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## **MANAGING CREDIT RISKS AND IT'S ANALYSIS IN THE SECOND TIER FINANCIAL INSTITUTIONS IN KAZAKHSTAN (ON THE EXAMPLE OF ATF BANK)**

### **Abstract**

*Purpose* – The purpose of this article is to provide an overview of risk management development in the banking sector of Kazakhstan and an insight into the practical application of a risk measuring tool. As later research shows, until recent time the risk management in the banks of Kazakhstan has had no decisive significance. Planning was done only at the general level and the legislation did not support open information, that would allow determining profitability of certain entity and the capital availability.

*Methodology* – The paper accumulates a sizeable set of secondary information, data and analysis, while maintaining the case study approach, as some proportion of the information is based on a semi-guided interview with one of the key officials of ATF Bank of Kazakhstan. These forms of primary and secondary data collection methods are chosen to make a critical assessment of the credit risk management practices of the commercial banking sector in Kazakhstan.

*Originality/value* – Credit risk management is very crucial to banks as it is an integral part of the loan process. As conventionally adopted, the credit risk management in commercial banks is a base for the growth and survival of the banks. The health of the financial system has an important role in any country as its failure can disrupt economic development of this country. According to the financial system stability assessment of the International Monetary Fund, the Kazakh financial system is highly vulnerable. The current situation is the direct result of the overheated expansion of the years between 2000 and 2008, when the booming construction sector relied extensively on credit.

*Findings* – Firstly, through the research it was found out that the banks had very weak risk management because the regulation was very rigid, and, as consequence, the prevalence of risk was strong and risks had second-rate importance. Secondly, the banks started addressing to the new circumstances by strengthening their internal risk management protocols in accordance with western standards (Basel Accords). Also, one of important results of this paper was development of an auto regressive model, which could be applied to forecast credit risk in commercial banks in the presence of the established low level of information.

*Key words* – Risk, risk management, Basel Accords, risk exposure, financial crisis of 2007-2008, banking sector, ATF bank, financial regulation, non - performing loans, risk concentration, banks liquidity, autoregressive model.

### Introduction

Risk means future vulnerability or deviation from expected earnings or expected result. Risk measures the vulnerability that an investor can expect to realize a gains or losses from an investment. Risks can be various types and start from various situations. There are business risks, insurance risks, liquidity risks default risks, sovereign risks etc. Various risks start because earning vulnerability arises from different factors that impact an investment or a situation/operation. Risk infuses all branches of the organization, but, as it usually happens, the initial attempts to handle innate hazards may focus on the specific needs of the distinctive organizational departments without a conceptual holistic approach.

It is an important to recognize that risk must be a central concept in the banking sector. Credit risk is a chance of the losses of a financial asset of a certain bank as the result of the inability of a borrower to fulfill his/her obligations to pay principal or interest. So, why does the credit risk occur? Firstly, it's because of the inability of a borrower to repay the loan in a full amount; next is a non-return of the loan amount from the borrower; last, not least, the risk of default by the borrower to fulfill other obligations under the credit agreement, etc.

As our research shows, the Kazakh banking sector is highly vulnerable [1, 2]. The current situation is the direct result of the overheated expansion of the years between 2000 and 2008, when the booming construction sector relied extensively on credit. This scenario led to substantially increased bank leverage, which was financed by external funding. At the outbreak of the financial crisis of 2007-2008, external funding dried up and the subsequently unavoidable deleveraging rapidly worsened the banking assets due to various factors, e.g. devaluation of the local currency.

To avoid a systematic collapse, three of the major banks were nationalized and their external debts were restructured in the total value more than 10 billion USD [3], but these regulatory actions did not affect the underlying structure of the banking system as a whole, and the level of nonperforming loans remained high [4]. Therefore, today the banking sector of Kazakhstan still continues to struggle with significant levels of bad debt, which puts pressure on profitability and there is only a small margin of resilience. Further deterioration of credit quality can be expected without significant changes prudential policy, including development new tools and resolution of current issues in insurance, risk management, accounting, banking, etc.

Up to the financial crisis, the economy of Kazakhstan had relied on bank financing. The time passed since the relatively fresh transition to a liberal financial environment was seemingly not enough for the banking sector to fully adopt the mechanisms and cultural traits to cope with the elevated level of financial risks. The banking sector was rather heavily shocked by the financial crisis of 2007-2008 and crediting practices and risk management policy of the prior years could hardly prevent the increase in risk exposures [5].

Further, on the example of ATF Bank JSC this paper will show the challenges of risk management and credit risk analysis in the banking sector of Kazakhstan.

ATF Bank JSC is a commercial bank and operates within the banking system of the Republic of Kazakhstan in the form of a joint-stock company. The purpose of the bank's internal credit policy is to reduce the risk in conducting active lending operations, including factoring, leasing, forfeiting, and others [6].

ATF Bank's *pre - crisis period* very well demonstrates the challenges. The unfortunate structure of the loan books of ATF Bank JSC was partly due to the company's ineffective risk management. The primary source identifies the number of hazards, including credit risk as the biggest ticket item, and a set of internal risks (entailing interest rate risk, currency risk and liquidity risk), country risk, market risk and affiliated organizational risk. The bank accumulated a risk portfolio that proved to be extremely vulnerable to unexpected financial and economic situations. To certain degree, the bank neglected some risks. It invested in risky ventures without comprehensively and thoroughly assessing risks, took debts and gave loans in foreign currency and, as result, it was not able to repay its debts because of the crisis and devaluation which increased significantly its commitments. With regard to the distribution pattern of credits, it was well spread over the regions of Kazakhstan, which resulted in the most favorable display of regional risk concentration among the banks operating in Kazakhstan. On the other hand, ATF Bank JSC hugely increased its exposure to the industrial sector throughout the years between 2007 and 2008, first of all, to the construction and real estate business [7].

With regard, to the *post - crisis period*, a range of secondary sources agreed that ATF Bank remained a high-risk financial institution. The already cited current rating (B3 at Moody's) was the result of significant

downgrading by external agencies. Moody's [8] gave a detailed set of reasoning on the downgrading: the ongoing deterioration of the bank's credit profile. The future prospect would be further shadowed by the fact that the bank had foreign debts due near-term, which significantly narrowed its legroom to amend the negative pattern in the loan books and give a boost to incomes. Given this negative scenario, the outlooks for the bank were regarded by Moody's as negative on all account [8]. At 2018 Moody's predicts the positive impact on banking system of Kazakhstan by the governmental capital infusions, which should lead to improvement of the quality of assets after a surge of bad loans and might help financial institutions return to profit [9]. However, the current weak solvency of some financial institutions presents a risk to the financial system. Limited economic recovery and high loan costs will hinder credit growth. Economy will extend 3%-4% in 2018 and 2019. Problem-loan ratios will decrease as governmental capital help quicken non-performing credit exercises. The money related guide will enable financial institutions to recognize and to write off more bad loans as well. Standard & Poor's agency [10] thinks that current indicators will step by step enhance from 2017 to 2020. Besides agency predicts that the loaning development in the economy will be at the level of 1.5% by and large from 2017.

To improve the post-crisis period situation, the bank switched to a conservative recovery mode. In practice, it meant reduced lending activity and the attempt to recover non-performing loan portfolio. The new management kicked off a portfolio cleaning initiative, which decreased the level of non-performing loans by 110 billion KZT by mid-2014 with aggressive plans for continuation to meet the regulatory benchmark of 15 percent non-performing loans (NPL) [11]. Both Moody's and Fitch agencies [12] draw attention to the market risk of the value of KZT; despite the efforts of ATF Bank JSC to reduce its NPL portfolio, the devaluation of the national currency increased the risk exposure of the bank [13]. While recovering from bad loans had no significant impact on the bank's NPL situation, the resulting cash inflow positively, to some extent, affected the liquidity status of ATF Bank JSC.

With the assistance of central banks, the new set of evaluation mechanism of the Basel Accords was inaugurated with the expressed aim to improve the stability of the international banking sphere. Nowadays many countries already applied the Basel Accords model. And Kazakhstan is not an exception – the country tries to satisfy the international standards. Kazakhstan has moved to Basel since 2007. The main purpose of the agreement Basel 1988 is to improve the quality of risk management in the banking industry, which, in turn, should strengthen the stability of the financial system as a whole [14].

With an implementation of Basel the banks of Kazakhstan have addressed to the new circumstances by strengthening their internal risk management protocols in accordance with western standards which will strengthen banks' transparency and disclosures - that is a good point to our banks. The financial market supervision agency reinforced their will to forward the progress and to reach a full compliance with all the components of Basel II by 2014. Banks also moved towards more risk control with the implementation of Basel III [14]. The process began in 2015 and was to be concluded by 2019 [16, 17]. But National Bank of Kazakhstan corrected the program of Basel implementation by delaying the transition to it until 2021 [18]. The freeze in the introduction of Basel III is due to the fact that the recovery of the banking sector has remained low in recent years, the dependence of banks on state aid programs is high, mechanisms for a real write-off of bad debts are still unresolved, and there remains high vulnerability to international relatively low credit ratings [19].

Thus, as it follows from the situation, which happened before and after the financial crisis of 2007-2008, the banks in Kazakhstan had and still have ineffective risk management due to the extremely tough regulation and the strong prevalence of risk [20]. In the pre-crisis period the second - tier financial institutions did not fully understand the importance of risk management. Currently the main task of the managers of the banks is still to avoid the credit risk.

Avoiding credit risk demands careful selection of borrowers, thorough analysis of loan conditions and constant monitoring of the financial condition of the borrower's ability (and willingness) to repay the loan. In this context, the development of new tools of credit risk models is still relevant and important from the point of view of both professionals and academicians in absence of the established today low level of necessary information [21].

### Credit risk model

In order to create the model, which can predict the risks, time series of risk per borrower will be formed and analyzed, the size of each of which exceeds 10% of the bank's equity for the period from January 2014 to December 2017 as of the first day of a month, with 48 observations. This series will be predicted using the autoregression model to forecast credit risks in ATF Bank will be used. All the data are open and can be found on the website of National bank of Kazakhstan [22].

Autoregressive model - a model of time series in which the values of the time series at a given moment are linearly dependent on the previous values of the same series.

A time series of the risk indicator was calculated. In addition, an average prediction for 2018 was derived. In order to create this analysis, the GRETl program was used.

To assess how many statistically significant lags a time series has, a correlogram can be constructed. Having loaded our variables, we calculated the coefficients of the autocorrelation function and the partial autocorrelation function. The stationary series is a series whose behavior in the present and future coincides with the behavior in the past. To determine stationarity of the series an autocorrelation function (ACF) and a partial autocorrelation function (PACF) can be employed.

The blue lines in the charts below indicate a critical interval within which the values of ACF and PACF considered to be non-zero. The decaying ACF graph and the emissions on the first lag of PACF indicate that it is an autoregressive model (see figure 1).

From the PACF plot it is seen that there is only one statistically significant autocorrelation coefficient on the lag 1, which indicates the presence of first-order autocorrelation.

Autocorrelation means that the values of the dependent variable in one period of time are linearly related to the values of the dependent variable in another period. In the autoregressive model, the forecast is found as a function of the previous values of the time series. To improve the efficiency of the model under the conditions of autocorrelation, a generalized method of least squares is used.

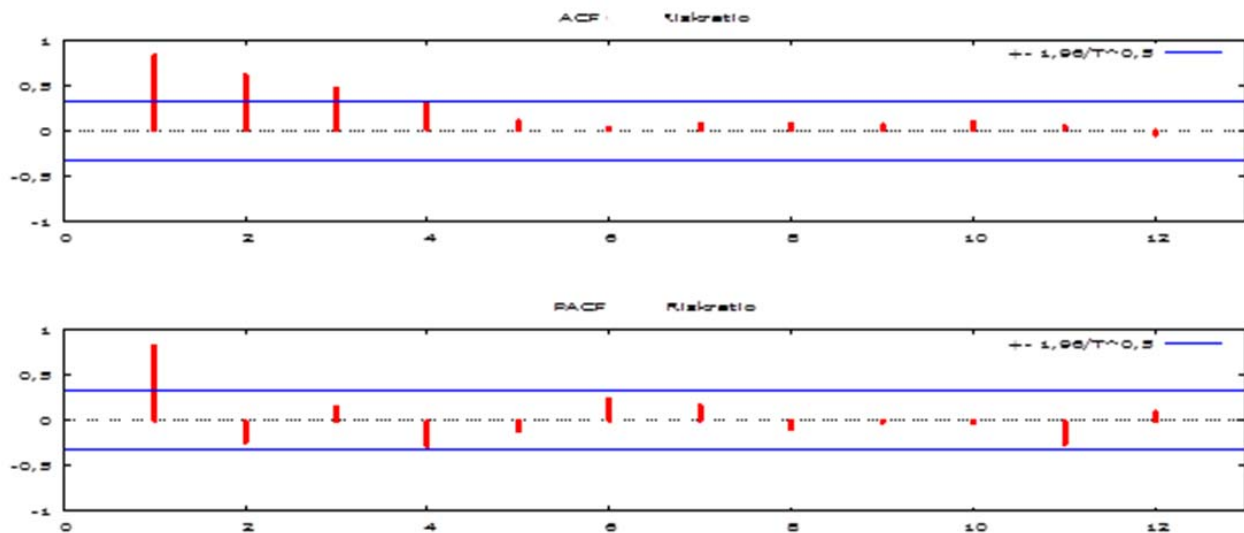


Figure 1 – Values of ACF and PACF for ATF risk factor

Note: compiled by the author

Next, we construct a model of autoregression of the first order by the Cochrane-Orcutt method. The autoregressive coefficient showed a statistically significant result – an R-square of 0.65 indicates that an autoregressive model based only on one lag explaining the current risk behavior by 65%. The Durbin-Watson statistics is 1.96 – in this case, it does not show the presence of autocorrelation. To confirm additionally the absence of autocorrelation one can construct a correlogram of the model residuals. As it can be seen from the

ACF and PACF graphs for the autoregressive model residuals, all the coefficients of autocorrelation do not go beyond the limits of significance, so autocorrelation among the residuals is not observed (see figure 2). The absence of the autocorrelation ensures the consistency and effectiveness of estimates of regression coefficients.

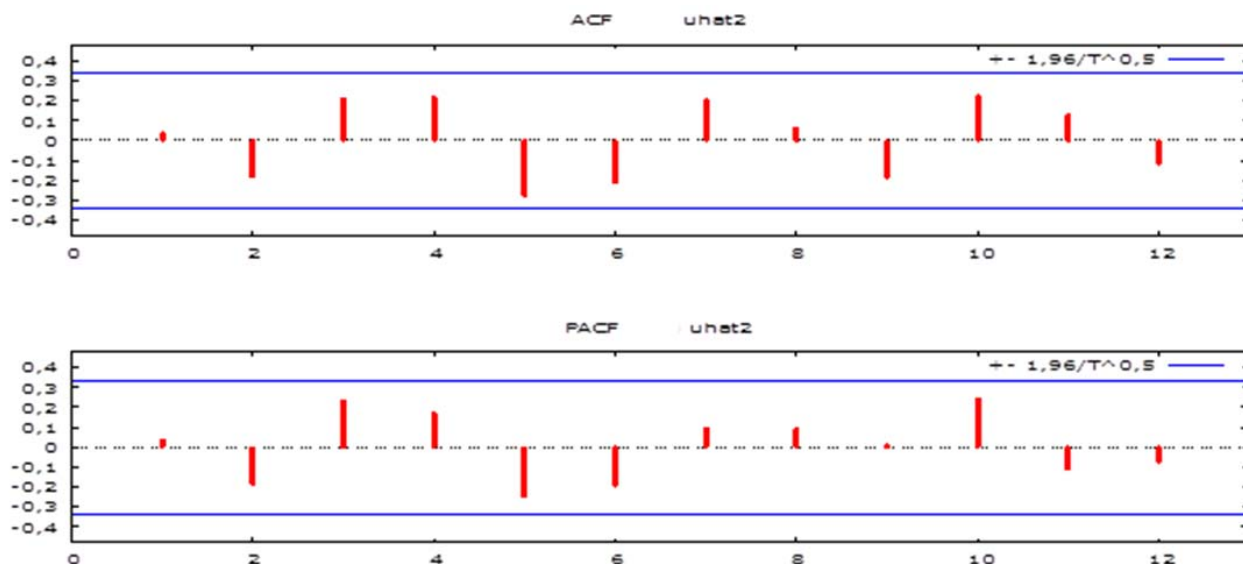


Figure 2 – ACF and PACF values for auto regressive model residuals [compiled by the author]

According to the calculations, which are shown in the table 1, the risk value for ATF Bank in 2018 is around 0.835 and with 95% probability it can be expected that this value will not exceed the interval of (0.18028; 1.4901). As for prediction of the risk ratio per borrower for 2018, in average, equals to 0.835, which is a very good value, and close to other numbers (see table 1).

Table 1 – Auto regression model

For 95% confidence intervals,  $t(44, 0.025) = 2.015$

	Fact	Prediction	st. error	95% confidence interval
1	2	3	4	5
2015:08	1.190	1.539		
2015:09	1.051	1.173		
2015:10	1.329	1.171		
2015:11	1.115	1.490		
2015:12	1.180	1.204		
2016:01	1.719	1.321		
2016:02	1.634	1.863		
2016:03	1.427	1.649		
2016:04	1.411	1.455		
2016:05	1.517	1.487		
2016:06	1.539	1.600		
2016:07	1.378	1.598		
2016:08	1.404	1.427		
2016:09	1.343	1.491		
2016:10	1.220	1.422		
2016:11	1.263	1.309		
2016:12	1.456	1.383		
2017:01	1.499	1.510		
2017:02	1.644	1.523		

2017:03	1.548	1.657		
2017:04	1.593	1.550		
2017:05	1.415	1.604		
2017:06	1.336	1.433		
2017:07	1.482	1.381		
2017:08	1.497	1.526		
2017:09	1.607	1.522		
2017:10	1.754	1.623		
2017:11	0.451	1.746		
2017:12	0.625	0.519		
2018		<b>0.835</b>	<b>0.3249</b>	<b>(0.18028; 1.4901)</b>

Note: compiled by the author

In this model, the forecasts did not reflect the sharp deviation from the actual data and the direction of the oscillations coincides with the original data. Below the diagram shows the actual and predicted values of the risk factor (see figure 3).

Therefore, the trend is adequately reflected, the R-squared ratio is high enough (0.65) and, as consequence, the conditional variance of the model is rather small, which says that this model is fully applicable for forecasting credit risks in ATF Bank.

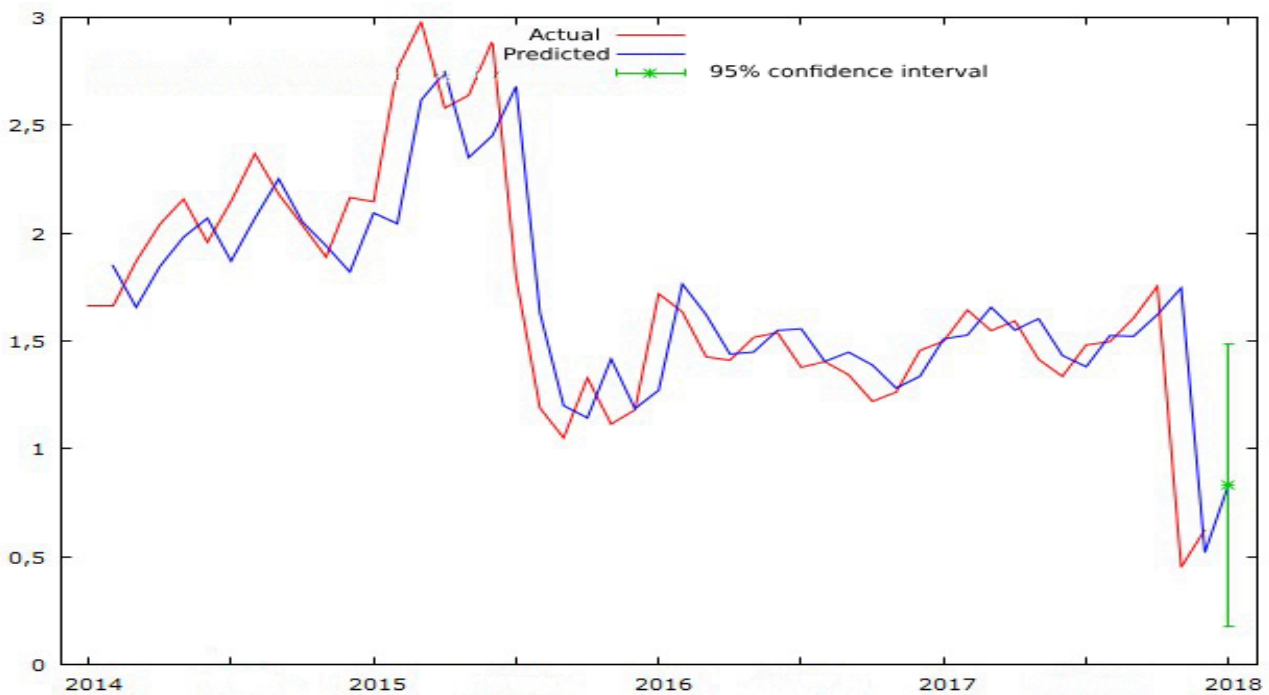


Figure 3 – Actual and predicted values of the risk factor [compiled by the author]

So, in this case we can say that this autoregressive model can be a good solution to predict short-term the risks with the minimum information along with the other bank models and can be useful for external users.

### Conclusion

This paper explores the prevailing situation of credit risk management in the Republic of Kazakhstan over period from mid of 2000s to recent years.

The risk management in the banking sector of Kazakhstan until recent time has had no great significance. The financial markets were nearly passive, and financial institutions were not allowed to work with foreign currency, the structure of the financial instruments was predefined and the interest rates were fixed. The legislation did not support open data that would permit determining profitability of certain entity or the capital availability and the planning was done mostly at the general level [23].

The recent economic crises revealed some basic principal problems of the financial system of Kazakhstan. The change from the former command economy model was a progress, which were created step by step and which was deliberated by the specialists of Kazakhstan. With subpar risk assessment protocols, the bank ventured into crediting operations that violated critical risk concentration standards. As a result, the financial situation deteriorated to such level that the European owner sold its stake at considerable deflated price to a buyer with a political connection [24]: later, as well known, the troubled financial institution received some form of bailout from the government. The main problem with the banks in Kazakhstan is that they are less opened for their credit policy [25], which means that our country is far from western standards, but let's hope that implementation of Basel III, at least a little, will change the situation.

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### Резюме

Научная статья посвящена центральной концепции риска и развитию риск-менеджмента в банковском секторе Республики Казахстан на основе тематического исследования АО «АТФ Банк» (case-study). В ходе исследования выявлено, что в процессе перехода от централизованного планирования к рыночной экономике, характеризующийся постепенной либерализацией и быстрой финансовой экспансией, казахстанские банки были мотивированы рассматривать риск вторичным по отношению к росту. В результате банковский сектор, как правило, занимался подпаритетными операциями по управлению рисками, что могло бы привести к неудачной схеме концентрации риска в течение 2000-х годов.

### Түйін

Ғылыми мақала «АТФ Банкі» АҚ-ның кейстік зерттеуі негізінде Қазақстан Республикасының банк секторындағы тәуекелдердің негізгі тұжырымдамасына және тәуекелдерді басқаруды дамытуға арналған. Зерттеу барысында, бірте-бірте ырықтандыру және жылдам қаржылық кеңейту сипатталатын орталықтандырылған жоспарлаудан нарықтық экономикаға көшу процесінде қазақстандық банктер өсудің қайталанатын тәуекелін қарастыруға қызыққан. Осы нәтижесінде, банк секторы 2000-шы жылдардағы тәуекелді шоғырландырудың сәтсіз схемасына әкелуі мүмкін тәуекелдерді басқару бойынша субпаренттік операциялармен әдеттегідей айналысты.

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