek, O. A. (1991). "Limiting loan loss probability distribution." KMV Corporation.

10. Vasicek, O. A. (2002). "The distribution of loan portfolio value." Risk, (12), 160–162.

11. Konurbayeva N.A., Nurkhanova O. V., Khakimzhanov S. T. (2021). "Assessing the Loan Portfolio Quality based on the Loan-Level Data." NBK's Economic Review, 2021, No. 7.

12. Razumovsky P.A. (2010). "Internal Ratings-based Approach and Creditrisk+: Strengths and Weaknesses of the Methodologies". Economic Policy. 2010. No. 4. p. 154-175.

13. Razumovsky P.A., Pomazanov M.V (2010). "Capital Charges for Credit Risk Concentration." Banking. No. 2.

Annex

Definition of the Gaussian Copula

Copula is a multivariate cumulative distribution function used for modeling and analysis of the dependence between random variables. Let's imagine that we have a vector of continuous random variables $[X_i, \ldots, X_N]$, then the vector of marginal distribution functions takes the form of $[F_i(X_i), \ldots, F(X_N)] = [U_i, \ldots, U_N]$, where each random variable will be uniformly distributed over the segment [0,1] (Meissner, 2019). Then, by Sklar's theorem (Sklar, 1959), there exists a unique copula C or multivariate distribution function for marginal functions $[U_i, \ldots, U_N]$:

$$C(u_i, \ldots, u_N) = P(U_i \leq u_i, \ldots, U_N \leq u_N) = P(X_i \leq F_i^{-1}(u_i), \ldots, X_N \leq F_N^{-1}(u_N)) =$$
$$= F(X_i \leq F_i^{-1}(u_i), \ldots, X_N \leq F_N^{-1}(u_N)).$$

The Gaussian Copula function uses a multivariate normal distribution function with a given correlation matrix:

$$C(u_i, \ldots, u_N) = \Phi(\Phi^{-1}(u_i), \ldots, \Phi^{-1}(u_N); \Omega).$$

In this paper, the Gaussian copula is used to model correlations of defaults between loans in different sectors of the economy.

Corporate Characteristics and Financial Soundness of Companies: Empirical Results for Kazakhstan

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There are many models in the scientific literature to assess the financial condition of enterprises, among which the Altman Z-score model is widely used. The Altman Z-score indicator that is based on the accounting data of firms, is used in this study as a proxy of financial soundness of Kazakhstani companies. The purpose of this paper is to assess the relationship between financial condition of the real sector enterprises and their characteristics, such as size, age, debt level, liquidity, availability of bank loans, bankruptcy, etc. The impact of these characteristics on the financial soundness of firms in Kazakhstan is assessed in this study in terms of economic sectors. According to the results of the analysis, firms with high leverage and large asset size are more financially vulnerable, while firms with more liquid assets and a mature stage of the life cycle are less financially vulnerable. It was also found that bankrupt enterprises and those with bank debt are less sound financially compared to other firms.

1. Preamble

The build-up of non-financial corporate debt has been a growing concern for both academicians and policymakers around the world, particularly in emerging economies. Over the past two decades, non-financial corporate debt in emerging markets has grown from around 70% of GDP to an all-time high of 100% of GDP, surpassing that of advanced economies (Fukuzawa and Islamaj (2022)). Post-pandemic inflation spikes and subsequent monetary tightening cycles around the world have potentially exacerbated the risks associated with higher levels of corporate sector debt. As a result, macroeconomic implications of corporate debt and structural problems of the non-financial sector's borrowings have received an increasing public attention. Interestingly, as Jord'A et al. (2022) argue, unlike household credit boom cycles, corporate debt accumulation does not typically lead to a prolonged economic downturn. One reason is that an individual company's liabilities are ultimately limited by its assets. When bankruptcy proceedings occur, liquidation of the firm is a certain way out of the situation, excess debt is written off, and the assets can be reused for other productive purposes. However, the liquidation process itself may be inefficient, as there is a risk of keeping inefficient firms afloat, which will ultimately lead to economic costs at the macro level.

The main contribution of this paper is to investigate the impact of quantitative characteristics of firms on their corporate financial soundness in the context of an emerging market economy. This paper uses enterprise-level administrative data from the Bureau of National Statistics of the Republic of Kazakhstan (BNS RK), which covers small, medium and large firms in a de-identified form. Information on the financial performance of enterprises is provided on an annual basis. This paper uses the Altman Z-score to assess the overall financial strength and/or vulnerability of firms, which is calculated for emerging market firms (Altman (2005). Balance sheet and income statement indicators were used to calculate the Altman Z-score as a proxy for the financial vulnerability (soundnes) of firms and other variables.

The purpose of this paper is to assess the relationship between the financial condition of enterprises in the real sector and their characteristics, such as size, age, debt level, liquidity, availability of bank loans, bankruptcy, etc., using data from financial statements of enterprises in Kazakhstan from 2010 to 2022. The study also assesses the impact of these characteristics of enterprises on their financial soundness in the context of sectors of the Kazakh economy.

Thus, the paper found that firms in Kazakhstan with high leverage and large asset sizes are more financially vulnerable. The effect of asset size on firm soundness is most noticeable in the construction and trade sectors, while the impact of leverage is more obvious in agriculture and construction. Second, it was found that firms with more liquid assets and a mature stage of the life cycle are less financially vulnerable. Third, firms that went bankrupt as a result of their activities have a Z-score significantly lower than the average Z-score of other firms. Also, enterprises with bank debt are less financially sound than firms without bank debt. These observations on the relationship between firm financial soundness, size, and leverage are consistent with earlier findings by Alfaro et al. (2019). We argue that in Kazakhstan, the larger the firm and the higher its leverage, the less financially sound it is. Our results are statistically significant.

The paper is organized as follows. Section 2 provides a literature review. Section 3 discusses the current dynamics of corporate debt and its share in the country's total domestic debt. Section 4 covers the methodology and data description, including the Altman Z-score and other firm characteristics. Section 5 presents the results of econometric tests. Section 7 – Conclusion.

2. Literature Review

Our study examines how firm characteristics affect the overall financial health of firms in the corporate sector and examines the role of firm heterogeneity across industries and their relationships with macroeconomic variables in the context of an emerging market economy. Despite the relevance of the problem, one of the few systematic contributions is provided by Altman (2005) with a modification of his long-standing bankruptcy risk model developed for emerging market firms. Thus, this paper belongs to several strands of the literature in corporate finance and macroeconomics.

First, we rely on studies that examine corporate default risk based on certain firm-specific financial variables. Shumway (2001) presents a multiple logit model that combines data from firms' balance sheets with a set of market variables including market size, net income to total assets ratio, total liabilities to total assets ratio, and other related characteristics. Campbell et al. (2008) find that firms are more likely to be in distress if they have higher leverage, lower profitability, lower cash holdings, higher market multiples, among other predictor variables. Additionally, Duffie et al. (2009) introduce vulnerability factors—unobservable factors—that complement each firm's default probability models. Their methodology can be applied to situations in which a common unobservable factor is assumed to play an important role in changing the timing of a class of events, such as merger and acquisition events. Alfaro et al. (2019) use firm-level data to show that the correlation between leverage and corporate vulnerability varies over time and is strongest for large firms and during periods of local currency depreciation.

Second, the empirical literature on corporate debt overhang is relatively mixed. Studies based on micro-data on European firms (Kalemli-ozcan et al. (2022) and Barbiero et al. (2020)) show opposite results with respect to investment and high debt levels. For example, Kalemli-ozcan et al. (2022) found that firms with higher debt levels and a higher share of short-term debt further reduce their investment after the crisis. This negative effect is stronger for firms linked to more vulnerable banks exposed to sovereign risk. At the same time, Barbiero et al. (2020) find that highly leveraged firms invest relatively more if they operate in sectors with good opportunities for global growth. The positive effect of a small increase in debt on investment in sectors with good opportunities for global growth disappears if firms' debt is excessive, if it is dominated by short maturities, and during systemic banking crises. Lang et al. (1996) argue that lenders cautiously reduce the supply of credit if they believe that firms' investment opportunities with leverage are reduced to an absolute minimum. This may therefore constrain firm growth and is not due to

shareholders' incentive to underinvest. Research conducted in the aftermath of the 2008–09 global financial crisis (Chodorow-Reich (2014), Giroud and Mueller (2017)) suggests that investment may have fallen not because of excess supply, but because stressed banks reduced their supply of loans to preserve capital. Given that large firms account for a particularly large share of overall economic activity, the vulnerability of these firms to leverage is particularly important for both regulatory and academic purposes.

Our contribution builds on the extension of empirical research on firm-level financial performance to further examine the heterogeneous effects of monetary policy, macroeconomic indicators, and other variables on firm performance. In particular, important empirical determinants of the response to firm-level monetary policy shocks include size (Gertler and Gilchrist (1994)), leverage (Anderson and Cesa-Bianchi (2020), Ottonello and Winberry (2020)), age (Anderson and Cesa-Bianchi (2018)), liquidity (Jeenas (2019), Greenwald et al. (2020)), the share of floating-rate debt (Ippolito et al. (2018), Gurkaynak et al. (2022)), the share of bond financing (Darmouni et al. (2022)) and the maturity structure of debt (Jungherr et al. (2022)). In terms of sectors, Durante et al. (2022) provide disaggregated estimates for twenty-four manufacturing industries, six service sectors, and the construction sector. The authors find that firms producing durable goods respond to investment much more strongly than others.

Since our paper mainly uses the method of Alfaro et al. (2019), we primarily test and build on the authors' findings on the relationship between corporate financial characteristics and firm resilience in emerging market economies using a large micro-level database of firms. To our knowledge, our paper is one of the few studies that uses an empirical approach and assesses firms' financial health at the micro level based on financial statement indicators. As in the paper of Alfaro et al. (2019), taking into account the study of an emerging market economy, a similar pattern is observed in Kazakhstan: the larger the firm and the higher its leverage, the less financially sound it is. In addition, firms with more liquid assets and greater age are found to be less financially vulnerable.

3. Corporate Debt as a Share of Total Domestic Debt: Recent Developments in Kazakhstan

In 2023, the corporate debt market in Kazakhstan was inferior to the government securities market. At the end of 2023, the volume of corporate debt amounted to almost 2.2 trillion tenge (US\$4 billion), while the government bond market reached 8.0 trillion tenge (US\$17 billion). The corporate bond market is one of the most dynamically developing financial sectors and has prospects for further growth. Over the past decade, the absolute value of corporate debt has increased significantly (Table 1). The average number of deals in 2022 was 75 in corporate debt (twice as much as in 2021) and 14 in the government securities market, while the average size of one deal in corporate and government bonds was US\$300,000 (25.6% higher than in 2021) and about US\$4 million, respectively. Within the corporate debt sector in 2022, the financial sector accounted for about 59%, the energy sector was the second largest at 29.8%, and the manufacturing sector accounted for about 9%. The majority of investors in the corporate sector are legal entities (73%) and institutional investors (13.2%), with the total number of active accounts in 2022 being 3,138 (up 63.3% from 2021).

Table 1

Total Debt Structure						
	Percentage of Total Debt			Percentage of GDP		
	2008	2015	2022	2008	2015	2022
Government securities	10.5%	3.0%	19.2%	5.8%	1.0%	9.2%
Corporate debt (bank loans)	62.0%	61.1%	30.8%	34.1%	21.5%	14.7%
Corporate debt (bonds)	5.0%	9.0%	8.0%	2.7%	3.2%	3.8%
Household debt (bank loans)	22.5%	27.0%	42.1%	12.4%	9.5%	31.6%

Note: Corporate bank lending does not include lending to a financial organization. Corporate bond debt shows the nominal value of all outstanding commercial paper of firms (including securities of financial institutions).
Authors' computations.
Source: Ministry of Finance of the RK, National Bank of Kazakhstan, Kazakhstan Stock Exchange.

The slowdown in the growth rate of corporate debt to GDP in recent years points to the difficulties of large companies in raising funds by issuing domestic bonds. As a result, the underdeveloped corporate bond market may hinder foreign investors from setting up joint business projects in the country and requires further development.

4. Methodology and Data Description

The analysis and assessment of relationship between Z-score[1] and leverage, a company's size and other characteristics at the firm level are based on the following model[2]:

$$Z_{i,c,t} = \alpha_i + \delta_{c,t} + \beta_1 * Leverage_{i,c,t} + \beta_2 * SIZE_{i,c,t} + \beta_3 * X_{i,c,t} + \varepsilon_{i,c,t} \qquad (1)$$

where $Z_{i,c,t}$ – is a Z-score of company «i», industry «c» and year «t»; $Leverage_{i,c,t}$ – leverage of company i, of industry c, year t; $X_{i,c,t}$ – other characteristics of firms; α_i – fixed effects for firms; $\delta_{c,t}$ – fixed effects for sectors of the economy; β_1, β_2, β_3 – ratios of debt, of firms' size and other explanatory variables. Standard errors are grouped at the company and industry-year level.

Log-assets are used as an indicator of a company's size ($SIZE_{i,c,t}$). Other firm characteristics include measures of liquidity and firm age. We also add dummy variables for bankruptcy and bank debt. The first dummy is equal to one if the firm is in bankruptcy, rehabilitation, or non-bankruptcy liquidation. The second dummy is equal to one if the firm has bank debt on its balance sheet.

In this paper, to calculate the Altman Z-score (Altman Z-model), the debt burden indicator and other indicators, data on small, medium and large enterprises of Kazakhstan as obtained from the BNS RK databases at the firm level in a de-identified form, are used. The components of the Altman Z-score are calculated on the indicators of the balance sheet and profit and loss statement from 2010 to 2022 (annually).

Information about financial performance of eterprises in the Republic of Kazakhstan is derived from statistical forms[3] of the national statistical observation of enterprise economic and financial operations on an annual basis. The data of the reporting forms, in addition to the indicators of the balance sheet, profit and loss statement and other information on the financial and economic activities of enterprises, also include individual national and departmental statistical classifications[4] of respondents. The range of respondents is limited to legal entities, while excluding educational organizations, healthcare establishments, banks, insurance organizations, the UAPF, public funds and public associations. The number of respondents – large and medium-sized enterprises on average in the reporting period is 4,648, small enterprises – 39,269.

The data sample consists of private enterprisesonly, excluding respondents with 100% state participation, including foreign state-owned firms. When calculating the Z-score, only those respondents were included in the sample that had data in both the denominator and numerator for

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[1] We use the Z-score term, meaning the EM Z-score from Section 4.2.1.

[2] For regression analysis, variables were trimmed at 5% of the maximum and minimum values of the Z-score.

[3] Index 1-PF is a report on the financial and economic activities of the enterprise, Index 2-MP – report on the operations of a small enterprise.

[4] Classifier of economic sectors, General classifier of types of economic activities (4 characters), Classifier of administrative-territorial objects (2 characters), Classifier of forms and types of ownership, Classifier of enterprise sizes, as well as a directory of organizational and legal forms of business.

each of its components as of the date[5]. Extreme values of the Z-score had been removed[6]. As a result, other indicators used in the paper were calculated for the respondents included in the sample. Thus, the sample for the Z-score coefficient consists of 246,605 observations (respondent-year), which includes 84,599 unique respondent enterprises. The final sample includes both enterprises liquidated in the period from 2010 to 2022 and those continuing their operations. This fact excludes or minimizes the systematic error of the survivor (survivorship bias), which would otherwise overstate the results of the analysis. The majority of respondents are represented by the wholesale and retail trade, manufacturing and construction industries, and the smallest share is from firms engaged in arts, entertainment and leisure activities. This data is quite sufficient for the purposes of calculating and analyzing the Altman Z-score as a measure of corporate unsoundness.

The study also uses information from debtor organizations that have been or are still undergoing bankruptcy, rehabilitation, and liquidation procedures without initiating bankruptcy proceedings, available on the website of the State Revenue Committee of the Ministry of Finance of the Republic of Kazakhstan. The list of debtors is based on public information for the period from 2015 to 2023 and is linked to the database of respondents to financial and economic activity reports of the Bank of Tax Service of the Republic of Kazakhstan. Thus, in total, the bankruptcy procedure has been or is still being applied to 3,621 small, medium-sized, and large respondent enterprises[7].

The Altman Z-score as a measure of financial soundness (vulnerability) of enterprises. Altman (1968) first introduced the Altman Z-score financial model (formula), developed to assess the probability of bankruptcy of an enterprise and which is still widely used in research. Initially, the Altman Z-model was proposed to assess the probability of bankruptcy of only manufacturing and publicly traded enterprises, based on 5 key financial indicators[8]. Each component directly affects the Altman Z-score, and the higher the score, the better the financial condition of the enterprise is considered. The Altman model gives a result with an accuracy of 72%[9] when predicting bankruptcy two years before its fact with a 6% error, when the model classified a company as bankrupt, which in fact was not.

After 1968, Altman extensively revised the model, adapting it for both non-manufacturing enterprises and private organizations. Altman (2005) also proposed another Z-model for assessing enterprises in emerging markets (Emerging Market Z-score or EM Z-score). The EM Z-score is adapted to the characteristics of developing countries including their less liquid markets. For example, the market value of capital used in the model was replaced by the book value. Considering that the EM Z-score is applicable to manufacturing and non-manufacturing enterprises, and is also suitable for assessing both public and private companies, we use this indicator in our work as the most suitable. The EM Z-score model is based on a combination of 4 financial indicators and looks like this:

$$\text{EM Z} - \text{score} = 6,56 * X_1 + 3,26 * X_2 + 6,72 * X_3 + 1,05 * X_4 + 3,25 \qquad (2)$$

where (Altman, 1968):

$X_1 = \frac{Working\ capital}{Assets}$ shows net liquid assets to assets of a firm. Working capital is calculated as the difference between current assets and current liabilities. Typically, a firm that consistently makes operating losses will have a decline in current assets relative to assets;

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[5] Respondents with zero or empty values in the denominator or numerator for each reporting period were excluded.
[6] The sample was trimmed, removing the lowest 5% and highest 5% of Z-score values of all respondents for all periods.
[7] Including rehabilitation or liquidation procedures without initiating bankruptcy proceedings.
[8] Z-score = 1,2*X1 + 1,4*X2 + 3,3*X3 + 0,6*X4 + 1,0*X5; where X1 – working capital / assets, X2 – retained earnings / assets, X3 – EBIT / assets, X4 – market value of equity / book value of liabilities, X5 – income / assets.
[9] Recall (True positive rate) shows the ratio of correctly classified bankrupts to the total number of actual bankrupts.

$X_2 = \frac{Retained\ profit}{Assets}$ assesses the ability of the enterprise to accumulate profits, and also implicitly indicates the age of the firms. A relatively young, dynamically developing company will probably have a low one due to less time for accumulating cumulative profits. Historically, there are more cases of business failure at an early stage of the enterprise's development;

$X_3 = \frac{Operating\ income}{Assets}$ evaluates the profitability of the company's assets, which largely determines the continued existence of the company. Insolvency of an enterprise within the framework of bankruptcy occurs precisely when liabilities exceed the fair value of assets. In turn, the market value of assets depends on their ability to generate profit, that is, profitability;

$X_4 = \frac{Equity}{Liabilities}$ determines the debt ratio of firms based on book value. The lower the ratio, the greater the debt burden of the enterprise.

The constant in the model (3.25) allows standardizing the model results so that the equivalent of default corresponds to a value below zero (Altman, 2005). Firms with low EM Z-score values are considered less resilient and more vulnerable to shocks. According to the distribution of scoring results in Altman (2005), values above 5.85 are classified as green or safe, values between 3.75 and 5.85 as gray or vulnerable, and values below 3.75 are classified as red or default.

The average EM Z-score for all observations in the sample was 9.65, and the median was 6.63 (Appendix, Table 1), which is in the safe zone. The average annual EM Z-score values of enterprises for the entire period are moderately increasing and are negatively correlated with financial leverage. The annual median EM Z-score values from 2010 to 2022 increased from 5.82 to 7.63, and the average value of the coefficient increased from 8.74 to 10.65 over the same period[10]. The most vulnerable sectors of the economy according to the Altman's EM Z-score include mining, electricity, and entertainment and leisure. The sample of EM Z-score values is mainly represented by the trade, manufacturing, and construction sectors. As with the debt burden ratio, there are noticeable differences in EM Z-score levels in the groups of respondents with and without bank debt. The average EM Z-score is 5.15 and 10.55 for companies with and without bank debt, respectively, and the median values are 4.90 and 7.27, respectively. This difference indicates that more solvent companies are less likely to finance their activities with bank debt.

EM Z-score for the enterprises that went actually bankrupt[11] as a result of their operations is on average in the red zone (3.65), and the median value for the entire sample was 3.39. Also, as in the case of the debt burden ratio, the bulk of bankrupt enterprises (58%) is concentrated in the construction, manufacturing and trade industries. The median EM Z-scores of these industries averaged 3.65, 2.92 and 3.77, respectively.

The average EM Z-score values of the group of enterprises that became insolvent as a result of their operations were already in the vulnerable zone 10 years before the fact of bankruptcy or rehabilitation (Figure 1). At the same time, on average, according to the EM Z-score, the group of bankrupt enterprises moved to the red zone 5 years before the fact of their bankruptcy, and the group of enterprises that were subject to rehabilitation procedures moved to the red zone 2 years before the start of rehabilitation. Thus, in the bankrupt group, 56% of respondents were in the red and 18% in the vulnerable zone according to the EM Z-score 5 years before the fact of bankruptcy. For comparison, in the group of rehabilitated enterprises, 55% of respondents were in the red and 21% in the vulnerable zone according to the EM Z-score indicator 2 years before the start of the rehabilitation procedure.

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[10] The average income-weighted EM Z-score values increased from 8.45 to 10.73 over the period of 2010-2022 – roughly in line with the arithmetic mean value of the EM Z-score.
[11] Or those who have been subject to rehabilitation or liquidation procedures without initiating bankruptcy proceedings.
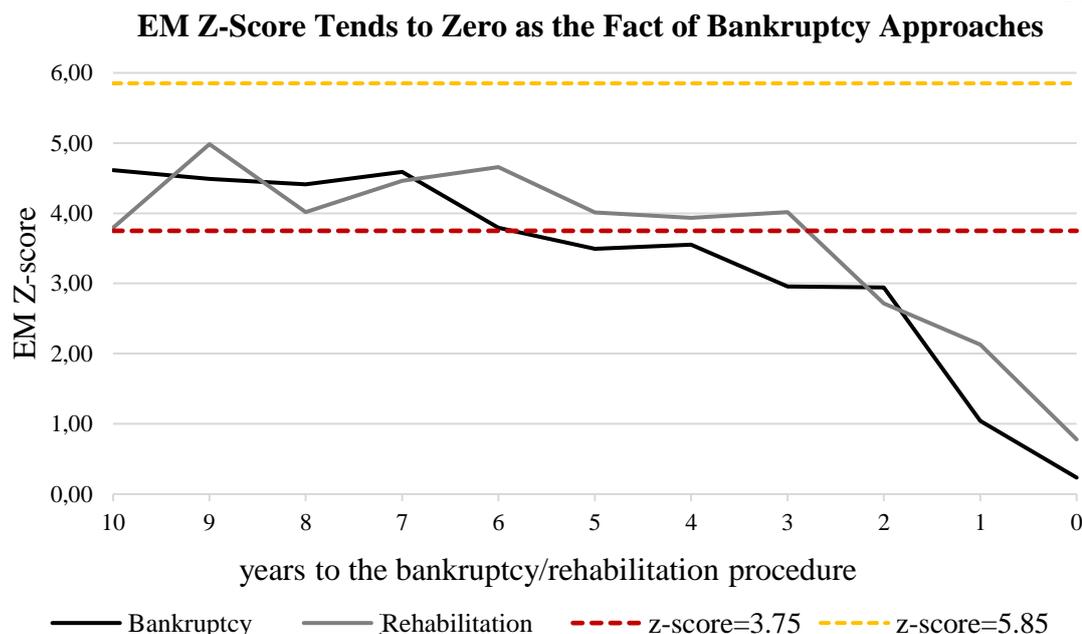
Figure 1

EM Z-Score Tends to Zero as the Fact of Bankruptcy Approaches

years to the bankruptcy/rehabilitation procedure

—— Bankruptcy　　—— Rehabilitation　　- - - z-score=3.75　　- - - z-score=5.85

Table 2

Error Matrix

	Fact*: A Bankrupt	Fact: Non-Bankrupt
Evaluation under the EM Z-score: Bankrupt	True positive = 73%	False positive = 42%
Evaluation under the EM Z-score: Non-bankrupt	False negative = 27%	True negative = 58%

*For the purposes of this table, when assessing the quality of the EM Z-score, the group of actual bankrupts included respondents who switched to the rehabilitation or bankruptcy procedure over the next 2 years. The number in the bankrupt group was 982 respondents.

The group of actually non-bankrupt enterprises included 3,089 enterprises that continuously submitted reports in the period from 2016 to 2022. The assessment of errors for the group of non-bankrupt enterprises was carried out 2 years before the year of the last submitted report of the enterprise. For example, the assessment of the Z-score of enterprises for 2020 and 2021, understanding that they existed in 2022, etc.

The error matrix (Table 2) shows the results of the EM Z-score error analysis to assess the quality of the EM Z-score in identifying bankrupts and non-bankrupts using the data from Kazakhstani enterprises. According to our results, the indicator correctly classified 73% of respondents in the bankrupt group[12] as insolvent[13] 2 years before their bankruptcy or rehabilitation, which is 1 pp higher than the result of Altman (1968). From the lender's point of view, it is much more important to avoid issuing a loan to a potential bankrupt than to make a mistake in classifying a non-bankrupt as bankrupt, and therefore the lender will seek to maximize the True positive rate. However, the error of EM Z-score in classifying actually non-bankrupts as bankrupt is much higher and amounts, according to our estimates, to 42%, while in the results of Altman (1968) such an error is only 6%. The high level of false assessment of bankrupts among Kazakhstani enterprises is possibly due, on the one hand, to the constant support of unprofitable businesses by shareholders or owners, and on the other hand, to the reluctance of creditors to go to court to declare the debtor bankrupt. Our study is not aimed at assessing the applicability of EM Z-score, and therefore we leave the study of this issue for separate studies. For the purposes of our work, we consider the EM Z-score to be an appropriate proxy of the financial condition of enterprises.

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[12] Including respondents that were subject to rehabilitation or liquidation procedures without initiating bankruptcy proceedings.

[13] Classification of the respondent into vulnerable or default categories. The share in the default category was 62%.

Debt Burden an Other Indicators of Enterprises. Contrary to L. Alfaro et al. (2019)[14], the debt-to-equity ratio or financial leverage used in this paper is calculated as the ratio of financial liabilities[15] to enterprise assets, which reflects the share of enteprises' assets financed with debt. The use of this measure, instead of the debt-to-equity ratio, is related to the presence of enterprises with no capital in our sample[16], with their share accounting for 21% of the entire sample. Also, financial liabilities have more onerous properties, unlike most other liabilities of the enterprise. For bonds or bank loans of the enterprise, if they are not serviced on time, creditors can declare a technical default, which will ultimately lower the company's credit rating and damage its reputation.

The average debt burden of respondents for all observations in the sample was 39%, and the median was 23% (Appendix, Table 1). At the same time, over the entire period, the average annual values of the debt burden ratio of enterprises gradually decreased. Thus, the leverage of the median enterprise from 2010 to 2022 decreased from 26% to 18%, and the average annual value of the debt burden ratio decreased from 41% to 34% over the same period. Half of the respondents in the financial sector[17] as well as in the sector of arts, entertainment and leisure have over 70% and 57% of financial liabilities to assets, respectively. At the same time, the shares of respondents from these industries in the total sample of enterprises are among the smallest. The sample by the debt burden of enterprises is mainly represented by the trade and manufacturing industries, where the median is at the level of 22% and 25%, respectively. There are minor differences in the levels of financial leverage in terms of the presence of a bank loan. The average value and median of financial debt to assets are higher for enterprises with bank debt (43% and 30%) than for enterprises without it (36% and 14%). Large enterprises are of the greatest interest, since their collapse has the greatest potential impact on the economy. Historically, larger enterprises by income have a lower debt to assets ratio. This is noticeable from the average annual value of leverage weighted by enterprise income, the levels of which are slightly lower than the average values. Thus, the average income-weighted debt burden ratio had decreased from 17% to 12% over the period from 2010 to 2022.

The debt burden of enterprises that went bankrupt as a result of their operations[18] is much higher than among other enterprises. Their average leverage across the entire sample was 58%, and the median was 37%. The bulk of bankrupt enterprises (60%) are concentrated in the construction, manufacturing, and trade industries. The debt burden of these industries averaged 28%, 72%, and 68%, respectively. The relatively low leverage of enterprises in the construction industry and the high level of their bankruptcy are explained by the fact that construction companies finance their activities more with short-term payables than with financial debt. The debt ratio we use does not cover the risks of enterprises associated with their excessive payables. However, the Altman Z-score calculation also uses leverage as the ratio of capital to liabilities, and therefore the risks of the construction industry should be taken into account better in the Altman Z-model.

5. Study Outcomes

Table 3 presents estimates of various financial characteristics of corporate firms and their relationship with the Altman Z-score. We use a fixed effects model to isolate factors independent of the period and industry to exclude possible distorting effects on our key regression results. Thus, column 4 is the main specification of the used model, while columns 1–3 serve as a robustness check of the results. In terms of the relationship between size, leverage, and the Z-score of business entities, our results are consistent with the results of Alfaro et al. (2019). Thus, firm size and

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[14] B L. Alfaro et al. (2019) use the debt-to-equity ratio as leverage.
[15] Bank loans account for a significant share of the financial liabilities of enterprises. Financial debt does not include tax liabilities and accounts payable.
[16] Capital is equal to zero or is negative.
[17] Mainly credit organizations (other than banks) and pawnshops.
[18] Or they were put into rehabilitation or liquidation procedures without initiating bankruptcy proceedings.

leverage are negatively associated with the Altman Z-score. In addition, unlike Alfaro et al. (2019), we document the relationship of Z-score with firm liquidity, firm age, interest rates on loans to business, and also take into account the effect of dummy variables on the fact of bankruptcy and the presence of a bank loan. The liquidity indicator has a positive effect on the financial condition of firms. Firms become more financially stable with age. An increase in interest rates on business loans has a negative impact on the Altman's Z-score. Bankrupt companies or companies that have bank loans are more financially vulnerable. These results, in our opinion, indicate the usefulness of the Altman's Z-score as an indicator of the financial health of firms.

All regression models in Table 3 indicate that firms with high leverage are more likely to default, and the effect of leverage on Z-score is statistically significant at the 1% level in all cases. The results also show that the larger the size of firms, the more financially vulnerable they are, and this effect of size on firms' Z-score is also highly statistically significant. On the other hand, we observe a positive and statistically significant effect of age and liquidity on firms' Z-score. Thus, firms with more liquid assets and a more mature age are less financially vulnerable. However, it is worth mentioning that the age coefficient is quite small, i.e., with an increase in Z-score by 1 unit, the age of a firm, all other things being equal, should increase by more than 10 years on average (=1/0.1). This indicates only a minor effect of age on the financial stability of firms.

Importantly, bankrupt firms have a significantly lower Z-score than the average Z-score of non-bankrupt firms, with a statistically significant effect at the 1% level. This result also justifies our use of the Altman Z-score as a proxy for firm financial fragility. We observe that firms with bank debt are more financially vulnerable than firms without bank debt. Given the results, we hypothesize that financially sound firms in Kazakhstan are less likely to take out a bank loan. Unlike other variables, the interest rate on business loans is not statistically significant in all parameters of the regression analysis. Therefore, higher interest rates on loans increase firms' financial vulnerability, but the coefficients are not statistically significant in the models with year fixed effects.

Table 3

Altman Z-Score, Debt and Financial Unsoundness

	(1)	(2)	(3)	(4)
	Z-Score	Z-Score	Z-Score	Z-Score
Size	-0.064***	-0.070***	-0.042**	-0.048***
	(0.017)	(0.017)	(0.017)	(0.017)
Leverage	-5.220***	-5.213***	-5.215***	-5.208***
	(0.661)	(0.662)	(0.682)	(0.682)
Liquidity	5.667***	5.672***	5.850***	5.851***
	(0.152)	(0.151)	(0.167)	(0.167)
Age	0.105***	0.104***	0.102***	0.102***
	(0.006)	(0.007)	(0.006)	(0.006)
Bankrupts	-2.136***	-2.137***	-2.002***	-2.016***
	(0.162)	(0.168)	(0.179)	(0.184)
Bank borrowers	-0.866***	-0.857***	-0.895***	-0.892***
	(0.075)	(0.077)	(0.082)	(0.084)
Interest rate	-0.099***	-0.096	-0.097***	-0.073
	(0.022)	(0.059)	(0.021)	(0.059)
Constant	8.798***	9.044***	9.655***	9.643***
	(0.434)	(0.863)	(0.445)	(0.854)

Observations	68945	68945	68945	68945
R^2	0.164	0.164	0.172	0.173
Year FE	No	Yes	No	Yes
Industry FE	No	No	Yes	Yes

Robust standard errors in brackets: $*p < 0.10, **p < 0.05, ***p < 0.010.$

Note: Size is expressed as the logarithm of assets, Leverage is represented as total financial debt divided by total assets, Liquidity is expressed as the share of liquid assets in current assets, Age is expressed in years as the difference between the reporting year and the date of incorporation of the enterprise, Bankruptcies is a dummy variable equal to 1 if the firm was declared bankrupt, Bank borrowers is a dummy variable equal to 1 if the firm has bank debt. Interest rate is the volume-weighted average short-term interest rate on loans to business entities with maturity of 3 months to 1 year.

We also examine the financial unsoundness of enterprises in various sectors of the economy, presented in Table 4. We observe that in the construction and trade sectors, as the size of enterprises increases, their financial soundness deteriorates. The largest negative size effect on the Altman's Z-score is observed in trade and construction. We also see that with an increase in financial debt, firms become less financially sound in all sectors, but the agriculture and construction sectors stand out in particular. In our opinion, individual reasons for the financial unsoundness of enterprises in agriculture and construction may be related to the susceptibility of these sectors to the seasonal effect (there is greater business activity in the warm season), a shortage of qualified personnel, and the presence of many concessional programs from the government (subsidies/guarantees). High reliance on government benefits makes these sectors in Kazakhstan less competitive.

Table 4

Altman Z-Score and Financial Vulnerability in Different Industries

	All	Manufact.	Construc.	Trade	Mining	Transport	Agricult.
Size	-0.048***	0.026	-0.086*	-0.268***	0.495***	0.001	0.090
	(0.017)	(0.040)	(0.048)	(0.037)	(0.061)	(0.049)	(0.067)
Leverage	-5.208***	-3.192**	-6.612***	-5.900***	-6.102***	-5.625***	-7.487***
	(0.682)	(1.351)	(0.370)	(0.193)	(0.235)	(0.211)	(0.604)
Liquidity	5.851***	7.382***	6.224***	5.755***	5.894***	6.015***	6.397***
	(0.167)	(0.459)	(0.499)	(0.554)	(0.762)	(0.530)	(0.531)
Age	0.102***	0.103***	0.015	0.123***	0.061***	0.043**	0.217***
	(0.006)	(0.013)	(0.017)	(0.011)	(0.021)	(0.019)	(0.017)
Bankrupts	-2.016***	-2.282***	-2.355***	-1.250***	-1.307***	-1.894***	-1.815***
	(0.184)	(0.401)	(0.230)	(0.214)	(0.396)	(0.365)	(0.334)
Bank borrowers	-0.892***	-0.925***	-0.197	-0.222*	-0.636***	-0.639***	-1.367***
	(0.084)	(0.170)	(0.173)	(0.126)	(0.241)	(0.202)	(0.200)
Lag (Interest rate)	0.004	0.047	-0.075	-0.015	-0.105	0.014	-0.056
	(0.029)	(0.055)	(0.078)	(0.048)	(0.165)	(0.115)	(0.101)
Constant	8.546***	4.399***	8.566***	11.856***	-2.794	5.576***	6.149***
	(0.544)	(1.025)	(1.479)	(1.041)	(2.698)	(2.040)	(1.942)
Observations	68945	12469	7544	11750	3149	5486	7888
R^2	0.173	0.151	0.142	0.169	0.297	0.192	0.196

Robust standard errors in brackets: $*p < 0.10, **p < 0.05, ***p < 0.010$

Across all sectors of the economy, firms with higher liquidity ratios are less financially vulnerable. Regarding the dummy variables, bankrupt firms and bank borrowers are less financially resilient across all sectors. The largest effects of bankruptcy and bank borrowing are seen in construction and agriculture, respectively. Our results provide additional support for

Altman's (2005) sector-specific properties, which often remain understudied in the literature, especially for developing and emerging market economies.

6. Conclusion

In this paper, we examine the impact of various specifics of enterprises on their financial soundness in the context of an emerging market economy. We use firm-level data from the Bureau of National Statistics of the Republic of Kazakhstan, covering small, medium, and large businesses. The firm-level data are used on an annual basis. For example, balance sheet and income statement indicators were used to calculate the Altman Z-score and other firm characteristics. The sample covers the period from 2010 to 2022. We were also able to identify firms among the respondents to the Bureau of National Statistics of the Republic of Kazakhstan that were or are still in bankruptcy proceedings.

Applying these data in a regression analysis, we arrive at the following main findings. First, we argue that in Kazakhstan, firms with high leverage and/or large assets are the most financially vulnerable (Z-score). The effect of size on the Z-score is most pronounced in the construction and trade sectors, while the effect of leverage is more pronounced in agriculture and construction. Second, we observe that firms with more liquid assets and a mature stage of the life cycle are the most financially resilient. Third, this paper finds that respondent firms that eventually fail have significantly lower Z-scores than the average of non-bankrupt firms. We also see that bank borrowers are more financially vulnerable than firms without bank debt. Thus, we complement previous studies on firm financial fragility and their characteristics based on the emerging market data.

It is worth pointing out that the disadvantage of the used Altman EM Z-score method may be that it does not take into account the specific features of enterprises in the Kazakh market. As we have already noted, in our study, Z-score levels were not calculated separately for Kazakhstani enterprises. Given the components used in the Altman EM Z-score model, it is obvious that the lower this indicator, the worse the financial condition of the enterprise, and the higher it is, the better. Thus, for the purpose of assessing the impact of individual characteristics of enterprises on their financial soundness, we consider the EM Z-score to be a good proxy indicator of the financial condition of enterprises, including Kazakhstani ones.

The financial condition of enterprises in Kazakhstan, as well as their specifics, are little studied, especially at the firm level. We believe that research in this area will stimulate discussions in the scientific literature and will allow a better understanding of the specifics of Kazakhstan enterprises. Further research in this area may address issues related to identifying the causes of low financial performance of 42% of enterprises (Table 2), whose condition is comparable to bankrupts according to the Altman Z-score. Also, further studies may consider the applicability of the Altman model for Kazakhstani enterprises and/or propose our own model taking into account the specifics of the Kazakh market.

Literature

1.   Alfaro, L., G. Asis, A. Chari, and U. Panizza (2019). Corporate debt, firm size and financial fragility in emerging markets. Journal of International Economics 118, 1–19.

2.   Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. The journal of finance 23 (4), 589–609.

3.   Altman, E. I. (2005). An emerging market credit scoring system for corporate bonds.

4.   Emerging markets review 6 (4), 311–323.

5.   Anderson, G. and A. Cesa-Bianchi (2018). Firm heterogeneity, credit spreads, and monetary policy. Monetary Policy and Financial Stability ECB.

6.   Anderson, G. and A. Cesa-Bianchi (2020). Crossing the credit channel: credit spreads and firm heterogeneity.

7.   Asis, G., A. Chari, and A. Haas (2021). In search of distress risk in emerging markets.

8.   Journal of International Economics 131, 103463.

9.   Barbiero, F., A. Popov, and M. Wolski (2020). Debt overhang, global growth opportunities, and investment. Journal of Banking & Finance 120, 105950.

10.   Barrett, J. P. (1974). The coefficient of determination—some limitations. The American Statistician 28 (1), 19–20.

11.   Campbell, J. Y., J. Hilscher, and J. Szilagyi (2008). In search of distress risk. The Journal of finance 63 (6), 2899–2939.

12.   Chodorow-Reich, G. (2014). The employment effects of credit market disruptions: Firm-level evidence from the 2008–9 financial crisis. The Quarterly Journal of Economics 129 (1), 1–59.

13.   Colton, J. B. and M. Keith (2002). Some misconceptions about r-square. 3.

14.   Darmouni, O., O. Giesecke, and A. Rodnyansky (2022). The bond lending channel of monetary policy. Columbia Business School Research Paper Forthcoming.

15.   Duffie, D., A. Eckner, G. Horel, and L. Saita (2009). Frailty correlated default. The Journal of Finance 64 (5), 2089–2123.

16.   Durante, E., A. Ferrando, and P. Vermeulen (2022). Monetary policy, investment and firm heterogeneity. European Economic Review 148, 104251.

17.   Fukuzawa, D. and E. Islamaj (2022). Non-financial corporates in emerging market and developing economies: Evaluating liquidity and solvency risk.

18.   Gertler, M. and S. Gilchrist (1994). Monetary policy, business cycles, and the behavior of small manufacturing firms. The Quarterly Journal of Economics 109 (2), 309–340.

19.   Giroud, X. and H. M. Mueller (2017). Firm leverage, consumer demand, and employment losses during the great recession. The Quarterly Journal of Economics 132 (1), 271–316.

20.   Greenwald, D. L., J. Krainer, and P. Paul (2020). The credit line channel. Federal Reserve Bank of San Francisco.

21.   Gu¨rkaynak, R., H. G. Karasoy-Can, and S. S. Lee (2022). Stock market's assessment of monetary policy transmission: The cash flow effect. The Journal of Finance 77 (4), 2375–2421.

22.   Helbling, T., J. P. Shanaka, and P. Monica (2023). Asia must monitor rising corporate debt amid higher interest rates. Technical report, IMF.

23.   Ippolito, F., A. K. Ozdagli, and A. Perez-Orive (2018). The transmission of monetary policy through bank lending: The floating rate channel. Journal of Monetary Economics 95, 49–71.

24.   Jeenas, P. (2019). Firm balance sheet liquidity, monetary policy shocks, and investment dynamics. Work 5.

25.   Jord`a, O`., M. Kornejew, M. Schularick, and A. M. Taylor (2022). Zombies atlarge? corporate debt overhang and the macroeconomy. The Review of Financial Studies 35 (10), 4561–4586.

26.   Jungherr, J., M. Meier, T. Reinelt, I. Schott, et al. (2022). Corporate debt maturity matters for monetary policy. Econometrica 1 (4), 345.

27.   Kalemli-O¨ zcan, S¸., L. Laeven, and D. Moreno (2022). Debt overhang, rollover risk, and corporate investment: Evidence from the european crisis. Journal of the European Economic Association 20 (6), 2353–2395.

28.   Lang, L., E. Ofek, and R. Stulz (1996). Leverage, investment, and firm growth. Journal of financial Economics 40 (1), 3–29.

29.   Ottonello, P. and T. Winberry (2020). Financial heterogeneity and the investment channel of monetary policy. Econometrica 88 (6), 2473–2502.

30.   Shumway, T. (2001). Forecasting bankruptcy more accurately: A simple hazard model.

31.   The journal of business 74 (1), 101–124.

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Attachment

Table 1

Descriptive Statistics of the Sample

#	Indicator	Observations*, Number	Mean	Standard Deviation	Median	P25	P75	Min	Max
At the firm level – all enterprises									
1	EM Z-score	246605	9.65	13.33	6.63	2.81	13.14	-17.81	77.52
	including:								
a.1	firms with capital	194532	12.68	13.06	8.70	4.75	15.61	-17.79	77.52
a.2	firms with no capital	52073	-1.67	6.47	-0.66	-5.17	2.30	-17.81	76.86
b.1	firms with bank loan	41156	5.15	6.32	4.90	2.31	8.07	-17.80	75.97
b.2	firms without bank loan	205449	10.55	14.16	7.27	2.94	14.69	-17.81	77.52
2	Financial debt	92257	0.39	0.56	0.23	0.05	0.57	0.00	51.20
3	Assets, bln tenge	246605	5.31	130.89	0.11	0.02	0.59	0.00	23347.40
4	Liquidity	242308	0.27	0.31	0.13	0.02	0.44	0.00	1.00
5	Age, years	179092	10.62	6.29	9.94	5.45	15.00	0.00	112.00
At the firm level - bankrupts									
1	EM Z-score	9369	3.65	8.54	3.39	-0.07	6.41	-17.80	76.36
	including:								
a.1	firms with capital	5406	7.43	8.06	5.32	3.44	9.04	-15.10	76.36
a.2	firms with no capital	3963	-1.52	6.12	-0.45	-4.83	2.36	-17.80	72.88
b.1	firms with bank loan	3259	1.91	5.73	2.88	-0.72	5.06	-17.75	41.81
b.2	firms without bank loan	6110	4.57	9.58	3.67	0.31	7.46	-17.80	76.36
2	Financial debt	5148	0.58	0.75	0.37	0.10	0.82	0.00	17.02
3	Assets, bln tenge	9369	2.42	12.20	0.35	0.08	1.43	0.00	950.47
4	Liquidity	9083	0.14	0.23	0.03	0.00	0.15	0.00	1.00
5	Age, years	7179	10.35	5.50	9.84	6.17	14.02	0.01	30.12

*Observations for all periods (2010-2022) and all respondents included into the sample.

The EM Z-score observations of the firms were truncated, removing the lowest 5% and the highest 5%. Only firms with EM Z-score data were left in the sample.

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Table 2

Median Leverage: Financial Debt to Assets by Industry

Industry	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
A	18.8%	20.5%	21.0%	22.4%	22.3%	27.3%	24.9%	23.6%	23.0%	22.7%	20.7%	21.7%	20.7%
B	31.5%	25.6%	27.1%	26.3%	24.1%	31.9%	30.6%	33.9%	26.8%	24.6%	24.8%	22.6%	25.3%
C	30.3%	30.5%	28.4%	26.5%	27.4%	30.0%	27.1%	25.8%	24.0%	22.9%	20.6%	19.1%	18.4%
D	9.6%	13.3%	14.3%	16.2%	15.2%	23.9%	20.6%	15.6%	17.7%	19.8%	20.3%	24.9%	20.8%
E	18.8%	19.9%	17.9%	18.0%	15.7%	22.8%	15.1%	11.2%	21.3%	14.3%	17.4%	16.7%	13.0%
F	15.6%	14.3%	11.6%	11.6%	13.5%	14.2%	9.4%	10.7%	11.3%	9.7%	8.6%	10.1%	8.5%
G	29.2%	24.9%	27.3%	22.3%	23.4%	25.5%	21.2%	21.4%	20.9%	20.6%	18.0%	16.4%	14.3%
H	25.1%	21.4%	29.2%	27.1%	25.3%	31.5%	26.3%	25.2%	24.2%	20.7%	21.2%	18.6%	16.8%
I	41.4%	25.6%	32.2%	35.7%	30.7%	37.1%	40.2%	37.7%	38.1%	33.4%	33.3%	29.9%	26.7%
J	18.2%	18.2%	15.3%	14.5%	16.5%	16.2%	15.7%	9.8%	6.8%	7.8%	9.3%	10.8%	13.4%
K	61.6%	63.2%	68.7%	74.5%	76.2%	75.5%	74.8%	73.2%	71.8%	67.4%	67.7%	67.3%	62.9%
L	39.5%	37.3%	32.8%	34.2%	32.8%	37.0%	33.7%	29.1%	28.4%	29.5%	26.1%	23.6%	26.3%
M	12.4%	20.7%	13.1%	14.8%	12.9%	19.1%	13.0%	14.6%	13.7%	11.0%	10.7%	12.5%	14.1%
N	17.8%	22.5%	19.9%	20.9%	16.2%	24.1%	14.5%	17.8%	17.1%	16.3%	14.8%	14.2%	12.2%
R	69.4%	66.2%	64.0%	55.4%	50.0%	65.9%	63.7%	51.4%	66.5%	54.6%	45.7%	39.9%	47.7%
S	34.0%	30.3%	18.0%	22.5%	27.2%	46.2%	27.2%	21.9%	23.0%	20.2%	28.8%	14.4%	11.5%
All	**26.2%**	**25.5%**	**25.4%**	**23.6%**	**23.6%**	**28.3%**	**23.7%**	**23.0%**	**22.3%**	**20.8%**	**19.1%**	**18.1%**	**17.7%**

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Table 3

Median EM Z-Score by Industry

Industry	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
A	6.20	7.52	6.28	5.91	5.89	6.22	6.65	6.93	6.74	6.82	7.59	7.62	8.06
B	3.76	4.62	4.81	4.76	4.47	3.79	4.10	4.24	4.66	4.97	5.59	5.83	5.32
C	5.48	5.49	5.71	5.75	5.89	5.64	5.97	5.97	5.95	6.32	6.52	6.72	6.91
D	3.97	5.56	5.31	5.54	5.74	5.28	5.25	5.76	5.27	4.83	3.99	4.89	5.05
E	5.36	4.82	4.82	5.90	6.22	5.95	6.11	5.84	6.74	7.07	7.10	7.38	7.25
F	5.13	5.13	5.85	5.54	5.53	5.47	5.80	6.09	6.63	7.07	7.54	7.33	7.32
G	5.22	5.08	5.45	5.51	5.63	5.66	6.15	6.36	6.58	6.93	7.03	7.27	7.38
H	4.61	4.81	5.12	4.96	5.05	4.75	5.42	5.78	6.20	6.15	6.01	6.70	7.14
I	6.07	6.74	6.92	6.79	6.38	6.02	5.95	6.79	6.54	7.71	6.05	6.71	8.31
J	7.42	7.84	8.94	8.50	8.53	9.51	9.74	9.23	10.01	10.25	11.03	10.46	11.19
K	7.80	6.78	6.94	5.69	5.76	6.82	6.31	7.10	7.58	6.97	6.50	7.64	8.57
L	6.98	6.47	7.23	7.72	7.41	7.12	7.33	7.30	7.53	7.58	8.52	7.71	8.01
M	7.40	7.73	8.36	7.75	7.73	8.10	8.04	9.19	9.28	10.23	9.27	9.58	9.36
N	7.95	7.58	7.45	7.92	8.69	8.41	8.67	8.82	8.08	8.40	8.09	8.09	8.34
R	4.12	4.39	5.40	4.40	5.86	4.86	5.46	5.77	5.41	6.71	5.01	6.66	6.49
S	10.28	9.69	11.22	9.50	8.44	8.76	7.27	8.16	9.24	8.57	8.89	8.24	9.01
All	**5.82**	**5.92**	**6.22**	**6.10**	**6.15**	**6.19**	**6.42**	**6.83**	**6.92**	**7.26**	**7.32**	**7.49**	**7.63**

Comparative Analysis of Investment Activity in Kazakhstan and in Neighbouring Countries: Trends, Problems, Perspectives

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The paper is devoted to the review and comparative statistical analysis of investment activity in Kazakhstan and in neighboring countries during the period of 2018-2022 in order to identify entify trends and problems in attracting investment. Despite the fact that all the countries reviewed are former USSR countries and after its collapse were in approximately the same conditions, territorial, natural, climatic, cultural and political peculiarities determine different paths of their further development. The paper compares the level and dynamics of fixed capital nvestments, including by industry, as well as other statistical indicators of the countries under consideration.

Key Words: investment activity, fixed capital investments, FCIs, economic growth, GDP, GVA, GFCF, gross fixed capital formation, non-current assets, property, plant and equipment, sectoral breakdown of investments, FDIs.
JEL-Classification: E22, O11.

1. Preamble

A key component of sustainable economic growth in any country is investment in fixed capital. Thus, back in 1936, J. M. Keynes noted in his work entitled "General Theory of Employment, Interest, and Monetary" that in order to increase national income (national production), it is necessary to increase investment. The mechanism of interaction between economic growth and investment is based on the principle of the multiplier effect, the essence of which is that investment resources increase the equilibrium level of national production by an amount greater than the investment resources themselves (Keynes, 1936).

According to the economic theory, fixed capital investments (FCIs) refers to expenditures aimed at purchasing capital goods and equipment for the production of goods and services in the future. That is, FCIs involve long-term investments in capital by postponing consumption in the present in favor of making a profit in the future and expanding the production process. Fixed capital includes a part of production capital that participates many times in production and creates added value for the manufactured products. However, FCI is a very volatile indicator that is sensitive to both external factors that are understandable to everyone and to factors that are understandable only to entrepreneurs. In this regard, the problem of stimulating investment and assessing its impact on economic growth is still relevant for modern economic science. At the same time, one of the important areas for study is the correct distribution of investment resources in order to achieve high-quality economic growth.

The purpose of this paper is to review modern literature devoted to the relationship between economic growth and investment and, based on a comparative analysis of statistical indicators on investments in Kazakhstan and neighboring countries, to identify trends and problems on the considered issue in some post-Soviet countries.

2. Literature Review

In modern economic literature, a huge number of works are devoted to studying the impact of investments on economic growth in the short and long term, the cause-and-effect relationship between them and other indicators, such as foreign direct investmens (FDIs), domestic savings, domestic investment, the importance of sectoral distribution of investments. A summary of the conclusions of some studies conducted by their authors based on the results of the literature review is given in Table 1. Although most authors emphasize the special role of investments in ensuring

the sustainability of the economy and its growth, the diversity of conclusions and the variety of approaches to assessing the importance of investments for achieving economic progress confirm the complex nature of the problem addressed.

Thus, conclusions about the causal relationship between investment and the rate of economic growth are controversial. For example, the close relationship between the share of gross fixed capital formation in GDP and the growth rate after the World War II led many authors, such as De Long & Summers (1991, 1992), to conclude that the rate of gross capital formation, or FCI, determines a country's pace of economic growth. However, examining this relationship over a 15- to 20-year time period does not prove causality. An early study on this issue was Lipsey & Kravis (1987), who showed that when dividing a long period into five-year periods, the growth rate was more closely related to the rate of capital formation in subsequent five-year periods than to the rate of capital formation in the preceding or corresponding five-year periods. This result suggested that the observed long-run relationship was driven by the effect of economic growth on capital formation rather than to the effect of capital formation on economic growth (Blomstrom et al., 1996).

Blomstrom et al. (1996), similarly looking at changes in capital formation and economic growth over successive five-year periods, but using more formal methods to examine the direction of causality, found no evidence that fixed investment is the key to economic growth. This finding is consistent with the last 25 years of research in development economics, which shows that the path to economic growth and development is more than simply raising savings and investment rates from 5% to 15% or some other benchmark. Institutional development, the economic and political climate, and economic policies that encourage education, foreign direct investments (FDIa), and the efficient use of investment are the main foundations of economic growth (Blomstrom et al., 1996).

When considering the impact of FDIs on economic growth, a literature review by Bruno & Campos (2013) shows that 50% of the empirical studies at the macro level report a significant positive impact of FDIs on economic growth, 11% find a negative impact, and 39% find that growth is independent of FDIs. The authors explain these contradictory results by the use of different econometric methods and specifications (Bruno & Campos, 2013) and different absorptive capacities of host countries (Blomstrom et al., 2003). Thus, empirical studies converge on the conclusion that the impact of FDIs on economic growth depends on several local circumstances, such as the level of development (Blomstrom et al., 1994), human capital (Borensztein et al., 1998), financial development (Alfaro et al., 2004), business environment (Busse et al., 2008) and sectoral distribution (Aykut and Sayek, 2007).

Table 1

Literature Review of the Role of Investments in Promoting Economic Growth

Authors, Year of Publication	Data Range	Outcomes and Findings
De Long & Summers (1991, 1992)	61 countries during the period of 1960–1985, 54 countries during the period of 1950–1985, 1985–1990.	Investment in machinery and equipment has a strong relationship with economic growth: each additional percentage point of GDP invested in machinery is associated with an increase in the GDP growth rate of one-third of a percentage point per year. This relationship is much stronger than the relationship found between economic growth and other components of investment. Higher investment in machinery contributes to faster economic growth; the social return on investment in machinery in well-functioning market economies is about 30% per year.

Blomstrom et al. (1996)	more than 100 countries during consecutive five-year periods from 1965 to 1985	When dividing the post-World War II period into five-year sub-periods, we find that growth in the GDP per capita over a given period is more closely related to subsequent capital formation than to current or past capital formation. Moreover, the results of simple causality tests suggest that economic growth stimulates subsequent capital formation to a greater extent than capital formation causes subsequent economic growth. Thus, no evidence is found that fixed investment (or investment in equipment) is the key to economic growth.
Aykut & Sayek (2007)	55 countries during the period of 1990–2003	The results show that if the sectoral composition of FDIs is biased towards the manufacturing sector, it has a significant and positive impact on economic growth. In contrast, if the sectoral composition of FDIs is biased towards services or the primary sector, it has a negative and mostly insignificant impact on economic growth. FDIs in the primary sector is expected to have a mostly negative impact on the local economy due to the following factors that will dominate: the impact on market structure, possible Dutch disease effects due to the impact on the real exchange rate, and the inherently low linkages of the industry with the local economy.
Blomstrom, Kokko and Mucchielli (2003)		The paper suggests that using investment incentives that target foreign firms exclusively – although theoretically motivated in some cases – is generally not an effective way to increase national welfare. The main reason is that the strongest theoretical motive for financial subsidies to attract FDIs – the diffusion of foreign technology and skills into local industry – is not an automatic consequence of foreign investment. Potential spillover benefits are only realized if local firms have the opportunity and motivation to invest in the absorption of foreign technology and skills. Therefore, to encourage foreign investment, it is necessary to simultaneously support training and investment in local firms. Therefore, instead of proposing a narrowly defined FDI policy, there is a need to view investment incentive packages as part of the overall industrial policy of the country and provide any incentives on equal terms to all investors, both foreign and domestic.
Ai and Zhang (2013)	China	The main channel through which FDIs contributed to economic growth was through increasing overall capital formation. The results showed that FDIs had a positive impact on China's economic growth but there were clear regional differences.
Abu & Karim (2016)	16 African coutries south of the Sahara in the preiod of 1981–2011	Although there is a bidirectional causality between economic growth and investment, the effect of domestic investment on economic growth is negative in the short run and positive in the long run.
Trojette (2016)	Countries of 5 regions: Africa	The magnitude of the influence of institutions on the relationship between FDIs and economic growth is uneven

	south of the Sahara, the Middle East and North Africa, Europe, Asia and America, in the period of 1984–2013	across country groups. The critical value of institutions explains the differences between groups. A minimum level of institutions is necessary for FDIs to have a positive effect on economic growth. FDI is found to contribute to growth through government stability, socioeconomic conditions, the rule of law, democratic accountability, and bureaucratic quality for three out of five groups. The results show that even when countries are above the threshold for institutional development, the impact of FDIs on economic growth can vary. This difference is driven by the income level of countries. Indeed, beyond the global institutional level, the positive effect of FDIs on economic growth is more important in middle-income countries than in high-income countries.
Yedder et al. (2023)	North African countries, in the period of 1990–2021	Empirical results confirm that domestic investment and exports have no impact on economic growth in the long run. Possible reasons for this include political instability, dependence on natural resource exports, difficulties in creating a robust infrastructure and transparent regulatory framework, and problems with education and skills of the workforce.

Thus, the above literature review shows that investments are not a panacea for economic growth, much less for high-quality economic growth, and act as one of the possible factors contributing to economic growth when certain favorable conditions are created that are mentioned by the authors of studies on the impact of investments on economic growth.

3. Country-by-Country Analysis of Investment Activity

There are quantitative and qualitative indicators for assessing investment activity at the country level.

The group of qualitative indicators is designed to assess the level of public-private partnership, the number of implemented projects to ensure a favorable investment climate, as well as measures taken to provide financial and other support to investors and entrepreneurs. In this paper, we will focus on the consideration of quantitative indicators, since information on qualitative indicators on a country-by-country basis is not fully available.

Quantitative indicators include sustainable dynamics of GDP and FCI, the share of gross fixed capital formation (GFCF) in GDP, the share of FCI in GDP, FCI per capita and other indicators.

At the same time, in accordance with international statistical standards, FCI is a set of costs aimed at the acquisition, creation and reproduction of fixed assets, that is, costs for new construction, reconstruction of facilities that lead to an increase in their initial cost, the acquisition of machinery, equipment, vehicles, production and business inventory, the formation of a working, productive and breeding herd, planting and growing perennial crops, etc., as well as investments in intangible fixed capital, which includes investments in intellectual property. FCI is reflected in current prices; to obtain real values, the physical volume index of FCI is calculated for the preceding period using a deflator.

According to international statistical standards, GFCF is the cost of acquisition by manufacturers of new and existing fixed assets used in production to create new income in the future, minus the cost of disposal of fixed assets. The calculation of GFCF is based on the FCI indicator, taking into account adjustments to bring it into line with the NAS concept. Thus, FCI includes the costs of acquiring working, productive and breeding livestock, and when calculating GFCF - the change in the value of animals of the main herd, equal to the total value of the

acquisition cost of animals, including growing for own use, minus the cost of disposal. FCI does not include the costs of organizing and maintaining nature reserves and national parks, does not fully include the costs of the end buyer of real estate for intermediary services related to the transfer of ownership rights to it, which should be included in GFCF. Interest payments on loans taken into account in FCI, according to the NAS methodology, are not included in GFCF and GDP.

According to the methodology for calculating such indicators as the "Share of fixed capital investments in the gross domestic product" and "Share of ixed capital investments in the gross regional product of a constituent entity of the Russian Federation" as approved by the order of Rosstat dated January 30, 2014 No. 56, in order to ensure uniform methodological principles for the comparability of data on FCI and GDP, it is proposed to use the GFCF indicator in calculations. At the regional level, due to problems associated with information support, it is proposed to use FCI in calculations. In our analysis, we will consider both of these indicators.

At the same time, the annual ratio of FCI to GDP does not actually show whether there were too many or too few investments. To determine this, it is more useful to consider the total stock of fixed assets, which includes the cost of all past investments adjusted for depreciation.

Thus, for a comprehensive comparative analysis, this paper uses various statistical indicators of investment activity that are available for the countries under consideration: Kazakhstan, Armenia, Belarus, Kyrgyzstan, Russia, Uzbekistan, Azerbaijan, Georgia.

To begin with, let us compare the rates of economic growth of the countries under consideration in 2018–2022 (Figure 1). Thus, in 2020, the "pandemic" year, real GDP reduced to varying degrees in all countries except Uzbekistan, where growth was recorded at 2%. Also, negative GDP growth developed in 2022 in Russia and Belarus due to the aggravation of the geopolitical situation and the imposition of sanctions by Western countries. In all other countries, growth was observed in 2022, while the growth of real GDP recorded in Armenia (12.6%), Georgia (10.4%, in 2021 – 10.5%), Kyrgyzstan (9%) are quite high indicators even for developing countries. Such unprecedented growth may be associated with the emigration of labor and other resources from Russia.
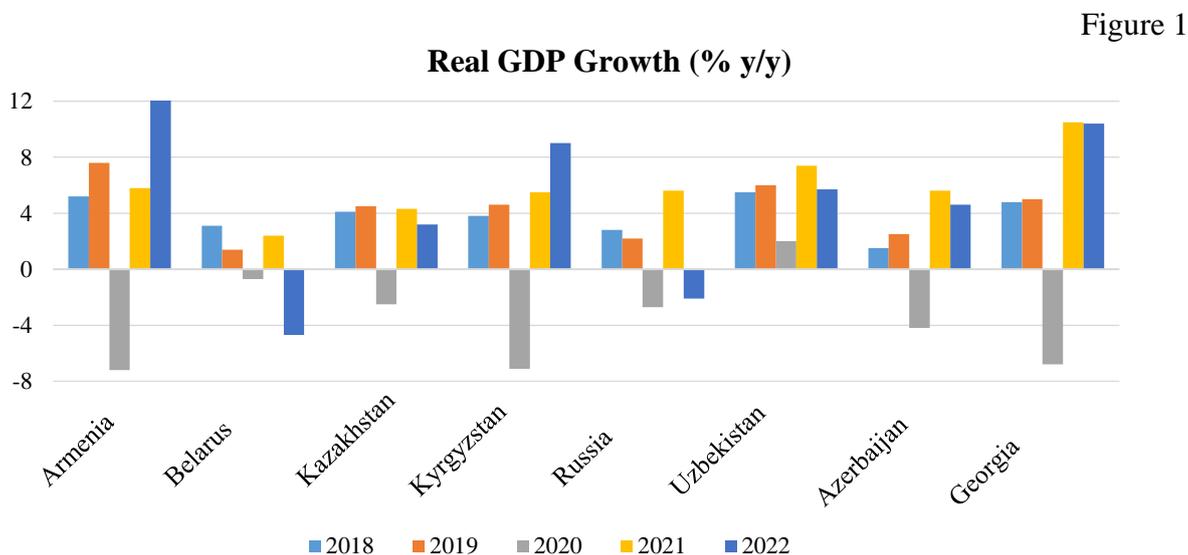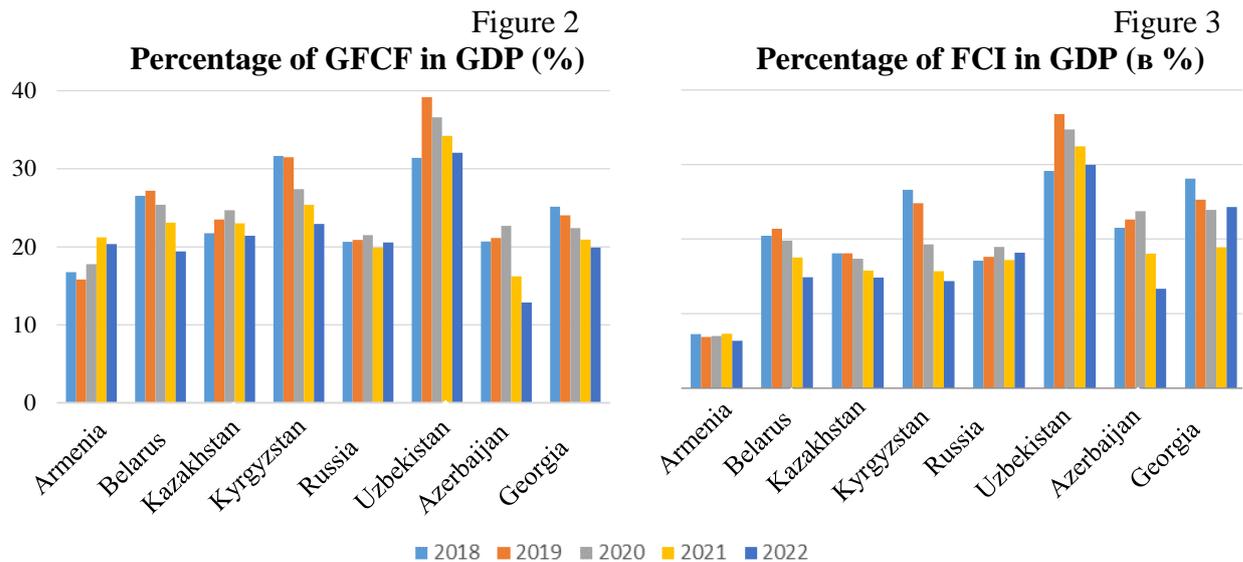
Figure 1

Real GDP Growth (% y/y)

Source: Statistics of the EAEU member countries https://eec.eaeunion.org/comission/, Statistical authoities data of the countries

A more in-depth econometric analysis is required to identify the presence of a connection between investment and high rates of economic growth in the above-mentioned countries. At the same time, certain conclusions can also be drawn by analyzing statistical data on investment activity. Such indicators as the share of GFCF in GDP and the share of FCI in GDP in the countries under consideration may indicate that high investment rates, for example, in Uzbekistan, allowed maintaining positive growth in the "pandemic" year of 2020 (Figures 2, 3). In general, the trend

in changes in the shares of GFCF and FCI in GDP in most countries shows a slightly lower level of the share of FCI compared to GFCF, with the exception of Armenia. Thus, the share of GFCF in GDP in Armenia for the period under review was 16-21%, while the share of FCI in GDP was 6.4-7.3%.

  Compared to global indicators, according to the World Bank, the average share of GFCF in GDP for 2022 across 141 countries was 24.56%, investments – about 20-25% of GDP[1]. Less developed countries usually have higher values than advanced economies, as these countries are in the process of industrialization, which requires additional investment. Thus, the indicators of Armenia, Russia and Azerbaijan in 2022 are below the world average, the indicators of Kazakhstan, Belarus, Kyrgyzstan and Georgia are near the world average, and Uzbekistan is above the world average.

Figure 2
Percentage of GFCF in GDP (%)

Figure 3
Percentage of FCI in GDP (в %)

■ 2018 ■ 2019 ■ 2020 ■ 2021 ■ 2022

Source: Statistics of the EAEU member countries https://eec.eaeunion.org/comission/, Statistical authoities data of the countries, the author's computations

  The overall FCI level in the US dollars at current prices and per capita was also compared (Figures 4, 5). When comparing the overall FCI level, Russia was excluded from the graph, since this indicator in this country was US$413 thousand, which is more than 12 times higher than the indicators of other countries. Russia is the largest among the compared countries both in terms of territory and population, and in terms of the size of the economy.

  When comparing the FCI level per capita, Russia's indicator (US$2,815 in 2022) exceeded the indicators of Kazakhstan and Georgia (US$1,666 and US$1,613 in 2022, respectively) by 1.6-1.7 times, while the indicators of Uzbekistan, Armenia and Kyrgyzstan (US$670, 418 and US$239 in 2022, respectively) were significantly lower.

  Low FCI per capita values indicate significant potential for growth in investment volumes in the future and their high efficiency when creating the necessary conditions for profitability, such as high-quality institutional development, increased development of human capital and the financial environment, correct sectoral distribution of investment, a favorable business climate, etc.

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[1] https://www.theglobaleconomy.com. The data is slightly different from the data of national statistical authorities.
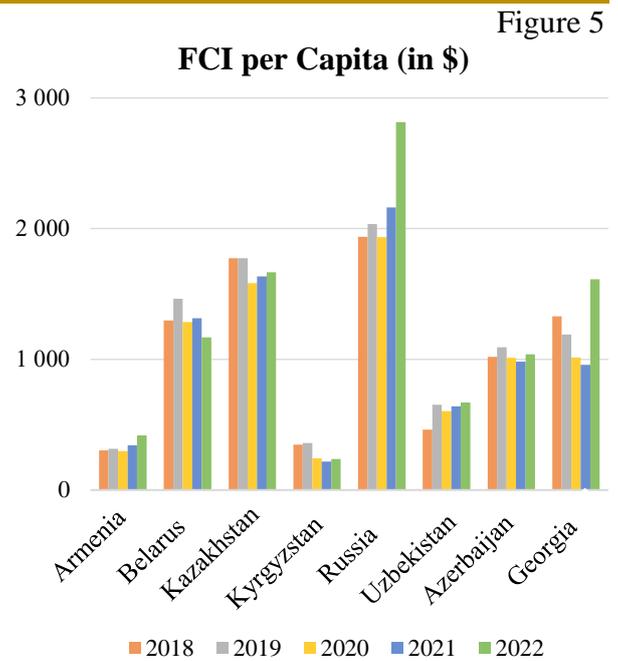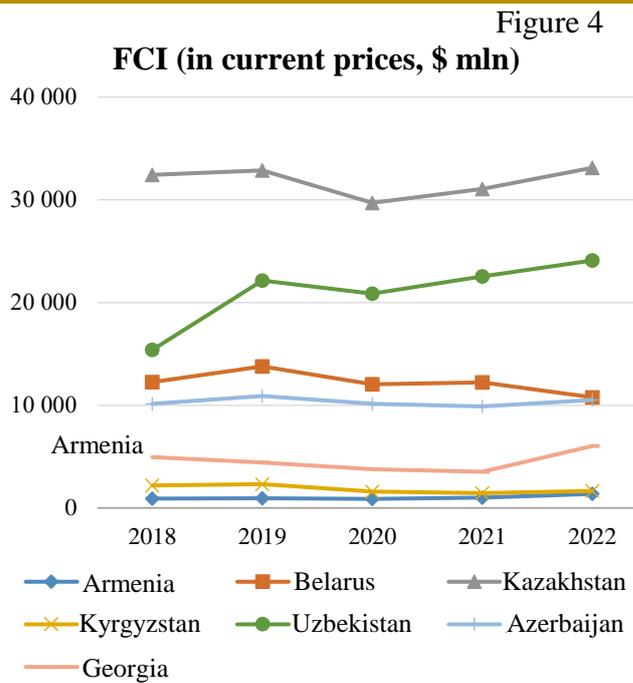
Figure 4

FCI (in current prices, $ mln)

Figure 5

FCI per Capita (in $)

Source: Statistics of the EAEU member countries https://eec.eaeunion.org/comission/, Statistical authoities data, the author's computations

In addition to investment indicators, it is of interest to compare the level of total PPE of the reviewed countries at residual book value, i.e. minus depreciation (Figure 6).
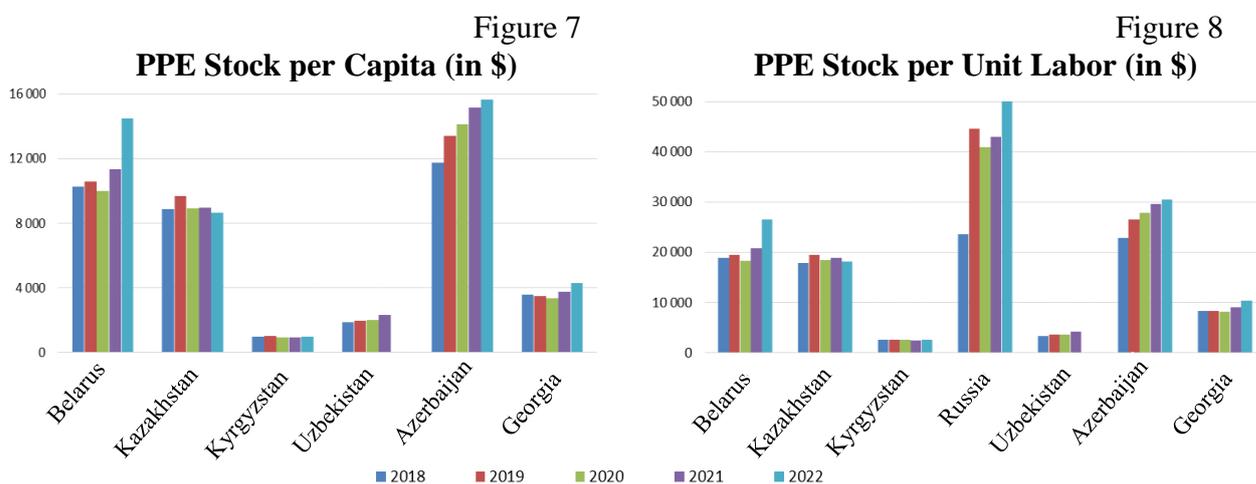
Figure 6

Property, Plant and Equipment
(at residual value at period-end in current prices, $ mln)
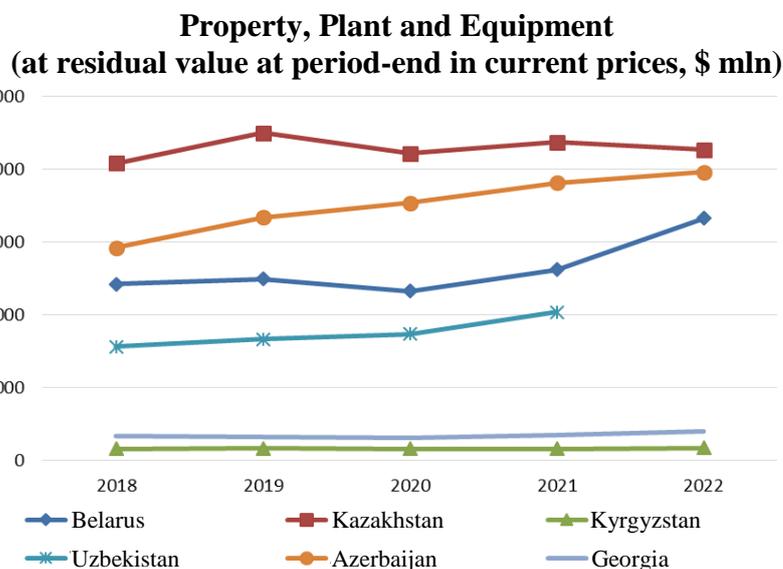
Source: Statistical authoities data, the author's computations

The comparative analysis of the PPE stocks does not include data for Armenia due to their lack of public availability. The data for Russia was also not included in the chart, as its figures are significantly higher than those of other countries (total stocks of assets at the end of 2022 were US$3.8 trillion, or US$535,000 per capita), due to the large size of Russian economy and the legacy of the USSR. Among the countries considered, the level of total stocks of assets in Kazakhstan (US$171 billion in 2022) and Azerbaijan (US$158.5 billion in 2022) is higher than in the others, which is explained by the predominance of capital-intensive industries in these economies, namely the extractive industry, whose share in the total stocks of assets in Kazakhstan was 16.8% in 2022, which is the second indicator after wholesale and retail trade (share 26.4%).

In Azerbaijan, the share of the extractive industry in the total stock of assets was the leader among other industries and amounted to 50.5%. At the same time, in Azerbaijan, over the past 5 years, there has been an increase in stock of assets in the US dollar equivalent at current prices (at a fixed rate of 1.7 manat per 1 US dollar) by an average of 6.3%, while in Kazakhstan, the growth of stockof assets in the US dollar equivalent is insignificant (0.9%), in the tenge equivalent it amounted to 6.9% at current prices.

The next countries in terms of total stocks of assets are Belarus, whose economy is dominated by manufacturing (24% of GDP in 2022), and Uzbekistan, whose economy is dominated by agriculture (25.2% of GDP in 2022) and manufacturing (20.5% of GDP in 2022). Georgia and Kyrgyzstan have low fixed capital stocks (below $20,000 in 2022), which is explained by the relatively small size of their economies and the predominance of the service sector. A more detailed sectoral analysis of investment for some countries is provided in the following sections.

Next, as suggested in the economic literature, it is important to compare the level of fixed capital stocks per capita or per unit of labor force (Figures 7, 8). Comparing these indicators or tracking their changes over time can provide valuable information about factors such as technological progress, labor efficiency, and foreign investment. In general, a high ratio of stock of assets per worker, or capital intensity, shows an economy with a robust productive infrastructure, which often leads to greater economic stability.

Figure 7
PPE Stock per Capita (in $)

Figure 8
PPE Stock per Unit Labor (in $)

Source: Statistics of the EAEU member countries https://eec.eaeunion.org/comission/, data of the countries' statistical authorities, the author's computations

The graph for PPE stocks per capita (Figure 7) does not include Russia, as its PPE figure is 34 times higher than that of Azerbaijan, which is next, while the graph for PPE stocks per labor force includes Russia, as its figure is only 1.65 times higher than that of Azerbaijan, amounting to about $50,000 per labor force in 2022. This confirms that in terms of capital intensity, all the countries we study lag behind global indicators. Thus, relatively small but highly developed countries such as the Scandinavian countries, Belgium, Ireland, Austria and Luxembourg are among the 20 countries with the highest capital intensity, with levels of over $200,000 per worker (Figure 9). While China, India and, to a lesser extent, Brazil and Russia are not very good in terms of capital intensity (Berlemann & Wesselhöft, 2017).

For a more detailed analysis, including consideration of the sectoral distribution of investments, we will focus on some countries individually.

Figure 9

Country Rating based on Capital Intensity in 2014 (in $ of 2010)
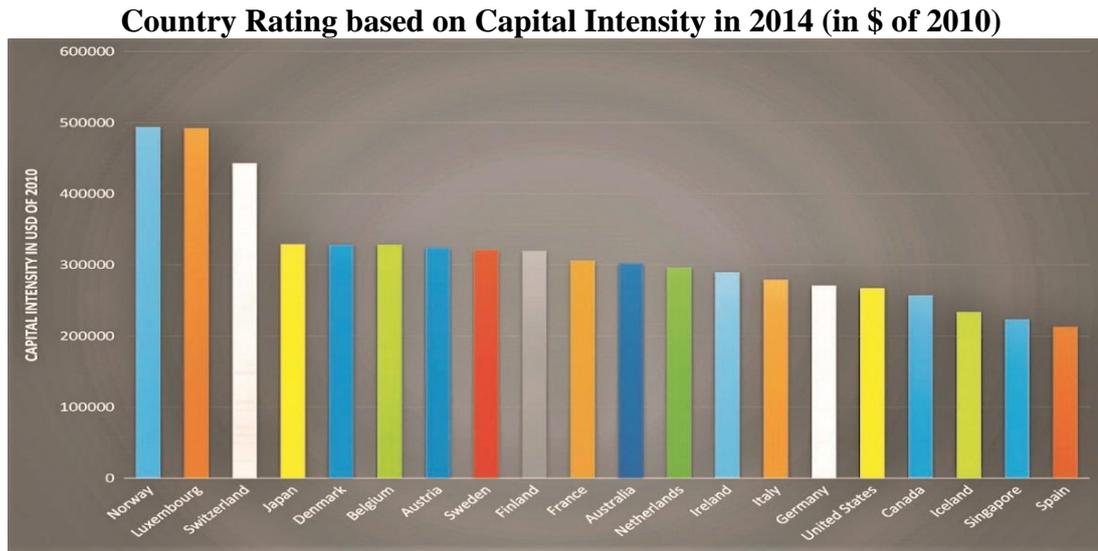
Source: Berlemann & Wesselhöft (2017)

Kazakhstan. Over the past 5 years, Kazakhstan has seen a decrease in the share of FCIs in GDP from 18% in 2018 to 14.7% in 2022 (Figure 10). This is happening against the lag in the average annual growth rate of investment (6.4% for 2018–2022) compared to the average annual growth rate of nominal GDP (10.9% for 2018–2022). The reduction in investments is observed across all sectors of the economy: the share of FCI in the extractive industry in GDP decreased to 4.3% in 2022 (7.2% in 2018), the share of FCI in the manufacturing industry is insignificant and is gradually decreasing in relation to GDP (from 2.0% in 2018 to 1.5% in 2022). At the same time, the FCI structure (Figure 11) retains the predominant share of the extractive sector (29.2%), which indicates not only the capital intensity of this industry, but also the raw materials focus of the country's economy. This is also promoted by foreign direct investments, of which 80% (US$ 139.6 billion as of July 1, 2023) are channeled to the mining and metallurgical industry, including 70.3% (US$ 122.2 billion) to the extraction of crude oil and natural gas. At the same time, the share of the manufacturing industry in the FCI structure is 3 times smaller - only 10.4%.

Figure 10   Figure 11

FCI of Kazakhstan's GDP, by Industries   **FCI Structure, Over Time**
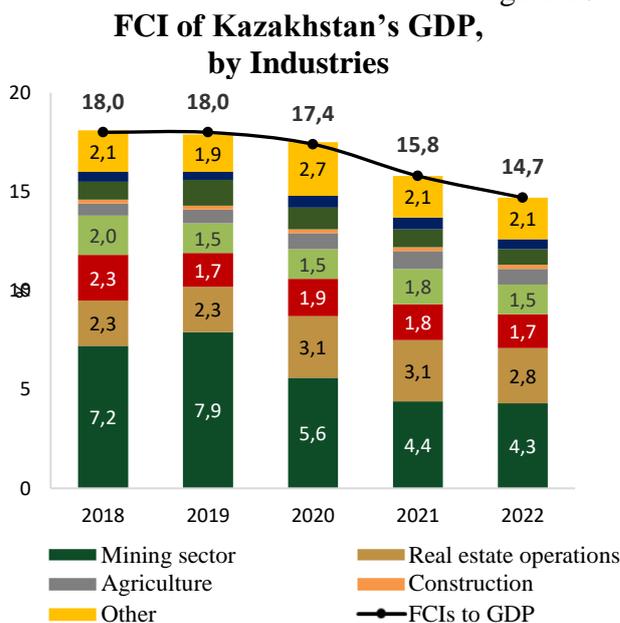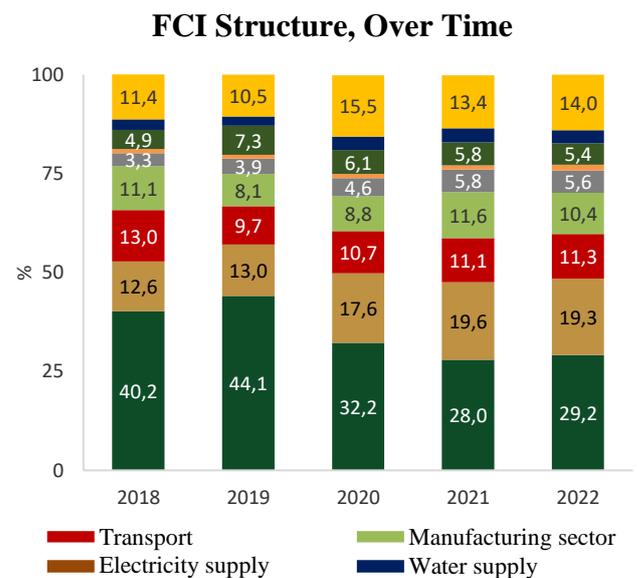
Source: BNS ASPR RK, the author's computations

Comparison of the contributions by Kazakhstan's economic sectors to gross value added (GVA) and FCI points to the underinvestment in Kazakhstan's manufacturing sector (Figure 12). Thus, the growth of investment in the manufacturing sector lags behind the growth of GVA in this sector by more than 3 times.

Figure 12

GVA and FCI by Industry, in bln tenge
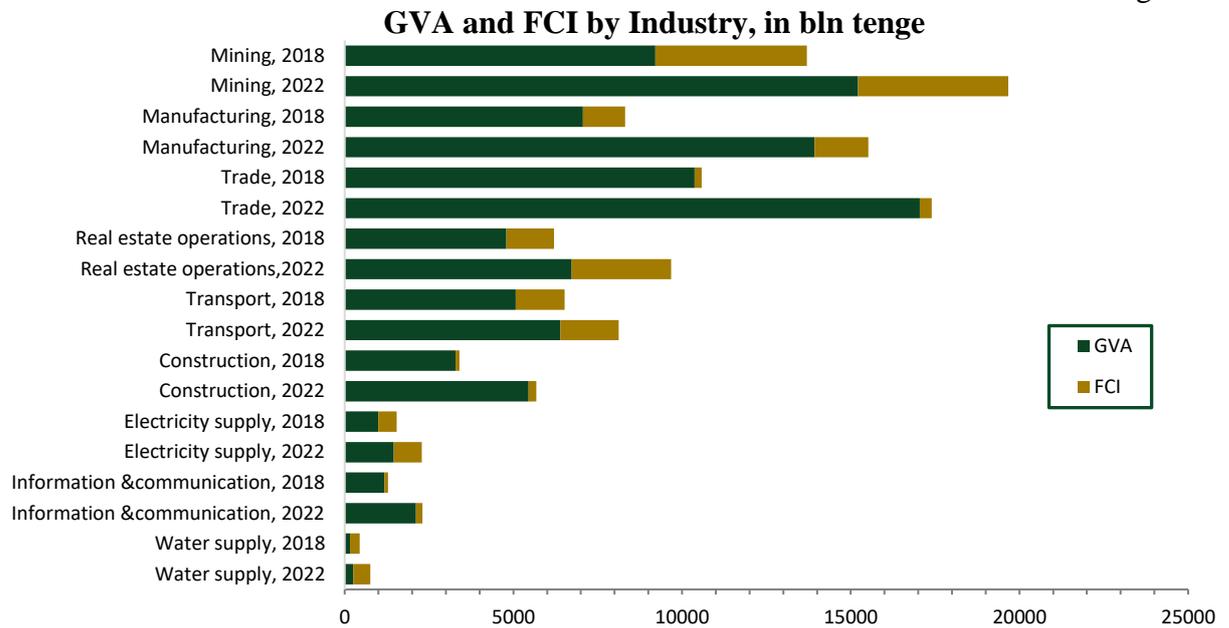
Source: BNS ASPR RK, the author's computations

Despite the fact that among the studied countries, with the exception of Russia, the level of PPE in Kazakhstan is the highest, there is an urgent need to update PPE in key sectors. Thus, the rate of PPE depreciation is 5 times faster than the rate of their replacement. The overall level of PPE depreciation increased from 38% in 2018 to 46% in 2022, while the replacement rate remained virtually unchanged (9.3% in 2018 and 9.7% in 2022).

Figure 13

PPE Distribution by Industries (as of the end of 2022)
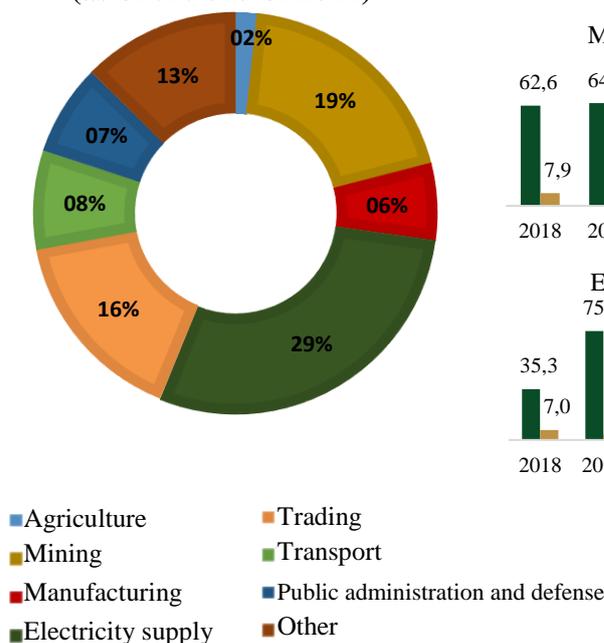
Figure 14

Degree of PPE Depreciation by Industries
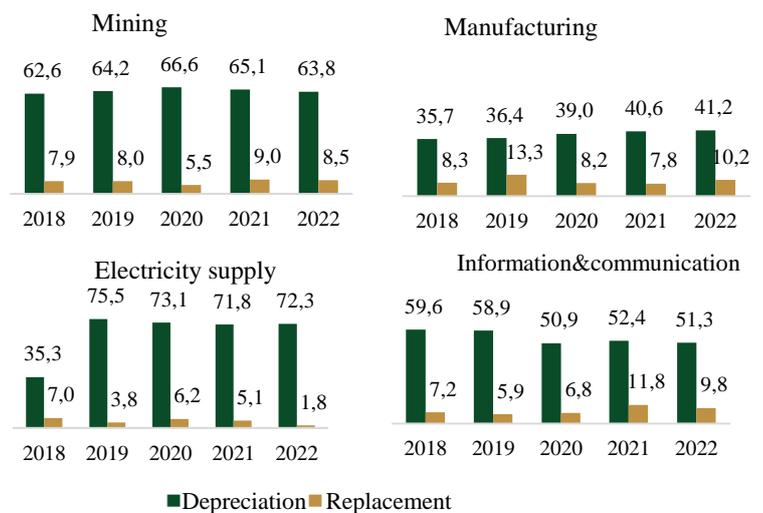
Source: BNS ASPR RK, the author's computations

The energy supply industry is the most capital-intensive (29% of all PPE in Kazakhstan) and at the same time with the highest degree of PPE depreciation (72.3%) (Figure 13). This industry has a minimum replacement rate (1.8%), which shows its underinvestment. Other industries with a high degree of depreciation are the extractive (63.8%) and manufacturing (41.2%) industries, as well as information and communication (51.3%) (Figure 14).

Investments in high-tech machinery and equipment and intangible assets are important for high-quality growth. A significant share of investments in Kazakhstan is directed to buildings and structures (61%), and they mainly prevail in the industry related to real estate transactions. In the manufacturing industry, more than half of the investment volume falls on the construction and major repairs of buildings and structures.

Costs for machinery and equipment make up less than a third (28%) of the total investment in Kazakhstan. Investments in intangible fixed capital are minimal and are decreasing from year to year (from 21% of all FCIs in 2019 to 11% in 2022). Their volume went down from 2.7 trillion tenge in 2019 to 1.6 trillion tenge in 2022. Investments in intangible assets are directly related to the financing of scientific and technological progress, increasing innovative aspects and improving the technological efficiency of production in general.

Figure 15

FCIs by Types of Costs, by Industries, %
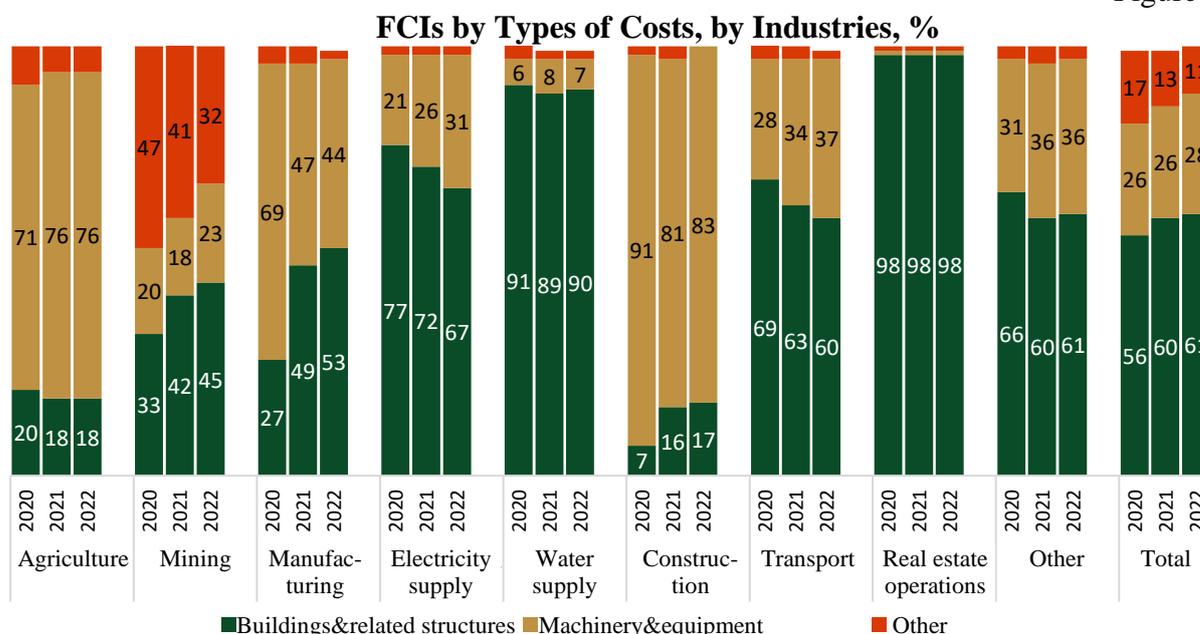
Source: BNS ASPR RK, the author's computations

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Uzbekistan. In Uzbekistan, as mentioned above, the FCI to GDP ratio is higher than the world average (30% in 2022) (Figure 16). The main industries generating GVA in Uzbekistan in 2022 were agriculture, forestry and fisheries (25.2% of GDP), manufacturing (20.5% of GDP), trade (7% of GDP), construction (6.7% of GDP), real estate operations (5.5% of GDP) and

transport services (5.2% of GDP). The remaining industries generate less than 5% of GDP, including mining (Figure 18). At the same time, according to the FCI sectoral structure, in 2022 the main recipients of investments were manufacturing (25.5%), real estate operations (11.6%), mining (8.7%), transport (7.7%), electricity supply (7.5%) and construction (6.1%) (Figure 17). The share of agriculture was 5.9%, which is not comparable with its contribution to the country's GDP and may indicate underinvestment in this sector.

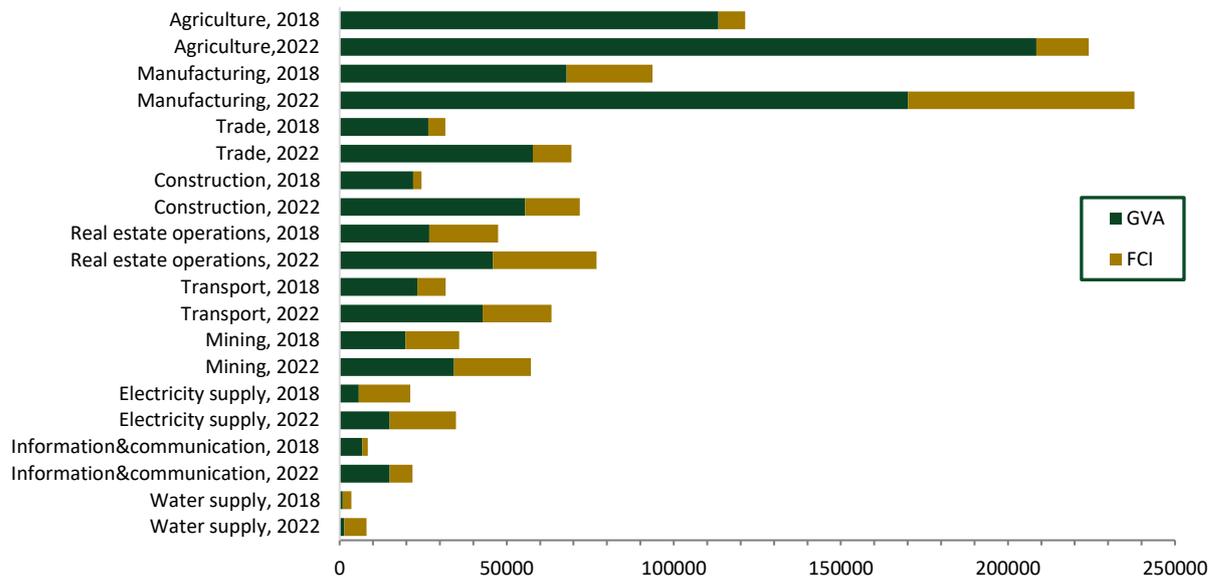Figure 16

FCI to GDP of Uzbekistan, by Industries
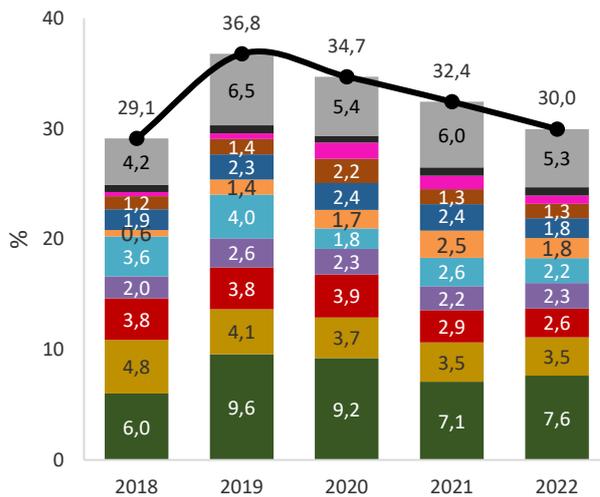
Figure 17

FCI Structure
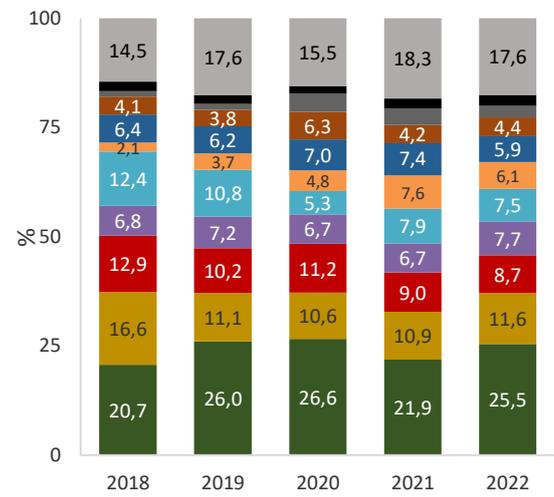
Source: Agency of Statistics under the President of the Republic of Uzbekistan , the author's computations

Figure 18

**GVA and FCI, by Industries of Uzbekistan, in bln sums**

Source: Agency of Statistics under the President of the Republic of Uzbekistan, the author's computations

Meanwhile, there are outpacing growth rates of investments compared to the growth of their contribution to GVA in construction (3.5 times), information and communication (2.75 times) and water supply (2.37 times), which shows an increase in investment attractiveness, as well as an increased priority of these industries for public policy. Thus, according to the study by Begalov B.A. et al. (2023), in the last 5 years, many projects have been implemented in Uzbekistan for the construction of infrastructure, social facilities, and facilities in the manufacturing industry.

In terms of funding sources, in 2022, about 16% of investments were financed through centralized sources, which include the state budget, public funds and foreign loans guaranteed by the Republic of Uzbekistan. The remaining 84% of the total investment was financed from non-centralized sources, such as own funds of enterprises (30%) and the population (10%), bank loans and other loans (6.6%) and other sources.

Figure 19

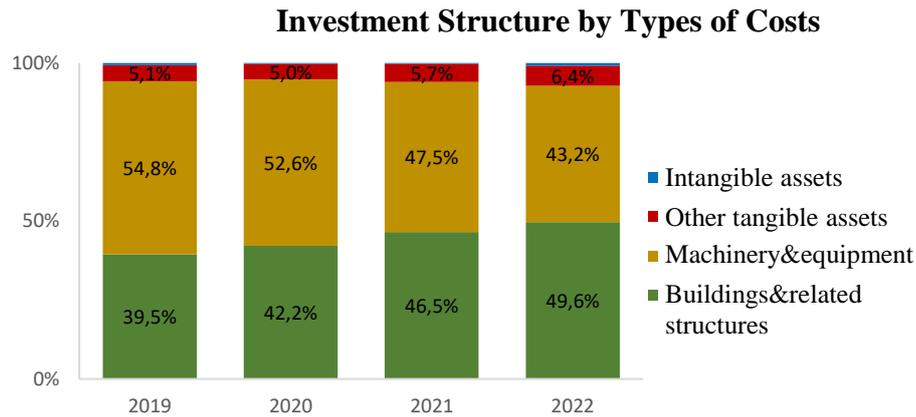**Sources of Investment Financing in Uzbekistan**
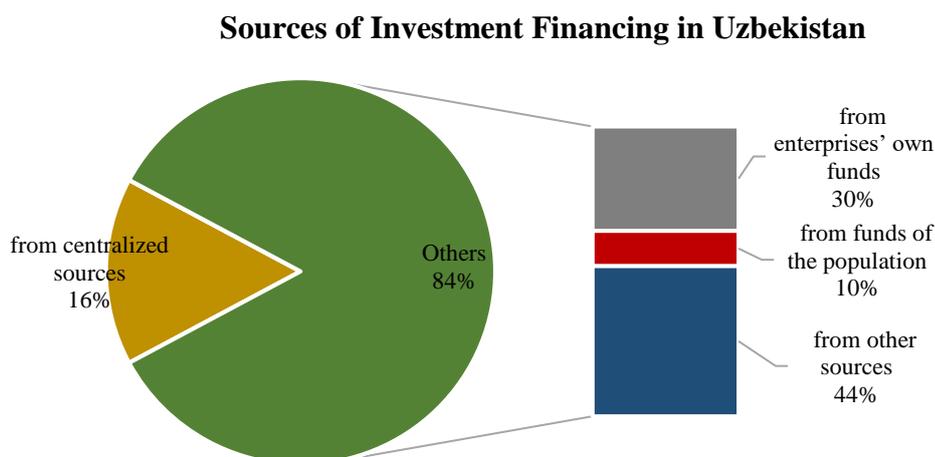
Source: Agency of Statistics under the President of the Republic of Uzbekistan

According to the Report of the State Committee of the Republic of Uzbekistan on Statistics, "The Status and Movement of PPE in the Republic of Uzbekistan for 2021", the degree of PPE depreciation from 2017 to 2021 decreased from 34.9% to 26.7%, and the rene rate fluctuated from 15.5% to 13.8% and averaged 14.1%. Despite the fact that the most capital-intensive industry in 2021 was the service sector with a share of 59.9% of all fixed assets (at residual value), which includes transport, construction, information and communication and other service industries, however, the highest degree of depreciation was recorded in industry – 30.4%, in particular, in the mining industry – 30.5%, the manufacturing industry – 31.0%, electricity supply – 29.2% and water supply – 25.2%. At the same time, the leaders in the commissioning of new fixed assets are industry (40.5%) and the service sector (39%).

The structure of Uzbekistan's FCI by types of costs shows that from 2019 to 2022, the share of costs for construction and major repairs of buildings and related structures increased from 39.5% to 49.6%, while the share of costs for machinery and equipment decreased to 43.2% (Figure 20). The share of costs for intangible assets remains insignificant (0.8%), although in value terms there is an increase of more than 2 times in 2022 (from 292.3 billion som to 1,169 billion som). Thus, a statistical analysis of Uzbekistan's data on the dynamics of FCI and their distribution by industry and by types of costs showed that the main focus of government policy is aimed at developing the manufacturing industry in order to saturate the domestic market with its own consumer goods. The reforms implemented over the past 5 years have proven successful, which has allowed increasing investments (the quantum index) on average by 11% annually in real terms. At the same time, FCI per capita and PPE per unit of labor force are quite low, which points to the need for further investment growth. It is important to focus on investments that promote scientific and technological progress, increase innovations and improve the technological efficiency of production in general.

Figure 20

Investment Structure by Types of Costs

Source: Agency of Statistics under the President of the Republic of Uzbekistan

Armenia. Armenia's FCI indicators for 2022, both as a share of GDP (6.4%) and per capita (US$418), are the lowest among the reviewed countries. This is due to the prevalence of less capital-intensive industries in the economy, as well as factors such as the unstable political situation in the country and the military situation driven by the situation on the border with Azerbaijan, which contribute to reduction in the level of investments. In addition, the small size of the economy, the deficient budget and relatively high debt, as well as low income of the population limit the potential for domestic investment sources. Therefore, foreign investors serve as the main source of investment.

From 2012 to 2020, Armenia has seen a downward trend in net FDI inflows to GDP. The most significant decline occurred in 2019 and 2020 – 0.7% and 0.5%, respectively. According to Avetisyan A. M. (2023), the decline in FDI inflows in recent years, with the exception of 2021 and 2022, is driven by the less than favorable investment climate and business conditions. The difficulty of doing business in Armenia depends on a number of factors, namely:

– the relatively small size of the Armenian market, complicated by logistics. Two of the four borders (with Turkey and Azerbaijan) are closed, which has a negative impact on trade and on economic growth in general;

– brain drain;

– corruption in the tax and customs system and in other systems;

– the existence of problems with the rule of law and transparency, including in judicial decisions.
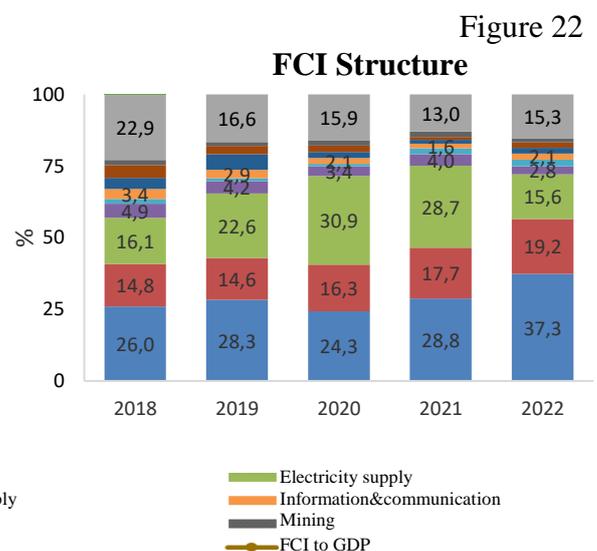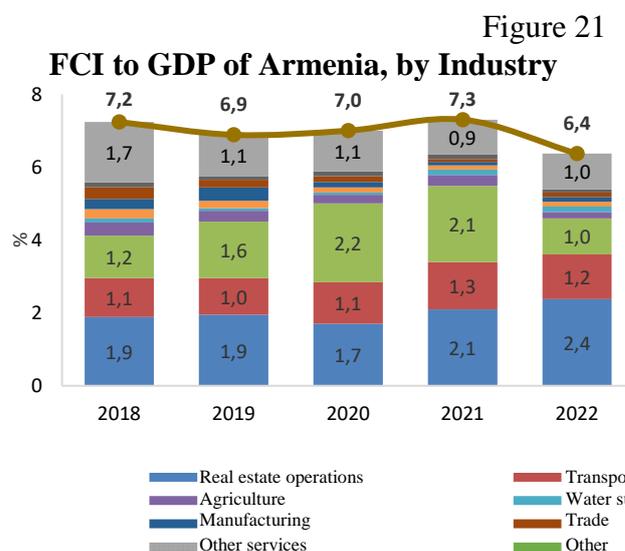
Figure 21

FCI to GDP of Armenia, by Industry

Figure 22

FCI Structure

Source: Statistical Committee of the Republic of Armenia, the author's computations

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In addition to the above factors, Armenia has structural problems in investment distribution. Investments are mainly channeled not to manufacturing industries but to service sectors such as real estate operations (37.3% in 2022), transport (19.2% in 2022), energy supply (15.6% in 2022) and other services (15.3% in 2022) (Figure 21, 22). At the same time, all other industries have seen a decline in investment. The main recipient of FDIs in 2022 was the energy supply industry (28.6% of net FDI inflow), ahead of the mining industry (25.8% of net FDI inflow). Third place in attracting FDIs belongs to real estate operations (16.7%).

At the same time, a comparison of the contributions of the Armenian economic sectors to the country's GVA and FCI shows that the top three sectors generating GDP – trade (11.6% of GDP), manufacturing (11.3% of GDP) and agriculture (10.4% of GDP) – are not receiving a proportionate share of investment (Figure 23).

Figure 23
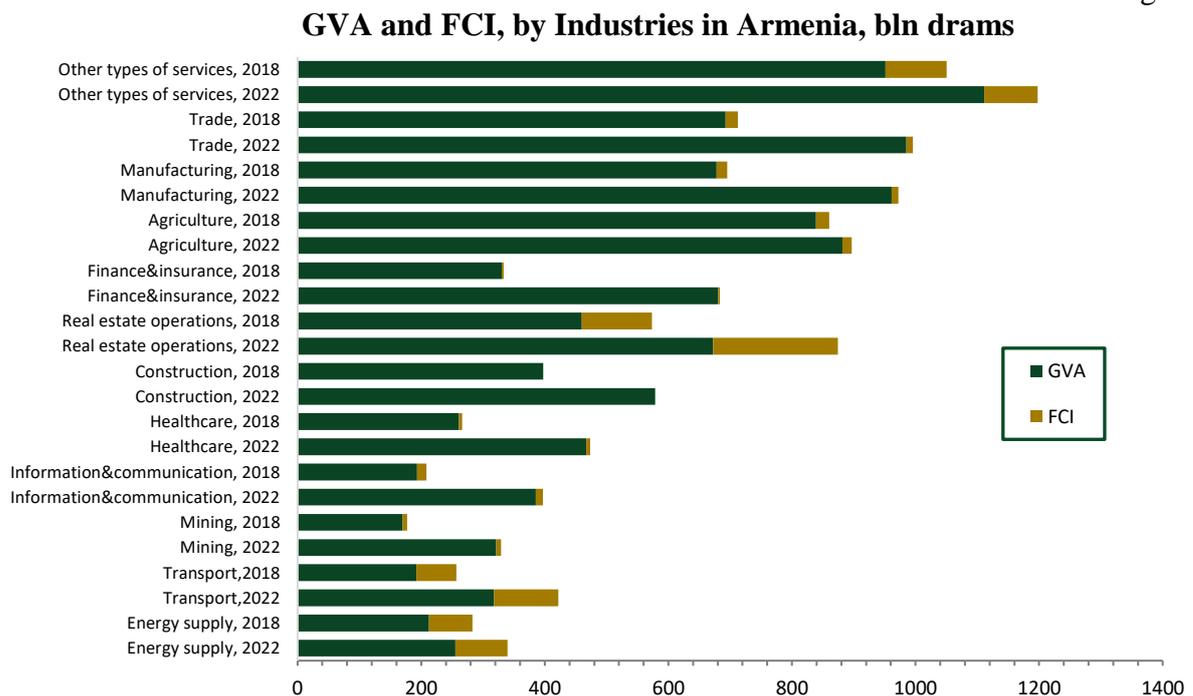
GVA and FCI, by Industries in Armenia, bln drams

Source: Statistical Committee of the Republic of Armenia, the author's computations
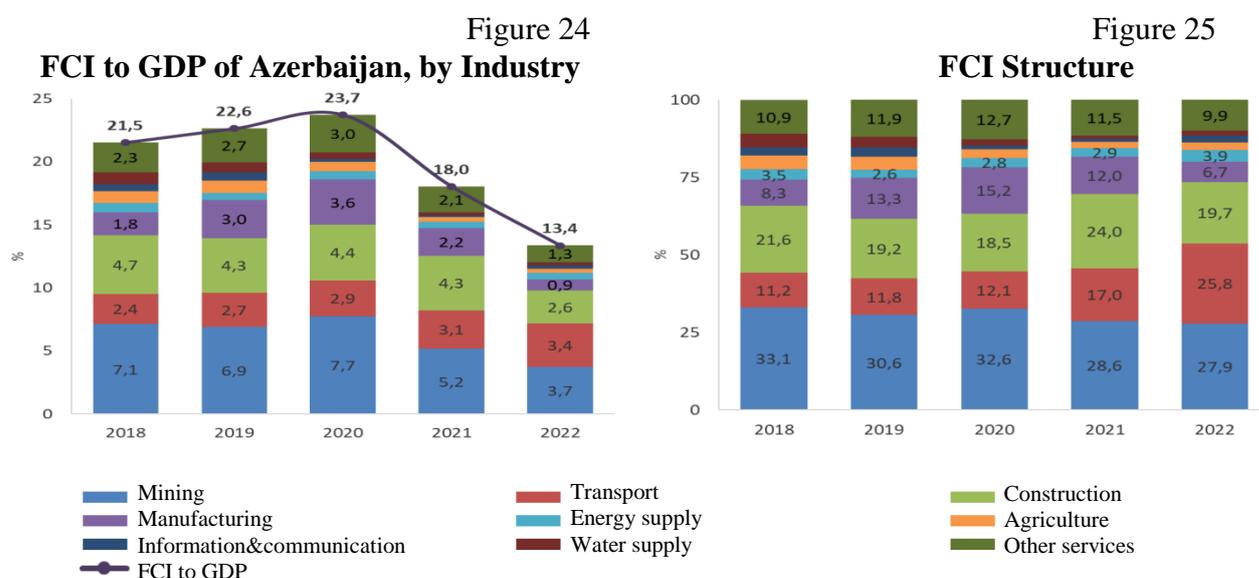
Meanwhile, in 2022, significant changes were observed in some industries in their contribution to the high growth of real GDP in Armenia (12.6%). Thus, the change in real GDP by industry was in such sectors as "Information and Communication" – 150.6%, "Financial and Insurance Services" – 146.8%, "Accommodation and Catering Services" – 142.2%, "Transport and Warehousing" – 133.8%. Based on the nature of services provided, it can be assumed that such significant increases occurred due to the emigration of labor and other resources from Russia. Therefore, in the future, maintaining such high growth in real GDP without reforms to attract investment in manufacturing industries and create a favorable business climate seems doubtful.

During the Soviet period, Armenia was a developed industrial country. The industrial production of the Nairit plant was shipped to 120 countries worldwide. The mechanical engineering, electrical engineering, and chemical industries were developed. After the collapse of the USSR, facilities in these industries ceased to operate. Despite the destructive consequences of the collapse of the USSR, experts note the high potential for investment development in the industry of Armenia (Petrosyan S.A., 2013).

Azerbaijan. In Azerbaijan, the dynamics of investment activity is similar to Kazakhstan. Thus, over the past 5 years, the share of FCI in GDP decreased from 21.5% in 2018 to 13.4% in 2022 (Figure 24). This is happening against the lag in the average annual growth rate of investments (for 2021–2022 – 0.7%) from the average annual growth rate of nominal GDP (for 2021–2022 – 10.8%). A decline in investments is observed in all key sectors of the economy: the

share of FCIs into the extractive industry in GDP decreased to 3.7% in 2022 (2018 – 7.1%), construction – to 2.6% (4.7%), manufacturing – to 0.9% (1.8%), with the exception of transport, where the share of FCIs in GDP increased from 2.4% in 2018 to 3.4% in 2022.

The FCI structure (Figure 25) maintains a dominant share of the extractive sector (27.9%) and shows a gradual increase in the share of transport (from 11.2% in 2018 to 25.8% in 2022), which is due to Azerbaijan's participation in projects such as the East-West and North-South Transport Corridors, the Baku-Tbilisi-Ceyhan oil pipeline, the Baku-Tbilisi-Erzurum gas pipeline, Shah Deniz 2 and the Southern Gas Corridor. Both of the latter are priority energy projects for the European Union. In addition, Azerbaijan has made significant progress through notable regional initiatives such as the Baku-Tbilisi-Kars railway, the New Baku International Sea Trade Port and the railway connecting Azerbaijan and Iran. These important activities contribute to the development of trans-regional infrastructure.

Figure 24
FCI to GDP of Azerbaijan, by Industry

Figure 25
FCI Structure

Mining — Transport — Construction
Manufacturing — Energy supply — Agriculture
Information&communication — Water supply — Other services
FCI to GDP

Source: State Statistical Committee of the Republic of Azerbaijan, the author's computations

At the same time, there has been a decrease in investments in the oil sector and an increase in investments in the non-oil sector in recent years. According to Yakhyaeva (2023), the volume of FCIs in the oil and gas sector of the Republic of Azerbaijan in 1995-2006 was higher than the volume of investment in the non-oil and gas sector due to the implementation of the Contract of the Century and large oil and gas projects (construction of the South Caucasus Gas Pipeline and the Baku-Tbilisi-Ceyhan oil pipeline). However, since 2007 (excluding 2016), the majority of FCIs have been in the non-oil and gas sector. If in 2005, 65.1% and 34.9% of FCIs were directed to the oil and gas and non-oil sectors, respectively, in 2020 this ratio changed to 34.8% and 65.2%, respectively.

The ratio of domestic and foreign investment inещ the extractive industry in 2020 was 57.6% and 42.4%, respectively (Yakhyaeva, 2023). If in 2015, 44.6% of investments were made into the extraction of crude oil and natural gas, in 2020 this figure decreased to 32.0%, mainly due to foreign investment. At the same time, foreign investment in the processing sectors of the economy of Azerbaijan is very insignificant. The investment of foreign financial resources not only in the processing industries but also in the agricultural sector and enterprises engaged in production of finished products is significantly lower than required (Yakhyaeva, 2023). Based on the results of comparison between the contributions of industries to GVA and FCI, one can also conclude that the manufacturing industry and agriculture are underinvested (Figure 26). Moreover, investment in agriculture has decreased by almost 2 times from 2018 to 2022.
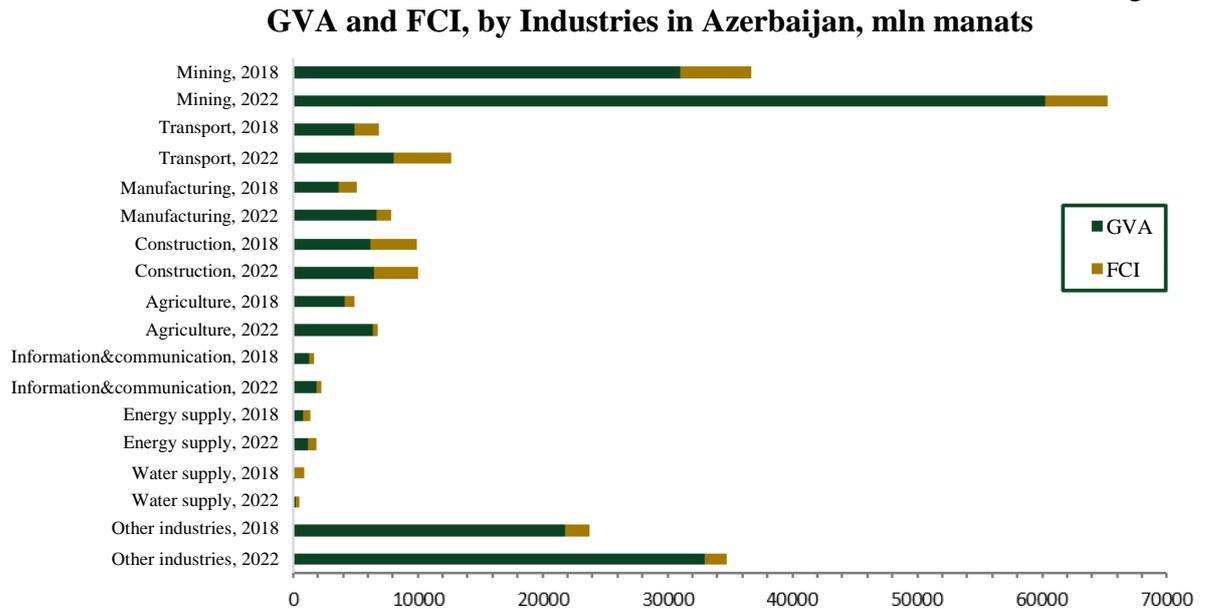
**GVA and FCI, by Industries in Azerbaijan, mln manats**

Source: State Statistical Committee of the Republic of Azerbaijan, the author's computations

The share of own funds of enterprises and organizations in the total volume of FCI in 2020 amounted to 56.4%, budget funds – 27.4%, personal funds of the population – 5.8%, bank loans – 6.2%, extra-budgetary funds – 1.5%, and other funds – 2.7%. Although bank loans account for only 6.2% of borrowed funds, this figure is significantly higher in developed countries. The low share of bank loans is driven by high interest rates of banks, which is a factor limiting investment activity in the country as a whole (Hajiyeva & Mirzayeva, 2024).

The most capital-intensive sector of the Azerbaijani economy is traditionally the extractive industry (50.5%), followed by transport (7%). At the same time, over the recent 5 years, Azerbaijan has seen an increase in PPE assets by an average of 6.3% per year, mainly owing to such sectors as construction (average growth of 16.3%), water supply (10.8%), and manufacturing (10.4%). However, due to the lack of publicly available data, it is not possible to draw conclusions about the degree of PPE depreciation and replacement.

Distribution of Non-Current Assets, by Industry in Azerbaijan
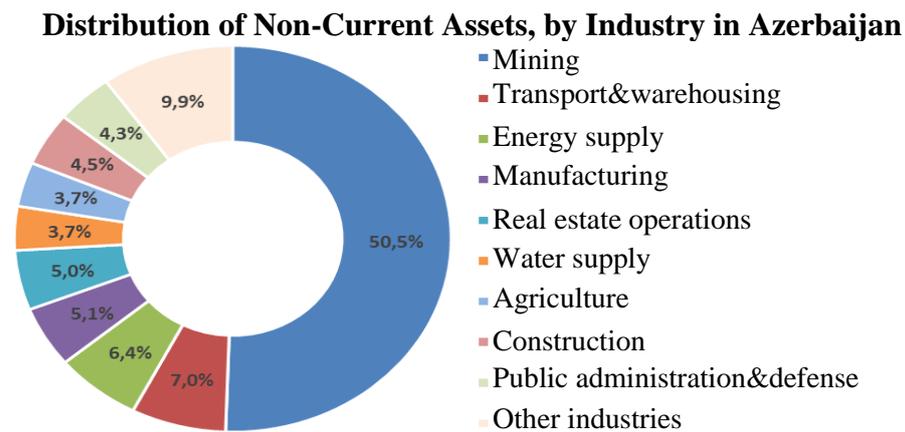
Source: State Statistical Committee of the Republic of Azerbaijan

According to the results of the correlation analysis of the relationship between domestic and foreign investment with Azerbaijan's GDP in 2000-2020, which was conducted by Hajiyeva & Mirzayeva (2024), the degree of correlation between domestic investment and GDP was 0.9323, and the degree of correlation between foreign investment and GDP was 0.6962. This suggests that there is a very close relationship between domestic investment and GDP, as well as a significant

relationship between foreign investment and GDP (according to the Chaddock scale). The combined effect of changes in domestic and foreign FCI on Azerbaijan's GDP is 0.9692. According to the results of regression analysis, an increase in domestic investment by 1 manat shows an increase in GDP by 4.386 manats, an increase in foreign investment by 1 manat shows an increase in GDP by 3.4405 manats.
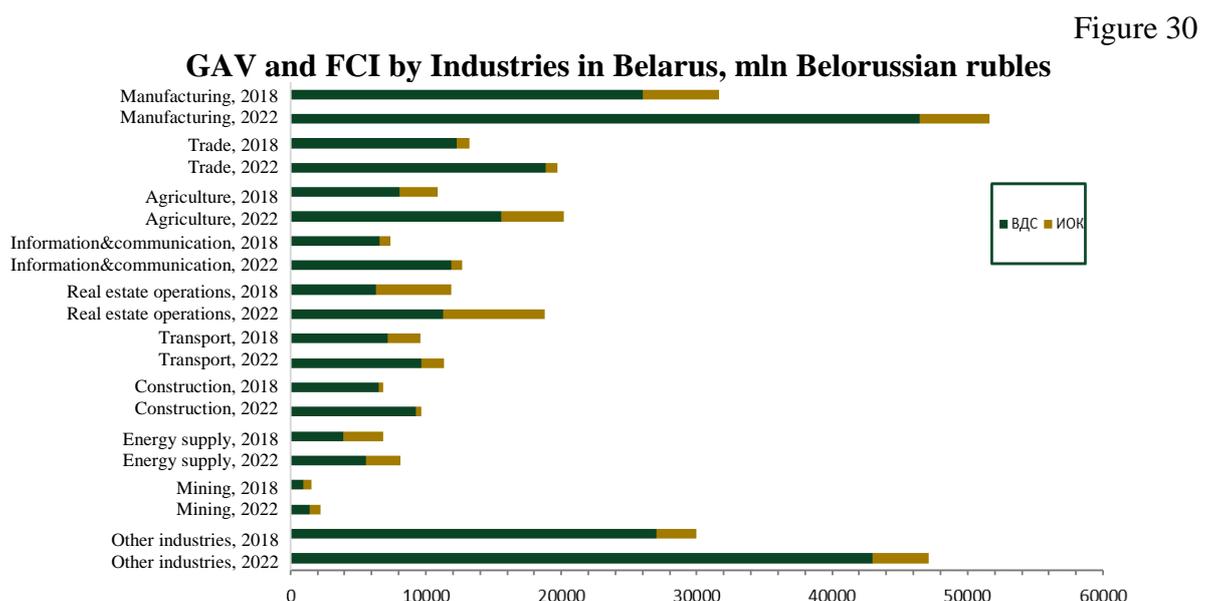
Thus, investments play a significant role in the growth of Azerbaijan's GDP, especially domestic investments directed to the non-oil sector. Therefore, the government's efforts to attract investments to the non-oil sector are effective.

Belarus. The dynamics of FCI to GDP in Belarus has been steadily declining in all sectors since 2020 (Figure 28) due to the decline in investment activity worldwide because of the COVID-19 pandemic, and subsequently due to Western sanctions.

In the FCI structure, real estate operations (including investments in residential construction) are in the first place (26.3% in 2022), followed by manufacturing (18.1%) and agriculture (16.2%) rounding out the top three (Figure 29).

Figure 28

FCI to GDP of Belarus, by Industry

Figure 29

FCI Structure
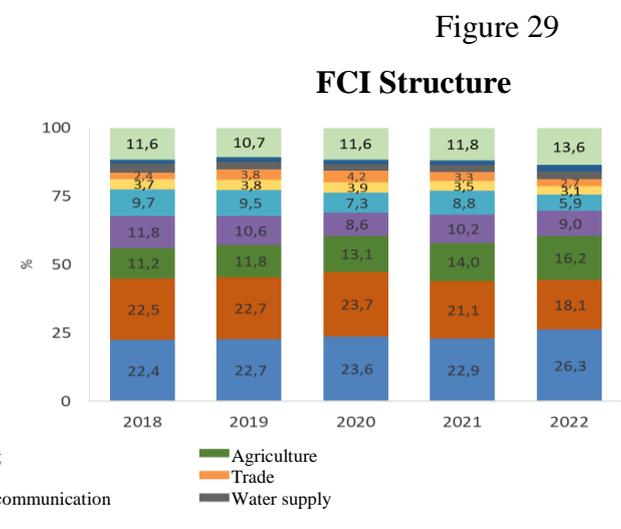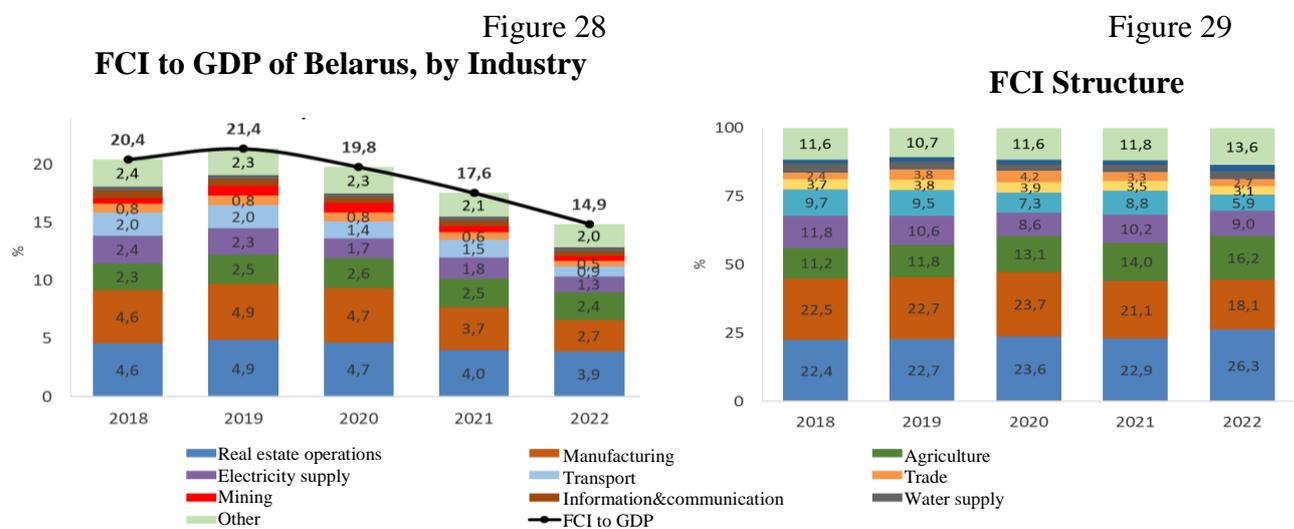
Source: The EAEU's statistics, https://eec.eaeunion.org/comission/, National Statistical Committee of the Republic of Belarus, the author's computations

Figure 30

GAV and FCI by Industries in Belarus, mln Belorussian rubles

Source: National Statistical Committee of the Republic of Belarus, the author's computations

At the same time, in terms of GVA generation, real estate operations rank fifth (6.5% of GVA in 2022) (Figure 30). The main industry that generates GVA in Belarus is manufacturing

(26.9% of GVA in 2022), followed by trade (10.9%), agriculture (9%), and information and communication (6.9%). Thus, a comparison of GVA and FCI by industry shows insufficient productivity of investments directed to real estate operations.

In Belarus, just as in Kazakhstan, there is an urgent need to modernize PPE in key sectors. Thus, the rate of PPE depreciation is more than 9 times faster than the rate of their replacement. The overall level of PPE depreciation increased from 38.8% in 2018 to 41.5% in 2022, while the replacement rate decreased (5.2% in 2018 and 4.5% in 2022).

The highest rate of depreciation is observed in the following industries: mining (58.1% in 2022), information and communication (57.5%), transport (54.9%), construction (51.3%), electricity supply (42.3%), and the lowest replacement rate is observed in the sectors of transport (1.4%) and electricity supply (2.5%) (Figure 32).

Figure 31
**PPE Distribution by Industries
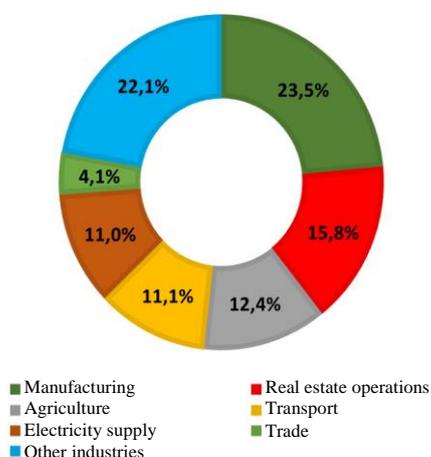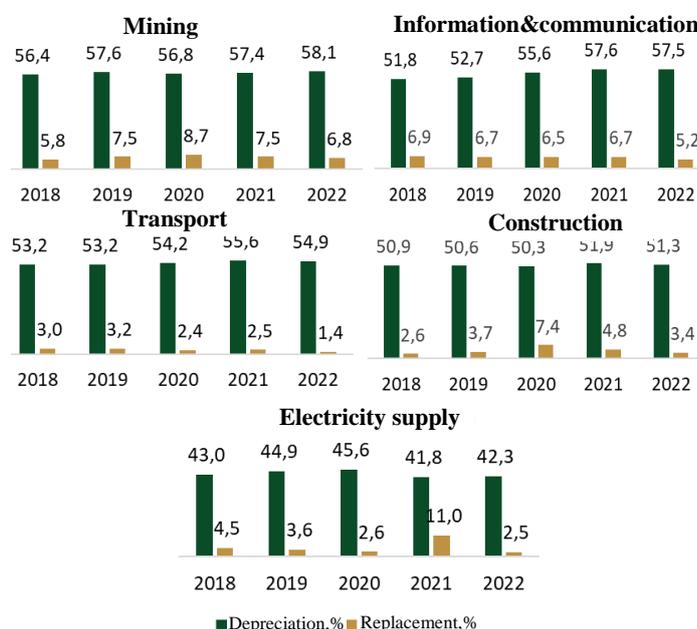(as of the end of 2022)**

Figure 32
**Degree of Depreciation and the PPE Replacement
Rate, by Industries**

Source: National Statistical Committee of the Republic of Belarus, the author's computations

In terms of the technological structure of FCI in 2022, 51.6% of investments in Belarus are directed to the construction of buildings and related structures, 34.3% – to the purchase of machinery and equipment, vehicles, tools, inventory, 14.1% – to other works and costs. There is no publicly available data on how much is directed to the acquisition of intangible assets. In terms of investment sources in 2022, there is a large share of the public (42.7%), private investment (50.4%) and an insignificant share of foreign investors (6.9%). Thus, Belarus also has structural problems associated with the distribution of investments and a high degree of PPE depreciation with a low degree of their replacement.

4. Conclusion

The conducted comparative analysis of investment activity in neighboring countries of Kazakhstan, which are former USSR countries, revealed both common problems and problems specific to a particular country. Thus, a common problem for the reviewed countries is the high degree of PPE depreciation and the low coefficient of their replacement in key industries and, as a consequence, the high level of costs and low productivity of industries. In addition, the volume of investments directed to intangible assets is minimal, while intangible assets are the basis for the development of high technologies and knowledge-intensive industries. In some countries, such as

Kazakhstan, Azerbaijan, Russia, there is low sectoral diversification of investment distribution with a shift towards the extractive industry, which aggravates the raw materials focus of the economies of these countries.

Increasing the diversification of raw material-oriented economies is seen in increasing investment activity in the manufacturing industry. In particular, in case of Kazakhstan, the priority of reforms to attract investment should be expanding investment in the production of consumer goods to reduce dependence on imports. The basis for providing the population with domestic consumer goods is the manufacturing industry. Activities that ensure the production of consumer non-food goods (textiles, clothing, furniture, computers and electrical equipment, machinery and equipment, automotive industry, woodworking and leather products, etc.) in Kazakhstan in total amounted to 6.5% of all investments in the manufacturing industry in 2022 (in 2018 – 7.2%). This is an insufficient volume, despite the fact that over the past 5 years, several government programs have been implemented to support businesses in the manufacturing industry ("Economy of Simple Things", Business Roadmap, concessional car loans, etc.).

In addition, the volume of investment in the economies of the studied countries tends to decrease. At the same time, the inflow of foreign investment is decreasing given a global decline in FDIs. Thus, global FDI flows, after a period of growth at the level of 9% per year (2012-2016) and reaching peak levels in the mid-2010s, decreased by an average of 5% annually, which exacerbates competition for a smaller volume of FDIs. In this regard, the situation in Central Asia and Kazakhstan is even more challenging: in addition to the general decrease in the net inflow of FDIs to Central Asia by an average of 5% per year from 2012 to 2022, Kazakhstan's share in the total investment pool over the same period had decreased from 75% to 61%. Given the reduction in the volume of both domestic and foreign investment, as well as the above problems that reduce the effectiveness of investments to maintain long-term economic development, simply reproducing existing production models and following the established trend of investment activity is not strategically promising. In order to obtain the maximum positive effect from investments and to give a strategically correct vector to the innovation process, the economies of the studied countries need to use a full range of tools, the most effective of which may be institutional transformations. It is the improvement of the business climate, increased competition in the domestic market, and the reduction of administrative barriers that will contribute to the growth of the efficiency of both production and investment activities of enterprises, as well as their attractiveness to investors.

Literature

1.   Keynes, J. M. (1936). The General Theory of Employment, Interest and Money. London: Macmillan (reprinted 2007).

2.   De Long, J.B., and Summers, L. (1991). «Equipment Investment and Economic Growth». Quarterly Journal of Economics, CVI (1991), pp.445-502.

3.   De Long, J.B. and Summers, L. (1992). «Equipment Investment and Economic Growth: How Strong Is the Nexus?». Brookings Papers on Economic Activity (1992), pp.157-211.

4.   Lipsey, R. and Kravis, I. (1987). «Saving and Economic Growth: Is the United States Really Falling Behind?». New York: The Conference Board, 1987.

5.   Blomstrom, M., Lipsey, R.E. and Zejan, M. (1996). «Is Fixed Investment the Key to Economic Growth?». Quarterly Journal of Economics, Vol. 111, No. 1. (Feb., 1996), pp. 269-276.

6.   Oleinik, E. and Zakharova, A. (2016). «Quantitative and Qualitative Aspects of Influence of the Investments on Economic Growth». International Journal of Economics and Financial Issues, 2016, 6(S8), pp. 340-345.

7.   Abu, N., Karim, M.Z.A. (2016). «The relationships between foreign direct investment, domestic savings, domestic investment, and economic growth: The case of Sub-Saharan Africa». Society and Economy, 38, pp.193-217.

8.   Yedder, N.B., Weriemmi, M.E., Bakari, S. (2023). «The Impact of Domestic Investment and Trade on Economic Growth in North Africa Countries: New Evidence from Panel

CS-ARDL Model». Munich Personal RePEc Archive. Available online at: https://mpra.ub.uni-muenchen.de/id/eprint/117956

9.   Ai, H., & Zhang, Y. (2013). «An empirical study of foreign direct investment and economic growth in China: Based on the provincial data». Pak. J. Statistics. Vol. 29(6), pp. 925-934.

10.   Aykut, D., Sayek, S. (2007). «The role of the sectoral composition of foreign direct investment on growth». Do Multinationals Feed Local Development and Growth?, Amsterdam: Elsevier, pp. 35-59.

11.   Blomström, M., Kokko, A., Mucchielli, J.-L. (2003). «The economics of foreign direct investment incentives». Springer. DOI:10.1007/978-3-540-24736-4_3.

12.   Bruno, R.L., Campos, N.F. (2013). Reexamining the conditional effect of foreign direct investment, IZA Discussion Paper No. 7458.

13.   Borensztein, E., De Gregorio, J., Lee, J.-W. (1998). «How does foreign direct investment affect economic growth?» Journal of International Economics, 45(1), pp.115–135.

14.   Busse, M., Groizard, J.L. (2008). «Foreign direct investment, regulations and growth» The World Economy, 31(7), 861–886.

15.   Alfaro, L., Chanda, A., Kalemli-Ozcan, S., Sayek, S. (2004). «FDI and economic growth: the role of local financial markets». Journal of International Economics, 64(1), pp.89–112.

16.   Balasubramanyam, V. N., Salisu, M., & Sapsford, D. (1996). «Foreign direct investment and growth in EP and IS countries». The Economic Journal, 106(434), 92–105.

17.   Berlemann, M., Wesselhöft, J. (2017). «Aggregate Capital Stock Estimations for 122 Countries: An Update». Review of Economics, vol. 68(2), pp. 75-92. DOI:10.1515/roe-2017-0004.

18.   Methodology for calculating the indicators of "Share of investments in fixed capital in the gross domestic product" and "Share of investments in fixed capital in the gross regional product of a constituent entity of the Russian Federation", approved by order of Rosstat dated 30.01.2014 No. 56.

19.   Methodology for compiling the capital account, approved by the order of the Chairman of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan dated 01.11.2016 No.254.

20.   Methodology for the formation of investment activity statistics indicators, approved by the order of the Chairman of the Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan dated 02.12.2016 No. 296 (as amended on 27.05.2022).

21.   Official internet resources of statistical authorities of the countries studied: https://www.stat.gov.az/,   https://stat.uz/,   https://www.geostat.ge/,   https://stat.gov.kz/, https://www.belstat.gov.by/,   https://rosstat.gov.ru/,   https://www.stat.gov.az/, https://www.stat.kg/.

22.   The EAEU Countries' Statistics https://eec.eaeunion.org/comission/

23.   Begalov, B. A., Zhukovskaya, I. E., Zhomolov, M. M., Abdurakhmonov, A. D. (2023)."Statistical Analysis of Fixed Capital Investments in the Republic of Uzbekistan in the Context of Digital Transformation". Digital Models and Solutions, Vol.2(3), стр. 37-50, DOI: 10.29141/2949-477X-2023-2-3-3.

24.   Report of the State Committee of the Republic of Uzbekistan on Statistics "The Status and Movement of PPE in the Republic of Uzbekistan in 2021".

25.   Avetisyan A.M. (2023). "Investment Policy of Armenia in the Field of Attracting Foreign Direct Investments". "INNOVATIONS AND INVESTMENTS". No. 5, p. 32-35.

26.   Petrosyan S.A. (2013). "Analysis and Assessment of the Investment Potential of Armenia". University Bulletin No. 6, pp. 163-167.

27.   Yakhyaeva A.Yu., (2023). "The Impact of Foreign Investments on the Non-Oil Sector of Azerbaijan". Journal of Central Asia Economy, №1'2023 (January–March), p. 49-61.

28. Hajiyeva, A. & Mirzayeva, F. (2024). "Statistical analysis of fixed capital investments in the Republic of Azerbaijan". Available online at: https://www.researchgate.net/publication/378287801_STATISTICAL_ANALYSIS_OF_FIXED _CAPITAL_INVESTMENT_IN_THE_REPUBLIC_OF_AZERBAIJAN

A Key Trend in the Global Economy's Development:
Fostering Sustainable Development (ESG)

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In the global economy, conducting business in accordance with new standards that incorporate a wide range of different factors is becoming increasingly important. The new standards that build the key trend in the development of the modern global economy include such significant areas as environmental (E), social responsibility (S), corporate governance (G), which together represent the new concept of ESG. The relevance of ESG is contingent on the understanding by investors, the government and society of the importance of stimulating the sustainable development of a company by introducing environmental, social and corporate approaches to company management, due to their impact on the potential of companies to create long-term value and contribute to the achievement of priority goals on the global agenda.

In this paper, the authors, based on the experience of foreign researchers and existing practices of ESG implementation, examined the procedures and consequences of stimulating sustainable development (ESG). The international ESG disclosure standards were analyzed, a comparative country-specific analysis of the legislation regarding ESG regulation was conducted, the effect of ESG projects implementation was assessed, global trends in fostering sustainable development of ESG were identified, the current state of development of ESG principles in the Republic of Kazakhstan was considered, proposals were formulated for further improvement of domestic legislation, including on the development of requirements for the content of annual reports published by listed companies on ESG issues..

Key Words: ESG, sustainable development, global economy, financial reporting standards, ESG trend.

JEL-Classification: F21, F64, F63, Q01, Q56.

Preamble

The concept of ESG first appeared in 2004 in the report entitled "Who Cares Wins. Connecting Financial Markets to a Changing World" [1], prepared at the UN initiative. The report reflects recommendations to financial institutions, companies, investors, pension fund trustees and other stakeholders on the need to implement environmental, social and governance (ESG) factors in their business processes, and to regulators – to form a regulatory framework that ensures a minimum degree of disclosure and accountability on ESG factors and facilitates the integration of these factors into financial analysis. ESG as an abbreviation touches on 3 factors that entities should take into account when carrying out their activities:

E – environmental, concerns issues of environmental protection, climate change, use of natural resources, waste management, application of clean technologies, etc.

S – social responsibility, includes issues related to social aspects such as health and safety of people, personnel management, product quality, relationships with stakeholders and the public in general.

G – corporate governance, covers issues of ensuring transparency of operations, compliance with business ethics, an appropriate risk management system in place and internal control.

The purpose of the study is to explore the international experience in implementing and fostering sustainable development (ESG), barriers and ways to overcome them, conduct a comparative analysis of international standards for ESG disclosures, determine the status of the current situation in the development of ESG principles in the Republic of Kazakhstan, including identifying barriers to ESG development and ways to overcome them, consider global trends in fostering ESG sustainable development, assess the effect of implementing ESG projects on financial indicators and the economy as a whole, including the impact of each ESG channel (environmental, social and corporate governance), choose the most suitable international standard on ESG disclosure by national listed companies and formulate proposals for the further development of the ESG area in Kazakhstan.

The study showed that stimulating sustainable development (ESG) is a key trend in the development of the global economy. Kazakhstan is actively implementing ESG principles, seeking to adapt to global trends in sustainable development. Despite positive trends, there are a number of barriers that requires an integrated approach to overcome, including legislative support and raising awareness of the principles of sustainable development.

1. Best International Practice in Fostering ESG Principles
1.1. International ESG Disclosure Standards

The increased interest in investing in sustainable development projects necessitates disclosure of information on both ESG factors and the risks inherent in them.

At present, there is no single global standard for ESG reporting, but there is a wide range of standards developed by various organizations, as well as by-laws of regulators in the field of ESG. In global practice, the most common international standards are those developed by the European Financial Reporting Advisory Group (EFRAG), the Global Reporting Initiative (GRI) and the International Sustainability Standards Board (ISSB).

The European Sustainability Reporting Standards (ESRS) were developed by EFRAG with the aim of widespread implementation of ESG standards in the operations of entities in the EU countries by 2024. ESRS sets out detailed reporting requirements for entities and is essentially divided into three main categories:

1. Mandatory cross-cutting standards ESRS 1 and ESRS 2. These standards are an integral part of the reporting of all entities seeking to report, and provide guidance on how to structure disclosures to ensure clarity, relevance and consistency. ESRS 1 clarifies the fundamental compliance requirements for corporate sustainability reporting, ensuring that entities meet the key sustainability reporting standards. ESRS 2 expands on this by detailing overarching disclosure requirements that apply across the board, regardless of the specific subject matter of the sustainability report. In doing so, ESRS 2 covers three key areas: governance – describes how sustainability is integrated into the corporate governance system; strategy – clarifies the role of sustainability in the entity's long-term planning and decision-making processes; and managing impacts, risks and opportunities – provides a framework for reporting on how sustainability-related impacts, risks and opportunities are managed, and how these are integrated into their overall risk management.

2. Topical standards. In addition to the key requirements, the ESRS proposes ten non-mandatory topical standards that delve deeper into the ESG specifics and facilitate disclosure in specific areas, and can be used to measure and report on sustainability performance. Although these topical standards are not mandatory, they are critical to entities' comprehensive disclosure of their practices and impacts in specific ESG areas.

3. Sector-specific standards. Given the diversity of industries, the ESRS will be further developed to include industry standards, which are expected to be finally adopted by the European Commission by June 2026. These standards aim to take into account the unique sustainability aspects and reporting needs of different sectors and ensure that reporting is as relevant and meaningful as possible.

EFRAG takes into account the work of other global standard-setting initiatives to the greatest extent possible and collaborates with the ISSB and GRI to enhance interoperability. However, despite this collaboration, entities using EFRAG's ESRS will not automatically meet all the requirements of the ISSB standards, which means that reports need to be reviewed and revised to ensure compliance with the chosen standard. GRI standards enable any entity – large or small, private or public – to understand and report on its impact on the economy, the environment and people in a comparable and credible way, thereby increasing the transparency of its contribution to sustainable development. The standards are of great importance to stakeholders, including investors and civil society. GRI standards are divided into 3 series: GRI Universal Standards, GRI Sector Standards,　and GRI Topic Standards. Each of these standards has subsections – "GRI indices" – that simplify access and understanding which standard applies.

1. Universal Standards (GRI 1, GRI 2, GRI 3) are designed for use by all entities, regardless of their line of business and industry. GRI 1 – basic information about the standard, the most important concepts and methodologies for use. GRI 2 – general information about an entity; this block sets out detailed requirements for disclosing information about the entity preparing the report, including its organizational structure, practice of providing other reports, area of activity, full-time and part-time employees, management methods, strategy, policy, interaction with stakeholders. GRI 3 – aspects of the entity's activities recognized as material, where guidance is provided for determining the most significant aspects of the activities and describes how industry standards are used.

2. GRI Sector Standards are aimed at deepening and expanding the information provided by a reporting entity in accordance with the sector activities and international standards and recommendations of experts in the relevant field (for example, gas – GRI 11, coal sector – GRI 12, mining industry – GRI 14). GRI sector standards are constantly being supplemented, and their application is mandatory for the reporting entity, if its sector activities are on the list.

3. GRI Topic Standards provide guidance on reporting on specific topics. Each standard provides an overview of the topic, the information related to it, and how the entity manages its impacts. The entity selects the relevant topic standards and uses them for reporting.

Examples of these standards include: GRI 200 – economic standards – issues related to an entity's economic activities, such as anti-corruption (GRI 205), economic presentation (GRI 201), etc. GRI 300 – environmental standards – indicators related to resource management, such as greenhouse gas emissions (GRI 305), use of water and other resources (GRI 303), waste management (GRI 306). GRI 400 – social standards – social aspects, including human rights (GRI 412), occupational health and safety (GRI 403), diversity and equality (GRI 405). GRI standards are a good place to start reporting when you have a small amount of data. GRI has a basic option that requires entities to disclose only one key performance indicator for each material issue. It is very important to identify aspects of activity using a materiality assessment –these are the areas where a company has the most significant impact on the environment, the economy, and people. Once these material aspects have been identified, the entity sets sustainability priorities to determine which aspects to include or exclude from its reporting.

The main requirements of the standards also include: materiality – identifying and disclosing only those aspects and topics that are significant for the business and its stakeholders; the context of sustainable development; data integrity – sufficiency and completeness of information; balance and comparability, i.e. reports should present both positive and negative aspects of the activities and allow comparison of data for different periods; accuracy and timeliness; responsibility, which implies confirmation of the reliability of data and a commitment to improve sustainability indicators.

The ISSB standards incorporate provisions developed by the Climate Disclosure Standards Board (CDSB), the Task Force on Climate-Related Financial Disclosures (TCFD), the Value Reporting Foundation (VRF), the Sustainability Accounting Standards Board (SASB) and the World Economics Association (WEA). In 2023, the ISSB published its first two sustainability

reporting standards, IFRS S1 and IFRS S2. When designing the IFRS standards, the following criteria were taken into account: completeness and accuracy of information, ease of use by stakeholders and international comparability. Through international comparability, the ISSB standards help entities to avoid double reporting and meet universal requirements for different legislations.

IFRS S1 sets out requirements for disclosures about risks and opportunities related to sustainability, with the primary users of financial statements being existing and potential investors and creditors. A risk that could affect the entity's future is described in two stages:

Stage 1 – Identifying the risk. An entity first considers the disclosure standards in IFRS S1, topic standards and SASB standards. SASB standards are industry-based and specify disclosure areas appropriate to the industry (e.g. water management) and a list of indicators for each area (e.g. total water withdrawn, total water consumed and the percentage of each in areas with high or extremely high initial water stress). IFRS S1 requires an entity to consider its ability to create value for itself and the value it creates, preserves or reduces for others, which is not incorporated in SASB standards that do not cover all sustainability-related disclosures. In order to provide complete coverage of the information provided, IFRS S1 suggests that it may be appropriate to consider other guidance, such as the CDSB (for disclosures related to water and biodiversity), and to take into account the experience gained by companies in related industries or geographic regions. In the first step, the company applies professional judgment.

The next step is to determine whether the risks and opportunities are material, as IFRS S1 requires disclosure of only material information. That is, step 2 is determining what information to disclose. In determining what information may be material to disclose, an entity must refer to the relevant IFRS sustainability disclosure standard that addresses the particular risk or opportunity. If the standard does not address sustainability risks or opportunities, an entity applies professional judgment to determine what information reliably reflects the particular risk. In making that judgment, an entity:

− shall consider the applicability of the indicators included in the disclosure sections of SASB industry standards and may take into account, to the extent consistent with IFRS;

− should take into account the guidance on the application of the CDSB framework for disclosure of water and biodiversity-related information;

− should take into account the most recent statements by other standard-setting bodies whose requirements are aimed at meeting the information needs of primary users;

− must provide information, including figures, disclosed by entities operating in the same industry or geographic region;

− should take into account the ESRS and GRI standards to the extent that they help the entity to achieve the objective of IFRS S1.

The following principles must be adhered to in accordance with IFRS S1.

1. Fair presentation of information. Information should be complete, have a neutral and accurate description of the risks and opportunities associated with the sustainable development of the entity, and comply with the framework of the objectives of financial reporting.

2. Connected information: Information should help users understand the relationships between sustainability risks and opportunities that could affect the entity's prospects.

3. Compliance with the "core content": Requires disclosure of material information in relation to each of the four core elements used within the TCFD: governance, strategy, risk management, metrics and targets.

4. Governance. Disclosures related to corporate governance help users understand the entity's governance processes, controls and procedures for monitoring and managing sustainability-related risks and opportunities. The entity should disclose information including, but not limited to, the governance body or individual responsible for overseeing sustainability-related risks and opportunities and their role in these processes.

5. Strategy. The company is required to disclose information about its strategy and how it addresses identified risks and opportunities related to sustainable development that affect the

entity's future over different time horizons; the entity's business model and value chain; and its strategy and decision-making process.

6. Risk management. Mandatory disclosures on risk management include the processes the entity uses to identify, assess, prioritize, and monitor identified sustainability-related risks and opportunities. Disclosures are required to the extent and in the manner in which these processes are integrated into the entity's overall risk management processes.

7. Judgements. An entity is required to disclose the judgements it has made that have the most significant effect on its sustainability reporting, except for those judgements that involve estimates.

8. Estimation and outcome uncertainties. When preparing financial statements related to sustainable development, situations may arise where amounts cannot be measured directly, but only any assumptions about possible future events with uncertain outcomes van be estimated.

9. Errors. Errors are defined in IFRS S1 in a similar way to IAS 8, Accounting Policies, Changes in Accounting Estimates and Errors.

IFRS S2 is based on the general principles of IFRS S1 and focuses on the disclosure of physical risks and transition climate risks. An entity is required to identify risks and opportunities related to climate change that could affect the entity's prospects in the short, medium and long term. In identifying these risks and opportunities, an entity should refer to the industry-specific sections defined in the Industry Implementation Guidance for IFRS S2 (which builds on the climate-related disclosures in the SASB standards) and consider their applicability.

Physical risks – risks arising from climate change, which may be caused by specific events, such as relatively short-term weather events (hurricanes, floods, droughts or heat waves) or long-term changes in climate conditions (increases or decreases in rainfall and temperatures, which may lead to sea level rise, reduced water availability, loss of biodiversity and changes in soil productivity). These risks can have a direct impact on the entity's financial sustainability through direct damage to assets and indirect impacts through supply chain disruptions. Financial performance of entities can also be impacted by changes in the availability, sources and quality of water, as well as extreme temperature changes that affect facilities, supply chains, transport needs and employee safety. Transition risks – risks arising from efforts to transition to a low-carbon economy. Transition risks include political, legal, technological, market and reputational risks. These risks may have financial implications for the entity, such as increased operating expenses or asset impairment due to new or amended regulations related to climate change. The company's financial performance may also be affected by changes in consumer demand and the development and implementation of new technologies.

IFRS S1 and IFRS S2 provide guidance to help entities avoid unnecessary duplication of information, even if this is not specifically addressed in the IFRS sustainability disclosure standards.

IFRS S2 requires compliance with the following points:

1. Corporate Governance. The requirements are broadly similar to IFRS S1, but additionally take into account the climate agenda.

2. Strategy: The entity is required to disclose its strategy for managing identified risks and opportunities related to climate change.

3. Climate change scenario analysis involves assessing a range of hypothetical climate-related impacts, risks and opportunities by considering different scenarios under a defined set of assumptions and constraints.

4. Risk management. The requirements are broadly similar to IFRS S1, but additionally take into account the climate agenda.

5. Metrics and targets. IFRS S2 requires an entity to disclose how the entity uses metrics, including targets, to measure, monitor and manage identified climate-related risks and opportunities.

IFRS S2 includes seven cross-cutting categories of measures that include quantitative and qualitative components that must be disclosed if they are material:

1) greenhouse gas emissions (absolute) – measured in accordance with the corporate GHG Protocol standard, unless the jurisdiction requires the entity to use a different method; data are presented in metric tons of CO2 equivalent;

2) climate change-related transition risks – information on the vulnerability of assets or activities in absolute and percentage terms (e.g. the amount and percentage of the entity's revenue from coal mining);

3) physical risks associated with climate change – information on the vulnerability of assets or activities in absolute and percentage terms (e.g. the volume and percentage of an entity's property portfolio in a flood-prone area);

4) climate change-related opportunities – information on the number and percentage of climate change-related assets or activities (e.g. the entity's revenues from services that support the transition to a low-carbon economy);

5) capital allocation – information on the amount used to cover climate change-related risks and opportunities (e.g. amount of investment in low-carbon product research and development as a percentage of annual revenue);

6) internal carbon prices used to calculate the cost of emissions per metric ton, as well as information on how the company uses these prices to make decisions;

7) remuneration – percentage of top management remuneration related to climate and qualitative aspects of the impact of remuneration on climate-related considerations.

Based on the advantages and disadvantages of each standard, the following conclusions can be made. GRI can be called the most preferable standard for entities that seek global and flexible ESG reporting. Its key advantages are: global applicability – applicable to all entities, regardless of size and location; flexibility – the ability to gradually implement reporting with minimum indicators, which reduces the burden on entities; a balanced approach takes into account environmental and social aspects, providing a more complete picture of sustainable development.

ISSB is preferable for large international companies focused on attracting investment and managing financial risks associated with sustainable development. It focuses on transparency and accessibility of information for investors.

EFRAG will be preferable for companies operating in the EU, since its standards are mandatory within the EU and take into account local requirements and expectations.

Growing interest in sustainable investing determines the need for transparent disclosure of information on ESG risks and management, which helps to increase trust in companies and their financial stability. Companies are faced with the choice of suitable reporting standards due to the diversity of existing regulations, which complicates the comparability of data. The main standards: EFRAG, GRI and ISSB – offer different approaches to disclosure, each with its own advantages and disadvantages. The GRI standard is the preferred choice as it provides flexibility, a focus on materiality and stakeholder engagement, which promotes transparency and comparability of ESG reporting.

1.2. International Practice in Implementing the ESG Principles

Sustainable development and the transition to a more resource-efficient, low-carbon, circular economy are key factors in ensuring the long-term competitiveness of economies around the world. By using the core principles of ESG, it is possible to build a socially responsible and sustainable economy.

Below is a comparative analysis of ESG legislation in the European Union (EU), the United States of America (USA), and Asia.

At the end of 2016, the European Commission appointed a High-Level Expert Group on Sustainable Finance. On 31 January 2018, the expert group published a report [2] that provides a comprehensive vision of how to design a sustainable development strategy for the EU. The report stated that sustainable development is associated with two urgent challenges: 1) enhancing the contribution of finance to sustainable and inclusive economic growth by financing the long-term

needs of society; 2) strengthening financial stability by factoring environmental, social and governance factors in investment decisions.

The recommendations set out in the report served as the basis for the development of the EU Action Plan on Financing Sustainable Growth [3], which is an EU roadmap that sets out three key objectives: reorienting capital flows towards sustainable investments; managing financial risks; ensuring transparency and sustainability of financial and economic activities.

In the context of implementation of the first key objective, the European Commission developed the EU Taxonomy, which formed a classification system for types of sustainable economic activities [4]. Due to the lack of uniform standards and terms in the ESG field, financial institutions had to determine the status of a particular investment as sustainable themselves. The need to define criteria for classifying financial products or corporate bonds as environmentally sustainable investments is aimed at increasing investor confidence and awareness of the impact of these financial products or corporate bonds on the environment, as well as to prevent greenwashing. Greenwashing is the practice of gaining an unfair competitive advantage by promoting a financial product as environmentally friendly, while in fact the main environmental standards were not met. To determine the environmental sustainability of economic activities, it is necessary to establish an exhaustive list of environmental goals, which includes such goals as climate change mitigation, climate change adaptation, sustainable use and protection of marine and water resources, transition to a circular economy, pollution prevention and control, protection and restoration of biodiversity and ecosystems. For each target, the European Commission has set technical selection criteria.

In 2021, the EU adopted its first climate law. It sets out clear targets for Europe to become climate neutral by 2050, as well as a target to reduce emissions by 55% by 2030 compared to 1990 and by 90% by 2040 [5].

Sustainability reporting is gaining momentum around the world, including in the EU. The Corporate Sustainability Reporting Directive (CSRD) [6], adopted by the European Parliament and the Council in December 2022, requires companies to include a sustainability report in their management reports as part of their financial statements. The CSRD aims to improve sustainability reporting by improving the quality of available sustainability information in order to meet the needs of different stakeholders and help the EU to become a more sustainable economy.

From 1 January 2024, the CSRD requirements must be followed by entities subject to non-financial reporting requirements. These entities must publish their first reports in 2025. From 1 January 2025, the CSRD requirements will apply to all large companies that are currently not subject to non-financial reporting requirements. These companies must publish their first reports in 2026. From 1 January 2026, the requirements will apply to small and medium-sized listed companies, small credit institutions, and captive insurance companies. These companies must publish their first reports in 2027. From 1 January 2028, the requirements will apply to third-country companies with net revenues in the EU exceeding EUR 150 million if they have at least one subsidiary or branch in the EU that exceeds certain thresholds. These companies must publish their first reports in 2029. Thus, about 50,000 companies will be required to report on the basis of the CSRD.

From 1 January 2024, the European Sustainability Reporting Standards (ESRS) [7] came into force, which were developed as part of the implementation of the CSRD requirements and aim to ensure the quality of sustainability information.

The most important regulatory document for the financial market is the EU Sustainable Finance Disclosure Regulation (SFDR) [8]. The SFDR came into force in March 2021 and requires the financial market participants and financial advisers to disclose information on how they incorporate sustainability risks in their investment decision-making. The SFDR also aims to strengthen investor protection and make it easier for them to compare financial products and services in terms of sustainability requirements when making investment decisions. The European Commission is currently summing up a series of stakeholder consultations to assess the effectiveness and usability of the regulation [9]. The above-mentioned regulations are

interconnected. The EU Taxonomy is the basis for assessing the sustainability of companies' activities, and the ESRS and SFDR are complementary to it, according to which disclosure requirements are set for companies. At the same time, the ESRS is aimed at comprehensive reporting by companies, and the SFDR is focused on the financial sector.

Among EU countries, the experience of such advanced countries in the field of ESG as Denmark, Norway and the Netherlands stands out. Denmark is a leader in wind energy and plans to switch completely to renewable energy sources by 2050. Government subsidies and support for research initiatives contribute to the development of sustainable technologies. Copenhagen initiated the Copenhagen Climate Plan project, which includes measures to reduce carbon emissions and develop green transport [10]. Danish legislation requires financial institutions to disclose information on their ESG strategies and sustainable investments. All companies with more than 250 employees are required to publish reports on their climate impact and their strategies to reduce carbon emissions [11]. Norway actively integrates ESG into the management of its sovereign wealth fund, which invests in companies that meet the principles of sustainable development. The country supports carbon capture and storage projects and develops initiatives to protect the environment [12]. Norway requires its government pension fund to consider ESG factors in investment decisions and disclose information about its ESG strategies. The country has strict licensing laws for resource extraction companies, which require them to consider ESG factors in their operations [13]. The Netherlands is implementing ESG through government strategies, including support for green projects and biodiversity conservation initiatives. Amsterdam is actively developing the concept of a "smart city", introducing sustainable technologies in public transport and infrastructure [14]. The Netherlands has a law requiring companies to meet carbon reduction targets and implement sustainable practices in their business. All companies registered in the Netherlands are required to publish reports on their ESG strategies, as well as on their measures to combat climate change [15].

The following could be highlighted among the main barriers to the development of ESG principles in the EU:

1. Regulatory and methodological challenges: Although the EU actively supports ESG, ESG reporting standards remain diverse and difficult to harmonize, creating challenges for entities in assessing and implementing ESG initiatives [16].

2. Lack of a unified approach to disclosure. Different countries and organizations use different reporting standards. This makes it difficult to consolidate data and hinders the comparability of ESG indicators across EU countries [17].

3. High costs. Implementing ESG principles requires significant investment, which is especially difficult for small and medium-sized businesses [18].

Possible solutions capable of overcoming the barriers in implementing the ESG principles in the EU are as follows:

1. Harmonization of ESG standards and reporting – development of unified requirements for ESG data disclosure and reporting at the EU level. This will simplify the process of implementing and monitoring ESG indicators for companies, increasing transparency and comparability of data.

2. Financial support and subsidies for SMEs: EU could introduce incentives and subsidies to support the transition to sustainable practices.

In the US, environmental, social and governance issues have been largely regulated by voluntary measures. This is in contrast to the EU, where specific ESG directives are in place, based on a mandatory approach. In the last few years, ESG has become more popular in the US as financial institutions strive for sustainability and social responsibility. American financial institutions are developing their own programs to implement ESG principles, including investing in socially responsible companies, reducing carbon emissions and improving ESG standards for their financial products [19].

– The US regulatory landscape has seen significant changes in 2021–2022, with the SEC issuing ESG proposals and government legislation. In February 2021, the US President Joe Biden

issued an executive order [20] requiring the federal government to "assess, disclose, and mitigate climate pollution and related risks in every sector of the economy." The SEC announced an agency-wide approach to addressing climate change and ESG risks and opportunities. This approach includes strengthening compliance efforts related to climate risks. In April 2021, the SEC issued an ESG Investing Risk Alert [21] to highlight the findings of its recent examinations of investment firms and advisors, as well as funds offering ESG products and services. The following regulations are in force in the United States aimed at developing ESG:

− The Dodd-Frank Wall Street Reform and Consumer Protection Act (2010) [23], which contains provisions on regulating the financial sector as a whole, as well as on increasing financial stability and transparency;

− The Infrastructure Act (2021) [24] is aimed at promoting sustainable development of the US economy, including investment in infrastructure, clean technologies, etc.;

− The Climate Risk Disclosure Act (2019) [25] requires entities, including financial institutions, to disclose information about their climate risks and the actions they plan to take to reduce them;

− Executive Order of the President of the United States "On Climate Risk and Financial Stability" (2021) [26] in respect of federal regulators and financial institutions, which prescribes the need to consider climate risks in financial and economic activities and take measures to reduce them.

The United States has adopted various initiatives and standards aimed at stimulating the development of ESG principles, such as the Principles for Responsible Investment (PRI), an initiative that forms standards for integrating ESG factors into investment decisions for investors and financial institutions. In view of climate change and increasing public demands on companies, many financial institutions are implementing their own ESG programs, enhancing their corporate responsibility. The government is actively promoting the development of a sound financial sector and the application of the ESG approach in the financial sector. Some states, such as California, Connecticut, Illinois, New Jersey, New York, Oregon and Washington, have tightened regulation of pension systems to support sustainable investments. However, some states, such as Florida, Kentucky, Oklahoma, Tennessee, Texas and West Virginia, on the contrary, have imposed new restrictions on cooperation with financial institutions and investment funds that use ESG-focused strategies, expressed in limiting investments in the oil, coal and gas industries [27]. In general, in recent years, the use of ESG principles in the United States has been increasingly criticized, mainly due to the conflict between Republicans and Democrats. A significant proportion of Americans believe that excessive implementation of ESG initiatives in the financial sector can lead to a loss of capital from the country's key industries, and analysts warn that a shortage of credit resources in industries important to national security, such as energy and agriculture, can negatively affect the economy. ESG policies over the past few years have led to the fact that jobs have actually "moved" to the jurisdiction of China, as the construction of cheaper and more reliable energy sources is actively developing there. As a result, this can negatively affect the country's economy [28]. The main barriers to the development of ESG principles in the US are:

1) political instability and conflicting regulations (the US is politically divided on the ESG issue, with some states supporting ESG principles and others introducing laws restricting ESG investing) [29]);

2) resistance from investors and corporations (large companies and financial institutions, especially in fossil fuel industries, have expressed concerns about the impact of ESG on profitability; some investors view ESG initiatives as costly and prefer traditional forms of investing) [30]);

3) lack of clear reporting standards (unlike the EU, where strict requirements for ESG data disclosure have been implemented, the US does not have a single mandatory reporting system, which leads to uneven ESG implementation [31]).

To overcome barriers to the implementation of ESG principles in the US, the following solutions are possible:

1) developing and implementing national ESG standards will help create transparency and confidence for investors while reducing inconsistencies in state regulation.;

2) investor and shareholder engagement strategies: Developing initiatives that demonstrate the long-term returns of ESG investing can reassure shareholders and investors that ESG promotes sustainable growth and risk mitigation, which is important for large businesses;

3) creating government support and incentive programs; the government can introduce benefits, subsidies and other incentives for companies implementing ESG, especially for those operating in traditional sectors such as energy.

Government regulators in the People's Republic of China, Malaysia, and Thailand have begun encouraging companies to take ESG risks into account in their activities and disclose relevant information to investors and the public. ESG regulation in Asia is at the stage of active formation and adaptation to global standards.

Since 2017, in accordance with the Corporate Governance Code developed by the Securities and Exchange Commission of Thailand, the board of directors of a company is required to provide ESG reporting commensurate with the scale of the company [32].

Since 2019, in accordance with the rules established by the Securities and Futures Commission of Hong Kong for management companies of mutual investment funds, information on environmental and other ESG factors included in investment strategies and the procedure for selecting investment objects is subject to disclosure [33].

In 2021, the China Securities Regulatory Commission approved a new version of the Disclosure Rules for Public Companies, which requires them to disclose information on administrative fines imposed on them for environmental violations [34].

Among Asian countries, the experience of such advanced country in the field of ESG as Singapore stands out. Singapore is actively developing the concept of a "smart city" and implementing ESG through sustainable construction and resource management programs. In 2022, Singapore introduced a new law requiring public companies to disclose information on their ESG strategies and sustainable development. The Singapore government has developed a strategy aimed at achieving carbon neutrality by 2050 through the development of green technologies [35].

The main barriers to the development of ESG principles in Asia include the following:

1. Lack of uniform standards and regulations. ESG standards vary greatly between countries such as Japan, China and Singapore. This creates difficulties for investors who want to compare ESG performance across companies [36].

2. Lack of awareness and cultural differences. In many Asian countries, the importance of ESG is only just beginning to be recognized, and a culture of sustainable development has not yet taken root. This leads to insufficient attention to ESG principles from company management [37].

3. Economic dependence on traditional sectors. In Asian countries, a significant part of the economy is focused on industry and fossil fuel extraction. The transition to sustainable development requires significant structural changes, which slows down the implementation of ESG [38].

To overcome the barriers to the implementation of ESG principles in Asia, the following solutions are possible:

1. Establishment of a unified regional ESG standard. For Asian countries such as Japan, China and Singapore, it is important to create standardized requirements that will improve the comparability of ESG indicators between companies and countries.

2. Awareness programs and adaptation to cultural characteristics. Implementation of educational and information programs for companies and investors that take into account the cultural characteristics of the region. This will improve the perception of ESG as a significant component of business culture.

3. Investments in sustainable development of traditional sectors. It is important to develop sustainable development programs for the transition from a traditional to a low-carbon economy.

Global ESG regulation is actively developing in different regions; the US, EU countries and Asia are implementing various initiatives and laws to ensure sustainable development and

transparency. Despite differences in approaches, critical opinions and the presence of various barriers to the development of ESG approaches, there is a general trend towards tightening standards and disclosure of information, which indicates the growing importance of implementing ESG principles in the global economy.

2. The Effect from ESG Projects and a Future Trend of the ESG Development in the Global Financial Infrastructure

Significant environmental impacts can be caused by incidents of industrial waste pollution and depletion of local resources, which may result from poor environmental standards, safety violations or unsustainable business models of the company. Such events may result in costly regulatory fines, litigation, clean-up costs, reputational risk, which in turn may result in a negative financial impact on the company (e.g. increased costs, decreased share price, decreased revenue and income).

Social risks considered in ESG implementation include risks related to controls over data privacy and security, human capital management of the business, including human rights and welfare issues in the workplace, product manufacturing and, in some cases, impact on the community. Protection of confidential information, employee turnover, worker health, training and safety, employee morale, ethics policies, absence of gender and other discrimination of employees and business process management can all impact the entity's ability to maintain a competitive advantage. Corporate governance is the system of checks, balances, and incentives that exists to manage the conflicting interests of an entity's management, board of directors, shareholders, customers, and other stakeholders. Effective corporate governance practices are essential to ensure sound capital markets and financial stability. Evaluation of corporate governance, including consideration of conflicts of interest and transparency of operations, is increasingly becoming an important factor in investment decision-making. Weaknesses in corporate governance can expose an entity to legal, regulatory, or reputational risks. An entity may be vulnerable to lawsuits brought by shareholders, employees, customers, or other parties for breach of contractual agreements and consumer rights. Improperly managed conflicts of interest or governance failures can cause reputational damage, and the associated costs can become a significant expense item.

To analyze the effect of environmental practices on financial performance, various studies in this area were reviewed. Moneva and Ortas[1] (2010) [39] found that corporate practices such as the use of cleaner energy sources or the reduction of greenhouse gas emissions can lead to optimized levels of environmental performance, which in turn leads to improved financial performance. Zeng et al.[2] (2020) [40] have shown that environmental disclosure can lead to entities' financial performance meeting or exceeding expectations. According to Liu et al.[3] (2021) [41], entities that implement green approaches convey positive information to society and government, create a favorable image, gain social reputation, eliminate information asymmetry problems, and receive government funds, resources, and other support. At the same time, green entities can improve their financial performance due to lower environmental costs. Kim and Park[4] (2015) [42] find that entities, which invest in clean technologies, can reduce environmental costs

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[1] A multivariate approach and empirical analysis of environmental and financial performance from 2005 to 2007 was used for a sample of 230 companies from 18 European countries, selected for representative results, taking into account the requirement to sufficiently reflect the economic situation in Europe and to exclude any possible geographical bias.

[2] The analysis was conducted based on data from 397 Chinese manufacturing companies listed on the Shanghai Stock Exchange from 2011 to 2017 to examine the relationship between corporate performance expectations and corporate environmental responsibility disclosures.

[3] The analysis is based on environmental responsibility performance and financial performance of Chinese listed companies published in annual company reports and social responsibility reports from 2008 to 2017.

[4] Results from an analysis of environmental data covering 4,924 observations of firms from 29 countries worldwide for the period of 2002–2011 using a multivariate approach, and assessing regional and industry differences in financial performance and performance adjusted for environmental costs.

in several ways, thereby improving financial performance. In addition, their results show that reducing environmental costs over a long period of time improves the financial performance of European companies in the short term, while North American corporations show a strong impact on the entity's long-term financial performance.

It is obvious that corporate social responsibility is of great importance for the sustainable development of entities. However, the practice of corporate social responsibility may vary due to cultural differences in different regions. Vuong[5] (2022) [43] pointed out that Japanese corporations have a tradition of mutual benefit as the key to sustainable development, which is different from the shareholder-oriented strategy of Western corporations. Japanese investors consistently perceive companies with clear environmental and social commitments as safer investment targets. Thus, these business firms can improve their financial performance through sustainable investment. George at al.[6] (2023) [44] showed that CSR activities in the Indian banking sector are aimed at providing financial services in different regions, thereby reducing the poverty gap. Spending wisely on CSR helps corporations improve their financial performance. When corporations use CSR as a competitive tool, it has a significant impact on the long-term financial performance of the companies. Studying emerging Asian economies, Saeed et al.[7] (2023) [45] noted that firms that consistently improve their social and environmental responsibilities expand their market share and increase customer loyalty, which ultimately increases profitability. Iqbal et al.[8] (2019) [46] suggested a relationship between microfinance firms and financial performance in Asia. Their findings showed that robust corporate reporting is key to sustainability of microfinance corporations and enhances their profitability .

Low performance of entities in the area of ESG is a reflection of their insignificant contribution to environmental and social protection, and their unethical behavior (such as polluting the environment) may cause them to become less of a customer choice. Firms with higher ESG scores are able to satisfy the intrinsic value of each stakeholder, thereby creating a competitive advantage, according to a study by Rahman et al.[9] (2023) [47]. In the study by Gao, Luo et al.[10] (2024) [48], the authors note that given the effectiveness of ESG in investment decision-making, effective governance can improve firms' financial performance. A study by Hu and Zhu[11] (2024) [49] supported the findings of the above-mentioned researchers that sound ESG performance improves an entity's financial performance.

Many researchers come to the same conclusion: ESG responsibility and sustainable development can have a positive impact on financial performance, especially if companies invest in environmental initiatives, take into account the interests of a wide range of stakeholders and follow the principles of sustainability in the long term. It should be noted that in the ESG field there are rating systems, for example, the assessment of independent companies MSCI and

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[5] The study aims to determine the relationship between investor sentiment, corporate social performance and financial performance based on empirical results obtained through panel regressions with fixed effects and instrumental variables based on data from 367 Japanese companies for 2005–2019.

[6] Results of assessing the impact of mandatory expenses on corporate social responsibility on the financial performance of commercial banks in India, obtained on the basis of a constructed panel regression model on the indicators of 22 Indian banks from 2016 to 2022.

[7] Results of an econometric research model based on the performance of firms operating in eight emerging Asian markets from 2007 to 2017.

[8] A two-stage ordinary least squares analysis using instrumental variables was conducted on data from 173 microfinance institutions in 18 Asian countries from 2007 to 2011.

[9] A study based on two-stage ordinary least squares analysis using industry mean instrumental variable to control for the relationship between environmental, social and governance factors and firm performance using a random sample of 255 non-financial companies listed in Pakistan Stock Exchange from 2016 to 2020.

[10] The study examines the impact of environmental, social, and governance (ESG) on firm financial performance with a focus on the moderating role of board diversity, which analyzed panel data of 494 Chinese non-financial listed companies from 2018 to 2022 using an econometric approach with industry and time effects.

[11] Based on a two-way fixed effects model with fixed time and industry to examine the relationship and internal mechanism between them, combined with relevant underlying theories, using data on listed companies in Shanghai and Shenzhen, China, from 2009 to 2021.

Sustainalytics, whose rating systems are used to assess the corporate responsibility and sustainability of companies. MSCI evaluates companies based on their risk management and opportunities in the field of ecology, social responsibility and governance and classifies them on a 7-point scale (from "AAA" to "CCC"), where the highest scores are received by companies with a lower level of ESG risks. The main focus is on the impact of external factors, such as climate change, cyber risks and human rights issues, on the financial stability of the entity [50]. Sustainalytics focuses more on assessing the level of ESG risks to which a company is exposed and its ability to manage these risks, using 5 risk categories (from "Negligible" to "Strong"), where a lower risk level means a better assessment. Of great importance is the analysis of the impact of a company's activities on society and the environment and the ability to minimize negative consequences [51]. Both methodologies have their own unique structure, but both seek to show how effectively companies cope with sustainability issues and ESG risks. The implementation of ESG principles brings an important advantage to companies, making them more attentive to factors that may affect or already affect their activities, ESG initiatives reveal specific benefits. Companies that realize the importance of environmental, social and governance aspects become more flexible in identifying strategic opportunities and strengthening their competitiveness in the long term. This allows them to develop new markets or increase their share in existing ones, increase brand awareness, which leads to revenue growth. ESG helps reduce costs (e.g. water, energy, raw materials, etc.), increasing the entity's efficiency.

Below are examples of the effects of ESG principle implementations.

In 2023, Siemens reported a 65% reduction in CO_2 emissions compared to 2014 thanks to investments in renewable energy sources and energy-efficient technologies [52].

Deutsche Bank is actively developing green financial products, including green bonds. In 2023, Deutsche Bank raised more than €10 billion to finance projects in the field of clean energy and sustainable infrastructure. The Bank's green asset pool made a significant contribution to the development of renewable energy sources and green buildings. By the end of 2023, more than 3.8 million tons of CO_2 emissions had been avoided. This was mainly achieved through investments in solar, wind and biomass energy production, which together generated more than 33 million MWh of renewable energy. In addition, Deutsche Bank pays special attention to energy efficiency in residential and commercial real estate, achieving significant energy savings and preventing emissions into the atmosphere. The continued focus on sustainability not only mitigates environmental impacts, but also strengthens Deutsche Bank's reputation as a leader in green finance [53]. In 2020, Microsoft announced that it would become carbon neutral by 2030 and offset all carbon emissions since its founding by 2050. This led to increased investor interest and an increase in the company's capitalization. In 2023, Microsoft reduced greenhouse gas emissions by 7% and continued to implement carbon-negative projects [54].

Morgan Stanley have launched the Sustainable Solutions initiative, aimed at promoting sustainable finance and ESG investing. The company has developed "green" financial products and sustainable investment strategies that promote greater transparency and responsible asset management [55].

Keppel Corporation is committed to improving working conditions and supporting local communities. In 2023, Keppel Corporation signed contracts worth $US500 million for energy efficiency and waste management projects. The company has committed to expanding its renewable energy portfolio to 7 GW by 2030, with 4 GW already announced by the end of 2023. [56] DBS Bank is a leader in green finance in Asia and continues to reap significant benefits from implementing ESG principles. The bank has committed over $US 15 billion to clean energy projects in Asia in 2023. As of December 2023, its sustainable finance commitments amounted to approximately $US 70 billion, net of disbursements. This demonstrates its commitment to environmental and social sustainability. DBS Bank's efforts to finance renewable energy projects and partnerships with companies like H&M to decarbonise supply chains highlight its role in the energy transformation in Asia. DBS Bank also achieved record financial results, with net profit up

26% to $US 10.3 billion. This growth was partly driven by ESG strategies that enhanced customer engagement through sustainable financial solutions and digital innovation. [57].

Compliance with ESG criteria can improve a number of financial indicators of companies, which, in turn, has a positive effect on the economy as a whole. Let's consider specific financial indicators and mechanisms for their improvement. The use of renewable energy sources and the introduction of energy-efficient technologies reduces long-term energy costs, increasing margins. This boosts net profit, return on equity (ROE) and assets (ROA). Companies that comply with ESG standards usually face lower risks (environmental, regulatory, social), which reduces the risk premium. As a result, the cost of borrowed capital decreases and investor confidence increases. Financial markets are increasingly focused on ESG, and companies with high ESG ratings can attract financing on preferential terms. An increasing number of institutional and private investors consider ESG factors when choosing assets. Companies implementing ESG strategies have an advantage in the market and can receive additional investments, which contributes to the growth of their market capitalization. The implementation of environmental and social standards helps improve operational efficiency. Environmental initiatives reduce the costs of resources, waste disposal, and environmental compliance, while improved working conditions and corporate culture reduce employee turnover and increase productivity. Adopting strict environmental standards allows companies to avoid future costs associated with changes in carbon emissions or environmental legislation. This reduces the risk of fines, legal sanctions, and compliance costs. ESG-oriented companies better manage reputational and social risks, which contributes to customer loyalty, stable partnerships, and brand development. These factors ensure stable revenues and a reduced risk of financial shocks.

Companies implementing ESG principles face the need to look for new ways of doing business, which stimulates innovation processes. Modern business models require adaptation to new conditions that involve reducing the negative impact on the environment, increasing social responsibility and enhancing the transparency of corporate governance. Innovations in this area are usually aimed at such aspects as environmental technologies (use of clean energy sources, reducing emissions and developing technologies to improve energy efficiency), social innovations (supporting inclusive growth, increasing the level of social responsibility, improving working conditions and creating a fair corporate climate), as well as management innovations (improving corporate governance mechanisms, increasing transparency and responsibility to stakeholders).

Digitalization is one of the key trends closely related to ESG. Companies are seeking to use digital solutions to achieve environmental and social goals, such as smart technologies for resource monitoring and management (greenhouse gas emission control systems), blockchain and digital platforms for transparent supply chain tracking, which helps combat human rights violations and reduce the environmental footprint, big data and artificial intelligence for analyzing environmental risks and optimizing corporate decisions. Digital tools also contribute to a more accurate assessment of ESG indicators of entities. In addition, digitalization allows entities to implement innovative consumption models, such as the sharing economy, circular economy, which are actively supported by ESG initiatives.

Financial technologies (fintech) play an important role in supporting sustainable development through the integration of ESG factors into the financial infrastructure (green finance, transparency of financial transactions, microfinance and inclusive finance through digital platforms).

Despite all the benefits of ESG innovations, there are certain challenges. The first is high costs at the initial stage. Implementing new technologies requires significant investment, which can be challenging for small and medium-sized companies. The second challenge is the lack of unified standards; the diversity of approaches to ESG assessment makes it difficult to compare companies and increases the risks for investors. Another challenge is regulatory barriers. Different countries have different rules and requirements for implementing ESG, which creates difficulties for multinational companies.

We believe that in today's environment, ESG is becoming an integral part of sustainable development strategies and an important factor in stimulating innovation. Fintech, digitalization, and new business models focused on ESG principles help companies adapt to new challenges, improve their reputation, and achieve long-term financial sustainability. Taken together, companies' compliance with ESG principles has a positive impact on the economy as a whole. ESG factors are becoming increasingly important for macroeconomic forecasts, as they affect the sustainability of economic systems. As more investors incorporate ESG criteria into their strategy, companies with high ESG ratings gain access to cheaper capital. Research by Eccles et al. (2014) [58] shows that ESG-informed investment funds can provide stable returns and lower risk amid global shocks, including pandemics or climate crises. The impact of climate change, such as an increase in the frequency of extreme weather events, threatens the sustainability of businesses and the economy. Companies that ignore climate risks may face significant losses, which in turn will negatively impact the economy as a whole, according to Berg et al. (2020) [59]. According to Clark et al. (2015) [60], governments are more and more introducing requirements to reduce carbon footprints, which affects investment decisions and incentives. Policymakers are incentivizing the transition to low-carbon technologies and rewarding companies that are focused on sustainable development.

At the company level, ESG influences their long-term strategy and sustainability. Research by Khan et al. (2016) [61] shows that companies with high ESG ratings demonstrate better operational efficiency and financial results in the long term. The reasons for this are an improved reputation, increased trust from consumers and employees, reduced operational risks and reduced costs of compliance with regulatory requirements. Companies that integrate ESG principles are better able to manage risks associated with regulatory changes, investor demands and changing societal expectations. This, in turn, reduces their vulnerability to crises, according to Albuquerque et al. (2019) [62].

Financial markets are actively promoting ESG. More and more funds and investment companies, such as BlackRock and Vanguard, are starting to incorporate ESG indicators when choosing companies for investment. Bond markets, such as "green bonds", are also developing due to the demand for sustainable finance, according to El-Ghoul et al. (2011) [63]. Some studies, such as Friede, Busch, and Bassen (2015) [64], show that companies with high ESG ratings receive a kind of "sustainability premium" because investors perceive them as less risky assets. Research by Xu et al. (2020) suggests that companies with a strong ESG strategy can raise capital at a lower cost due to high investor confidence and reduced risks associated with their operations [65].

The impact of ESG on the economy varies by region. In Europe and the US, ESG has become an important component of corporate strategy and investment decisions, while in developing countries this trend is only just starting to gain momentum. In Europe, there are many regulations that stimulate the transition to sustainable development, while in other regions ESG initiatives may face a lack of institutional support, says Schramade (2016) [66].

In general, the impact of ESG on the economy can be viewed through the prism of changes in the behavior of investors, companies and governments. ESG contributes to increasing long-term sustainability both at the micro level (at the level of individual entities) and at the macro level (the economy as a whole). As climate and social challenges intensify, according to Capella-Blanquart and Petit (2019) [67], the importance of ESG will only increase, and companies that ignore these factors may face serious economic and reputational risks. Companies with high ESG ratings gain access to cheaper capital and can attract investments from large financial players. This is due to the fact that investors increasingly value ESG components as a tool for reducing risks and ensuring stability. At the same time, companies that ignore ESG may face increased risks and, as a result, higher costs of raising capital. At the macro level, ESG affects the sustainability of the economy through environmental and social factors. Climate change, emission regulation and the development of technologies aimed at sustainable development are becoming important macroeconomic drivers. Government policies on climate and sustainability have a significant impact on economic activity, stimulating the development of green technologies and regulating

corporate activities. Financial markets play a key role in popularizing ESG. Institutional investors and funds increasingly accept ESG indicators as criteria for investment decisions, which encourages companies to implement more sustainable practices. The green bond market is also becoming an important source of financing for sustainable projects, which confirms the growing interest in sustainable financial instruments. There is a significant difference in the development of ESG between regions. In Europe and the US, ESG principles are already an important part of corporate strategy and government programs. In developing countries, ESG approaches are gaining momentum, but they have yet to overcome institutional barriers and gain wider support.

There is a trend around the world where more and more investors want to purchase financial instruments not only with high returns, but also, first of all, those that comply with ESG principles. In some cases, investors are ready to refuse to invest in companies that do not take sufficient measures on ESG issues. A number of international financial institutions are gradually refusing to finance projects that do not comply with ESG principles. As for the world's largest investment companies, today almost all investment strategies provide for requirements for assessing projects in accordance with these principles. According to the Bloomberg database, as of July 1, 2024, issuers issued 6,982 ESG bonds from 2007 to 2024, of which 65% (4,523 issues) are green bonds (Figure 1). The commitment of developed countries to sustainable development and "greenness" is significantly higher than that of developing countries (Figure 2).

Figure 1

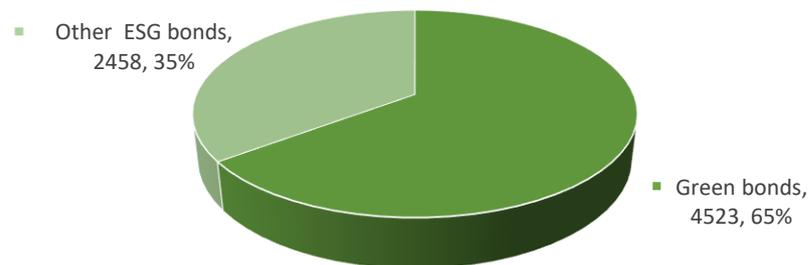**Distribution of the number of ESG bond issues by green and other ESG bond category**

Figure 2

Distribution of ESG bond and green bond issuers by the advanced and developing economies category
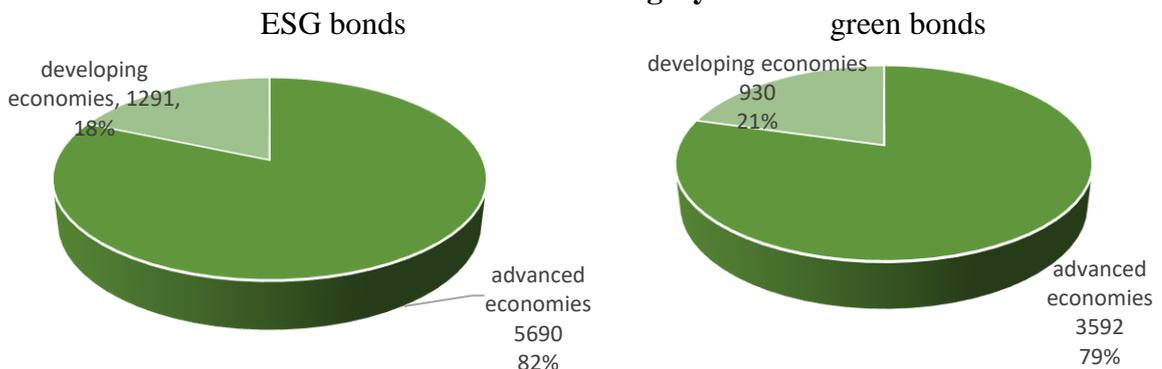
The leaders in the number of ESG bond issues by region (Figure 3) are Europe (47%) and Asia (35%). The largest number of issues in Asia belong to South Korea (817), Japan (637), Malaysia (323) and China (256). In Europe, the largest share of ESG bonds is issued by the UK and dependent territories (523), Sweden (517), France (499), Germany (264), Norway (246) and

Spain (142). The United States, which is part of the North America region, issued 637 ESG bonds during the period under review. In Latin America, the leader in the number of ESG bond issues is Brazil (140), in the Australia and Oceania region - Australia (47), in Africa - South Africa (47).

Figure 3

Distribution of ESG bond issuers by regions
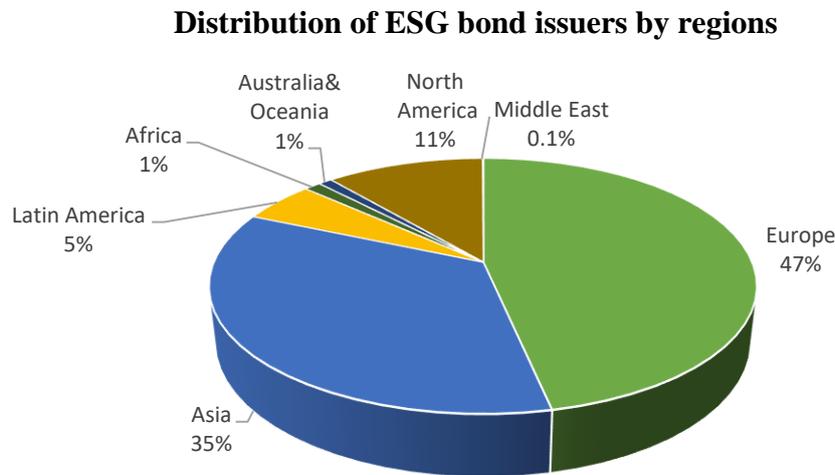
Bloomberg classifies issuer types by the following industries: banking, financial, industrial, telephone, transportation, utilities (electricity and gas), and others. The main industries for issuing ESG bonds are financial (51%), industrial (26%), and utilities (electricity) (13%). As Figure 4 shows, activity in the ESG bond market has increased sharply in 2021 (almost 3 times), which is driven by significant changes in the US regulatory environment in 2021–2022, expressed in the initiation of ESG proposals by the Securities Exchange Commission and the adoption of legislative acts by individual states.

Figure 4

Volumes of ESG bond placements, $US bln.
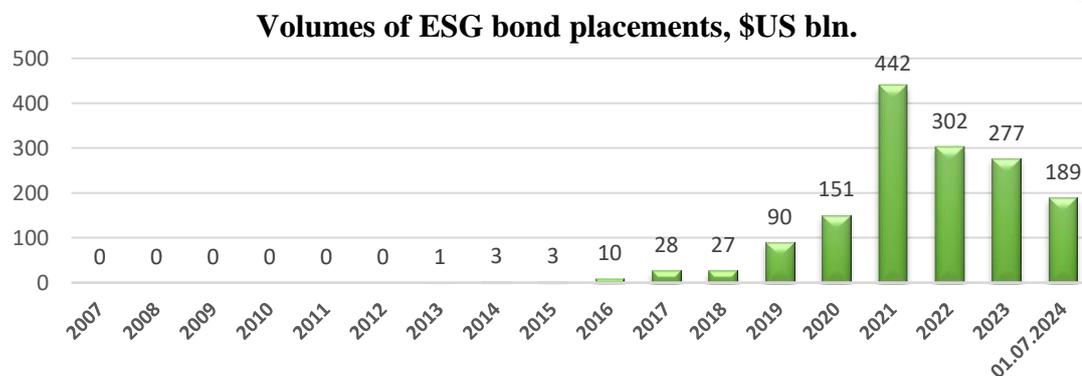
The following trends in the global financial infrastructure can be noted.

Many countries and international organizations are introducing new regulations and ESG reporting standards. Financial institutions will be required to provide more detailed and standardized reports on their environmental, social and governance indicators. This will ensure greater transparency and comparability of data, which in turn will facilitate investment decisions. For example, in the EU, a new Green Investment Pact has been in force since 2023, which requires large companies to publish climate and social impact reports in accordance with the requirements of the EU Taxonomy [68].

Financial institutions and investment funds are increasingly directing funds to projects that comply with the principles of sustainable development. This applies to both green bonds and investments in companies with a high ESG rating. This trend contributes to the development of a "green" economy and innovative technologies. For example, in the US, funds managed by

BlackRock increased their investments in sustainable infrastructure (primarily solar and wind projects) by 50% in 2023 compared to the previous year [69].

The use of artificial intelligence, big data and blockchain to collect, analyze and verify ESG data will become standard practice. This will improve the quality and accuracy of information, which will contribute to more objective assessments of companies and projects. For example, in the UK, Revolut has introduced a new ESG assessment tool that uses artificial intelligence to assess the impact of client investments on sustainable development [70].

In addition to environmental issues, more and more attention will be paid to social aspects such as working conditions, gender equality and human rights. Companies will strive to improve their social performance, which will become an important factor in investment decisions.

Financial analysts and risk managers will begin to include ESG risks in their financial models and risk management strategies. This will allow them to better predict potential threats and opportunities related to sustainable development. For example, in Australia, Westpac has integrated ESG factors into its credit models and also conducts regular stress tests to assess the impact of climate risks on its assets [71].

New financial instruments such as green loans, social bonds and sustainable investment funds will continue to emerge and develop. These instruments will provide more opportunities for companies and investors to engage in sustainable projects. In Japan, Mizuho Financial Group issued ¥500 billion in green bonds to finance sustainable development projects, including renewable energy [72].

Financial institutions will invest heavily in training and raising awareness among employees and customers about the importance of ESG. This will help improve the understanding and adoption of ESG principles at all levels of business and society. These trends indicate that ESG will become an integral part of the global financial infrastructure, shaping new standards and practices aimed at creating a more sustainable and equitable future. Singapore Management University has launched a Sustainability Leadership program to prepare students for leadership in sustainability and ESG [73].

These examples highlight current ESG initiatives and their impact on sustainability in different countries.

Research confirms that companies with high ESG indicators demonstrate better financial results, since investing in environmental initiatives, social projects and corporate governance increases reputation and trust. Despite the different methodological approaches of the studies, most of them come to the conclusion that corporate, social and environmental responsibility and sustainable development have a positive impact on financial performance, especially in the context of growing demands for ESG responsibility. Compliance with ESG criteria helps improve key financial indicators, such as return on equity and assets (ROE and ROA), reduce the cost of capital and increase market capitalization. Companies such as Siemens, Deutsche Bank, Microsoft, DBS Bank and others have made significant progress in implementing ESG principles, which has had a positive impact on their environmental performance and reputation.

3. Overview, Analysis and Assessment of the Current Situation in the Republic of Kazakhstan in Fostering Sustainable Development

The application of sustainable development principles around the world is of particular importance for the economy and financial system, taking into account the achievement of global goals in the field of ecology, social development and corporate governance.

The ESG topic has become quite popular in Kazakhstan due to the fact that it was introduced into the Concept of Investment Policy of Kazakhstan and the Concept for the Financial Sector Development. According to these documents, public administration and reporting requirements for companies will be revised.

The financial sector plays a key role in the implementation of sustainable development principles, primarily providing financing for the green economy, the transformation of Kazakhstani companies taking into account the principles of sustainable development and the risks

that these principles include. One of the top priorities in this area is the gradual integration of ESG criteria into the strategies and business models of financial organizations - second-tier banks, investment managers, etc.

The most important international agreement that regulates ESG principles is the UN Sustainable Development Goals and the Paris Agreement on Climate Change. These agreements are aimed at supporting the environmental integrity of the green economy and adaptation to a changing climate. Kazakhstan has adopted the global sustainable development agenda and is moving towards a green economy, having been a party to the Paris Agreement since 2016. In October 2021, the Head of State supported the UN call for zero greenhouse gas emissions at the International Conference on Carbon Neutrality. On February 2, 2023, the Carbon Neutrality Strategy in Kazakhstan was adopted, its goal is to achieve sustainable development of the Kazakh economy to climate change, the main task is to achieve carbon neutrality by 2060. This scenario involves joint efforts of the state, business and society. In Kazakhstan, the necessary legal framework for the development of green financing has been designed, work on improving ESG regulations has been underway since 2021. Within the framework of the Environmental Code, legislative definitions of the concepts of "green financing", "green projects" have been introduced, a classification of green projects is provided; the Green Taxonomy approved by the Government of the Republic of Kazakhstan in December 2021 and defining the categories of green projects: renewable energy, energy efficiency, green buildings, pollution prevention and control, sustainable use of water, waste, sustainable agriculture, biodiversity conservation and clean transport was put in. The social aspect of ESG is being actively implemented at the legislative level, and there is a plan to develop a Social Taxonomy. In general, state policy is aimed at stimulating decarbonization, providing support in the form of fiscal, financial and other measures for green projects. To increase the investment attractiveness and financing of these projects, the concept of "green bonds" was introduced; Kazakhstani companies can receive subsidies on green bonds issued on the Kazakhstan Stock Exchange (KASE) and the Astana International Financial Center Exchange (AIX). On July 12, 2022, the issuance and circulation of ESG bonds has been legislated. The Law of the Republic of Kazakhstan "On the Securities Market" defines the concepts of "green, social bonds", "sustainable development bonds", "sustainability bonds". These bonds are associated with the earmarked allocation of funds from the placement, which was stated in the prospectus: ecology, environmental protection, socially significant projects. To prevent cases of misuse of funds from the placement of ESG bonds, procedures for their mandatory external assessment, or so-called verification, are provided. Verification is carried out by international financial organizations, audit organizations, consulting firms that perform independent assessments in accordance with ESG principles.

In Kazakhstan, there are already examples of investments based on ESG principles. According to the websites of the KASE [74] and AIX [75], as of August 1, 2024, the volume of the ESG bond market in Kazakhstan amounted to 539 billion tenge, of which 93% are listed on the KASE and 7% on AIX.

Social bonds accounts for the largest share in the structure of ESG bonds in terms of issuance volume (Figure 5); this is related to the two recent issues of social bonds by the "Housing Construction Savings Bank "Otbassy Bank" JSC for a total of 200 billion tenge, which has led to a significant increase in the share of social bonds in the structure of ESG bonds (for comparison, before the issue of these social bonds, the share of green bonds in the structure of ESG bonds was 45%, the share of social bonds – 25%).

Figure 5

Distribution of ESG bonds listed on the KASE and AIX, by types of bonds (issuance volume)
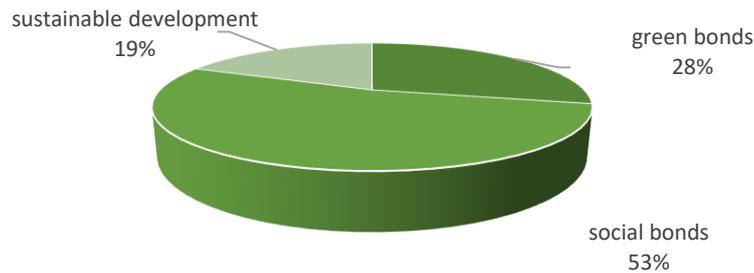
KASE lists 21 ESG bond issues for a total of 504 billion tenge (85% (429 billion tenge) placed), of which 11 are green bonds, 9 are social bonds, and 1 is a sustainable development bond (Figure 6). These bonds were issued by the Asian Development Bank (2 issues - green bonds, 3 - social bonds), JSC Development Bank of Kazakhstan (3 issues - green bonds, 1 - sustainable development bonds), Eurasian Development Bank (1 issue - green bonds, 1 - social bonds), JSC Housing Construction Savings Bank Otbasy Bank (2 issues - social bonds) (Figure 7). As of August 1, 2024, 4 bond issues for a total of 35 billion tenge are listed on AIX, of which 3 are green bonds (JSC Samruk-Energy, JSC Development Bank of Kazakhstan, Jet Group Ltd), 1 is social bonds (JSC Industrial Development Fund). Since 2021, 19 ESG bond issues worth more than 303 billion tenge have already been listed on KASE to finance sustainable projects.

Figure 6

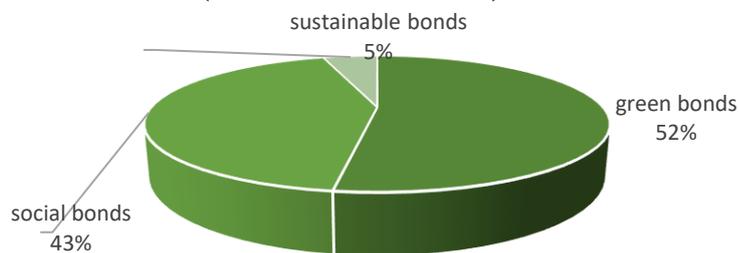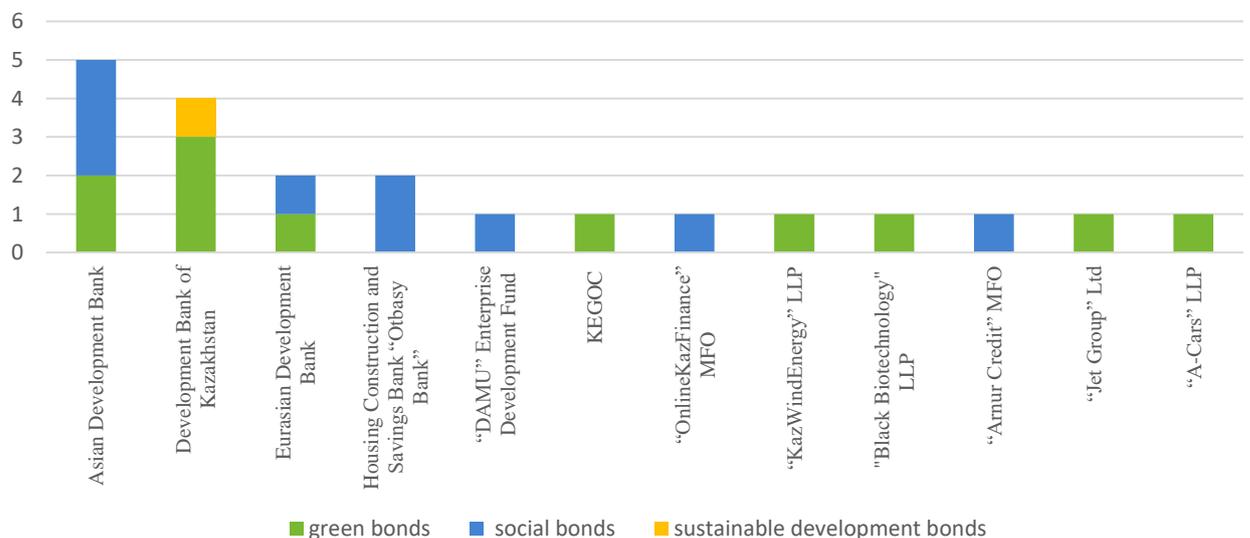**Distribution of ESG bonds listed on the KASE, by types of bonds (the number of issues)**

Figure 7

ESG bonds listed on the KASE (the number of issues)

The Agency of the Republic of Kazakhstan for Regulation and Development of the Financial Market (FRA), together with experts in the field of ESG standards from international organizations, is developing procedures for identifying and assessing ESG risk management, requirements to the internal risk management system for financial institutions. In 2022, in order to interact on the development of the green financing market and the implementation of international ESG standards in the financial market, agreements were concluded with the International Finance Corporation (IFC) and the European Bank for Reconstruction and Development (EBRD). On March 16, 2023, the Roadmap for implementation of ESG principles in the regulation of the financial market of the Republic of Kazakhstan was approved, providing for a policy of phased implementation of ESG principles in the financial sector. As part of the Roadmap, the Guidelines for the Disclosure of ESG Information for Banks and Other Financial Institutions were approved in April 2023. In 2023, financial institutions could voluntarily disclose non-financial information on their environmental, social, and economic impacts, as well as an assessment of the impact of ESG factors on financial institutions' performance, as part of their annual reporting. From 2024, voluntary disclosure of information on a financial institution's compliance with ESG criteria will become mandatory.

As part of the Unified Business Support and Development Program "Business Roadmap 2025", the "DAMU" Entrerprise Development Fund provides financial support for ESG projects (subsidizing interest rates on bonds and loans).

On July 15, 2024, the FRA adopted the Guidelines for Managing Environmental and Social Risks for Banks and Other Financial Institutions, which includes recommendations on the creation and implementation of a system for managing environmental and social risks of financial institutions when implementing various types of financing, including trade finance, microfinance, financing of small and medium-sized enterprises, corporate and project financing.

Government policy is aimed at continuing the phased implementation of ESG principles in the strategies and business models of financial institutions; Guidelines for Assessing the Carbon Footprint of Bank Loan Portfolios are being developed.

At the same time, despite the positive trends in ESG development in Kazakhstan, there are a number of obstacles to sustainable development. Many companies, especially small and medium-sized businesses, are not sufficiently aware of the importance and benefits of implementing ESG principles. This is due to the lack of experience and knowledge in the field of sustainable development. Despite its efforts to develop the legal environment, Kazakhstan does not yet have strict and mandatory ESG requirements for non-financial organizations. Existing laws are often not specific enough and do not encourage businesses to adopt sustainable practices. For example, financial institutions have difficulty with labeling green loans and assessing credit and market risks, which discourages investors from investing in green economy projects. ESG implementation requires a complex monitoring and transparent reporting system, which causes additional costs and efforts on the part of businesses. In practice, many companies face difficulties in correctly collecting data and preparing reports on ESG standards. ESG implementation also requires specialists with the relevant knowledge and experience, but Kazakhstan has a shortage of personnel in the field of sustainable development. For many Kazakh companies, focusing on the long-term benefits of ESG principles seems less attractive than short-term profits. Although interest in sustainable practices is growing, there are still not many investors in Kazakhstan that actively demand ESG standards from businesses, and consumers are not always aware of the importance of environmentally and socially responsible choices. The Kazakh economy is heavily dependent on extractive sectors (oil, gas, metals), which complicates the implementation of environmental standards, as these industries traditionally have a high level of environmental impact.

Kazakhstan is actively working to integrate sustainable development principles into the financial sector, which implies the setting of new standards and requirements for companies. The establishment of mandatory ESG disclosure standards highlights the transition to stricter regulation aimed at sustainable development. Financial support for ESG projects through

government programs demonstrates the government's desire to encourage green initiatives in business. However, the implementation of ESG principles faces obstacles such as low awareness, the need for further improvement of the legal framework, difficulties in monitoring and reporting, insufficient number of qualified personnel, the desire for short-term profit, a low level of requirements from investors and clients, dependence on extractive industries.

4. Ways to Further Improve the Legislation of the Republic of Kazakhstan in Order to Foster Sustainable Development

Fostering sustainable development is a key trend in the development of the global economy. In developed economies, the introduction of ESG principles into the activities of companies is a widely used tool that reflects the new thinking of the business world. Stimulating sustainable development is also a pressing issue in Kazakhstan. The use of environmentally friendly green technologies can radically change the situation with the quality of air and water, which, in turn, will have a positive impact on the health of the entire nation. Strengthening the role of business in the social sphere can help solve problems of social inequality. Transparent corporate governance will improve the investment attractiveness of both companies and the country as a whole.

In Kazakhstan, the necessary legal framework for the development of sustainable financing has been formed. At the same time, ESG issues, taking into account global trends, require further improvement of legislation in terms of strengthening regulation and reporting standards, stimulating the growth of investment in sustainable projects, introducing technologies to improve ESG assessments, integrating ESG risks into financial models of companies, developing green and social financial instruments, and raising awareness of ESG issues. Based on the conducted analysis of the best global practices and the study of international standards in the field of ESG information disclosure, the authors recommend improving the legislative requirements for the content of annual reports published by listed companies on ESG issues. At the same time, we believe that the GRI standard is preferable for the following reasons. The ESRS industry reporting standards are still at the stage of formation and compilation (the ESRS industry standards will be finally finalized and adopted by the European Commission by June 2026), and GRI has already developed standards for such industries as oil and gas, the coal sector, agriculture, aquaculture and fisheries, mining and have an easier and more understandable reporting process. GRI is the most widespread standard in the world, adopted by 68% of N100 companies and 78% of G250 companies, and it is most widespread in North and South America [76]. The ISSB standards are based on the work of market initiatives in the field of reporting oriented at investors. At the same time, the ISSB does not divide reporting by industry areas. Moreover, reporting under ISSB requires a company to refer to other reports if certain aspects are not covered by ISSB. This format may cause difficulties for small and medium-sized companies.

Taking into account the barriers existing in Kazakhstan that hinder the development of ESG, we propose the following measures to further improve the legislation:

1. Creating strict and mandatory ESG requirements for all companies – developing mandatory norms and standards for non-financial organizations that would stimulate their transition to sustainable business models and promote more active implementation of ESG principles. The introduction of clear requirements for transparent reporting based on international standards (for example, GRI) will simplify the collection and analysis of data to assess the impact of companies on the environment, social sphere and corporate governance.

2. Government support and incentives – creating tax breaks, subsidies or grants for companies implementing ESG practices, which will help overcome short-term economic losses and increase their motivation for sustainable development.

3. Strengthening the labeling system for green financial instruments – standardizing processes and criteria for labeling green loans and bonds, which will facilitate access to green investments and reduce barriers to their dissemination in the market.

4. Developing public educational programs and training personnel to train ESG and sustainable development specialists, as well as raising awareness among businesses and consumers about the long-term benefits of ESG practices.

5. Supporting small and medium-sized businesses – providing consulting and financial resources to adapt to new standards.

6. Diversifying the economy – implementing programs to reduce the economy's dependence on extractive industries and developing sectors such as renewable energy and waste recycling.

7. Adapting to modern trends through the introduction of innovative processes – introducing fintech, digitalization and new business models into ESG implementation strategies, which will optimize monitoring and management of ESG risks, integrate ESG factors into the financial infrastructure and focus on long-term sustainability.

Kazakhstan is actively promoting the implementation of ESG principles, forming a legal framework for sustainable development, but the legislation requires further improvement, especially in terms of reporting and regulation. Transparent corporate governance based on international standards such as GRI helps increase the investment attractiveness of the country and companies. In order to ensure further development of ESG in Kazakhstan, it is necessary to improve the legislation, increase reporting requirements and stimulate investment in sustainable projects. In the future, key tasks will include the integration of ESG risks into business models, development of human resources and raising awareness of companies about the long-term benefits of sustainable practices.

Findings

As global practice shows, ESG implementation helps reduce negative impact on the environment, improve social standards and increase transparency of corporate governance. These achievements play a key role in creating a sustainable economy and attracting investment globally. The effects of ESG implementation include reducing negative impact on the environment, improving working conditions, attracting investment and strengthening the reputation of companies. In the future, further strengthening of regulation and incentives for ESG practices is expected, which will contribute to the creation of a more sustainable and responsible economy globally. Initiatives should ultimately be aimed at expanding the coverage of the system, its infrastructure, pricing tools in order to attract significant investments in environmentally friendly projects that help reduce greenhouse gas emissions, as well as in social projects that affect the improvement of social aspects of society. ESG principles are becoming key for companies, ensuring sustainable development, risk mitigation and long-term value creation, which improves their financial performance and competitive advantages. Companies with high ESG indicators demonstrate better financial results due to an improved reputation and increased trust from stakeholders, which leads to business sustainability. The introduction of technologies such as artificial intelligence and blockchain contribute to a more accurate assessment of ESG, and the integration of ESG risks into financial models helps companies better predict threats and opportunities. Strengthening regulation and reporting standards, as well as the growth of investments in sustainable projects, emphasize the importance of ESG in the financial infrastructure, forming new practices and approaches to business. An analysis of the experience of the EU, USA, and Asia showed that the key trend in the development of the global economy is the stimulation of sustainable development of ESG, which is confirmed by the Bloomberg estimate [77] that ESG assets will exceed USD 40 trillion by 2030 and will account for 25% of total assets under management. According to Bloomberg, 82% of ESG bonds are in developed countries, with South Korea, the USA, Japan, Great Britain, Sweden, and France in the lead. The main industries issuing ESG bonds are financial (51%), industrial (26%), and utilities (electricity) (13%). Activity in the global ESG bond market has increased sharply in 2021 (almost 3 times), due to significant changes in the US regulatory environment, expressed in the initiation of ESG proposals by the Securities Exchange Commission (SEC) and the adoption of legislation. Thus, the existence of a

legislative framework and its improvement contribute to the acceleration of the implementation of ESG principles.

The practice of implementing ESG includes the creation of a unified classification system of green taxonomy, which needs to be developed to prevent greenwashing, the establishment of targets for emission reduction at the legislative level, the implementation of ESG principles in the business processes of both financial organizations and public companies of all industries, the development and improvement of ESG reporting systems, as well as the improvement of measures to stimulate ESG sustainable development in order to achieve the global sustainable development goals defined by the UN. Kazakhstan is on the path of ESG development. In Kazakhstan, the effort to improve ESG regulations has been underway since 2021: the Green Taxonomy was approved, the Carbon Neutrality Strategy by 2060 was adopted, and the issuance and circulation of ESG bonds were regulated, procedures for their verification were provided, the Guidelines for Disclosure of ESG Information and the Guidelines for Managing Environmental and Social Risks for Banks and Other Financial Organizations were approved. The development of ESG projects is fostered through the "DAMU" Enterprise Development Fund by subsidizing interest rates on bonds and loans. The concept of investment policy provides for the development of requirements to the content of annual reports on ESG issues published by listed companies. Thus, the necessary legal framework for the development of sustainable financing has been built in Kazakhstan. As of August 1, 2024, the volume of the ESG bond market in Kazakhstan amounted to 539 billion tenge, of which 93% are listed on KASE and 7% on AIX. Despite positive trends, there are a number of barriers to the development of ESG in Kazakhstan: insufficient awareness of companies, especially small and medium-sized businesses; the ESG disclosure system in Kazakhstan is not comprehensive and requires revision, including the development of mandatory requirements for non-financial organizations; difficulties in monitoring and reporting; the Kazakh economy is heavily dependent on the extractive industries, which complicates the implementation of environmental standards.

The authors suggest considering recommendations for disclosure of ESG information by listed companies based on the international GRI standard, which, in their opinion, has the easiest and most understandable reporting process, and also remains the most common standard for disclosure of ESG information.

Literature

1. UNEP FI. (2005) «Who Cares Wins: Connecting Financial Markets to a Changing World». Available at: https://d306pr3pise04h.cloudfront.net/docs/issues_doc%2FFinancial_markets%2Fwho_cares_who_wins.pdf.

2. European Commission. (2018) «Sustainable Finance Report». Available at: https://ec.europa.eu/info/publications/180131-sustainable-finance-report_en .

3. European Commission. (2018) «Communication from the Commission: Action Plan on Sustainable Finance». Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018DC0097#footnote7 .

4. European Union. (2020) «Regulation (EU) 2020/852 on Sustainable Investment». Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0852 .

5. European Commission. (2023) «European Green Deal». Available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/story-von-der-leyen-commission/european-green-deal_en .

6. European Union. (2023) «Regulation on Sustainability Disclosures in the Financial Sector». Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302775 .

7. PwC. (2023) «The Corporate Sustainability Reporting Directive (CSRD)». Available at: https://www.pwc.com/lv/en/about/services/sustainability-services/the-corporate-sustainability-reporting-directive-CSRD.html .

8.   European Union. (2019) «Regulation (EU) 2019/2088 on Sustainability Disclosures in the Financial Services Sector». Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32019R2088 .

9.   European Commission. (2023) «SFDR Implementation Summary of Responses». Available at: https://finance.ec.europa.eu/document/download/0f2cfde1-12b0-4860-b548-0393ac5b592b_en?filename=2023-sfdr-implementation-summary-of-responses_en.pdf .

10.   Danish Energy Agency (2023). Danish Energy Policy: Wind Power. Available at: https://ens.dk/en.

11.   Danish Business Authority (2023). The Danish Climate Act. Available at: https://danishbusinessauthority.dk.

12.   Norwegian Government (2023). Sustainable Development in Norway. Available at: https://www.regjeringen.no/en/topics/sustainability.

13.   Norwegian Ministry of Finance (2023). Management of the Government Pension Fund Global. Available at: https://www.regjeringen.no/en/topics/economy/management-of-the-government-pension-fund-global.

14.   Dutch Ministry of Infrastructure and Water Management (2023). Sustainable Urban Development in the Netherlands. Available at: https://www.government.nl/topics/sustainable-urban-development.

15.   Dutch Ministry of Economic Affairs and Climate Policy (2023). Climate Agreement and Corporate Sustainability Reporting. Available at: https://www.government.nl/topics/climate-change/climate-agreement.

16.   European Commission (2023) EU Sustainable Finance. Available at: https://ec.europa.eu/finance/sustainable.

17.   EY (2023) Challenges in ESG Reporting in Europe. Available at: https://www.ey.com/europe/esg-reporting.

18.   OECD (2023) Sustainability Costs for Small Businesses in Europe. Available at: https://www.oecd.org/sustainability.

19.   Gruzdeva, K.N. and Zaborovskaya, A.E. (2021) «ESG-Concept as a Guide for Sustainable Development of the Russian Banking Sector». In: «Russian Regions in Focus of Changes: Proceedings of the Conference, Yekaterinburg, 18-20 November 2021». Yekaterinburg, pp. 405-409.

20.   White House. (2021) «Executive Order on Tackling the Climate Crisis at Home and Abroad». Available at: https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/ .

21.   SEC. (2021) «ESG Risk Alert». Available at: https://www.sec.gov/files/esg-risk-alert.pdf.

22.   Yahoo Finance. (2023) «U.S. SEC Chair Pledges Trading Reform». Available at: https://finance.yahoo.com/news/u-sec-chair-pledges-trading-164051534.html .

23.   U.S. Congress. (2010) «Dodd-Frank Wall Street Reform and Consumer Protection Act». Available at: https://www.congress.gov/111/plaws/publ203/PLAW-111publ203.pdf .

24.   U.S. Senate. (2023) «S.2491: Climate Risk Disclosure Act of 2023». Available at: https://www.congress.gov/bill/117th-congress/senate-bill/2491/text .

25.   U.S. House of Representatives. (2023) «H.R.3623: Climate Risk Disclosure Act of 2023». Available at: https://www.congress.gov/bill/116th-congress/house-bill/3623/text .

26.   White House. (2021) «Executive Order on Climate-Related Financial Risk». Available at: https://www.whitehouse.gov/briefing-room/presidential-actions/2021/05/20/executive-order-on-climate-related-financial-risk/ .

27.   Egorova, E.M. and Avanesova, E.S. (2022) «The Role of ESG Banking in Shaping the Financial Vector of Socially Oriented Business Projects». *Economics: Theory and Practice*, 4(68), pp. 49-54.

28. The Washington Standard. (n.d.) Top US banks under investigation over ESG & climate action. Available at: https://thewashingtonstandard.com/top-us-banks-under-investigation-over-esg-climate-action/.

29. Harvard Law School Forum on Corporate Governance (2023) The Political Divide on ESG in the United States. Available at: https://corpgov.law.harvard.edu/.

30. Morningstar (2023) Challenges in ESG Investing in the United States. Available at: https://www.morningstar.com/esg.

31. U.S. Securities and Exchange Commission (2023) The Need for Unified ESG Standards. Available at: https://www.sec.gov/esg.

32. Thai Institute of Directors. (2020) «Corporate Governance Report of Thai Listed Companies 2020». Available at: http://www.thai-iod.com/imgUpload/CGR2020%20Report(1).pdf .

33. Securities and Futures Commission. (2021) «Circular on Product Authorization». Available at: https://apps.sfc.hk/edistributionWeb/gateway/EN/circular/products/product-authorization/doc?refNo=21EC27 .

34. Lexology. (2023) «Latest ESG Developments in Financial Services». Available at: https://www.lexology.com/library/detail.aspx?g=c235bc6c-64f4-425b-af5a-97c26311d25b .

35. Singapore Ministry of Sustainability and the Environment (2023). Sustainable Development in Singapore. Available at: https://www.mse.gov.sg.

36. Asian Development Bank (2023) Sustainable Finance in Asia. Available at: https://www.adb.org/sustainable-finance.

37. PWC (2023) ESG in Asia: Emerging Awareness and Barriers. Available at: https://www.pwc.com/asia/esg.

38. World Economic Forum (2023) Sustainable Development Challenges in Asia. Available at: https://www.weforum.org/.

39. Moneva, J.M.; Ortas, E. Corporate environmental and financial performance: A multivariate approach. Ind. Manag. Data Syst. 2010, 110, 193–210. [CrossRef].

40. Zeng, Y.; Gulzar, M.A.; Wang, Z.; Zhao, X. The effect of expected financial performance on corporate environmental responsibility disclosure: Evidence from China. Environ. Sci. Pollut. Res. 2020, 27, 37946–37962. [CrossRef] [PubMed].

41. Liu, Y.; Xi, B.; Wang, G. The effect of corporate environmental responsibility on financial performance-based on Chinese listed companies. Environ. Sci. Pollut. Res. 2021, 28, 7840–7853. [CrossRef] [PubMed].

42. Kim, H.; Park, K. Corporate Environmental Responsibility and Firm Performance in the Financial Services Sector. J. Bus. Ethics 2015, 131, 257–284.

43. Vuong, N.B. Investor sentiment, corporate social responsibility, and financial performance: Evidence from Japanese companies. Borsa Istanb. Rev. 2022, 22, 911–924.

44. George, A.K.; Kayal, P.; Maiti, M. Nexus of Corporate Social Responsibility Expenditure (CSR) and financial performance: Indian banks. Q. Rev. Econ. Financ. 2023, 90, 190–200. [CrossRef].

45. Saeed, A.; Alnori, F.; Yaqoob, G. Corporate social responsibility, industry concentration, and firm performance: Evidence from emerging Asian economies. Res. Int. Bus. Financ. 2023, 64, 101864. [CrossRef].

46. Iqbal, S.; Nawaz, A.; Ehsan, S. Financial performance and corporate governance in microfinance: Evidence from Asia. J. Asian Econ. 2019, 60, 1–13. [CrossRef].

47. Rahman, H.U.; Zahid, M.; Al-Faryan, M.A.S. ESG and firm performance: The rarely explored moderation of sustainability strategy and top management commitment. J. Clean. Prod. 2023, 404, 136859.

48. Gao, J.; Luo, C.; Xu, H.; Shi, G. How does boardroom diversity influence the relationship between ESG and firm financial performance? Int. Rev. Econ. Financ. 2024, 89, 713–730.

49. Xu Y, Zhu N. The Effect of Environmental, Social, and Governance (ESG) Performance on Corporate Financial Performance in China: Based on the Perspective of Innovation and Financial Constraints. Sustainability. 2024; 16(8):3329. https://doi.org/10.3390/su16083329.

50. MSCI (n.d.) ESG Ratings. Available at: https://www.msci.com/esg-ratings.

51. Sustainalytics (n.d.) ESG Risk Ratings. Available at: https://www.sustainalytics.com/esg-risk-ratings.

52. Siemens AG. (2023). Annual Sustainability Report. Available at: https://www.siemens.com/sustainability-report-2023.

53. Deutsche Bank. (2023). Sustainability and ESG Report 2023. Available at: https://www.db.com/sustainability-report-2023.

54. Microsoft Corporation. (2023). 2023 Environmental Sustainability Report. Available at: https://www.microsoft.com/environmental-report-2023.

55. Morgan Stanley (n.d.) Sustainable Investing. Available at: https://www.morganstanley.com/sustainableinvesting.

56. Keppel Corporation. (2023). Sustainability Highlights 2023. Available at: https://www.keppel.com/sustainability-2023.

57. Annual Sustainability Review. Available at: https://www.dbs.com/sustainability-review-2023.

58. Eccles, R.G., Ioannou, I., & Serafeim, G. (2014). «The Impact of Corporate Sustainability on Organizational Processes and Performance.» Management Science, 60(11), 2835-2857.

59. Berg, F., Koelbel, J.F., & Rigobon, R. (2020). «Aggregate Confusion: The Divergence of ESG Ratings.» MIT Sloan School Working Paper.

60. Clark, G.L., Feiner, A., & Viehs, M. (2015). «From the Stockholder to the Stakeholder: How Sustainability Can Drive Financial Outperformance.» University of Oxford and Arabesque Partners.

61. Khan, M., Serafeim, G., & Yoon, A. (2016). «Corporate Sustainability: First Evidence on Materiality.» The Accounting Review, 91(6), 1697-1724.

62. Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). «Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence.» Management Science, 65(10), 4451-4469.

63. El Ghoul, S., Guedhami, O., Kwok, C.C., & Mishra, D.R. (2011). «Does Corporate Social Responsibility Affect the Cost of Capital?» Journal of Banking & Finance, 35(9), 2388-2406.

64. Friede, G., Busch, T., & Bassen, A. (2015). «ESG and Financial Performance: Aggregated Evidence from More than 2000 Empirical Studies. » Journal of Sustainable Finance & Investment, 5(4), 210-233.

65. Hsu, P.H., Liang, H., & Matos, P. (2020). «Leviathan Inc. and Corporate Environmental Engagement. » Review of Financial Studies, 33(8), 3783-3820.

66. Schramade, W. (2016). «Integrating ESG into Valuation Models and Investment Decisions: The Value-Driver Adjustment Approach.» Journal of Sustainable Finance & Investment, 6(2), 95-111.

67. Capelle-Blancard, G., & Petit, A. (2019). «Every Little Helps? ESG News and Stock Market Reaction.» Journal of Business Ethics, 157, 543-565.

68. European Commission (2023). The Green Deal: Delivering on the European Green Deal. Available at: https://ec.europa.eu/green-deal.

69. BlackRock (2023). Sustainable Investing: 2023 Trends. Available at: https://www.blackrock.com/us/individual/investment-ideas/sustainable-investing.

70. Revolut (2023). Introducing ESG Ratings. Available at: https://www.revolut.com/en-US/esg-ratings.

71. Westpac (2023). Climate Risk and ESG Integration. Available at: https://www.westpac.com.au/about-westpac/sustainability/climate-risk/.

72. Mizuho Financial Group (2023). Green Bonds Issuance. Available at: https://www.mizuho-fg.co.jp/english/investors/green-bonds.html.

73. Singapore Management University (2023). Sustainability Leadership Program. Available at: https://www.smu.edu.sg/sustainability .

74. KASE, n.d. ESG Bonds. Available at: https://kase.kz/ru/esg/bonds/.

75. AIX, n.d. Listed Companies. Available at: https://aix.kz/listings/listed-companies-2-2/.

76. GRI (2023), «Four-in-five largest global companies report with GRI» https://www.globalreporting.org/news/news-center/four-in-five-largest-global-companies-report-with-gri/.

77. Bloomberg, 2023. Global ESG Assets Predicted to Hit $40 Trillion by 2030 Despite Challenging Environment. Available at: https://www.bloomberg.com/company/press/global-esg-assets-predicted-to-hit-40-trillion-by-2030-despite-challenging-environment-forecasts-bloomberg-intelligence/ .

78. GRI. (2023) «The GRI Perspective: ESG Standards and Frameworks». Available at: https://www.globalreporting.org/media/jxkgrggd/gri-perspective-esg-standards-frameworks.pdf .

79. Azeus Convene. (2023) «The ESG Reporting Frameworks and Standards Explained». Available at: https://www.azeusconvene.com/esg/articles/the-esg-reporting-frameworks-and-standards-explained .

80. GeneOnline. (2023) «The World of ESG Standards and Their Organizations». Available at: https://www.geneonline.com/the-world-of-esg-standards-and-their-organizations/ .

81. Novisto. (2023) «List of ESG Reporting Frameworks and Standards». Available at: https://novisto.com/list-esg-reporting-framework-standard/ .

82. EFRAG. (2023) «European Sustainability Reporting Standards - Exposure Draft». Available at:
https://www.efrag.org/Assets/Download?assetUrl=%2Fsites%2Fwebpublishing%2FSiteAssets%2FED_ESRS_AP1.pdf .

83. KPMG. (2022) «European Sustainability Reporting Standards (EU ESRS)». Available at: https://kpmg.com/xx/en/home/insights/2022/05/european-sustainability-reporting-standards-eu-esrs.html .

84. KPMG. (2022) «Get Ready for ESRS - Talkbook». Available at: https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2022/07/talkbook-get-ready-for-esrs.pdf .

85. GRI. (2023) «Standards». Available at: https://www.globalreporting.org/standards/ .

86. GRI. (2023) «A Short Introduction to the GRI Standards». Available at: https://www.globalreporting.org/media/wtaf14tw/a-short-introduction-to-the-gri-standards.pdf .

87. GRI. (2023) «About GRI». Available at: https://www.globalreporting.org/about-gri/ .

88. GRI. (2023) «Our Mission and History». Available at: https://www.globalreporting.org/about-gri/mission-history/ .

89. GRI. (2023) «Why Report?» Available at: https://www.globalreporting.org/how-to-use-the-gri-standards/ .

90. GRI. (2023) «Standards Development». Available at: https://www.globalreporting.org/standards/standards-development/ .

91. GRI. (2023) «Four-in-Five Largest Global Companies Report with GRI». Available at: https://www.globalreporting.org/news/news-center/four-in-five-largest-global-companies-report-with-gri/ .

92. GRI. (2023) «Linking GRI Reporting to Other Requirements». Available at: https://www.globalreporting.org/how-to-use-the-gri-standards/global-alignment/ .

93. GRI. (2023) «A Short Introduction to the GRI Standards». Available at: https://www.globalreporting.org/media/wtaf14tw/a-short-introduction-to-the-gri-standards.pdf .

94. B Corporation. (2023) «GRI and B Lab Team Up on Impact Management». Available at: https://www.bcorporation.net/en-us/news/press/gri-and-b-lab-team-impact-management-0/ .

95. IFRS. (2023) «International Sustainability Standards Board (ISSB)». Available at: https://www.ifrs.org/groups/international-sustainability-standards-board/ .

96. PwC. (2023) «IFRS Sustainability Disclosure Standards». Available at: https://viewpoint.pwc.com/dt/gx/en/pwc/in_depths/in_depths_INT/in_depths_INT/ifrs-sustainability-disclosure-standards.html .

97. IFRS. (2023) «IFRS S1: General Requirements for Disclosure of Sustainability-related Financial Information». Available at: https://www.ifrs.org/content/dam/ifrs/publications/pdf-standards-issb/english/2023/issued/part-a/issb-2023-a-ifrs-s1-general-requirements-for-disclosure-of-sustainability-related-financial-information.pdf .

98. IFRS. (2023) «IFRS S2: Climate-related Disclosures». Available at: https://www.ifrs.org/content/dam/ifrs/publications/pdf-standards-issb/english/2023/issued/part-a/issb-2023-a-ifrs-s2-climate-related-disclosures.pdf .

99. Global Reporting Initiative (GRI) (n.d.) GRI Standards. Available at: https://www.globalreporting.org/standards/.

100. MSCI (n.d.) ESG Ratings Methodology. Available at: https://www.msci.com/esg-ratings.

101. Sustainalytics (n.d.) ESG Risk Ratings Methodology. Available at: https://www.sustainalytics.com/esg-risk-ratings .

102. SASB (Sustainability Accounting Standards Board) (n.d.) SASB Standards. Available at: https://www.sasb.org/standards/ .

103. GRI. (2023) «GRI Report Services Methodology». Available at: https://www.globalreporting.org/media/wrthwegq/gri-standards-alignment-check-services-methodology.pdf .

104. GRI. (2023) «Sector Program». Available at: https://www.globalreporting.org/standards/sector-program/.

Green Loans. The Potential in Kazakhstan and Worldwide

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The paper presents an overview of the regulatory framework for the development and regulation of green loans in individual countries and international experience in the application of green loans by type of product, provides an overview of the regulatory framework in Kazakhstan, as well as the current situation on green loans, outlines the factors limiting the development of green lending in Kazakhstan, and ways to solve problems of green lending.

1. Preamble

In recent years, there has been a global trend towards sustainable development and the "green" agenda. Governments of many countries are developing action plans and regulatory environments to adapt their economies to climate change. Business seeks not only to make a profit, but also to pay attention to the social and environmental responsibility of its activities. Given global environmental changes and the need to combat the effects of human activity on the environment, the issue of financing environmental initiatives, especially energy-efficient and low-carbon projects, is becoming increasingly relevant.

This paper examines one of the green financing instruments – a green loan, which has been rapidly developing in recent years and is already widely used in the world. An overview of the regulatory framework and examples of the implementation of green lending instruments in individual countries is provided. The position of green loans in the Kazakh financial market is considered, factors hindering the development of green loans in Kazakhstan are identified, and solutions are proposed taking into account international experience.

2. Theoretical Treatment

Climate change and environmental problems, which are getting closer and closer to critical limits every year, create a need for active economic actions to combat the consequences and prevent future negative changes. The transition of countries to a low-carbon economy requires significant investments. Green finance in this context is the direction of financial flows for the benefit of the environment.

Globally, the catalyst for green finance was the Paris Agreement: at the UN Climate Change Conference in Paris in 2015, governments reached an agreement to limit global warming to 1.5-2°C compared to pre-industrial levels. The agreement is aimed at strengthening the global response to the threat of climate change and efforts to eradicate poverty[1]. To date, 195 countries have joined the Paris Agreement, including Kazakhstan.

Within the framework of green finance, several terms are inextricably linked with each other. Among the main concepts is sustainable development. The most common definition is given in the Report of the World Commission on Environment and Development "Our Common Future": sustainable development is the approach to growth and human development that aims to meet the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Sustainable development includes 17 global goals and covers three areas: responsible attitude to the environment (Environment), social responsibility (Social) and an effective system of corporate governance (Governance) - ESG. ESG criteria assess compliance with the principles through the disclosure of relevant information in public non-financial reporting.

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[1] The Paris Agreement, 2015

While ESG finance generally means investing in organizations with good social, environmental performance and effective governance, green finance is aimed at specific projects that can minimize negative impacts on the environment. Today, traditional green finance instruments include green bond, green loan, green insurance, green deposits, and green grants.

The green loan market emerged relatively recently, in 2016, starting with Lloyds Bank's earmarked loans of $US 1.27 billion for greener real estate companies in the UK (Larsen, 2019).

The International Finance Corporation (IFC) of the World Bank Group is the largest development financial institution that supports ESG approaches and has made a significant contribution to the development of the Green Loan Principles (GLP). According to them, green loans are any type of credit instruments and/or conditional loans (bond lines, guarantee lines or letters of credit) provided exclusively for the purpose of financing, refinancing or guaranteeing in whole or in part new and/or existing and compliant green projects and covering the four key components of GLP:

1) Use of Proceeds: loan proceeds must be directed towards green projects with demonstrable environmental benefits that are properly assessed, measured and described in the borrower's financial documents;

2) the Process for Project Evaluation and Selection: the borrower must specify the environmental sustainability objectives of green projects, describe the process for determining whether the project complies with the principles and manage perceived, actual or potential environmental and social risks;

3) Management of Proceeds: funds must be tracked by the borrower in an appropriate manner to maintain the transparency of the green loan, for example, funds can be credited to a special account;

4) Reporting: borrowers must provide accessible, up-to-date information on the use of funds, identifying and briefly describing green projects, amounts allocated, impact achieved and expected (if possible).

The same definition of a green loan is given in the LMA Glossary of Green and Sustainable Lending Terms, whereunder a green loan is any type of credit instrument (such as bond lines, guarantee lines or letters of credit) provided exclusively for the purpose of financing, refinancing or guaranteeing, in whole or in part, new and/or existing green projects that comply with the four principles of GLP (LMA, 2023).

Ran Zhang et al. define a green loan as a new form of environmental regulatory instrument that can ensure environmental protection by implementing differentiated credit policies for different enterprises. It usually offers lower interest rates and credit support to green enterprises (Zhang et al., 2022).

Whatever the definition and scope of a green loan, its main principle is to provide real environmental benefits.

The categorization of green loan objects is basically the same in all countries. These are the production and distribution of energy from renewable sources, pollution prevention and control, rational management of natural resources, careful attitude to biodiversity, adaptation to the effects of climate change and green construction. For households, green products can be credit products aimed at purchasing housing in energy-efficient houses using renewable energy sources, or loans for the purchase of electric vehicles.

The sources of funding are the credit institution's own funds or international or government support to ensure the necessary profit corresponding to the investment of funds in non-green projects. Most often, green loans are funded by green bonds. The first green bonds were issued in 2007 by the European Investment Bank, which is controlled by the European Union: 600 million euros were allocated for the construction of wind farms and solar power plants (Artemov, 2023).

In Kazakhstan, green bonds were first issued in 2020 by the Damu Fund with the support of the United Nations Development Programme (UNDP) in the trading system of the Astana International Financial Centre (AIFC) stock exchange with a coupon rate of 11.75% per annum and a maturity of 3 years. The proceeds from the placement of bonds were directed to second-tier

banks and microfinance organizations for re-lending to small and medium-sized businesses implementing green projects. The lead manager for the issuance and placement of the Fund's green bonds was "BCC Invest" JSC, a subsidiary of the "Bank CenterCredit" JSC (Damu, 2020). In addition to the benefits expressed in a positive impact on the environment, reduced interest rates and favorable loan terms, green loans help improve the reputation of enterprises receiving green loans, contribute to the economic development of such industries as renewable energy sources, sustainable agriculture and green construction.

3. International Overview of the Regulatory Framework for Green Lending

International practice shows that the process of developing a regulatory environment for the recognition and operation of green loans may evolve with some differences, depending on economic, political, and geographical features. However, individual norms are generally accepted to one degree or another: defining general principles and criteria, developing national green taxonomies, designating a further vision of development in the country's strategic documents, designing roadmaps for achieving goals, and formulating regulatory measures.

Among the designated categories of documents, an important role is played by taxonomy, whose task is to determine whether investments are sustainable. At the same time, green taxonomy identifies potential areas of financing for investors to positively impact the climate, environment, and/or social issues. Taxonomy uses thresholds and targets to assess and define types of activities or assets. In addition, taxonomy helps prevent greenwashing, which creates the erroneous opinion that investments are directed to environmental projects.

China is the first country in the world to develop its own national green taxonomy. In 2015, a catalog of green projects was compiled, and green bonds were issued to support it. Initially, the taxonomy included projects on lending to clean coal and other fossil energy sources that do not meet the principles of environmental friendliness, and was therefore criticized. However, it was later revised in terms of approximation to international standards: coal-related industries were excluded, and industries on green agriculture, green architecture, and economical use of water resources were added. In addition to China, the European Union was one of the first to develop its own taxonomy. The EU taxonomy is a standardized classification of economic activities aimed at achieving a low-carbon transition in 27 EU member states. According to the EU Taxonomy for Sustainable Activities Regulation, which became the basis for the Taxonomy, in order to determine the environmental sustainability of a specific economic activity, it is necessary to establish an exhaustive list of environmental objectives (6): climate change mitigation, climate change adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, protection and restoration of biodiversity and ecosystems[2]. The EU Taxonomy does not designate green financial products, but the Taxonomy classification system is used to label green financial products. The document does not oblige investment in green financial products, but does include an obligation to disclose all information relevant to the Taxonomy. The document is reviewed every three years to remain relevant based on technological changes and the emergence of new activities.

In 2021, India, through the Sustainable Finance Task Force under the Ministry of Finance, launched a national green taxonomy. This effort has helped define an approach to help stakeholders identify what investments can be termed as green. To date, this work is still in progress and in the absence of a taxonomy, there is a scattered landscape of listing specific green assets (Bhattacharyya, 2024). Some experts see the lack of a national taxonomy as one of the reasons holding back the development of green finance in India.

Among the countries forming the EAEU, Kazakhstan and Russia have national green taxonomies; in Armenia, Belarus and Kyrgyzstan they are in the process of being designed. In 2021, the Government of the Russian Federation approved the National Taxonomy of Green and

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[2] Regulation (EU) 2020/852of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088

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Adaptation Documents, thereby creating a regulatory framework for the sustainable financing, including green, financing market in Russia. The criteria for compliance with green projects include the following areas: waste management, energy, construction, industry, transport and industrial equipment, water supply and sanitation, natural landscapes, rivers, water bodies and biodiversity, agriculture. The document also contains a section on the verification of sustainable (including green) development projects, and defines the purposes for which financial instruments are attracted and the rules for the use and management of funds[3].

National taxonomies exist or are being developed in Asian countries (Indonesia, Sri Lanka) and America (Canada, Colombia, Mexico, Peru, Chile, Dominican Republic). The United States does not have its own green taxonomy, but alternative lists of industries and sets of rules that could serve as a national taxonomy are being considered.

When implementing green financing (green lending), it is important not only to focus efforts on developing and stimulating this area, but also to extend regulatory standards, providing for potential risks and identifying solutions. The traditional method of regulation is the establishment of prudential standards. The analytical note on green financing by the World Bank Group provides an overview of individual requirements of central banks. In particular, the Central Bank of Brazil requires banks to conduct stress testing of loans for compliance with criteria for assessing and managing environmental and social risks and the availability of additional capital. Bank Indonesia requires banks to assess the impact of large or risky loans on the environment. The regulator in Peru introduced minimum requirements for managing social and environmental risks (Damianov et al., 2018).

Green loan issues are gradually being reflected in the legislation of many countries with both advanced and developing economies, while, based on the characteristics of each country, the process of forming the legislative environment may differ. Below are examples of the specifics of how the green lending institution should be established.

The European Banking Authority launched the Technical Standards (ITS) on Prudential Disclosure on ESG Risks in 2022. The standards set out requirements for European banks to disclose information on transition and physical risks related to climate change, including information on carbon-linked assets and assets exposed to chronic and acute climate change (EBA, 2022). In addition, the standards introduce a Green Asset Ratio (GAR), which is intended to measure the proportion of climate-friendly financial instruments in a lender's total assets. Although the introduction of a new indicator intended to disclose economic activity consistent with the taxonomy causes mixed reaction among banks due to the controversial methodology for calculating the ratio (EBF, 2024), it marks a fundamental change in green finance.

In 2017, the European Commission announced that the European Union was considering lowering the capital requirements for banks for green investments (Green Supporting Factor). The main idea was to consider green investments as less risky than investments in carbon-intensive industries. Consequently, banks were allowed to form a smaller amount of capital to withstand potential losses by reducing the risk weights for green loans. However, this initiative was criticized by experts. According to them, banks will be more susceptible to default, while doing little to help the environment. In addition, the initiative was not supported by research that the measure would actually stimulate investment growth. In 2023, the EU banking regulator announced its decision to abandon the green supporting factor in favor of less risky prudential regulation measures (Azizuddin, 2023).

A distinctive feature and largely responsible for the success of China's green economy development is its top-down system, with the state (as opposed to, for example, financial associations or markets) playing a leading role in setting the direction of green finance, sourcing funds, and stimulating the market. Thanks to state policies, China has seen rapid development of

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[3] Resolution of the Government of the Russian Federation of September 21, 2021 No. 1587 "On approval of the criteria for sustainable (including green) development projects in the Russian Federation and requirements to the verification system for sustainable (including green) development projects in the Russian Federation"

green industries over the past decade. China has been the largest green bond market for several years in a row, reaching US$ 83.5 billion in 2023 from domestic and offshore issues, putting the country ahead of the United States and Germany. In 2016, the People's Bank of China became the first central bank in the world to issue Guidelines for Establishing the Green Financial System. The document plays a central role in shaping green finance in China and focuses on actions in the following areas: green bonds, green lending, green development funds, green insurance, pollution rights markets, local government initiatives, and international cooperation. The guidelines established a Green Finance Committee (GFC), which became the main body for coordination of implementation and enforcement of the guidelines. The GFC is supported at the local level, with more than 20 regional green finance committees playing a similar role locally (Larsen, 2020).

In 2022, the China Banking and Insurance Regulatory Commission (CBIRC) updated its green finance guidelines, focusing on green loans. In addition to requiring banking and insurance organizations to implement a new philosophy for the development and promotion of green finance, the document sets requirements for the board of directors, credit and investment policies of a financial institution, the inclusion of ESG in management processes and comprehensive risk management systems (NFRA, 2022). The first document regulating green lending in China was the Green Credit Initiative developed by the China Banking and Insurance Regulatory Commission. The green credit initiative includes a requirement for banks to provide green loans for environmental protection, emission reduction and energy conservation projects, and to limit loans to industries with high pollution, emissions and excess capacity. (Cui, Y. et al., 2018).

In China's financial system, green credit is undoubtedly the most important component of green finance. For enterprises seeking to operate more environmentally friendly, green credit facilitates access to finance and reduces corporate financing costs, while for enterprises with high energy consumption and pollution emissions, green credit imposes restrictive measures by raising credit thresholds and increasing interest rates on loans (Bao & He, 2022).

Recognizing the important role of the banking sector in implementing projects to "green" the economy, the Chinese government has been implementing policies to stimulate green lending. To this end, the People's Bank of China has introduced the green macroprudential assessment (MPA) system, which ranks banks according to their efficiency. Banks with a higher proportion of green loans and those that have issued green bonds receive higher MPA scores. The scope of guarantees under the medium-term loan facility (MLF) has been expanded to include green finance instruments as eligible collateral. China is also in the process of considering lower risk weights for green assets based on the financial stability of the banking system. So far, no country has reduced the risk weights for green assets, mainly because most of them still do not have a definition of a green loan and therefore cannot calculate the default rate of green loans. However, from a financing perspective, this measure encourages the issuance of green bonds (Larsen, 2020).

India has taken the path of pre-assessing the regulatory environment. In 2022, the Reserve Bank of India conducted a survey of banks to assess their preparedness to respond to climate risks. The survey identified priority areas for further reform, including climate-related financial disclosures and risk management frameworks (Bhattacharyya, 2024). The Climate Risk and Sustainable Finance Survey Report finds that Indian banks have started taking steps on climate risk and sustainable finance, recognizing climate-related financial risks as a material threat to their business, but most do not have a dedicated sustainability and ESG framework. In addition, board-level engagement on climate risk is insufficient and climate-related financial disclosures are not aligned with international norms (RBI, 2022). The same year, the country's International Financial Services Centres Authority (IFSCA) developed Guidelines for Sustainable and Sustainability-Related Lending by Financial Institutions. The document stipulates that financial institutions must direct at least five percent of their gross loans and advances to green/social/sustainable/sustainability-related sectors/objects starting from April 2023. In case of failure to meet the indicator, institutions must provide an action plan to ensure compliance with this framework. The document provides an indicative list of eligible green and social categories. (IFSCA, 2022).

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In the Russian Federation, active measures to develop green financing (green lending) actually began in 2019. However, despite the fact that green lending issues have only recently begun to appear on the agenda of green architecture participants, certain steps have already been taken to develop green lending. In 2018, the Working Group on Ecology of the Expert Council under the Government prepared a report with proposals to create a green bank in Russia. It was assumed that the financial structure would solve the problems of expanding the availability of financial resources for investing in green projects and increasing their investment attractiveness, and would also help improve the capital market function of distributing resources and servicing the real sector of the economy. The initial plans included government participation in the structure of the green bank at the stage of creation and development with the subsequent transformation of the funding source to international development institutions (REO, 2018). Information on the creation of a financial institution was not available at the time of writing. In 2019, the Central Bank of Russia (CBR) developed the Concept for the Organization of a Methodological System in Russia for the Development of Green Financial Instruments and Responsible Investment Projects. The document analyzes the main elements of the methodological support for the modern ecosystem of green finance and responsible investment that is taking shape in the world, prepares a roadmap for the development of the system, and compiles a list of methodological materials developed in different countries of the world and in Russia[4]. In 2020, the Central Bank of the Russian Federation established a Working Group on Sustainable Development Financing, which defines the strategic agenda in this area and monitors its implementation. The group includes five thematic expert subgroups consisting of representatives from federal executive bodies, development institutions, financial market participants, self-regulatory organizations and science and dealing with:

– development of the financial instruments market and infrastructure of sustainable development;

– corporate governance and disclosure;

– environmental, governance, and social risks; micro- and macro-prudential supervision;

– implementation of approaches fostering the achievement of sustainable development goals into the operating activities of the Bank of Russia;

– carbon regulation and the carbon trading system.

In general, central banks in both advanced and emerging economies are demonstrating a commitment to developing sustainable finance by incorporating climate issues into their mandates and using various tools such as prudential regulations, stress testing, and adapting the regulatory environment to new challenges. However, it is important to keep in mind that low-carbon lending is considered riskier than traditional lending under the Basel III. Therefore, when applying any green measures, it is important to consider the risks that may potentially arise in the financial sector.

4. Country Overview of Green Loans

The drive to build responsible businesses is driving the need for more and more financing towards green lending. Given that green loans were originally designed for long-term projects of large enterprises that pollute the environment the most, the share of the corporate sector in green lending has always been significant. China, as the world's largest greenhouse gas emitter, prioritizes the development of a green, low-carbon and circular economy. Today, China is the world leader in green lending. According to open source data, the balance of green loans issued in local and foreign currencies increased by 36.5% year-on-year to 30.1 trillion yuan (about 4.2 trillion US dollars) as of the end of 2023. The growth rate of green loan balances was 26.4 percentage points higher than the growth rate of other types of lending (Xinhua News Agency,

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[4] Expert Council on the Long-Term Investment Market under the Bank of Russia. Concept of organizing a methodological system for the development of green financial instruments and responsible investment projects in Russia, 2018.

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2024). In a review of green banking practices in China, the Climate Policy Initiative (CPI) identified the most significant green lenders in China – Industrial and Commercial Bank of China (ICBC), China Development Bank (CDB), Export-Import Bank of China (EXIM Bank), China Agricultural Development Bank (CADB), as well as Industrial Bank and Shanghai Pudong Development Bank – that have completely reoriented their operations towards a green direction (Choi et al., 2020). These banks offer a wide range of green lending products to the corporate sector, supporting the Government's aspiration to achieve carbon neutrality goals.

In recent years, India has been shifting green finance towards reducing bank lending to non-renewable energy sectors. The government has been promoting access to finance for renewable energy companies. In 2023, the Reserve Bank of India identified priority sectors for green lending, raising bank loans to a limit of Rs 3 lakh crore for borrowers for this purpose (PIB, 2023). The country's financial market is keeping pace with government initiatives. State Bank of India (SBI) is exploring opportunities in the renewable energy and electric vehicle sectors as part of its loan portfolio diversification strategy. One of the major banks, Canara Bank, also offers a range of products for renewable energy initiatives. Bank of Maharashtra, in association with the Indian Renewable Energy Development Agency (IREDA), began issuing syndicated loans for a wide range of renewable energy projects in September 2023 (ETBFSI, 2024). According to Rystad Energy, India has commissioned 7.1 GW of renewable energy capacity as of March 2024 (Global Energy, 2024), and the rise of green lending by Indian banks is not the least of the factors that have contributed to the spread of renewable energy in the country.

Green loans to the private sector are aimed at minimizing the ecological footprint of everyday human activities. Examples of such loans include green mortgages; loans for green energy-efficient modernization of a residential building, home renovation using energy-efficient equipment, repair of the plumbing system to save water; loans for the purchase of transport running on safe energy. The majority of loans issued to individuals are loans for the purchase of energy-efficient green housing. According to international estimates, residential and commercial buildings consume about 40% of all energy in the world (UNEP), and the construction sector accounted for 37% of global greenhouse gas emissions in 2022 (UNEP, 2022).

According to the US Environmental Protection Agency, greenhouse gas emissions from commercial and residential buildings increase significantly when including emissions from final energy consumption, as the building sector uses 75% of the electricity generated in the US (EPA, 2024). US banks actively lend for the construction and modernization of green buildings by participating in the US Department of Housing and Urban Development's Energy Efficient Mortgage (EEM) program. Such mortgages differ from other products by a reduced interest rate and access to more funds, special incentives and subsidies. In addition, borrowers can use the potential savings generated by upgrading the energy supply system as additional funds and add the cost of the upgrade to the mortgage, paying them as part of the monthly mortgage payment (HUD). The US Fannie Mae and Freddie Mac offer green loan products that encourage borrowers to improve their properties for environmentally friendly purposes. Lending programs can provide more favorable rates and other benefits. Freddie Mac's product is designed to lend to properties that are at least 20 years old (15 years for tax-advantaged real estate) and that have not yet been "greened" through significant renovations involving HVAC or plumbing systems. With Fannie Mae green loans, potential savings on interest rate reductions can range from 15 to 39 basis points. In addition, under the latest program changes, the agency guarantees 75% of the cost savings, which can increase the loan amount for the borrower, and guarantees up to 25% of the savings experienced by the tenant (Northmarq).

According to a report by the European Banking Authority, mortgages, which constitute the largest component of EU banks' assets (around 30%), are considered green only when the underlying property has an A-class energy performance certificate (EPC) or is among the top 15% of most energy-efficient properties (EBA, 2022). The Energy Efficient Mortgages Initiative has contributed significantly to the development of green mortgages in the European Union. The initiative aims to introduce greener and more sustainable ways of buying, renovating and living by

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providing preferential loans. The pilot scheme, launched in 2018, was joined by 37 banks in the EU, using sector labels in line with the EU Taxonomy (EEMI, 2018). Under the Energy Performance of Buildings Directive (EPBD), revised in May 2024, all new residential buildings constructed in the EU must be zero-emission by 2030 and new public buildings must be zero-emission by 2028. The Directive establishes that the renovation of buildings is considered sustainable if it achieves energy savings of at least 30% and meets minimum energy performance requirements or consists of individual measures related to the energy performance of buildings, such as the installation, maintenance or repair of energy efficient equipment or instruments and devices for measuring, regulating and monitoring the energy performance of buildings[5]. Thus, the requirement for the availability of metering devices is established in high-level documents, thereby creating the basis for an information base of emission indicators, which subsequently facilitates the receipt of information for both the public sector and the private sector represented by investors and financial institutions.

Green mortgages are also available in developing countries. State Bank of India offers green housing loans to support eco-friendly housing projects. The terms of the loan offer incentives such as 5% margin concession, 0.25% interest rate concession and zero processing charges for projects rated by the Indian Green Building Council (IGBC) (Soundarrajan, P., & Vivek, N., 2016).

According to the analysis of the Expert RA rating agency, based on the results of the first half of 2023 in the Russian Federation, real estate accounts for the main share (37%) in the portfolio of green and social loans. This industry mainly includes green home construction projects. In 2022, the Central Bank of Russia initiated the process of creating a national system of green building standards, which resulted in the adoption of GOST R "Green residential multi-apartment buildings". The standard includes 81 criteria, the achievement of at least 16 of these criteria will be mandatory for recognizing a building as green[6]. Considering that the definition of green mortgages is fixed at the level of the taxonomy of the Russian government, the criteria have become uniform for all credit institutions. Today, several large banks offer green mortgages, independently determining the parameters of the green product. For example, in the first quarter of 2024, Sberbank began issuing green mortgages for the purchase of housing in a building with energy efficiency class A, A+, A++ and allows to reduce the rate by 0.3 percentage points (Domclick, 2024). A number of other banks also offer green mortgages on favorable terms. However, the first bank to begin issuing green mortgages in September 2021 was VTB. The bank offered a discount of up to 1.6 percentage points to the base mortgage rate when clients purchase real estate in new buildings with energy efficiency class A++ (Banki.ru, 2021).

The second popular area of green lending to individuals next to loans provided for the purchase of green housing are electric car loans. China, being a leading manufacturer of electric vehicles, has not ignored the car loan market, actively developing the green sector. In an effort to interact with the environment in an eco-friendly manner, Chinese residents began to choose cars running on safe energy (NEV, PHEV). In early April 2024, the Central Bank of China announced a revision of the terms of car loans in order to encourage the exchange of cars under the trade-in program and to abandon the minimum down payments for consumers. Before these lending terms and conditions came into force, a minimum down payment of 15% was required for electric cars, and 20% for internal combustion engine cars (Reuters, 2024). According to the expectations of the Central Bank of China, this will help achieve two goals at once: maintaining environmental friendliness, as well as revitalizing the consumer loan market as a whole.

Bank of America, in partnership with the U.S. Environmental Protection Agency (EPA) and the National Trucking Industry, launched express loans for trucking companies to purchase fuel-efficient technologies without collateral and under flexible terms. Since its launch in

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[5] Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings
[6] GOST R 70346-2022 "Green" standards. "Green" multi-apartment residential buildings. Assessment methodology and criteria for design, construction and operation

November 2006, the transportation loan program has helped trucking companies save fuel and reduce truck emissions (NATF, 2007).

According to the EU Taxonomy, loans and leases for the purchase of low-emission vehicles - electric vehicles - are automatically classified as green, and hybrid cars can be classified as green until the end of 2025. Banks in EU countries are actively providing loans and leases for the purchase of electric vehicles. In addition to preferential lending rates, banks use additional incentives. For example, the French BNP Paribas offered a bonus of up to 8,000 euros for the purchase of a passenger electric car or an electric van. The Government of India has recognized transport as a key priority within India's commitment to achieving zero emissions, as transport is India's third largest sector in greenhouse gas emissions. To provide the population with affordable finance for the purchase of vehicles with the EV label (electric vehicles, electric two-wheelers/three-wheelers/four-wheelers, electric rickshaws), banks provide loans on preferential terms. The implementation of the programs is supported by funds from the Development Bank of India, as well as international organizations (EVreporter, 2023).

Speaking about green loans, it is worth mentioning such line of business as a green bank, which is another participant in the process of responsible and environmentally friendly lending. The green bank institution is especially popular in the United States. According to the definition given by the Coalition for Green Capital[7], green banks are mission-driven institutions that use innovative financing to accelerate the transition to clean energy and combat climate change (CGC). They are typically government, quasi-government, or non-profit organizations that provide loans directly or through other lenders. Green banks often use government, international, or private funds. An interesting example of private funding is that in some states, utility bills may include a small ratepayer surcharge specifically earmarked for green bank funding (CRP, 2024).

Green banks in the United States have different goals. Connecticut Green Bank, the first state green bank, focused on renewable energy as its funding focus but has since expanded to include sustainable infrastructure, climate resilience, water, and waste projects. Michigan Saves, a green nonprofit bank, finances energy efficiency. Hawaii Green Bank, a state green bank, is increasing solar energy use. Maryland's green bank is financing rooftop solar infrastructure and electric vehicle charging stations (The Conversation, 2023). In recent years, US green banks have advocated for a cap on lending to accelerate the transition to clean energy and combat climate change, and aim to address housing affordability for citizens. The Massachusetts Community Climate Bank was created to increase the supply of sustainable and affordable housing. The bank leverages private sector capital and federal funds to finance retrofitting buildings to meet long-term climate goals and constructing new decarbonized buildings.

There are also examples of green banks in China, in particular, China's Industrial Bank made green finance one of its core business areas in 2015. In addition to expanding its loan portfolio with green loans, the bank is also developing innovative financial products in various areas: from energy conservation and emission reduction to biodiversity conservation. To achieve a completely green transformation, Industrial Bank has proposed to create a professional team of specialists in 2022, setting a goal of hiring more than 10,000 green finance experts in three years (CIB).

5. Regulatory Control of Green Loans in Kazakhstan

Today, Kazakhstan has created a basic regulatory environment for the development of green finance and, in particular, green lending.

In 2020, at the Climate Ambition Summit, dedicated to the fifth anniversary of the adoption of the Paris Climate Agreement, the President of Kazakhstan announced the government's plans to achieve carbon neutrality by 2060. In the top-level document entitled "Strategy for Achieving

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[7] An American organization whose mission is to stop climate change by increasing investment in clean energy technologies.

Carbon Neutrality of the Republic of Kazakhstan until 2060"[8], a separate chapter is devoted to financing and green investments. The fundamental document defining green financing in Kazakhstan is the Environmental Code[9]. For the first time, such terms as green financing, green projects, green bonds and green loans are defined at the level of law. Thus, green loans are recognized as earmarked loans intended to finance the implementation of "green" projects, defined on the basis of an approved classification (taxonomy), aimed at increasing the efficiency of using existing natural resources, reducing the level of negative impact on the environment, increasing energy efficiency, energy conservation, mitigating the effects of climate change and adapting to climate change.

In 2021, a Classification (taxonomy) of green projects eligible for financing through green bonds and green loans was adopted[10]. The document presents a classification system for categories of green projects eligible for financing through green bonds and green loans. The taxonomy identifies the following eight areas as such projects: (1) renewable energy; (2) energy efficiency; (3) green buildings; (4) pollution prevention and control; (5) sustainable use of water, waste; (6) sustainable agriculture, land use, forestry, biodiversity conservation and ecotourism; (7) clean transportation; (8) energy transition .

To clarify the norms of the Green Taxonomy, Methodological Explanations were developed, which will determine the interaction of all participants in green financing and the receipt of financial support for green projects by entrepreneurs. The document is intended to facilitate the practical application of the Green Taxonomy, covering such issues as determining the role and functions of each participant in the process, identification and examination of green projects. It also provides a list of basic documents for the green project assessment process and a sample conclusion on green labeling of a loan. The document is currently at the approval stage.

Taking into account the agenda to foster the business environment in the field of green financing, amendments were made to the Entrepreneurial Code of the Republic of Kazakhstan[11] in 2021, providing for the expansion of sources of financial support from the government by:

– subsidizing the interest rate on loans provided by second-tier banks to private entrepreneurs for the implementation of "green" projects;

– subsidizing the coupon rate on green bonds, including those issued in accordance with the acts of the Astana International Financial Centre and included in the list of the AIFC exchange;

– partial guarantees for issuers' bonds, including "green" bonds, listed on the stock exchange.

Given the growing investment demand, a significant step towards disclosure of information on green lending was the development of the Environmental, Social and Corporate Governance Disclosure Guidelines (ESG)[12] for banks and other financial institutions in 2023. The Guidelines define the order and range of ESG information to be disclosed, in particular, they establish requirements for banks and other financial institutions to disclose information on green loans: the volume and amount of loans, the share of overdue green loans in the total volume of green loans.

The Rules for Submitting Information on Loans and Contingent Liabilities [13] were supplemented in terms of expanding the presented indicators with the characteristics of a

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[8] Decree of the President of the Republic of Kazakhstan dated February 2, 2023 No. 121 "On approval of the Strategy for achieving carbon neutrality of the Republic of Kazakhstan until 2060"

[9] Code of the Republic of Kazakhstan dated January 2, 2021 No. 400-VI ЗРК "Ecological Code of the Republic of Kazakhstan"

[10] Resolution of the Government of the Republic of Kazakhstan dated December 31, 2021 No. 996 "On approval of the classification (taxonomy) of "green" projects subject to financing through "green" bonds and "green" loans"

[11] Code of the Republic of Kazakhstan dated October 29, 2015 No. 375-V ЗРК "Entrepreneurial Code of the Republic of Kazakhstan"

[12] Order of the Chairman of the Agency of the Republic of Kazakhstan for Regulation and Development of the Financial Market dated April 28, 2023 No. 291 "On approval of the Guidelines for Disclosure of Information in the Field of Environmental, Social and Corporate Governance (ESG) for Banks and Other Financial Organizations"

[13] Resolution of the Board of the National Bank of the Republic of Kazakhstan dated December 28, 2018 No. 313 "On approval of the list, forms, terms and Rules for submitting reports on loans and contingent liabilities by second-tier

sustainable development project. The changes came into force at the beginning of 2024, the introduced indicator is intended to identify loans that comply with the Classification (taxonomy) of green projects.

Given the pace of green lending development in the world and potential risks, the drafting of the regulation of green finance, including loans, from the point of view of prudential standards remains important in the near future. Currently, the regulatory environment for prudential regulation of green lending is at the stage of formation.

6. Green Lending in Kazakhstan

Green financing should be considered both through the prism of the financial sector and through the government mechanism. The green loan market cannot develop without government participation - the creation of an appropriate legislative framework, the identification of bodies responsible for the implementation of green lending policies, the development and implementation of a system of incentives and penalties, the creation of a favorable investment environment - all these are the pillars on which the green agenda of any state is built. Each of the parties contributes to the development of the green financing market based on its objectives. According to the Strategy for Achieving Carbon Neutrality of the Republic of Kazakhstan until 2060, the investment need to achieve carbon neutrality is US\$ 10 billion by 2030 and US\$ 600 billion by 2060. If more than half of the necessary investments are existing and circulating investments in the economy that will be reoriented from raw materials sectors to "greener" sectors of the economy, the remaining US\$ 224 billion are new investment resources.

The path to developing green financing is already being laid out in the country's strategic documents. In accordance with the National Development Plan of the Republic of Kazakhstan until 2029[14], green loans are identified as a promising area in the medium term for Kazakhstan as an alternative source of financing to support the economy. In addition, in the Concept of Investment Policy of the Republic of Kazakhstan until 2029, measures to attract green finance are established as approaches to the development of investment policy until 2029. The Agency of the Republic of Kazakhstan for Regulation and Development of the Financial Market is the central figure directly determining the further development of green lending through mechanisms of economic restrictions in order to ensure financial sustainability. Since 2023, the government agency has been a member of the Central Banks and Supervisors Network for Greening the Financial System (NGFS), created at the initiative of the Bank of France, whose purpose is to exchange experiences and promote the development of climate risk management in the financial sector. The agency is carrying out step-by-step work in the process of developing key standards for assessment and management of environmental and social risks, thereby enabling financial organizations to adapt to new regulatory requirements.

In 2023, the Agency adopted the Guidelines for ESG Disclosures for Banks and Other Financial Organizations to prepare reliable, useful and comparable ESG information. The document is advisory in nature and is based on international best practices and standards for reporting on sustainable development. In addition, the Guidelines are based on the Methodology for Compiling a Report on Environmental, Social Responsibility and Corporate Governance Criteria developed by the Kazakhstan Stock Exchange (KASE) and are designed to help financial institutions prepare for the future development of the regulatory framework for risk management and disclosure. Mandatory disclosure of information, according to the Guidelines, is planned to be introduced in the near future. In 2024, the Agency continued the phased implementation of ESG principles in the activities of financial organizations. It is planned to approve the Guidelines for ESG Risk Management in Financial Organizations. The Guidelines will include procedures for

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banks, branches of non-resident banks of the Republic of Kazakhstan, the Development Bank of Kazakhstan joint-stock company and organizations engaged in certain types of banking operations"

[14] Decree of the President of the Republic of Kazakhstan dated July 30, 2024 No. 611 "On approval of the National Development Plan of the Republic of Kazakhstan until 2029 and recognition of certain decrees of the President of the Republic of Kazakhstan as invalid"

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managing ESG risks, their integration into the lending decision-making process and subsequent monitoring. The decision-making process for loans will involve a comprehensive environmental and social assessment to determine whether the financed project meets ESG standards. In addition, it is planned to adopt Guidelines for Assessing the Carbon Footprint of Bank Loan Portfolios, which will define procedures for collecting and recording information on emissions within financial organizations, as well as their loan portfolio.

One of the key organizations promoting the development of green financing instruments in Kazakhstan is the Green Finance Center at the Astana International Financial Center. The main goal of the Center is to attract investment in a sustainable economy using financial instruments such as green bonds, social bonds and loans. The Center laid the foundation for national legislation in the field of green financing and stimulation of green investments. In particular, together with the Ministry of Ecology and Natural Resources of the Republic of Kazakhstan, it developed the Kazakhstani version of the green taxonomy and methodological recommendations for it. The Center assists international financial institutions in finding green and social projects and related organizational procedures, as well as in issuing decisions on the compliance of projects with the principles of green financing. It has developed the Concept for the Implementation and Development of Green Financing Instruments and Principles, the Strategy for Ensuring Regional Leadership of the AIFC in Green Finance until 2025, and the Rules of Green Bonds. In addition, the organization's official website provides statistics on sustainable financing. In 2018, by the Decree of the Government of the Republic of Kazakhstan, a non-profit joint-stock company, the International Green Technologies and Investment Projects Center, was established with 100% government participation in the registered capital, which is designed to help accelerate Kazakhstan's transition to a green economy by promoting technologies and best practices, business development and investment. According to the center, within the framework of the Global Cleantech Innovation Programme, annual Cleantech competitions will be held over three years (2023–2025) to select promising projects in the field of clean technologies that will attract public and private investment in the following areas: energy efficiency, renewable energy, waste management, efficient water use, modern materials and chemicals, green construction and transport (IGTIPC).

International organizations make a significant contribution to the development of green financing in Kazakhstan. The European Bank for Reconstruction and Development (EBRD) helps Kazakhstan reduce electricity consumption, promote the use of renewable energy sources and supports entrepreneurs in Kazakhstan in implementing environmentally friendly practices. The EBRD financing program provides funds to financial institutions in Kazakhstan participating in the Kazakhstan Green Economy Financing Facility II (GEFF Kazakhstan II) project for lending to individuals, private companies and small and medium-sized businesses. The GEFF Kazakhstan II project is based on the GEFF Kazakhstan pilot project, implemented since 2020 with the support of the Government of Austria and the Global Environment Facility (GEF). Since the beginning of the project, more than one and a half thousand participants have been involved, and the volume of financing directed to energy and energy efficiency projects in the country amounted to more than 30 million US dollars. Financing was carried out through "Bank CenterCredit" JSC, "Shinhan Bank Kazakhstan" JSC and the microcredit organization "KMF" (GEFF).

UNDP, in collaboration with the "DAMU" Enterprise Development Fund, has led efforts to create an enabling environment and develop a green finance system in Kazakhstan to overcome current barriers to financing green initiatives. The organizations have jointly developed financial instruments designed to increase the availability and acceptability of green finance for small and medium-sized businesses in the field of energy efficiency and renewable energy sources. These instruments include subsidizing the interest rate on bank loans, subsidizing the principal amount of the loan, which provides for the repayment of up to 40% of the loan after the launch and acceptance of the project, as well as a UNDP loan guarantee as a guarantor of debt repayment to the bank in the event of a default of the green project (Forbes, 2022).

Along with international organizations, the "Development Bank of Kazakhstan" JSC contributes to the development of a green economy. The organization provides financing for projects related to renewable energy sources. In 2018–2021, more than 91 billion tenge were allocated to financing with the participation of DBK. One the priority areas of the "Development Bank of Kazakhstan" JSC is to increase the share of projects in accordance with the Green Taxonomy in the loan portfolio.

In addition to development institutions, the banking sector plays an important role in the implementation of green lending. From an environmental perspective, there are two roles for a financial institution: responsibility for the activities of the bank itself and direct financing of green activities of corporations and individuals. A bank, as a constituent entity of sustainable development, can implement its activities based on the principles of sustainability by optimizing internal business processes, including reducing electricity consumption, developing electronic document management, etc. If in the first area there is an active position of Kazakh banks in striving to minimize the environmental footprint of their activities, the banking sector of Kazakhstan is at the initial stage of development in green financing. According to the results of a survey among second-tier banks, 5 out of 21 banks did not provide green loans at the time of the survey, while individual banks are considering the possibility of planning and developing green products for the corporate sector and for individuals in the future. When providing green loans, banks are guided by the Classification (taxonomy) of green projects subject to financing through green bonds and green loans, the Guidelines for Disclosure of Information in the Field of Environmental, Social and Corporate Governance (ESG) for banks and other financial organizations.

Banks receiving foreign funding for origination of green loans, in addition to the laws and regulations of the Republic of Kazakhstan, take into account the requirements set by donor organizations being guided by international principles and documents that define specific requirements for the object or subject of lending. Such documents include the Sustainable Development Goals formulated by the General Assembly of the United Nations, the Green Bonds Principles of the International Capital Markets Association (ICMA), the Green Loan Principles of the Credit Market Association (LMA) and the Syndicated Lending and Secondary Credit Association (LSTA), the Taxonomy of Sustainable Economic Activities of the European Commission, and the Taxonomy of Climate Bonds (Climate Bonds Standard). At the same time, the mechanism for green lending may differ from the traditional one if a green loan or a loan that meets the criteria of a green loan is provided by an international financial institution. In this case, an additional examination is carried out for compliance with the earmarked financing, which may include an environmental audit and an environmental impact assessment. It should be noted separately that international financing may include a requirement for localization of production or services, including from the point of view of further maintenance.

Since at present there is no requirement about a separate body and internal documents for labeling green products in a financial organization, only a few banks have developed internal documents that determine whether a loan meets the green criteria in accordance with the Kazakh or international standards. Most often, such documents are available in banks that use external financing for green lending. One of the banks is already working on introducing the identification and application of an unacceptably high level of ESG risks in the lending process. The bank is introducing measures to stimulate clients with an unacceptable level of ESG risk and principles of sustainable development in business into its lending policy, assigning an ESG risk level. At the same time, no bank has a separate internal service for labeling green loans. Only a few banks can offer separate green products. Such products are distinguished by favorable conditions in the form of a reduced interest rate, no commission for organizing financing and reviewing/expertising a loan application. Most often, banks do not have a separate banking product positioned as green, while the banks' portfolios contain loans with signs of a green loan. As an example, banks cite loans issued for the purchase of so-called clean transport - low-carbon vehicles. At the same time, a number of banks define loans for the purchase of electric vehicles as green, and some - as loans

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with characteristics of a green loan. Due to the possibility of obtaining information on the belonging of a vehicle to an electric vehicle through the service of the Ministry of Internal Affairs of the Republic of Kazakhstan, the implementation of internal labeling procedures for loans is not required, which reduces the costs associated with origination of a loan.

In general, one can note the scarcity of information or lack of coverage by banks of the green loans offered or loans with green characteristics on official Internet resources.

"Otbassy Bank" JSC is implementing the Green Mortgage program launched on the platform of the National ESG Club that was created in 2022; its mission is to promote the achievement of sustainable development goals and effective energy transition of the Republic of Kazakhstan through the implementation of ESG principles. It has become the first green mortgage program in Kazakhstan aimed at protecting the health of people and the environment. The product provides for origination of a loan for the purchase of housing in facilities that meet the "green standard" – the facility must have a certificate of compliance with the national standard "ӨMIP"[15], or the Russian standard GOST R[16] or such international standards as BREAM[17] or LEED[18]. Currently, the bank offers the following conditions for those wishing to use a green mortgage: an initial payment of 20-50% of the contract amount, an interest rate of 12.5% per annum (AGER 13.3-18.1%) with a rate reduction for certain categories of persons and conditions for reducing the rate under the accumulation conditions, the maximum loan amount is 35 million tenge. The bank's own funds are used to implement the program, but external sources of financing can also be attracted. At the moment, all green lending facilities of the bank (11) are located in cities of national significance and the city of Ust-Kamenogorsk. The lack of a wide choice of facilities that meet green standards is one of the factors hindering the development of green mortgages.

The sustainable finance analytics published on the AIFC website is represented by one green loan provided by a second-tier bank in 2021. "Halyk Bank of Kazakhstan" JSC provided a loan verified by the AIFC in the amount of 7.9 billion tenge. According to open source data, the funds were provided to "Kaz Green Energy" LLP for the construction of a biopower plant.

To determine the statistics of issued green loans, information was requested from second-tier banks for the past few years (for 2021-2023 and Q1 2024). To categorize green loans, a classification system of green project categories was used in accordance with the Green Taxonomy[19] with a breakdown into green loans that meet the requirements of the Green Taxonomy and other loans that meet the criteria for green lending. There is a high growth rate in the number of loans issued, classified by banks as green loans in accordance with the requirements of the Green Taxonomy. According to a survey of banks, if in 2021 and 2022 the number of green loans was 30 and 57, respectively, then in 2023 it was already 800, and in the first quarter of 2024 – 311 loans. The main increase in 2023-2024 was achieved due to the activation of lending to the

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[15] Kazakhstan's system of environmental assessment of buildings, developed by the "Union "Kazakhstan Green Building Council "KazGBC""ALE. The "ӨMIP" standard – multi-apartment residential buildings ("ӨMIP-MЖЗ") – consists of 10 categories, including 56 assessment criteria. The assessment criteria of the "ӨMIP-MЖЗ" standard are divided into voluntary and mandatory. The main voluntary assessment criteria are given in eight main categories of the "ӨMIP-MЖЗ" standard: management, health, energy, transport, water, materials, waste, ecology (https://kazgbc.kz/assets/files/standart-omir-mzhd-v-02-2024-f.pdf).

[16] The system of assessment of multi-apartment residential buildings, developed by the Ministry of Construction and Housing and Communal Services of the Russian Federation, consisting of quantitative and qualitative characteristics of the assessment of multi-apartment residential buildings according to green criteria, covering the entire life cycle of the construction project. The standard assumes mandatory and voluntary green criteria for the design, construction, operation and disposal of green multi-apartment residential buildings (https://allgosts.ru/91/040/gost_r_70346-2022).

[17] Building Research Establishment Environmental Assessment Method developed by the British corporation BRE Global. The building assessment procedure is carried out in several sections, establishing requirements for improvement, construction of buildings and finishing the building.

[18] The Leadership in Energy and Environmental Design (LEED) rating system, developed by the U.S. Green Building Council, is a set of standards for environmentally sustainable construction with a focus on energy efficiency and commissioning.

[19] Resolution of the Government of the Republic of Kazakhstan dated December 31, 2021 No. 996 "On approval of the classification (taxonomy) of "green" projects to be financed through "green" bonds and "green" loans"

categories "Green Buildings" and "Clean Transportation" (the structure of originated loans in Figure 1).

Figure 1

Structure of green loans originated in line with the Green Taxonomy requirements (%)
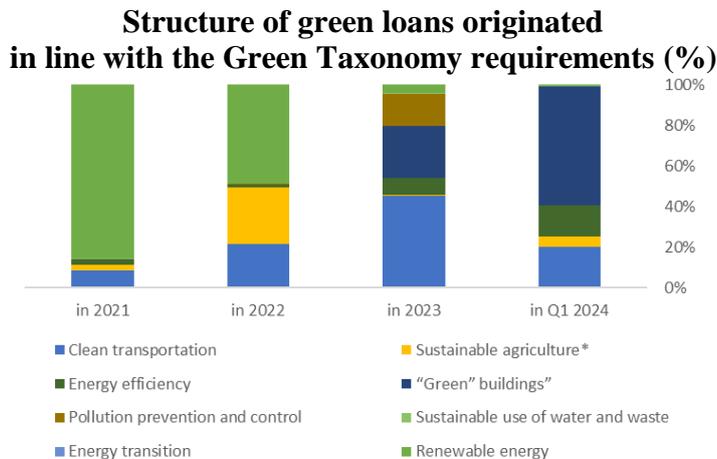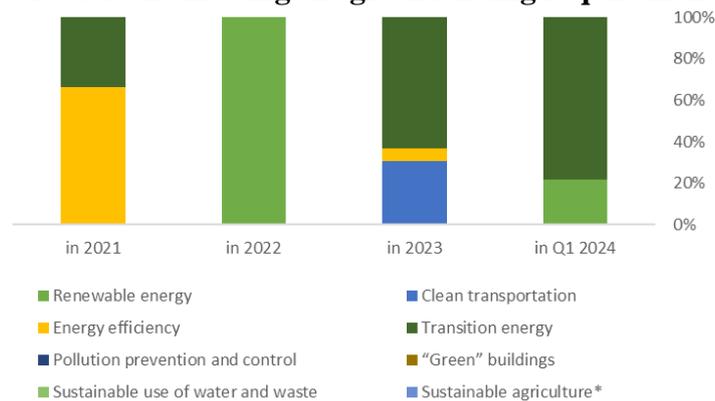

Source: second-tier banks

In 2021, the largest amount of loans issued was in the category "Renewable energy" – more than 85%, later the value of this indicator changed downwards: 49% for 2022, 4% for 2023, and less than 1% for the first quarter of 2024. Such dynamics are explained by the implementation of lending programs within the framework of cooperation with financial institutions, in particular the "Green Economy Financing Facility" for renewable energy sources in 2021. The subcategories "Wind energy" and "Hydroenergy" account for the largest share of loans provided in this industry for 2021 and 2022.

Looking at the industry by sub-category for peak periods, in 2021 the largest number of Green Taxonomy loans were provided in the Renewable Energy sub-sector for wind power facilities, in 2022 the number of provided loans prevailed in the "Hydroenerg" sub-sector, in 2023 and in the first quarter of 2024 – in the Supply Chain and Ancillary Infrastructure for Renewable Energy Sources sub-sector.

The Clean Transportation category accounted for 8% of all green loans provided in 2021, with a growth trend in subsequent periods: 21% in 2022, 45% in 2023, 20% in the first quarter of 2024. Starting from 2023, the growth in the amount of provided loans issued category was driven by the expansion of electric vehicles in the Kazakhstani car market. In the periods under review, the largest number of loans were in the sub-sectors of "Purchase, lease of low-carbon vehicles" and "Production supply chains for low-carbon vehicles, non-motorized and micro-electric transport", while in 2021, funds were issued in the "Clean Transportation" category only for low-carbon transportation. Loans in the "Green Buildings" category in 2023 amounted to 26%, in the first quarter of 2024 – 59% of the amount of all green loans provided, which is due to the launch of the green mortgage program in Kazakhstan. The remaining sectors are a minority, reflecting the small variability of the share of provided green loans. In the structure of provided loans classified by banks as loans that meet the criteria for green lending, in addition to the "Renewable Energy"category, the categories "Energy Transition", "Pollution Prevention and Control" and "Energy Efficiency" account for the largest shares (Figure 2).

The source of financing for the implementation of green lending is mainly funds from international financial organizations, development institutions of Kazakhstan through government programs, as well as banks' own funds, which are most often disbursed to provide loans to individuals, for example, for the purchase of low-carbon vehicles.

Figure 2

Structure of loans meeting the green lending requirements (%)

Source: second-tier banks
*Sustainable agriculture, land management, forestry, biodiversity conservation and ecotourism

As reasons that complicate the attraction of foreign funding, banks note its high cost, which increases the cost of loan for end borrowers, high reporting and monitoring requirements from international investors and high costs of project verification. At the same time, banks most often identify a lack of finance as a factor hindering the overall development of green lending. In addition to the limited amount of financing, banks identify the following barriers affecting the issuance of green loans:

– imperfection of the existing legal and regulatory framework;

– lack of incentive instruments, for example, through the provision of tax breaks for green projects, subsidies or guarantees from the government, as well as through easing in regulatory requirements;

– high costs of environmental assessment and audit;

– lack of awareness among potential borrowers about the benefits of green financing;

– low interest of potential borrowers in the green lending;

– lack of information for banks about the possibilities and mechanisms for financing green projects;

– lack of official information about the profile of the potential borrower. At present, the information for determining eligibility for green loans is limited to data obtained only from the borrower himself/herself.

The vast majority of surveyed banks plan to develop green lending in the near future by developing or improving a mechanism for providing green loans at each stage of disbursement. Priorities include developing internal methods and expanding the internal expert base by training employees to label and evaluate green projects, developing new green loan products that compare favorably with traditional ones, and strengthening partnerships with international financial institutions.

In an analytical material by the World Bank published in 2022, experts recommended including the transition to a green economy in credit risk management, as well as taking it into account in setting the loan rates. Based on the results of the calculations, it was concluded that when pricing loans, banks in Kazakhstan largely ignore these risks, maintaining the trend of lending to the so-called "brown" sectors (Figure 3). At the same time, stimulating the inflow of loans to regions of Kazakhstan with more environmentally friendly industries could contribute to a more accelerated transition to a less carbon-intensive economy (World Bank Group, 2022).

Figure 3

Cost of funding of the economic sectors in the domestic banking market (%)
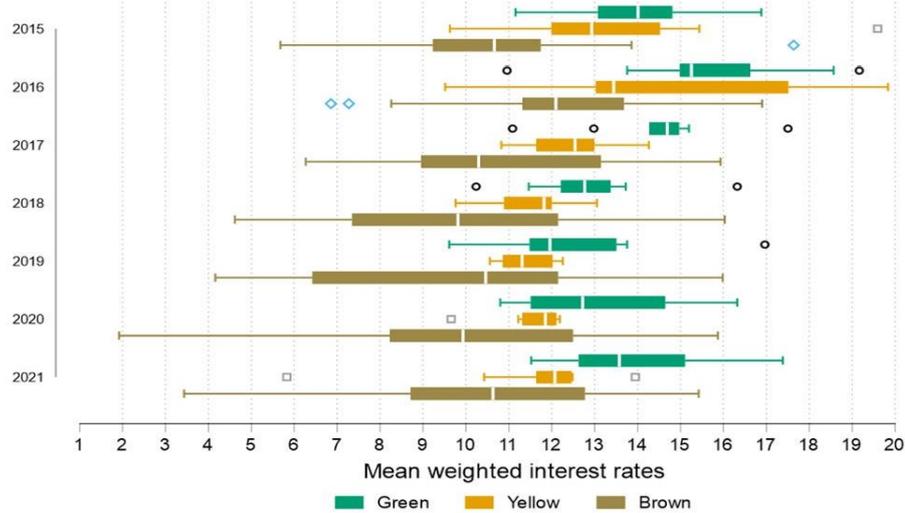
Source: World Bank staff estimates using data from Bureau of National Statistics and the National Bank.

Source: World Bank Blog.

In 2023, the same World Bank experts, based on the analysis of bank lending, concluded that the portfolio of Kazakh banks is dominated by lending to energy-intensive industries, and banks are hesitant to provide green loans. In order to set decarbonization targets, banks were recommended to require reliable data on the carbon footprint from borrowers, and the financial regulator was recommended to encourage green lending and reduce the risk associated with the transition (World Bank Group, 2023). Along with second-tier banks, large microfinance organizations were surveyed (10), the majority of which responded about the absence of green microloans, but at the same time about their readiness to contribute to the development of green financing in Kazakhstan in the future. Some organizations were participating in the Green Financing Program from GEFF of the European Bank for Reconstruction and Development. As with banks, the process of providing a green loan imposes additional requirements if funds from international financial institutions are involved.

In addition to those mentioned by banks, organizations also include factors related to the geography of microloan origination (most clients are in rural areas) as barriers to the full-cale development of green microcredit: low awareness of the rural population about the benefits of green microloans and their low income level, increased logistics costs for delivering purchased goods to rural areas, lack of interest from suppliers due to the higher price of goods or services that meet green criteria compared to analogues, as well as a limited list of highly effective technologies and materials that have been assessed and pre-approved as eligible for GEFF financial support in the event of participation in the program.

7. Challenges

Despite the expected benefits of implementing green economy projects, there are factors that may act as a barrier to the development of green finance worldwide: lack of financing incentives, low diversification of green instruments, imperfect conformity assessment procedures, insufficient disclosure of information on environmental protection. The European Banking Authority (EBA) shared interesting results of its study of the green lending market: green loans currently account for a small share of total loans, while loans to households account for a significant share in the green portfolios of credit institutions, which suggests that a relatively large proportion of households benefit from green loans. The share of green loans to small and medium-sized enterprises is small compared to household lending, which may indicate that small businesses do not see benefits from green lending markets. The reasons may be the availability of other

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sources of financing, such as equity and debt issuance, or difficulties in obtaining a loan. Consequently, green lending markets are relatively more developed in those segments where data and documentation are available, and the exchange of information between the credit institution and the borrower is most developed. Although banks use the EU Taxonomy, applying the green loan criteria in accordance with the Taxonomy causes difficulties, since the process of collecting information is quite expensive due to the unavailability of data or the complexity of collecting it. Among other reasons for the underdevelopment of the green loan market, experts include the lack of a harmonized EU definition of green loans, insufficient awareness and knowledge of potential borrowers about green banking products, as well as a lack of trained personnel in credit institutions. The organization sees the introduction of voluntary EU labeling for green loans and the integration of the green mortgage concept into the Mortgage Directive as a key mechanism for developing green lending. Also decisive is the training of banking personnel in sustainable financing, marketing and wide dissemination of information about green products, focused on the specific needs of borrowers (EBA, 2023).

Some researchers claim that the reason for the insufficient development of green lending in Russia is the low level of development of the risk assessment system for green loans (Khudyakova & Urumov, 2021).

In Kazakhstan, it is possible to identify factors limiting the development of green lending, similar to those in the world, and those that were formed based on the economic characteristics of the country.

1. Lack of suppliers and manufacturers of green technologies. The "International Center for Green Technologies and Investment Projects" JSC is working on a Register of domestic manufacturers and suppliers of green technologies and equipment. According to the latest published data, the Register currently includes 38 manufacturers and suppliers of green technologies and equipment. On an economic scale, this is an incomparably small value.

According to the EU estimates, buildings account for 40% of EU energy consumption and 36% of energy-related CO2 emissions, making them the largest source of energy consumption in Europe. By 2030, the EU aims to renovate 35 million buildings, which will significantly reduce emissions and create 160,000 new jobs in the construction sector. In Kazakhstan, there is a lack of building construction and operation practices aimed at reducing the level of material and energy consumption. The use of green technologies is not a priority for developers, and one of the reasons for the low indicators may be, among other things, the lack of suppliers and manufacturers of green technologies in the country. In 2023, the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan conducted a sample survey on the nationwide statistical observation "Questionnaire for the Survey of Energy Consumption in Households", which is carried out every five years. According to the survey results, the annual consumption of coal for 2022 was 7,312.1 thousand tons, natural gas by households – 5,160.5 million cubic meters, electricity – 14,328.2 GWh, liquefied gas by households – 507 million liters. At the same time, the statistical observation does not provide information on the use of alternative energy sources by households.

2. Low interest from banks and lack of incentives for the development of green lending. Stimulation of green lending can be carried out through concessions or preferences. Often, concessions for participants in the green financing system occur through tax breaks or through relaxation of regulation. Currently, regulation does not provide for measures to stimulate green lending, the need for the introduction of which should be preliminarily assessed in terms of expected benefits and risks.

3. Lack of funding. Among the main constraints to origination of green loans, banks cite the lack of cheap borrowing. Banks are still cautious about green lending due to existing barriers. At the same time, funds from the public sector and international organizations alone may not be enough to develop green lending.

4. Greenwashing. Not all products that brands call eco-friendly and natural are actually such, and not all manufacturers who claim to use green technologies in production comply with

the standards, manufacturers can abuse the concept of "greenness" to gain access to green financing. Incorrect labeling of a green project when issuing a loan creates a favorable basis for green laundering. Accusations of green laundering can, in turn, lead to litigation, undermine investor confidence, and also cast doubt on the integrity of green loans. At the same time, international experience shows that so-called green camouflage can occur both on the part of the borrower and on the part of the lender.

5. Vague definitions and imperfect taxonomy. According to banks and microfinance organizations, one of the reasons hindering the development of green financing in Kazakhstan is the imperfection of the regulatory framework. Regarding the Green Taxonomy, the most frequent comments from financial organizations are about the practical application of standards for the correct identification of green loans, the complexity of the classification system in practice, the labeling of green loans, the lack of a description of the process of issuing green loans and detailed examples of the application of standards.

The draft Methodological Recommendations for the Application of the Green Taxonomy, developed by the Ministry of Ecology and Natural Resources of the Republic of Kazakhstan, is intended for practical use, including by financial market entities, so it is important to work out the project in detail with financial organizations, identifying all the "blind spots". The document should reflect commitment to the international standard "Green Credit Principles", and also disclose the identification of green projects (and their classification), the examination process, requirements for the transformation of activities and internal policies, risks and reporting.

Issues related to lending conditions, credit risks, reporting and other aspects of issuing loans should in the future be reflected in the documents of the Agency of the Republic of Kazakhstan for Regulation and Development of the Financial Market concerning the application and accounting of green lending instruments and the management of relevant risks.

6. Difficulties in assessing green loans. To determine whether a provided loan complies with the principles of a green loan, banks and international financial organizations use various assessment methods in the form of criteria, efficiency ratios, international labels and ratings. As a rule, classifying a loan as green and financial risk assessment should be carried out by specialists competent in environmental labeling and assessment. International organizations resort to the services of expert organizations; in banks, this can be implemented using the services of full-time or outsourced specialists. Due to the immaturity of the green lending market in Kazakhstan, there is a shortage of qualified experts, which can create difficulties when making a decision on providing a loan.

7. Lack of information about the profile of a potential borrower. To make a decision on origination of green loans, the bank must be guided by reliable data on the borrower's field of activity, the presence of factors that may influence the decision to provide a loan, the proposed loan object and its environmental characteristics. Currently, each credit institution collects information independently; there are no databases that could satisfy this "information hunger".

8. Lack of internal incentives for the implementation of environmental initiatives. The preparation of regulatory documents, incentives or penalties is required for the development of green finance and a successful transition to a green economy, but they are not a determining factor. Environmental awareness and interest on the part of the corporate sector, the population and financial institution remains as the key and necessary condition. In Kazakhstan, the desire to minimize the environmental footprint of both the entire enterprise and the individual in particular is only just forming.

8. Conclusion

The main mechanism for ensuring the transition to a green economy is green financing. According to expert estimates, the need for green financing will only grow every year, and the role of green loans is significant in the distribution of resources for sustainable investments. To solve the problems that banks and society face on the way to the confident use of green lending as one of the instruments of green financing, an integrated approach of the financial market, the public

sector and society as a whole is needed. This requires a thorough analysis and involvement of all participants in the green lending architecture. An important area of the government support for green lending is the improvement of regulatory documents and strengthening of measures aimed at the transition to a green economy, the creation of conditions and an environment for the implementation of green projects for both the financial sector and for business and society. However, the basis for the successful development of the green loan market is the availability of projects in the economy that can effectively use the allocated funds. Kazakhstan already has a basic regulatory environment for green lending, the general boundaries and directions of the area have been defined, but detailed study of all existing problematic issues of practical application of regulatory documents, harmonization of standards, development of incentive measures that can encourage financial institutions to develop green lending, and businesses and the population to enjoy the benefits of green lending will be required. In addition, in the near future, it will be necessary to correctly assess the risks associated with green loans, as well as minimize the unfair use of green loan.

To increase interest in green projects on the part of businesses, it is necessary to prioritize environmental components in any area, stimulate the flow of loans to regions that most need to improve the environmental situation. At the same time, domestic production should be increased: funds from international organizations for green lending are often disbursed on the condition that goods are produced in Kazakhstan and their import is excluded. This criterion can also be transferred to domestic financing of green projects.

Considering that, according to experts, residential and commercial buildings consume about 40% of all energy in the world, it is necessary to begin assessing the environmental carbon footprint now and make an effort to minimize it. The issue could be partially resolved by installing special metering devices, which is a widely used practice in some countries with developed environmental aspirations.

Difficulties with green loan labeling and assessing credit and market risks deter investors from investing in green economy projects. The introduction of a training program in higher education institutions, or an internship for existing specialists in international organizations practicing green labeling and standardization is seen as a solution to the problems associated with the lack of specialists in the assessment or labeling of green projects.

There is a lot of work to be done to ensure the effective functioning of green lending; however, with the coordination of all participants in the process, the elimination of current shortcomings and the implementation of measures based on best international practice, green loans in Kazakhstan can be an effective means of green financing.

Literature

1. Report of the World Commission on Environment and Development: Our Common Future (1987). http://www.un-documents.net/our-common-future.pdf

2. Larsen, M. L. (2019). A growing toolbox of sustainable finance instruments. Green Finance & Development Center. https://greenfdc.org/a-growing-toolbox-of-sustainable-finance-instruments/

3. Green Loan Principles (2018). https://www.lsta.org/content/guidance-on-green-loan-principles-glp/

4. Loan market association, LMA (2023). Sustainable Lending Glossary of terms. https://www.lma.eu.com/application/files/7717/0203/8790/Sustainable_Lending_Glossary.pdf

5. Zhang, R., Cao, Y., Wu, K., Sun, H. (2022). Research on the effect of green credit on ecological welfare performance: Evidence from China. *Frontiers in Environmental Science,* 10, 950341. https://doi.org/10.3389/fenvs.2022.950341

6. Artyomov S. (2023). Green Debt on the Verge of Bloom. ESG Bonds are High-Priced Again. *Vedomosti.* https://www.vedomosti.ru/esg/green_finance/articles/2023/07/28/987348-zelenii-dolg-na-poroge-rastsveta

7. The "DAMU" Enterprise Development Fund" JSC (2020). First Green Bonds in Kazakhstan Offered by the DAMU Fund Supported by the UNDP" https://damu.kz/en/news/detail.php?ELEMENT_ID=27805

8. Bhattacharyya, U. (2024). Understanding the Regulatory Framework for Sustainable Finance in India https://www.nlsblr.com/post/understanding-the-regulatory-framework-for-sustainable-finance-in-india

9. Damianova A., Guttierez E., Levitanskaya E., Minnasyan G., Nemova V. World Bank Group (2018). Green Financing in Russia: Creating Opportunities for Green Investment https://documents1.worldbank.org/curated/en/699051540925687477/pdf/131516-RUSSIAN-PN-P168296-P164837-PUBLIC-Green-finance-Note.pdf

10. European Banking Authority. Implementing Technical Standards (ITS) on prudential disclosures on ESG risks in accordance with Article 449a CRRhttps://www.eba.europa.eu/activities/single-rulebook/regulatory-activities/transparency-and-pillar-3/implementing-technical-standards-its-prudential-disclosures-esg-risks-accordance-article-449a-crr#:~:text=The%20Implementing%20Technical%20Standards%20(ITS,assets%20subject%20to%20chronic%20and

11. European Banking Federation (2024). Staff paper «Green Asset Ratio cannot be to sustainability what CET1 is to capital». https://www.ebf.eu/wp-content/uploads/2024/01/Green-Asset-Ratio-January-2024-002-2.pdf

12. Azizuddin, K. (2023). EU Banking Regulator pulls plug on «green supporting factor». *Responsible Investor.* https://www.responsible-investor.com/eu-banking-regulator-pulls-plug-on-green-supporting-factor/

13. Cui, Y., Geobey, S., Weber, O., & Lin, H. (2018). The impact of green lending on credit risk in China. Sustainability, 10(6), 2008. https://www.mdpi.com/2071-1050/10/6/2008

14. National Financial Regulatory Administration (2022). CBIRC Releases the Green Finance Guidelines for Banking and Insurance Sectors. https://www.cbirc.gov.cn/en/view/pages/ItemDetail.html?docId=1055048&itemId=981

15. Larsen, M. L. (2020). Introduction to Green Finance. *International Institute of Green Finance.* https://iigf-china.com/green-finance-info-2

16. Bao, J., & He, M. (2022). Does green credit promote green sustainable development in regional economies?—Empirical evidence from 280 cities in China. *PLoS One*, 17(11), e0277569. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0277569

17. Larsen, M. L. (2020). Introduction to Green Finance. *International Institute of Green Finance.* https://iigf-china.com/green-finance-info-2

18. Bhattacharyya, U. (2024). Understanding the Regulatory Framework for Sustainable Finance in India https://www.nlsblr.com/post/understanding-the-regulatory-framework-for-sustainable-finance-in-india

19. Reserve Bank of India (2022). Report of the Survey on Climate Risk and Sustainable Finance. https://www.rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=&ID=1215

20. International Financial Services Centres Authority (April 26, 2022). Guidance framework on Sustainable and Sustainability linked lending by financialinstitutions. https://ifsca.gov.in/Document/Legal/sustainable-lending-framework-26-04-202226042022065717.pdf

21. Russian Ecological Society (2018). Experts of the Open Government Prepared the Green Bank Concept. https://www.ecosociety.ru/bez-rubriki/eksperty-otkrytogo-pravitelstva-podgotovili-kontseptsiyu-zelenogo-banka/

22. Central Bank of Russia. Sustainable Development. http://www.cbr.ru/develop/ur/

23. Xinhua News Agency (2024). The Volume of "Green" Lending in China had Notably Increased in 2023". https://russian.news.cn/20240213/0d7d0b67dbfa4a58b22f54028fe3224c/c.html

No. 3, 2024

Oishynova G. A.:
Green Loans. The Potential in Kazakhstan and Worldwide

24. Choi, J., Escalante D., Larsen M. L. (2020). Green Banking in China – Emerging Trends With a spotlight on the Industrial and Commercial Bank of China (ICBC). *Climate Policy Initiative.* https://www.climatepolicyinitiative.org/wp-content/uploads/2020/08/Green-Banking-in-China-Emerging-Trends-1.pdf

25. Press Information Bureau (2023). Government efforts to avail easy financing to renewable energy generating companies. https://pib.gov.in/PressReleasePage.aspx?PRID=1897041

26. ETBFSI Research (2024). Green finance: How banks are pushing the pedal on lending to renewable energy. https://bfsi.economictimes.indiatimes.com/news/banking/green-finance-how-banks-are-pushing-the-pedal-on-lending-to-renewable-energy/106617620»

27. "Global Energy" Association on Development of International Research and Projects in the Field of Energy (2024). India Sets Record for Renewable Energy Deployment. https://globalenergyprize.org/ru/2024/04/28/indija-ustanovila-rekord-po-vvodu-vije/

28. United Nations Environment Programme. Energy efficiency for buildings. https://www.renewableinstitute.org/images/unep%20info%20sheet%20-%20ee%20buildings.pdf

29. United Nations Environment Programme. Global Status Report for Buildings and Construction. https://www.unep.org/resources/report/global-status-report-buildings-and-construction

30. United States Environmental Protection Agency Annual Report (2024). Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990-2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

31. U.S. Department of Housing and Urban Development. Energy Efficient mortgage homeowner guide. https://www.hud.gov/program_offices/housing/sfh/eem/eemhog96

32. Northmarq. Fannie and Freddie Step Up Green Lending. https://www.northmarq.com/news/fannie-and-freddie-step-green-lending

33. Energy Efficient Mortgage Initiative. https://energyefficientmortgages.eu/creating-a-virtuous-circle/

34. European Banking Association (2022). EBA Report. Developing a framework for sustainable securitisation. https://www.eba.europa.eu/sites/default/files/document_library/Publications/Reports/2022/1027593/EBA%20report%20on%20sustainable%20securitisation.pdf

35. Soundarrajan, P., & Vivek, N. (2016). Green finance for sustainable green economic growth in India. *Agricultural Economics/Zemědělská Ekonomika, 62(1).* https://www.agriculturejournals.cz/pdfs/age/2016/01/04.pdf

36. Domclick (2024). "Green Mortgage: SberBank's Program Conditions. https://blog.domclick.ru/ipoteka/post/zelyonaya-ipoteka-usloviya-programmy-v-sbere

37. Banki.ru (2021). Banks launch a concessional "green" loan mortgage program. https://www.banki.ru/news/lenta/?id=10955685

38. Reuters (2024). China eases car loan policy for first time since 2018 to boost demand». https://www.reuters.com/business/finance/china-scraps-mandates-down-payments-personal-car-loans-2024-04-03/

39. A report of the North American Task Force of the United Nations Environment Programme Finance Initiative (2007). Green Financial Products and Services. Current Trends and Future Opportunities in North America https://www.unepfi.org/fileadmin/documents/greenprods_01.pdf

40. EVreporter (2023). SIDBI provides INR 10 cr term loan to Mufin Green Finance to promote EV financing in India. https://evreporter.com/sidbi-partners-mufin-green-finance-to-promote-ev-financing/

41. The Coalition for Green Capital. What are Green Banks. https://coalitionforgreencapital.com/what-is-a-green-bank/

No. 3, 2024

Oishynova G. A.:
Green Loans. The Potential in Kazakhstan and Worldwide

42. The Climate Reality Project (2024). What is a green bank? https://www.climaterealityproject.org/blog/what-green-bank

43. The Conversation (2023). Using green banks to solve America's affordable housing crisis – and climate change at the same time. https://theconversation.com/using-green-banks-to-solve-americas-affordable-housing-crisis-and-climate-change-at-the-same-time-208098

44. Industrial Bank Co. https://www.cib.com.cn/cn/index.html

45. "International Center for Green Technologies and Investment Projects" JSC. Information on the global program of innovations in the field of clean technologies. https://igtipc.org/ru/projects/20230831-105349/20230901-110854/2344-20230901-112347

46. GEFF. The EBRD offers new sources of finance to support green investment in Kazakhstan. https://ebrdgeff.com/kazakhstan-geff2/ru/projects/geff-kazakhstan-ii-launch-event-the-ritz-carlton-hotel-almaty-27-march-2023/

47. Forbes (2022). How the Green Finance Market is Developing in Kazakhstan. https://forbes.kz/articles/kak_v_kazahstane_razvivaetsya_ryinok_zelenogo_finansirovaniya

48. World Bank Blogs (2022). How Kazakhstan Can Leverage Green Finance to Reduce Emissions (2022). https://blogs.worldbank.org/ru/europeandcentralasia/how-kazakhstan-can-leverage-green-finance-to-reduce-emissions

49. World Bank Blogs (2023). Kazakhstani Banks Must Adopt Supervised Plans for Boosting Greener Lending. https://blogs.worldbank.org/ru/psd/kazakhstanskim-bankam-neobkhodimo-vnedrit-podkontrolnye-plany-po-stimulirovaniyu-zelenogo

50. European Banking Authority (2023). «EBA REPORT IN RESPONSE TO THE CALL FOR ADVICE FROM THE EUROPEAN COMMISSION ON GREEN LOANS AND MORTGAGES». https://www.eba.europa.eu/sites/default/files/2023-12/e7bcc22e-7fc2-4ca9-b50d-b6e922f99513/EBA%20report%20on%20green%20loans%20and%20mortgages_0.pdf

51. Khudyakova, L. S., & Urumov, T. R. (2021). Green Finance in the BRICS Countries. *World Economy and International Relations, 65(9), 79-87.* https://www.imemo.ru/en/index.php?page_id=1248&file=https://www.imemo.ru/files/File/magazines/meimo/09_2021/09-KHUDYAKOVA.pdf.