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BANK RISK EVALUATION THROUGH Z-SCORE MEASURE AND ITS EFFECT ON FINANCIAL HEALTH OF THE INDUSTRY OF TRANSITIONAL ECONOMY OF KAZAKHSTAN

Studying the systematic risk of the banking industry, as a measure of the financial stability, is one of the options to evaluate how strong is the overall industry's standings against the systematic risk itself. There are number of studies in related areas for both developed and developing markets. This study is the part of the overall examination of the banking industry performance for the developing transitional economies. With the help of the risk evaluation through the measure of Z-score, we are trying to evaluate the financial health of the institutions and as a whole the industry. This will let us explore the financial standings and the performance of the particular market. The other point is that the examination covers the post-financial crisis period with the certain macroeconomic fluctuations of the endogenous to the industry problems such as devaluation in-between the study coverage timeframe. These impacting factors help us understand the effect of both external and internal shocks affecting the banking industry. The relationship between the financial stability and the overall profitability, as a risk and return relationship with the effects of external factors like crisis and internal macroeconomic shocks as devaluation is the core point of the interest of this particular study. The findings suggest that the size of the bank plays important but negative role in the way bank behaves. It negatively affects the financial health of the bank industry. Overall, the financial stability is very unstable; as the fluctuations of the Z-score over the period of examination is significant, stating only that the transitional economy is very much vulnerable towards both internal and external risks.

Key words: Bank Performance, Bank Risks, Bank Growth, Z-score, Transitional economy.

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Z-индикаторын қолдану арқылы банктік тәуекелділікті бағалау және оның Қазақстанның өтпелі экономикасының қаржылық жағдайына әсері

Қаржылық тұрақтылықтың өлшемі ретінде банк саласының жүйелік тәуекелін зерттеу жалпы саланың жүйелік тәуекелге қарсы тұруының қаншалықты берік екендігін бағалау нұсқаларының бірі болып табылады. Дамыған және дамушы нарықтар үшін бірқатар бағыттар бойынша зерттеулер бар. Бұл зерттеу дамушы өтпелі экономикалы елдер үшін банк саласының жұмысына жалпы сараптама бөлігі болып табылады. Z-score өлшемі арқылы тәуекелдерді бағалау көмегімен біз мекемелердің және жалпы саланың қаржылық жағдайын бағалауға тырысамыз. Бұл бізге қаржылық жағдайды және нақты нарықтың көрсеткіштерін зерттеуге мүмкіндік береді. Тағы бір ескеретін жайт, сараптама қаржылық дағдарыстан кейінгі кезеңді, саладағы проблемаларға белгілі бір макроэкономикалық ауытқулармен, мысалы, оқу мерзімінің арасындағы девальвациямен байланысты. Бұл әсер ететін факторлар бізге сыртқы және ішкі күйзелістердің банк саласына әсерін түсінуге көмектеседі. Қаржылық тұрақтылық пен жалпы кірістіліктің, тәуекел және сыртқы факторлардың әсерінен дағдарыс және ішкі макроэкономикалық күйзелістердің әсерімен байланысы – бұл нақты зерттеу қызығушылығының негізгі нүктесі. Зерттеу нәтижелері банктің мөлшері банктің іс-әрекетінде маңызды, бірақ теріс рөл атқаратындығын көрсетеді. Бұл банк саласының қаржылық жағдайына теріс әсер етеді. Жалпы, қаржылық тұрақтылық өте тұрақсыз; өйткені Z-score өзгеруі тексеру кезеңінде маңызды болып табылады, бұл өтпелі экономика ішкі және сыртқы тәуекелдерге өте осал екендігін көрсетеді.

Түйін сөздер: банктің тиімділігі, банктік тәуекелдер, банктің өсуі, Z-score, өтпелі экономика.

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Оценка банковского риска с помощью Z-показателя и его влияние на финансовое состояние отрасли переходной экономики Казахстана

Изучение систематического риска банковской отрасли как меры финансовой устойчивости является одним из вариантов оценки того, насколько сильны позиции отрасли в целом по отношению к самому систематическому риску. Есть ряд исследований в смежных областях как для развитых, так и для развивающихся рынков. Это исследование является частью общего исследования эффективности банковской индустрии в развивающихся странах с переходной экономикой. С помощью оценки риска посредством измерения Z-показателя мы пытаемся оценить финансовое состояние учреждений и отрасли в целом. Это позволит нам изучить финансовые показатели и показатели конкретного рынка. Другой момент заключается в том, что исследование охватывает период после финансового кризиса с определенными макроэкономическими колебаниями эндогенных для отрасли проблем, таких как девальвация между периодами охвата исследования. Эти влияющие факторы помогают нам понять влияние внешних и внутренних потрясений, влияющих на банковскую индустрию. Взаимосвязь между финансовой стабильностью и общей прибыльностью, как отношение риска и доходности с влиянием внешних факторов, таких как кризис и внутренние макроэкономические шоки, как девальвация, является ключевой точкой интереса данного конкретного исследования. Результаты показывают, что размер банка играет важную, но отрицательную роль в поведении банка. Это негативно сказывается на финансовом состоянии банковской индустрии. В целом, финансовая стабильность очень нестабильна; поскольку колебания Z-показателя в течение периода исследования значительны, указывается лишь то, что переходная экономика очень сильно уязвима как к внутренним, так и к внешним рискам.

Ключевые слова: банковская деятельность, банковские риски, рост банка, Z-score, транзитная экономика.

Introduction

Economies in transition were always of high interest for the investors and overall worldwide business community (Allen et al., 2013). The reasoning behind the statement is in the opportunities that developed economies see in the new fertile lands. Most of these opportunities occur to be risky and, as a result, have the return rates higher than in the developed markets. The developed economies never stop searching and targeting the new markets. However, majority of the planned economies are usually blocked or partially unreachable to the outside business opportunities. These opportunities are then lost for both of the parties. However, during the later few decades, the changes took place in many of the countries previously blocked (Haselmann et al., 2016). The collapse of the Soviet Union and the transition from planned to market economy in some countries opened up the frontiers and the investors from the entire world streamed into these new lands. The allocation of funds as almost everything else is under the control of the central apparatus in the planned economy countries (Iannotta et al., 2012). This makes the business orientation of the financial institutions in these countries useless. Generally, financial institutions like banks play the role of the

engines that are just allocating the funds agreed beforehand with the central government. Hence, the option of the financial intermediaries as obviously the market economy opportunities is not at all the case for these economies as stated by Stiglitz (1994). Nowadays, it is almost thirty years since the collapse of the Soviet Union and our interest now lies in the study of how these planned economy countries reacted to the changes in the financial aspect.

Broadly, we concentrate on the examination of the banking industry financial health in the developing market of the transitional economies. We study the opportunities, or as we may call them risks in the view of financial stability and how these factors affect the performance of the whole banking industry. The one feature of the developing markets is the privileged role of the bank. This view is reasonable, as the other institutional options are mostly not available in majority of the transitional economies, as their financial market development is low. Hence, to study the development of the financial streams in transitional markets can be no better than through the study of banking industry.

Our core interest in this particular study is the examination of financial performance and the financial stability of the banking industry of the transitional economy of Kazakhstan. We study

the effects of different outside shocks such as the financial crisis and inner macroeconomic challenges like devaluation and their effect on the risk and return of the industry. We cover the local features of the market and therefore include the country specific and industry specific variables into examination. Our hypothesis is that the financial stability (risk) is low when the outside macroeconomic challenges take place and the performance is negatively affected by the same challenges. Additionally, our interest is to study which particular risks are significantly affecting the performance in a negative way and which of them, the other way around, are creating the opportunities.

We use accounting measures of return on assets and different profitability margins to evaluate the effect of financial health of banking sector. Following the literature, the risk is evaluated by financial stability, Z-score.

Background

The transitional banking industry of Kazakhstan has now been experiencing almost thirty years of independent and a fluctuate history of banking. The industry, common to planned economy standards, has two-tiered banking system, with the regulator at the first line and all the other banks in the second. In the early stages of the transition, the banking practice has not been significantly different compared to the one in a planned economy. However, the outside hits as the financial, Asian and Russian ruble crisis drove out significant number of weak institutions from the market. The number of financial institutions decreased significantly from around 200 to 30 banks Pak (2017), and that is in general a positive signal. To make the industry prosper, many international norms and standards like Basel III (Basel Committee on Banking Supervision) have been applied.

In this paper, we use ROA as a measure of performance. The usage of ROA helps define the level of operational performance and it is convenient to cross compare the results of the findings with previous studies. Another measure that is suggested by Abdullah et al. (2014) is Net Interest Margin (NIM), which covers the spread of the interest costs and revenues. The volume of spread directly affects the funding strategy decision-making done by the managers of the banks. As for the risk, we evaluate it through the risk stability measure of the Z-score.

Previous studies mostly examined the periods before the crisis or after it. We contribute to the literature through the evaluation of the risk and return measures of the transitional economy of Kazakhstan both during and afterwards the crisis period. We

evaluate Kazakhstani banking industry performance and risk incorporating crisis and devaluation.

This paper is organized as follows: Section 2 presents the literature review. Section 3 describes data and descriptive statistics. Section 4 explains the methodology applied. Section 5 outlines the findings. Section 6 concludes.

Literature review

Existing literature, both theoretical and empirical, states that there is a strong relationship between the financial health and financial stability of the bank industry. We examine several factors and outline them in the next four sections. Our choice stays with four the most significant performance affecting factors such as assets, profitability, funding and regulation.

Assets composition to bank performance

The first strand in the literature links bank performance to the asset composition. The examination of the poor performance as a result of the assets that mainly consist of the part of the liabilities (deposits) was studied by Fahlenbrach et al. (2016). The findings of the study suggest that this type of the assets composition needs to be supported by the higher portion of the loan loss reserves (LLP). The expected ratio is to be calculated with respect to the loan growth amount. Following previous studies, we can conclude that the main factor contributing to the low performance as a result of the loan growth development strategy is the inability of the managers of these banks to properly evaluate the extent of this loan growth, therefore, as a result they cannot properly evaluate the risk either. The risk taking attitude through the impact of competition has been examined by Mustafa and Toci (2018). They found that the competition negatively affects the European countries banks' risk taking behavior. However, for non-European counties of the region, the study suggests that the competition positively affects the risk taking behavior. Berger and Bouman (2011) examined the study of the effect of the capital on the bank performance in times of financial crisis. They have suggested that the effect of the bank performance under the expectation of capital changes (increase or decrease) would most likely be different in times of the normal and crisis times of the general economic condition. Demirguc-Kunt and Huizinga (2012) examined whether general banking system industry needs to have big banks at all. To evaluate the problem both standard and systemic size of the banks were evaluated. How does the liquidity

affects the regulatory capital has been examined by Distinguin et al. (2013). Authors considered both large and small banks, and examined how banks' behavior changes as the capital and liquidity levels increase. Chen et al. (2017) studied the effect of the liquidity risk on the performance. Based on the idea of Chen et al. (2017) and as well numberless other confirmations from the relevant literature such as Sapienza (2012) and Shleifer (1998), the liquidity can be the source for both performance enhancement and quality decrease. Hence, authors state that liquidity risk is the discount for bank profitability and as a result, that can lead to the bad performance.

The Risk effect on Profitability

Studying the risk effect on profitability, Bhagat and Bolton (2015) examined the relationship between the size and the risk-taking behavior among different financial institutions. The overall findings of the paper suggest that size increase results in increase in risk taking behavior. Strong corporate governance can optimize risk taking behavior. Diversified financial institutions such as investment banks are more risk oriented in comparison with the banks that are considered commercial banks. Mergaerts and Vennet (2015) have studied the relationship between the business models and the performance in the banking industry with an account of the risk behavior. Their main finding was that European banking business model is efficient because of its diversified approach. Saghi-Zedek (2016) pointed to the importance of the ownership structure as a source of potential risk. Author studied the question of the controlling shareholders, how control in different scenarios can affect the performance. Diversified control chain positively affects the performance. Primarily, the contributing factor is the skills of those newcomers that can contribute to better management of the general project development as suggested by the author.

Effect of funding on performance and risk

The third strand is the effect of funding on the risk and performance of the banking system. The examination of the effect of the western sanctions on the economic union seems to be only a one part of the obstacles on the way of the development for Russian economy as shown by the study of Pak and Kretzschmar (2016). Factors such as credit quality, funding, and bank ownership play important role in performance evaluation as authors stated. Nevertheless, the sanctions create substantial inconveniences in terms of capital market access. Additionally, the authors found that the local banks are having poor ongoing credit quality management

that is not contributing positively to the overall development. La Porta et al. (2000) and Micco and Panizza (2004) in their studies have been referring to the importance of the state ownership structure as one of the fundamental factors affecting the availability of the funding. Pak (2017) has studied the business drivers of bank stability in Kazakhstan. Author closely examines the effect of aggressive lending and short term wholesale effect of funding on the financial stability of the Kazakhstani banks. The findings show that the size growth has a negative effect on stability. Pak (2018) studied the impact of the state ownership and business models on the stability of the Eurasian Economic Union banks. Author suggests that ownership is the crucial criteria for the region's banks to survive during the negative exogenous effects like crude oil price decrease. In the study of the relationship between the funding structures and risk, Vazquez and Federico (2012) identified that the banks that are leveraged by the local governments are more likely to fail after the crisis. Authors suggest that regulations in the basis of the Basel III are proposed to be an optimal variant as the solution for the problem; however, the emphasis still has to be made on the improvement of the structural liquidity.

Regulation and supervision

The latest strand in the examination of transitional economies' banking industry performance is the regulation and different norms. Herner et al. (2018) examined the impact of the supervision on the level of the growth, risk taking behavior, volatility, sensitivity towards the downturns in the industry and the levels of the profitability. Authors identified that the supervised banks happen to have more benefits in comparison with the banks, which are not supervised. They state that the higher supervisory actions contribute to efficient business for the banks and make the managers behave within the interests of the company. Of course, there is an option that supervisory actions might not lead to the expected results, as the actions on the part of the supervisors can be not efficient in general. Beltratti and Stulz (2010) studied the reasons for different performance of similar banks. Stock returns of the largest banks all over the world were examined. Authors have suggested that the restrictions imposed on the banks can help them perform better. Moreover, a too much benevolence of management towards the shareholders, especially before the crisis, resulted in poor performance during the crisis itself. Additionally, they examined the effect of the regulatory factors in the banking business industry

such as implementation of the standards as Basel III and introduction of the international capital standards. Authors found no direct effect of the imposed standards and introduction of regulatory frameworks on the efficiency of the banks under examination. Laevin and Levine (2008) have studied the relationship between the risk taking behavior and regulation with particular emphasis on the ownership structure of these banks. The core idea of the authors was related to the understanding that risk regulation is strongly related to the ownership structure. Hence, the examination of the relationship between managers and the shareholders is the one we can call central to the study. Therefore, regulation as

it is can have different effect on banks depending on their corporate structure.

Data and methodology

Sample

We collected the data through local statistical agencies and resources of National Bank of Kazakhstan. To satisfy the international standards, audited accounting data with the International Financial Reporting Standards, has been acquired from Bloomberg financial resource agency. Table 1 shows the descriptive statistics of the variables that have been used in the study.

Table 1 – Kazakhstani banks, descriptive statistics, 2008- 2018 quarterly based

	Observations	Mean	Median	Maximum	Minimum	Std. Dev.
Bank risk and return						
Z-score	370	10,09	0,048	104,459	-78,469	15,417
NIM	370	0,179	0,02	8,44	-12,31	1,399
ROA	370	0,161	0,03	22,42	-29,27	3,308
Bank specific variables						
Commission	370	0,212	2,8	3,8	-6,4	9,719
Credit risk	370	0,002	0,005	0,665	-0,892	0,088
Debt to assets	370	0,202	1,03	5,6	0,3	0,163
Equity to assets	370	0,085	0,08	2,73	-4,28	2,969
Fee	370	0,312	0,316	6,455	-6,379	0,587
Investments	370	0,026	5,8	9,5	-5,4	5,485
Liquidity risk	370	0,003	0,005	0,676	-0,867	0,1
Loan growth	370	0,048	0,023	1,488	-0,579	0,141
ROE	370	0,504	0,265	19,99	-14,57	3,218
Macroeconomic variables						
GDP growth	370	0,038	0,043	0,008	-0,024	0,028
Inflation	370	0,084	0,072	0,2	0,039	0,043

Note – compiled by authors based on the data collected from Bloomberg financial resource agency

The measure for the risk, Z-score, has a mean value of 10.09. Overall suggestion is that the higher is the value of the Z-score the lower is the risk and the stronger the position of financial stability. The interesting point is that both NIM and ROA show approximately the same positive results of 17 and 16 percent, respectively. Nontraditional income generation shows that Kazakhstani banks are very much concentrated on the earnings that are not industry oriented. More than 50 percent comes from the commissions and fees. Previously, in the study

of Pak and Kreschmar (2016), it was suggested that the proportion of the non-traditional income is high for Kazakhstani banks, especially before the crisis times. As for the equity, return is quite high, most likely suggesting that the owners of the banks are directly controlling this particular measure in means to earn higher returns. This suggestion goes in line with the idea that the reformers of the political and economic tendencies in Kazakhstani financial market are the same subjects. Debt composition portion of the financial intermediary is quite

standard for the developing markets, and is not very efficient especially in Kazakhstan. This way of funding is expensive enough and suggest only one fifth of the overall composition. The findings of the macroeconomic variables in the model shows the results that are very close to the true values of the economy in the examination period. Real GDP shows an overall of 3, 8 percent growth and inflation rate is equal to 8, 4 percent.

Outcome variables

We use Z-score as a proxy of financial stability. Z-score is calculated as the sum of return of the assets and equity over assets divided by the standard deviation for every bank i at time t . Since we are covering the quarterly data, the standard deviation is calculated following the example of Delis et al. (2012) over rolling window for the calculated next three quarters.

We examine the value of the Z-score over the ten-year period from 2008 up to 2017 quarterly. The distressed years of the crisis (2008-2010) have negative signs suggesting that the financial stability was very low and overall banking industry suffered during the period. On the other hand, the level of the Z-score was quite high aftermath the crisis what is in general not as good sign as it might seem.

That kind of fluctuations suggest that the financial support was given for the survival of the distressed banks from the government and it was not the inner result of good modeling of the management or adequate business application. In general, the above figure only says that the banking industry during the period of the examination as a measure of the financial stability shows that it was very vulnerable and not consistent enough to take the blows of the changes of the macroeconomic conditions of the whole economy. Those negative signs, partially, are explained by the devaluation policies applied in the country.

Net interest margin (NIM) and return on assets utilized as determinants of the performance of the banking industry in Kazakhstan. As was stated by Abdullah et al. (2014), ROA covers the operational performance of the banks and examines the scope of the level of the assets invested by the bank. On the other hand, NIM measures the level of the spread between the interest revenues and costs. It helps management decide where from they can have the cheapest source of funding.

Variables

Table 2 shows the list of dependent and independent variables.

Table 2 – Definitions of dependent and independent variables

Variables	Measures
Bank risk and return	
Z-score	$(ROA + E/A) / \text{Standard deviation of ROA}$
NIM	Net Interest Income/Total Assets
ROA	Net Income/Total Assets
Bank specific variables	
Size	$\ln(\text{Total assets})$
Loan growth	$\text{Loan}(t) / \text{Loan}(t-1) - 1$
Credit risk	Total Loans/Total Assets
Liquidity risk	$(\text{Total Loans} - \text{Total Assets}) / \text{Total Assets}$
Investments	Trading securities as a percentage of overall investments
Fee and Commission	Non interest income/Total operating revenue
Borrowing	Debt/Assets
Macroeconomic variables	
GDP growth	$\text{GDP}(t) / \text{GDP}(t-1) - 1$
Inflation	$\text{CPI}(t) / \text{CPI}(t-1) - 1$
Crisis	Dummy variable of «1» in case of crisis and «0» otherwise
Devaluation	Dummy variable of «1» in case of devaluation and «0» otherwise
Note – compiled by authors based on the data collected from Bloomberg financial resource agency	

Most of the variables examined in the study are specific to the banking industry. Other variables such as macroeconomic factors have exogenous effect. In addition, crisis and devaluation are included into the examination that might lead to the shift of sensitivities of the variables during and after the events. Dietrich et al. (2014) suggested that in studies of performance examination, the risk must be evaluated as both a systematic and specific to the bank risk. Therefore, following Fama (1969) studies of systemic and idiosyncratic risk for the financial institutions, we include overall industry risk into analysis. Apart from that, following the study of Baghat et al. (2015), we estimate bank specific risk through liquidity examination and credit loans growth over the period of study.

Methodology

Following the previous studies of Altunbas et al. (2014), Dietrich et al. (2014) and Pak (2017) we evaluate the risk measure of the financial stability, Z-score, against specific to the industry and macroeconomic variables. The equation model goes in the next form:

$$\begin{aligned} Z\text{-score } it = & C i + B1 \text{ Size } it + B2 \text{ Loan Growth } it + \\ & + B3 \text{ Investment } it + B4 \text{ Fee and Commission } it + \\ & + B5 \text{ Borrowing } it + e \text{ } it \end{aligned} \quad (1)$$

All the variables are specific to the the bank i and to the outlined timeframe t . C stands for the intercept for bank i and error term stands for e .

Some previous studies as Pak (2017) and Dietrich et al. (2014) were using no lag effect. They have reasoned it as a simultaneous response of the managers to the increased level of risk. However, this can lead to the endogeneity problem of the variables. Hence, we opt to use the lagged variables for right hand side of the equation. There are number of different criterion for choosing optimal length for lags such as Akaike Information Criterion (AIC), Root Mean Square Error and Hannan-Quinn (HQ) criterion. The function for the criteria selection differs and therefore can lead to conflicting results. The number of observations in the study permits us to apply any of the above-mentioned criterion selection (Konishi and Kitagawa, 2008). Both Akaike and Schwarz information criterions of the VAR order selection suggests taking at least one lag. In addition, it always the case that bank operates in the conditions of where the industry is heavily affected by the macroeconomic events, if they take place. In our case, we consider both crisis and devaluation effects. Over the latest two decades, Kazakhstan has experienced two devaluations that was allowed

by the National bank. Despite the fact that previous devaluations were more severe, these two were significant as well with currency devaluation percentages of 24 and 19, respectively. We use dummy variable to account for macroeconomic shocks in the model. Devaluation effect account for the first two quarters of year 2009 and after year 2014 for another two years. Crisis years take the value of "1" all quarters for the years 2008, 2009 and 2010 and "0" otherwise. As was suggested by Pak (2017), crisis years are taken based on the start of default of the Lehman Brother investment banking in 2008. Hausmann specification test suggests Pooled effect model of the Panel ordinary least squares regression method as the optimal methodology to evaluate bank profitability. Augmented Dickey Fuller (ADF) test suggested that not all the variables are stationary at levels. First difference was applied to the Size and Liquidity Risk variables only.

Findings

Table 3 represents the correlation coefficients between the measures of risk and profitability for the Kazakhstani banks.

Table 3 represents the correlation coefficients between the measures of risk and profitability for the Kazakhstani banks. Following Pak (2017), correlation coefficients are in the next values: 0 – 0.2 scarcely correlated, 0.2 – 0.4 weakly correlated, 0.4 – 0.6 correlated, 0.6 – 1 strongly correlated.

Examining the correlation coefficients, we can observe that Return on Assets has weak correlation with Commission and Fees as well as weak correlation with Non-interest Income and Net Interest Margin. Weak correlation between these factors suggests that assets are more correlated with factors that are more fundamental rather than with factors that are contributing weakly to the overall profitability of the banks. However, the correlation of ROA with other factors is even smaller. We can probably attribute that to the poor financial development of the industry as a whole that makes factors such as ROA imperceptible to majority of the factors. Z-score is highly and negatively correlated with Loan Growth. It comes in line with most of the literature and theoretical background (Pak, 2017, Dietrich et al. 2014). The higher is the volume of the credit loans, the higher is the proportion of the loans distributed with poor quality of loan takers. Hence, this tendency, eventually leads to the overall worse industry performance. In addition, we can see that NIM is positively correlated with Non-interest Income and Investments. It rather can be reasoned

as that the funding strategy is highly dependent on the investments, what is rational. Alternatively, it can be explained as that NIM has weak overall effect on the industry performance. We refer to the second explanation, since the investments in our particular study are taken as the portion of overall investment

divided by trading securities. The positive and significant correlation between Credit Risk and Liquidity Risk needs no explanation.

Table 4 shows the regression coefficients of the risk measurement model for the sample of Kazakhstani banks.

Table 3 – Correlation coefficients for the specific to banking industry variables of Kazakhstan, 2008-2017, quarterly based

	Commission and fees	Credit risk	Non interest income	Investments	Liquidity Risk	Loan Growth	NIM	Z-score	ROA
Commission and fees	1								
Credit risk	-0.05	1							
Non interest income	-0.072	-0.021	1						
Investments	-0.534	-0.031	0.643	1					
Liquidity Risk	-0.123	0.873	-0.02	-0.005	1				
Loan Growth	-0.023	0.05	-0.026	-0.022	0.039	1			
NIM	-0.022	0.057	0.313	0.032	0.053	-0.058	1		
Z-score	0.025	-0.228	0.016	-0.02	-0.044	-0.454	0.065	1	
ROA	0.314	-0.019	0.296	-0.081	-0.054	-0.042	0.259	-0.049	1

Note – compiled by authors based on the data collected from Bloomberg financial resource agency

Table 4 – Risk measure of Kazakhstani Banks, 2008-2017, quarterly

Dependent Variable: Z_SCORE	
Method: Panel Least Squares	
Variables	Coefficients Prob.
COMANDFEES(-1)	-0.049 *
CREDRISK1(-1)	-21.112 *
CRISIS	-2.476 *
DEBTTOASSETS(-1)	-0.309 ***
DEVALUATION	4.532 **
FEE(-1)	4.116 **
GDP(-1)	-44.432 *
INFLATION(-1)	12.281 *
INVESTMENTS(-1)	-0.038 *
LIQRISK1(-1)	33.811 *
LOAN_GROWTH(-1)	-2.775 *
LNTOTALASSETS1(-1)	-5.688 *
Adjusted R-squared	0.565
F-statistic	23.24

Note – compiled by authors based on the data collected from Bloomberg financial resource agency

Table 4 shows the regression coefficients of the risk measurement model for the sample of Kazakhstani banks. Significance levels of the probability values are indicated as the next: ***, **, * significant at 1, 5 and 10 % levels, respectively.

As we can observe from results, the size of the bank has negative effect on the measure of risk indicating that the size presuppose the negative tendencies on the hand of the managers of the banks neglecting the obvious risks that arise before them. Relying too much on the size and being a strategic player might accumulate the problems for

the big sized banks. This result is in line with the results of Pak (2017). Liquidity risk has a positive relationship with Z-score, meaning that lower liquidity increases the risk level. As expected, the loan growth has negative effect on the level of risk as stated in many previous studies. Generally, as the volume of the loans increases the quality of them decreases and eventually increasing the risk level.

Table 5 shows the regression coefficients of the profitability measures of the model for the sample of Kazakhstani banks.

Table 5 – Profitability regressions of Kazakhstani banks, 2008-2017, quarterly based

Panel A		Panel B	
Dependent Variable: ROA		Dependent Variable: NIM	
Variables	Coefficients	Variables	Coefficients
COMANDFEES(-1)	0.014 *	COMANDFEES(-1)	-0.016 **
CREDRISK1(-1)	-6.3 *	CREDRISK1(-1)	-8.473 **
CRISIS	-1.493 **	CRISIS	0.934 **
DEBTTOASSETS(-1)	19.041 **	DEBTTOASSETS(-1)	-0.079 ***
DEVALUATION	0.179 *	DEVALUATION	0.644 **
FEE(-1)	0.317 *	FEE(-1)	-0.275 *
GDP(-1)	-31.19 **	GDP(-1)	-4.112 **
INFLATION(-1)	22.042 *	INFLATION(-1)	1.033 *
INVESTMENTS(-1)	0.222 *	INVESTMENTS(-1)	-0.003 *
LIQRISK1(-1)	4.696 *	LIQRISK1(-1)	8.604 *
LOAN_GROWTH(-1)	0.818 *	LOAN_GROWTH(-1)	1.022 *
Adjusted R-squared	0.744	Adjusted R-squared	0.65
F-statistic	41.024	F-statistic	41.161

Note – compiled by authors based on the data collected from Bloomberg financial resource agency

Table 5 shows the regression coefficients of the profitability measures of the model for the sample of Kazakhstani banks. Significance levels of the probability values are indicated as the next: ***, **, * significant at 1, 5 and 10 % levels, respectively.

Based on the results for ROA and NIM, coefficients suggest quite different conclusions. Return on assets is negatively affected by the crisis. However, the effect on net interest margin is insignificant. Both measures are negatively dependent on the credit risk. Return on assets is increasing as non-traditional income generation increases. NIM spread between the interest revenue and cost increases as the portion of non-traditional income generation increases. This is in line with the study of Huizinga et al. (2010) who states

that the probability of the default increases as the banks increase the share of the non-traditional activities of the assets side. On the other side, the overall effect of neither commissions nor fees is significant for both the ROA and NIM indicators. Debt portion has positive and significant effect on the ROA. What is interesting is that devaluation effect has a positive impact on both profitability measures. One explanation to that can be that most of the deposits in the time of the examination were held in proportion of almost 70 to 30 percent of foreign to local currencies, respectively. Crisis has insignificant but negative relationship with ROA. It can be explained as a result of state support of the banks. Macroeconomic measure of GDP is negatively related with both NIM and ROA. This is

an unexpected finding, which generally goes against the economic theory and probably can be explained with the specific banking behavior; when GDP grows, banks tend to behave more in a risk-taking manner. Riskier projects have higher probability of failure. That can negatively affect the performance. Inflation has positive relationship with both profitability measures. However, since we calculate inflation based on the consumer price indices, the results can be biased. Price as an indicator holds too many information within itself. Hence, it can be biased to other variables.

Conclusion and contribution

Based on the quarterly data for the Kazakhstani banks for the period of 2008 – 2017 years, this study examines the level of risk and return, evaluating through during and post crisis industry performance. The overall results suggest that performance is affected by size of the banks. The bigger the bank size, the higher is the risk of low performance, and the higher is the proportion of credit risk. The effect of global crisis on the performance is negative. This is in line with our expectations and most of the studies (Altunbas et al. 2011, Allen et al. 2013, Frederick et al. 2015). Devaluation effect has positive impact on the profitability measures suggesting that the proportion of the foreign to local currency composition within the examination period was significant. The fluctuations of the Z-score in the ten-year period can only suggest that the industry is quite vulnerable to the changes in the macroeconomic environment. Kazakhstani banks still rely more on traditional banking strategies of loans and deposits. Non-traditional activities as differentiated investment strategies are not significant in their proportions.

The findings of the work clearly address the weakness of the financial stability of Kazakhstani banking system. Low development of the financial intermediaries suggest slender choice of funding. Parental anxiety on the side of the government

about the overall stand of the industry and market players create weak-willed financial institutions and plant corrupted managers. The fluctuations of the risk measure of the industry over the period of examination goes in line with macroeconomic shocks such as devaluation of local currency and worldwide financial crisis. We suggest that should government keep funding weak institutions, patch up their financial gaps and persist overlooking poor credit management, the Kazakhstani financial outlook is very likely continue to be negative. Moreover, should this tendency continue, most likely the local financial crisis will take place. Our proposal is that Kazakhstani banking business managers together with local government must consider the best fitting free market conditions for the local industry. Create equal market conditions for the state, foreign and private banks. This will stimulate integration from international community and outflow weak players off the market of transitional economy. As a result, an overall economy stand will get closer to developed country standards. Eventually, these financially necessary changes will happen one way or another. The only point is that it will take place by the conscious will or a desperate need.

Therefore, the following paper suggests new aspects for the further research of the banking industry, especially in the areas of ownership, regulation and stability as these are the new challenges that the field is already experiencing.

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