Assessment of SME Loan Portfolio Quality in Kazakhstan: Empirical Analysis from 2013 to 2023

Aizada Seisenbayeva[1] | **Nazira Gumar[2]** | **Nurzhanat Sherimova[1]** | **Nurgul Pernebekkyzy[3]*** | **Urazgul Dzhakisheva[1]**

[1] Caspian Public University, Almaty, Kazakhstan

[2] Almaty Technological University, Almaty, Kazakhstan

[3] Toraighyrov University, Pavlodar, Kazakhstan

[4] Abai Kazakh National Pedagogical University, Sorbonne-Kazakhstan Institute, Almaty, Kazakhstan

Corresponding author:
*Nurgul Pernebekkyzy – PhD, Associate Professor, Caspian University of Technology and Engineering named after Sh. Yessenov, Aktau, Kazakhstan.
Email: tnurgul888@gmail.com

EJEBS

ABSTRACT

The article is devoted to the assessment of the quality of the loan portfolio of small and medium-sized businesses (SMEs) in Kazakhstan to identify periods of credit instability and hidden risks that can limit the investment potential of enterprises. The methodological framework encompasses an analysis of the overdue debt structure, calculation of the sustainability coefficient and delinquency index, as well as cluster analysis to identify periods with varying degrees of credit risk. The results showed that the share of loans without delay increased from 69.2% in 2013 to 94.2% in 2023, while the share of problem loans over 90 days decreased from 23.9% to 3.9%. The overdue debt index decreased from 0.31 to 0.06, and the sustainability coefficient exceeded 5.5 in 2022, indicating an improvement in payment discipline and the ability of SMEs to service debts. The cluster analysis identified two periods: the crisis (2017-2018) and the recovery (2021-2023), which confirms the need for a differentiated policy in managing credit risks. The study confirmed the presence of cyclicity in the dynamics of SME credit risks and showed that the stabilization of the loan portfolio is possible only with a combination of macroprudential tools, government support programs and digitalization of credit monitoring. Future studies could focus on ESG factors and the level of digitalization of enterprises in credit risk assessment models, as well as comparative cross-country studies to identify adaptive policies in the context of regional differences.

KEYWORDS: Economy, Economic Growth, Small Business, Medium-Sized Businesses, Business Lending, Overdue Debt, Financial Stability, Loan Portfolio

1. INTRODUCTION

Global economic changes affect the structure of business, access to finance, and risk management. Small and medium-sized enterprises (hereinafter – SMEs), despite their significant contribution to employment and added value, are particularly vulnerable to fluctuations in the macroeconomic environment. The sustainability of SMEs largely depends on the availability of credit resources. At the same time, structural constraints lack of collateral, weak credit history, limited financial reserves – reduce the ability to attract borrowed funds on acceptable terms.

In many countries, SMEs are characterized by high borrowing costs and a limited choice of financial instruments. The lack of reliable mechanisms for assessing solvency and risk management increases barriers to entry into financial markets. Under these conditions, government measures aimed at reducing credit constraints, such as subsidised loans, guarantee funds, and risk-sharing mechanisms, are particularly important. According to the OECD, expanding SME access to bank lending is considered a necessary condition not only for growth but also for stabilising the economy (OECD, 2023).

Singapore has programmes that combine standard credit products with support mechanisms tailored to the specific needs of SMEs (IMDA, 2023). The UK is developing lending schemes that reduce collateral requirements and simplify the approval process (Department for Business and Trade, 2023). Internationally, loans are seen as the main instrument for financial support of SMEs, especially in the context of limited access to venture and grant capital. In this regard, the quality of the SME loan portfolio is of practical importance for assessing sustainability and identifying potential risks. The experience of Kazakhstan highlights the presence of systemic imbalances, including a high share of overdue debt, unstable reserve policy, and a limited ability of banks to adapt to the specific needs of SMEs.

Loan programmes that support digital transformation are becoming one of the most widely applied tools internationally. For SMEs, access to credit often determines the feasibility of technological upgrades. Where grants or equity financing are unavailable or limited, credit remains the most scalable mechanism. In this regard, SME loan portfolios become crucial for financial planning and policy design. In Kazakhstan, SMEs constitute a significant portion of the economy in terms of employment and added value. While entrepreneurship support programmes exist, mechanisms for linking credit instruments with digital objectives are still underdeveloped.

The study aims to assess the quality of SME loans in Kazakhstan by identifying hidden risks, structural imbalances, and potential constraints that may hinder digital investments in the sector. Therefore, to have a clear understanding of the financial foundation on which digital transformation is expected to occur, the following research questions have been developed:

RQ 1: What factors determine the dynamics and stability of the SME loan portfolio in Kazakhstan?

RQ 2: How can periods of increased credit risk in SME lending be identified during 2013-2023?

2. LITERATURE REVIEW

Creating a sustainable financial environment for small and medium-sized businesses requires a multifaceted consideration of the role of lending, which is interpreted differently in studies depending on the institutional and economic conditions prevailing at the time. For countries and segments with high information asymmetry and weak institutional support, SME lending is more often limited or goes into informal forms (Berger & Udell, 2006), which directly affects the quality of loans and the likelihood of delinquencies: the higher the asymmetry and

the weaker the institutions, the higher the risks and the share of problem assets. Even in the presence of a formal sector, the share of SMEs in banks' loan portfolios remains understated due to increased risks and strict collateral requirements (Beck, 2013). This problem is especially acute in low- and middle-income countries, where access to finance is limited by structural barriers including high interest rates, corruption costs, and bureaucratic restrictions (Osano & Languitone, 2016). In these conditions, the state acts as an active intermediary in expanding the range of financial instruments for SMEs, including leasing, factoring, as well as venture and angel financing (Abbasi et al., 2017). In addition, limited access to credit is determined by three groups of factors: firm characteristics (size, age, availability of collateral), financial parameters (debt burden, business plan), and owner characteristics (education, experience) (Chowdhury & Alam, 2017).

Research on SME credit risks encompasses three primary areas: defaults, borrower assessment structures, and the impact of non-financial factors. Dietsch & Petey (2002) point out that SME credit risks are particularly sensitive to systemic shocks and require special approaches to pricing and reserve formation to manage them. Where economic, environmental, and social factors influence credit risk through borrower liquidity, collateral quality, and total exposure (Weber et al., 2010). Duarte et al. (2018) noted that loan portfolio management should take into account macroeconomic parameters (inflation, GDP dynamics, interest rates, and unemployment. A firm with a low level of sustainability (economically, environmentally, or socially) is more likely to show deterioration in financial performance and, therefore, has a higher probability of default (Höck et al., 2020). Thus, to reduce risks, sustainable finance models are needed that take into account not only "dry" financial indicators, but also the firm's ability to adapt to sustainability requirements, e.g., ESG factors, business flexibility, and market adaptability (Calabrese et al., 2020; Hossain et al., 2023).

Some studies consider reserves under International Financial Reporting Standards (hereinafter – IFRS), particularly IFRS 9, in the context of analysing the quality of SME loan portfolios. This analysis links the calculation of Expected Credit Loss (hereinafter – ECL) to delinquency levels, borrower stability, and the amount of potential losses. The IFRS 9 standard requires that loss reserves be formed not only based on actual overdue debt, but also taking into account projected losses, based on the probability of default and macroeconomic scenarios (Novotny-Farkas, 2016). An adaptive calculation of expected credit losses based on a modular approach allows for the incorporation of borrower behaviour patterns and portfolio characteristics (Schutte et al., 2020). Fluctuations in reserves serve as indicators of asset quality and cyclical vulnerability in the banking sector (Resende et al., 2024). In the context of emerging economies, as shown by Abakirov et al. (2019), the application of the standard requires adaptation to the specifics of guarantee and credit instruments, including sensitivity to macroeconomic changes. In Kazakhstani practice, Lambekova et al. (2020) described the use of a logit model for internal audit aimed at identifying problem assets. Therefore, a systematic assessment is necessary for such indicators as the share of loans without delinquency, the structure of delinquency by maturity, and the amount of reserves, allowing for the identification of hidden risks and periods of instability in SME lending.

Credit instability in SME portfolios occurs during specific periods due to the accumulation of hidden risks, structural shifts, and a weak response to macroeconomic changes. The instability of loan portfolios develops in stages, which requires identifying the hidden phases of risk accumulation before the onset of crisis states (Breuer et al., 2012). The increase in the probability of default is attributed to changes in macroeconomic parameters, including GDP dynamics, inflation, and interest rates, which form cycles of portfolio instability (Buncic & Melecky, 2013). The greatest vulnerability arises with low diversification, when loans are

concentrated in a limited number of industries or with individual borrowers (Shim, 2019). Instability phases intensify through debt market and currency fluctuations, which create additional channels for risk transmission (Em et al., 2022). The case of Kazakhstan demonstrates that internal distortions in the lending structure, including high asset concentration, can lead to periods of credit instability (Zaitenova & Abzhalelova, 2025; Nurpeissova et al., 2025).

Institutional, financial, and regulatory weaknesses shape credit vulnerability. SMEs face barriers to finance arising from income volatility, limited borrowing sources, limited access to alternative financing, and high transaction costs (Nizaeva & Coskun, 2021; Kumar et al., 2023). In addition, inflationary pressures, uncertainty in calculation standards, and instability of the tax regime increase risks for lenders and limit investment activity (Karybay & Zhussupov, 2024). Thus, regional differences and access to private sources of capital determine the effectiveness of credit support (Beenstock, 2025).

Previous studies predominantly focused on the problem of access to finance for SMEs. However, the issue of credit portfolio quality remained underexplored, particularly regarding the structure of overdue loans and the resilience of SME lending. Additionally, earlier research did not provide a periodisation of instability phases in the development of SME credit portfolios, which limited the ability to capture cyclical fluctuations in risk.

Institutional barriers, regulatory instability, and industry distortions affect the availability of financing and the sustainability of credit relations in the SME sector. More complex conditions for access to capital, increased risks, and reduced predictability of regulation create a need for an objective assessment of the quality of the loan portfolio. The key indicators are the volume of bank and SME lending, the share of loans without delinquency, the level of overdue debt, as well as the volume of reserves formed under IFRS. These parameters allow us to assess the volume of credit support, the quality of the portfolio, and the level of risk in the SME segment.

3. METHODOLOGY

Support for small and medium-sized businesses in Kazakhstan is considered a priority area of economic policy; however, the sustainable development of this sector is impossible without considering the reliability of its credit collateral. A proper understanding of the structure and quality of borrowings enables an objective assessment of the financial stability of SMEs and the associated risks for the banking sector. To achieve the set goal of assessing the quality of the loan portfolio of SMEs in Kazakhstan and identifying periods with different levels of stability, it was necessary to conduct a comprehensive analysis of the dynamics and structure of key indicators. Indicators were selected that reflect the ratio between timely serviced and overdue loans, the level of reserves, and the stability coefficient.

Table 1 presents all the indicators used as the basis for the calculations.

TABLE 1. Indicators used for the assessment of SME loan portfolio quality

Category	Variable	Coding
Total volume	Bank loans (total volume of loans issued by banks)	TOTAL_LOANS
SME Portfolio Quality	SME loans, including loans without overdue debt and loans with overdue payments of various maturities	SME_TOTAL
	Loans without overdue debt	SME_GOOD
	Loans overdue 1-30 days	SME_OVERDUE_1_30
	Loans overdue 31-60 days	SME_OVERDUE_31_60
	Loans overdue 61-90 days	SME_OVERDUE_61_90
	Loans overdue by more than 90 days	SME_OVERDUE_90PLUS

Risk Assessment	IFRS Provisions	SME_IFRS_PROVIS

Note: compiled by the authors

The assessment of SME loan quality relied on three core indicators: (1) loan portfolio structure, (2) overdue debt index, and (3) loan stability coefficient. These were calculated according to the following formulas.

The structure of the SME loan portfolio (%) was defined by representing each portfolio component as a proportion of total SME loans, as presented in formula (1):

$$Share_i = \frac{X_i}{L_{SME}} \times 100 \qquad (1)$$

where:

$Share_i$ – the share of the corresponding loan category;

X_i – volume of a specific loan category (e.g., non-overdue, overdue 1-30 days, etc.);

L_{SME} – total volume of SME loans.

Index of Overdue Debt (IOD), the share of overdue loans (of all categories) in the total volume of SME loans, was applied as shown in formula (2):

$$IOD = \frac{L_{1-30} + L_{31-60} + L_{61-90} + L_{90+}}{L_{SME}} \qquad (2)$$

where:

IOD – the Index of Overdue Debt;

$L_{1-30}, L_{31-60}, L_{61-90}, L_{90+}$ – overdue SME loans grouped by delay duration (up to 30 days, 60 days, 90 days, more than 90 days);

L_{SME} – total volume of SME loans.

Stability Coefficient (SC), the ratio between high-quality and severely overdue loans and was applied as shown in formula (3):

$$SC = \frac{L_{good}}{L_{61-90} + L_{90+}} \qquad (3)$$

where:

SC – the Stability Coefficient;

L_{61-90}, L_{90+} – SME loans overdue by more than 60 days, more than 90 days;

L_{good} – SME loans without overdue payments.

The indicators were calculated for each year from 2013 to 2023 to trace the dynamics of SME loan quality and credit risk trends. These measures served as the basis for addressing the second research question, identifying periods of increased credit risk in SME lending. However, calculations based on the coefficients allow only a descriptive assessment of the quality of the loan portfolio, but do not provide a distinction between stable and crisis years. To overcome this limitation, the study uses cluster analysis as an element of scientific novelty. Grouping years with similar credit risk profiles allows for the identification of hidden phases of instability that are not visible when analyzing individual indicators. The use of the K-means method in combination with Gap Statistic distinguishes this study from previous descriptive works. It provides a more comprehensive assessment of SME credit risks in Kazakhstan.

In addition to the descriptive and ratio-based calculations, a cluster analysis was conducted to identify homogeneous periods in terms of SME credit risk. The K-means method was applied to standardized variables (z-scores) including: share of non-overdue SME loans (SME_GOOD), share of loans overdue more than 90 days (SME_OVERDUE_90 PLUS), index of overdue debt (IOD), loan stability coefficient (SC), and IFRS-based provisions (SME_IFRS_PROVIS). The optimal number of clusters was determined using the Gap Statistic method. The final segmentation into two clusters allowed for the differentiation between high-risk and stable credit portfolio years, based on the aggregated behavior of all selected indicators.

4. RESULTS

The assessment of the quality of SME lending is based on an analysis of the portfolio

structure, the level of overdue debt, the stability of borrowers, and the volume of reserves formed. In accordance with the research methodology, the portfolio structure is analysed by shares of loans in different states: loans without overdue debts and loans with overdue periods of varying duration, ranging from short-term (1-30 days) to long-term, including the riskiest category of over 90 days.

For this, official statistical data for 2013-2023 were used, grouped by key indicators that reflect the degree of credit reliability and associated risks.

Table 2 shows the dynamics of the SME loan portfolio structure by category: the share of loans without overdue payments and levels of overdue debt by maturity.

TABLE 2. Structure of SME loan portfolio quality, in %

Year	SME_GOOD	Loans overdue by 1-30 days	Loans overdue by 31-60 days	Loans overdue by 61-90 days	Loans overdue by more than 90 days
2013	69,21	2,45	1,07	3,36	23,92
2014	80,65	3,94	0,45	0,27	14,69
2015	82,84	4,22	1,20	0,85	10,90
2016	82,87	5,52	3,26	1,34	7,02
2017	4,40	2,74	1,18	1,18	9,86
2018	8,64	2,28	0,99	0,99	10,05
2019	80,88	2,56	1,07	1,01	14,48
2020	80,51	2,94	1,21	2,01	13,32
2021	84,94	1,82	0,76	0,58	11,90
2022	93,56	1,21	0,60	0,23	4,40
2023	94,17	1,27	0,45	0,21	3,90

Note: compiled by the authors according to calculations

Loans without overdue debt on the principal and/or accrued interest (SME_GOOD) reflect the quality part of the loan portfolio of small and medium-sized businesses. In 2013, their share was 69.2%, after which there was a steady growth, reaching 82.9% in 2015 and 2016. The maximum values were recorded in 2022 and 2023 - 93.6% and 94.2%, respectively. In 2017 (4.4%) and 2018 (8.6%), a decline was recorded, disrupting the overall upward trend.

Overdue loans demonstrated multidirectional fluctuations. In the 1- to 30-day segment, the values have not exceeded 5% since 2015, reaching minimum levels of 1.2% and 1.3% in 2022–2023. In the 31–60 days category, stabilization within 0.5–1.2% is also noted, except in 2016 (3.3%). Overdue loans of 61–90 days are decreasing from 3.4% in 2013 to 0.2% in 2023. The category over 90 days remains the most problematic, despite the positive dynamics: from 23.9% in 2013 to 3.9% in 2023. Short-term overdue loans remain

manageable, and the reduction in debts over 90 days indicates an improvement in loan servicing discipline.

A comparison of SME_GOOD and total overdue loans highlights the opposite trends. During periods of high SME_GOOD, the share of problem loans, especially long-term ones, decreases. The sharpest gap is observed in 2023, with 94.2% against a total of 5.8% for all categories of overdue loans. Such dynamics indicate a qualitative improvement in the SME portfolio, as well as a gradual recovery after the crisis years of 2017-2018.

The sharp deterioration in 2017–2018 was mainly due to macroeconomic shocks. Such problems include events resulting from the devaluation of the national currency and the rise of inflation. In particular, it is worth noting the tightening of the credit policy of the banking sector, when the share of loans without delinquency fell to critically low levels - 4.4% in 2017 and 8.6% in 2018. The situation began to stabilize only after 2019, which was

facilitated by government support programs and the normalization of monetary policy.

The increase in the share of loans with no overdue payments and the reduction in debts over 90 days indicate a decrease in risk for both banks and borrowers. Moreover, an improvement is also caused by improved access to credit resources for SMEs, especially with stable credit, which helps to reduce rates and expand credit limits. A decrease in overdue payments indicates a strengthening of enterprises' solvency, which increases their investment attractiveness.

From the state's perspective, an improvement in the structure of the SME loan portfolio reflects the effectiveness of measures to provide financial support and reduce barriers to borrowing. A high share of high-quality loans minimizes the burden on the guarantee system and contributes to the stability of the banking system. Thus, loans remain a profitable instrument provided there is a stable macroeconomic environment and adequate financial discipline.

Although the structure of the SME portfolio by types of debt at first glance demonstrates positive dynamics, an additional check of the total debt burden is required through the overdue debt index, which reflects the total level of credit risks (Figure 1).
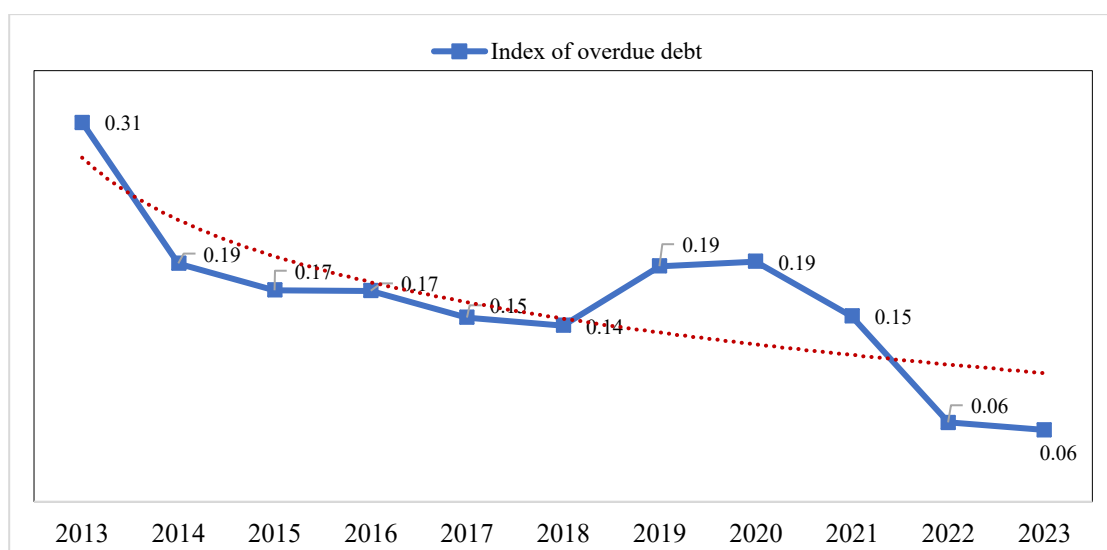

FIGURE 1. Dynamics of the SME loan overdue debt index for 2013-2023

The overdue debt index has been steadily declining from 2013 to 2023, from 0.31 to 0.06, indicating a consistent reduction in the share of problem loans within the SME loan portfolio. An average reduction of 0.02-0.025 points every two years suggests a stable positive trend. The temporary increase in the index to 0.19 in 2019-2020 revealed a short-term escalation of financial risks, presumably related to external economic conditions. The growth of the overdue debt index in 2019-2020 was associated not only with internal changes in credit policy, but also with external factors. Restrictive measures introduced during the COVID-19 pandemic led to a decline in business activity and a reduction in enterprise income, thereby increasing the risk of non-payment. Additional pressure was caused by currency fluctuations and an increase in debt servicing costs due to macroeconomic instability. Ultimately, it led to short-term deterioration in the quality of the SME portfolio. A return to the minimum values of 0.06 in 2022-2023 confirms the restoration of solvency and reinforces the risk reduction trend. Consequently, small and medium-sized businesses are characterised by a more stable financial position, which ensures timely

repayment of debt and reduces the level of credit risk.

Additionally, the debt sustainability characteristics of SMEs can be revealed by the sustainability ratio, which reflects the ratio of non-performing loans and debt with a term of over 60 days (Figure 2).
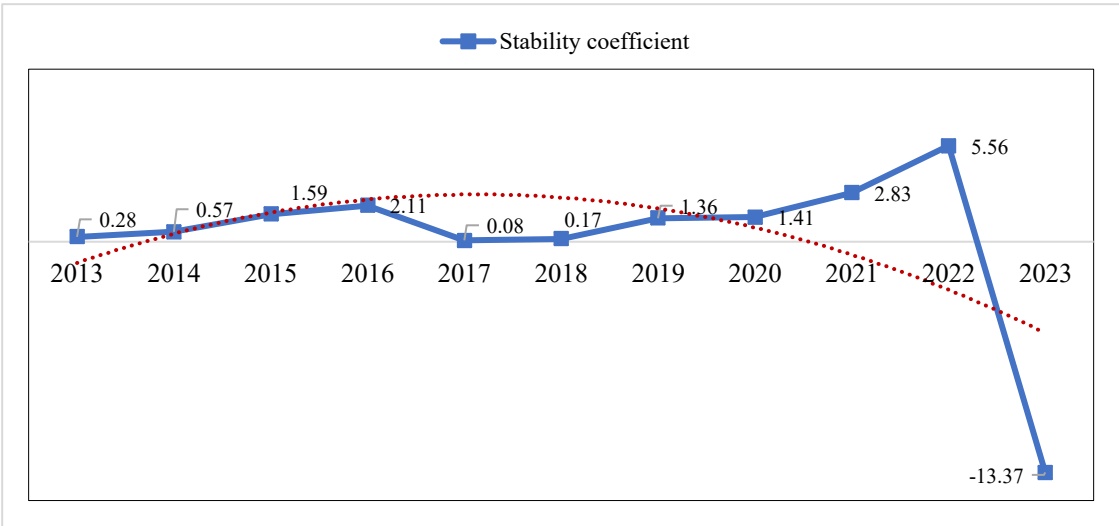

FIGURE 2. SME loan stability coefficient for 2013-2023

The sustainability ratio in 2013 was 0.28, which showed predominance of overdue debts over non-overdue debts. Between 2014 and 2016, the ratio significantly strengthened to 2.11. Thus, the loan portfolio's structure improved. In 2017, there was a sharp decline to 0.08, indicating a violation of the ratio between reliable and problem loans. Since 2019, the ratio has consistently exceeded one, confirming a more stable balance in favor of non-overdue loans. In 2013, the volume of provisions for SME loans reached 4.598 billion tenge, which reflects a strict risk assessment at the beginning of the period.

From 2014 to 2016, there was a sharp decrease in the level of reserves, with further fluctuations (1,600-2,200 billion tenge), as shown in Figure 3.
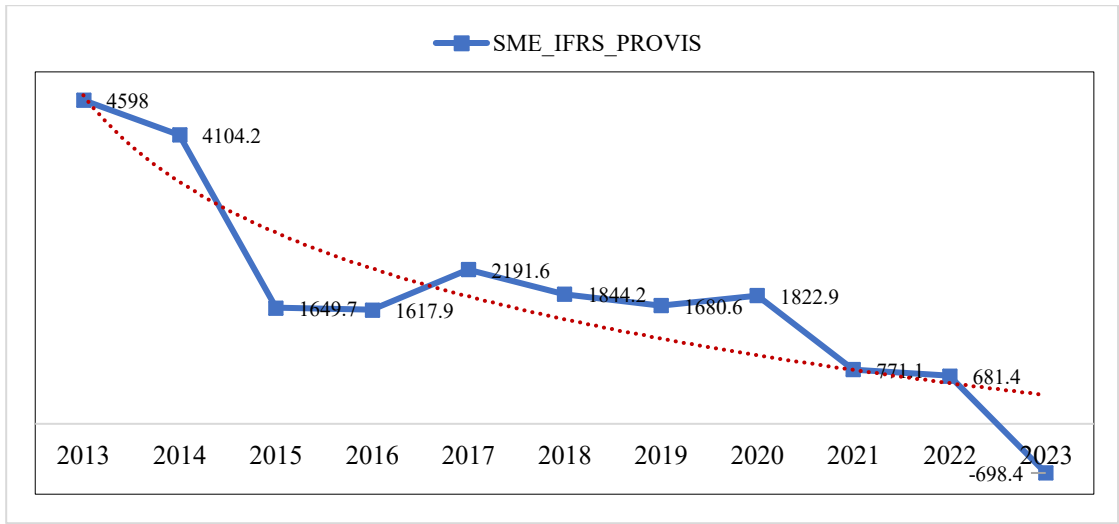

FIGURE 3. Dynamics of IFRS-Based provisions for SME loans for 2013-2023, in billion KZT

Since 2020, a gradual decline began, reaching 681.4 billion tenge in 2022. In 2023, the indicator became negative (-698.4 billion tenge), indicating the restoration of previously created reserves or the write-off of liabilities that do not carry risk. Overall, there was a decrease in the level of expected losses and a change in approaches to assessing the quality of the loan portfolio. That is, banks have become less afraid that SME loans will not be repaid. At the beginning of the period, they created huge reserves, that is, they set aside money in case the business was unable to repay the debt. Gradually, these reserves decreased because the risk level decreased. In 2023, banks even returned some of these reserves because they believed that the risks were no longer relevant. SMEs became more reliable borrowers, and banks began to evaluate them more stably and confidently.

To identify periods with different levels of credit risk in the SME sector, a cluster analysis was conducted using calculated indicators that covered portfolio structure, overdue debt, stability ratio, and volume of provisions. The optimal number of clusters was determined using the GAP statistics method, the results of which are presented in Figure 4.
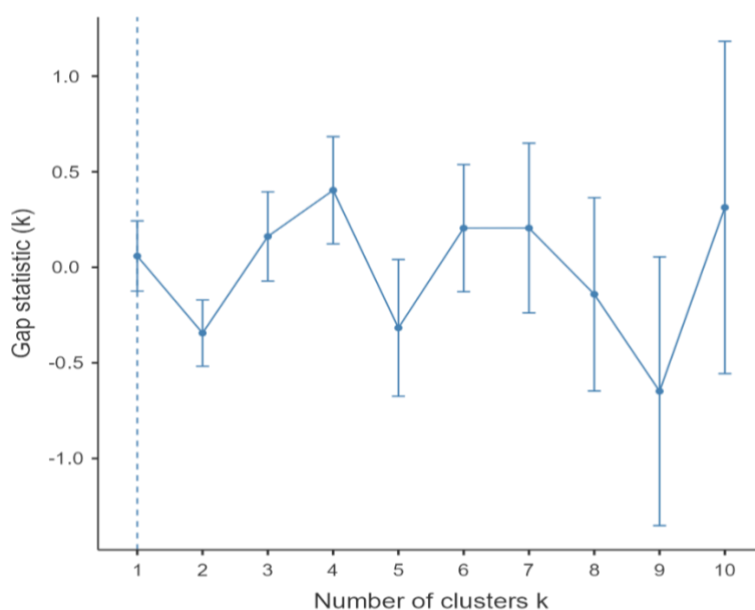

FIGURE 4. Gap statistic for determining the optimal number of clusters

Based on the analysis of the GAP statistics values, the optimal number of clusters is considered to be the one that shows the most significant increase in intercluster dispersion compared to a random distribution. Despite the presence of local maxima at $k = 4$ and $k = 7$, a stable increase at $k = 2$ allows identifying two large groups of observations with clear internal consistency.

Further details of the distribution of years across clusters and the assessment of intra- and inter-group dispersion are given in the summary table of the cluster analysis results (Table 3).

The first cluster comprises two years with sharply different characteristics of the loan portfolio, as reflected in the extremely low value of intra-cluster dispersion (122 thousand). The second cluster encompasses the main period, characterized by a moderate risk level and stable characteristics, with an intra-cluster sum of squares of 6.4 million. The significant excess of inter-cluster dispersion (15.4 million) over intra-cluster dispersion indicates a high degree of difference between

TABLE 3. Results of cluster analysis of SME loan quality indicators

Cluster number	Count	Within-cluster sum of squares
1	2	122,027
2	9	6,400,000
Between-cluster dispersion	–	15,400,000
Total	11	21,900,000

Note: compiled by the authors according to calculations

the identified groups and the justification of cluster segmentation 4 million). Over intra-cluster dispersion suggests a high degree of difference between the identified groups, justifying cluster segmentation.

The characteristics of each of the two clusters are refined based on the average values of the key indicators presented in the centroid table (Table 4).

TABLE 4. Centroid clusters

Cluster	SME_IFRS_PROVIS	SME_GOOD	SME_OVERDUE_90PLUS	IOD	SC
1	4351.100	74.930	19.305	0.251	0.425
2	1284.556	68.090	9.537	0.144	0.193

Note: compiled based on calculations

The centroid values reflect the average characteristics of each cluster for five indicators. The first cluster has the highest level of provisions (4,351.1 billion tenge), an increased share of non-performing loans (74.93%), and a high burden of overdue loans over 90 days (19.31%). The overdue debt index (0.251) and the sustainability coefficient (0.425) also exceed the values of the second cluster, indicating a tense and unstable structure of the loan portfolio.

In the second cluster, the average values are significantly lower for all indicators: the volume of reserves is 1,284.56 billion tenge, the share of non-performing loans is 68.09%, and overdue loans over 90 days are 9.54%. The overdue debt index has been reduced to 0.144, and the sustainability coefficient has been reduced to 0.193. Thus, the second cluster characterizes a balanced lending model with a more favorable structure and a decreased level of risk.

The results of the analysis confirmed the provisions of the literature in several respects. The decrease in the share of overdue loans, especially in the segment over 90 days, and the increase in the share of high-quality loans are consistent with the findings of Duarte et al.

(2018) on the importance of resilience to financial shocks in reducing the risk of defaults. The dynamics of IFRS reserves reflect changes in approaches to loss assessment, which correspond to the provisions of Novotny-Farkas (2016) and Schutte et al. (2020) regarding the role of reserves in risk management. The identification of clusters with different degrees of credit vulnerability confirms the need for differentiated portfolio assessment, as proposed by Breuer et al. (2012) and Buncic & Melecky (2013) in the framework of stress testing and macroprudential analysis. The decrease in the overdue loan index and the increase in the resilience ratio are also consistent with the approaches of Weber et al. (2010) and Höck et al. (2020), focusing on the structural aspects of portfolio sustainability. The results reflect the same patterns as in several previous studies, which confirm the validity of the chosen indicators and the reliability of the conclusions drawn.

At the same time, Kazakhstan's results can be compared with international practices. For example, in Singapore, the share of SME loans exceeded 90% of the portfolio after the introduction of targeted state-backed credit

guarantees, which resulted in a sharp decline in non-performing loans to below 5%. In the United Kingdom, there is a government-backed guarantee scheme (Enterprise Finance Guarantee), where the state assumes part of the risks on SME loans. Thanks to such schemes, banks could continue lending even during the crisis, and the default rate was maintained at about 6-7%. According to the OECD (2023), in developed countries, measures such as easing reserve requirements, preferential lending, and portfolio diversification have enabled the stabilisation of overdue SME loans at a rate of 3-6%. In Kazakhstan, as the results of the analysis showed, there was a reduction in the share of SME loans overdue by more than 90 days from 23.9% in 2013 to 3.9% in 2023. This indicates a convergence with international practice, i.e., achieving levels typical for OECD countries, although the trajectory was more volatile (particularly during the 2017–2018 crisis).

Fluctuations in the dynamics of the quality of the SME loan portfolio were mainly due to the impact of macroeconomic factors. The period from 2017 to 2018 was characterised by devaluation processes and rising inflation, which increased the debt burden of enterprises and led to a deterioration in payment discipline. In 2019-2020, the situation was complicated by the impact of the COVID-19 pandemic, as the introduction of restrictive measures and a reduction in business activity led to an increase in overdue debt and a need to increase reserves. Currency fluctuations and changes in regulatory policy additionally affected the stability of the loan portfolio, increasing the differences between clusters. Thus, the identified differences in stability and risks reflect not only the internal characteristics of SMEs, but also external shocks that had a significant impact on the availability and quality of debt financing.

Based on the conducted analysis and the identified patterns of SME credit risk, a set of policy recommendations for regulators and banks is proposed and summarized in Table 5.

TABLE 5. Policy recommendations for SME lending stability

Area	Recommendation	Target group	Expected effect	Supporting literature
Dynamic provisioning (IFRS 9)	Refine forward-looking ECL methodologies and macro-scenarios	Regulator, banks	More accurate loss estimation, smoother cycles	Novotny-Farkas (2016)
Counter-cyclical measures	Flexible adjustment of reserve requirements and buffers during crisis years	Regulator	Sustaining SME lending under shocks	Duarte et al. (2018)
Stress testing and early warning	Regular SME portfolio stress tests; cluster-based monitoring of risk phases	Banks, regulator	Early detection of instability	Breuer et al. (2012)
Portfolio diversification	Sectoral and borrower concentration limits; portfolio rebalancing	Banks	Reduced sensitivity to external shocks	Shim (2019)
Guarantee mechanisms	Expand state guarantees and recognize alternative collateral	Government, regulator	Improved SME access to loans	Beck (2013)
Liquidity and refinancing	Refinancing lines for SME portfolios in local currency, including crisis instruments	Regulator, development institutions	Stabilization of lending volumes, lower defaults	Em et al. (2022)
Expansion of instruments	Promote leasing, factoring, venture, and angel financing	Government, regulator	Lower transaction costs, wider financing options	Abbasi et al. (2017)

Digital transparency	Introduce e-KYC, e-invoicing, open banking, and digital scoring	Banks, fintech	Reduced information asymmetry, improved credit risk assessment	Kumar et al. (2023)
ESG integration	Incorporate sustainability into PD/LGD; provide preferences to "green" SMEs	Banks, regulator	Lower default probability, sustainable growth	Höck et al. (2020)
SME financial readiness	Strengthen reporting standards, credit histories, and financial planning skills	Government, banks	Improved portfolio quality	Chowdhury & Alam (2017)

Note: compiled by the authors

The proposed measures aim at reducing the vulnerability of the SME loan portfolio by creating a more stable financial environment. Creating conditions for sustainable lending during periods of instability and ensuring a balance between risk management requirements and the strategic objectives of long-term economic development are significant. The implementation of these measures will not only mitigate the effects of macroeconomic shocks through the use of countercyclical reserve requirements, stress testing, and refinancing programs, but also increase the availability of financing through the expansion of guarantee instruments, the development of alternative lending forms, and digital monitoring platforms. In this way, sustainable SME lending can be maintained alongside an effective balance between banking risk management and long-term economic development goals.

5. CONCLUSION

The assessment of SME lending quality showed that the credit portfolio developed unevenly, with periods of instability followed by partial recovery. While the share of non-overdue loans increased and provisions declined, imbalances in the structure of overdue debt and fluctuations in the stability coefficient persisted. However, the stability of credit dynamics remained irregular, with periods of imbalance between timely repayments and long-term overdue debt. At the same time, specific structural imbalances persisted, particularly in the relationship between high-risk exposures and the quality of loan servicing. The most significant vulnerabilities were associated with the concentration of overdue debt and declines in the stability ratio during individual periods.

The analysis of the quality of the SME loan portfolio in Kazakhstan for 2013-2023 allowed us to obtain a number of significant results.

Firstly, the IOD has shown a steady downward trend, which confirms a reduction in credit risks. At the same time, the SC has consistently exceeded one since 2019, reflecting the predominance of "high-quality" loans over problem loans. These results correspond to international studies and confirm the correctness of the selected indicators for assessing the quality of the loan portfolio.

Secondly, the use of cluster analysis made it possible to identify hidden phases of instability that were not recorded when using only descriptive indicators. Segmentation of the years into stable and crisis periods showed that the crisis of 2017-2018 was abnormal in terms of credit risks, while in other years the SME portfolio showed a tendency to recover. This approach is an element of scientific novelty, as it allows us to differentiate periods according to the degree of vulnerability of the loan portfolio and complements traditional assessment methods.

Thirdly, the results of the study indicate a gradual strengthening of the quality of the SME loan portfolio in Kazakhstan, a reduction in credit risks and an increase in the sustainability of the sector. The findings have practical significance: they can be used by banks in improving risk management systems, as well as

by government agencies in developing SME support programs and macroprudential regulation tools.

To improve the sustainability of SME lending, measures have been proposed that can be grouped into three areas. First, macroprudential instruments: the introduction of countercyclical reserve requirements and regular stress testing of SME portfolios. Second, based on the expansion of financial support and resource availability, such as government guarantees or alternative financing options. Third, digitalization and risk monitoring through digital platforms for borrower analysis and early detection of problem debt. Future studies could focus on ESG factors and the level of digitalization of enterprises in credit risk assessment models, as well as comparative cross-country studies to identify adaptive policies in the context of regional differences.

AUTHOR CONTRIBUTION

Writing – original draft: Aizada Seisenbayeva, Nazira Gumar, Urazgul Dzhakisheva.
Conceptualization: Aizada Seisenbayeva, Nurgul Pernebekkyzy, Urazgul Dzhakisheva.
Formal analysis and investigation: Nazira Gumar, Nurzhanat Sherimova, Nurgul Pernebekkyzy.
Funding acquisition and research administration: Aizada Seisenbayeva, Nazira Gumar, Nurzhanat Sherimova, Urazgul Dzhakisheva.
Development of research methodology: Aizada Seisenbayeva, Nurgul Pernebekkyzy.
Resources: Nazira Gumar, Urazgul Dzhakisheva.
Software and supervisions: Nurgul Pernebekkyzy.
Data collection, analysis and interpretation: Nurgul Pernebekkyzy, Urazgul Dzhakisheva.
Visualization: Aizada Seisenbayeva, Nazira Gumar, Urazgul Dzhakisheva.
Writing review and editing research: Aizada Seisenbayeva, Nurzhanat Sherimova, Nurgul Pernebekkyzy.

REFERENCES

Abakirov, M.A., Abakirov, S., Avazov, E., Baialieva, E., Kazieva, M., Kurmankojoeva, R., & Mamytova, E. (2019). Special aspects of IFRS 9 application by credit guarantee funds in developing countries. *Reforma, 2*(82), 46-60.

Abbasi, W. A., Wang, Z., & Abbasi, D. A. (2017). Potential sources of financing for small and medium enterprises (SMEs) and role of government in supporting SMEs. *Journal of Small Business and Entrepreneurship Development, 5*(2), 39-47. https://doi.org/10.15640/jsbed.v5n2a4

Beck, T. (2013). Bank financing for SMEs–lessons from the literature. *National institute economic review, 225*(1), R23-R38. https://doi.org/10.1177/002795011322500105

Beenstock, M. (2025). Evaluating Subsidized Credit Policy in Kazakhstan with SME and Spatial Panel Data: First-and Second-Best Policy. *Comparative Economic Studies*, 1-29. https://doi.org/10.1057/s41294-025-00257-1

Berger, A. N., & Udell, G. F. (2006). A more complete conceptual framework for SME finance. *Journal of Banking & Finance, 30*(11), 2945-2966. https://doi.org/10.1016/j.jbankfin.2006.05.008

Breuer, T., Jandačka, M., Mencía, J., & Summer, M. (2012). A systematic approach to multi-period stress testing of portfolio credit risk. *Journal of Banking & Finance, 36*(2), 332-340. https://doi.org/10.1016/j.jbankfin.2011.07.009

Buncic, D., & Melecky, M. (2013). Macroprudential stress testing of credit risk: a practical approach for policy makers. *Journal of Financial Stability, 9*(3), 347-370. https://doi.org/10.1016/j.jfs.2012.11.003

Calabrese, R., Girardone, C., & Sclip, A. (2020). Financial fragmentation and SMEs' access to finance. *Small Business Economics, 57*(4), 2041-2065. https://doi.org/10.1007/s11187-020-00393-1

Chowdhury, M., & Alam, Z. (2017). Factors affecting access to finance of small and medium enterprises (SMEs) of Bangladesh. *USV Annals of Economics and Public Administration, 2*(26), 55.

Department for Business and Trade. (2023). SME Digital Adoption Taskforce: Summary of interim report. Retrieved July 30, 2025 from https://www.gov.uk/government/publications/sme-digital-adoption-taskforce-interim-report/sme-digital-adoption-taskforce-summary-of-interim-report

Dietsch, M., & Petey, J. (2002). The credit risk in SME loans portfolios: Modeling issues, pricing, and capital requirements. *Journal of Banking & Finance, 26*(2-3), 303-322. https://doi.org/10.1016/S0378-4266(01)00224-2

Duarte, F. D., Gama, A. P. M., & Gulamhussen, M. A. (2018). Defaults in bank loans to SMEs during the financial crisis. *Small Business Economics, 51*(3), 591-608. https://doi.org/10.1007/s11187-017-9944-9

Em, O., Georgiev, G., Radukanov, S., & Petrova, M. (2022). Assessing the market risk on the government debt of kazakhstan and bulgaria in conditions of turbulence. *Risks, 10*(5), 93. https://doi.org/10.3390/risks10050093

Höck, A., Klein, C., Landau, A., & Zwergel, B. (2020). The effect of environmental sustainability on credit risk. *Journal of Asset Management, 21*(2), 85-93. https://doi.org/10.1057/s41260-020-00155-4

Hossain, M., Yoshino, N., & Tsubota, K. (2023). Sustainable financing strategies for the SMEs: Two alternative models. *Sustainability, 15*(11), 8488. https://doi.org/10.3390/su15118488

IMDA. (2023). SMEs Go Digital. Government of Singapore. Retrieved July 30, 2025 from https://www.imda.gov.sg/how-we-can-help/smes-go-digital

Karybay, S., & Zhussupov, A. (2024). The Effects of Regulatory Restrictions on the Financial and Credit System of Kazakhstan. *WSEAS Transactions on Business and Economics, 21*, 2769-2780. https://doi.org/10.37394/23207.2024.21.226

Kumar, D., Phani, B. V., Chilamkurti, N., Saurabh, S., & Ratten, V. (2023). Filling the SME credit gap: a systematic review of blockchain-based SME finance literature. *Journal of trade science, 11*(2/3), 45-72. https://doi.org/10.1108/JTS-06-2023-0003

Lambekova, A. N., Temirbekova, L. A., & Syzdykova, E. Z. (2020). Internal audit of banks: methodological model for reducing credit risk (Logit model). *Buketov Business Review, 97*(1), 66-74. https://doi.org/10.31489/2020ec1/66-74

Novotny-Farkas, Z. (2016). The interaction of the IFRS 9 expected loss approach with supervisory rules and implications for financial stability. *Accounting in Europe, 13*(2), 197-227. https://doi.org/10.1080/17449480.2016.1210180

Nizaeva, M., & Coskun, A. (2021). Determinants of the financial constraint and its effects on the SME growth in Central Asia. *Eurasian Journal of Business and Economics, 14*(27), 1-28. https://doi.org/10.17015/ejbe.2021.027.01

Nurpeissova, M., Saimagambetova, G., Omarova, A., Saubetova, B., & Baishukurova, Z. (2025). Kazakhstan's Banking Sector: Between Domestic Regulation and Macroeconomic Trends. *Eurasian Journal of Economic and Business Studies*, *69*(1), 64-80. https://doi.org/10.47703/ejebs.v69i1.464

OECD. (2023). Digitalisation of SMEs. Organisation for Economic Co-operation and Development. Retrieved July 30, 2025 from https://www.oecd.org/en/topics/digitalisation-of-smes.html

Osano, H. M., & Languitone, H. (2016). Factors influencing access to finance by SMEs in Mozambique: case of SMEs in Maputo central business district. *Journal of innovation and entrepreneurship, 5*(1), 13. https://doi.org/10.1186/s13731-016-0041-0

Resende, M., Carvalho, C., & Carmo, C. (2024). Impacts of the expected credit loss model on pro-cyclicality, earnings management, and equity management in the Portuguese banking sector. *Journal of Risk and Financial Management*, *17*(3), 112. https://doi.org/10.3390/jrfm17030112

Shim, J. (2019). Loan portfolio diversification, market structure and bank stability. *Journal of Banking & Finance, 104*, 103-115. https://doi.org/10.1016/j.jbankfin.2019.04.006

Schutte, W. D., Verster, T., Doody, D., Raubenheimer, H., & Coetzee, P. J. (2020). A proposed benchmark model using a modularised approach to calculate IFRS 9 expected credit loss. *Cogent Economics & Finance, 8*(1), 1735681. https://doi.org/10.1080/23322039.2020.1735681

Weber, O., Scholz, R. W., & Michalik, G. (2010). Incorporating sustainability criteria into credit risk management. *Business strategy and the environment, 19*(1), 39-50. https://doi.org/10.1002/bse.636

Zaitenova, N., & Abzhalelova, S. (2025). Assessment of Bank Profitability through Structural Indicators: Evidence from Kazakhstan. *Eurasian Journal of Economic and Business Studies, 69*(2), 79-94. https://doi.org/10.47703/ejebs.v69i2.514

AUTHOR BIOGRAPHIES

Aizada Seisenbayeva – Doctoral student, Caspian Public University, Almaty, Kazakhstan. Email: aizada2023s@proton.me, ORCID ID: https://orcid.org/0000-0002-4084-6735

Nazira Gumar – Cand. Sc. (Econ.), Associate Professor, Almaty Technological University, Almaty, Kazakhstan. Email: gumnaz@mail.ru, ORCID ID: https://orcid.org/0000-0001-7516-899X

Nurzhanat Sherimova – PhD, Professor, Toraighyrov University, Pavlodar, Kazakhstan. Email: asanek2010@mail.ru, ORCID ID: https://orcid.org/0000-0003-4482-8531

*Nurgul Pernebekkyzy – PhD, Associate Professor, Caspian University of Technology and Engineering named after Sh. Yessenov, Aktau, Kazakhstan. Email: tnurgul888@gmail.com, ORCID ID: https://orcid.org/0009-0008-6842-7824

Urazgul Dzhakisheva – PhD, Associate Professor, Abai Kazakh National Pedagogical University, Sorbonne-Kazakhstan Institute, Almaty, Kazakhstan. Email: symbat_201176@mail.ru, ORCID ID: https://orcid.org/0000-0002-2918-6318