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Analysis of Bank Risk and Performance across Transitional Economies

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CONTENT

INTRODUCTION

General characteristic of the research topic

The dissertation work examines banking industry business models of transitional economiesin aspects of financial performance and risk.

Relevance of the research topic

We have tested the hypothesis on the effect of regulatory norms, ownership structure and specific determinants on the performance and risk of banks in emerging markets backed up by several fundamental works of [1]. While building the picture of banking business modeling in transition countries we refer to the next specific aspects of the problem.

We examine the performance and risk of the transitional economies in the banking industries. However, the final beneficiary is social welfare that the countries are willing to maximize. Hence, the factors of consolidation, competition and many other business structures and their combination have to be reviewed. This can help the study be sustainable and might open up new aspects to the problem. Since, we indicate banks as the main target of examination, the reasonable arrangements of financial markets and other financial institutions are important. Therefore, we consider different internal functions of banks to clarify how these functions affect the efficiency and eventually the social welfare.

There are few important reasons why we need to consider banking sector of transitional economies apart from other types of markets. In the way [2] stated, transitional economies have weak financial markets. Banks play crucial role in financial intermediary process. Therefore, we need to consider transitional market as a separate financial establishment.

Purpose and objectives of the research:

The following study is the examination of establishment of banking business modeling in the aspect of performance and risk in emerging markets of transition economies. The economic crisis outlined a vast number of questions for the policymakers and made them rethink, reorganize, and re-strategize the existing frameworks completely. These events bubbled up the layman's distrust towards financial and governmental norms and regulations, and appropriately raised the question of whether newly introduced policies and compliance with them would increase the financial stability and performance of these longstanding financial institutions. We view the problem from different angles.

Research objectives:

1. Examination of current state of business models in existence what helps us define the weaknesses and make recommendations to overcome further market development difficulties.

2. The unique place a bank takes in the financial intermediary process in markets of transition economies. Following [3] we address the idea that financial markets in economies of transition tend to be weak. Therefore, banks play a core role in the financial market development with no alternative option both in regulatory aspect and in practice.

3. The interest of this study is the economies in transition. In our study of regulation effect on profitability of banks in transition economies [4]. Moreover, many previous studies neglect the importance of post-Soviet Union countries by not including them into general observation of economies in transition [5, 6]. The findings based on examination of only European transitional economies or any other regions separately will most likely produce biasedfindings.

4. The problem of banking business modeling is the ownership factor. It is well known that the ownership factor plays a crucial role in establishment of the business, irrespective of the type of the business. However, there is a need to mention that in transition economies, bank ownership has a special place. The problem here is that owners of the banks tend to have high affiliated relationship with the regulators and reformers of the industry. The following relationship constraints the financial market development.

5. The regulatory framework itself. The idea is that the regulation before the times of crisis possibly had been the reason for the crisis embryo itself. Transition economies typically have weak financial markets. The tradeoff faced by regulators is between financial market development and macroeconomic stability.

Research object:

We focus on the transitional countries using quarterly bank data over period of 2008-2019 years and covering one hundred transitional banks across 17 recently switched from planned to free market economies. [7] stated that difference in perception of performance of the institutions depends on the structure of the industry. Therefore, our study will contribute to the literature as a new vision of this relationship.

Model and methodology building

We utilize the "Generalized Methods of Moments" methodology employing panel data regressions over 17 different transitional economies during, and after the crisis period of 2008 through to 2019.

Scientific novelty of the research:

1. Seven different combinations applied for the profitability measures of Return on Assets, Net Interest Margin, and Risk score for the full sample of transition economies.

2. Separate regressions are run for the four sub-samples allocated in regions of Eastern European, Central European, Balkan and Caucasus countries applying the methodology from general to specific in the selection of variables in line with the study of [8].

3. The results for the robustnessof the findings are checked utilizing five different regional samples with different banking industry specifications.

4. Only transitional economies are covered in the research and most of the previous studies are related to emerging or developing markets.

5. The GMM system was applied to deal with the problems of endogenous variable, simultaneous causality, heteroscedasticity, heterogeneous variable and unrecognized features of the coefficients applied in the model.

Scientific and practical significance of the research

We contribute to the literature in few important ways:

1. We utilize model of GMM system that permits us to cover the effect of unrecognized measures that are largely omitted when other methodologies are employed in the panel data use.

2. The GMM system recognizes the use of measures that are correlated among each other and permits us to apply them while dealing with endogeneity bias [9]. Endogeneity bias is common in use of panel data. Bank managers apply different adjustments and amendments to improve financial positions. These changes today affect values of measures in the future, leaving trace of preceding variables today. Hence, the standard errors of these variables can be highly correlated and, therefore, data adjustments are quite important. Nevertheless, adjusted data squeezes the range and creates another problem. Therefore, the GMM system use is quite reasonable.

3. We use period that covers both crisis and post crisis time. Timeframe permits us to see a complete picture of how countries in transition reflect to changes on a macroeconomic level, likewise the Global Financial crisis.

The main provisions for defense:

1. The results obtained through of the application of Generalized Methods of Moments method.

2. The result of substantial liquidity portion as the only part of the business model that has significant effect on both financial stability and performance measures of banks in transition.

3. The result of whether ownership structure of banks has a direct effect on performance of financial institutions in transitional economies.

4. The negative result of effect of concentration of both political and economic power, which slows down transmission from planned to market economy.

5. The results of robustness tests of the main findings applying GMM across five different sub-samples.

6. The results ofeffect of regulatory norms such as Reserve Requirements, Activity Restrictions, and Capital Stringencies on the overall industry profitability and stability of the financial institutions.

7. The results utilizing the GMM methodology indicating the Reserve Requirements regulatory norms as the only significant effect factor that improves the profitability and diminishes the risk of financial instability in the banking sectors of transitional economies across a large sample of countries.

Personal contribution of the author:

The author of the work participated in the choice of the concept and object of research, determining the purpose of the work, setting research objectives, as well as in the design and running all regressions, collecting and analyzing the data obtained and writing a dissertation.

Approbation of work

The results of the research and the main provisions of the dissertation were reported and presented at international and republican scientific conferences:

1. Bankregulationintheeconomiesintransition // 33rdEBESConference (Madrid, 2020, October).

2. FinancialStabilityofBankingIndustryinKazakhstanaftermaththeWorldfinancialCrisis (Almaty:TuranUniversity Press, 2020).

3. OwnershipasaQualitativeFactoraffectingtheBusinessModelofBankingIndustryinKazakhstan // KIMEP-2020 InternationalResearchConference (Almaty, 2020).

4. Bank Risk Evaluation through Z-score Measure and its Effect on Financial Health of the Industry of Transitional Economy of Kazakhstan // Bulletin of Kazakhstan National University.– 2020.

5. Kazakhstani Banking Industry Performance Overview in the Post Financial Crisis Decade // Central Asian Economic Review. – 2020. – Vol. 4(127). –P. 40-50 (ISSN2224-5561).

6. Bank specific, macroeconomic and industry specific determinants of bank performance and risk.The case of Kazakhstan // ICBM-2019 Maltepe University. – Istanbul, 2019 – June (ISBN978-605-2124-27-7).

7. So called "Private" Ownership Structure in Kazakhstani Banking Business Model.Industry Performance Evaluation // News of the National Academy of Sciences of the Republic of Kazakhstan.Series of Social and Human Science. –2019. –Volume 6, №328. – P.139-154 (ISSN2224-5294).

8. How does risk and return affect Kazakhstani banking industry performance? // KIMEP-2019 International Research Conference (Almaty, 2019).

9. Bank Regulation in the Economies in Transition // Sage Open. – 2021. – Volume 11, Issue 4 (Article first published online: November 29, 2021;Issue published:October1).

Projects:

The Impact of Business Models on Financial Stability and Profitability of Banking Industries of Economies in Transition.In progress.

Publications

Main provisions, results, conclusions and conclusion of the dissertation presented in 10 publications, including 1 article in an international journal, which is included in the Thomson Reuters database; 4 articles in republican scientific journals recommended by the Committee for control in the field of education and science of the Ministry of Education and Science of the Republic of Kazakhstan; 4 articles and 3 theses in materials of international conferences and symposiums.

Dissertation structure. The dissertation consists of 7 sections, conclusion, list of sources used

The examination of the research problem is divided into separate chapters.

The first chapter is the introductory body to the dissertation that indicates the main subject of the problem we examine.

The second chapter reviews the empirical literature over the tradeoff between the efficient market and the financial stability.

The third chapter is an empirical observation of the methodology and model construction. In particular, we discuss the model, variables, and give a detailed overview of countries under examination and their respective banking industries.

In the fourth chapter, we evaluate the effect of changes in their business models on risk and efficient operation of bank industries in the economies in transition.

The fifth chapter covers specifics of the local Kazakhstani banking industry market with an accent on bank, industry and macroeconomic environment determinants in the first part. The second part examines the effect of ownership structure changes on bank performance.

The sixth chapter examines significance of regulation factor for banking industries in transition economies.

In the Appendix A, we provide a summary of the interviews we have conducted with specialists from the field. The objective is to see whether the findings based on the empirical model we have built for the sample differs from the true, unbiased reality of banking in economies of transition. This work helps to fill possible missing points of the study. Hence, the gaps can be used for further research of the field. The video interviews can be provided by the author if required.

We hope this work may help shed a fresh view on necessities of political and economic reforms of banking for markets in transition.

1 INTRODUCTORY REMARKS

The following study is the examination of establishment of banking business modeling in the aspect of performance and risk in emerging markets of transition economies. We view the problem from different angles. Therefore, the examination is divided into separate chapters. We start with the examination of conceptual literature followed up by the chapter of empirical model and variables building. Thereafter, in the next three chapters we examine overall model, narrowing into Kazakhstani market with ownership impact and rounding up with regulatory framework effect.

We have tested the hypothesis on the effect of regulatory norms, ownership structure and specific determinants on the performance and risk of banks in emerging markets backed up by several fundamental works of [1, p. 281].While building the picture of banking business modeling in transition countries we refer to the next specific aspects of the problem.

First of all, we examine current state of business models in existence what helps us define the weaknesses and make recommendations to overcome further market development difficulties.

We examine the performance and risk of the transitional economies in the banking industries. However, the final beneficiary is social welfare that the countries are willing to maximize. Hence, the factors of consolidation, competition and many other business structures and their combination have to be reviewed. This can help the study be sustainable and might open up new aspects to the problem. Since, we indicate banks as the main target of examination, the reasonable arrangements of financial markets and other financial institutions are important. Therefore, we consider different internal functions of banks to clarify how these functions affect the efficiency and eventually the social welfare. The importance to examine the implementation process of the interest income earnings is vital as it directly affects the business system performance. The effectiveness and efficient process of credit allocation can be vital for the sustainable development of a single unit and as a result affecting the whole business industry. We first stop by the examination of the processes of bank internal functions. Proper examination of the inefficiencies of the process will help us identify the weaknesses and indicate necessary amendments and changes to be done. Therefore, the review of the literature will help us shed light on the sources of the inefficient operations and growth of financial stability. Banks in transitional economies are considered as the main locomotive of economic growth. Generally, banks hold much of the assets that are not liquid. The liabilities required to be paid back in the case of economic stagnation, what can be difficult to implement. Hence, the banks are considered the most vulnerable among financial institutions despite their important role in financial systems of transitional markets. Moreover, the concentration of huge financial streams going through the banks largely contribute to the misbehavior of managers of banks and might create the problems such as moral hazard.This requires many regulation norms and conditions to be applied that shrink the ability to develop the robust economic system for the bank industry. The main cause is the asymmetry of information. Hence, in this part of examination we stop by the examination of the problem of management misbehavior

and its impact on the process of business establishment in banking industry. This examination once again is crucial for transitional economies, as the weak performance of the banks can be affecting these economies more severe than any other financial institutions. Therefore, there is a debate that opens up new-old discussion for the policy makers that is the tradeoff between the financial stability and the efficient operation of the market. The goal for the policymakers of each single country is to find the optimal option.

The other aspect is the unique place a bank takes in the financial intermediary process in markets of transition economies. Following (Jimenez G.et al.) we address the idea that financial markets in economies of transition tend to be weak. Therefore, banks play a core role in the financial market development with no alternative option both in regulatory aspect and in practice. Banks affect overall macroeconomic condition within particular transition economy. Hence, the problem of the risk perception in the study is shown as the logical sequence of: starting from a specific bank unit to a systemic risk in the industry, with further effect on a macroeconomic condition within the country. This risk evaluation process developed in the study is a conceptual vision of the risk perception sequence. Therefore, in the second aspect to the problem, we evaluate specific banking industry variables as the representation of the inner banking attitude towards the risk perception. The specific banking determinants possess the information on how banks respond to the challenges they face in the market.

Discussion of relationship between risk and bank performance is overloaded in literature. However, most of the studies are related to economies of developed countries or emerging markets. The interest of this study is the economies in transition. In our study of regulation effect on profitability of banks in transition economies [4, p. 1415], we mentioned that structure and bank business models vary significantly across transition countries. Moreover, many previous studies neglect the importance of post Soviet Union countries by not including them into general observation of economies in transition [5, p. 1155; 6, p. 295]. The findings based on examination of only European transitional economies or any other regions separately will most likely produce biasedfindings.

There are few important reasons why we need to consider banking sector of transitional economies apart from other types of markets. In the way (Jimenez G.et al.) stated, transitional economies have weak financial markets. Banks play crucial role in financial intermediary process. Therefore, we need to consider transitional market as a separate financial establishment. Business models of developed markets will not be fitting. The approach needs adjustments. Secondly, there are drastic changes that have happened during last three decades that have changed structures of transition economies. The Soviet Union collapse is one of them. There are many countries that are in the list of transition economies emerged after collapse of the Soviet Union (table 1).

Table 1 – Overview of economies in transition and emerging markets

Overview of economies	Transitional Economies	Emerging Markets
Background	Just recently emerged over the latter three decades	Long established countries with development histories
History	Most of the countries emerged after the financial crisis of 2008 and collapse of post-Soviet Union Countries	Long-lasting economic histories with well developed financial structures
Industry	Less market oriented banking industries with central apparatus responsible for the funds allocation.	Better market oriented financial systems with legislative powers.
Crisis	Apart from global shocks, most of the countries under examination experienced local monetary and other financial defaults.	More stable markets with less vulnerability towards external and internal shocks.
Integration	Less integrated economies because of the historical heritage	Higher integration with international financial community

We focus on the transitional countries and most of the studies are covering the emerging markets. [7, p. 148] stated that difference in perception of performance of the institutions depends on the structure of the industry. Therefore, our study will contribute to the literature as a new vision of this relationship. Moreover, the conditions of the transitional economies and emerging markets are different and therefore the application of the findings related to the emerging markets for transitional economies may not be right. Institutional settings define how banks behave. We outline the main criteria and characteristics of the emerging and transitional economies in the Table 1 above.

Bank structures changed and many financial institutions were privatized. Liberalization was at full steam. Ownership structures, regulation and supervision modes all changed. Moreover, over this period of time, other external shocks such as the Asian financial crisis (1998), the Russian ruble crisis (1997) and the Global Financial crisis (2008) took place and all left their deep traces. As was noted by [10], the Russian ruble crisis resulted in contraction or consolidation of newly created banks because of changes that required higher quality financial institutions in terms of capital structures, minimum reserve requirements and many other financial and non-financial regulatory norms. Along with these changes, a lot has been resumed and amended in structures of bank business models of these transitional economies. High technology companies and foreign investments affected structures of newly emerged markets. This contributed a lot to the competition level among institutions, but foremost, this change increased systemic risk. All in all, business models of banks in transition economies changed drastically.

Therefore, we contribute to the literature in few important ways: first of all, we utilize model of GMM system that permits us to cover the effect of unrecognized measures that are largely omitted when other methodologies are employed in the panel data use; secondly, the GMM system recognizes the use of measures that are correlated among each other and permits us to apply them while dealing with

endogeneity bias. Endogeneity bias is common in use of panel data. Bank managers apply different adjustments and amendments to improve financial positions. These changes today affect values of measures in the future, leaving trace of preceding variables today. Hence, the standard errors of these variables can be highly correlated and, therefore, data adjustments are quite important. Nevertheless, adjusted data squeezes the range and creates another problem. Therefore, the GMM system use is quite reasonable. Third, we use period that covers both crisis and post crisis time. Timeframe permits us to see a complete picture of how countries in transition reflect to changes on a macroeconomic level, likewise the Global Financial crisis.

The third aspect of the problem of banking business modeling is the ownership factor. It is well known that the ownership factor plays a crucial role in establishment of the business, irrespective of the type of the business. However, there is a need to mention that in transition economies, bank ownership has a special place. The problem here is that owners of the banks tend to have high affiliated relationship with the regulators and reformers of the industry. The following relationship constraints the financial market development.

[4, p. 1418] mentioned that holder of financial institution and the regulator who is in charge of reforms taken in the industry can be the same subject in these economies. This is the concentration of power and it can negatively affect the market. The concentration of power whether financial or political is a specific matter for most of the transitional countries. Therefore, the examination of the shareholders of the banking business and adding this factor into the model in studying performance level of industry is crucial. As was stated by [11], the modernization of financial system of Kazakhstan is strategically important for the state to diminish its integration into financial markets.

Works on the measurement of the performance of the banking sphere are probably of those the most studied ones. It has its own reasoning, especially for the related to the transitional or recently switched from planned to market economy countries. The idea here is that banks play a significant role in the overall economies of transitional countries. Moreover, political implications to the development strategies of these transitional countries are concentrated around financial institutions. The reforms, both political and economic within transitional countries are taken with the consideration of the necessities of the banking sphere. Specifics of the Kazakhstani banking industry states that causality effect to these reforms can be endogenous to the industry itself as the owners of those financial institutions are in many cases the same subjects proposing country economic development reforms.

The forth aspect is the regulatory framework itself. The idea is that the regulation before the times of crisis possibly had been the reason for the crisis embryo itself. Transition economies typically have weak financial markets. The question to address is whether it is a deliberate procrastination of market development? The tradeoff faced by regulators is between financial market development and macroeconomic stability. New regime is bringing tighter norms and conditions in line with the Basel accord. Since, we stepped into a new timeframe, and just recently switched from planned economy standards towards so called "free

market regimes", there is a need to examine the new regulatory framework and how it affects bank business modeling.

The economic crisis outlined a vast number of questions for the policymakers and made them rethink, reorganize, and re-strategize the existing frameworks completely. It became clear that change was vital. That change was imminent. Yet to make that very necessary change, the problematic roots needed to be identified and removed hastily. These events bubbled up the layman's distrust towards financial and governmental norms and regulations, and appropriately raised the question of whether newly introduced policies and compliance with them would increase the financial stability and performance of these longstanding financial institutions.

We focus on these questions in the work and examine the transitional markets that have recently switched from planned to open market economies.

For further research opportunities, and to fill the gap of missing views and cross compare the findings with the true state of the industry, we interviewed field specialists. This approach is a unique method and quite an interesting way to obtain robust findings. The discussion with top management of financial market opens up new fertile lands for new research opportunities. Moreover, this intriguing methodology helps us define the overall picture of banking in transition economies.

We address these main pillars within the study. The first is the examination of the literature in Chapter I. Then we build the model and construct the variables in Chapter II. In Chapters III, IV and V, we examine empirical cases of full sample transition economies, separately Kazakhstani market with the ownership effect, rounding up with the effect of regulation for a full sample.

2 LITERATURE REVIEW

2.1 Introduction
We examine banking industries of emerging transitional economies. Regulatory norms and conditions, in line with the policy making, have significant impact on banking business development. Therefore, apart from the empirical examination of the risk and return of the bank performance and financial stability in the transitional economies, it is quite important to examine the literature. Hence, the following part of the study is the observation of vast literature for perception of different views.

2.2 Literature review
What is the best possible option for development of the market with competitive structure within?

The vast literature examines the tradeoff between risk and return. There is a tradeoff between competitive market and concentration as well. The discussion on the matter seems to advocate that the researchers say competitive market is the best one option for the perfect market. The regulation of the market power and the norms and conditions to stimulate competition in combination can be named as the best option. However, the option is not the best for all market types. This is what we discuss in this part of the work. Some factors have cross and mutual effect.

2.2.1 Efficiency
Government bodies allocate funds through the banks. In transition economies, banks are considered the main instruments for this particular task. Therefore, efficient bank operation has a direct effect on economic growth. Factors such as risk, return, capital adequacy ratios are all affecting the efficiency.

The study of [12] examines the effect of the activity diversification in non-banking areas. Banks with the purpose of additional ways of income generation and risk allocation through the diversified ways of development entered the market of the financial institutions. This helped diversify earnings through non-interest generating approach such as trading securities and insurance sale. However, [13] indicated that too much diversification can be reversely affecting the efficiency. Simply stating the banks can benefit from applying both ways of income generation, if these two approaches are not correlated with one another. The expectation of risk reduction is based on the fundamental idea that the traditional bank income generation and non-interest income generation models are not correlated. Therefore, authors state that the reduction of risk is expected. Despite the precautions and modeling, some of the theorists and practitioners argue that the banking itself has higher probability of risk in comparison to the non-interest income generation [14-18].

[19-22] found that financial institutions that rely more on the non-traditional to the banks income generation approach, such as 'non-interest income generation', this method tends to have higher insolvency rates. The probability of failure is even higher for the banks that are small in size and that have higher portions allocated for commission and fee generating activities. The combined business model assessed by

the bankers in different ways; some state that the development can be risky initially, however, can be beneficial in the long term. Authors employ simple portfolio variance equations to address the idea with two ways of income generation *I* and *J*:

*Variance of Portfolio = Sum of asset $_I$ * Sum of asset $_J$ * Proportion of $_I$ * Proportion of $_J$ * Standard deviations of $_I$ and $_J$ * Correlation (I, J)*

In this approach, authors found that the combined business model can be less risk oriented than the traditional one. Moreover, traditional to the banks income generation is less efficient than non-interest income generation. However, literature states that diversification is not an only option for higher efficiency. [23-25]examined the effect of the financial services on the markets. The integration of new technologies into the financial services changed the structure of the business affecting overall efficiency. However, the point to be mentioned is that regulatory norms can be rightly settled only when the services that the financial market provides are well known. Simply stating, mutual dependence between the instruments of the financial markets and their regulation is at place. Investors will bring the funds in case these norms are well known for them. That is why [26] argued that banking efficiency is only an option in well developed markets. Well developed market is a market with no inflationary finance. Even developing countries can have efficient market, if financial liberalization would not be procrastinated. However, there is a need of financial literacy. As [27] stated, the entrance of foreign new players into the banking industries of the emerging market led to the technology improvements. In overall, efficiency has improved with the entrants of foreign direct investments. However, the structure of the ownership changed significantly, what is reasonable as was outlined in many works [28-34].

The other factor affecting the efficiency in banking is the capital. [35] stated that the relationship between capital buffers and risk reduction has not been studied through the vision of cyclical behavior of the capital. The point is that the capital requirements can affect the credit system and put the real economy under the pressure. Authors employ the GMM system. Overall findings indicate that there is a negative relationship between the higher capital requirements and business cycle. However, the findings in this area are diverse. For example, [36] indicate the significant positive relationship of capital buffer and cyclicality. [37-41] on the other hand, found no significant effect of higher capital on the wellbeing of the financial institutions.

[42] examined capital adequacy ratios. Author indicated that the main argument has been the liquidity problem. Financial institutions were not able to satisfy the short term obligations requiring them to pay back the liabilities. Therefore, the sale of the assets of financial institutions to fulfill their financial liabilities decreased the prices and pushed other institutions to sell as well. This led to the financial distress and imbalances in the statements of similar institutions.

Well balanced external regulation and internal supervision is important for a good sustainable bank business modeling. In example [43] in line with the study of [6, p. 300]state that regulation increases transparency within the market and increases

financial stability, however, decreases efficiency. Banks are micro oriented in solution of performance targets. However, regulators are responsible for a macro economy. Hence, as [44] states, the final target of imposed regulation and norms as of Basel accord is achieving a general wellbeing of an overall market.

2.2.2 Risk or financial stability

Any factor in banking is a potential source of the risk.

Financially stable banks are considered those, which have higher capital and other prudential regulatory norms satisfied [45-47]. Author indicates that the main contributor to the weak performance of a particular bank is the fundamental incompliance to the standard norms and conditions specified within particular market. On the other hand, [48] indicates that the stricter is the regulation, the higher is the probability of failure, when banks are choosing higher risk projects. Therefore, the introduction of the lever, as the deposit insurance program, positively affects the financial stability of the market. However, deposit insurances are considered as regulatory requirements.

There are other sources of financial instability as the approach to accounting measurement, potential sources of earnings and even entry costs. In example, [49]examined how accounting measures affect risk that incorporate cyclicality. Authors found negative relationship between expected cycles and risk. Managers are expecting the financial reallocation at certain time periods and, therefore, plan the way they can increase the volumes of higher risk investments. Therefore, as [26, p. 55; 50-52] stated the well intended regulation can be lead to unintended and undesirable consequences. Accounting regime affects bank risk exposure. [53] states that banks rely more on a fair value accounting measures compare to accounting historical measures. Banks are under constraint of capital regulation and government prefers to have lower cost accounting. Hence, overall bank industry systemic risk can increase as managers would be willing to dig more for new higher risk, higher return projects. Similar logic works for large sized banks as [54] mentioned. Large sized banks risk more as they are considered strategically important for overall economic state [55]. Hence, big banks are expected to be bailed out. However, this way of building banking infrastructure negatively affects overall financial stability as [56] mentioned in the study utilizing Z-score. Therefore, regulatory bodies need to amend their approach and diversify banks to diminish dependence on one or two big strategically important banks as [57] mentioned. This approach would help decrease systemic risk.

In terms of earnings of the financial institutions, it depends on the business model these institutions follow. As [58] point, the earnings can be based on the lending that is considered traditional to the bank's structural income generation. The lending can be either household lending or in corporate banking. Business development models have both positive and negative returns in relation to risks. Therefore, diversification has a potential power to reduce the risk. Therefore, the combination of different sources can possibly allocate the risk into different baskets, and permit managers of the banks construct less risk oriented portfolio. Some of the studies as [59-63], indicate that the fee and commissions earnings require not high

portions of the capital reserves and hereby reducing the necessity to increase the portion of the leverage. Authors state that the pure interest income generation preferred less than the combination with non-interest income. Thereby, it can also diminish the financial risk. In terms of new players in the market, [64] stated that the banking industries with too high entry prices can enlarge the risk of the systemic default as the new entrants might go insolvent with too high costs.

Generally, the idea is that market players, if are well acknowledged of the possibility of the risk, will behave in a risk-averse manner [65-67]. The other option is to create different types of safety pillows as insurance programs. This case is more applicable to the market, where the information is not equally acknowledged.

2.2.3 The discussion over the tradeoff between concentration and competition

Do a large number of financial institutions create a market with a more competitive nature?

[68] examined the relationship between the concentration and competition in banking. Authors test the hypothesis whether the concentration level diminishes the level of competitiveness. The findings show weak competition for the specification with only local banks, and higher competitive levels between banks in the international arena. Authors indicate rapid technological developments and open international arena as the reason for higher competition. The necessity to merge or apply new technologies to decrease the costs and enhance performance became a vital question in the long term sustainable development for the industry players. There are [69-72] and later [73] indicate negative impact of the market power on the banks. Precisely, authors state that volatile income levels and higher risk of becoming insolvent is generally associated with the financial institutions that have higher market power. However, higher market power banks in Asia are considered to have larger capital ratios. Generally, less competitive markets tend to be less vigilant towards the higher risk activities. [74-76] had a neutral position on the question. Author points two prime directions, where the competition leads to more efficient market, however, has some means to destabilize overall performance. On the other hand, market power can affect the stability in a positive way. However, too much market power is considered as an inefficient market. Different schemes of the competition and monopoly structures can impose different effects on the market. For example, the introduction of the deposit insurance schemes can result in higher competition between the financial institutions. However, it can trigger the moral hazard problem. Bank managers will try to invest in higher risk higher return projects. It is interesting that the author indicates that both concentration and competition is stoic against the systemic risk. The competition on its own is not the factor that affects the stability of the market directly. Authors like [77-81] found that the competition affects the efficiency positively. In terms of the productivity, the effect of the reformation of the industry is positive, but, only in the long term. [82-84] found that the effect of competition on market wellbeing is generally positive. Competition has the effect of market fragility and the monopoly can be inefficient as a result of high concentration of power. The other point is the consolidation of power. The consolidation generally is not meant to be affecting the competition directly.

There are opponents as well. In example, [85,86] examining the risk taking behavior in Asian markets found that the competition is stressful for the overall market and, therefore, negatively affects the financial stability. Moreover, with the higher level of competition comes higher level of moral hazard.

Bank capital structure changed a lot after the Global Financial crisis. Regulatory requirements became tighter. [87] state that interest rate margins became wider as capital requirements got bigger. Borrowers now are paying more. The same logic applies to bank liability, as [88] indicate. Deposits accumulation is now more expensive. The market shrinks and competition between banks gets even higher. However, as [9, p. 419] state, price games lead to vulnerable markets. Therefore, competition leads to increase in volume of higher risk projects and as a result higher volume of NPL and lower overall market performance. As the fundamental study of [89] states, competition is a two side stick. The important point is how competition is evaluated. [90-92] stated that the competition evaluation methodology utilized in different studies tend to evaluate different factors of the competition function. Therefore, findings can be diverse for the same countries and the same timeframes. To find the most robust results authors use both structural and non-structural examination of the competitive behavior of the banks.

2.2.4 Market power or concentrated market

The literature shows that concentrated markets can be more competitive in comparison to markets with more banks and little market power. Technological progress and inter boundary global financial streams made the changes to the market irreversible [93]. This led to the structural transformations within the markets. Therefore, market players needed to adjust to compete with others. Some banks have been required to merge and some were acquiring others.

The literature shows diverse findings. In example, [94-96] showed that the effect of competition on the risk taking behavior is positive. The higher is the level of competitiveness the higher is the risk appetite. In the studies of [97-101] a positive relationship is found between the concentration of the banks and higher risk attitude of the institutions. Author points that the measure of the bank market power can be inadequately assessed if the applied measure is based on the performance indicators of the banks. Therefore, the market power needs to be evaluated based on the endogenous to the bank factors. Overall study findings suggest that the market power is getting higher with the concentration getting tighter. [102] investigated the effect of reverse causality, when the competition between the financial institutions causes the failure of the banks. The overall study findings show that the market power has positive effect on the degree of failure. The Authors point that the reduction of the competition is not the solution, the solution is the qualification of the level of competition. [103]stated that the benefits and costs of the consolidation can be difficult to estimate. Authors state that in case if the US banking industry, the findings showed that consolidation improves the diversification of the assets portfolio and thereby diversifying the risks and reducing the costs. The following sequence eventually increases the performance of the economies in different states of the banking industry of the USA.

[104]examined bank lending structures. Authors found that bank ownership structure affects lending. State owned banks increase lending in times of crisis as opposed to privately owned banks. The main reason is to hold a stable overall economic state. [105]as well mentioned that the crisis makes amendments to the lending process. However, authors state that lending in Central and Eastern European countries is conditional upon the type of crisis, namely; home, foreign or global. Some other studies as[106-109] indicate that state owned banks in economies in transition perform better than non-state banks as are privileged in allocation of governmental funding. Studies as [90, p. 1330] in examination of European market, and [110] of Chinese commercial banking, state that bank ownership structure significantly affects risk taking attitude. Privately owned and foreign banks are more risk averse in comparison to state owned financial institutions. However, as [111-113] findings indicate performance of state owned banks decreases with high risk attitude.

Leverage affects bank lending strategies. [114] state that bank holding companies diversify lending strategies with leverage volume increase. Banks tend to use more repo agreements as are de-intensified by leverage requirements. Studies as [115, 116] for the developed western and European markets point that regulators are responsible for leverage increase as it is a necessity to create safety cushions against possible financial difficulties. Other ways to control risk attitude is to increase the volume of deposit insurance, mentioned in many studies [117-122]. Generally, as [123] state banks are holding different quality assets and therefore, creating safety cushions is well reasoned. In the study of the relationship between the funding structures and risk [124-126] identified that the banks that are leveraged by the local governments are more likely to fail after the crisis.

Another important factor affecting bank business modeling is a macroeconomic condition within country. [110, p. 241] as well as [43, p. 66] stated that cyclicality depending on macroeconomic state of a country can affect bank lending and as a result profitability. Studies as [127-130] indicate that government mostly controls cyclicality and make adjustments to regulation norms and conditions to help bank business be sustainable. On the other hand, banks are given permission to accumulate deposits from population. Hence, regulator constantly increases prudential norms that are constraining bank performance.

2.2.5 Regulation

The goal of regulation is to reduce risk taking by tightening regulatory requirements:

1. Capital

[131]stated that regulation targets restrictions on banking activities that are prohibited and regulation norms that are targeting diminishing the size of the risk and misbehavior of management. There is a big question of how to implement it. For example, [132] stated that regulation of bank ratios would not help control risk taking. Authors suggest that choosing the optimal management compensation scheme can help maximize the best investment output for the company. The theory of regulation states that banks need to restrict their actions in liability or asset activities.

Alternatively, they need to provide some back up, for example, deposit financing (leverage). Some authors state that bank ownership structure significantly affects all other bank factors. For instance, [133] studied the empirical relationship between risk taking, ownership and capital regulations. Authors state that shareholders with comparably small fractions of shares are more risk oriented. For example, [118, p. 1225; 134] stated that shareholders with high fractions in the business were found to be risk averse. [43, p. 66; 94, p. 205;135, 136] stated that bank risks affect bank fragility. Authors found that ownership structure is well associated with risk and regulation. There are opposing views to the regulation effect as well. Authors [98] examining bank stability found that regulation of deposit insurance pose a negative effect on stability. Moreover, state banks tend to be affected more severely rather than private banks. In addition, as [137] stated regulators face difficulties in controlling the activities of individual banks. [2, p. 250] argued that capital concentration can cause systemic risk. Therefore, as [138] stated, capital must be risk adjusted (risk weighted assets). Only then it will enhance bank performance. One sided governmental regulation is a little help [139]. Moreover, [29, p. 1036; 140]stated that regulation seeks benefits for the politicians at first. There are studies indicating positive effect of regulation on performance such as[141-145]. However, in 85 percent of the cases in times of crisis government had to recapitalize the banks [146-148].

2. Activity restrictions

Examining the activity restrictions effect, it is important to study the characteristics of the markets first, as they vary significantly. Therefore, some of the studies applied institutional difference hypothesis [7, p. 147]. Moreover, [149] found that institutional settings affect the way banks behave. [131, p. 30] stated that restrictions mainly represent regulations and supervision with the purpose to stop institutions from taking too much risk. Otherwise, poor regulation may lead to crisis [150]. There are studies indicating poor regulation as one of the main reasons why crisis took place [103, p. 1205;150, p. 735; 151-153]. In terms of effect of restriction, there are few strands in the literature. The first view is that regulation comes late or not in a timely manner [154-157]. The second view is that regulation norms and conditions are poorly implemented [5, p. 1155;6, p. 300;131, p. 25; 158]. The third view is the approach. In example, [159] suggest that it is important for African countries to apply *not the best* but *the best fitting model* of regulation. Restrictions must be specified for particular institutions as [160] mentioned. Moreover, regular monitoring and supervision can help decrease NPL [161].

3. Reserve requirements and other regulatory restrictions

[8] examined the effect of supervision and regulation on bank risk. Authors state that supervision and regulation have significant effect on liquidity and market risk. At the same time, [162] found that there is no significant effect of compliance with Basel norms and conditions on banking performance. However, as in the study of [153, p. 251;163, 164] state that poor regulation of the banking system leads to the slowdown of economic growth in general. There is an interesting view stating that regulation is a tool to maximize political power on banking[165-169]. Some studies are even indicating that regulation increases the level of corruption and sequentially

slowdowns economic growth [159, p. 320; 161, p. 200]. Independent monitoring of the regulation enhances the quality and implementation of the regulation. In example, authors as [170, 171] mentioned that bank efficiency improves with a supervisory authority being independent of the institution of the consideration. Some studies like [155, p. 1523]found that different dimensions of regulation and supervision affect bank performance in different ways. Authors say that examining the risk through the effect of regulation and supervision can cause the problem of homogeneity when researcher applies panel data. Authors say that neglecting heterogeneity in banking can lead to the problems and eventually lead up to wrong results (Hanson et al., 2008).

Some authors found no significant effect of Basel compliance with systematic risk [144, p. 200; 172, 173], But, authors such as [159, p. 304; 161, p. 211;174-176], stated that the effect of the regulation and supervision is not guaranteed to be homogenous. It depends on many specific features. Proponents of the regulation effect such as [154; 161, p.211; 170;177] suggest that the effect is positive and enhance financial stability of the banks. But, these studies are largely examining single regions. These studies represent largely developed countries. Therefore, these particular study findings are not applicable to emerging or developing countries. Both of the risk and return sides of the business are affected by regulation. In example, [107, p. 83] found that prudential norms are realized through the adequate collateral for the lending, necessary capitals and restrictions like entry restrictions. [175, p. 440] stated that regulated banks are open to moral hazard problems. Majority of the studies agree upon the fact that reforms are helpful to decrease economic downturns, but at the same time they increase budget gaps [54, p. 570; 151, p. 151; 159, p. 304;172, p. 43; 178-181].

Conclusion on the 2th section
In the following part of our study we target the examination of the effects of economic tradeoff between the efficiency of the operation of banking industry market and financial stability. The examination is covering both empirical and theoretical literature. Moreover, the effect of the regulatory norms and conditions following the findings in the literature review indicate strong impact of the reforms on the structural standing of the banking industry. The impact of the reformation of the industries tends to be even higher in comparison to the structures themselves, for example competition or concentration within the industry. The following reasoning indicates that the so called Keynesian hand still plays significant role in the establishment of the banking business modeling. This is even harsher in the economies of transition. Despite the fact that the main target is social welfare improvement, the review of the literature indicates that in most of the cases, human nature has impeded the good will of the idea.

The traditional way of the banking income generation through the interest earnings can be significantly affected by the structure of the industry as a whole. The competitive behavior can generate higher sales of the credits as the rates are smaller. However, the systemic risk is higher in this case as the quality of the loans is generally poor in comparison to the structure, where market power is a substantial

factor. Both structural establishments can be specifically regulated by the central control departments. This can stimulate the market and the necessity to satisfy the prudential norms. The studies under observation state that the features of the industries are specific to the country economic establishments. The study methodologies and the approaches of the researchers can be leading to diverse findings even so the examination periods can be the same. Therefore, it is rational to state that the literature findings indicate that the minimization of market power is not the solution. The specific option can be to stimulate competitive behavior between the units that have market power. There is no one answer that can settle the tradeoff between balancing an effective and efficient market and its over-all financial stability. There are features of all the markets and they must be taken into account.Hence, the literature review can only open up new fertile lands for the upcoming discussions.

3 MODEL AND METHODOLOGY DEVELOPMENT

3.1 Preamble

In this section, we discuss the details and building parts of the empirical model we have used in different chapters of the dissertation. In addition, we do historical background overview of financial positions of countries under examination for completeness of the picture. We discuss the historical behavior of bank industries in countries of transition economies and the specific features of their markets. This way we can distinguish between the weaknesses and strengths of particular markets and show why the models we have used are the most optimal ones for examination of problems we look for.

3.1.1 Financial stability

The fundamental examination of the Z-score was developed by Altman (1968). Altman (1968) developed this mode for commercial companies that have failed to develop in a sustainable manner. The idea is to cross compare sustainable and insolvent companies by applying commonly accepted business ratios that are weighted against coefficients in use.

Z-score, employed in the study, has been evolved significantly since the first approach to evaluate company risk exposure by Altman (1968). The mode developed particularly for financial institutions differs significantly from the one developed for commercial companies. In evaluation of risk in the study we use deviation of performance factor of Return on Assets (ROA). The computation is based on work of [182], where we use a rolling window across three quarters. The indication of score of deviation with higher values states that risk is high. Therefore, overall score of risk is low when Z-score is high.

The examination of bank risk in a changing environment or with respect to changes in structures within an institution itself is of high importance for prosperity of financial institution. We, therefore, refer to evaluation of risk utilizing the mode of [182, p. 18]. Following [182, p. 18] we evaluate risk indicator as measure of insolvency for overall list of banks or we may state the consolidated list. The insolvency is indicated as the probability of default when;

$$P \ (Profit < - \ Consolidated \ Equity)$$

Where overall *Capital* is then defined as the *Consolidated Equity* divided by the *Consolidated Assets*,

$$k = - E / A$$

We as well assume that distribution of residuals is normal in the range of 0 to 1:

$$N \ (0, \ 1)$$

Hence, the probability of density of distribution of residuals will be the next:

P (r < k), where r is the density

As a result we obtain risk measure in the next function:

Z = (k − r) / st.dev (k)

Therefore, consolidated risk measure of insolvency is evaluated as the number of deviations that are considered to be below the mean.So, simply stating Z-score is a risk score of distance from bank insolvency.

Generally, application of standard deviation of residuals contributes to difficulty of use of particular approach, despite its huge usage in overwhelming literature of risk evaluation. The application of Z-score outlines number of difficulties for estimation as is stated by [183]. The deviations are calculated over rolling window and, therefore, every additional roll decreases number of observations and significance of the test. Therefore, in examination of small data, the approach application can be difficult. Another point is that data of the ROA itself is varying and application of deviations that are in the past can be less relevant and, therefore, the precision of the findings will decrease. Moreover, the common application of score to all banks can be misleading if researcher uses different time periods for banks under consideration and comparability will be useless. Generally, data shrinks over test and approaches during the examination, and, therefore, differences and lags of variables in line with method of Z-score application will diminish the number of observations and its effect on the findings.

The view is that profits of banks will decrease for the insolvent institution. Therefore, the measure of financial stability shows us the response of bank in terms of capital decrease before it is completely depleted. The use of Z-score has some privileges as the method only requires accounting data that can be mostly available for financial institutions. Hence, the usage permits to have longer range of observations as a result. However, range and different financial institutions canbe the cause to outliers among the scores. The way to decrease the number of outliers is to use natural logarithm of dependent risk measure, which is a better approach rather than adjustment by deletion or averages of the data. The OLS we have used in specific country level studies (Kazakhstan) has been quite effective within examination of risk exposure of local banks.

3.2 Generalized Methods of Moments

This study employs the Generalized Methods of Moments (GMM) system developed in the fundamental work of [1, p. 277]. In the test specification work, authors use lag variables of dependent variable, which the GMM system permits to have. The model contains error terms with no serial correlation and there are effects that contain individual impact. Still, authors state that equation in the model based on the GMM system covers all restrictions of linear moment. So, generally examination of study of [1, p. 277] helps to understand the generelizability of specification tests. These tests can be made only after application of the GMM system.

The previous studies that utilize the GMM system such as [1, p. 277] were using explanatory variables that were robust exogenous in terms and models as well were covering the less exogenous or even with permanent effect under differentiation variables. The point is that these studies were using no assumptions on covariance of variables in the model. Simply stating, random variables that were jointly varying have the covariance between them, and this means that these random variables exhibit similar behavior. If we look at regression results, than we can observ co-linearity of these variables, meaning that these variables have similar effect on the dependent category variable. The researchers have mixed approach towards thesolution of these types of problems. The proponents state that there is no much difference if two of similar effect variables will be added to the equation as there is no overall negative impact of them being recognized together. [1, p. 277]pointed that previous works have been utilizing instrumental variables of high exogenous factor with the restrictions on covariance. However, the fact that covariance existed was left. The exogenous variables signaled that variables under use have no permanent effect. The past, the present and the future values of variables and instrumental variables in use were creating foundation based on which differenced permanent effect variables and lagged dependent variables equation can be constructed. In terms of lags of dependent variable, the works of [184,185] state that these lagged dependent variables can be categorized as instrumental as well and used as explanatory variables in equation. The use of GMM system permits to use lagged dependent variables as explanatory variables. However, authors [1, p. 279;186] state that this case creates problem in the error terms. Therefore, the validity of applied variables and instrumental variables must be confirmed. Authors apply three different tests to confirm the validity, namely Sargan test, Hausman test and direct test of residuals.

In building of equation we refer to the work [1, p. 278]. Few points that we need to make are:

1. We apply variables that are not in a strong endogenous form:

$$Y_{it} = B + e_{it},$$

We as well can incorporate lagged value dependent variable and get

$$Y_{it} = B*Y_{i(t-1)} + \ldots + e_{it},$$

With covariance for the sample equal to zero,

$$Cov_{(Y_t, Y_{(t-1)})} = ((Sum\ (Y_t - Mean\ (Y_t))*(Y_{(t-1)} - Mean\ (Y_{(t-1)}))) / N-1 = 0$$

2. The sample is randomly selected with number of N variables and with effects of the series from.

$$(Y_i \ldots Y_I),$$

3. In the way of [1, p. 280] we refer to the *Beta (B)* coefficient being bigger than *0.*

$$B > 0,$$

4. The same way we expect that the correlation between the error terms (*e*) is small as we apply weakly endogenous variables, hence, the expected returns are equal to 0.

$$E\,(e_{it}) = E\,(e_{it},\,e_{iv}) = 0,\ hence,\ \text{t}is\ not\ equal\ to\ \text{v},\ (\,i...v)\ here\ is\ the\ distribution\ of\ error\ terms,$$

5. The coefficient values can be high, as correlation between variables is assumed to be low.

6. Following the Hausman test recommendations, we apply the maximum of *twolags* for dependent and macroeconomic variables and *one lag* for weakly exogenous (endogenous) variables.

Overall T is equal to 3 (we don't apply 3 lags) or at least cannot be higher than 3,

7. As opposed to previous works, both size of *N* and time *T* is big.

8. Some of previous studies applied quadratic form of the residuals to get linearity of distribution; we make that assumption, but don't apply quadratic form not to lose the true effect of residuals, we only assume that

$$E\,(e_{it} * e_{i\,(t-1)}) = 0,$$

Hence, the correlation of residuals taking into account the assumption of zero covariance between the variables is not linear

$$Correlation = Cov\,(Y_t,\,Y_{(t-1)}) \,/\, St.\ Dev.\,(Y_t) * St.\ Dev.\,(Y_{(t-1)}) = 0,$$

This doesn't imply that the correlation between variables' residuals doesn't exist. We made an assumption that variables have dependence between them, but this dependence is not linear.

The use of GMM system is recommended for panel data use by the fundamental studies such as [1,p. 280;187, 188]. In these studies for the equation moments authors apply vectors for convenience. We refer to instrumental variables with lagged values of dependent and macroeconomic variables. This approach was applied by [189].

The other point that we need to consider is the fact that explanatory variables can incorporate Complete Exogenous Factor variables. In the terms that correlation between residuals of variables is zero,

$$E(Y_{it},\,e_{it}) = 0.$$

However, there is a possibility that Explanatory Variables can incorporate both predetermined factor and exogenous value in a single variable, and as a result the correlation will not be equal to zero, but will incorporate vectors of both:

$$Vectors = (B*Y_{i(t-1)} + ... + e_{it})^{-1} *B*Y_{i(t-1)} + ... + e_{it,}$$

Following this equation, we can observe both choices, alternative and original. In above mentioned studies, authors had an opportunity to utilize two step estimation approach of the GMM system.

The point with an unbalanced panel data;

We need to consider the fact that some of the data might not exhibit completeness in terms of periods. The missing data over consecutive time frame is a common practice. The application of data that is missing can lead to misleading findings in the same way as the fact that arrangement of data done by researcher by applying averages etc [190]. The omission of the units from the list of observation can lead to the biased results. Therefore, the econometric method that is in use can help solve the issue. The idea is that there are methods that are now statistically robust against these types of fluctuations. Generally, the sample of observations shall be big enough to be appropriate and generalized to the true population. In the study of [1, p. 277] the approach was to make arrangements for the vectors of the matrices applied. The missing data on the matrices were replaced by the "0" term. All the options of data arrangement affect the findings in one or another way. Therefore, there is no one best option. It depends on the assumptions, model, methodology, econometric methods, specifics of the data and general conceptual framework that researchers follow.

The degree of freedom for the variation of the variables within the sample identified is important. In the study we apply predetermined, completely exogenous and endogenous variables. For correct application of these different types of variables we utilize the GMM system with the arrangements in terms of differences, the use of the lags for the both sides of equation. We follow the study of [1, p. 280] and apply the lagged effects. We refer to the idea that the GMM system itself has power to recognize the values of factor of inobservance.

While examining the data applied we refer to the hidden information that basic statistical applications cannot count. One of the powers of the GMM model apart from solution of possible problems of the heteroscedasticity and endogeneity of the variables is the inclusion of the information of the hidden character of the variables under examination. Simply stating, the variables we take into consideration are not always sharing complete information they posses, and, therefore, not all statistical approaches and methodologies have this power to identify the complete effect of variables in the model. One of the powerful methodologies of dynamic modeling is when researcher can incorporate values of dependent variables of preceding time periods as the explanatory factor into equation is considered the GMM system. Moreover, the sophisticated modeling of the GMM system type incorporates the possibility of the missing data or the outliers problem and, therefore, solves the obstacle of the unbalanced panel data, when the data is missing in time series. We

already discussed the solutions and the causes of the missing data problem. The arrangements in all terms of imputation or exclusion will one or another way affect the final results. Therefore, the best option is to discuss the situation and the application of the decision we have made. We outlined the position indicating our assumptions, amendments and interference to the statistical model more precisely in each part of the data and methodology section of the work. Therefore, the understanding of the data, the relationship between applied variables and statistical requirements and compliance with the norms of the econometrics as well as the necessary assumptions all is the responsibility of researcher. In general, the missing data in the sample is normal, since it is part of true population condition.

The study of [1, p. 280] indicates that in specification of tests, applying the Sargan test can be evaluated with no serial correlation between residuals of variables. However, this will require additional arrangements that can be quite difficult to implement.

The equations that we have applied to the study are then the following:

$$Y_{it} = c + B*Y_{i\,(t-1)} + \dots + e_{it,}$$
$$Y_{i\,(t-1)} = c + B_1*Y_{i\,(t-2)} + B_2*X_{i\,(t-2)} \dots + e_{it,}$$

For the present indicating the *X* as the macroeconomic factors incorporated to the model:

Where *(I = 1 … N, and T = 1…+),*

We as well identified that there are variables that are complete exogenous:

$$E\,(e_{it} * e_{i\,(t-1)}) = 0,$$

We use these variables in estimation and target performance identification relying on lagged factors; the GMM will cover the impact of unobservable effect on the coefficients. For the specification of residuals and proper evaluation of correlation, the tests that have been done by Anderson and Hsiao and Arrelano and Bond utilizing the matrices and the estimators with the help of the tests of Hausman and Sargan can be beneficial for further studies.

Moreover, the application of this particular system can help distinguish the true usefulness of variables that can be less correlated with the effects as it is stated in the study of [1, p. 281]. The point is that these types of variables play important role in the findings and the generalizability of sample findings application to true state of population. On the other hand, the usefulness of the method is that at least it can identify correlated variables that are endogenous. But, before application of the model, proper specification of equation must be done. Previous fundamental studies of [1, p. 281;191, 192] used the method for the time series data and applied vector expressions. This way authors decreased the necessity to use matrices that can be very huge. So, generally applications of variables that are considered predetermined are better to be used in forms of lagged variables and the GMM technique use, with

differenced instrumental variables. This way of application of variables will let researcher apply strictly exogenous variables that have no correlation with residuals of other variables in the regression. Let's now consider the model itself following the expression of [1, p. 281]:

$$Y_{it} = B * X_{it} + V * F_{it} * e_{it,}$$

Where the residuals of the variables of X and F are strictly exogenous because of individual effect of d_{it}, hence the residuals then are in the form of:

$$E_{it} = u_{it} + d_{it,}$$

Where $t = (1 \ldots T)$, and $i = (1 \ldots N)$ with the assumption made in line with [1, p. 282]that the T is small and the N is large. Taking into account standard assumption we can explain the B only. To explain the V we need to make the next assumption that value of X and F with individual effect d is equal to zero.

$$E (d_{it} / X_{i1} \ldots X_{iT}, F_{i1} \ldots F_{iT}) = 0$$

The assumption indicates the mode that is between the Fixed Effects, where all variables are potentially correlated and the Random Effects mode, where the residuals are not correlated.

We use standard regression based on GMM model with residuals incorporated in estimation of performance and risk exposure of banks in transition economies. We refer to the work of [193], where authors decided to refer to the stochastic frontier model. Authors signify that efficiency evaluation is well defined with help of building of the best stochastic frontier, where outliers are considered as the inefficiency. We use country, bank and industry specific variables in line with the studies of [194-195] and [193, p. 197]. The main difference is that [193, p. 197] exclude from the observation a lot of Russian banks, explaining the decision by huge difference in structures of Russian banks. We do incorporate the banks of the Russian Federation in our study to represent full sample of true population of transition economies. However, the point of authors is reasonable as the Russian banks tend to be very much subject to governmental intervention and highly dependent on commodity price fluctuations. Therefore, we state that complete omission of the Russian banks can affect the precision of the findings in examination of whole transitional banking industry in the world. In the study we run samples of different types that include regional allocation of banks. Hence, we would be able to examine banks separately and compare the findings with complete list of banks.

Generally, the GMM system automatically excludes the non valid observations. Before the application of GMM the number of advisable lags is suggestedby the Hausman test. In example, in this study we apply the maximum of two lags. Indicating three lags, the system automatically incorporates the second and third. The OLS regression mode can be considered as the one step GMM. However, since we apply the instrumental variables, in the two step estimation the option of

residuals' mean sum being not equal to zero is possible. However, we made that point in the beginning that the OLS has the requirement that the explanatory variables are not correlated with the residuals. Hence, if that is the case, the reasoning of the application of the instruments utilizing the lagged variables is appropriate.

The endogeneity problem is the estimation problem. Dependent variable and explanatory factors can be determined simultaneously as [89, p. 226] indicate. Using the Sargan-Hansen test authors identify the existence of the problem. The following solution was to examine the cost factor in the lagged form utilizing the two-step GMM system in line with our study. The Marginal Cost has been used in the lagged form to explain the completion efficiency. Authors examine the risk and completion relationship and as well utilizing the risk measure (Z-score) in the lagged form since considering it as the highly correlated factor with the explanatory variable of completion. However, for this specific relationship examination authors use the frontier analysis, where the residual term is decomposed in the next form:

$$E_{it} = u_{it} + v_{it},$$

Where, the first part of the error term U is normally distributed representing the factors that are not under control of the research. The other part of the error term V is the part representing the residual that can be affected by the decisions of the managers of the banks. Hence, it is partially normally distributed and can be considered under control error term; however, the inefficiency is the result of the technical problems or systemic misspecification.

In the buildup of the indices of regulation factors we refer to the work of [172, p. 40] and use surveys based on the World Bank supervision and regulation. The study of the [193, p. 197] refer to scale building, where the range of 1 to 10 will indicate the range of the lowest and the highest compliance with the regulatory norms as *Capital Requirements*, *Restriction* level on the *Non-banking Activities* or the *Reserves* level for the lost loans. In our study we do apply similar logic indicating the highest and the lowest volumes of variables representing regulatory factors, but not referring to separately build indices. We refer to overall average and the highest and the lowest volumes of regulatory variables.

The other point is that [193, p. 197] are using quantile regressions reasoning it by the fact that many previous works conclude that overall findings would be homogenously accepted for all banks under examination. However, this is not the case. The reasoning is adequate, since banks under consideration are different and have their own specifics despite the fact that the markets they work in are all considered transitional. We, in our study, as well take this moment into account and, therefore, for robustness of tests apply the regression modes to overall sample and then separate regions and thereafter compare the significance of the findings.

In terms of autocorrelation, the point is that if we apply lag variables or some differentiated variables (instrumental variables), these variables can correlate with the initial base variable. Moreover, the existence of error term by itself presupposes that there is a small term of correlation. Therefore, statistically the first order autocorrelation almost always indicates correlation between the variables and the

second order autocorrelation shows true level of autocorrelation. This idea was generally stated in the study of the [1, p. 280], where authors tested autocorrelation utilizing the Durbin-Watson test. Generally, the autocorrelation in theory exists when there is a model weakness in terms of theoretical and conceptual background. This means that the model is missing some important variables and, therefore, the applied variables can exhibit autocorrelation. We stated already that all is the responsibility of researcher; both empirically correct established model and conceptually right formed idea represented by the use of the truly valuable but may be statistically insignificant variables.

The above reasoning is done with the purpose of exhibition that thorough analysis has been given to utilized data and methodology applied both in terms of empirical and conceptual approaches. The overall regression that we use is based on the next two equations:

$$Z\text{-}score_{t\text{-}1} = C + Regulation_{t\text{-}1} + Bank_t + Industry_t + Macro_{t\text{-}1} + Crisis,$$

$$Z\text{-}score_{t\text{-}2} = C + Regulation_{t\text{-}2} + Bank_{t\text{-}1} + Industry_{t\text{-}1} + Macro_{t\text{-}2} + Crisis,$$

where the *Macro* variables are represented by the *Inflation* and *GDP growth* that are considered endogenous variables. Hence, these variables are better to be represented in the timeframe in line with the dependent variable [113, p. 296]. In terms of Bank and Industry specific variables, we express them with one lag only if dependent variable is two lags. We refer to the study of [11, p. 190], that managers of banks tend to react in time to solve possible problems by making adjustments to different type of the requirements of capital or reserves increase. However, the regulation always comes with the lagged response and, therefore, represented as a least in line with the timeframe of the dependent variable consideration.

3.3 Model, variables and effects on performance and risk

Following the study of [111, p. 600] we draw models of performance and risk estimation with respect to ownership structures, regulation norms and conditions and specifics of countries under examination. The model is generally the resemblance of function developed by [151, p. 150]:

$$Performance / Risk = Constant + Bank\ Specific + Industry\ Specific + Regulation + Macroeconomic + Crisis + error\ term,$$

Where, the Crisis factor exhibits local country shocks as the devaluation of currency, the local financial crisis and the Global financial crisis. Moreover, transitional countries are regionally interdependent. Therefore, the crisis of local Russian Ruble of 1997 has been affecting former Soviet Union countries, spreading financial difficulties among these countries as well. Other explanatory variables are discussed more precisely in the separate parts of the thesis. We use regression function instead of frontier analysis with the examination of endogenous/exogenous variables utilizing the mode of GMM system. Some studies, such as [151, p.

150]indicate that the factor of building parametric frontier can make the results more precise and decrease the measurement errors as stochastic term is determined in this methodology. We discussed that the frontier analysis decompose the error term that can help examine the individual effects of particular variables. However, the adjustment by itself narrows precision of the findings. In any way, the use of the GMM system presupposes the coverage of dynamic effects of variables under the study.

The other empirical moment that we need to examine separately is the adjusted weights of assets, capital and other fundamental banks specific factors against risk. The study of [87, p. S60] has mentioned that the format of business risk appraisal has significantly changed after the financial crisis of 2008. The changes took place in volume of assets of all market types, of whether emerging, developed, developing or transitional countries have increased against the previous norms before the crisis. These adjustments in the balance sheet structures of banks have been more severe in financial institutions with lower capital volumes.

Going back to the basics of accounting, we can outline few options how banks can diminish risk by increasing the volume of the capital. Theoretically, the first option to boost the retained earnings is to increase profits by decreasing the costs (keeping the earnings without paying the dividends) and increasing the profits by widening the range of the spread between the loan and debt interest rates. In addition, the business model has been modified in terms of income generation from non-banking activities.

The other option of the *pecking order* is to increase marketability of financial institutions by enlarging the volume of equity selling. And the third option is through the adjustments made to the assets of a bank.

One more way is to diminish the size of the loans in the portfolio that will affect securitization against non-payments and, hence, will decrease the necessity to increase the volume of the buffer capital.On the other hand, banks can always diminish the volume of the risk weighted capital by increasing the weight of portfolio with the less risky assets of governmental securities caliber. Generally, the strategy is to positively affect the macroeconomic condition of country as a whole. Therefore, as the authors point, both policies of cost reduction or profit maximization are expected to positively affect the macro economy in the long term perspective. However, the differing view that the effect of tighter capital regulation is stating that this strategy will negatively affect the short term lending and as a result affect the cost structure.

The general overview of risk weighted change in the world aftermath the challenges of the 2008 Global financial crisis has significantly restructured the capital adequacy ratios of financial institutions in all types of markets. The following graph represents Basel III based capital adequacy framework in the study of [87, p. S58]. The figure 1 (graph) represents international banks of *large size* and *all other* bankscategories and the percentage change over period. The graph indicates that the increase in the volume of capital in all years. The adequate increase touches the volume increase with respect to capital conservation buffer as well. This point of overall increase of capital volume is appropriate despite the fact that calculations of

capital ratios between country specifics and the years examined are possible to be different.
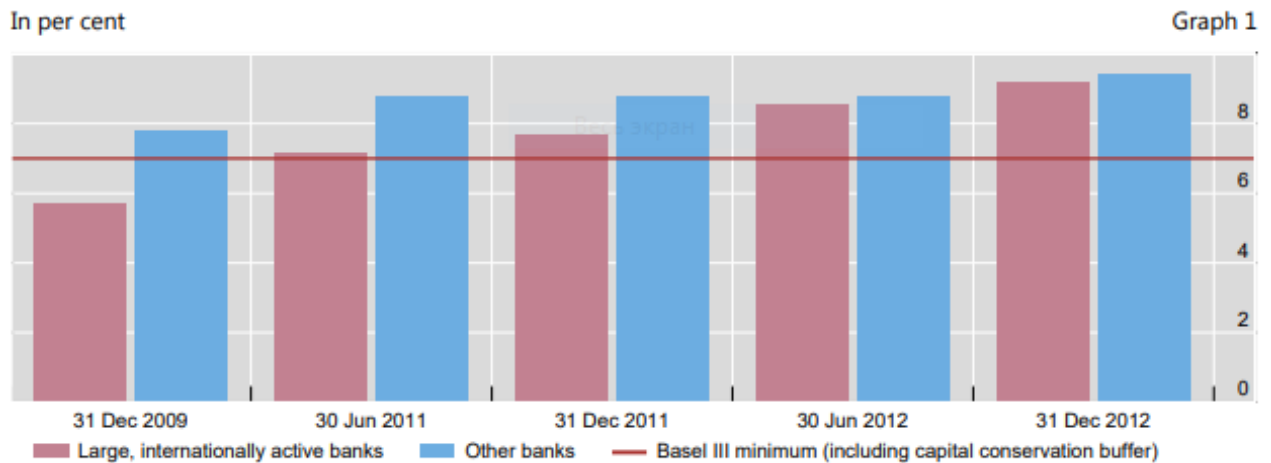
Figure 1 – Common eguity risk –weighted capital ratios under Basel III definitions

In constructing the capital risk weights we refer to the study of Scatigna and Cohen (2014) again. Generally, the weights just shrink the volume of the risk and respectively increase the capital. Therefore, we adjust the main components of the capital with respect to the overall capital in the next way,

$$\text{Income}_1 / \text{Capital}_0 - \text{Dividends}_1 / \text{Capital}_0 + \text{Other}_1 / \text{Capital}_0,$$

Where the *Other* factor is the index of (0 - 1) contributing the overall capital structure. This way we adjust the *Capital* in the time ($_0$) to the possible additions (*Income + Other*) and deductions (*Dividends*) in the future time ($_1$).

In the same way we adjust the liability side by indicating the *Risk Weighted Assets (RWA)* to the *Total Assets (TA)* in the next form:

$$((\text{RWA}_1 / \text{TA}_1) / (\text{RWA}_0 / \text{TA}_0)) * ((\text{TA}_1/\text{TA}_0)),$$

So the risk weight itself is adjusted with respect to the time frame of ($_0$) and ($_1$) period. The purpose we are targeting is the separate examination and risk adjustments of the factors contributing one or another way to the capital structure of the banks. In overall, the capital in the time ($_0$) needs to be adjusted to the possible risk weight of assets in the period ($_0$). Thereafter, the adjustments done to the capital with respect to the risk weight must be adjusted to the future period of ($_1$). The empirical formulation is the next:

$$(\text{Capital}_1 / \text{RWA}_1) / (\text{Capital}_0 / \text{RWA}_0).$$

Following the study of Scatigna and Cohen (2014) we obtain the next equation that must be satisfied:

$$(Capital_1 / RWA_1) / (Capital_0 / RWA_0) = (1 + Income_1 / Capital_0 - Dividends_1 / Capital_0 + Other_1 / Capital_0) / ((RWA_1 / TA_1) / (RWA_0 / TA_0)) * ((TA_1/TA_0))$$

Generally, decomposing the structure of risk weighted capital we observe that transition economies under examination indicate that overall weight of risk weighted assets increase for these economies. The same study of [87, p. s58] state that, for their sample of advanced economies, the volume of adjusted assets reversely decreased. This reasoning shows that the level of risk adjustments to the capital has been higher in developed economies and these economies had higher regulation indices than what was expected following the requirements of the Basel III regulations and norms. The risk weighted assets has been constructed following the Basel III requirements. However, the overall world has showed that the risk weights increased the volume of the capital at least by 3 percents on average across different types of markets. Therefore, the expectation of the overall risk weight to increase is rational. Moreover, the Basel II requirements are less tight in comparison to the Basel III. For the normalization of the values we obtained, both sides of the equation have been taken in the logarithm form. The overall target of research apart from the main theoretical appropriateness is selection of the right model. However, the point must be emphasized that statistical significance of variables we apply is not based only on the significance of the variables, the idea we follow requires us to make adjustments in terms of proper econometric applications. We do explain some of the cases whenever the applications of the assumptions are not following statistical requirements. These types of adjustments are necessary if theoretical background is in comparative advantage to the econometric significance of the enquired subject.

Few other points are in relation to the assumptions of the econometric analysis of the data. The distribution of the data is normal referring to the size of the sample of the core model, which consists of higher than 3500 observations after adjustments. The GMM successfully solve the issue of heteroscedastic variables. Both theoretically and statistically the variables included have significant impact factor with no one specific variable that has higher influence. Variables in the observation model are homoscedastic. The linearity is common for all the relationships between explanatory and dependent variables. The non-metric factors as dummy variable are adjusted with the log forms to attain necessary condition of linear relationship. Dependent and independent variables are well correlated, with residuals of independent variables being the other way less correlated.

In building the model we follow number of performance and risk measures of banking industries. Following [196] we build the most of the bank specific variables. Risk exposure incorporates the *Credit Risk,* which is built as a ratio of *Loan Loss Provision* over *Total Loans* or as in the study of [151, p.150] as a ratio of *Total Loans* over the *Total Assets.* The other part of the risk, *Liquidity Risk*, is build based on the study of [197], where the liquidity of the banks is measured as the difference of *Total Loans* and *Total Deposits* divided by the *Total Assets*. Accounting measures of *Return on Assets*, *Return on Equity (Common Equity)* and *Return on Capital* are represented as *Total Equity* over *Total Assets*, *Net Income* over *Total Assets* and *Net Income* minus *Dividends* divided by the sum of *Debt* and *Equity*, respectively.

Following [151, p. 150] we construct Fee measure that is *Non-Interest Income* divided by the *Net Interest Income*. We will discuss the risk of liquidity more precisely further. Here briefly examine liquidity of the short and long terms. *Net Stable Funding Ratio* is one of the option how we estimate long term (more than a year) liquidity risk. In line with the study of [198], we use the NSFR as the ratio of *Available Stable Funding* divided by the *Required Stable Funding*. The ratio of stable funding must be higher than 1, as a least, for the bank to be considered safe. Otherwise there is a liquidity concern that might affect overall efficiency of the bank. We build the *Net Interest Margin* and *Investments* based on the work of [199]. The first is the *Net Interest Income* divided by the *Earning Assets*. The second is represented as *Trading Securities* divided by the *Total Investments* in the study. Factors as *Non-Traditional Activities* to the bank and *Cost Efficiency* are given as Non-Interest Income divided by the Total Revenue and Expenses over Total Assets, respectively. The importance of the tests to analysis we apply is high as the application of the model and method and the robustness of the results is the crucial point of the research. The rightly posed question can solve half of the problem, because it helps to distinguish between the right and wrong usage of the method, which is the other half of the good strategy to make the research effective.

The other discussion that is of high importance is the understanding of the variables of the explanatory character that is in the model researcher employs. The case of the collinear variables or as it is known the variables with the high likeliness and henceforth similar contribution to the overall explanation of the change in the dependent variable. The overall effect on the model significance is small in case of application of the variables with high similarity and the predictive power effect. However, the point here is that these variables can be poorly examined individually. This means that the effect of the individual variable on the dependent variable is hard to identify as the variables have similar effect. On the side of the econometrics, if the variables are examined in the matrix than the inversion of the matrix of the variables will not give the right outcome because of the missing rank. Therefore, the co-linearity can be accepted with the models, where the overall effect is important and individual is less.

In case of multicollinearity the precision of the explanatory variable and its effect on the dependent factor is getting weaker. The point that the examination of the relationship between two variables only, holding others constant no longer works if there is a collinear relationship between two explanatory variables. Therefore, in these types of models the standard errors tend to be very high and the hypothesis of the other coefficients being zero is rejected, when relationship between one independent and dependent variable is considered. However, the results of the findings are not biased, what is good.

There are number of options that are recommended how to tackle the inconvenience of multicollinearity. Dummy variable application can be the source of the collinear variables presence. For this particular study we have applied the dummies for the years of the crisis identification. However, the collinear variables arise in the case of application of the dummies in all categories of the regressions with the combination of constant term. This is not the case for our study. Hence, this

source can be omitted. Generally, the collinear variables are mostly arising with the small data approach. For the large number observations, the multi-collinear variables can even be left for the examination as it is. The idea is that the inclusion of the variables into the model doesn't only depend on statistical significance or the empirical examination of the factors. Usually, author can rely on personal conceptual judgment and include similar statistical impact variables into the model just to express the information that particular variable has. Therefore, the other option to drop the variable from the examination with the purpose of increasing the coefficient value of another variable is very specific decision. The better option is to identify possible collinear variables and list them with the assumptions researcher makes. However, this is the case with collinear variables. We do run the regressions with collinear variables only in the case of the Kazakhstani banking industry examination and for the sake of research interest. However, general model that we run has no collinear variables as the model incorporates enough number of observations.

We refer and accept collinear variables as the generated or instrumental variables [200]. Collinear variables are generated from variables that we already use in the study. Therefore, we can consider the collinear variables as the specification of research that we include deliberately. The problem can arise in the case when the data that we use, the raw data, is collinear in some of the variables. Therefore, there is a big question whether the multicollinearity needs to be fixed. Hence, there is a question whether collinear variables in the examination are of target interest of our study; or whether this is generally the experimental research driven approach and the collinear variables are acceptable; and, or the effect of the collinear variables is very small on the significance of the findings.

3.4 Norms and regulations

The examination of the transitional countries and their risk exposure in the banking industries requires the understanding of the norms and regulations that the banks work under apart from the general risks that these banks hold from more exposure. We cover the *Basel Committee on Banking and Supervision* as the main core standards that the countries under examination of this study work on. Therefore, this part of the thesis will cover the background of the theoretical norms and conditions we incorporated into the empirical model we have applied.

The basic idea of the Basel Framework is to reduce the potential risk of arbitrage. The risk one bank bears can spread among other institutions through financial intermediation. Therefore, the application of the standards is common to the *Bank Holding Companies (BHS)* on the same conditions as the standard bank. Here is why it so important for the supervisors to intelligently examine the implementation of the norms and the compliance with them of the banks under consideration.

The crisis consequences required new reforms and regulations. Basel III regulation update formed a new norm of Net Stable Funding Ratio (NSFR) that targeted liquidity consolidation following requirements to fulfill bank prudential norms. The other alternative option has been the Liquidity Coverage Ratio (LCR). The NSFR is the combination of the available and the required amount of the funding that must be at hand of the financial institution. The ratio must be at least equal to 1.

NSFR = Available amount of stable funding / required amount of stable funding,
And the ratio must be higher than 1 (>100%),

The idea is that short term funding is excluded from the examination and only includes long term customer deposits, long term funding and other long term liabilities. Moreover, the weights of the assets are not equally distributed. For example, the portion of the longer than 1 year period loans covers 100 percent, 20% belongs to the bonds, retail loans need to be 85 and 50% of corporate loans for less than a year for the later two categories. This examination of the NSFR, however, has been calculated through the accounting based liquidity estimation in the study of Allen et al. (2014) and [181, p. 11], whenever the validity of the data is questionable. As an alternative measure of the liquidity risk, authors used the next formula:

Liquidity Risk = (Total Loans – Total Deposits) / Total Assets

Some of the other studies such as [96, p.91] have used this formula for the calculation of the Reserve Requirements based on the Basel II norms and regulations.

The *Net Stable Funding Ratio (NSRF)* is the buffer that covers risk against the activities of the financial institutions proportionally allocated against the bank assets. The exposure that can lead the bank to higher risk is called as the Large Exposures. For the Derivatives products the margins are settled as the minimum that would cover the risk of non-return. All these requirements are addressed to encounter the wrongdoing of the bank management in all means of deliberate and by chance situations that might lead to the risk. One of the options of the control is the disclosure of the requirements compliance that can directly affect the discipline and eventually the efficiency and performance of the financial entity. We further discuss the applied regulatory and supervisory measures in the study with empirical implications. The compliance of the banking business modeling with the core principals and norms of Basel accord presuppose the better performance of the banks in overall. Our task is to check whether the applied norms and conditions of the supervision and regulation work as it is targeted.

Consolidation of financial institutions helps examine the financial streams [201]. The point is that bank needs to provide the consolidated review of its whole business that might incorporate the subsidiaries, small financial firms belonging to the conglomerate and so force. The introduction of the *Activities* not directly related to the banks are treated with higher caution and examined as the risk exposure. One example is the insurance that the banks sell or buy the securities that are covered by the insurances. Generally, the common practice of the supervisors in the case is to withdraw the adequate volume of the devoted amounts from the equity side to make the balance of the highly probable withdrawals from the balance sheet of the capital side [202].

The systemic importance of the bank is categorized in the equal weight of five different subsections. Basel recognizes five categories that the banks considered systemic and must comply with: the size of the bank in terms of the assets holding; activities across jurisdictions in terms of liabilities and claims of the bank;

connections in terms of financial systems in the way of securities, liabilities and assets buy and sell; financial intermediation in the market of the debt, equity and external financing; and complexity of the institution. Based on the equal proportions of each of the categories the score is calculated.

In terms of the *Minimum Capital Holdings*, the bank must comply with the next percentage fractions: common equity with 4.5% minimum risk weighted assets, 6 and 8% of the Tier 1 and Total Capital, respectively. The calculations of the Risk Weighted Assets vary among the banks and, therefore, can be the potential source of misinterpretation. The problem is that the assets are calculated based on the internal information of the banks and can be approved by the management only. Hence, assets weighted on the market, credit and operational risk can pose serious misleading results and be beneficial for the examined bank only but not represent true state of the risk exposure. The credit risk weight is generally calculated based on the Values at Risk (VAR) assets that are specific to all banks and formed on the individual calculations.

Market Risk is another important source of risk to be controlled, which can arise from the movements of the prices. This affects the equity composition and, therefore, might require higher capital buffer in case of a negative scenario. The products of the Trading Desk such as repo, forwards, future contracts, foreign-ex are the potential sources for the risk and, therefore, must be incorporated into the calculation of the market risk as it has direct impact on the capital of the bank.

The graphs below demonstrate the main historical ratios.
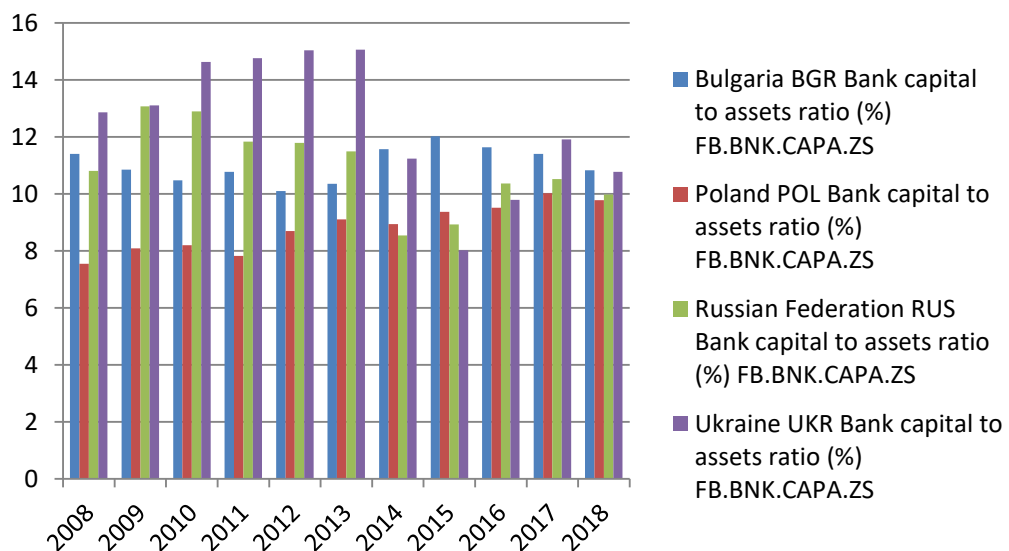
Figure 2 – Bank Capital Assets ratio (%), Transitional countries of Eastern European region, 2008-2018

Note – Compiled by source[194]

Figure 2 (graph) indicates the capital assets ratio for the transitional countries of Eastern European region. We observe that the smallest ratio is in Poland across the whole period under examination. We summarize that the ratio for Poland is smaller in

comparison to the other regional countries because of more stable financial position. The ratio is known as well as leverage ratio and calculated based on the requirements of the Basel accord. Details are in the (Appendix B).
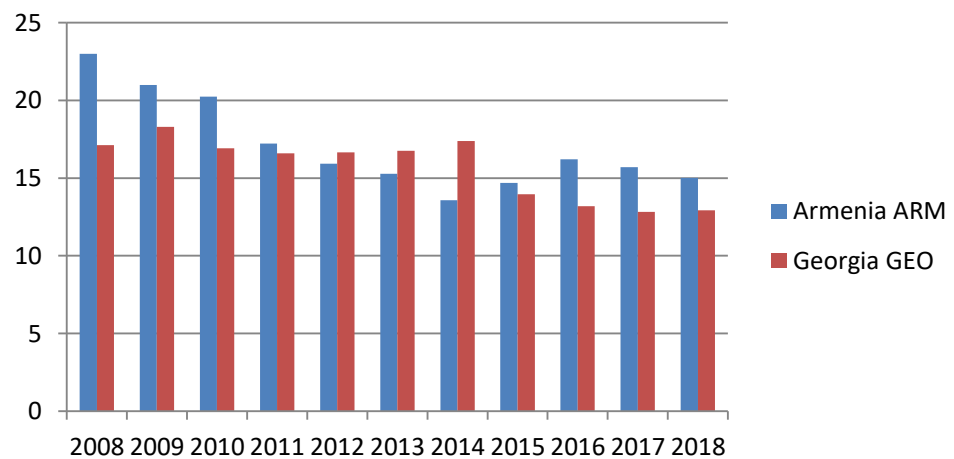
Figure 3 – Bank Capital Assets ratio (%), Transitional countries of Caucasus and Balkan region, 2008-2018

Note - Compiled by source[194]

Figure 3 (graph) indicates the capital assets ratio for Armenia and Georgia transitional countries. Both countries indicate high ratios signaling weak financial markets, especially in the years of the crisis. The region represents the highest portion of the capital assets ratio among the examined regions (the average of around 15%).
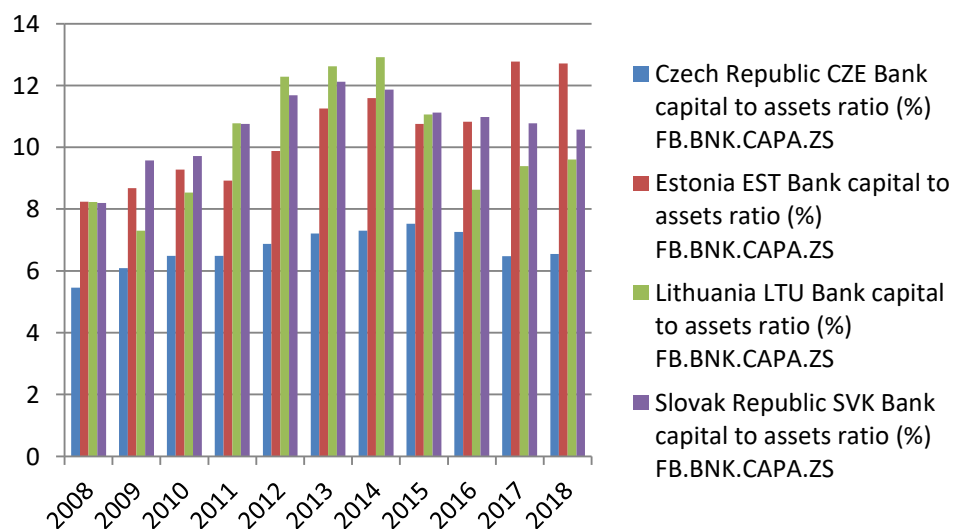
Figure 4 –Bank Capital Assets ratio (%), Transitional countries of Central European region, 2008-2018

Note – Compiled by source[194]

Figure 4 (graph) indicates capital assets ratio for the Central European transitional countries. The average of the whole period is not above 13% indicating

moderate stable region. The fluctuation across the years and the countries are specific to the internal conditions of the separate economies.
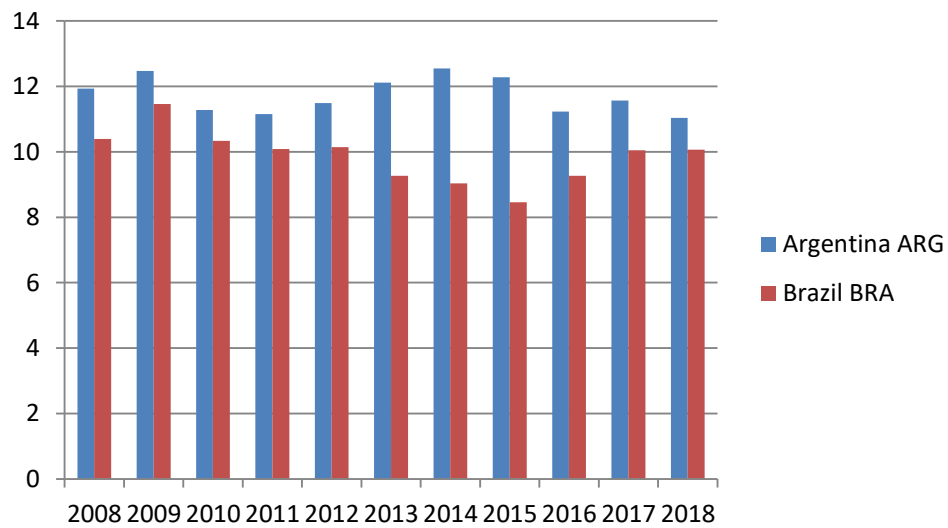
Figure 5 –Bank Capital Assets ratio (%), Peer transitional countries of Argentine and Brazil, 2008-2018

Note – Compiled by source[194]

The figure 5 (graph) above indicates the capital assets ratio for the Peer transitional countries of Argentina and Brazil. The same as in the Central and Eastern part European regions, countries show moderately stable financial markets with leverage ratio not higher than 12.5% across the whole examination period.

3.5 Historical overview

The part of transitional countries that were part of the former Soviet Union is quite substantial. This part of the thesis introduces some historical overview and current effect of these countries on the overall strand of transitional market. In times of the Soviet Union there were mainly outlined two directions of development considered crucial: the first one is to hold the inflation rate in the range of the centrally planned apparatus; the second one is the planned finance of the sources of the output. The centralization of private ownership in all terms and accumulation of the finance and savings was the main target of the Soviet ideology that was named as the industrialization process (Lavrov, 1972). The situation on financial intermediation has been not marketable at all. The finance of the enterprises that were governmentally owned was planned. There were no capital and credit markets that can outline the rates for the market financial intermediation. Generally, the funds were simply distributed among the planned sectors of the planned economy. This is generally what is called a one tier banking system, where all the financial streams were dependent on the policy making of the central apparatus. This system of the control is called the monobank control system. Since the control of the plan was as well the responsibility of the central apparatus, the implementation of the targets that were not reached didn't lead to the insolvency of the branches of the central bank.

Generally, the system was working in a way that the finance was given again with the administrative warnings. This process is not working in the today's financial intermediation very often. In case of the existence of the additional spending from the government today, this would be called soft budgeting. However, this will not solve the problem of the bank unit most likely; this type of financial behavior today is called the inefficiency and most likely will lead to the insolvency of the financial institution in the future.

The financial liberalization took place as a necessity since the failures of the banking units became a norm. The inefficiency of the process led up to the market failures. The process of liberalization was under the strict control of central government and the regulation of the market was considered as the governmental intervention to the banking business, rather than the process of adequate regulation and supervision with the purpose of industry development. The credit system makes the development of any area go further. Therefore, the banks were considered as the core point of a country's economic growth [199, p. 577]. Eventually, the liberalization turned the system into two tier banking system. The process permitted to make the crucial separation between the commercial banking and the monetary policy of the central bank. However, this process of liberalization has been still under the regulation of the central bank in most countries.

Moreover, with the introduction of the liberalization and its process, some of the Soviet Union countries continued with the finance allocation plan from the central government. The freedom was not given completely to the enterprises under the planned economy; however, the liberalization process at least triggered the reforms start and the opportunity for the enterprises to decide where they can get the finance and capital. Closer to the 1990th the transitional countries of today's example permitted to the businessmen to start the private banking.

We examine the transitional economies of different regions of the world. Therefore, the processes within these countries were differently introduced. The European and America's countries were some way in line in the development process. However, the reforms that took place in the post Soviet Union countries were different. Generally, the purpose was to introduce the two tier banking system with no planned allocation of the credits and, therefore, market created prices. These new introductions were generally positive for the development of the industry in overall. However, the heritage from the planned economy with its bad loans, old ties and inefficient allocation of funds did not let the industry work on a full stream, as it was planned by the newly created governments of the transitional economies. Poor regulation and the open market gave birth to many financial institutions that were generally not much different in terms of the effectiveness and the efficiency than those that were present under the planned economy markets. These institutions rather have been considered as the financial units that were created for the sake of the business of the wealthy companies and enterprises. The next stage of the development touched exactly these types of small banks as the government introduced additional regulatory norms and supervision. The second wave of the reforms pushed out the inefficient financial institutions from the market mainly because of the new requirements in terms of capital holdings, monetary policy and

different regulatory reforms that cannot be arranged by the small "pocket" banks. These financial constraints caused the financial crises in all the countries that have switched from planned to free market economies. The difference was just in the severity of the crisis that took place. Mainly, those countries with closer market allocation of funds and institutions gradually vanishing because of the impossibilities to comply with the norms, coped better than those countries like Russia that have been trying to bailout the drowning local inefficient financial institutions. This policy of keeping the old ties and leaving them in the market played negative role for the whole economy that resulted in the most severe crisis of Russian ruble back in 1997.

We have discussed the countries under examination in separate terms. However, taking into account the special circumstances of the post Soviet Union countries, we need to mention that in the state of the independence, largely, these countries still were looking back into the old ties and were dependent on the central government, which was Moscow. Therefore, entering the new era of the transitional order, the weaknesses of the separate countries were at large. We refer to the study of [203], where we can observe the countries of the post Soviet Union and their ratios of per capita assets.

Following the examination of per capita assets for the single country, author found that the best three in the list are Russia, Kazakhstan and Ukraine with rounded dollar values per capita of 9000, 5500 and 3600, respectively. On the other side of the list, the weakest countries are Tajikistan, Uzbekistan and Kyrgyzstan with the dollar values of 247, 282 and 481 per capita, respectively. These values are covering the second wave of the transition period aftermath the global financial crisis. The below table 2 shows the overall stand of the transitional countries under CIS (table 2) [203, p. 303-310].

Tabel 2 – Banking system assets per person, US$, 2007-2014

Country	Year								
	2007	2008	2009	2010	2011	2012	2013	lst half 2014	Averade by
Russia	5774,4	6679,2	6815,1	7764,8	9043,7	11383,2	12252,4	12611,6	9040,6
Kazakhstan	6272,1	6277,9	4840,7	5005,6	5218,5	5479,0	5911,3	5477,4	56560,3
Belarus	2091,1	3023,6	3099,5	4607,9	3253,8	3922,6	4361,5	4467,3	3603,4
Ukraine	2552,0	2732,5	2392,9	2579,0	2888,0	3092,6	3515,1	2169,2	2740,1
Azerbaijan	927,2	1463,6	1623,4	1839,7	1976,4	2417,9	2759,4	2862,9	1983,8
Armenia	826,1	1121,4	1182,2	1448,3	1807,3	2061,9	2438,0	2401,8	1660,9
Moldova	789,8	1053,7	910,1	977,2	1143,8	1357,8	1639,6	1602,7	1184,4
Uzbekistan	267,6	316,8	373,6	442,7	1143,8	605.1	659,1	674,1	481,5
Kyrgyzstan	224,9	261,9	100,7	228,3	513,2	303,0	392,5	404,9	272,1
Tajikistan	229,9	245,4	150,5	203,5	244,7	276,7	322,9	303,0	247,0
Average by year	4049,1	4617,8	4528,3	5125,3	5815,8	7130,2	7706,6	7635,3	-
Note –Compiled by source[113, p. 286]									

The integration to the world markets for the economies in transition has not been an easy task [204]. The diverse structures and all the approaches of the planned

and free market economies have been large obstacles. The situation got even more difficult with the Global Financial Crisis of 2008. Through the same channels of financial intermediation the finance crisis stepped into the transitional economies. The credit growth of the economies in transition has been considered widely as the source of the finance and generally was poorly regulated [205]. This situation played a bad joke with the most of the countries under transition. The flow of the finance has been on the brake as the host countries needed to deal with their own financial difficulties, what led to the problems of the impossibility of the transitional countries to refinance the borrowings they needed to pay back. Banks and other financial institutions faced real necessity of regulation of the prudential norms and capital to make the growth sustainable.

The other point that we need to make is that the share of the state ownership have been higher in the post Soviet Union transitional countries compared to the other structural establishments of the transitional economies. Returning back to the Commonwealth of the Independent States (CIS) that largely were the transitional economies of the previous planned economy orders exhibit the highest portions of the state ownership of banks. We follow the study of [113, p.206] and the study of [206] in examination of the state ownership of banks in CIS region (table 3).

Tabel 3 – Banking sectors state ownership in CIS (%), 2005-2013

Country	Year									Change in 2005-2013
	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Armenia	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Azerbaijan	58,3	58,3	42,0	42,0	42,0	42,0	34,0	34,0	34,0	-24,3
Belarus	74,0	74,0	75,2	75,2	79,0	71,0	67,0	65,0	63,0	-11,0
Kazakhstan	0,5	0,5	0,2	6,0	14,6	18,8	23,1	23,1	20,0	19,5
Kyrgyzstan	16,0	16,0	4,8	4,8	10,2	10,3	20,3	20,3	20,3	4,3
Moldova	13,6	13,6	0,0	2,4	2,4	7,4	12,5	12,5	12,5	-1,1
Russia	46,4	44,7	45,4	46,4	54,6	46,0	52,0	53,0	55,0	8,6
Tajikistan	4,6	4,6	9,7	10,8	11,9	12,9	14,0	14,0	14,0	9,4
Turkmenistan	97,1	97,1	97,1	97,1	97,1	97,1	97,1	97,1	97,1	0,0
Ukraine	12,0	12,0	12,0	12,0	17,0	17,0	17,0	18,0	18,0	6,0
Uzbekistan	94,3	94,4	94,5	94,6	80,1	94,9	95,5	95,75	95,9	1,6
Average by year	37,9	37,7	35,4	35,6	37,2	37,9	39,3	39,3	39,1	1,2
Note – Compiled by source[113, p. 286]										

Barth et al. (2009) study covers the pre crisis and after crisis time and indicates that there is no significant difference between the two stages in terms of the state ownership participation in the bank industries of the transitional economies of the CIS. Moreover, the percentage of the government ownership is tremendous, indicating the structure of the banking business that is highly dependent on the governmental support. Generally, the case is specific of the banks under planned economy market structure.

3.6 Banking sectors in figures, 2000-2018

Next we examine the allocation of the credits in the banking sectors across different regions we have examined and cross compare them with the European Union standards across the years. This will help us understand the change in the liabilities side of the single transitional country banking sector. Moreover, we can see the general progress in terms of the financial intermediation.

Figure 6 – Credit growth (%) against GDP, Eastern European Transitional Countries in comparison to the European Union, (2005-2018) line graph

Note - Compiled by source[194]

On the figure 6 (graph) above we can see the allocation of the domestic credit production of diverse sources of the origin for the Eastern European transitional countries against the overall data of the European Union countries in the time lapse of 2006 and 2018 years. As was already mentioned [207], the main financial institutions in the transitional economies for the financial intermediation are considered to be the banks as the core point of the financial streams. The overall picture indicates that the line of the percentage growth has been moderately smooth for all the transitional countries along the examination period with the small decreases or little or no growth in the times of distress that are the preceding periods to the years of 2009 and 2014. Both of the years of 2008 and 2013 have been known as the financial distress periods. If we observe the timeframe between the 2008 and 2014, we can see that most of the countries of Central Europe decreased their credit provision as it was the case all across the European Union. However, the allocation of credit reversely increased in Poland. We can state that in times of distress, the economic condition of the general population worsens as their purchasing abilities decrease with their incomes decreasing also. Hence, the state support through monetary and fiscal policies is vital for the further development and prosperity of the overall economic state of the

country. This is the theoretical notion, however, when a global crisis takes place, overall funding opportunities decrease [208]. As financial institutions face a home country's difficulties, they stepped into tackle the various issues and put them at a priory. Hence, the development of the banking industry and the well organized financial intermediary will not be the best solution. Moreover, the well organized financial intermediary process can fasten the process of the global crisis in the local markets as the liabilities of the local banking industry become international as was the case of Poland. We mentioned that the banking business model of Poland proved to be sustainable as the country developed the ties with other international financial institutions very well, becoming an open market economy. The ownership of local banks has been widely open for foreign entries as well as for the subsidiaries of international banks. However, the allocation of credit streams is still tight in the world's financial distress years. On the other hand, we can see that among Central European countries only Poland has increased their volume of credit, especially, after the distress years of 2008 and 2013. Poland has no alternative option of the economical development. We can state that the financial institutions built well organized financial intermediary with carefully chosen hedging strategies. Therefore the funds for the financial support in times of crisis were available. The later statement can be proved sustainable based on the recent financial data on the credit production of Poland, which is higher than in other transitional countries of Central European region (figure 7, 8, 9). Details are in the (Appendix B).
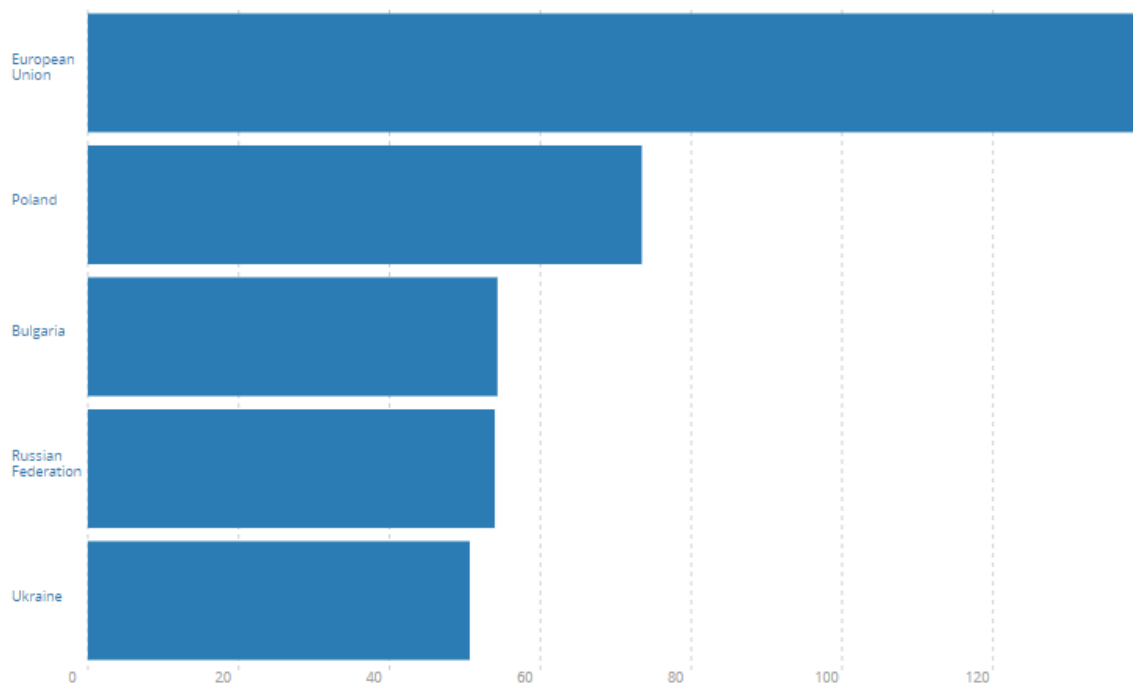
Figure7 – Credit growth (%) against GDP, Eastern European Transitional Countries in comparison to European Union (2018) Bar graph, recent data

Note – Compiled by source[194]
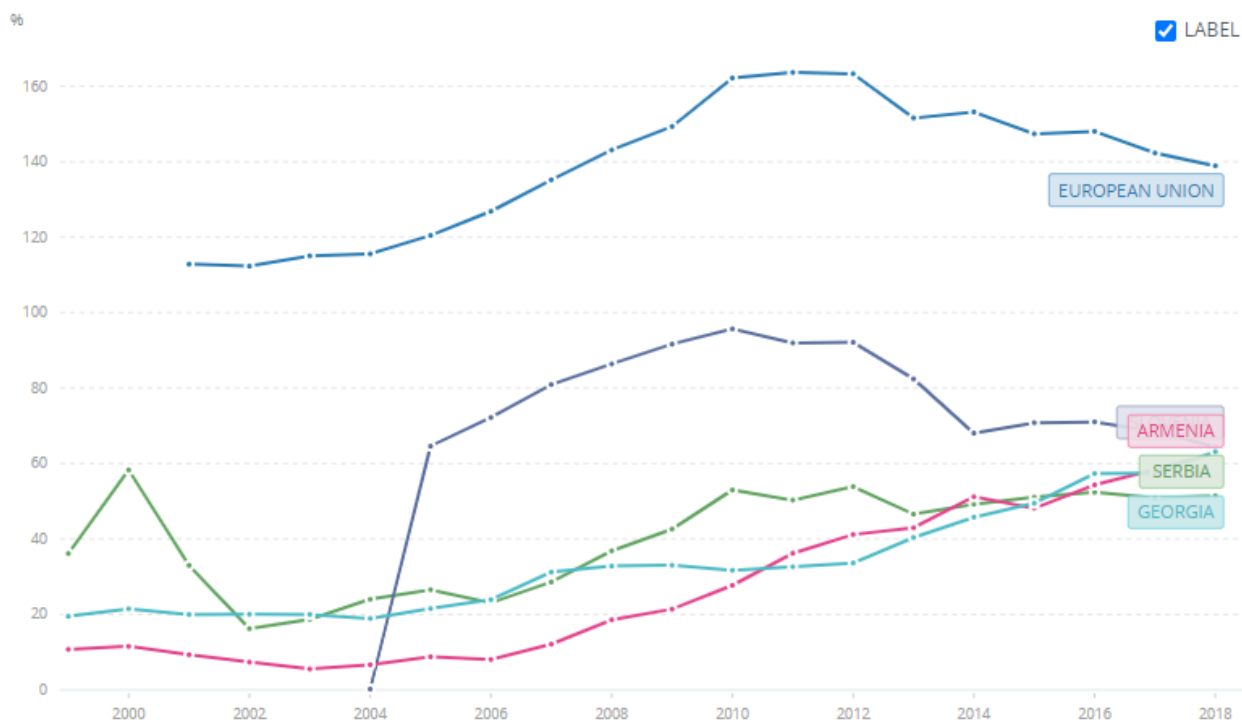
Figure 8 – Credit growth (%) against GDP, Balkan and Caucasus Transitional Countries in comparison to European Union, (2000-2018) line graph

Note – Compiled by source[194]
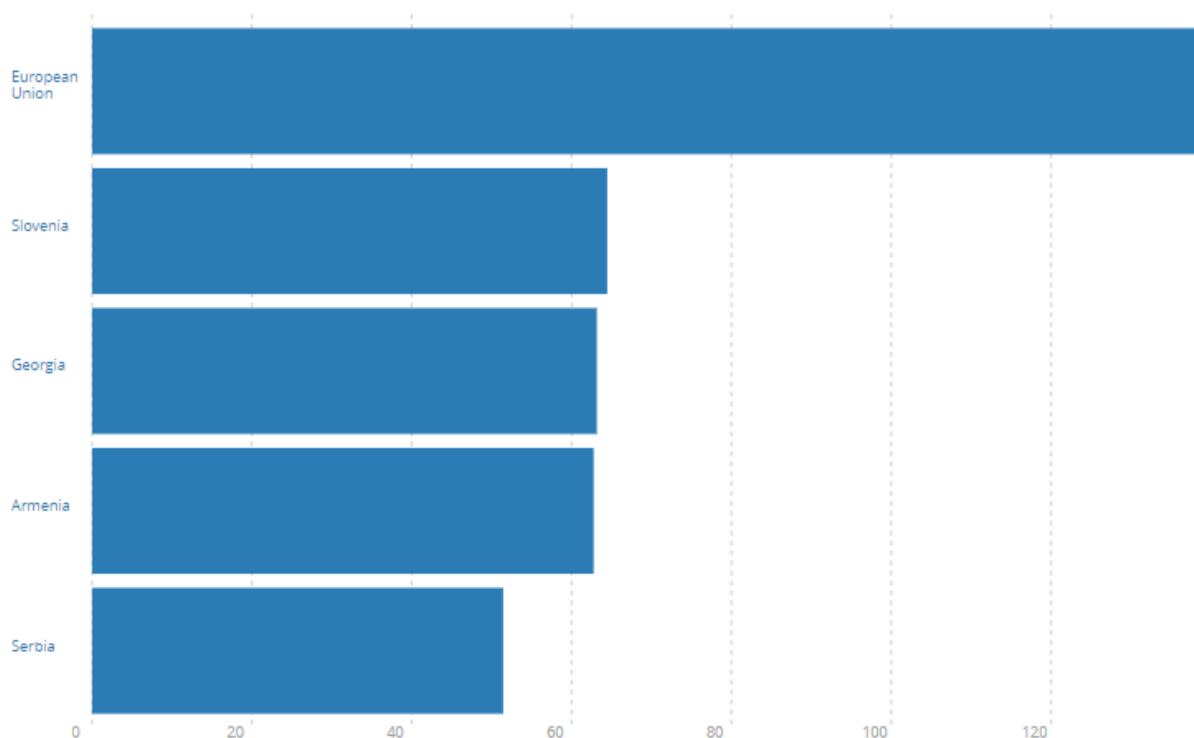
Figure 9 – Credit growth (%) against GDP, Balkan and Caucasus Transitional Countries in comparison to European Union, (2018) Bar graph, recent data

Note – Compiled by source[194]

On the above picture we see the data of credit production for the transitional countries of Balkan and Caucasus region. The credit production growth line represents the timeframe of 2000-2018 years. All the countries indicate moderate smooth growth with exception of Slovenia. However, Slovenia proved sustainable development indicating the highest credit production percentage growth in the two regions in 2018.For more details see(Appendix C).
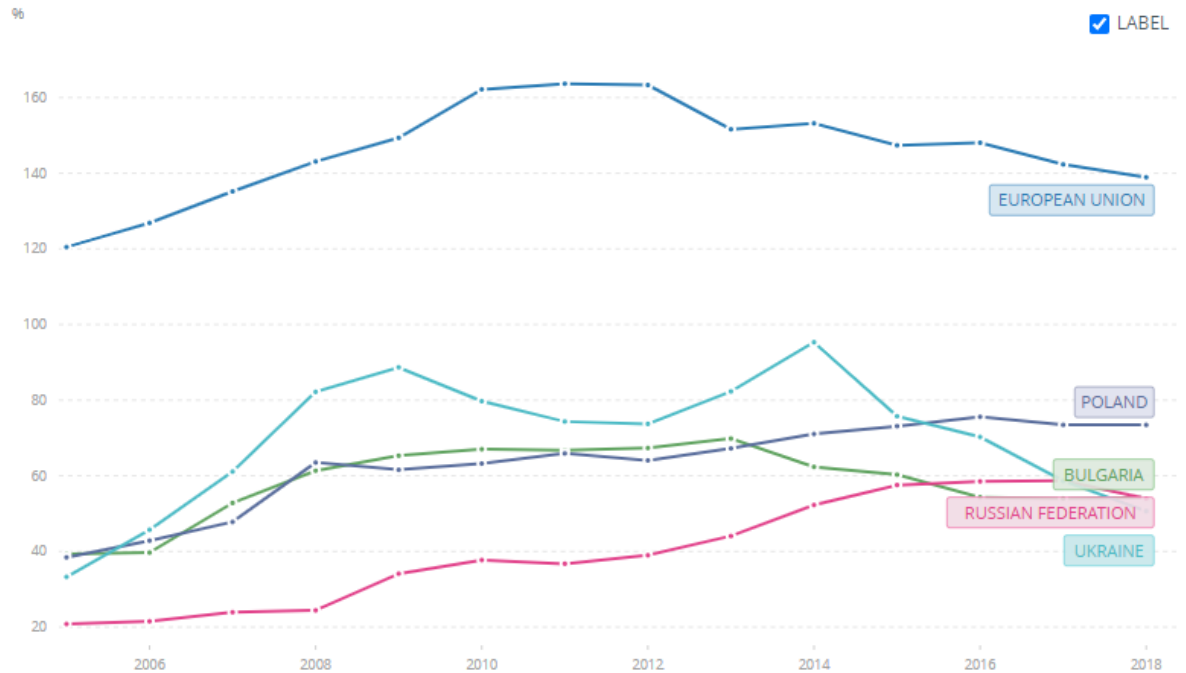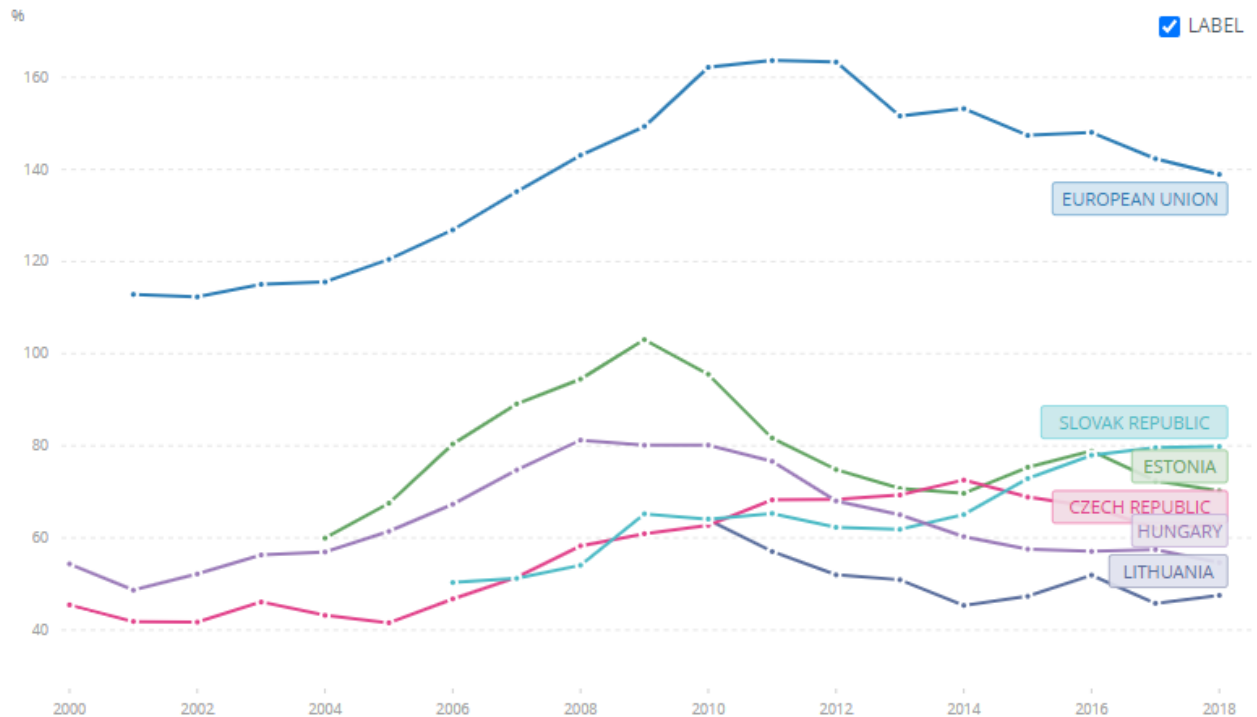

Figure 10 – Credit growth (%) against GDP, Central European Transitional Countries in comparison to European Union, (2000-2018) line graph

Note - Compiled by source[194]

The above (figure10) graph indicates the credit provision in the Central European transitional countries in the time period of 2000-2018. We mentioned that Slovakian banking industry has been developed in its own way during the open market economy. Generally, it was developing in the free market economy, but behind closed doors for the international entries up until the 2014. Therefore, the government has supported local banks in terms of the financial intermediary and we can obverse that the credit growth has been substantial.

Thereafter, with the international banks coming to the Slovakian market, this volume of the financing became less aggressive as the international investments with different types of the debt, equity and shares selling intermediary became available. Slovakia shows sustainable credit production indicating the highest in the region recent percentage growth.
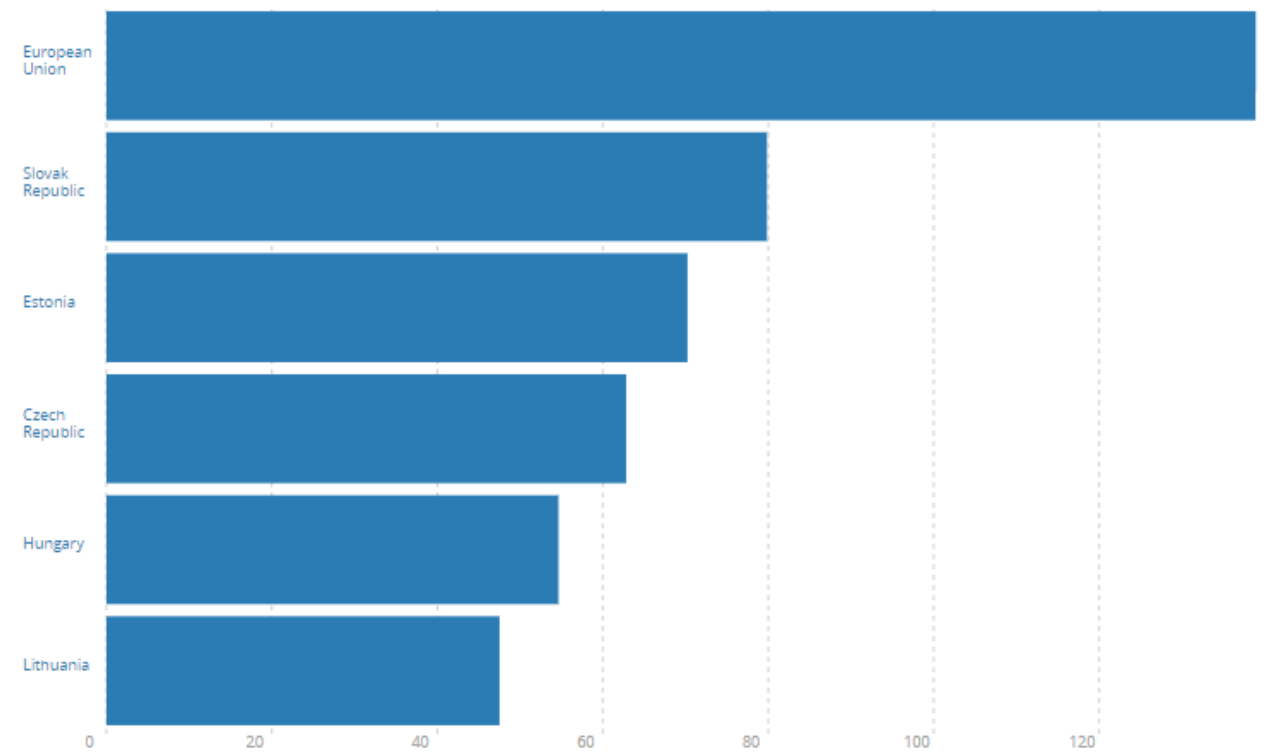
Figure 11 – Credit growth (%) against GDP, Central European Transitional Countries in comparison to European Union, (2018) Bar graph, and recent data

Note – Compiled by source[194]
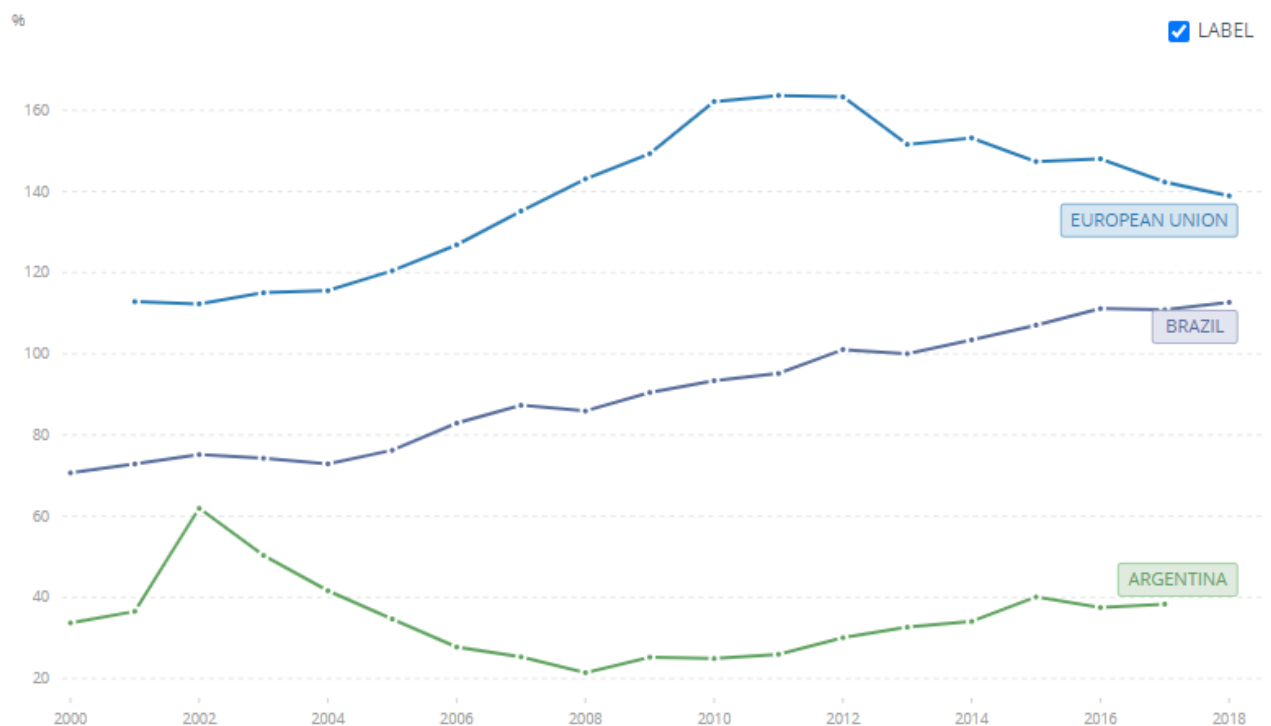
Figure 12 – Credit growth (%) against GDP, Peer Transitional Countries of Argentina and Brazil in comparison to the European Union, (2000-2018) line graph

Note – Compiled by source[194]
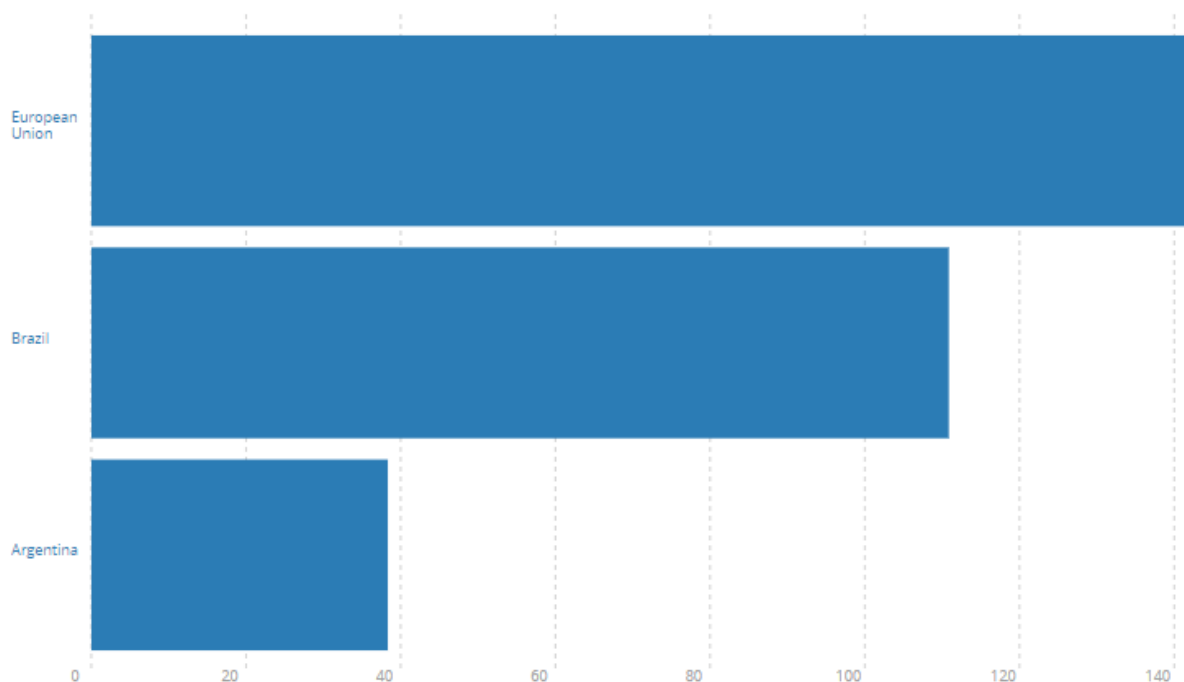
Figure 13 – Credit growth (%) against GDP, Peer Transitional Countries of Argentina and Brazil in comparison to the European Union, (2017) Bar graph, and recent data

Note – Compiled by source[194]

The above two 11, 12, 13-figures indicate the credit production growth of the Peer transitional countries of Argentina and Brazil for the period of 2000-2018 years in comparison to the European Union. The growth line indicates stable growth over the whole period and below the European Union for both countries.

3.7 The effect of the stock exchange on banking industry
When it comes to the risk management of the banking industries, the core point of the question is whether the generally accepted norms and the conditions for the standard industries are kept [209]. The point is that the market rhythm depends on the market conditions, where the central rule of supply and demand always is the core foundation. Likewise in the marketof any type, different players tend to be differently informed about the prices, the information the prices hold, and many other factors. The specifics of the market conditions in the transitional economies are very different in comparison to the market conditions of the developed, emerging or developing markets. The economies in transition are of those, where the crude products such as oil, is one of the main sources contributing to the GDP growth.

The risk projection is very uncertain as the prolongation of the social distancing can deepen the economic downfall. The global demand for the crude products, commodities keeps decreasing making the stagnation of the operations larger. Kazakhstani currency Tenge has devalued almost by 11% over last four months of 2020. It is stated by the local governments that the risk can be elevated by the sufficient fiscal policy of the financial easing. However, the allocation of USD 13 billion as the stimulus package will rebound in the long term and the spending today will approximately decrease the growth in the near future for at least 3%. The first

week of the quarantine launch completely paralyzed the work of the stock exchange with the local management taking the strategy of closing the market. This action was taken due to their uncertainties and unfamiliarity with the situation. In the later two months, the situation was gradually recovering with the central bank (National Bank of Kazakhstan) intervening to the market with the purpose of local currency (KZT) support target. It was mainly launched through the legislative ways of the new laws, where corporate companies were allowed to buy the foreign currency of up to 50 000 USD. The amounts that are higher were forbidden without the required documentation proving the necessity to operate in other currencies (invoice payments, contracts, installments, dividends and other reasons). Apart from that the local transitional Kazakhstani market is very much affiliated. Most of the huge companies in the market of the crude oil production are quasi companies related to the government. Therefore, the volumes of the bid/call can be indirectly affected/managed by the central bank. This situation just signifies that the market is highly controlled by the local governments. However, the overall state of the industry itself is very much vulnerable and weak against the challenges on macro level.

4 BANKING BUSINESS MODEL

4.1 Introduction

Risk taking is one of the core determinants that affect all factors of bank industry such as ownership factor, regulation norms and macroeconomic shocks. However, these factors are mutually affecting one another.

This work studies changes in business models of banks in transitional economies and how these newly adjusted business structures affect the operational efficiency of banks, their profitability factors and financial stability. First we cover different regions of the world in a full sample examination. Secondly, separately different regions are analyzed utilizing technology from general to specific mode to have as precise and robust results as possible. Therefore, our main contribution is the new sight to an old problem in a new time frame that covers both crisis and post crisis period.

We use Z-score to evaluate risk and different accounting measures to estimate profitability.

The chapter is organized in the next sequence of sections. Section 2 is a background of transition banking. Section 3 is data and the methodology applied. Section 4 is the findings. And section 5 is conclusion.

4.2 Background: Transition Banking

The change that took place in early stage of transition had not been smooth in any of countries under examination. Planned economy leaves a heritage that lasts mainly because of old ties. The proponents of old structures with all strength kept to old rules of the game and many financial institutions kept old practices of crediting state enterprises that have been on a surface and solvent only because of tremendous state transfers and funding. This approach did not recover the problems, but instead, deepened them even more. Moreover, new free market economies opened up the frontiers for new international players paired with their vast experience of the financial markets and sharp and heavy handed approach to the industry. Newly emerged institutions were in a comparative disadvantage from the beginning.

On the other hand, foreign investors have been promoting their new technologies and ways of doing business in exchange for participation in local ownership structures [54, p. 577]. But, largely, new entries were accepted by local bank managers with different-hesitant will. Some smaller European countries were ready for foreign direct investments that had been largely accepted in exchange for ownership pies in local banks. Some foreign investors had up to ninety percent shares in local banks. The only European country that kept closed towards foreign investments was Slovakia, however only up until to the year 2005. Eventually, it led up to a huge banking crisis in the country. These interventions changed structures of banking business modeling, because new funds required new protections. Reforms (economic and political), regulations, deeper internal supervisions and all that comes with it had been put in place. However, despite all precautions, every single country that changed from a planned to an open market economy experienced a local banking crisis (World Bank Financial Indicators, June, 2020).

The growth eventually reached tremendous levels in economies of transition but only before the Global Financial crisis took place. The crisis hit strong, leaving all countries with sharp decrease in their GDPs. In the aftermath of the crisis, in Latin America, both Argentine and Brazil adopted norms of CAMEL and Basel, respectively. All transition countries of European regions as well introduced Basel norms and regulations. Still, most of the countries experienced local currency devaluations that led up to huge problems of loans repayment that have been given to these countries in the US dollars. In example in Argentine, loans from foreign financial institutions were given in the US dollars, and distributed to population in Argentine pesos.

In line with the idea of Julian and [141, p. 1320], which developed the Institutional Difference Hypothesis, we state that transitional economies perceive macroeconomic changes differently. Financial markets are not homogenous in nature. Similar tools as regulations, reforms, and financial models have different effect on markets because of their structures. Hence, application of findings related to structures of emerging, developing or developed economies can be misleading with respect to transitional countries. Therefore, precise business modeling, examination and regulation of banking industry for particular case of transitional economies are crucial. Hence, our study sheda new vision of an old problem and will help both theorist and practitioners of transitional markets.

4.3 Sample
In the study, we use different category variables, some of them are specific to the industry, specific to the bank, country specific and categorical variables representing macroeconomic environment. We are examining the financial positions of the banks with different business models in times of crisis and before. How these factors drive the banks and their business performances. To explore this, we identify the best variables that are explaining the changes in financial stability and profitability of the institutions utilizing the approach from general to specific.

The data has been hand collected from different sources. Mainly data were from Bloomberg financial information resource for the accounting variables, from local statistical agencies of respective countries the data on country and industry specific variables. Following the previous study [132, p.45] and based on the work of [199, p. 579], we add dummy to indicate the timing of the crisis in the model, indicating the years of 2008, 2009 and 2010 as the crisis years, when the investment bank Lehman Brothers defaulted.

Our main sample consists of almost hundred banks from 17 different countries representing different regions to maximize the effect of the general true world representation. Nine countries are from Central and Eastern Europe – Bulgaria, Poland, Russia, Ukraine, Estonia, Lithuania, Czech Republic, Slovakia and Hungary; four Balkan and Caucasus countries – Serbia, Slovenia, Armenia and Georgia; and two peer countries – Argentine and Brazil. The data utilized is seasonally adjusted and represented as unbalanced panel. The period covers the two decades of the transition period including the global financial crisis starting from 2008-2019. All the

data collected are represented in the form of the International Financial Reporting Standards (IFRS).

4.3.1 Impact variables

We use the combination of different variables based on the previous works of [16, p. 310; 20, p. 260; 145, p. 263],and use only the variables that have significant impact factor on the risk and profitability measures. The data for the variables listed are obtained from the statistical agencies of the countries of examination, their Central banks and Bloomberg financial information resource. The variables of regulation, supervision norms and activities of non-banking income generation approach such as trading securities, commission and fees, capital volume regulation, minimum reserves for the times of uncertainties are represented below.

1. Following the work of [164, p. 213] we compose the representation of Capital variable as the assets that include liabilities parts as cash, securities and capital. Following Basel requirements, the Capital variable composition is strictly controlled for the origin of funds by the supervisors. Moreover, this particular measure is risk adjusted, what makes it more precise.

2. As mentioned above, the values of the activities that are considered non-banking are represented as fees, commissions, insurances, securities trading and participation in financing of other firms. These indices are represented based on the works of [164, p. 213; 172, p. 41] with the compliance to the Basel regulation norms.

3. We use *Liquidity Risk* as the variable representing the reserve requirements based on the work of [173].

4.3.2 Control variables

We utilize some of the variables based on our previous work [132, p. 45] that represent the control variables. For more precision, please see the table 4 depicted below.

Table 4 – Definitions and formulas for the variables

Variables	Definitions
Performance measures	
NIM	*Net Interest Income/Total Assets*
ROA	*Net Income/Total Assets*
ROE	*Total Equity/TotalAssets*
Industryspecificmeasures	
Loangrowth	*Loan(t)/Loan(t-1)-1*
Creditrisk	*TotalLoans/TotalAssets*
Liquidityrisk	*(Total Assets-Total Loans)/Total Assets*
Borrowing	*Debt/Assets*
Investments	*Trading securities as a percentage of overall investments*
Country specific and macroeconomic measures	
GDP growth	*GDP(t)/GDP(t-1)-1*
Inflation	*CPI(t)/CPI(t-1)-1*
Crisis	*Dummy variable of "1" in case of crisis and "0" otherwise*

We study different countries with their own specifics of the bank industries. Hence, the data under examination can possibly be heterogenous, and, therefore, the variables that we include must be common to different banks and represent similar values. Simply stating, these variables in the study must be universal to all [113, p. 276]. We use *Size* as the natural logarithm of total assets. We use *Net Interest Margin* and *Return on Assets* as the profitability measures and risk as the *Z-score*.

4.3.3 Model

We employ Generalized Methods of Moments (GMM) methodology to our model based on the work of Djalilov and Piesse [16, p. 310]. The approach permits us to properly represent hidden values of all the variables that have effect on the risk and profitability of the banks when there is a change in banking business models. This approach helps to deal with endogeneity bias. The GMM methodology takes the dynamic nature of the variables into account and permits to have these types of variables in the model even if the values of these variables can be represented in one another. This is possible as managers make the amendments following the necessity to improve the business models along the way of development of financial institutions. This increases the level of correlation between the variables and therefore the effect can result in biased findings. Therefore, the GMM model use is quite reasonable [172, p. 40]. Regulation of the industry mostly comes with the lag in time. Similarly the macroeconomic effect comes with difference in time. Hence, we use the lagged values of the dependent,regulation and macroeconomic variables applying the Fixed Effect model. The Fixed Effect model as stated by Lemmon and Zender [146, p.25] is more statistically significant in representation of time fixed bank specific factor. The validity of the instruments applied is checked by the Hansen-test application.

4.3.4 Methodology

Constructing the model, we look at the one we utilized in our previous study [210; 211] and follow the works of [212, 213] and [198, p. 264]. The risk and return models are represented in the following way:

$$Y_{it} = C_{it} + Crisis_{it} + Bank_{it} + Industry_{it} + Macro_{it} + e_{it} \quad (1)$$

The dependent variables of risk and return are represented as the function of *Y*and the explanatory variables represent the bank specific, macroeconomic, country and industry specific variables for bank *i* in the time *t*. The constant and the error term stand for *C*and *e*terms, respectively. The variables used in the model are constructed based on the work of Pak [199, p. 580].

Descriptive statistics for the full sample (table 5).

Table 5– Transitional economies, descriptive statistics, 2008-2019 quarterly based

-	Observations	Mean	Median	Std. Dev.
Bankrisk and return				
Z-score	1849	53,00	0,82	42
NIM	1849	0,001	0,001	0,011
ROA	1849	0,011	0,001	0,601
Bankspecificvariables				
Commission	1849	-0,010	0,900	0,981
Creditrisk	1849	0,002	0,001	0,237
Debttoassets	1849	0,901	0,400	1,011
Equitytoassets	1849	0,882	0,929	1,991
Fee	1849	0,282	0,888	0,114
Investments	1849	0,599	0,000	0,929
Liquidityrisk	1849	0,097	0,000	0,004
Loangrowth	1849	0,000	-0,902	0,558
ROC	1849	0,099	0,011	4,004
Macroeconomicvariables				
GDP growth	1849	0,066	0,776	0,449
Inflation	1849	0,011	0,122	0,042

Table 5 summarizes the descriptive statistics for the banks in transitional economies over years 2008-2019 quarterly based on the work of Kaliyev [132, p. 45]. Dependent measures of return are assets and interest margin based. The risk is evaluated utilizing the Z-score measure, which is the sum of return on assets and equity divided by standard deviation of return on assets.

The Z-score represents the risk score indicating the level of the financial stability. In the full sample model, the score level is 53 points with the overall spread between the banks going as high as to 138 score and the minimum of (-99) indicating high instability despite the average positive score. Overall profitability measures represent weak effect over the period of examination. The assets return indicates not more than 2 percent in average. We can observe that the effect of non-traditional to the banks ways profit generation variables as commissions, fees and investments in securities have very diverse effect over the examination period indicating that the banks have been using different modes of the business modeling. We can mention that the banks in transition have been heavily relying on the charges as fees and this factor contributed quite significantly to the overall industry.

4.3.5 Risk and Profitability

To estimate the effect of the business models on the risk perception of the banks we utilize the methodology of Delis [197, p. 60]. The risk score is calculated based on the formula:

$$\text{Z-score} = ((\text{Sum of ROA} + \text{Equity}) / \text{Standard deviation (ROA)})_{it}$$

Each bank states for i at a time t. The rolling window diminishes the number of the observations, but is has little effect on the full sample model as the data is quarterly based. The inclusion of the Net Interest Margin (NIM) as the profitability measure shows the impact on the spread of costs and revenues of the banks because of the changes in business models. The Return on Assets represents the effect on the operational efficiency [38, p. 90]. As we mentioned above, all the data complies with the IFRS.

4.3.6 Correlation matrix

Table 6 shows banks in transition economies. Following Pak [199, p. 578], 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.

Table 6–Correlation coefficients, 2008-2019, quarterly based

Name	Commission and fees	Creditrisk	Noninterestincome	Investments	LiquidityRisk	LoanGrowth	NIM	Z-score	ROA
Commission and fees	1								
Creditrisk	-0,011	1							
Noninterestincome	0,066	0,099	1						
Investments	0,119	-0,011	0,011	1					
LiquidityRisk	-0,901	0,501	0,034	-0,011	1				
LoanGrowth	0,001	-0,277	0,023	0,089	-0,199	1			
NIM	-0,087	0,043	0,028	-0,099	0,009	0,009	1		
Z-score	0,077	-0,028	-0,079	-0,033	-0,187	0,048	0,091	1	
ROA	-0,067	0,058	-0,001	0,011	0,048	-0,009	-0,087	0,077	1

Table 6 represents the coefficients of correlation between the bank specific variables. Strong negative correlation is only between Liquidity and nontraditional to the banks way of income generation indicating high level of risk. Moderate positive correlation identified between credit and liquidity risk, what is quite reasonable as the credit risk increases with the scarce liquidity. The loan growth is negatively affected by the credit risk increase.

4.4 Empirical findings

We mentioned that in line with the study of Agoraki [172, p. 40], we consider the dependent variables to be endogenous because of the adjustments to the current values of these factors that have been applied by the managers in preceding years. We utilize the GMM system with this respect for one reason and apply the lags for the variables. The financial stability measure is the *Z-score* and the profitability measures are *Return on Assets* and *Net Interest Margin* applied for the full sample observation and for the robustness of the results for the four different regions that we name as peer, Eastern and Central Europe, Balkan and Caucasus countries. We select only

specific factors of the business models of banking utilizing the approach of Klomp and De Haan [97, p. 3200] in selection of the variables. In overall, in the models we utilize, the variables are significant, the instruments we choose are valid as the Hansen test suggests. The test significance is addressed incorporating the factors like dynamic modeling, individual effects and partially exogenous variables. Following Roodman [129, p. 90] the recommended p-value range is between points of 0.25 to 1, which is indicating the validity of instruments. The test recommendations are in line with fundamental work of [1, p. 277] and recent study of [193, p. 200]. To choose the optimal number of lags, we refer to the Hausman Test that is as well helpful in identification of the model choice, Random or Fixed Effect [132, p. 45]. The lags of the values are applied for the dependent, macroeconomic and control effect variables. We examined the data for the presence of the unit root. We found no non-stationary variables applying the Augmented Dickey Fuller unit root test at the 5% significance level. Considering the panel data use, it is an important that the data examined found to be stationary at level. This way it shows that the use of fixed effect GMM compare to the first difference effect is justified. The data observed does not have time-dependent structure (Appendix D).We test the hypothesis that set of independent variables in different model specifications including instruments have jointly zero significance effect applying *p*-value of F-*test*. In overall, we apply two model specifications, namely unrestricted and restricted sets incorporating instruments where first we include crisis factor and then hold it constant. Coefficients are not equal to zero in all specifications for performance and risk examination. The crisis factor adds to the significance of explanatory power of the model. The models are significant.

Table 7 shows the regression coefficients of the Return on Assets profitability measurement model for the five different samples of examined banks of transitional economies including crisis factor. Standard errors are represented in parentheses.

Table 7 – Profitability, GMM, quarterly based, 2008-2019

Dependent variable: ROA	Full sample	Peer countries	Balkan and Caucasus	Eastern Europe	Central Europe
1	2	3	4	5	6
Variables					
Commission	-0,018* (0,008)	-0,018* (0,001)	-0,021* (0,001)	-0,021* (0,001)	0,021* (0,007)
Credit risk	-0,116** (0,081)	-0,006* (0,001)	-0,006* (0,071)	-0,092** (0,071)	-0,274* (0,069)
Equity to assets	-0,091** (0,022)	-0,096* (0,022)	-0,097* (0,021)	-0,092* (0,022)	-0,055** (0,022)
Loan growth	0,011** (0,001)	0,011* (0,001)	1,909** (0,561)	0,222* (0,091)	1,561** (0,814)
ROA $_{t-1}$	-0,009*** (0,006)	-0,011*** (0,001)	-0,059*** (0,009)	-0,009*** (0,001)	-0,022*** (0,003)
Crisis	0,005** (0,002)	0,003** (0,002)	0,003* (0,002)	0,003** (0,002)	0,003* (0,002)

Table continuation 7

1	2	3	4	5	6
Liquidity risk$_{t-1}$	0,083* (0,006)	0,032* (0,001)	0,576* (0,057)	1,016* (0,501)	1,259* (0,551)
Capital$_{t-1}$	0,081* (0,004)	0,044* (0,004)	0,098* (0,004)	0,098* (0,004)	-0,013* (0,001)
Fee Income$_{t-1}$	0,002** (0,006)	0,001** (0,003)	0,579* (0,003)	0,059* (0,003)	-0,092** (0,003)
GDP growth$_{t-1}$	0,102* (0,087)	0,101* (0,017)	0,574* (0,074)	0,084* (0,014)	-0,153* (0,051)
Inflation$_{t-1}$	0,021* (0,007)	0,019* (0,001)	0,017** (0,001)	0,016** (0,001)	0,017* (0,008)
Adj. R sq.	0,891	0,402	0,669	0,664	0,551
Hansen-test	0,453	0,336	0,201	0,333	0,326
AB test for AR (1) p-value	0,000	0,000	0,000	0,000	0,000
AB test for AR (2) p-value	0,443	0,401	0,394	0,459	0,418
p-value (F-*test*)	0,000	0,000	0,000	0,000	0,000
Observations	1849	395	282	760	416
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability					

Table 7 above shows us the findings of the profitability *Return on Assets* measure for the five subsamples including the effect of the *Crisis* factor. The full sample column shows that the factors such as *Liquidity Risk, Capital Regulation and Fee Income* obtained from the not traditional to the bank way of profit generation positively associated with the *Return on Assets* factor. However, the findings suggest completely different outcome when the *Crisis* factor is omitted from the observation (AppendixE). This fluctuation can only be reasoned as the weakness of the overall banking business model averaged across all the banks under examination. However, it also indicates that the *Crisis* increases the vigilance towards the need to capitalize more, differentiate the ways of profit generation and restrict the activities that enhance the vulnerability of the systems. Moreover, we can see that the composition of the pre-crisis business models of banking such as low capital inflows from the equity holders, low diversity of product lines and state funding of the banks clearly indicate weak control of the management referring to the problems of moral hazard. *Crisis* diminishes the possibility to allocate the funds to higher return – higher risk projects. In this way, managers have difficulties to misbehave. *Investments* decrease and *Loan Growth* increases when the *Crisis* included. In times of crisis, government conducts monetary policy through the banks to support the economic growth by allocating the funds to the population. On the other hand, non-payment loans increase with difficulties of the population to pay back the loans increasing the *Credit Risk* variable. Therefore, the *Credit Risk* has negative association with *Return on Assets* in full sample examination. Across all the sub-samples, only *Liquidity Risk*has positive

association with *Return on Assets* profitability measure. We explain this finding as the fact that the higher liquidity provision positively affects industry profit levels. Transitional bank industries still heavily rely on traditional ways of business modeling where credits play the central role. Generally, the coefficients across the subsamples show similar results indicating the additional robustness of the findings despite quite different specifications across the models. By stating that the specifications are different, we mean that the structures of the Post Soviet transitional countries and the subsample of peer Latin America countries is significantly different. We can observe that the restrictions are not over identified following the Hansen test results. The directions of the effects are as well confirmed in almost each of the model specification. The effect on the ROA performance variable differs only for the European region transitional countries in the *Capital* and *Fee Income* effects, representing negative effect of (-0.013) and (-0.092) coefficients, respectively. We reason this effect as the point that the Central European region countries have more stable banking business models, and incorporating additional increases of the capital or more non-banking income generation will negatively affect the performance of the overall industry. We as well find an interesting result that some of the standard deviations are high and the significance of these coefficients is as well high. We test the variables for the co-linearity and found no significant effect. However, some of the bank specific variables' standard deviations indicate that there is a point that the correlation between the dependent and explanatory variables can potentially exist. The *Loan Growth* standard deviation for Balkan and Caucasus and Central Europe region indicate high levels of (0.561) and (0.814), respectively. However, both of the coefficients indicate significant level of the effect. For the Eastern and Central European regions, the coefficients of the *Liquidity Risk* are significant at 10% percent level and the deviations indicate (0.501) and (0.551), respectively, what is as well high enough. In overall, both of the bank specific variables of *Loan Growth* and *Liquidity Risk* theoretically are highly inter-correlated with the general performance. The liquidity for the banks is high whenever the assets in possession of the banks are risk adjusted and less risk oriented. This causes the funding to be easier arranged for the banks as the beliefs of the investors of all terms is positive. Sequentially, the effect on the *Loan Growth* is positive as well since the liquidity presupposes high lending.

Table 8 shows the regression coefficients of the Net Interest Margin profitability measurement model for the five different samples of examined banks of transitional economies including crisis factor. Standard errors are represented in parentheses.

Table 8 above indicates the main findings in relation to *Net Interest Margin* profitability measure. In line with the previous findings, we found that the *Net Interest Margin* has positive association with the *Liquidity Risk* factor only in all five sub-samples with *Crisis* factor included. The findings don't hold for the examination without the *Crisis* factor inclusion (AppendixE). The significance of the *Crisis* factor indicates the vulnerability of the business models affecting the profitability and once again showing the strong reliance on traditional ways of income generation by the transitional economies. In the full sample model, controlling the *Crisis* factor

(AppendixE), the business model framework consisting of higher reserve requirements, higher regulation and higher per bank capital all positively associate with *Net Interest Margin*. We consider that the revenues from risky projects in a favorable economic state overcome the losses.We can observe that the NIM performance measure is confirming the results of the findings with respect to the ROA. The coefficient of the *Capital* is less significant but more effective; however, the sign still holds (-0.073) in compliance with our previous reasoning that the Central Europe has more stable banking industry financial system. The other indicators as well state similar findings. For the Balkan and Caucasus region we find similar high deviation of the residuals (0,491) with high significant coefficient (0.741) for the *Loan Growth* variable.

Table 8– Profitability, GMM, quarterly based, 2008-2019

Dependent variable: NIM	Full sample	Peer countries	Balkan and Caucasus	Eastern Europe	Central Europe
Variables					
Commission	0,034** (0,002)	-0,031* (0,001)	-0,041* (0,001)	-0,029* (0,001)	0,011** (0,007)
Credit risk	-0,226** (0,005)	-0,006* (0,001)	-0,495*** (0,001)	-0,032* (0,003)	-0,094* (0,007)
Equity to assets	0,078*** (0,015)	-0,070* (0,002)	-0,097* (0,002)	-0,015*** (0,002)	-0,095* (0,002)
Loan growth	0,021** (0,001)	0,033* (0,001)	0,741** (0,491)	0,201* (0,011)	0,161* (0,034)
NIM_{t-1}	-0,261*** (0,005)	-0,018*** (0,011)	-0,076*** (0,009)	-0,019*** (0,009)	-0,011*** (0,003)
Crisis	0,005* (0,007)	0,003** (0,002)	0,003* (0,002)	0,003** (0,001)	0,006* (0,002)
Liquidity $risk_{t-1}$	0,023* (0,001)	0,032* (0,001)	0,016* (0,007)	0,016* (0,001)	0,139* (0,061)
$Capital_{t-1}$	0,028* (0,009)	0,019* (0,004)	0,017* (0,004)	0,059* (0,004)	-0,073* (0,001)
Fee $Income_{t-1}$	0,012** (0,008)	0,011** (0,003)	0,049** (0,009)	0,119** (0,003)	-0,006* (0,003)
GDP $growth_{t-1}$	0,011* (0,007)	0,019* (0,007)	0,014* (0,004)	0,014* (0,004)	-0,023* (0,001)
$Inflation_{t-1}$	0,091* (0,001)	0,027* (0,001)	0,497** (0,001)	0,116** (0,001)	0,597* (0,003)
Adj. R sq.	0,888	0,401	0,559	0,533	0,408
Hansen-test	0,441	0,301	0,228	0,227	0,299
AB test for AR (1) *p*-value	0,000	0,000	0,000	0,000	0,000
AB test for AR (2) *p*-value	0,411	0,356	0,331	0,448	0,397
p-value (F-*test*)	0,000	0,000	0,000	0,000	0,000
Observations	1849	393	282	760	416
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability					

Table 9 shows the regression coefficients of the risk measurement model for the five different samples of examined banks of transitional economies including crisis factor. Standard errors are represented in parentheses.

Table 9 – Risk, GMM, quarterly based, 2008-2019

Dependent variable: Z-score	Full sample	Peer countries	Balkan and Caucasus	Eastern Europe	Central Europe
Variables					
Commission	-0,047* (0,008)	-0,039* (0,001)	-0,021* (0,001)	-0,021* (0,001)	0,037* (0,007)
Credit risk	-0,116** (0,001)	-0,006* (0,001)	-0,006** (0,001)	-0,012** (0,001)	-0,274* (0,007)
Equity to assets	-0,055** (0,002)	-0,051* (0,002)	-0,057* (0,002)	-0,022* (0,002)	-0,055* (0,002)
Loan growth	0,041** (0,001)	0,039* (0,001)	1,040* (0,561)	0,061* (0,091)	1,061* (0,814)
Z-score $_{t-1}$	-0,021*** (0,006)	-0,021*** (0,001)	-0,059*** (0,009)	-0,022*** (0,009)	-0,027*** (0,003)
Crisis	0,005** (0,002)	0,003** (0,002)	0,003* (0,002)	0,003** (0,002)	0,009* (0,002)
Liquidity risk$_{t-1}$	0,083** (0,006)	0,032** (0,001)	0,036* (0,007)	1,016* (0,501)	1,259* (0,551)
Capital$_{t-1}$	0,031** (0,004)	0,031** (0,004)	0,028* (0,004)	0,027* (0,004)	-0,033** (0,001)
Fee Income$_{t-1}$	0,032** (0,006)	0,011** (0,003)	0,009* (0,003)	0,059* (0,003)	-0,092** (0,003)
GDP growth$_{t-1}$	0,022* (0,007)	0,021* (0,007)	0,024* (0,004)	0,024* (0,004)	-0,053*** (0,001)
Inflation$_{t-1}$	0,031* (0,007)	0,029* (0,001)	0,107** (0,001)	0,056** (0,001)	0,027* (0,008)
Adj. R sq.	0,891	0,402	0,669	0,664	0,551
Hansen-test	0,453	0,336	0,201	0,333	0,326
AB test for AR (1) p-value	0,000	0,000	0,000	0,000	0,000
AB test for AR (2) p-value	0,575	0,405	0,434	0,512	0,493
p-value (F-*test*)	0,000	0,000	0,000	0,000	0,000
Observations	1849	395	282	760	416
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability					

The financial stability *Z-score* measure findings with the *Crisis* factor included are represented in Table 6 above. *Crisis* requires higher regulation, higher reserves for the NPLs and strict control of risky, non-banking activities. We can observe that the financial stability increases with all three factors indicating positive signs in full sample observation. Findings are confirmed across all samples with *Crisis* factor included. However, only full sample observation states that the these factors have

similar effect when the *Crisis* factor is omitted (AppendixE).The overall findings suggest that the effect of the *Crisis* pushes bank industries to have higher capital, creates safety cushions as higher reserves and necessity to differentiate the banking activities. We conclude that the banks in transition economies still lack development and have very basic financial intermediary tools. Examining the standard errors we can see that the potential for the correlation of the *Loan Growth* factor with dependent variable Risk Stability score (Z-score) is high for the Central European and Balkan and Caucasus region with respective deviations of (0.561) and (0.814). The same way the risk is dependent on the liquidity as we can see from the European Region results, what can be confirmed with the standard deviations of (0.501) and (0.551) for the Eastern and Central European regions of the transitional countries, respectively.

The use of the GMM model generally helps us solve number of obstacles on the way to have appropriate findings: the solution for the simultaneous identification of the variables, when the causality can go from one to the other way and backwards indicating the endogenous variable problem; and the potential problem of heteroskedasticity in the variables (whenever the dispersion of the variables is spread) that is consistent within the models of the panel data use. Still we need to indicate almost no endogeneity problems in the study. The fundamental analysis of the problem that was well observed by the key works we rely on in statistical aspect of Arellano and Bond [1, p. 280] indicate that the autocorrelation of the first order almost always indicate some portion of the correlation between some of the highly linked dependent and explanatory variables. Despite the fact that the study was mainly addressed for the use of the time series data, we have obtained empirical confirmation based on the other fundamental work of the Arellano and Bond [1, p. 280] where the findings were based on the panel data use.

We have obtained similar results in sub-sample examinations that we have been mainly running for the confirmation of the findings for the full sample examination. GMM system indicates that banks in transition have business models that are based on the mode with more traditional ways of income generation. Despite the fact that the significance and coefficient scores are lower in separate regional examination results (smaller number of observations), still we can state that the findings confirm the main results indicating strong form of methodology selection constructed based on the studies of AltunbasY., DjankovS., and Pak O.

Conclusion on the 4th section

Over the later thirty years of history of transition economies, bank industry has been the mirror of economic development of this market. New markets needed new processes, reforms, regulations and all other compositions of the banking business models. Investors were ready to put their funds into these new fertile lands if development promised to be sustainable. The core point of business model is a sustainable development of the business itself and its firm position against different types of shocks. Global financial crisis proved that economies in transition had many drawbacks in all aspects of the business. There were many related studies, but with respect to structures of developed, developing or emerging markets. We are interested

in economies just recently switched from planned to free market structures. There is a huge lack of studies of the effect of business models changes on efficient operation and financial stability of bank industries in transitional markets.

We study the effect of business modeling in banking on financial stability and efficient operation of countries in transition, covering the crisis and post crisis periods of 2008-2019 years. Studies in relation to performance of banks in transitional markets with the impact of separate factors as in example regulatory norms have different effect [131, p. 21]. The same methodologies and similar models applied to different countries have diverse effect, indicating the point that there is no one best model for all and especially in very specific market as transitional economies.

This study has few important and new aspects. First of all, we observe transition economies only as opposed to the studies of Pasiouras [11, p. 190] and Barth [206, p. 2880] where largely the stake of countries represents the European region. We add peer countries in transition such as Argentine and Brazil and most of the countries under post-Soviet Union regime. Second of all, the timeframe coverage puts us into position when we can discover the change in business modeling of the effect of the global financial shocks on these markets. Third, we apply the GMM system that puts possible drawbacks of endogenous variables aside and let us consider the unobservable effect of variables in the model. Fourth, we test the main full sample findings across regional sub-samples to confirm the robustness of true effect of methodology we used.

We outline the main findings in the next aspects. First, despite negative effect of the *Crisis* factor on many separate parts of banking business models, the overall effect on risk attitude is positive. However, the findings suggest that performance represented in profitability measures decreases in overall. The states of banking models are weak and not stoic against the crisis. The structural change from planned to free market economy seems changed only the central apparatus from authoritative government to foreign investors and old-school authoritative management. Banks kept being intermediary tools to financial streams, but not setting the pitch strong individual financial institutions. Secondly, we found that the effect of the high liquidity has positive effect on the performance and financial stability of the banks in transition. Other parts of banking models have weak or not sequential effect across all sub-sample examinations. This implies that transition economies rely more on old ways of running the business where foundation of banking business model is concentrated around credit business.

Overall findings indicate that there is no best banking business model for markets in transitions. Under examination countries have their own specifics and their risk and profitability measures differently respond to changes in seemingly the same modes in the business. General suggestion is to constantly observe the realms of business models and in cooperation with both bank managers and policy makers react to problems that take place. Easily adjustable mode of business in banking seems to be the best one in a frequently changing newly emerged market of transition economies.

5 KAZAKHSTANI MARKET AND OWNERSHIP FACTOR. PART 1

5.1 Introduction

This particular part of the study interest is the examination of the performance of Kazakhstani banking industry. The way different measures whether endogenous to the industry or from the outside impacts affect the risk banks bear and as a result influence their performance.

The main question is how performance is affected by current structure of industry development. This study covers the effect of profitability as a measure of return evaluating the performance and risk that banks are ready to take up to a certain level to meet their wanted profitability levels. In terms of risk, since the development of finance as a separate science, talking about the risk in a manner of quantifiable form has become a powerful tool and one of the crucial contributions of general finance direction (CopelandT.E.). This helps a lot to answer the questions of the relation between risk and performance. We are conducting an empirical study and the main difficulty is in the judgment different institutions value their risk exposure as was mentioned by Westerfield [72, p. 155]. Hence, all the findings must be treated with caution and implications applied taken with respect to the mentioned complications.

5.2 Background

The banking sphere of Kazakhstan has its independent history for almost three decades almost and there are sufficient grounds for discussion and evaluation of some of the results. Historically, number of events had already taken place that indirectly affected the local system. These events like an Asian financial crisis of (1997) following with the Russian crisis of (1998) presupposed and opened all the weaknesses of the lemon market players that were blurred from observation during the times of positive overall economic condition. As Pak [199, p. 580] stated these grounds led up to the reduction of the number of banks in Kazakhstan from 204 to 55 in the first decade and to around 35 banks in the second decade. However, this reduction generally had a positive signal sending to the regulatory bodies in regards to the norms and mainly prudential regulations that became tighter. The intermediation of the Kazakhstani banking system took a new level with these norms imposed and acceptance of the compliance and regulation norms of international standards like Basel III.

In this part of the work we examine profitability returns of accounting measure ROA as it helps define the level of operational performance [214, 215]. We cross compare the results of the findings with previous studies, as ROA is the measure used a lot in the studies conducted previously. Another measure that is suggested by Abdullah [216] is Net Interest Margin (NIM), which is helpful in the coverage of the spread ofthe interest revenues and costs. It helps define funding strategies. We compare the effects of ROA and NIM has on the performance level. As for the risk measure, we evaluate it through the risk stability measure of the Z-score.

This part is organized in next sections. Section 3 describes data and descriptive statistics. Section 4 explains the methodology applied. Section 5 outlines the findings. And section 6 concludes.

5.3 Data and descriptive analysis

5.3.1 Sample

Most of the financial data was collected through the Bloomberg financial information resource, local state statistical agency and from statistical resources of National Bank of Kazakhstan. The data coverage is the period of 2008 and 2018 quarterly based for ten Kazakhstani banks with respect to International Financial Reporting Standards (IFRS). Table 1 presents the analysis of the descriptive statistics for both dependent and independent variables.

Table 10 summarizes the descriptive statistics for the Kazakhstani banks over years 2008-2018 quarterly based. Dependent measures of return are assets and interest margin based. The risk is evaluated utilizing the Z-score measure which is the sum of return on assets and equity divided by standard deviation of return on assets.

Table 10– Kazakhstani banks, descriptive statistics, 2008-2018 quart. based

Name	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

The measure for the risk, Z-score, has a mean value of 10.09. Overall suggestion is that the higher the level of the measure 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 suggesting 17 and 16 percent, respectively. Non-interest 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. 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 as was stated before in the above sections. The measures for the liquidity and credit risks are not high going against our expectations. Debt composition is quite standard for the developing markets, as that tool is not very efficient especially in Kazakhstan as the rates for this option of funding is expensive enough suggesting only one fifth of the overall composition. As for the macroeconomic variables, real GDP growth suggests an overall of 3, 8 percent and 8, 4 percent inflation rate.

5.3.2 Risk and Return

The financial stability or the risk is a classic proxy of Z-score. The measure is calculated as the sum of return of the assets and equity over assets divided by the standard deviation of return on assets for every bank i at time t. Since we are covering the quarterly based data, the standard deviation is calculated by the example of Delis [197, p. 60] over rolling window for the calculated next three quarters. Figure 14 indicates the Kazakhstani banking measure of risk, Z-score, quarterly based for the years 2008-2017 quarterly based.
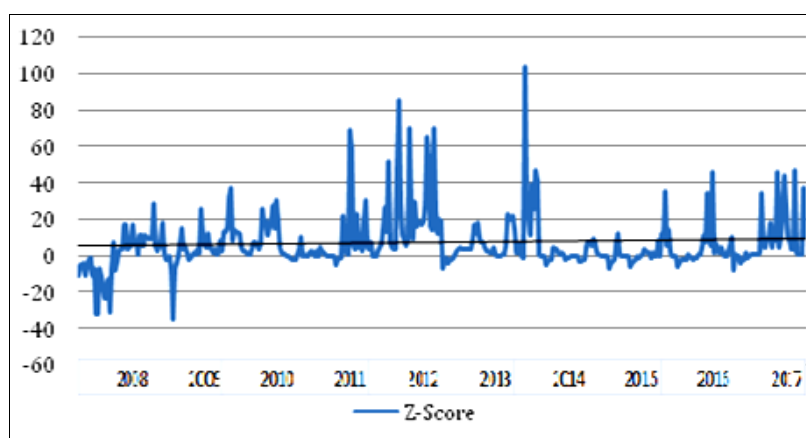
Figure 14 – Presents the Z-score measure for the Kazakhstani banks over the years of 2008-2017 quarterly based

Note – Own calculations

The line in the Figure 14 shows the value of the Z-score over ten years from 2008 up to 2017. We observe the distressed years of the crisis (2008-2010) that have negative signs suggesting that the financial stability was very low and overall banking industry suffered a lot in the period. On the other hand, the level of Z-score was quite high after the crisis, what is in general, seen as a bad sign in this particular case due to volatile nature of the fluctuation. That kind of fluctuation, can most likely suggest that the helping hand was given for the survival of the distressed banks from the government and it was not the inner result of good modeling of the ruling management or 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 blow of the changes of the macroeconomic conditions of the whole economy. Those

negative signs as well can be interpreted as a result of devaluation policies applied in the country.

Net interest margin (NIM) and return on assets are given as a determination of the performance level of the banking industry in Kazakhstan. As was stated by Abdullah [216, p. 26], 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.

5.3.3 Macroeconomic and bank specific variables
Table 11 shows the list of dependent and independent variables used.

Tabel 11 – Determinants of dependent and independent variables

Variables	Measure
Bank risk and return	
Z-score	(RAO+E/A)/standard deviation of ROA
NIM	Net interest income/Assets
ROA	Net income/Total Assets
Bank specific variables	
Size	Ln (Total assets)
Loan growth	Loan (t)/Loan(t-1)-1
Credit risk	Total loans/Total Assets
Liquidity risk	(Total Loans-Total deposits)/ Total Assets
Investments	Trading securities taken as percentage of overall investment
Fee and Commission	Non interest income/Total operating revenue
Borrowing	Debt/Assets
Macroeconomic variables	
GDP growth	GDP(t)/GDP(t-1)-1
Inflation	CPI(t)/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

Some of the variables examined in the study are specific to the industry; other variables are of those that have exogenous effect. In addition, the major macroeconomic events of crisis and devaluation are included into the examination that might lead to the shift of sensitivities of the variables during and after the events. More precision to the analysis will be given in the next section.

5.4 Methodology
Following the previous studies of Altunbas [212, p. 927], Djankov[213, p. 400] and Pak [199, p.580] 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:

$$\text{Z-score}_{it} = C_i + B1\ \text{Size}_{it} + B2\ \text{Loan Growth}_{it} + B3\ \text{Investment}_{it} + B4\ \text{Fee and Commission}_{it} + B5\ \text{Borrowing}_{it} + e_{it} \qquad (equation\ 1)$$

As it is common to see all the variables are specific to the bank *i* and to the outlined timeframe *t*. C stands for the intercept for bank *i* and error term stands for *e*.

In the previous studies on financial stability, authors like Pak [199, p.580] and DjankovS.et al.[213, p. 400] were using no lag effect. They have reasoned it as a simultaneous response of the managers to the increased level of risk. We opt to use the lagged variables of the right hand side of the equation. Both Akaike and Schwarz information criterions of the VAR order selection suggest taking at least one lag. For the selection concerns, the least available criterion needs to be taken. In our case, we consider both crisis and devaluation effects. For the Crisis we measure it as the value of "1" for the years 2008, 2009 and 2010 all quarters and "0" otherwise. As Pak (2017) suggests, crisis years are taken based on the start of default of the Lehman Brother investment banking in 2008. Devaluation effect is captured by the dummy variables in the first two quarters of year 2009 and after year 2014 for another two years. As for the bank profitability measures, we consider the effect of the variables utilizing the Pooled effect model of the Panel ordinary least squares regression method suggested as the optimal one by the Haussmann specification test.

5.5 Findings

Table 12 represents the correlation coefficients between the measures of risk and profitability for the Kazakhstani banks. Following Pak [199, p.580] 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.

Tabel 12 – Correlation coefficients for the specific to banking industry of Kazakhstan, 2008-2017, quarterly based

Name	Commission and fees	Credit risk	Non interest income	Investments	Liquidity Risk	Loan Growth	NIM	Z-score	RAO
Commission and fees	1								
Credit risk	-0,050	1							
Non interest income	-0,072	-0,021	1						
Investments	-0,534	-0,031	0,643	1					
Liguidity Risk	-0,123	0,873	-0,020	-0,005	1				
Loan Growth	-0,023	0,050	-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	-0,020	-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

As we can observe from table 3, return on assets has weak correlation with commission and fees as well as weak correlation with non-interest income and net interest margin. Z-score is well and negatively correlated with loan growth. Also, we can see that NIM is positively correlated with non-interest income.

Table 13 shows the regression coefficients of the risk measurement model for the sample of Kazakhstani banks.

Table 13– Risk measure of Kazakhstani Banks, 2008-2017 quarterly based

Dependent Variable: Z_SCORE	-	-	-
Variable	Coefficients	t-Statistic	Prob.
Comandfees (1)	-0,049	-1,286	*
Credrisk1(-1)	-21,112	-0,674	*
Crisis	-2,476	-1,038	*
Debttoassets(-1)	-0,309	-3,778	***
Devaluation	4,532	1,951	**
FEE(-1)	4,116	2,112	**
GDP(1-)	-44,432	-1,364	*
Inflation(-1)	12,281	1,081	*
Investments(-1)	-0,038	-1,494	*
Liqrisk1(-1)	33,811	1,177	*
Loan_growth(-1)	-2,775	-0,488	*
Adjusted R-squared	0,565	-	-
F-statistic	23,240	-	-
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability			

Table 14 shows the regression coefficients of the profitability measures (Panel A, ROA and Panel B, NIM) of the model for the sample of Kazakhstani banks.

Table 14 – Profitability regressions of Kazakhstani banks, 2008-2017 quarterly based

Panel A				Panel B			
Dependent Variable: RAO				Dependent Variable: RAO			
Method: Panel Least Squares				Method: Panel Least Squares			
Observations: 360				Observations: 360			
variable	coefficients	t-statistic	prob.	variable	coefficients	t-statistic	prob.
Comandfees (1)	0,014	1,142	*	Comandfees (1)	-0,016	-2,539	**
Credrisk1(-1)	-6,300	-0,648	*	Credrisk1(-1)	-8,473	-1,673	**
Crisis	-1,493	-2,020	**	Crisis	-0,934	-2,409	**
Debttoassets(-1)	19,041	1,581	**	Debttoassets(-1)	0,079	-5,981	***
Devaluation	0,179	0,247	*	Devaluation	0,644	1,705	**
FEE(-1)	0,317	0,521	*	FEE(-1)	-0,275	-0,868	*
GDP(1-)	-31,190	-11,931	**	GDP(1-)	-4,112	-2,171	**
Inflation(-1)	22,042	4,518	*	Inflation(-1)	1,033	0,785	*
Investments(-1)	0,222	0,264	*	Investments(-1)	-0,003	-0,732	*
Liqrisk1(-1)	4,696	0,526	*	Liqrisk1(-1)	8,604	1,844	*
Loan_growth(-1)	0,818	0,463	*	Loan_growth(-1)	1,022	1,102	*
Adjusted R-squared	0,744	-	-	Adjusted R-squared	0,650	-	-
F-statistic	41,024	-	-	F-statistic	41,161	-	-
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability							

As we can observe from Table 4, the size of the bank has insignificant effect on the measure of risk. Relying too much on the size and being a strategic player might accumulate problems for big sized banks. This idea comes in line with the summary

of Pak [23, p. 13]. Liquidity has a positive relationship with Z-score. As liquidity shortens the risk level increases. This weakens the financial stability. As expected the loan growth has negative effect on the level of risk. Generally, as the volume of the loans increases the quality of them decreases and eventually increasing the risk level.

Table 14 represents the profitability measures regression models for ROA and NIM. Generally, indicators of the bank performance are not showing the same results. Per unit assets are negatively affected by the crisis when interest revenues are less affected. Both measures are negatively related to 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-interest income generation increases. This is in line with the study of Huizinga [217] who stated 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 both for the ROA and NIM indicators. Debt portion has positive and significant effect on the ROA. What is interesting is that devaluation has a positive impact on both profitability measures. It is possibly can be interpreted as the result of the facts that the composition of the deposits are dollar valued. Crisis has insignificant 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. Inflation has positive relationship with both profitability measures. But, since we calculate inflation based on the consumer price indices, the results can be biased. Price as an indicator holds too much information within itself. Hence, it can be biased to other variables.

Conclusion on the 5th section
Based on the quarterly data for the Kazakhstani banks for the period of 2008 – 2017 years, this study examines the industry risk and return. The overall results suggest that performance is affected by size of the banks. The bigger is the bank, the higher is probability of lower performance, and the higher is the proportion of credit risk. The effect of crisis on the performance is negative. Devaluation effect has positive impact on profitability measures suggesting that the proportion of foreign to local currency composition within examination period was significant. The fluctuations of the levels of Z-score in ten year period can only suggest that the industry is quite vulnerable to the changes in a macroeconomic environment. Kazakhstani banks still rely more on traditional banking strategies of loans and deposits. Non-traditional activities such as differentiated investment strategies are not significant in their proportions.

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

6 KAZAKHSTANI MARKET AND OWNERSHIP FACTOR. PART 2

6.1 Introduction

The performance of banking industry requires an understanding of the main contributing factors to it. Considering regulatory and supervisory frameworks and overall bank industry positions will help rightly identify the necessary variables to take into account when researcher examines the performance level. The regulatory framework closely interrelated with supervision of industry requires the international norms such as Basel III to be taken into consideration. These types of norms applied mostly to developed countries and adjusted with some applications to emerging developing countries. Therefore, these norms may not completely be able to reflect and help transitional economies enhance development. Moreover, regulatory bodies and their control levers may as a result be inefficient. Consequently, additional factors that can be specific to country are necessary to be included into examination. The specifics of transitional countries and generally poorly developed financial markets presuppose the necessity to examine the final beneficiaries of business outputs. Hence, apart from examination of risk and return of industry, a separate study of the effect of business owners needs to be done in the framework of current model. Because the bank, in our case, is the source of both risk and return, both assets and liability parts are necessary to be considered. The examination of systematic and specific to bank risk is dependent in many cases on the way financial institutions raise the funds. Transitional economies generally have poor financial intermediary levers. Hence, financing mostly flows from equity holders in these types of economies. The next stage is the allocation of these resources. Poor performances of managers will lead up to poor overall performance of the whole institution even if the resources are available. The above reasoning identifies owners of shares as crucial and the most powerful players of the market in emerging economies. However, the resources of planned economies were biasedand distributed directly to the institutions with no market rates; the change to the transitional conditions required different level of participation from financial institution owners. This was not the case in the early stages of transition and is still the case in some of the countries of post planned economies. Largely there were no other owners apart from the central apparatus in the planned economy banks. The primary role of bank was the transmission of funds to state companies as a rule. Therefore, the norms such as Basel III require higher own capital provision for cases with systematic risk that might occur.

6.2 Background

The heritage of the post-Soviet Union with planned economy market definitely had its own effect on the structure of newly born economy of independent Kazakhstan. The financial sphere in early stages of transition was far from the one we consider market economy today. The planned distribution of resources took place in early transmission years and gradual move towards market economy and options of international financial intermediaries were slowly arising. It is now almost thirty years of independent history and we can see that the changes in all areas have been taking place. In economic perspective, corrections were at hand with the shocks that

took place both externally and internally. The Global financial crisis of 2008, previously took place crisis in Asia (1997) and Russian ruble crisis (1998) had their print on the way economy was developing. In terms of the banking industry, the numbers of the institutions were getting smaller over the period. Apart from that, problems with macroeconomic position at the country level made the government and central bank interfere with sharp decisions to devalue local currency several times during examination period. The factor considered as internal shock was added to the model of the study. In general, number of financial institutions, in three decades, declined from around two hundred to thirty. That trend shows that market had number of institutions not fit and as a result, they went out of it. However, it showed that more supervision and regulation of market economy conditions were necessary. The control of allocation of the resources and more capital provision from the shareholders became higher. Not many owners of institutions were able to satisfy these prudential norms. Some of the institutions merged and some were acquired as the result by the banks with higher capital. The primary purpose of the study is to evaluate the effect of ownership with influence of macroeconomic shocks on performance of banking industry in Kazakhstan.

This part of work is then followed by section 3 - the data observation, section 4 - the methodology, section 5 – the findings and section 6 – concludes.

6.3 Descriptive analysis

6.3.1 Data
The financial data is from the Bloomberg financial information resource for most of specific to bank variables, macroeconomic and country specific data was obtained through the local central statistical agency and the statistical resource from the National Bank of Kazakhstan. Categorical variables of ownership structure for every bank, devaluation and crisis periods have been hand collected and mainly collected from bank financial statements. Majority of banks under examination are listed in the Kazakhstani Stock Exchange, but with almost no structural change in share prices. Nevertheless, this resource has only been used as the source for categorical data. The other important point is that some of privately categorized banks have the owners directly linked (affiliated) with the state government. Since owners of the banks are from the business areas, in the following study, we categorize these banks as privately owned. Following work of Pak [199, p. 580], we have examined all 28 banks. However, as the data for some of the banks was incomplete, the panel shrienked. Nevertheless, in the study, the overall structure for Kazakhstani banks ownership composes around 88% of privately owned banks. Pak [199,p.581] stated that for the period of 2008-2016 years the percentage of privately owned banks in Kazakhstan was equal to 85%. We follow the work of [218] and categorize the bank as state owned if the share of government is at least 20%. Otherwise, the bank is categorized as private and all foreign banks are taken as private following the work of Cornett [219]. The descriptive statistics of values of performance of return on assets and net interest margin suggest that both factors are significant and each accounts for one fifth of overall effect. As for equity factor, it is

as well significant and shows almost 51%. We account that for the structure of transitional economies. Transitional economies tend to have high concentration of power in the hands of one subject. The same subject can represent both the reformer of the industry and the final beneficiary of reforms applied. Macroeconomic variables like GDP growth and inflation are less significant; however, represent the values that are close to true values of economy in the examination period. On the other hand, [220] stated that banks can respond to the crisis and cyclical changes differently.

6.3.2 Performance measures

The performance measures in the study are determined as Net Interest Margin (NIM), which accounts for net interest income over assets and helps properly evaluate the spread between the revenues and the costs the bank bears. This has a direct effect on the decisions of top management of the bank about the funding strategy. Hence, it has direct effect on overall performance of the industry. The measures of performance like return on assets (ROA) and return on equity (ROE) are the most used ones and therefore will be easy to cross-compare with other studies. Moreover, both equity and assets have huge proportions in accounting measures of banks in developing economies. Therefore, using them as performance measures is quite reasoned.

6.3.3 Country and bank specific measures

Table 15 represents the description for dependent and independent variables with the references to the theories and studies of area.

Table 15 – Definitions and formulas for the variables and formulas for the variables

Variables	Definitions
Performance measures	
NIM	*Net Interest Income/Total Assets*
ROA	*Net Income/Total Assets*
ROE	*Total Equity/Total Assets*
Industry specific measures	
Loan growth	*Loan(t)/Loan(t-1)-1*
Credit risk	*Total Loans/Total Assets*
Liquidity risk	*(Total Assets-Total Loans)/Total Assets*
Borrowing	*Debt/Assets*
Investments	*Trading securities as a percentage of overall investments*
Country specific and macroeconomic measures	
GDP growth	*GDP(t)/GDP(t-1)-1*
Inflation	*CPI(t)/CPI(t-1)-1*
Crisis	*Dummy variable of "1" in case of crisis and "0" otherwise*
Ownership	*Dummy variable of "1" in case of private bank and "0" if state*
Devaluation	*Dummy variable of "1" in case of devaluation and "0" otherwise*

We apply country, industry and macroeconomic variables in regression model. To cover the effect of crisis, ownership and devaluation categorical factors, the dummy variable is used.

6.4 Methodology

The study is based on cross methodology application of works of Allen [105; 142, p. 403] and Micco [85, p. 250]. The evaluation of performance dependence measures of return on assets, on equity and net interest margin are estimated against macro, country and bank specific variables with stepwise inclusion of factors like devaluation, ownership and crisis categorical variables all together and separately. The following way to regress dependent variables might help check a single factor effect and overall dependence of bank performance on both endogenous and exogenous to the economy shocks. The equation is then constructed in the next format:

$$Performance_{it} = C_{it} + Ownership_{it} + Crisis_{it} + X_{it} + e_{it} \quad (1)$$

We apply common to the area approach in examination of banking industry, we take all the variables for the specification of time t, and bank i. C commonly states for the intercept and we apply error term as e. X states for the variables specific to the bank, macro and country level. Following the previous studies and in particular Pak [199, p. 583], we use credit risks to account the flows of credit growth. Debt and equity to assets to account for the proportions of financial intermediation; fees and commissions to account for the non-bank driven profit generation; investments as the funding variable; loans and deposits as bank specific variables controlling the assets and liabilities part. Macroeconomic variables like GDP growth and inflation are as well included into the regression model to cover the country effect. Total assets are taken in log form. To diminish the endogeneity problems of the regression we apply all the right hand side variables with the lag. We have already mentioned that in the work of [213, p. 396], the variables were taken normally without lag application. That was driven with the explanation of the fact that managers can respond first time and fast to the changes that take place and can as a result decrease the risk. However, we examine the performance measures and the response to the blurred, but potentially possible risk of endogeneity, still can take place. Hence, we apply the lagged variables with the help of criteria selection test of Schwarz and Akaike. The selection criteria suggest the application of at least one lag for the most of the variables using the VAR selection criteria. We run the regressions separately and together for the categorical variables of ownership structure, crisis and devaluation as a local shock. The period of the world financial crisis have been taken as a starting point of the insolvency of the investment bank Lehman Brothers for the years of 2008, 2009 and 2010 as it was suggested and applied in the work of [199, p.584]. The studies on the local shock of tenge devaluation covers first two quarters of the year 2009, and 2014 for the whole two years afterwards to cover the long-lasting effect. Ownership structure is considered private or state only. All the three categorical factors are taken

as dummy variables with the values of "1" for private, crisis, devaluation, and "0" if the ownership is state; there is no crisis and no devaluation effect.

6.5 Findings

6.5.1 Correlation

Table 16 represents the correlation coefficients between performance measures and bank specific variables for the Kazakhstani banks. Following [199, p.581], 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.

Table 16 – Correlation coefficients for the specific to the Kazakhstani bank variables. 2008-2017

Name	1	2	3	4	5	6	7	8	9	10	11	12
Commission and fees	1											
Credit risk	-0.05	1										
GDP	0.045	0.077	1									
Investments	-0.534	-0.031	-0.041	1								
Liquidity risk	-0.123	0.873	0.073	-0.005	1							
Size	0.032	-0.385	0.004	0.073	-0.415	1						
Deposits	0.087	-0.268	0.005	0.022	-0.562	0.699	1					
Equity	-0.121	-0.156	0.081	0.03	-0.068	0.405	0.15	1				
Loan growth	-0.031	0.572	0.063	0.04	0.449	0.13	0.307	0.123	1			
NIM	-0.088	0.064	-0.108	-0.08	0.081	0.016	0.013	0.047	0.14	1		
ROA	0.097	-0.028	-0.124	0.034	-0.038	0.005	0.035	0.026	-0.001	0.028	1	
ROE	0.115	-0.013	-0.117	0.035	0.006	0.142	0.078	0.091	0.153	0.085	0.622	

Examining the correlation coefficients form the Table 2 among bank specific and macroeconomic variables, we can observe that factors such as *Loan Growth* have a good correlation with *Credit Risk*, as the volume of loans increase, the probability that the quality of the loan taker will decrease is high attributing to the increase of *Credit Risk*. This is quite reasonable and goes in line with many previous studies. The other expectation that comes true with the right economic condition is the high correlation between the *Liquidity Risk* and the *Deposits*. The correlation between the factors is high and negative, what means that the possible problem of the liquidity in the financial institution will most likely outflow the stream of deposits from it. This is the case in banks with liquidity problems. The performance measures are as well highly and positively correlated. The Kazakhstani banking business is very concentrated, and mostly controlled by a very small group of people. This group of people, the shareholders, in most cases controls the equity part of the bank directly or through representatives. Therefore, the assets of the bank can as well be under control of the group. Hence, high correlation of the equity and assets is not something that can surprise. *Loan Growth* and *Deposits* correlation is weaker for Kazakhstani market and in comparison with the previous studies of the field. Generally, the expectation is that the growth of the deposit base will boost the loan distribution, but here we can

see that the correlation is not that high. Therefore, we can reason that as a positive signal that states that there are other options of the fund accumulation by the banks and probably cheaper than the most conservative way of deposit base increase. This means the financial intermediary is growing in the local market and banks have their benefits of it. *Deposits* grow well in the positive state of the economy and the correlation between factors such as *Size* of the bank and *Deposits* are as well, high and positive. We assume that the size of the bank grows with the overall economy prosperity. However, there is almost no correlation between *GDP* growth and bank *Size*. Hence, we can probably attribute that fact to the cyclical changes in the industry. Equity is as well positively correlated with the growth of the bank *Size*.

6.5.2 Performance measures regression results

To fully examine the performance of the banking industry of transitional economy of Kazakhstan, we used the methodology that was formed as the combination of the models that were applied in the works of [105; 213, p. 400; 218, p. 93; 219, p. 74; 221, 222]. The predictor variables are significant in number. We use the next measures as independent variables: the bank size as a log of total assets, ratios of debt and equity to assets, to cover up profits flowing from not traditional to the bank sources, we use commissions and fees. The country effect is covered up by the *GDP* growth and inflation. Bank specific accounting measures like investments, liquidity risk, deposits, equity, and loan growth are as well applied. As for the categorical measures, the year dummies used for the identification of ownership structure of the bank, the outside shock of world financial crisis and the local macroeconomic shock of devaluation. For all performance measures, we run the regressions that are of the full sample, without inclusion of dummies and with year dummy separately. In the first sample, without inclusion of dummies, in the Table 3, we observe moderately significant negative effect of the *Size* of the bank on the performance measure. The literature mostly states similar outcomes as the Kazakhstani banks tend to take higher risk opportunities with their size, growing or large. This goes in line with the theory of "too big to fail" banks, which are relying too much on state support. This case is particularly significant in weak markets with low financial institutional diversity. *Loan growth* consistently increases their return on assets, what can probably be reasoned as the idea that the compositions of the assets have a huge part of the loans in it as was stated in the work of Altunbas [212, p. 930]. This explains the finding why the deposits have high coefficient and moderately significant effect. The *Deposit* base increases the *Loan Growth* and affects the performance positively. On the other hand, we can mention the negative effect of *Credit Risk* on performance. Therefore, additional tests are required to check for the length of the positive effect on performance. Interestingly, non-traditional ways of profit generation for banks like *Fees and Commissions* have significant positive effect. It appears that the changes in business model of banks have some positive effect on the performance of the whole industry.

In all five regressions types with respect to return on assets, the significance of the macroeconomic factor of *GDP* and of *Commission and Fees* is high. We can attribute the fact to the *GDP* growth and sequential increase in the liquidity of the

private banks in line with Pak [199, p.581]. We pointed already that our sample consists of almost ninety percent of the private ownership structure. In the full sample, world financial crisis has significant and negative effect on the performance. The ownership structure as well has a negative effect on performance. The devaluation, on the other hand positively affects the return on assets. We assume that this can be attributed to the fact that the composition of assets can have a large portion priced in foreign currency. Therefore, the local shock, in the face of currency devaluation positively affects the performance.

In the sample with only *Ownership* structure examined, we can see that the coefficient of the *Ownership* structure became positive and moderately significant in comparison to the full sample. It then means that *Crisis* and *Devaluation* can seriously undermine the effect of ownership on the performance when both factors are included into the regression model. We categorize the banking industry in the examination period for almost ninety percent as private. Hence, it seems obvious that private owners of the banks are in large dependence on the both internal and external economy shocks like world financial crisis and local currency devaluations. The coefficient of *Crisis* in the sample with only crisis dummy years and the full sample is significant. Both samples' coefficients are high and negative. It only can imply that the bank stability can seriously be deteriorated in the times of the crisis. The *Devaluation* effect changes the sign of coefficient from full sample positive to alone examined negative sign. We can probably attribute it to the fact that in full sample regression the effect of devaluation is mostly neglected for the reason of Crisis inclusion.

This table 17 shows the regression coefficients of the Return on Assets performance measurement model for the sample of Kazakhstani privately owned banks. Following [15, p. 453], we evaluate private ownership type as 20% least. Following [219, p.75], we consider all foreign banks as private. 88% of the whole industry represents privately owned banks. The explanatory variables are in *Italics* and represent bank specific, macroeconomic and country specific factors. Five types of regression models applied. None – only the explanatory variables with no categorical factors. All – full sample with three categorical year dummies applied. Ownership, Crisis and Devaluation – explanatory variables with private ownership structure, crisis and devaluation dummies separately examined, respectively.

This table 18 shows the regression coefficients of the Net Interest Margin performance measurement model for the sample of Kazakhstani privately owned banks. Following Dinc [15, p. 453], we evaluate private ownership type as 20% least. Following Cornett [219, p.75], we consider all foreign banks as private. 88% of the whole industry represents privately owned banks. The explanatory variables are in *Italics* and represent bank specific, macroeconomic and country specific factors. Five types of regression models applied. None: only the explanatory variables with no categorical factors. All – full sample with three categorical year dummies applied. Ownership, Crisis and Devaluation – explanatory variables with private ownership structure, crisis and devaluation dummies separately examined, respectively.

Table 17 – Kazakhstani Bank Performance Measure, 2008-2017, quarterly based

	Dependent variable: the Return on Assets (ROA)														
	Method: Panel least squares. Pooled regression model														
	none	-	-	all	-	-	ownership	-	-	crisis	-	-	devaluation	-	-
	coeff.	t-stat.	prob.	coeff.	t-stat.	prob.	coeff.	t-stat.	prob.	coeff.	t-stat.	prob.	coeff.	t-stat.	prob.
Credit risk	-3.04	-0.263	*	-2.132	-0.185	*	-3.115	-0.269	*	-2.788	11.444	*	-3.743	-0.323	*
Debt to Assets	0.075	0.97	**	0.075	0.985	**	0.076	0.984	**	0.076	0.076	**	0.075	0.966	**
Equity to Assets	0.131	1.045	**	0.151	1.208	**	0.142	1.125	**	0.159	0.125	**	0.141	1.118	**
Fee	1.029	1.737	***	1.212	2.045	***	1.061	1.789	***	1.172	0.587	***	0.996	1.677	***
GDP	-0.293	-2.84	***	-0.312	-2.585	***	-0.244	-2.169	***	-0.307	0.102	***	-0.325	-2.976	***
Inflation	-0.066	-0.838	**	-0.03	-0.336	*	-0.083	-1.036	**	-0.062	0.078	**	-0.093	-1.103	**
Investments	0.012	0.994	**	0.012	0.983	**	0.011	0.906	**	0.012	0.012	**	0.012	0.96	**
Commission	0.021	2.319	***	0.023	2.552	***	0.021	2.368	***	0.022	0.009	***	0.021	2.322	***
Liquidity risk	-2.21	-0.206	*	-3.625	-0.34	*	-2.459	-0.229	*	-3.335	10.638	*	-1.981	-0.184	*
Size	-6.012	-1.156	**	-6.1	-1.184	**	-6.096	-1.173	**	-6.054	5.104	**	-5.905	-1.135	**
Deposits	3.461	0.828	**	3.013	0.727	**	3.414	0.817	**	3.119	4.132	**	3.534	0.845	**
Equity	1.621	0.681	**	1.643	0.694	**	1.544	0.648	*	1.501	2.355	*	1.477	0.619	**
Loan growth	3.761	0.768	**	4.714	0.967	**	4.074	0.83	**	4.918	4.859	**	4.117	0.837	**
Ownership	-	-	-	-0.402	-0.536	*	0.707	1.091	**						
Crisis	-	-	-	-2.336	-2.793	***				-1.912	0.64	***			
Devaluation	-	-	-	0.431	0.628	*							-0.544	-0.895	**
R-squared	0.642			0.896			0.674			0.818			0.661		
Adj. R^2	0.234			0.412			0.239			0.454			0.228		
F-test	15.743			18.653			15.509			20.669			15.251		
Observations	360			360			360			360			360		

* – significant at 10% levels, respectively Significance levels of the probability;

** – significant at 5% levels, respectively Significance levels of the probability;

*** – significant at 1% levels, respectively Significance levels of the probability

Table 18 – Kazakhstani Bank Performance Measure. 2008 – 2017, quarterly based

	Dependent variable: the Net Interest Margin (NIM)														
	Method: Panel least squares. Pooled regression model.														
-	None	-	-	All	-	-	Ownership	-	-	Crisis	-	-	Devaluation	-	-
-	Coeff.	T-stat.	Prob.	Coeff.	T-stat.	Prob.	Coeff.	T-stat.	Prob.	Coeff.	T-stat.	Prob.	Coeff.	T-stat.	Prob.
Credit risk	-5.174	-0.906	**	-4.758	-0.851	**	-5.059	-0.9	**	-5.342	-0.956	**	-4.132	-0.728	**
Debt to Assets	-0.003	-0.08	*	-0.004	-0.112	*	-0.005	-0.126	*	-0.004	-0.096	*	-0.003	-0.072	*
Equity to Assets	0.032	0.514	*	0.005	0.087	*	0.016	0.257	*	0.014	0.224	*	0.017	0.283	*
Fee	-0.343	-1.174	**	-0.408	-1.415	**	-0.392	-1.362	**	-0.438	-1.527	**	-0.294	-1.012	**
GDP	-0.184	-3.626	***	-0.202	-3.436	***	-0.26	-4.767	***	-0.175	-3.515	***	-0.137	-2.56	***
Inflation	-0.048	-1.247	**	-0.017	-0.406	*	-0.022	-0.56	*	-0.051	-1.347	**	-0.008	-0.199	*
Investments	-0.008	-1.291	**	-0.006	-1.057	**	-0.006	-1.037	**	-0.007	-1.218	**	-0.007	-1.203	**
Commission	-0.007	-1.576	**	-0.008	-1.879	***	-0.008	-1.763	***	-0.008	-1.886	***	-0.007	-1.6	**
Liquidity risk	2.625	0.495	*	3.152	0.608	*	3.009	0.576	**	3.372	0.649	*	2.285	0.434	*
Size	-5.051	-1.969	***	-5.027	-2.008	***	-4.92	-1.948	***	-5.023	-2.002	***	-5.209	-2.049	***
Deposits	1.541	0.747	**	1.674	0.831	**	1.614	0.795	**	1.768	0.876	**	1.433	0.701	**
Equity	0.699	0.595	*	0.906	0.787	**	0.819	0.708	**	0.774	0.673	*	0.913	0.782	**
Loan growth	4.389	1.816	***	3.414	1.441	**	3.903	1.638	**	3.621	1.526	**	3.861	1.607	**
Ownership	-	-	-	-0.631	-1.731	***	-1.097	-3.477	*	-	-	-	-	-	-
Crisis	-	-	-	0.771	1.897	***	-	-	-	1.271	4.064	**	-	-	-
Devaluation	-	-	-	0.349	1.047	**	-	-	-	-	-	-	0.806	2.715	***
R-squared	0.139	-	-	0.188	-	-	0.169	-	-	0.179	-	-	0.157	-	-
Adj. R^2	0.102	-	-	0.145	-	-	0.13	-	-	0.141	-	-	0.118	-	-
F-test	3.712	-	-	4.386	-	-	4.348	-	-	4.669	-	-	4.005	-	-
Observations	360	-	-	360	-	-	360	-	-	360	-	-	360	-	-

* – significant at 10% levels, respectively Significance levels of the probability;

** – significant at 5% levels, respectively Significance levels of the probability;

*** – significant at 1% levels, respectively Significance levels of the probability

Analysis of bank specific variables in all the regression sections for the return on assets performance measure shows not much difference in all applications. The the industry is affected by the shocks and ownership structure changes. Finally, we need to point that the choice of the predictors in the regression sections with return on assets are significant as the value of adjusted r-squared shows and the model is in general significant as the F-statistics indicates.

In Table 4, in the full sample, the *Crisis* coefficient has the positive sign indicating positive effect on Net Interest Margin performance measure. This finding complies with the study of [123, p. 221] who states that during and after crisis period, the state support as a funding for the private banks increases in the emerging market economies. We previously pointed that net interest margin is helpful in identification the spread between interest revenues and costs. The small spread pushes management of the banks make the decision about the funding increase. Hence, we can attribute the positive sign of the *Crisis* to the specifics of the developing economy. Simply stating, *Crisis* increases the possibility that government will devote more funds to the private banks making the position of the Net Interest Margin positive. Therefore, Net Interest Margin increases in the case of the crisis, because the overall market insolvency threatens economy safety. This is based on the assumption that banks tend to play the major role in the emerging markets. Hence, government will try to keep the market safe and will support the banking industry financially. The appropriateness level of the predictor variables is lower when applied against NIM performance measure.

Table 5 presents the regression coefficients of the five subsamples against the dependent variable Return on Equity. The regressions with separate examination of predictors of *Ownership*, *Crisis* and *Devaluation* go in line with the findings in similar regressions for ROA. However, it is worth mentioning that the coefficients for these variables are quite high. In all regressions for Return on Equity, we can observe that that the coefficient for *Loan Growth* is high and positive. On the other side, *Credit Risk* has negative and significant impact. We can state that aggressive lending positively affects equity and increases the volume of loans, but decreases the quality and eventually leads to overall low performance. Financial stability represented as the equity is seriously undermined whenever the crisis or devaluation takes place. The significance is high in all the specifications, in a full sample or for each dummy separately.

This table 19 shows the regression coefficients of the Return on Equity performance measurement model for the sample of Kazakhstani privately owned banks. Following Dinc [15, p. 453], we evaluate private ownership type as 20% least. Following Cornett [219, p. 75], we consider all foreign banks as private. 88% of the whole industry represents privately owned banks. The explanatory variables are in *Italics* and represent bank specific, macroeconomic and country specific factors. Five types of regression models applied. None: only the explanatory variables with no categorical factors. All – full sample with three categorical year dummies applied. Ownership, Crisis and Devaluation – explanatory variables with private ownership structure, crisis and devaluation dummies separately examined, respectively.

Table 19 – Kazakhstani Bank Performance Measure, 2008-2017, quarterly based

Dependent variable: the Return on Equity (ROE)														
Method: Panel least squares. Pooled regression model.														
-	None	-	-	All	-	-	Ownership			Crisis	-	-	Devaluation	-
-	Coeff.	T-stat.	Prob.	Coeff.	T-stat.	Prob.	Coeff.	T-stat.	Prob.	Coeff.	T-stat.	Prob.	Coeff.	T-stat.	Prob.
Credit risk	-27.622	-0.488	*	-28.566	-0.507	*	-28.111	-0.498	*	-26.408	-0.472	*	-34.512	-0.611	*
Debt to Assets	0.103	0.274	*	0.106	0.284	*	0.111	0.293	*	0.107	0.287	*	0.101	0.269	*
Equity to Assets	0.168	0.273	*	0.317	0.517	*	0.236	0.384	*	0.3	0.492	*	0.263	0.428	*
Fee	2.341	0.809	**	2.871	0.99	**	2.549	0.881	**	3.027	1.053	**	2.015	0.697	**
GDP	-1.807	-3.586	***	-1.958	-3.313	***	-1.485	-2.706	***	-1.874	-3.757	***	-2.122	-3.99	***
Inflation	-0.147	-0.381	*	-0.208	-0.484	*	-0.259	-0.663	*	-0.127	-0.333	*	-0.412	-1.004	**
Investments	-0.004	-0.065	*	-0.009	-0.152	*	-0.011	-0.179	*	-0.008	-0.139	*	-0.008	-0.131	*
Commission	0.133	3.061	***	0.141	3.263	***	0.136	3.132	***	0.142	3.289	***	0.134	3.078	***
Liquidity risk	1.453	0.028	*	-2.813	-0.054	*	-0.178	-0.003	*	-3.951	-0.076	*	3.701	0.071	*
Size	-7.74	-0.305	*	-7.619	-0.302	*	-8.297	-0.327	*	-7.942	-0.316	*	-6.692	-0.264	*
Deposits	1.732	0.085	*	0.449	0.022	*	1.423	0.07	*	0.092	0.005	*	2.447	0.12	*
Equity	10.679	0.917	**	9.768	0.843	**	10	-	-	4.801	-	-	4.401	-	-
Observations	360	-	-	360	-	-	360	-	-	360	-	-	360	-	-

* – significant at 10% levels, respectively Significance levels of the probability;
** – significant at 5% levels, respectively Significance levels of the probability;
*** – significant at 1% levels, respectively Significance levels of the probability

Conclusion on the 6th section

Using quarterly based data from 2008 to 2017 years, we examine the effect of composite ownership structure, external global financial shocks and internal macroeconomic changes as devaluation on financial stability and performance of Kazakhstani bank industry. The financial stability of Kazakhstani market deteriorates as external environment worsens as both factors of Return on Equity and Assets indicate. On the other side, the Net Interest Margin shows that crisis only positively stimulates financial stability of industry. Since the development of financial market in Kazakhstan is low, the positive effect is only attributed to the fact that in times of the negative economic conditions, banks tend to receive additional funding from state budget to diminish the possibility of insolvency of industry. Hence, the positive moments indicated by Net Interest Margin performance measure in times of crisis cannot be explained by the good business model, because other two performance variables suggest that the crisis has negative and significant impact on overall state of banks in Kazakhstan. As for the ownership structure, the Kazakhstani banking industry has almost ninety percent private banks during examination period. However, owners of the financial institutions are closely affiliated with governmental executives or previously have been on the state service. Therefore, the problem of fiscal costs that arise in times of crisis cannot be neglected even if the whole ownership of Kazakhstani banks are almost completely in the hands of private sector.

With respect to the models applied, we can report that examining regression model with private ownership only, excluding the crisis and devaluation shocks, positively affects bank performance. Results indicate strong evidence that the bigger is the size of the bank, the higher the credit risk possibility; the higher the volume of loans and the poorer the quality of them, eventually affecting overall performance level. In the full models, the effect of ownership is weaker. Findings suggest that macroeconomic shocks seriously affect the financial stability of banks undermining the effect of ownership. The other observation suggests significant increase of non-traditional profit generation factors contributing to the performance level in all regression stimulations. This can be attributed to the fact that traditional business models in Kazakhstani banking industry changes and shows clear reliance on the other possible options of profit generation. This indicates a positive signal to the fact that the industry is developing. For a full picture of the industry's performance, however, further research of the regulation and supervision of the industry is necessary.

7REGULATION

7.1 Introduction

The fallout from the financial crisis of 2008 had been enormous. Markets were not ready for the crisis and shock which unearthed the harsh reality that many of the reforms, regulations, and newly implemented management strategies had undisguisable weaknesses riddled across many, if not all of the world's developed and developing economies. Moreover, for many years it had become evident that the pre-crisis period of profitability had been growing exponentially for most stable financial institutions. However, the best-assumed risk-adjusted financial models of developed economies struggled during the crisis, offering no viable contingency plan, eventually plunging the markets into despair. Therefore, these unique challenges required a new set of regulatory standards, heavy financial reforms, and a level of supervision that had never been seen before. Many of the market players introduced vigilant internal checks as part of their permanent audit functions within their respective companies. Many international central regulators directed these entities to correspond with the newly adjusted worldwide measures soon to be known as the "Basel standards".

The crisis had questioned whether the existing framework of system regulation and surveillance had in part, been to blame for the crisis itself. Had the current regulations of the market been breeding the cause for the crisis itself?

We expect that banks complying with these new regulatory norms would become more efficient. In this text, we will investigate complete case studies within varying economic zones and regions to cross-examine the results to investigate across a large test sample, increasing our test's robustness and to factor in the many possible differences in cultural opinion and perception. This scattered examination will help us to identify possible weak areas in given economic zones and eventually apply targeted reforms and norms to enhance their risk performance. We will evaluate systemic risk using the Z-score method, coupled with the methodology of Delis [197, p.57]. This methodology was used in the evaluation of financial stability within the Kazakhstani banking industry [132, p.45]. In the study, we assess our chosen test subjects' compliance with regulatory norms in the full sample and separate the economic areas for each specific country in question. Following this approach, we will observe how countries with varied circumstances perceive the effect of regulation. We will hold the shocks of the macroeconomic environment and bank-specific and industry-specific characteristics as control variables. Studying the relationship between bank performance and compliance with the newly adjusted regulations such as minimum required capitalization, activity restrictions, and reserve requirements will help us point out the weaknesses of specific areas and help policymakers make the targeted reforms that are needed. [171, p.202] studied the economic growth of different countries and found that a well-established financial market positively affected the economic growth of these nations.

In the study of Kaliyev and Nurmakahnova [157, p. 11] the transitional economies were found to be highly dependent on their banking sector, however, the study of Berger, Hasan, and Zhou [223] states that in the long run, the effect will be diminished for emerging markets. Djalilov and Piesse [16, p. 310] examined how this

efficiency affected a country's regulatory norms. The authors stated that previous studies omitted the former Soviet Union countries. Therefore, for the examination of transitional economies in general, these types of omissions might create significantly biased findings. Moreover, most of the post-Soviet Union countries represent exactly what we have come to see as a transition economy. This study examines different regions including former Soviet Union nations, eastern and southern European countries, and some Latin American states also.

This study covers the transitional economies of eastern and central Europe, Caucasus, Balkan countries, and some peer countries of Latin America in the period of 2008-2019. This period of study allows us to capture the full effect of the changes in regulatory norms in times before and after the crisis. Previous studies like Ayadi [131, p. 20] or Barth [154] have contradictory findings. Especially in the cases when most of the observed countries have undergone serious reforms and systemic changes like the collapse of the Soviet Union.

We contribute to the literature examining the question using the GMM approach. We run regressions across the full sample, regional subsamples, and separate countries to obtain more detailed and precise findings. The data covers more than 100 banks worldwide, representing 17 transition countries between the years 2008 and 2019. We incorporate macroeconomic shocks and banking variables to capture specifics of the institutions and industry variables to enroll country-level features into the model. The regulation effect is represented by the main factors of Basel accord: such as activity restrictions, reserve, and minimum capital requirements.

This part of the thesis is organized in the next sequence of sections. Section 2 is characteristics of economies in transition. Section 3 describes data and the methodology applied. Section 4 outlines the findings. And section 5 concludes.

7.2 Characteristics of economies in transition

Financial institutions differently perceive similar norms and regulations Julian and Ofori-dankwa [141, p. 1320]. The "Institutional Difference Hypothesis" developed by Julian and Ofori-dankwa [141, p.1321] states that emerging and developed markets differently perceive the reforms because the norms established in developed economies (such as minimum required capital and reserve requirements) are frequently different to those required in emerging or transition economies.

Previous studies mostly focus on developing markets. In this study, we focus on transitional economies exclusively. Therefore, this study will provide new insights on the effect of regulatory norms on performance and risk estimation in transition economies. In addition to this, the framework of institutional development is still raw and developing in the majority of transition economies which makes the study even more challenging and interesting.

Existing controls within the banking industry in Argentina still lack confidence to this day. New players such as fin-techs are now in the market. The regulation of the market is becoming increasingly more difficult due to the implementation of new, sophisticated, non-banking products and cash flows that have become more complicated to control. Today's industry regulations in Argentina were mainly

formed in 1977 with the Financial Institutions Law. Thereafter, starting from the year 1994 Argentina introduced CAMEL quality regulation, where each of the letters stood for its main pillars of interest: Capital, Assets, Management, Equity, and Liquidity regulation. Many banks started to carry out regular internal audits with few opening special functions within institutions. These were all requirements based on Basel III norms and regulations. In regards to funding, the Argentine banking industry has access to all pecking order theory options as loans, debts, and customer deposits. Liberalization of the industry in 1990 mainly touched on liquidity, foreign investments, and higher capital requirements. Still, only 30% of the GDP corresponded to the banking industry in Argentina. Historically, the main problem for the banking industry in Argentina has always been one of local currency devaluation. Basel III norms were introduced in Brazil in 2013, where both cash and time deposits are used for funding. Apart from that, bonds were commonly used as cross border funding. Eastern European countries performed quite well before the financial crisis of 2008.

However, global growth after the crisis was expectedly weak. The crisis mainly took place because of the poor regulatory norms. Weak risk evaluation, high costs, and poorly organized funding contributed to its inception. Overall, weak industry regulations made the first year after the crisis very challenging for the banks as shareholder's returns were much lesser than the cost of the capital. In Balkan countries, such as Serbia, the Basel II framework was adopted in 2011. The framework opened up macro-prudential transparency, an increase in capital, better overall risk-adjusted management, and improved corporate governance structure. Basel II requirements state that banks need to hold capital with a least 8% of risk-adjusted assets. In regards to Caucasus, central banks eased the monetary policy to increase weak lending. The Caucasus region faced various difficulties with weak lending sales. Regulation of the entrance of foreign banks was necessary also. An interesting example, when Slovakia prohibited foreign entrance to its banking industry market, it eventually led to the local crisis and fall of Slovak market financial stability. Therefore, regulation can lead to both positive and negative outcomes. Like in the case with Slovakian macro-prudential regulation, it negatively affected the financial stability of the system. (Source: World Bank Financial Indicators, June, 2020).

Despite all these facts, Eastern Europe (EE) is the region which has shown the fastest growth in the world since the financial crisis. We observed that three factors affected performance of Eastern Europe after the crisis: portfolio restructuring, regional governance, and innovation in the industry. Cost-effectiveness for the EE countries' banks needed to be improved. The authors state that the EE banking industry was still far behind many of the emerging market countries. In Hungary, because of the overall weak performance, many banks reduced their operational costs by closing their branches. For example in 2012, almost 90 branches closed their doors. In Poland, the overall banking sector performance was the best in the region. Even after the crisis, ROE and revenues were growing. The reason for that was an open market that was very adjustable to changes as many of the foreign banks were represented within the country with their new technologies, products, and

innovations. In Russia, growth after the crisis was the fastest among EE countries. ROE reached almost 14% in 2011 in Russia. However, the problem with the Russian banking business was one of concentration. Almost half of the total banking profit was attributed to Sberbank which was very risky in terms of systemic risk evaluation. Hence, the regulation and supervision of the banking industry are of high importance for industry prosperity as it puts direct pressure on profitability and overall performance.

7.3 Data

7.3.1 Sample

We have collected data mainly through the Bloomberg financial information resource for the data obtained for country and bank specific variables and macroeconomic shocks. Global financial crisis categorical variable used as dummy with the value of "1" in case of crisis for the years of 2008, 2009 and 2010 for all the quarters and "0" otherwise with no crisis period. The following crisis period has been taken based on the work of Pak [199, p. 583], where crisis years were taken as the start of default of the Lehman Brothers investment banking in 2008. The sample itself consists of 97 banks from 17 economies in transition. Nine countries from Central and Eastern Europe – Bulgaria, Poland, Russia, Ukraine, Estonia, Lithuania, Czech Republic, Slovakia and Hungary; four Balkan and Caucasus countries – Serbia, Slovenia, Armenia and Georgia; and two peer countries – Argentine and Brazil. All the data applied is unbalanced quarterly panel. The period of examination is covering years of 2008-2019. The bank data collected is based on the International Financial Reporting Standards (IFRS). The regulation data are based on the surveys of regulation from World Bank papers and local country specific industry surveys.

7.3.2 Regulation variables

The variables for the regulatory framework are constructed based on the works in respective literature of Barth [154], Laevin and Levine [20, p.260] and Djalilov and Piesse [16, p.310]. The variables of the regulatory norms of minimum Capital requirements, Reserve requirements and restrictions of the Activities (non-banking) that we calculate based on the data obtained mainly from the local statistical agencies of the examination countries, Central Banks and from the Bloomberg financial information resource:

1. We use Capital as the variable based on the work of Barth [154], where the capital composed of the assets that include factors such as securities, loans and cash. The origin of the all resources of funds is checked by the external supervisors. The minimum required capital calculation must satisfy the capital-assets ratio with the adjustments to the risk and compliance with Basel requirements.

2. We use the restriction on Activities of banks following the work of Barth [154] and Agoraki [172, p.45]. The variable composition is based on the activities restrictions in securities markets, activities in insurance, in trading securities, ban of commissions and fees and acquisition of non-banking firms as financial firms. All in line with Basel principals and norms.

3. We use Reserve requirements regulatory variable based on the study of Demirguc-Kunt [176, p. 595]. To satisfy the regulatory condition of reserve requirements, reserves must be in line with Basel requirements and be at least equal to the market level.

7.3.3 Control variables

The study covers number of countries. Therefore, the possibility of the heterogeneity of the data observed between countries and the banks themselves is high. Hence, following the study of Djalilov and Piesse [16, p. 310], we apply variables that are applicable to most of the banks worldwide. We apply *Size* as natural logarithm of total assets; apply *Liquidity* and profitability measures as *Net Interest Margin*, *Returns on Assets* and *Z-score* as a score of risk. For details of the data, please see Table 20 with description and formulas of the variables applied in the study.

Table 20– Definitions and formulas for the variables

Variables	Definitions
Performance measures	
NIM	*Net Interest Income/Total Assets*
ROA	*Net Income/Total Assets*
ROE	*Total Equity/TotalAssets*
Industryspecificmeasures	
Loangrowth	*Loan(t)/Loan(t-1)-1*
Creditrisk	*TotalLoans/TotalAssets*
Liquidityrisk	*(Total Assets-Total Loans)/Total Assets*
Borrowing	*Debt/Assets*
Investments	*Trading securities as a percentage of overall investments*
Country specific and macroeconomic measures	
GDP growth	*GDP(t)/GDP(t-1)-1*
Inflation	*CPI(t)/CPI(t-1)-1*
Crisis	*Dummy variable of "1" in case of crisis and "0" otherwise*

7.3.4 Model

To examine the effect of regulation on bank performance and risk for the transition economies, and taking into account the fact that performance measures have dynamic nature as in the study of Djalilov and Piesse [16, p. 310], we apply the Generalized Methods of Moments methodology. The idea is that GMM methodology helps properly use the endogenous variables. Likewise, in the study of Agoraki [172, p. 43] we can observe the endogenous variables of our model of both weak and strong forms. The problem is that actual and future values of the performance factor are related and therefore can be biased in their values. Djalilov and Piesse [16, p. 310] stated that this relationship between today's and future values of variables can be forward looking, what means that the value of the variable today is correlated with the value of the variable tomorrow. Moreover, the transition economies over the later three decades experienced many challenges that required theses countries to take

number of reforms both political and economic. Therefore, we consider the values of macroeconomic variables as endogenous with regulatory factors.

7.3.5 Methodology

We follow the study of Altunbas [212, p. 930] and Pak [199, p. 579] in building the model for evaluating the risk (Z-score) and performance variables against independent variables. Our baseline equation is the following:

$$Y_{it} = C_{it} + Regulation_{it} + Crisis_{it} + Bank_{it} + Industry_{it} + Macro_{it} + e_{it} \qquad (2)$$

The equation is formed based on the above-mentioned works and contains the values of the main factors as bank, industry, and country macro-specific variables with the specification for all variables of time t, and bank i. We capture the Crisis factor representing the global financial crisis. For regulation norms, we use Capital Requirements, Reserve Requirements, and Activity Restrictions. C stands for the intercept and error term indicated as e. For the selection of bank-specific variables, we take the study of Pak [199, p.580] as the basis, where we consider credit growth, credit risks, loans, and deposits for the composition of assets and liabilities part. GDP growth and inflation growth are taken as country macro-specific variables.

The GMM model use is addressed when the dependent variables are found to be persistent Blundell and Bond [224]. In the study, we utilize the performance measures and risk variable regressed against other mentioned factors. The GMM methodology catches up with unobservable factors of the variables. We choose GMM based not only on the statistical significance and persistency of the variables in use but based on the conceptual understanding of the problem. Otherwise, the use of the instrumental variables can be sufficient in terms of an empirical approach to deal with the problems of endogenous variables. We don't take that way. We use the GMM with the lagged differences for the dependent variables. We apply the Fixed Effect in the dynamic model considering the fact that individual effects are correlated with the variables in the model. Based on the Hausman test recommendations we can use up to two lags for the macro and regulation variables. Generally, the Hausman test indicates which effect is better applicable for the dynamic panel data using the correlation results between the constant and coefficient [225]. Rejection of the null hypothesis of the correlation suggests the use of the fixed effect rather than random effect and vice versa. In addition, theoretically, we refer to the works of Lemmon and Zender [146, p.23] and Gropp and Heider [226] in choosing the Fixed Effect. The authors state that the fixed effect models better identify the variability of the institutional factor that is not time-dependent. Applying the Hansen test we check the validity of the instruments. Arellano and Bond [1, p.280] indicated that the autocorrelation in the first order is almost always the case. The true level of the variable autocorrelation can be identified in the second order. The variables in use within the model are not showing the autocorrelation in the second order. However, we need to point out that the problem of the data within the transition economies is generally the subject for the auto correlative behavior as the data can be replicated and averaged between the financial institutions.

We use unbalanced panel data. One of the main problems we face in panel data use is the endogenous variable. The endogenous variable is the estimative problem. In understanding it, we can follow the study of Tabak [227], where the problem is explained as simple as the explanatory factors of the model determined together with the dependent variable. Generally, it is quite difficult to come by purely exogenous variables. Therefore, we rely on our self-judgment and literature-based experience in the selection of variables. Moreover, we use the fundamental idea of Arellano and Bond [1, p.280] work, where authors studied the problem of exogenous explanatory variables. The main idea is to build the model with the application of the variables in origin correlated with each other. Using the model we can exclude the risk of correlation between past, present, and future variables of the same measures. This methodology permits to take the lag of the dependent variable without significant consequences and diminish the endogenous variables problem. This is one reason why we address the use of GMM methodology. It recognizes the endogenous variable and permits its' use. Moreover, the application of GMM can recognize the unobservable factors of the variables in use. Many studies assume that the effect of the explanatory factors on dependent variables is homogenous. For example, the regulatory effect represented through the specific methodology can be equally recognized by all of the banks in the sample. However, banks tend to be heterogeneous in nature. Therefore, the use of the GMM system is justified.

7.3.6 Descriptive statistics

Table 21 summarizes the descriptive statistics for the banks in transitional economies over years 2008-2019 quarterly based. Dependent measures of return are assets and interest margin based. The risk is evaluated utilizing the Z-score measure, which is the sum of return on assets and equity divided by standard deviation of return on assets.

Table 21– Transition economies, descriptive statistics, 2008-2019 quarterly based

	Observations	Mean	Median	Std. Dev.
1	2	3	4	5
Bank risk and return				
Z-score	1849	67,00	0,62	82
NIM	1849	0,001	0,010	0,211
ROA	1849	0,018	0,010	0,711
Bankspecificvariables				
Commission	1849	0,460	0,300	0,441
Creditrisk	1849	0,002	0,001	0,097
Debttoassets	1849	0,030	0,000	0,074
Equitytoassets	1849	0,060	0,040	0,269
Fee	1849	0,030	0,000	0,074
Investments	1849	0,510	0,000	0,066
Liquidityrisk	1849	0,001	0,000	0,104
Loangrowth	1849	0,002	-0,002	0,848
ROC	1849	0,083	0,010	5,434

Continuationtable 21

1	2	3	4	5
Macroeconomicvariables				
GDP growth	1849	0,017	0,019	0,726
Inflation	1849	1,425	1,308	1,706

The overall suggestion over the Z-score is that the higher the score, the better the financial stability of the banks. The score for the transitional economy under observation is 67 points suggesting quite a stable financial position overall. However, the range of the score is quite wide, indicating a diverse level of risk for the banks under examination. The Margin of the costs and revenues is small for many of the economies, meaning that this profitability measure is highly dependent on only one source of funding. The ROA profitability measure is more significant, indicating a mean of 1.8% overall growth for the transition economies. Overall, non-interest earnings are lower for the banks in transition economies. Banks in transition industries rely increasingly on a more traditional approach to interest. Findings based on the Investments factor confirm this fact. The portion of the income generated through trading securities is small for all of the banks under examination. Return on Capital is in general, high, indicating a little more than 8 % for the sample.

7.3.7 Correlation matrix

Table 22 represents the correlation coefficients between the measures of risk and profitability for the banks in transition economies. Following Pak [199, p.580], 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.

Table 22–Correlation coefficients for the specific to banking industry variables, 2008-2019, quarterly based

Name	Commission and fees	Credit risk	Non interest income	Investments	Liquidity Risk	Loan Growth	NIM	Z-score	ROA
Commission and fees	1								
Creditrisk	-0,091	1							
Noninterestincome	0,072	0,014	1						
Investments	0,502	-0,019	0,014	1					
LiquidityRisk	-0,013	0,595	0,022	-0,017	1				
LoanGrowth	0,010	-0,257	0,017	0,102	-0,249	1			
NIM	-0,016	0,055	0,031	-0,101	0,010	0,011	1		
Z-score	0,011	-0,033	-0,082	-0,047	-0,209	0,051	0,001	1	
ROA	-0,077	0,061	-0,004	0,003	0,043	-0,012	-0,056	0,088	1

From table 22, we can observe that the correlation between the risk of low liquidity and increases in the drop of financial stability is high. Liquidity problems can also negatively affect loan growth. Trading securities positively correlate with non-interest earnings. The correlation between liquidity issues and credit risk growth is significant.

7.4 Empirical results

In the study we consider macroeconomic and regulation variables to be endogenous in line with the study of Agoraki [172, p.40] since the different reforms, norms and regulations were applied by the managers as amendments to diminish the possibilities of risk. Moreover, the policy in the economies of transition had been frequently changing affecting the decisions of authorities in terms of macro-economy. These actions affected the values of these measures further. Therefore, the application of the GMM methodology is reasonable with the further use of lag variables. We use seven different combinations for the profitability measures of Return on Assets, Net Interest Margin, and Risk score for the full sample of transition economies. For an in-depth look into the findings, we run separate regressions for the four sub-samples allocated in regions of Eastern European, Central European, Balkan and Caucasus countries. We apply the methodology from general to specific in the selection of variables in line with the study of Klomp and De Haan [97, p.3200]. As a result, we exclude from the observation some of the insignificant variables and parameters such as total assets and quantity of workers. All the coefficients are significant and show comparative stability across different models. The overall validity of the instruments applied in the GMM model is significant as we can observe from the Hansen test.

Table 23 shows the regression coefficients of the Return on Assets profitability measurement model for the full sample of examined banks of transitional economies. Standard errors are represented in parentheses.

Table 23–Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variable: ROA	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2	3	4	5	6	7	8
Variables							
Commission	-0,003* (0,001)	-0,003* (0,001)	-0,002* (0,001)	-0,003* (0,001)	-0,003* (0,001)	-0,012*** (0,001)	-0,022* (0,001)
Credit risk	1,475*** (0,795)	-0,116** (0,081)	1,344*** (0,052)	1,349*** (0,056)	1,328** (0,024)	1,855*** (0,058)	1,147*** (0,791)
Equity to assets	-0,057*** (0,021)	-0,051** (0,022)	-0,073*** (0,027)	-0,073*** (0,022)	-0,073*** (0,051)	3,034*** (0,028)	-0,057*** (0,017)
Loan growth	-0,070* (0,006)	0,056** (0,006)	-0,070* (0,005)	-0,070* (0,005)	-0,070* (0,005)	0,064* (0,004)	-0,069* (0,006)
ROA $_{t-1}$	0,008*** (0,007)	-0,008*** (0,006)	0,008*** (0,004)	0,008*** (0,006)	0,004*** (0,001)	0,008*** (0,001)	0,008*** (0,004)
Crisis		0,005** (0,002)					

Continuation table23

1	2	3	4	5	6	7	8
Reserve Requirements$_{t-1}$	-0,054** (0,008)	0,083** (0,006)			0,025* (0,006)		-0,053* (0,007)
Capital Requirements$_{t-1}$	-0,290** (0,060)	0,101** (0,004)				-1,309*** (0,003)	-0,029*** (0,013)
Activity restrictions$_{t-1}$	-0,011** (0,008)	0,006** (0,001)		-0,006* (0,001)	-0,008* (0,002)	-0,096** (0,009)	
GDP growth$_{t-1}$	0,123** (0,087)	0,022* (0,007)	0,128*** (0,064)	0,128** (0,062)	0,128** (0,062)	-0,101* (0,067)	0,123*** (0,089)
Inflation$_{t-1}$	0,060* (0,002)	0,061* (0,037)	0,061** (0,009)	0,061** (0,006)	0,061** (0,006)	-0,125* (0,003)	-0,125* (0,003)
Adj. R sq.	0,878	0,891	0,601	0,598	0,599	0,881	0,771
Hansen-test	0,335	0,453	0,552	0,441	0,441	0,401	0,465
Observations	1849	1849	1853	1853	1853	1849	1849
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability							

The main results for the dependent profitability measure of Return on Assets for the full sample of transitional countries are depicted in table 5. The first column shows the model with the inclusion of all of the regulatory and control variables holding the effect of the Crisis constant. Macroeconomic variables, in this model, positively affect the overall profitability. However, regulation factors in all aspects have a negative impact on the performance of the banks. With the inclusion of Crisis, findings in column two show the complete reverse effect and all the regulatory factors start to have a smaller but positive effect on profitability. We reason this effect of Crisis as the weakness and vulnerability of the general banking systems of the countries under examination and consider that regulation has a very significant role in times of crisis. When there is no crisis, the regulation norms create obstacles for the banks to realize more risk oriented strategies of profit generation and this way decrease possible higher returns from more risky projects. On the other hand, regulatory norms decrease moral hazard problems. This is what we observe when the crisis factor is included in the model. The effect of capital stringency, higher reserve requirements, and activity restrictions diminish the profitability, but the overall effect became positive. As for the control variables, the Loan Growth changes from negative to positive with the inclusion of Crisis in the equation. Investments decrease with the crisis; this is reasonable and comes in line with general economic theory. In general, positive Loan Growth can be explained by the governmental financial support of the state via monetary policy in times of crisis. However, this increases the Credit Risk and negatively affects profitability, as we can observe from column two. We can observe the significant effect of the Crisis factor on other variables. Therefore, we exclude it from the observation of separate regulatory effects. In this case, only the Reserve Requirements factor has a positive impact on profitability. We

treat this effect in the way that banks' performances can be largely dependent on governmental financial support. Separately examined, higher Reserve Requirements positively affect the overall banking performance but with the minimum significance.

Table 6 shows the regression coefficients of the Net Interest Margin profitability measurement model for the full sample of examined banks of transitional economies. Standard errors are represented in parentheses

Table 24–Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variable: NIM	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables							
Commission	-0,011* (0,005)	0,011** (0,002)	-0,012* (0,001)	-0,011** (0,001)	-0,011* (0,006)	-0,089*** (0,008)	-0,112* (0,006)
Credit risk	-0,115** (0,014)	-0,226** (0,055)	1,399*** (0,051)	1,349*** (0,016)	1,228** (0,094)	1,878*** (0,058)	1,001** (0,091)
Equity to assets	-0,011** (0,005)	0,017*** (0,005)	-0,011*** (0,001)	-0,081*** (0,008)	-0,089*** (0,001)	1,094** (0,008)	-0,011** (0,005)
Loan growth	0,018** (0,004)	0,011** (0,001)	-0,011* (0,005)	-0,011* (0,005)	-0,089* (0,005)	0,012* (0,004)	-0,021* (0,001)
NIM $_{t-1}$	0,086*** (0,017)	-0,261*** (0,015)	0,023*** (0,014)	0,021*** (0,016)	0,026*** (0,014)	0,028*** (0,014)	0,022*** (0,014)
Crisis	-	0,015* (0,007)	-	-	-	-	-
Reserve Requirements$_{t-1}$	0,081** (0,005)	0,011** (0,001)	-	-	0,026* (0,002)	-	-0,089* (0,001)
Capital Requirements$_{t-1}$	0,011** (0,009)	0,034** (0,001)	-	0,011** (0,002)	-	-1,999** (0,002)	-0,089** (0,001)
Activity restrictions$_{t-1}$	0,002** (0,001)	0,018** (0,001)	-	0,011* (0,001)	-	-0,018** (0,002)	-
GDP growth$_{t-1}$	0,008* (0,001)	0,008* (0,001)	0,008** (0,001)	0,008** (0,001)	0,007*** (0,001)	-0,006* (0,001)	0,008*** (0,001)
Inflation$_{t-1}$	-0,044** (0,001)	0,081* (0,001)	0,044** (0,001)	0,044** (0,001)	0,044** (0,001)	-0,044* (0,001)	-0,044* (0,001)
Adj. R sq.	0,791	0,888	0,601	0,661	0,559	0,779	0,701
Hansen-test	0,339	0,441	0,551	0,332	0,551	0,335	0,449
Observations	1849	1849	1853	1853	1853	1849	1849
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability							

Table 24 presents the results of the profitability measure of *Net Interest Margin*. In line with the previous results of the effect on *Return on Assets*, *Reserve Requirements* has positive sign in all specifications with and without included *Crisis* effect into the model. Traditional way of banking is still dominant in transitional economies. However, the spread between revenues and costs is positively affected by all regulatory norms without inclusion of crisis into the model as opposed to our previous results. This can be explained by the fact that return from risky investments is higher than the cost in times of positive economic state. The *GDP growth* has

positive effect in almost all specifications apart from the one where we don't include *Reserve Requirements*, confirming once again our reasoning that this factor is crucial for the overall model.

Table 25 shows the regression coefficients of the risk measurement model for the full sample of examined banks of transitional economies. Standard errors are represented in parentheses

Table 25–Regulation and risk, GMM, quarterly based, 2008-2019

Dependent variable: Z-score	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables							
Commission	-0,008** (0,001)	0,023** (0,002)	-0,008* (0,001)	-0,007** (0,001)	-0,011* (0,002)	-0,011** (0,001)	-0,012* (0,001)
Credit risk	-0,114* (0,005)	-0,212** (0,005)	0,399*** (0,001)	1,349*** (0,016)	1,223** (0,014)	1,618** (0,014)	1,011** (0,011)
Equity to assets	-0,011* (0,001)	0,023*** (0,005)	-0,021*** (0,001)	-0,021*** (0,002)	-0,017** (0,001)	1,001** (0,068)	-0,009** (0,003)
Loan growth	0,010* (0,001)	0,022** (0,001)	-0,0011* (0,001)	-0,111* (0,025)	-0,078* (0,005)	0,011* (0,005)	-0,021* (0,006)
Z-score $_{t-1}$	0,011*** (0,009)	-0,261*** (0,005)	0,012*** (0,001)	0,011*** (0,001)	0,011*** (0,001)	0,088*** (0,001)	0,007*** (0,001)
Crisis	-	0,225** (0,007)	-	-	-	-	-
Reserve Requirements$_{t-1}$	0,133** (0,029)	0,009** (0,006)	-	-	0,012* (0,009)	-	-0,049** (0,009)
CapitalRequirements$_{t-1}$	0,012** (0,001)	0,078** (0,004)	-	-	-	-1,901*** (0,033)	-0,011** (0,009)
Activity restrictions $_{t-1}$	0,010** (0,008)	0,231** (0,009)	-	-0,121** (0,023)	-0,199* (0,008)	-0,019* (0,009)	-
GDP growth$_{t-1}$	0,013** (0,002)	0,021** (0,001)	0,023* (0,002)	0,028** (0,001)	0,025** (0,001)	-0,011* (0,001)	0,018*** (0,002)
Inflation$_{t-1}$	-0,009* (0,001)	0,011* (0,001)	0,006** (0,001)	0,011** (0,002)	0,018* (0,001)	-0,011* (0,001)	-0,019* (0,001)
Adj. R sq.	0,779	0,771	0,501	0,661	0,501	0,801	0,698
Hansen-test	0,301	0,331	0,322	0,299	0,339	0,319	0,337
Observations	1849	1849	1853	1853	1853	1849	1849
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability							

Table 25 shows us the results of the effect of regulatory norms and control variables on the financial stability of the full sample of economies in transition. All the regulatory factors positively affect the risk with and without the inclusion of the Crisis effect. In specifications where we examine all regulatory factors separately, only the Reserve Requirements has a positive effect on financial stability, other specifications show negative signs. Commission associates positively with risk, only in case of Crisis inclusion. The other six combinations show negative signs.

Commissions and charges increase with crisis and positively affect the financial stability of the industry overall.

Tables D2, D3, and D4present the results for the profitability measures of Return on Assets, Net Interest Margin, and financial stability of Z-score for the peer countries sample of Argentina and Brazil (Appendix D). The findings of the Return on Assets are generally consistent with the full sample results. The effect of Reserve Requirements is positive in its separate inclusion. The significance of the regulation is increasingly high when the Crisis factor is included into the model. The effects of all regulation norms are positive in this model. The omission of the Crisis effect shows the negative effect on the performance of the banks in peer countries. Similar results hold for the effect of regulatory norms and control variables on the Net Interest Margin profitability measure in Appendix D. Macroeconomic variables have positive signs in almost all specifications. The negative signs are in the model where we omit Reserve Requirements as a factor of regulation. The Inflation and GDP Growth have negative signs in cost and revenue spread examination in the specification without Reserve Requirements.

The sub-sample confirms our previous findings of the Reserve Requirements as the crucial factor of the model.

Tables D5, D6, and D7(Appendix D) present the findings of the sub-sample of Eastern European countries. Likewise the sub-sample of peer countries, the number of observations is smaller in these two samples, and therefore the results can be less reliable. Still, we run these models with the purpose of thoroughness, to test our main results. Generally, the findings are in line with the main results in both profitability measures and risk score estimation. However, the significance of the coefficients is lower. The interesting difference with the previous findings is that the Credit Risk factor has a negative impact in full models with and without the inclusion of the Crisis factor (Appendix D). Credit Risk negatively affects profitability measures in both cases of the Crisis factor inclusion and omission.

Tables D8, D9, and D10 represent the sub-sample of Balkan and Caucasus countries (Appendix D). The number of observations is 282 after the adjustments. Still, the main results are in line with our full sample findings. The effect of the Crisis is moderately significant in both examinations of profitability and quite close in their coefficient scores. The capital ratio has negative signs in all specifications for financial stability (Appendix D), stating the fact that the shareholders of the banks in transition economies of Balkan and Caucasus countries rely a lot on governmental financial support.

Tables D11, D12, and 13 are representing the findings of the sub-sample of Central European countries (Appendix D). We can observe that the findings are similar to our previous results. For example, the Reserve Requirements is the only regulatory factor positively affecting the profitability in both Return on Assets and Net Interest Margin representations. Other regulatory factors have negative signs in all specifications of separate examination, including and excluding the Crisis factor (Appendix D).

Thus, we conclude that utilizing the GMM methodology, the Reserve Requirements were found to be the only significant and positive regulatory factor that

improves the profitability and diminishes the risk of financial instability of the banking sectors of the transition economies across a full sample of countries. We check and confirm the findings with the tests over the regional sub-samples.

Conclusion on the 7th section

The banking industry has always been the center of interest for both theorists and practitioners. The rebuilding of banking regulation has been at the core of its sustainable development since the financial crisis of 2008. The main objective was to ensure that these types of financial fluctuations would be prevented or at least forecasted and dampened more efficiently. The task was to understand how well regulatory norms would be affecting the factors of profitability, efficient operation, and overall banking industry performance. Therefore, the studies on the theme of banking industries and economies in transition that have recently switched from planned to open market economies became the core interest of our research. In this study, we explored the effect of banking regulation on the profitability and risk measures for the transition economies in the period of 2008-2019. Theoretically, we expect that the effect of regulatory norms in terms of Activity Restrictions, an increase in the level of Reserve and Capital Requirements will positively affect the overall industry performance and financial stability of a nation. However, the previous findings in the related area show contradicting results [131, p. 20]. Moreover, the recommendations on the best possible methodology will not work for all countries, and especially in the case of transition economies, which is, in essence, the core interest of our study.

We contribute to the field of study in a number of points.

Firstly, this work has covered the transition economies only. Most of the previous studies were related to developed or developing markets specifically, such as Pasiouras [11, p. 189]and Barth [164, p.210]. Additionally, we considered both the crisis and post-crisis periods in our examination, which has helped us define the effect of the vast differences in perception on the banks, and the financial changes on a macroeconomic level. Secondly, we utilized the methodology of "Generalized Method of Moments" to diminish the problem of endogenous variables applied in the model. In use of panel data, the most frequent problem we faced was the dynamic nature of these variables. The GMM methodology takes into account the dynamic nature of both dependent and independent variables. Thirdly, we examined the results for the thoroughness of our findings utilizing five different regional samples all with different banking industry specifications.

In summary, our conclusive findings from this in-depth analysis are the following: Firstly, we found that in a full sample examination the inclusion of Crisis into the model shows that the applications of regulatory norms positively affected the overall performance and financial stability of the industries in question. This indicates the overall weakness and vulnerability of the bank industries in economies in transition because the effect of regulation on profitability is negative without the inclusion of the Crisis factor, indicating possible management moral hazard problems in times of positive economic state. Second, we found that in all specifications, only the Reserve Requirements regulation mode exhibits positive regulatory effects,

improves profitability, and increases the financial stability of the banks in transition economies. All other factors, control variables, and regulatory norms affect differently the financial stability which confirms that there is no "one size fits all" system. This leads to the idea that both practitioners and theorists in the face of managers, reformers, and supervisors need to regularly investigate their banking industries for the effectiveness of currently applied regulatory norms. This will help diminish the possibilities of systemic risk. Because when a financial crisis takes place, it may be once in a generation, a dramatic collapse in a single moment, a devastating splash where the ripples can be felt by every economy, every institution, and by every one of us.

CONCLUSION

Concluding remarks

We study the bank performance of transition economies in times of financial distress and aftermath. We concentrate our attention on economies just recently switched from planned to free market structures. There is a gap in study of the effect of business models changes on efficient operation and financial stability of bank industries in transitional markets.

In overall, separate chapters within the study cover the crisis and post crisis periods of 2008-2019 years. There is no one best option in modeling business approach in banking industry. The specifics of transition economies are quite diverse.

In Chapter II, we discuss the tradeoff between the efficiency of operation of banking industry and financial stability of the market. We examine the literature mainly with the purpose to identify different approaches and methodologies authors have been using to evaluate the risk exposure and performance in banking industries. The tradeoff is the point of discussion between the managers of the industry and the policy makers. Regulation has a direct impact on the establishment of sustainable industry development. Overall findings indicate significant structural changes in the business models as a result of reforms that are taking place. The reforms affect economic situation within the countries of emerging markets and lead to the structural changes in business models in banking such as competition or concentration.

In chapter III, we show the detailed construction of the methodology and model build.

The brief outline of the findings in the chapter IV of the study is the next. First, despite negative effect of the *Crisis* factor on many separate parts of banking business models, the overall effect on risk attitude is positive. However, the findings suggest that performance represented in profitability measures decreases in overall. The states of banking models are weak and not stoic against the crisis. The structural change from planned to free market economy changed only the central apparatus from authoritative government to foreign investors and old-school authoritative management. We found that some banks were kept sole to be intermediary tools to financial streams, but not to set the rules for the market. Secondly, we found that the effect of high liquidity has positive effect on performance and financial stability of banks in transition. Other parts of banking models have weak or non sequential effect across all sub-sample examinations. This implies that transitional economies rely more on old ways of running their businesses, where the foundation of banking business model is concentrated around the credit business.

We conclude that there is no optimal banking business model for the markets in transitions. Based on particular country specifics and their risk and profitability measures, the reaction to changes in seemingly the same modes in business can lead to completely different findings. We suggest that the best approach is to constantly observe the realms of varying business models. In this regard, cooperation between bank managers and policy makers and timely reaction to the problems that take place

can significantly improve business models of banking in transition economies. As we mentioned already, being able to smoothly adjust one's mode of business in banking seems to be the best way to adapt to the frequently changing, newly emerging markets of transitional economies.

In Chapter V, we examined the Kazakhstani form of banking business establishment. Covering quarterly period of 2008-2017 years, we examined the level of risk and return in the industry. Our findings indicate that performance is affected by the size of the banks. The bigger the bank size, the higher the risk of low performance, and the higher is the proportion of credit risk. The effect of crisis on the performance is negative. In regards to external shock, devaluation effect has positive impact on the profitability measures. We reason that as high portion of foreign currency within the economy. Z-score indicates that the industry is vulnerable to the changes in a macroeconomic environment. We summarize that local Kazakhstani banks are very traditional in regards to the activities applied. The differentiated investment strategies are not much in use.

Another important factor affecting performance and risk within transition economies is the ownership structure. In the period of examination, the Kazakhstani banking industry consists almost ninety percent of private banks. We observe that owners of financial institutions are affiliated with governmental executives or previously have been on the state service. Overall, skipping the factors of external effect such as devaluation and the Global Financial Crisis, the findings indicate that the bank's performance is positive within privately owned financial institutions. We indicate strong evidence that the bigger the size of the bank, the higher the credit risk possibility, the higher the volume of loans and the poorer the quality of them also, eventually affecting the bank's overall performance level. In the models with all factors included, the effect of ownership as a factor is not significant. The macroeconomic shock as financial crisis negatively affects financial stability. Private ownership as a factor in times of financial distress proves to be insignificant with respect to the overall positive performance of financial institutions.

In Chapter VI, we study the regulation effect on development of banking industry during the financial crisis and the period aftermath. We look for the difference that regulation can impose on the long term profitability and financial stability of industries in transition economy banks. We apply regulatory norms as *Activity Restrictions*, *Reserve* and *Capital Requirements* in the model and expect them positively affect overall industry performance and financial stability.

The overall contribution to the literature is the next. First, we cover transition economies only, and most of previous studies are related to emerging or developing markets such as Pasiouras [11, p. 189] and Barth [164, p. 210]. We consider both the crisis and post-crisis period. Second, we utilize the methodology of Generalized Method of Moments to diminish the problem of endogenous variables applied in the model and to cover unobservable factors. We consider dynamic nature of dependent variables in the model applying them as instrumental variables defining the dependent variable. Third, we check the results for the robustness of the findings utilizing five different regional samples with different banking industry specifications.

In summary, the study findings are next. First, regulation as a factor positively affects performance and financial stability in times of financial distress indicating moral hazard problems in the market in times of positive economic state. Managers of banks misbehave in times of positive economic state as regulation factors have significant effect in financially stressful years only. Second, the *Reserve Requirements* regulation mode is the only factor in all specifications that exhibits positive regulatory effect, improves profitability, and increases financial stability in bank industries of transition economies under examination. Other factors have a diverse effect in different specifications. We summarize that constant collaboration in regards to regulatory framework between the market players, reformers, theorists and practitioners considering the specifics of particular country banking model will help establish sustainable long term positive performance of banks in transition economies.

In the Appendix A (references [225-249]), we provide a summary of the interviews we have conducted with specialists from the field. The objective is to see whether the findings based on the empirical model we have built for the sample differs from the true, unbiased reality of banking in economies of transition. This work helps to fill possible missing points of the study. Hence, the gaps can be used for further research of the field. The video interviews can be provided by the author if required.

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APPENDIX A

Interview with practitioners from the field

Introduction

We look for the questions of banking establishment in economies of transition period. This period is addressed as the time of emerging markets. However, we differentiate it from the traditional emerging markets. The economies that went through the process of planned market to free market economy are quite specific. These countries mostly are under heavy state control even when the market is considered free. Therefore, in example, some of the European emerging market economies can have much stronger market tools, in comparison to the countries that were under authoritative regimes in times of planned economy. Hence, the importance to recognize this difference is vital. However, generally the transition period economies are recognized as the emerging markets worldwide.

We examine banking business model development in economies of transition. Based on our findings, we talk to the theorists and practitioners from the field to obtain their views. We have been examining the questions in regards to overall development of banking industries in economies of the countries that recently switched from planned regime to free market development. Our previous studies covered the core questions of risk and performance in banking. In particular, how different effects, both empirical and categorical, as the ownership structure, bank, macroeconomic and industry specific factors affect the development. Empirically, the findings indicate significance of ownership as the factor affecting the establishment of banking in these economies. We found that liquidity plays an important role in development of banking business model. While incorporating the outside shocks into model, we found that banking business is very much vulnerable to the financial crisis, both internal country crisis and the Global Financial Crisis. In overall, the banking business models stability in transition economies is questionable.

We interview specialist from the field to question the findings we have obtained. Do the study model findings are in line with the real state of banking development? These interviews can help clarify the missing points of the study and be useful for further research.

Methodology

The methodology we apply in this part of the study is an interview with practitioners from the field. We discuss the findings of the work; compare the results of the study to real banking sector performance indicators; and open up gaps for further research.

General questions are outlined in the next form:

1. The liquidity is a crucial point for any banking business model. What role liquidity plays in the specific market of banking in transition economies? How does the liquidity affect financial stability of a single bank and overall systemic risk?

2. For transition economies, does authoritative regime is more efficient for the establishment of sustainable banking development in comparison to markets with lower state involvement? At least at the first stages of the development.

3. How does concentration of power (both political and economic) affect industry development?

4. Free market economy presupposes the usage of different financial instruments. What is the level of financial literacy of players and financial infrastructure in Kazakhstan?

5. The tradeoff between higher risk and financial stability is the way of development. What is the best option for emerging markets in the first stages of development?

6. Banking regulation and legislation is getting tighter in Kazakhstan with the new challenges in the face of financial crisis. Please comment on currency control measures in Kazakhstan. (In particular, the minimum permitted amount that can be acquired per day).

7. What is the role of the bank as the financial institution in the infrastructure of emerging markets? Does it only play the role of financial intermediary or has it more significant features affecting overall industry development?

8. How does international player (foreign financial institution) affect local emerging markets?

9. Ownership as the factor of stability in transition economy banks. How significant is the ownership role in establishment of sustainable banking?

10. Regulation is the necessity in all types of markets. Does player of emerging market is now self-intelligent enough to accept safe portion of the risk? Does player is mature enough to step into the business with adequate risk and return ratio?

11. How the digitalization changed the market of banking in newly established markets?

Discussion

In the study of the establishment of free market conditions in emerging markets, we observe the empirical factors such as performance, systemic and micro firm(bank) risks. We investigate how categorical factors as ownership and regulation affect overall industry development. The coverage period of the study puts us into position where both crisis and aftermath crisis timeframes are observed. The crisis is included into examination as the dummy variable. Local internal financial shocks as devaluation are as well incorporated into the empirical model. The findings are diverse. We now are willing to discuss the findings with practitioners from the field:

1. Liquidity

Mr. Gani Uzbekov, former vice minister of Finance of the Republic of Kazakhstan and the top management banker stated in the interview that the liquidity has a prime importance for all the banks in all the types of the markets. It is not the specific feature of the transition economies only. However, the point we want to emphasize is the fact that the liquidity banks obtain in the economies of transition markets is accumulated following the subsidies from the government. In the study we conducted, the findings showed that the liquidity has the most significant effect on the sustainable development of the banks in full sample model. The sustainability has been estimated based on the profitability measures of ROA, NIM and ROE. Mr. Uzbekov indicated that the subsidies from the state can be given to the banks in the developed markets as well. Subsidies do not indicate the weakness of the particular

financial institution. However, in the study, we found that the cornerstone of the business model of banks in emerging markets is the liquidity. Therefore, the question is whether it is good to have the liquidity as the foundation of the business modeling. Moreover, the liquidity is sourced from the governmental subsidies, as a cheap way of financing. Can we call this type of bank business model establishment as the sustainable way of development? The other way to obtain the funding is the market. Financial intermediary is the privilege of the well established markets. However, there are other obstacles that can arise. [111, p. 599] advocate that the sentiment of the investors about the bank overall financial position can be the reason for lower portions of investments. Authors state that the volume of the investments decrease with the unstable loan prices. That means that investors do not trust the volatile market. On the other hand, the volatile credit market is formed because of the profit maximizing approach of the banks. Shareholders are not against this particular way of development, if the approach leads to higher returns. However, investors are suspicious about this particular business approach as the systemic risk grows up. On the other side, the governmental concern here is twofold. The support of the banks is mainly addressed following the necessity to sustain stable macroeconomic development. To address the problem of liquidity in the banks, Korinek and Simsek [228] examined the effect of macro prudential policy. Authors advocate that through the prudential policy and allocation of resources by constraining the financial movements, overall welfare in the banks can improve. We already mentioned that the liquidity plays an important role in the sustainable development of the bank industry. The importance of the bank as a financial unit for the markets in the first stages of transition is high. Khwaja and Mian [4, p. 1413] examined the banking industry of the emerging markets and how the liquidity changes affect the lending volumes. Authors state that the liquidity decrease of 1 percent diminishes the lending for 0.6 percent in the Pakistani economy. Those financial institutions with good political ties and those that are considered large in terms of Pakistani economy rely on the credit market, where they can obtain the additional funding. Smaller institutions, reallocate the shock of the liquidity on the consumers by increasing the rates. So, as we can observe, large economies tend to collect the reserves (funding) from the field. Governmental financial subsidies in large economies are the privilege of small group of financial institutions. Therefore, the option to have financial intermediation is a good opportunity for the banks. That is why the cost of the funding is high even in the well developed markets. It was mentioned in the work of [229, p. 15] that the financial claims are not always satisfied at the first requirement. Hence, knowing this, investors want the premium above the funds they lend to the borrowers. This is the way they compensate the risk and lend the funds. Authors indicate that banks need to have capital that can be used at first need to satisfy the financial claims. The liquidity concern is of great importance as it affects the banking capital structure that has a direct effect on the efficiency and performance of the banks.

2. Funding

We discussed the banking source of funding with Serik Zhukenov, economist and former director of Treasury Department of JSC Halyk Bank. The source of funding is critical for the overall economy development. Authors Jimenez [119,

p. 10-25] state that bank lending can decrease as a result of financial constraints in the balance sheet. This way the firms will face inconvenience and will have to look for other sources of finance. Generally, Mr. Zhukenov has stated that the accumulation of funds through the governmental subsidies is a fiscal tool that is practiced worldwide across different economies. However, the predominant target of the state financial subsidies is the macroeconomic condition of the economy in overall. In terms of microeconomic approach, the efficiency of this tool is questionable. The short term economic state of particular financial institution that was given subsidy can be enhanced. However, this way of funds generation can lead to the problems of moral hazard and high risk project investments.

Another way to fund the banking financial needs is through the portfolio of safe assets, the likes of the treasuries. Authors Krishnamurthy and Vissing Jorgensen [8] point that the financial market players, prefer to have low risk and liquid assets in their portfolios. Authors advocate that the short term debt volume decreases with the growth of safe safe amount of governmental securities. The interesting point that authors mention is that the crowding out of the safe securities in the market is not attributed to higher returns as might be expected in theory. Authors state that the return is in overall similar between the debt and equity financing. This means that banks prefer to have more stable governmental funding as the source of finance. That is generally the case in the economies of transition countries. Despite the availability of the diverse ways of funding, the privilege still is oriented towards governmental funding. We discussed already the importance of the banks as the financial institutions of the market in transitional economies. The one way to sustain long term development is to keep the financial streams on within the economy. The fiscal policy is, therefore, has a direct effect on the long term development of the economy as a whole. The lending policy of banks is directly linked to the fiscal policy within the country. Therefore, the lending goes in traditional way whenever the generation of funds for the banks is obtained through client deposits and fiscal inflows. The other way to generate the funds for the banks is through fund market. Authors Black [230, p. 40] have examined the difference between the two ways of funding and found that the only bank that has the combination of both funding approaches can be long term sustainable. Otherwise, one of the two options applied will increase the probability of failure and insolvency of the banks.

Authors Gornall and Strebulaev [130] investigate the question of the capital structure in a form where two sides of the business, lenders and borrowers are interrelated. Banks and borrowers are considered together to build the best mutually fitting capital structure. Authors state that the volatility of the capital assets of banks depends on the borrowers. Moreover, authors advocate that the efficient performance of the supply chain is directly linked to the financial intermediary that is leveraged in its best possible way. On the other hand, higher leverage can help banks be efficient as the supply chain is more stable. Lenders in terms of the banks can internationalize the loans and this way diminishes the systemic risk. Authors state that this is the approach that can diminish the risk with respect to Basel II requirements on the regulation norms. Authors found that the other way of capital accumulation through the deposits and governmental intervention in terms of funding can negatively affect

the bank performance and efficiency. Capital can be negatively impacting the leverage in terms of accumulation and increase the costs that will be transferred to the borrower side. However, the stability of the performance of banks will be higher.

The examination of the overall performance of the bank industry in transitional or any other state of the business modeling requires the account of both external and internal effects. The external shocks as the financial crisis can trigger the problems that lie in the internal state of the banking industries. Gozzi and Goetz [70] have been examining the US market. How the local financial institutions, banks, respond to the changes in the economic activity that has been affected by the external financial shocks and created liquidity problems. The difference in the way bank structure is composed determines the performance and the efficiency of the banks. Authors found that the banks relying on the wholesale are more able to lend during the times of the financial distress in comparison to those institutions that have liabilities of the short more liquid term. In example, the funding based on the deposits acquired through the client deposits can suddenly vanish if the negative economic state will occur. This will lead to the problem of liquidity and failure of the responsibilities in the market by the bank. The other interesting finding is that the employment in times of the crisis in the central areas of the US states has dropped suggesting that the economic state in overall is highly dependent on the banking industry development. This is quite important to mention as the bank industry is considered the core point of the financial establishment in the transition countries. However, based on the following study we can observe that even in the most independent banking business establishment as in the USA the system of the financial streams is still highly correlated with banks. Even so, the financial system literacy is on the highest level and the alternative route for the financial intermediation apart from the banks is more than enough. The following reasoning indicates the importance of the banking industry for the economies in general and not only for the transition countries. Authors point that the importance of the external financing through the banks is highly important for the small business.

In terms of the wholesale funding such as the repos, financial commerce papers and large deposit for the long term, this is the privilege of the big corporate companies. However, still the risk of the funding through the wholesale is quite huge. The best example is the situation with financial crisis in 2008, when the liquidity just vanished as the result of the financial distress. It was found that in the times of the financial crisis of 2008 the financial institutions relying more on the papers, repos and generally wholesale funding lend much less than those relying on the client deposits. However, every single situation must be examined separately with the specifics. There is no one answer for the best model of the funding, there can only be the optimal way for particular financial institution and it can be completely unfit for other financial institution.

3. Crisis

Macroeconomic shocks as the financial crisis no doubt affect the competitive financial equilibrium. Lorenzoni [19, p. 809] examined the borrowing of banks in times of financial distress. Author's findings indicate that the borrowing increases before the crisis with volatility increasing aftermath. The inefficiency in the market

hence can be attributed to different commitments from the players and because the spot prices are set in the market, where the claims are not satisfied at agreed delivery dates. Mr. Zhukenov mentioned that the problem here is the cost of funding as the reliability of the institutions in emerging markets is lower compared to the developed market players. The crisis has many folds.

The effect of the crisis in the economies of transition on the establishment of the banking industry over the latter three decades proved the cyclical manner of the negative impact that must be regulated. The approach to stabilize the market and regulatory requirements are not easy to come by and most of all not cheap endeavor. The balance between the effective market and low risk approach is not easy to obtain. Dewatripont and Tirole [167] examined the relationship between the macroeconomic shock and regulation incorporating into the model both equity and capital requirements. Authors indicate that both external debt and capital requirements can significantly enhance the control over the banks.

Jimenez G., Ongena S., Peydro J.et al. examined the effect of the macroeconomic policies during the financial crisis in Spanish banks. The examination covered the policies that were deliberately introduced to counter the cycles of the crisis. The findings indicate that the effect on the banks had been different across the country. Authors indicate that the dynamic provisioning can help with the right allocation of the credit supply. The idea is that the allocation of the credits is planned for the periods and not necessarily can be higher even so it is possible to obtain today. The allocation is strictly portioned and, therefore, during the difficult times the surplus can be provided and the help stand against the financial difficulties leading up to the sustainable development of the whole industry. This way is the most efficient way of firm performance that helps the business prosper [231, p. 50]. Authors found that in general one point increase in the capital buffers can help sustain the activity of the credit turnover for 9 points and help sustain the long term development for 1 point and keep the employment rate at 6 points. This means that during the positive economic conditions banks need to accumulate the profits and dynamically use it over the periods. The capital buffer increase can only positively affect the longevity of the banking business model. For the study we do it is important to emphasize this exact point as the transition economies are new to the market of global finance and usually the spike of the returns are going very high in the first stages of the development. This is a good opportunity to accumulate funds for future possible financial distress periods.

How has the lending volume changed over the time of the financial crisis has been examined by Ivashina and Scharfstein [232, p. 319]. Authors indicate that the investments into capital contracted. All the loans that were devoted to the large companies have fallen to almost 50 percent. The short term debts decreased in volume, many financial institutions as well as the banks hedged the funds in the Lehman Brothers investment bank that went bankrupt. Moreover, the period was harsh in the other way as well, borrowers' portion of non-payable loans have increased adding up the problems of the banks. The question is whether these obstacles were the reason for the liquidity shock in the banking industry leading up to the financial crisis. Authors indicate that banks had the most difficult situation

because of the high reliance on the short term debts and on the deposit finance. The main reason for the crisis has been still the uncontrollable credit boom that was securitized by the overpriced mortgage papers.

The question of the causal effect from banking crisis to overall downturn of the economic growth and development has been examined by [233, p. 2301]. How banks satisfy the needs of industrial organizations. Authors state that the problem is endogenous to the banks. Banks are dependent on state finance. External funding is poorly developed. Industrial organizations are highly dependent on local banks financing. The banks are the financial institutions that have the most direct and significant effect on the economies in transitional countries. The main problem is the low financial literacy and the low development of the financial intermediation that chapters the funding options with the only significant financial streams coming from the internal bank institutions. The low access to the global finance can diminish the effect of the external negative impact on the economy of the transitional country. However, the point is that the effect still going to be negative with the lag. The norms and conditions imposed on the banking industries affect the overall economy. Mr. Uzbekov stated that there are two ways of who bears the costs. First, the fiscal spending increases to support the whole economy. The other option is the rates increase. One way or another, the costs are beared by the borrowers.

[234, p. 1220] examine both sides of the problem, how the behavior of the borrowers changes towards the borrowing ability and willingness and the way the credits are supplied. The complete examination of the question helps to determine the overall level of the financial performance and banking industry performance in the period in particular. Authors signify that banks had much lower returns than the financial firms in the crisis period. That was mainly attributed to the low access of the banks to the debt market. Between the banks, those with lower financial flexibility had more problems in comparison to those, where the liquidity had been in higher portions. However, we need to state that in times of the crisis both financial firms and banks had serious drawbacks as a result of the financial distress. It has happened after the debt market stagnated. This reasoning is quite important for the sake of the sequence of the stagnation because the banks once again are the locomotive of the economic development in the countries of transition. Despite the financial help from the central apparatus, the stagnation of the banking sector and causal negative effect on the borrowers has taken place.

One important consideration that was outlined is the fact that the bond debt market development can help sustain the economy in a way, where it can be diversified. This way the growth can be kept. Therefore, the consideration of this fact is of high importance for the economies in transition.

4. Financial literacy of players

Discussing the matter of the financial literacy in the emerging markets, all interviewed practitioners had similar position: the players in the market are educated enough to deal with diverse options of financial intermediation. The main problem is the actual implementation that is poor because of weak market infrastructure. The management literacy is high; the constraints in majority of the cases are in regulation matters. Local financial markets are small, and the trade is implemented on

international desks. However, as Mr. Zhukenov mentioned, local regulation constraints the activities on international desk. This situation founds the shadow market economies and internal misbehavior problems. Morisson and White [40] study problems such moral hazard and adverse selection. The control of the regulation requirements implementation is a tough task. Regulator can impose frequent audit of the bank functions. However, authors advocate that the reputation of the central regulator plays significant role in the solution of the problems of banking misbehavior. The privilege of the free financial market is the opportunity to have financial intermediation options. The importance lies in options of financial claims in different periods of times. Holmstrom and Tirole [235, p. 663] examine the question of how investment options and interest rates are changing for the players of the market depending on their financial intermediary options. Authors state that low capital level financial institutions are affected negatively the most.

Mr. Uzbekov stated that financial intermediary tools can be very helpful for the industrial economic development as the options to fund the projects through the ways of the capital market are diverse. We stated that the strong financial market has a power to support the real economy. This is the case if the financial market is well established. Authors Dang [236] state that the banks in well developed economies are keeping the information in regards to the ways of financing quite. In the financially well established economies the ways of funding can be signaling to the markets the information that can be costly for the players and create a comparative disadvantage. Therefore, this type of information is kept secret at best possible ways.

The question between the dependence and overall relationship of financial sector and economic growth is the one, which has been studied in many studies. As Mr. Zhukenov stated, the relationship is important to be understood as it directly affects the performance of the banking sector. Authors [237, p. 929] have been examining this question of the relationship between the economic growth and financial sector development. The main finding indicates that the relationship is positive and that the industrial sector largely contributes to the economic development as the growth in the sector fastens with the financial markets being strong. The examination of the local financial development and its effect on the overall development of the area has been studied by [238, p. 1005]. Authors have used the methodology, where the model was build with no access to the credit market. Mr. Uzbekov stated that large financial institutions have privilege in terms of funding compared to the smaller firms. Larger institutions are strategically important and have political ties in major cases. Therefore, an option of financial intermediation is vital for the rest of the market players.

5. Tradeoff between risk and financial stability

The successful model of banking business is a combination of diverse options. Interviewing individuals from the banking sector of Kazakhstan, we found that there are many steps that have already been done to diversify the financial market infrastructure. However, the implementation of these options as the financial intermediation is still raw. Mr. Uzbekov stated that largely the diversification is only related to banking industry. However, the development needs to take into account all the financial institutions. As Mr. Uzbekov stated, the problem is that financial market

in transition economies, and especially in Kazakhstan, is very dependent on banking industry. In example, the business establishment requires a lot of payments to be done. The only way to process the payments is through the banks, because the legislative regulation permits to operate the payments only to the banks. As Mr. Uzbekov mentioned, this way it is easier to supervise and regulate the streams of financial movements. Hence, we can conclude that the regulator prefers to have transparent market. *However, as previously mentioned, the successful sustainable model is the one, where diverse financial tools are available for diverse financial institutions.* This is related to individual financial institutions and overall financial market infrastructure. However, despite regulatory precautions, the business cycle in the banking sector fluctuates a lot in the recent years. In the banking industry, the best way to understand turbulence of the business is to examine micro structure of individual institutions. Ruckes [65, p. 1073] examined the question why emerging market is not stable recently in the aspect of competition in the prices and changing standards of credit distribution. Author points that the credit distribution and borrower loan payments improve with the overall positive economic state. A lot depends on the screening process of the borrowers. In times of positive economic state, when screening process is at its ease, the competition increases between the banks, leading up to the low quality of borrowers. The reverse process takes place with the economic state getting worse. The credit distribution diminishes and overall credit standards decrease. Author states that insurance in terms of deposits can positively affect the market in this type of turbulence. Authors Kim and Santomero [234, p. 1219] state that banks' portfolio can be higher risk portfolio as a result of the high priced compensation schemes for the deposit insurances. Authors address the problem of low effect of simple capital ratios. For the bank capital ratios to be effective, it is necessary to have them adjusted to the risk. However, the risk adjusted capital ratios are recognized by the banks as not optimal for them.

The important consideration in the banking business model structure is the monetary policy that affects the business and the efficiency of the financial institutions. Authors Black [51, p. 48] examined the relationship between the loans and the deposits in terms of the mutual benefits. Authors advocate that the banks in traditional business tend to lend much lesser amounts in comparison to what they take in as the deposit funding. This way the positive surplus of capital buffer is created. Authors state that in times of negative economic state, banks with higher capital buffers can lend more and sustain the long term development. Authors as well state that the banks that have higher portions of capital buffer are less dependent on the monetary policy changes that might affect the rate and the volume of the lending of the financial institutions. The only banks dependent on the monetary policy are those that have higher dependence on the cost side, where the deposits are the primary source of funding. Admati [239, p. 74] have questioned whether the high equity that is theoretically assumed to be leading to higher social costs is true? Authors found that these fallacies are mainly inappropriate and that the higher equity not necessarily transfers the cost of it to the social side. Theoretically, it is expected that the social projects will be scarce or expensive as the cost of the equity increase, what will make the banks inefficient. However, it doesn't mean that this additional cost will make the

banks efficient. It may not be good for the society in general. On the other hand, social stability can be increased as the lending from the banks is stable with higher portions of the equity than it is required by the standards of Basel in example. The social benefits are larger in case of the higher equity and higher capital requirements. We reversely found that the capital requirement as the regulatory tool for the transition economies has little impact on the efficiency of the banks. In transition economies, banks are receiving high portions of the financial flow from the government and the shareholders often are linked to the politically affiliated people. This can be very inefficient as the funds are not efficiently used as the result. Moreover, higher portions of the equity requirements can negatively affect the performance as the funds are not invested in new projects instead.

6. Regulation

The interesting discussion on the matter of regulation we had with Mr. Zhukenov. Working as the head of Treasury department of JSC Halyk Bank, Mr. Zhukenov stated that the regulation sometimes is too narrow and specific in details. Mr. Zhukenov stated that regulation needs to be strategic in a sense to help the industry develop in a long term sustainable way. However, the regulator in practice pointed attention to some small routine mistakes and charged for that the banks. The approach, as Mr. Zhukenov suggests, must contain supportive manner. The last resort is the charging policy. The regulation target is to create socially optimal conditions of business for all market participants. Otherwise, strict charges can only negatively affect the development. The regulation got even sharper after the global financial crisis. Schularik and Taylor [240, p. 1029] advocate that the volume of the leverage increased significantly after the crisis took place. Moreover, authors found that the credit booms predict the financial crisis indicating that the problem of the credit volume increase is not well regulated by the policymakers. The ignorance of this particular factor can lead to the financial crisis.Macro-prudential capital regulation became the core point of the examination aftermath the financial crisis of 2008 for the business industry establishment. The concentration has switched from the micro level of the examination of single financial institution to overall banking industry macro level. Harris [98] examined the level of bank effectiveness of the macro-prudential regulation in the condition of the competitive market. Authors state that the competition has negative effect on the regulation as it becomes almost ineffective as the bank managers go into the high risk projects to sustain the business ashore. The increases in the volume of the capital requirements are pushing the banks to risk more, in order to have maximum possible volumes of return. Eventually, banks with more safe overall conditions and safe NPV client base switch attention to the riskier profile clients with the level of NPL higher than it is recommended.

The study of Hanson [241] as well has stated that the regulation prior to the financial crisis of 2008 has been largely micro-prudential. Authors advocate that the concentration was more oriented on particular individual financial institutions. The difference with the macro-prudential regulation and norms is in the fact that it has the overall effect on the market, and, therefore, recognizes the overall systemic risk. This view has been common aftermath the financial crisis among both theorist and practitioners. The concentration on the regulation of particular single financial unit

cannot examine the overall view of the market and hence lead to the loss of the overall stand of the market. The regulation core point is to keep the market players within the frames of the socially optimal market.

The question of the diverse positions of the bank industries despite similar markets across the countries is one that has direct effect on why the financial development is different in these countries. Author [149, p. 451] investigates this question and points that regulation in the countries that is particular optimal for one can be completely unfit for the other banking industry despite similar structures and the market conditions. Author asks the question whether the countries must have diverse regulation norms depending on their diverse fiscal policies. Author examines whether countries with more financial inflows from the government in terms of the fiscal policy would suggest that the banks would have lesser capital in return. Whether this development approach would lead to higher possibilities of moral hazard problems in the banking industry as the funds accumulated by the financial institutions are obtained easily as the donations. Theoretically, this way it is expected that the banks' management will misbehave. Author indicates that the optimal policy for the regulation in the banking industry is the one, which implies the specifics of the fiscal policy of particular country. This is another one example that there is no one best policy of regulation for all.

7. Role of bank

The role of the bank in establishment of the financial market is fundamental. In transition economies, the bank is the only systemic financial institution that has direct impact on the economic development. There are few reasons to that. Financial literacy in terms of market infrastructure development is in the beginning stage. The other reason is planned economy heritage of banking industry. Mr. Uzbekov mentioned that big banks in transition economies have privileges in comparison to smaller banks. The systemic importance of big banks is too high for the overall economy. Since that, financial stability of the overall system would be under risk if some of the big banks will go insolvent. The regulator, hence, is willing to sustain this type of bank ashore. However, this political patronage of big banks can affect the bank performance in a negative way and it doesn't help emerging market to develop. In one of the fundamental questions affecting the overall bank performance, Rajan [55, p. 399] has examined why frequent fluctuations of the credit policies of banks take place. Author states that following the general theory the lending from the banks should continue without constraints if the borrowers have positive NPV. However, the lending cycles are not dependent only on this one condition. Author states that single bank lending is highly dependent on the overall supply in the industry. Hence, big banks can affect overall bank industry. The mutual dependence between big banks and regulator can eventually be leading to inefficient market. Big banks having this comparative advantage can misbehave. The question of crediting the economy during the positive and negative economic states is always the prime question that affects the development of the bank industry business performance. The point is that banks tend to increase the volume when the economy is flourishing and reversely decrease it as is stagnates. Therefore, the banks can negatively affect the credit market and authors Gersbach and Rochet [242, p. 73] state that there are three

reasons why this situation takes place. The first reason is the moral hazard that is exposed by the borrowers. Lenders in the face of the bank do not properly gather the information about the borrowers. The second reason is the bank's positive attitude towards higher risk higher return projects. The third reason is that the fast way to reallocate the funds between the projects that can be easily done by the financial institutions. This can negatively affect the prices as the market is not responding very fast to the changes in credit, output and asset prices. Authors, therefore, indicate that the necessity of the prudential regulation can positively affect the stability of the credit market. Mr. Zhukenov pointed that regulation is advised to be having micro approach. Banks are different in sizes, and the systemic importance is different as well. Hence, the best approach is to regulate macro economy with micro approach, when every single bank is examined separately.

In the study on the regulation effect on the banking industry of the transition economies we found that the main factor that has positive effect on the performance of banks is the liquidity regulation or reserve requirements volume control. For the banks in transition economies this consideration is vital and it is one that has more of a traditional way of the banking business modeling. Authors Moreira and Savov [39, p. 25] examined the transformation of liquidity and its effect on the financial sector. Authors state that the options of the financial intermediation are good to have at hand. However, the liquidity concern over the transmission of the securities and other financial papers is quite delicate as the stress in the market can create the chain of the sequential failures to satisfy the claims of the counter agents requiring the liquidity. Stating simply, the liquidity cannot be easily obtained if the overall financial market conditions under the stress. The options of the likes of shadow banking then are used, as the claims must be satisfied. Shadow banking effect is good in times of positive economic state. However, the ties are shrinking when the economic downturns are taking place and banks fail to fulfill the obligations.

One of the important points in the establishment of the new market is the case when the parallel markets, so called, shadow markets are taking place. Hansen [243, p. 1269] examined the standard banks in the aspect of the competition with the financial institutions of the shadow markets. The idea is that the financial intermediation can work systemically in both of the markets; however, the two ways are different in terms of the accumulation of funds. Even more, the traditional banks are referred as less efficient as they rely on the insurances created for the funding sources of deposits and equity that are more costly. The money the traditional banks create is back-upped by the neither assets that are not liquid. Hence, the banks are not worried much about the price changes. This can create problems for the investors as the financial claims will be satisfied with some time lags. The shadow banking works differently as the funds can be returned to the investors at first claim. However, traditional banking is more stable as the authors advocate. The reason for that is the high risk that the shadow banking is facing. There is a tradeoff for the investors as the overall market always suggests. More stable money means lower risk and the vice versa.

The other important player in the market of any type whether emerging, developed or transitional as in our case, is the development bank. The theoretical

notion of these types of banks is the category of the bank that denotes the funds allocation to the politically linked firms that following the criticism of the bankers can be obtained from many other sources. Moreover, critiques advocate that these loans to affiliated firms are many times cheaper for them in comparison to the market rates. Lazzarini [24, p. 40] studying the Brazilian Development bank, indicate that there is no significant effect of the investment from the development banks in line with governmental subsidies on the performance of the connected firms. The other finding indicates that still development banks try to invest in better performing firms and the politically connected firms. However, authors state that the findings do not point to any of the facts that the development banks try to bailout politically connected firms. Authors use the fixed effect model that represents the fixed measures, and those are the measures that cannot truly represent the economic state as the reality is very dynamic. This consideration is important as we expect that the banks in the transitional economies following the historical heritage of the planned market are receiving huge donations from the banks. Our findings are stating that the main factor affecting the performance and efficiency of the market of transitional economy is the liquidity that is mainly attributed to the donations from the state. However, this study points that the donations from the government and in line with donations from the development bank in Brazil has little effect on the Brazilian transitional banking industry performance. However, in our empirical study we found that transitional economies, including Brazil, are mainly receiving effect from the donations. Hence, these findings are contradicting our study results.

We study the transitional economies, where the political and economic concentration of power is high. Mr. Uzbekov states that this concentration doesn't help the market development. Financial constraints are well known for the moral hazard problems. This problem is the specific of the market, where the financial intermediation is well developed, making us all understand that the human nature is common for all people and must be regulated for proper implementation of the activities of any kind. However, the problem of corruption is the one that is the most lived in the less developed economies of the emerging markets. Khwaja amd Mian [211, p. 1371] investigate the politically connected lending in Pakistan. Authors study the firms and their lending behavior. Thefirm is recognized as politically connected if the management related to the election process or even directly participates in it. The main findings indicate that the firms with political linkage has higher rate of lending for almost 50 percent in comparison to the standard firms. Moreover, the ratio of default is as well almost 50 percent lower; that confirms our previous expectations that financial institutions with state participation has higher portions of donations from the government. In addition, the power of the individual politician linked with the firms has the direct effect on the volume and the density of the firm lending. The following examination is important as the transition economies are the economies with high portion of the politically linked financial institutions, mainly because of the historical heritage.

The effect of the political impact on the banking industry is twofold. Duchin and Sosyura [46, p. 24] and De Haas [244, p. 388] examined the power of the financial firms over the political decisions. The question is, whether the politics can

be done in a way that will create a condition with the best option for the particular firm performance. Authors indicate that there are factors of the political influence. The main defining moment is the connection between firms and policy makers. There are ways how the financial firms can affect decisions of the policy makers that directly affect the overall stand of the banking business modeling. In example, the lobbying of the political campaigns, the support of the regulators by the management of the bank and the satisfaction of the needs of funding of the particular districts. Therefore, the relationship between the policy and business in the aspect of the bank institution is very close and tight. Authors found that the financial institutions with the connections with policy makers are performing better in comparison to those where the connection is low or even at zero level. However, authors found that the overall impact on the industry is negative from this type of relationship as the more efficient but less oriented towards the government institutions and with less connection suffer from this impact. The following reasoning advocates that the necessity of the regulation of the banking business modeling is crucial. Moreover, the regulatory concern must be covering not only the bank institutions, but all the players including external powers as the political influences and regulators themselves. It means that there must be the counter powers against the biased regulatory norms and biased political support. This notion is important for the transition countries as the political reformers tend to be the same subjects and the owners of the banks.

The studies on the emerging markets are commonly touching the question of the ownership structure as it is considered one of the main contributors to the overall economic state of the development in the emerging markets. One of the main sources for the ownership of the banks is the governmental ownership. Dinc (2005) examined the impact of the political power on the banks with governmental ownership. The main findings are quite in line with those common in the literature. State owned banks increase the volume of the funding through the lending in times of the election periods and before it. The portion of the increase is substantial if to compare it with privately owned banks. The study of Dinc [15, p. 453] indicates that the proportional increase in lending is around 11%. However, it is important to understand the way how the political motivation works in banks with governmental ownership. Dinc [15, p. 453] states those three moments must be taken into account as the motive of the political influence, differences between transition countries and the institutions within. There are countries with specific financial institutions that are better off with the governmental owned structures rather than private banks in terms of both efficiency and performance.

8. Capital

Kashyap [7, p. 145] argue that crisis negatively affects the capital markets. The sales growth of the capital market increases, pushing the financial instability to go up. Authors state that shadow banking becomes interesting for the banks as the market gets tighter with only capital and liquidity tools. Our study indicates interestingly unexpected findings in terms of capital. The significance of the capital as the factor affecting the performance of the banks is low. Moreover, the crisis diminishes the impact even more. Therefore, just the regulation of the minimum capital reserves is not enough for the efficient market. Credit supply and prudential norms are

interrelated. In example, Jimenez [245, p. 55]explore the credit supply in the Spanish economy. The regulation in terms of higher capital and higher reserve requirements (liquidity) in times of negative economic state presuppose tighter monetary conditions. The findings indicate that weaker in these two regulation terms banks are supplying significantly lower portions of credit in negative economic state. This is the question of big and small banks. As was mentioned by Mr. Uzbekov, banks within one country can have very diverse business models.

The prudential regulation is the requirement that controls the macroeconomic state of the banking business model [102, p. 2137]. The main target is to keep the banks as the financial institutions affecting the market from taking higher portions of risks that might lead to the financial instability. Therefore, the role of the necessary minimum capital is the safety cushion or the buffer that would help resolve the possible financial difficulties if they take place. On the other hand, the discussion over the true real effect of the minimum capital as the balancing counter power to the risk taking behavior is under the question and still discussed in the relevant literature. There are two outcomes that oppose to such a measure of increasing the minimum capital requirement exists: the first one tells that the higher capital requirements affect the return in terms of the allocation of funds. The return decreases as the strategy requires higher capital storage instead of increasing the portion of funds devoted to the higher return projects. The second view is that managers will risk and allocate the left portion of the available funds to the projects with higher risk and higher return putting the overall state of the financial institution under risk of being insolvent.

The capital structure and the more detailed examination of its liability side is important for the efficient operation of the bank institutions. Andrianova [246, p. 40] and Sundaresan and Wang [215] in details examined the capital structure incorporating the insurance on deposits, regulation norms and services. Authors examine how the banks are maximizing the profits with the insured deposits. Authors found that the banks generally balance between the two options of funding using the insured deposits and non-deposits debt funding. This way banks can diminish the costs of too high insurance payments and to high tax deductions on debt funding. This consideration is quite important as the cost efficiency is one of the ways on diminishing the price of sustainable development for the financial institutions.

Capital structure regulation is the one regulation that comes first in the line to be regulated in the banking industries. The point is that banks as the financial institutions have higher appetite for the risk in comparison to the one, which the regulator can call a socially optimal. Therefore, the regulation touches this particular factor quite significantly. On the other hand, the too much regulation can postpone the earnings backwards for the banks and motivate the institutions to misbehave. Hence, the shadow banking as the notion comes to the arena. Generally stating the capital regulation has the aim to diminish the risk in the system. However, tightening the capital structure has the possibility of the reverse effect, when banks move to the shadow banking that is much higher risk oriented activity. This idea can be recognized as the weakness of the regulatory body as the impossibility of the control powers to estimate all the risks. Shadow banking is more efficient for the banks

themselves and doesn't require higher portions of liquidity and capital reserves. The necessity to have higher portions of minimum capital has been reasoned mainly because of the failures that have happened in the markets. Higher portions of the capital requirements and the more regulation norms were presupposed to smooth down the externalities that were shocking the markets. The insurances for the deposits and other safety measures are done with the purpose of keeping the funds accumulation process on. Therefore, the processes of the regulation in the banking industries have changed significantly over the later years. The change has taken plays on both of the assets and liabilities sides of the balance sheet of the bank financial institutions. Authors Gorton and Winton [75, p. 42] investigating capital structure has questioned whether socially adequate equilibrium can be introduced into the banking systems through the regulation of the structure of capital. The main findings suggest that the risky investment is more beneficial for the banks rather than keeping the accumulation of funds mode on. Moreover, the regulation that can affect bank behavior can increase the necessity to establish higher portions of the capital. However, the tradeoff can make the bankers to prefer to leave the banking industry business rather than satisfy the regulatory requirements.

9. Ownership

Regulation through the way of control of the loan distribution by the banks is the one option that can be very efficient in terms of control of the industry financial stability. Aiyar [247, p. 40] documented the study on the UK banking industry and the main difference between the highly, tightly regulated financial institutions and those that are considered more flexible in this particular term. Authors advocate that the representatives of the banks with more flexible regulatory conditions, those that are under different jurisdiction within the host countries are mostly subsidiaries or the branches of internationally represented foreign banking institutions. Authors state that the banks that are more regulated and mostly are the financial institutions working within the jurisdiction of the home country are diminishing the volume of the loans distribution as the regulation gets tighter. On the other hand, the foreigners are more oriented towards the increase in the volume of loans. The main core regulatory factor affecting the loan distribution changes is the factor of capital regulation. It is known that since the first introduction of the Basel I regulation norms with the higher minimum capital requirements, the difference between the loan distribution before and after the regulation were imposed almost equal to one third of the decrease in loans distributed by the local banks. In the study of our own we found that the effect of the capital regulation has little impact on the positive performance and better efficiency of the overall banking industry

How the decisions of the financial institutions are affected by the interference of the government has been investigated by the Carvalho [248, p. 577]. Author states that the real effect is significant from the governmental interference. The findings state that the lending is increased during the times close to election periods and in the areas mostly attractive for the government in terms of the electorate. Moreover, author advocates that the lending gets more attractive for the borrowers with its conditions. However, these favorable lending options usually are provided in times of

pre-election periods and thereafter do not exist. Author concludes that the bank financial allocation is used by the governmental politicians and seriously affects the real decisions bank managers do. Moreover, using this way, politicians affect the employment in the regions as the population usually gather around the areas, where the financial allocation is higher in comparison to the low funded areas. The state owned banks tend to allocate the funds into the regions, where the politically important decisions can be made with the support of the local population[249, p. 1751]. These regions are politically attractive and, therefore, the funding in the areas is overwhelming with the best possible conditions in the times of pre-election periods.

10. Other

We cover the period of the examination both during the crisis and aftermath. [134, p. 306] studied what is the effect of the crisis. To what extent the crisis hit the world economy and how long will the crisis last aftermath. Authors indicate that the market of the assets will be in the stressful economic situation for the next six years and equity market for almost four years aftermath, with around 35 and 50 percent decline, respectively. In terms of the banking industries, authors state that at least 7 percent increase in unemployment rate is expected for at least 4 years further. The inability to pay taxes will cause the budget deficit and sequentially that will increase the portion of the debt. Credit distribution is the primary task of the banks. Authors Jeanne and Korinek [109, p. 2] examined the effect of accumulation of bank debt on the credit distribution. Authors examining the market indicate that the borrowers do not recognize the difference between the times of credit booms and higher prices of assets. Authors state that the introduction of the tax system can diminish the boom in the credit market. Barth [206, p. 2879] stated that one of the crucial points in making wrong lending decisions is the lack of information. Going back to the examination of the financial stability we refer to the necessity of investigating the regulation and supervision of the banking industry. Borio [63, p. 181] has made a study in relation to the necessity to strengthen the macro prudential levels that will help to contribute to the levels of stability. Author states that the increase in the macro prudential requirements will lead to the closer interconnection between the work of supervisors and the business.

White [124] in the theoretical discussion had been questioning has the bank been the only place where the option of intermediation has been available. Author states that the alternative markets were not available. Bankers collected the necessary information about the borrowers to provide them with the necessary loans. The asymmetry of the information had been the problem in the market, but other structural obstacles had not been the constraints for the banks as the competing alternative ways of financing. Therefore, the market was not well regulated and largely was dependent on the terms that had been settled by the bankers as they were providing funds. Nowadays, the picture has changed with emergence of the new alternative routes of financial intermediation and the other competitive players. Moreover, as Kowalewski [186, p. 112]stated regulation has significantly constrained the banking businesses as well as the new technological innovations, where banks needed to adopt.

The cost of the funding for the bank capital accumulation is important as it affects the profitability and defines the level of the efficiency of the financial institutions. Capital structure with the ways of financing through the deposits or own funds as the equity accumulation is the question that has been reviewed many times. In general, the cost of the equity is higher than the funds accumulation through the deposits. Studying this question, Allen and Carletti [88, p. 601] found that the mode of the bank lending is different with the perception of the risk of the projects. In overall, with the policy of investing in higher risk projects, financial institutions tend to have higher portions of the capital. Moreover, the diversification of the portfolio is high as well. The main point is that high risk projects are diversified with the projects that cannot be bankrupt with high probability [249, p. 1752]. Other findings indicate that the deposit returns are lower in comparison to the equity; hence, the price is lower as well.

Concluding remarks

Banking industries in transition economies had very turbulent performance over later three decades. Adjusted western sample business models implied on emerging market banking industries exhibit diverse results. The crisis that took place during the period proved that the banking models of transition economies are weak. The regulation norms implied are more of a descriptive nature. The true effect of regulation works in times of crisis only. Implying the fact that banks misbehave in times of positive economic state. Old ties of planned economy still work. Some of the banks keep crediting the inefficient firms. The study findings indicate that the major liquidity portions in the banks are accumulated based on financial streams allocated from the government. Discussions with practitioners proved that the bank is the core institution in financial market of transition economy. Paradoxically, this is the major reason for an overall constrained financial market development.

Additional materials, Part 1
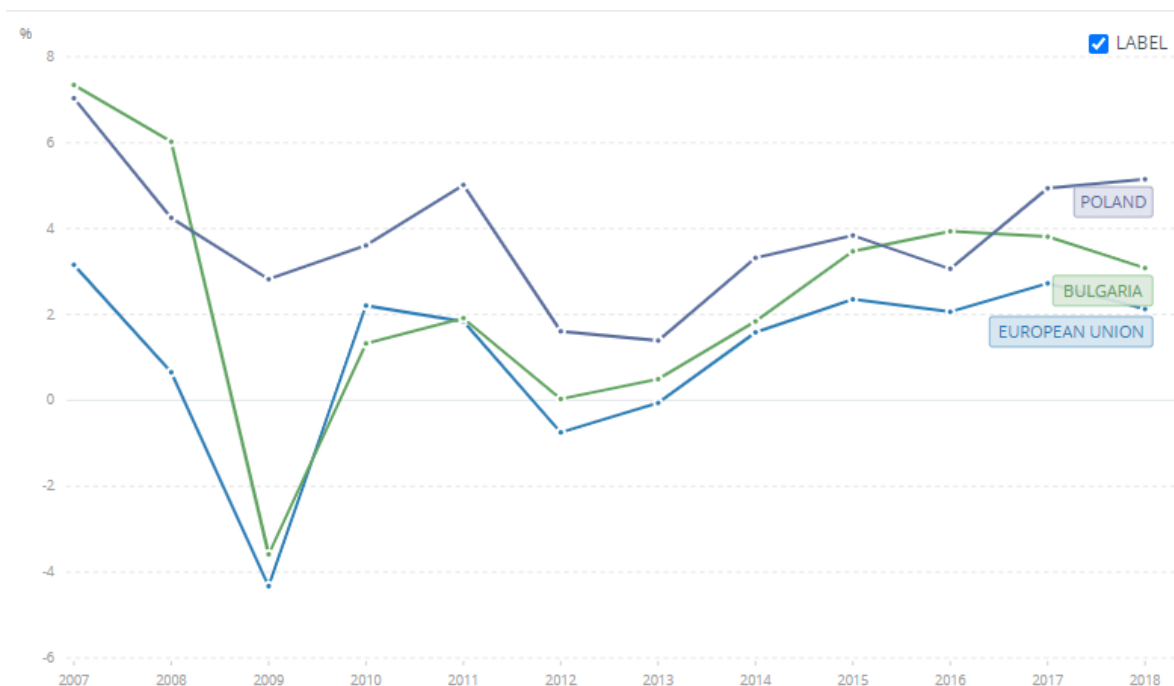
Figure B.1 – Eastern Europe best performer 2 transitional countries against the
European Union, GDP Growth (%), (2007-2018)

Note - Compiled by source[194]

We have been mentioning already that among the transitional countries the best banking business model and its adaptation following the financial crisis of 2008 has been in Poland. Largely, it is attributed to the diverse structure of the business making in the banking field. The financial intermediation has been central point of the country development for the transitional markets. Therefore, the GDP growth has been heavily increased mainly because of the operational activities of the banks as the central financial institutions of the transitional market. The diversification of the banking business model in Poland was the fact that the transitional country has been open for the foreign banks and their new technologies. The state supported the local banks to increase the competition level within the industry. Moreover, the investments to the local banks and furthermore participation in the ownership structure of foreigners in the local banks positively affected overall banking industry. The process of modernization of the bank industry has been gradually and sequentially introduced with country being transmitted from planned economy standards to the free market economy and not as the response to the financial crisis. As a result we can observe that the GDP growth for the most severe year after the crisis of 2009 has been positive for Poland (3%), while the average for the European Union the same year has been equal to (-4,2%).
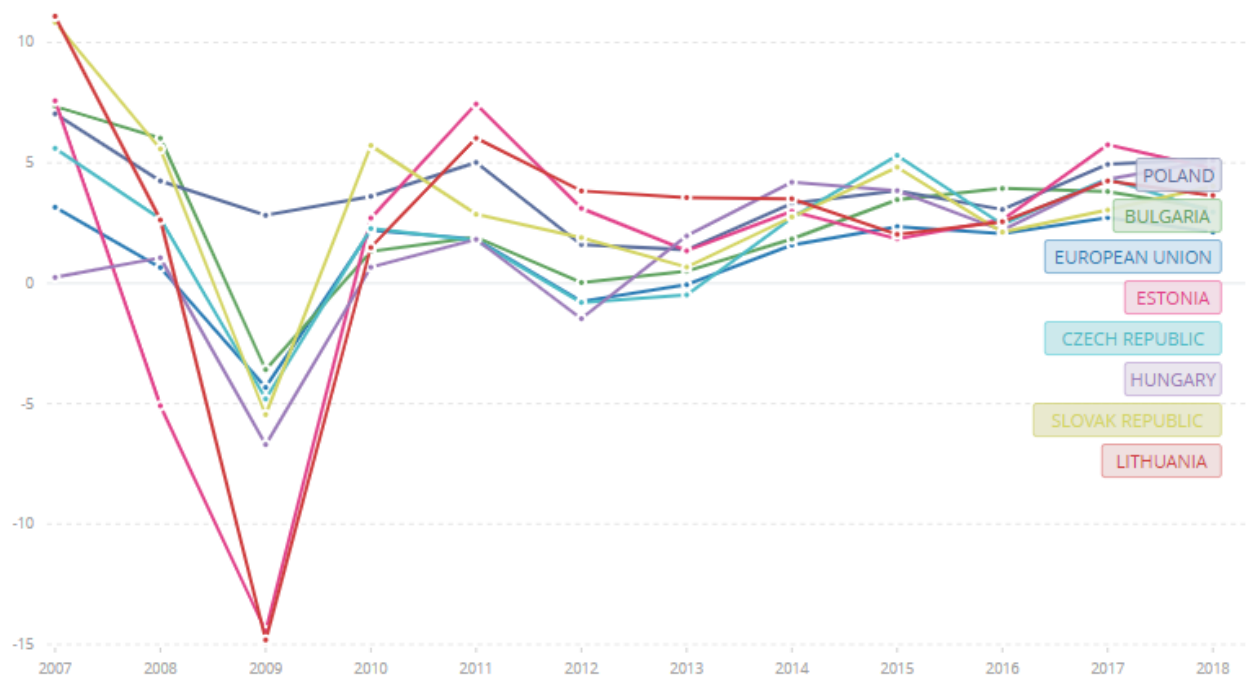
Figure B.2 – Central Europe all best performer transitional countriesagainst the European Union, GDP Growth (%), (2007-2018)

Note - Compiled by source[194]
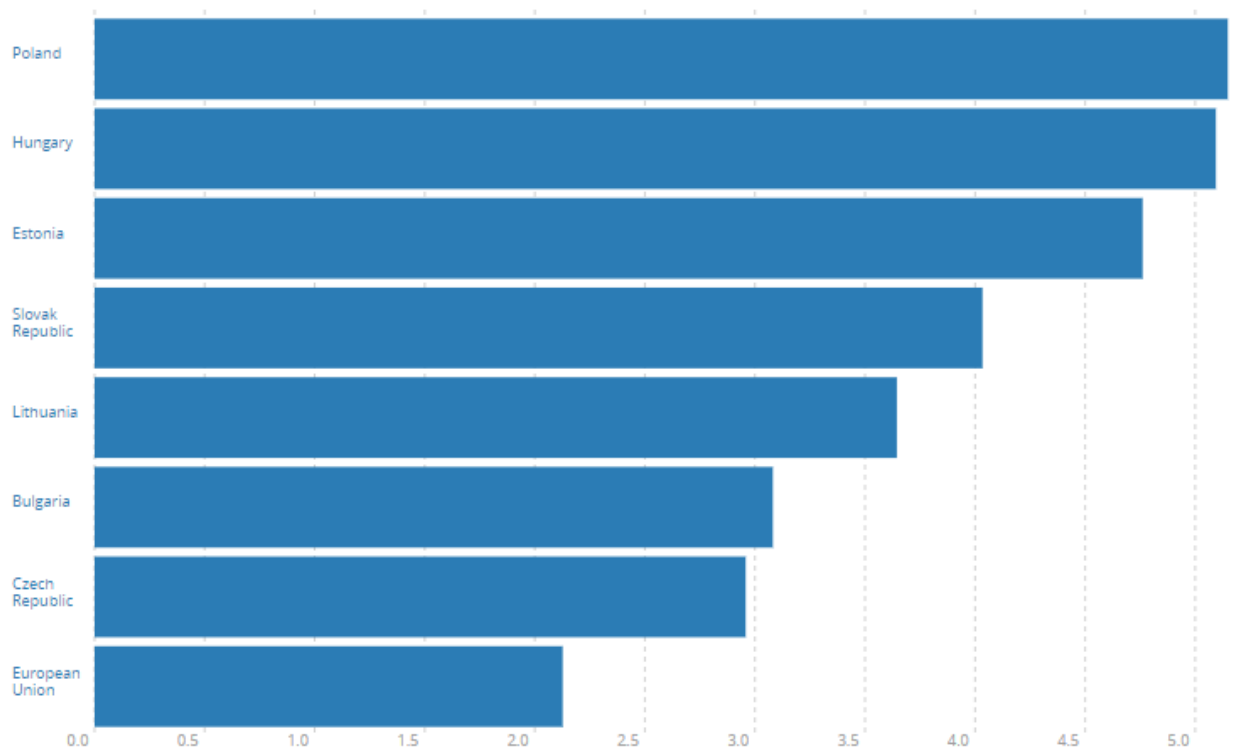
Figure B.3 – Year 2018 / GDP Growth %/Poland is the best performer

As of the most recent data, we can see that the strategy of the banking industry development has proved to be sustainable for Poland. The GDP growth for Poland exhibits (5,1%) while the average for the European Union is (2,3%) for the year

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2018. The most heavily hurt by the crisis countries of the Central and Eastern European region have been Estonia and Lithuania. However, we can see that the performance of these countries enhanced significantly considering the values of the production per head in the countries with respective percentages of (4,7%) and (3,7%) in 2018. Both of the countries indicated almost (-15%) GDP growth, in the year 2009.
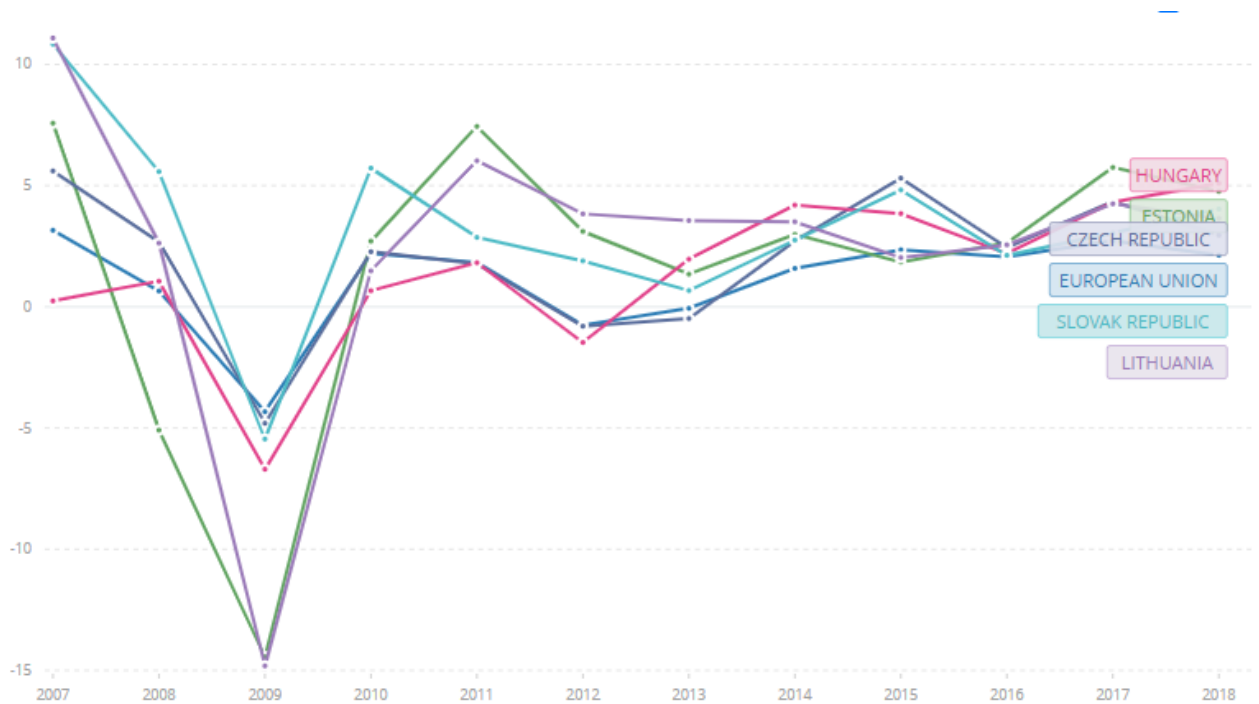
Figure B.4 – Central Europe best performer 5 countries, GDP Growth (%), (2007-2018)

Note - Compiled by source[194]

Examining separately Central European countries we can see that Slovakia has been largely struggling to recover from the crisis up until to the year 2013. However, the features of the banking business model, in this transitional country, have not been much better before the crisis with the structural change from planned to open market economy. Country was one of those, which performed badly during these two decades. The point is that Slovakian government prohibited the entrance of foreign banks and foreign investments to the local banks. This led to the local financial crisis.
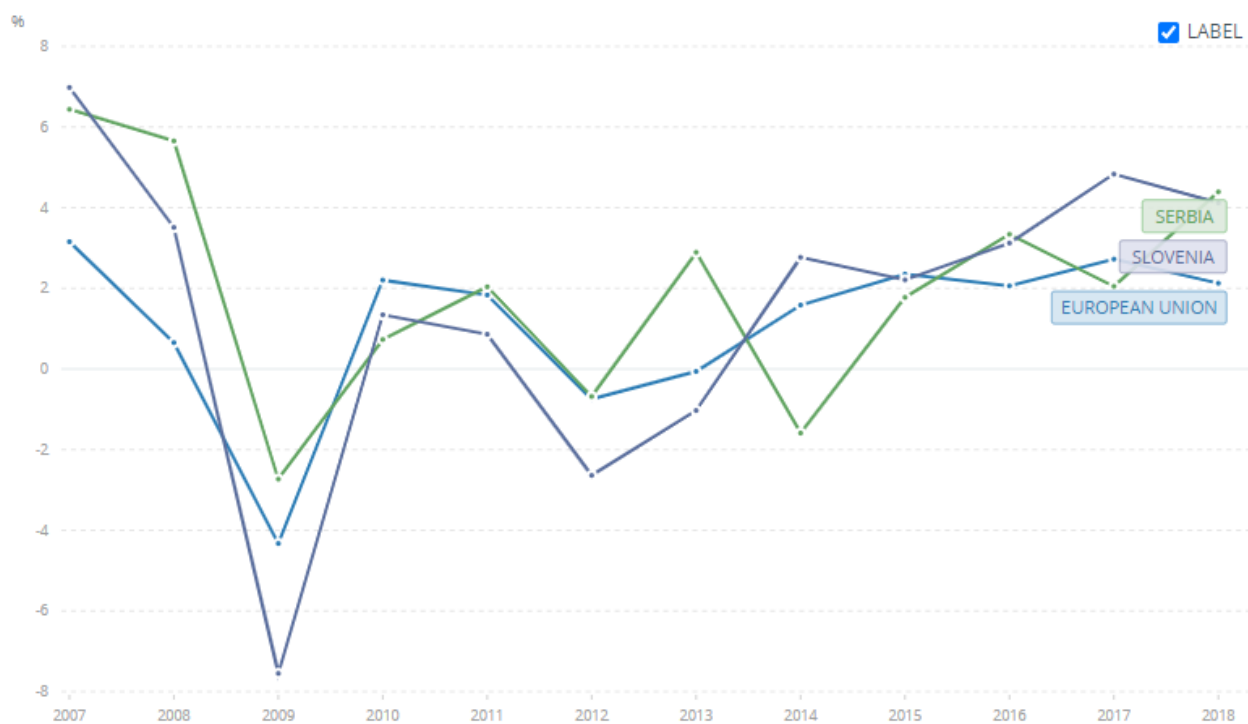
Figure B.5 – Balkan Countries GDP Growth (%), against the European Union average, (2007-2018)

Note - Compiled by source[194]

On the above figure we can observe the Balkan region countries of Serbia and Slovenia in comparison with the European Union. Slovenian financial intermediation opportunities went to the levels, where it was not able to fund the refinancing of the banking loans leading the country to the negative (8%) GDP growth, in year 2009. However, the Caucasus region country of Armenia has been hurt even more badly. The Armenian GDP was equal to (- 15%) in 2009.
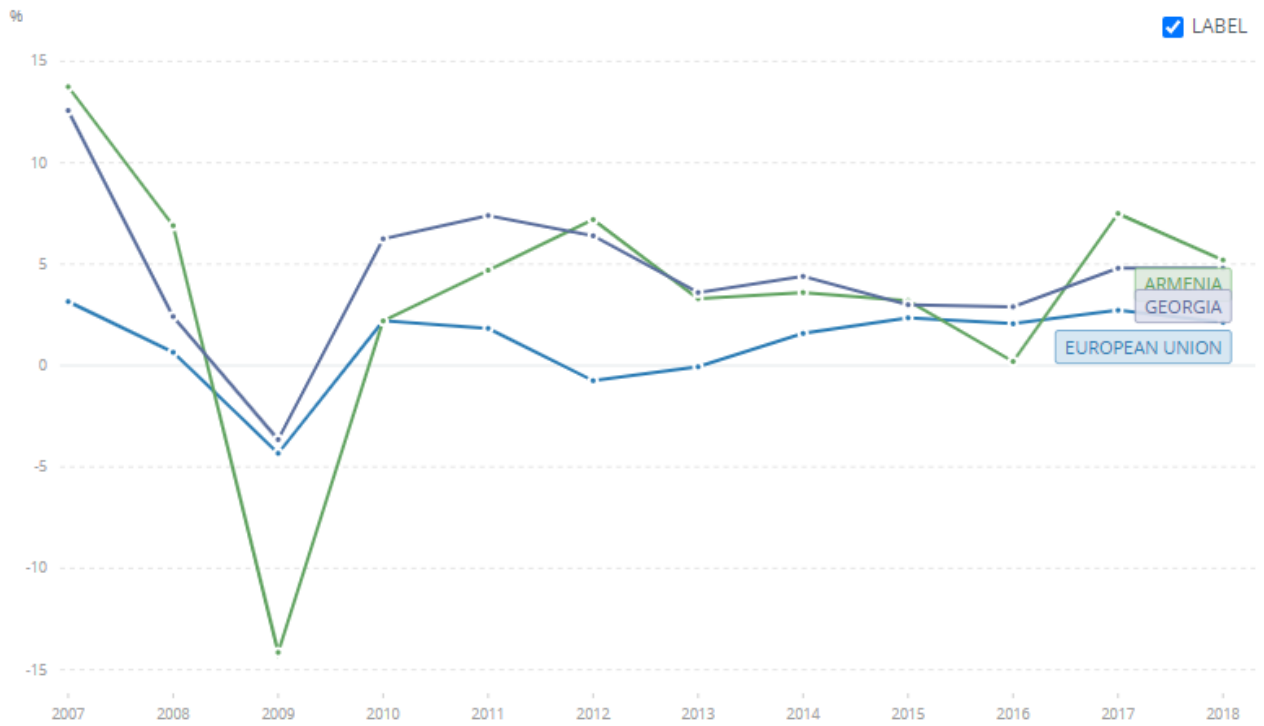
Figure B.6 – Caucasus countries GDP Growth (%), against the European Union average (2007-2018)

Note - Compiled by source[194]
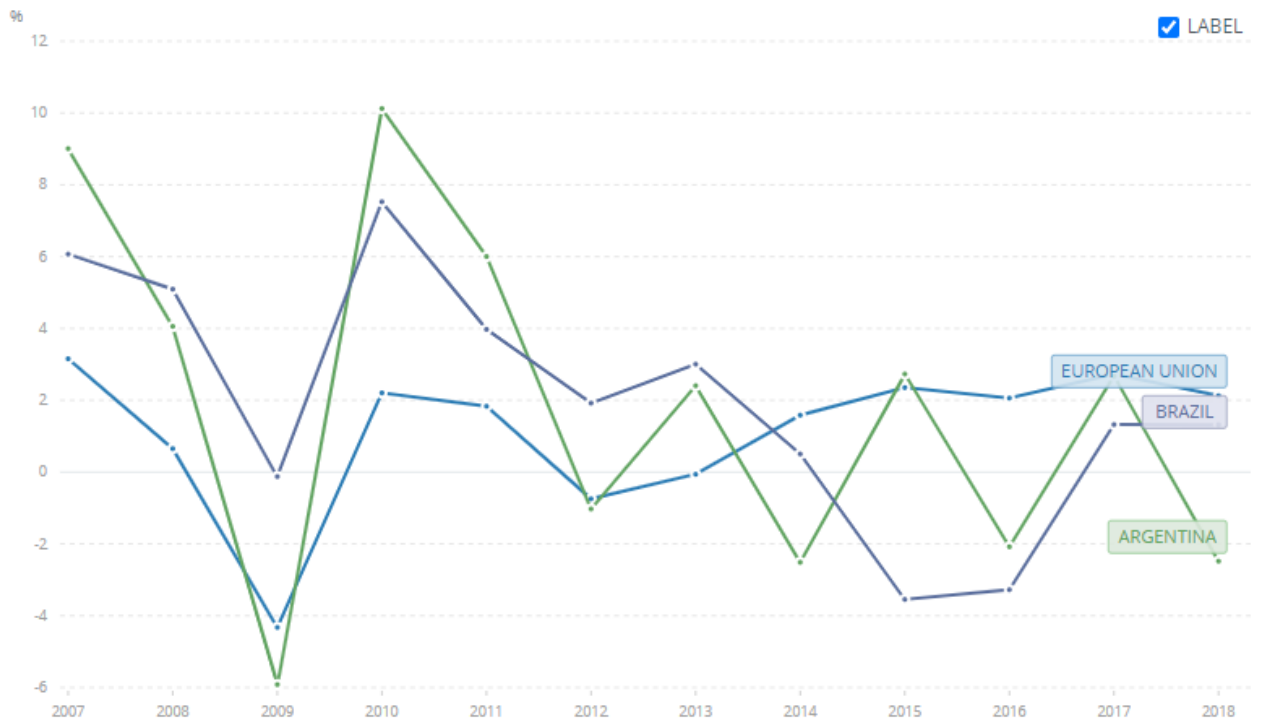
Figure B.7 – Peer countries Argentina and Brazil GDP Growth against the European Union average, line (2007-2018) and bar (2018 year) figures

Note - Compiled by source[194]
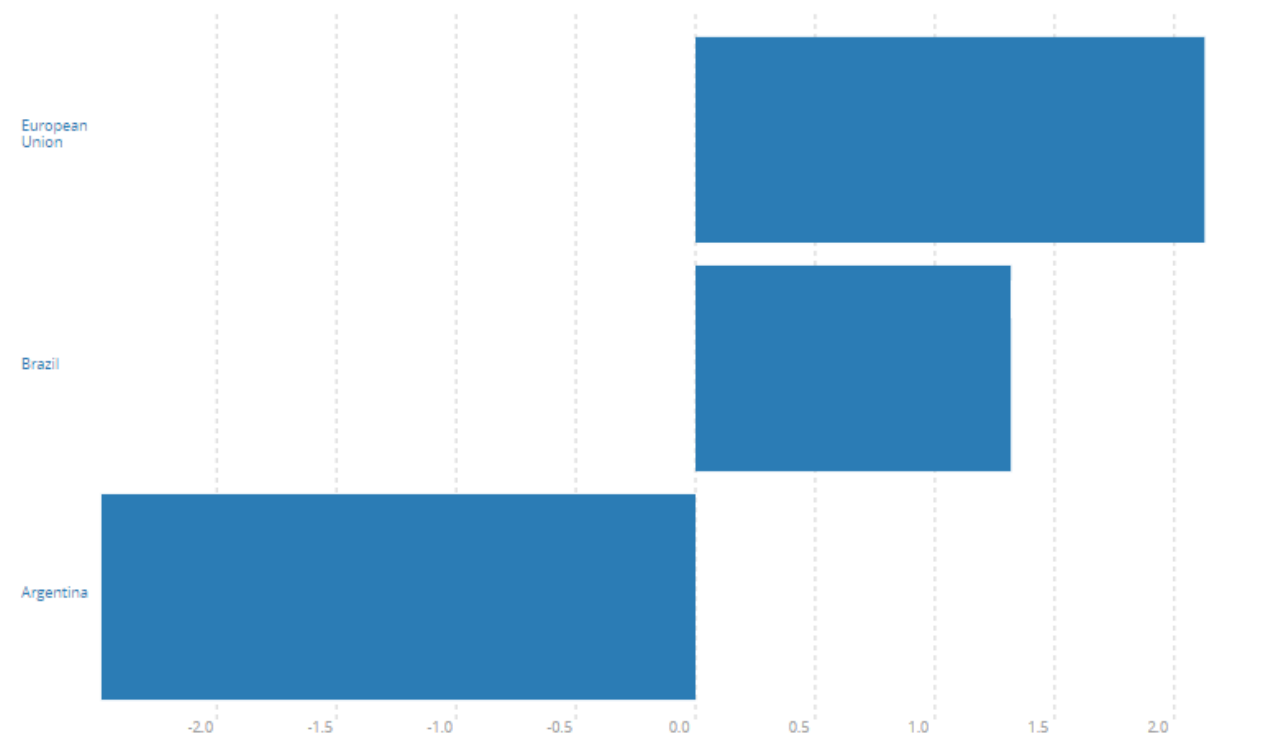
Figure B.8 – European Union and Peer countries

As for the peer countries of Brazil and Argentina, we can see that in comparison to the European Union transitional countries, Brazil performed moderately better with Argentina responding much worse. In 2009, Brazil indicated zero GDP growth, with Argentina indicating negative (6%) growth. Despite the fact that both countries showed V-turn recovery in the following year of 2010, the next development stage has been very hesitant. In comparison with more stable development of the countries of European Union, we can observe that Peer transitional countries of Brazil and Argentina had very turbulent years of banking industry development. The confirmation for our statement is the fact that the recent GDP growth for both Brazil and Argentina indicate lower than European Union countries percentage growth, with even Argentina indicating negative growth of (-2,5%).
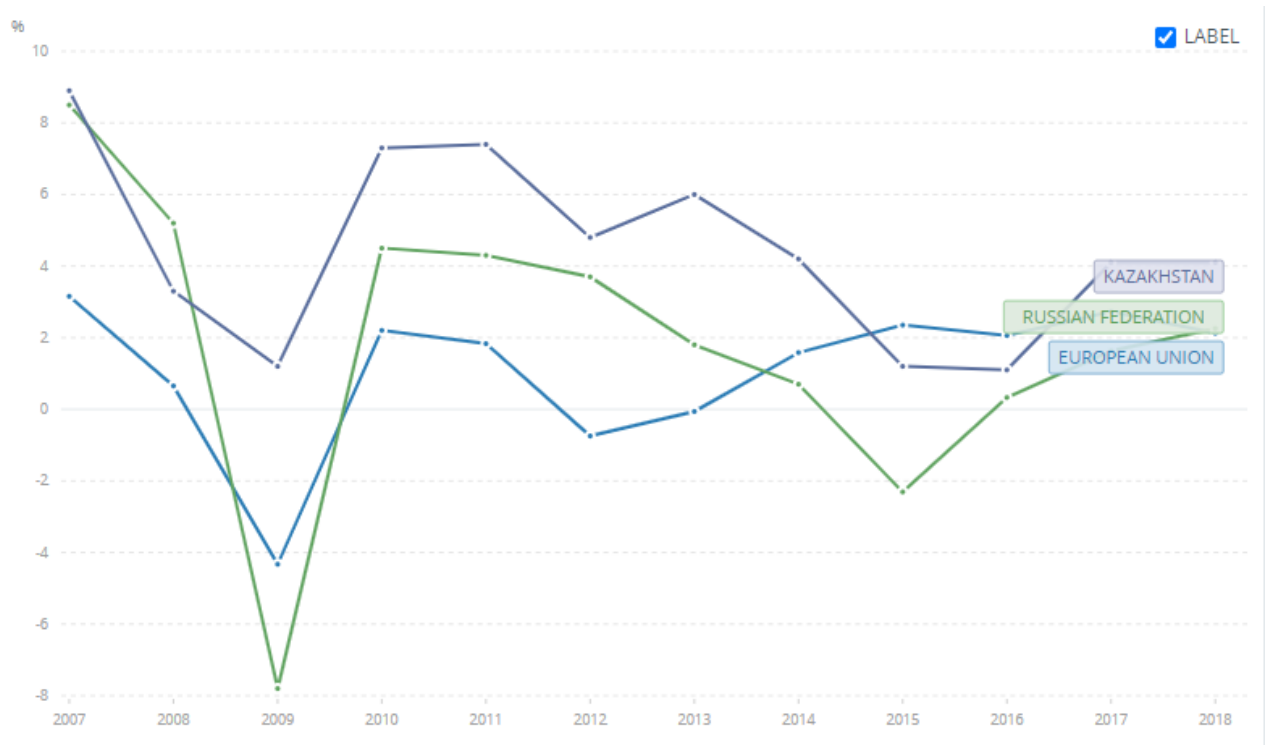
Figure B.9 – Kazakhstan and Russian Federation GDP Growth against the European Union average, line (2007-2018) and bar (2018 year) figures

Note – Compiled by source[194]

With respect to significant differences in the structural development of banking of European and Post Soviet Union transitional countries we decided to show the economic growth indicators separately for Kazakhstan and Russian Federation. Kazakhstan showed positive growth along the whole period of the decade aftermath the financial crisis of 2008. This, however, cannot be attributed completely to the well structured development model. Kazakhstan is the country with the main source of the economic growth coming from oil production. During the times of the heavy crisis, country has been using the funds to keep the banks from insolvency. The fund was mainly accumulated with the finances coming from selling of the oil reserves. Therefore, this strategy of development of banking industry cannot be called sustainable. Moreover, the growth indicator is calculated based on the overall production divided by the per capita within the country. Kazakhstani population is very small. As of Russian Federation, the GDP growth went negative in 2009 indicating similar growth rate of (- 8%) as in Armenia, what confirms that the old tie of the post Soviet Union countries is still on. The population and territorial distances doesn't permit Russia be having higher indicators of growth with the chosen development model.Kazakhstan and Russia shows (4, 2) and (2, 1) GDP growth in 2018, respectively.
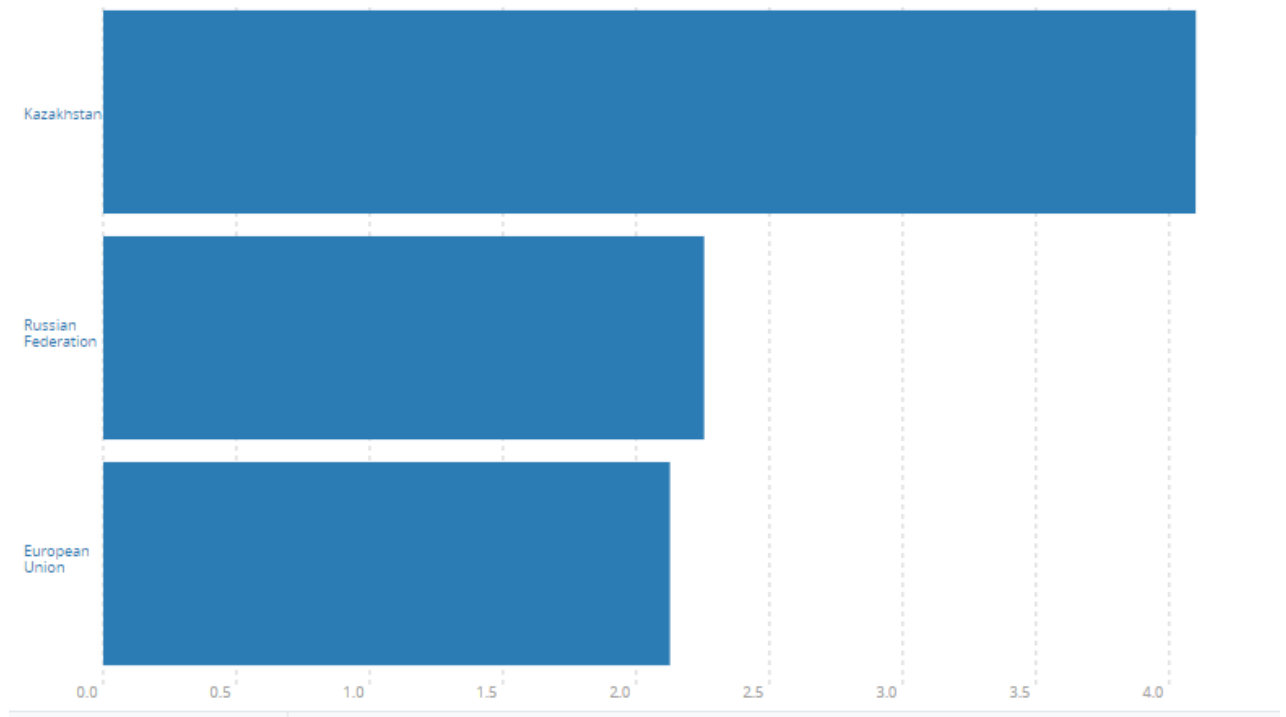
Figure B.10 – Kazakhstan, Russian Federation and European Union

Generally, we indicate that the banking industry development in the examined transitional countries have been experiencing fluctuate decades of growth and slump. It seems that only few countries such as Poland have been trucking the right mode of the banking industry development. Others were sustained by the national governments and different subsidy programs.

Additional materials, Part 2
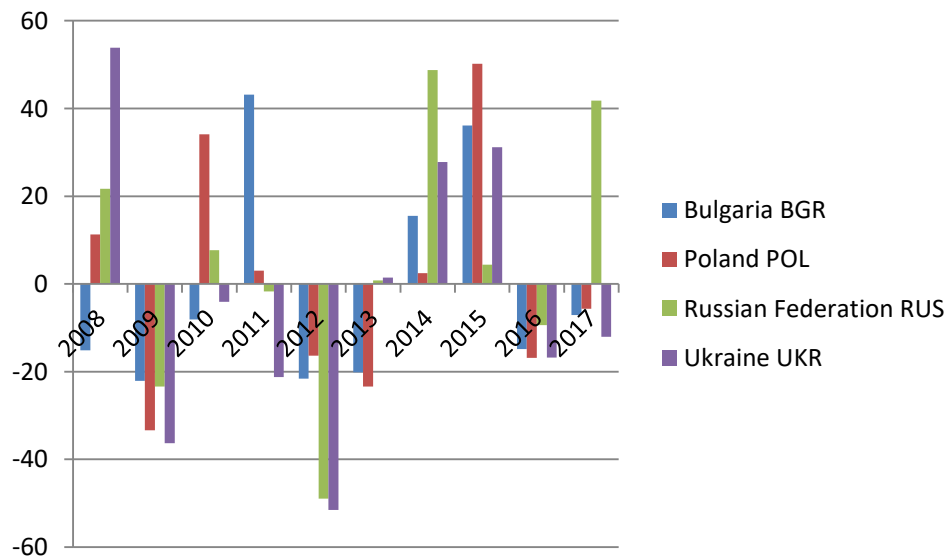
Figure C.1 – Total Equity structure (%), Eastern European Transitional Countries, (2008-2018)

Note - Compiled by source[194]

The above graph shows the percentage change in the equity structure of the transitional countries of Eastern European region. The graph indicators are constructed based on the S&P Global Equity Index Series. The indicators show the shares price change over the preceding years. General expectations are that the increase in prices followed with high development of the commercial banks, when the activity of the stock buy and sell becomes significant. Because of the availability of cross country financial intermediation, the efficiency of the markets on international level attracts foreign capital inflows. The fluctuations over the period of examination of the transitional countries of Eastern European region are expected. Years preceding to the international financial distress periods indicate higher changes with the opposite aftermath the distressed years. The highest percentage decrease has been in years 2009 for Poland and Ukraine and in year 2012 for the same Ukraine and Russian federation. The decrease in equity shares is adequate as the financial crisis touches all the countries in the world diminishing the size of the investments as countries allocate them to their own hosts as the financial support. We can see that in 2017 the investments into securities of Russian Federation has drastically increased as the investors decided to put the funds in riskier securities with higher return as the Russian OFZ (Obligacii Federalnogo Zaima), securities of the Russian Federation Ministry of Finance.
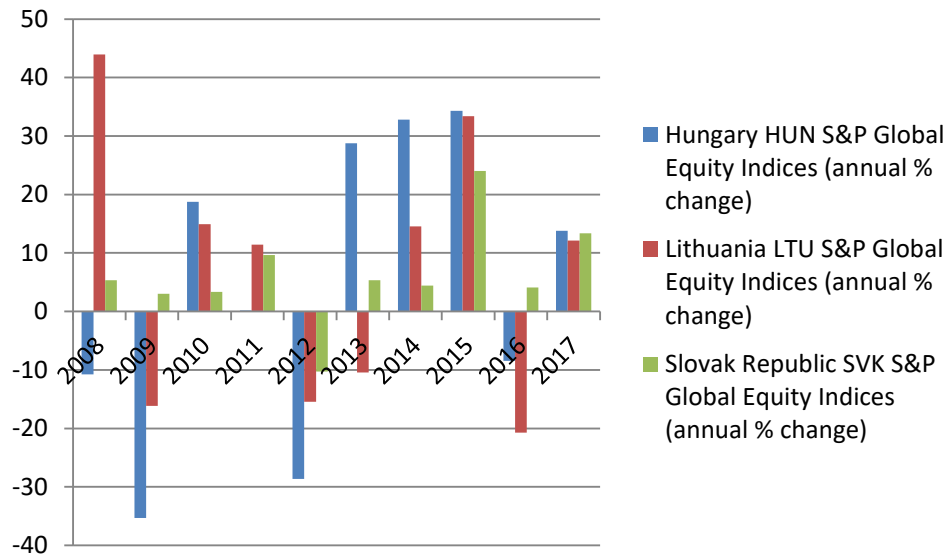
a
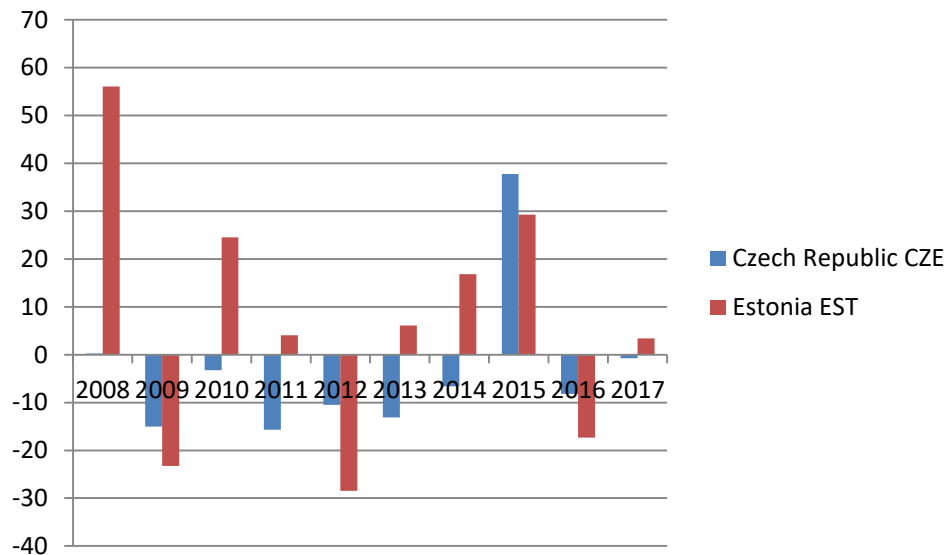
b

a – Hungary, Lithuania and Slovak Republic; b – Czech Republic and Estonia

Figure C.2 – (a, b), Total Equity structure (%), Central European Transitional Countries, (2008-2018)

Note - Compiled by source[194]

The above two graphs indicate the Central European transitional countries and their respective changes in equity structures over the period of 2008-2017 years. The indicators generally resemble the overall move of the Eastern European transitional countries with the country specifications.

80

60

40

20

0

-20

-40

-60

2008 2009 2010 2011 2012 2013 2014 2015 2016 2017

■ Argentina ARG

■ Brazil BRA
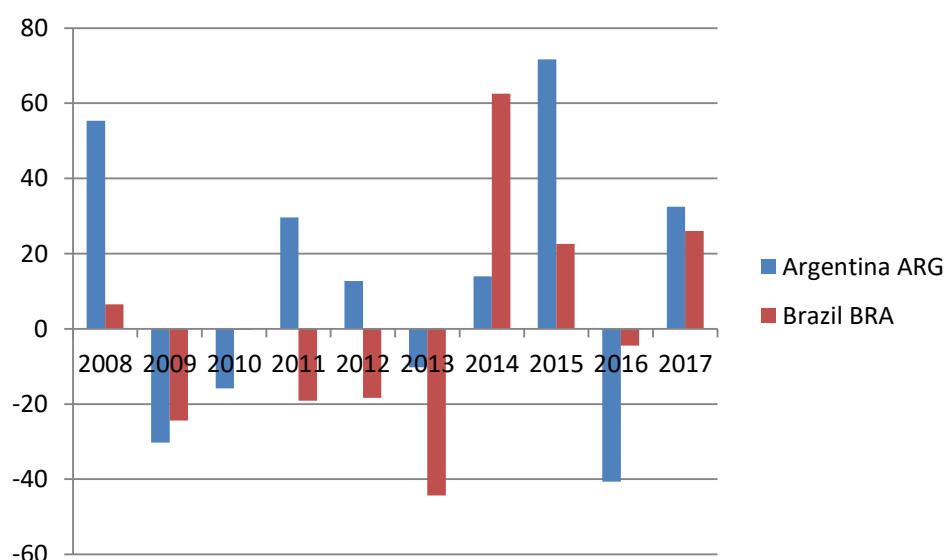
Figure C.3 –Total Equity structure (%), Peer Transitional Countries of Argentina and Brazil, (2008-2018)

The above graph shows the Total Equity structure of the peer transitional countries of Argentina and Brazil. The indicators of the fluctuations go in line with the overall other transitional country changes. However, we can observe that in years 2014 and 2015, first in Brazil, and then second in Argentina, there has been significant increase in the equity growth. These two countries were expected to grow rapidly and the international financial community has been investing largely into them. However, it didn't work out as expected. Eventually, it led to decrease of foreign funds allocation to the countries' securities growth with drastic percentage change in equity in 2016. Thereafter, there was a gradual improvement with less effect.

Overall statistics

This table D.1 represents the results of Augmented Dickey Fuller (ADF) test. The null hypothesis is that variable is non-stationary. ADF test report that all variables of the full sample are stationary at level

Table D.1–Unit root test for a full sample of bank specific and macroeconomic variables, 2008-2019

Variable:	ADF
ROA	-17,08*
NIM	-33,16*
Z-score	-11,91*
Commission	-23,18**
Credit risk	-17,16*
Equity to assets	-12,74*
Loan growth	-42,01*
Liquidity risk	-16,83*
Capital	-2,81*
Fee Income	-15,02*
GDP growth	-1,102
Inflation	-0,21
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability	

Table D.2 shows the regression coefficients of the Return on Assets profitability measurement model for the sub-sample of peer banks of Argentine and Brazil transitional economies. Standard errors are represented in parentheses.

Table D.2 – Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variable: ROA	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2	3	4	5	6	7	8
Variables							
Commission	-0,031* (0,008)	-0,031* (0,001)	-0,028* (0,001)	-0,019* (0,006)	-0,021** (0,006)	-0,022** (0,001)	-0,022* (0,006)
Credit risk	0,146* (0,043)	-0,066* (0,041)	1,344** (0,052)	1,349** (0,056)	1,328** (0,024)	1,807** (0,053)	1,101** (0,091)
Equity to assets	-0,007* (0,004)	-0,004* (0,002)	-0,003** (0,001)	-0,073** (0,003)	-0,008** (0,003)	3,034** (0,048)	-0,057** (0,001)
Loan growth	-0,022** (0,001)	0,023* (0,001)	-0,017* (0,001)	-0,023* (0,005)	-0,059* (0,006)	0,007* (0,004)	-0,061* (0,002)
ROA $_{t-1}$	0,024*** (0,001)	-0,021*** (0,001)	0,021*** (0,004)	0,022*** (0,001)	0,109*** (0,003)	0,021*** (0,002)	0,021*** (0,002)

Continuation of tableD.2

1	2	3	4	5	6	7	8
Crisis		0,011** (0,002)					
Reserve Requirements$_{t-1}$	-0,049* (0,001)	0,032* (0,001)			0,011* (0,001)		-0,005* (0,001)
Capital Requirements$_{t-1}$	-0,201* (0,001)	0,021* (0,004)				-1,309** (0,003)	-0,011** (0,003)
Activity restrictions$_{t-1}$	-0,011* (0,001)	0,014* (0,003)		-0,011** (0,002)	-0,023** (0,003)	-0,016** (0,003)	
GDP growth$_{t-1}$	0,116** (0,082)	0,101** (0,017)	0,101** (0,064)	0,117* (0,062)	0,101** (0,092)	-0,101* (0,067)	0,069*** (0,095)
Inflation$_{t-1}$	0,022* (0,002)	0,021* (0,001)	0,018* (0,001)	0,021* (0,002)	0,019* (0,001)	-0,25* (0,003)	-0,022* (0,003)
Adj. R sq.	0,651	0,402	0,301	0,441	0,399	0,881	0,623
Hansen-test	0,221	0,336	0,338	0,299	0,362	0,401	0,266
Observations	395	395	395	395	395	395	395
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability							

Table D.3 shows the regression coefficients of the Net Interest Margin profitability measurement model for the sub-sample of peer banks of Argentine and Brazil transitional economies. Standard errors are represented in parentheses.

Table D.3– Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variables: NIM	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2	3	4	5	6	7	8
Variables							
Commission	-0,011* (0,007)	-0,051* (0,001)	-0,022* (0,003)	-0,021* (0,009)	-0,021** (0,006)	-0,019** (0,001)	-0,022** (0,006)
Credit risk	-0,011* (0,001)	-0,006* (0,001)	1,209** (0,052)	1,309** (0,096)	1,328** (0,024)	1,889** (0,059)	1,001** (0,031)
Equity to assets	-0,025* (0,008)	-0,021* (0,002)	-0,027** (0,007)	-0,025** (0,008)	-0,008** (0,003)	3,089** (0,008)	-0,089** (0,007)
Loan growth	-0,044** (0,005)	0,041* (0,001)	-0,039* (0,005)	-0,059* (0,007)	-0,059* (0,006)	0,089* (0,004)	-0,056* (0,002)
NIM $_{t-1}$	0,091*** (0,014)	-0,087*** (0,011)	0,089*** (0,014)	0,066*** (0,019)	0,119*** (0,019)	0,089*** (0,014)	0,025*** (0,016)
Crisis		0,003** (0,002)					
Reserve Requirements$_{t-1}$	-0,021* (0,001)	0,032* (0,001)				0,078* (0,007)	-0,065* (0,001)
Capital Requirements$_{t-1}$	-0,202* (0,002)	0,071* (0,004)				-1,389** (0,093)	-0,112* (0,063)
Activity restrictions$_{t-1}$	-0,043* (0,001)	0,071** (0,003)		-0,063** (0,001)	-0,059** (0,003)	-0,009** (0,002)	

Continuation of tableD.3

1	2	3	4	5	6	7	8
GDP growth$_{t-1}$	0,022** (0,002)	0,021* (0,001)	0,021** (0,002)	0,019* (0,002)	0,019*** (0,002)	-0,019* (0,001)	0,021*** (0,001)
Inflation$_{t-1}$	0,042* (0,003)	0,041* (0,001)	0,039* (0,001)	0,041** (0,002)	0,036* (0,001)	-0,038** (0,003)	-0,036* (0,001)
Adj. R sq.	0,449	0,401	0,449	0,401	0,333	0,449	0,623
Hansen-test	0,229	0,301	0,337	0,339	0,269	0,401	0,266
Observations	393	393	393	393	393	393	393

* – significant at 10% levels, respectively Significance levels of the probability;
** – significant at 5% levels, respectively Significance levels of the probability;
*** – significant at 1% levels, respectively Significance levels of the probability

Table D.4 shows the regression coefficients of the risk measurement model for the sub-sample of peer banks of Argentine and Brazil transitional economies. Standard errors are represented in parentheses.

Table D.4– Regulation and risk, GMM, quarterly based, 2008-2019

Dependent variable: Z-Score	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2	3	4	5	6	7	8
Variables							
Commission	-0,009* (0,007)	-0,009* (0,001)	-0,011* (0,008)	-0,011* (0,001)	-0,019** (0,006)	-0,109** (0,001)	-0,011* (0,006)
Credit risk	-0,059* (0,009)	-0,042* (0,001)	1,009** (0,002)	1,216** (0,009)	1,558** (0,006)	1,889** (0,009)	1,201** (0,001)
Equity to assets	-0,059** (0,003)	-0,058* (0,002)	-0,017** (0,009)	-0,066** (0,008)	-0,008** (0,003)	3,089** (0,008)	-0,599*** (0,007)
Loan growth	-0,021*** (0,005)	0,021* (0,001)	-0,025* (0,005)	-0,009* (0,007)	-0,009* (0,006)	0,009* (0,004)	-0,006* (0,002)
Z-score $_{t-1}$	0,022*** (0,004)	-0,021*** (0,009)	0,019*** (0,004)	0,016*** (0,009)	0,019*** (0,009)	0,019*** (0,004)	0,025*** (0,006)
Crisis		0,321** (0,062)					
Reserve Requirements$_{t-1}$	-0,023** (0,006)	0,056** (0,001)			0,008* (0,007)		-0,055* (0,001)
Capital Requirements$_{t-1}$	-0,259* (0,002)	0,891* (0,004)				-1,389* (0,003)	-0,005* (0,003)
Activity restrictions$_{t-1}$	-0,201** (0,005)	0,081** (0,003)		-0,893** (0,001)	-0,599** (0,003)	-0,019** (0,009)	
GDP growth$_{t-1}$	0,011** (0,003)	0,011* (0,001)	0,011** (0,002)	0,019* (0,002)	0,019** (0,002)	-0,011* (0,001)	0,019** (0,002)
Inflation$_{t-1}$	0,022* (0,001)	0,021* (0,001)	0,029* (0,002)	0,026** (0,002)	0,026* (0,001)	-0,028** (0,001)	-0,026* (0,001)
Adj. R sq.	0,881	0,806	0,669	0,544	0,561	0,599	0,481
Hansen-test	0,301	0,296	0,326	0,337	0,299	0,338	0,299
Observations	395	395	395	395	395	395	393

Continuation of tableD.4

1	2	3	4	5	6	7	8
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability							

Table D.5 shows the regression coefficients of the Return on Assets profitability measurement model for the sub-sample of banks of Eastern European transitional economies. Standard errors are represented in parentheses.

Table D.5–Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variable: ROA	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables							
Commission	-0,006* (0,001)	-0,021* (0,001)	-0,061* (0,008)	-0,061* (0,001)	-0,011** (0,008)	-0,059** (0,001)	-0,022* (0,006)
Credit risk	-1,223** (0,007)	-0,112** (0,091)	1,012** (0,002)	1,566** (0,011)	1,051** (0,089)	1,596** (0,014)	1,591** (0,057)
Equity to assets	-0,087** (0,001)	-0,022* (0,002)	-0,107** (0,009)	-0,106* (0,008)	-0,558** (0,003)	0,087** (0,008)	-0,339*** (0,007)
Loan growth	-0,416* (0,001)	0,561* (0,001)	-0,051* (0,005)	-0,509* (0,007)	-0,401* (0,005)	0,599* (0,004)	-0,559* (0,007)
ROA $_{t-1}$	0,005*** (0,003)	-0,019*** (0,009)	0,061*** (0,004)	0,046*** (0,001)	0,559*** (0,001)	0,056*** (0,004)	0,022*** (0,006)
Crisis		0,013** (0,002)					
Reserve Requirements$_{t-1}$	-0,069** (0,031)	0,016** (0,001)			0,055* (0,011)		-0,055* (0,001)
Capital Requirements$_{t-1}$	-1,231* (0,004)	0,598* (0,004)				-1,557* (0,003)	-0,015* (0,001)
Activity restrictions$_{t-1}$	-0,073* (0,008)	0,059* (0,003)		-0,093* (0,001)	-0,013* (0,005)	-0,019* (0,009)	
GDP growth$_{t-1}$	0,442*** (0,031)	0,044* (0,014)	0,356* (0,022)	0,199* (0,022)	0,699* (0,022)	-0,191* (0,027)	0,082* (0,027)
Inflation$_{t-1}$	0,023* (0,002)	0,056** (0,001)	0,328** (0,009)	0,691** (0,002)	0,066* (0,002)	-0,568** (0,003)	-0,559* (0,001)
Adj. R sq.	0,771	0,664	0,556	0,601	0,428	0,661	0,728
Hansen-test	0,336	0,333	0,229	0,221	0,333	0,229	0,331
Observations	758	760	758	758	760	760	760
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability							

Table D.6 shows the regression coefficients of the Net Interest Margin profitability measurement model for the sub-sample of banks of Eastern European transitional economies. Standard errors are represented in parentheses.

Table D.6–Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variable: NIM	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables							
Commission	-0,011* (0,001)	-0,011* (0,001)	-0,231* (0,008)	-0,061* (0,001)	-0,021** (0,008)	-0,009** (0,001)	-0,331* (0,004)
Credit risk	0,113* (0,067)	-0,092* (0,063)	1,001** (0,002)	1,066** (0,071)	1,591** (0,099)	1,501** (0,014)	1,571** (0,017)
Equity to assets	-0,097* (0,001)	-0,015*** (0,002)	-0,067** (0,007)	-0,096* (0,001)	-0,058* (0,007)	0,057** (0,008)	-0,039** (0,007)
Loan growth	-0,016* (0,001)	0,061* (0,001)	-0,051* (0,005)	-0,059* (0,007)	-0,011* (0,005)	0,019* (0,007)	-0,059* (0,007)
NIM $_{t-1}$	0,065*** (0,013)	-0,079*** (0,019)	0,061*** (0,014)	0,056*** (0,011)	0,097*** (0,011)	0,056*** (0,014)	0,052*** (0,016)
Crisis		0,091** (0,011)					
Reserve Requirements$_{t-1}$	-0,599** (0,001)	0,006** (0,001)			0,089* (0,009)		-0,615* (0,001)
Capital Requirements $_{t-1}$	-0,031** (0,004)	0,059** (0,004)				-0,007* (0,003)	-0,077* (0,001)
Activity restrictions$_{t-1}$	-0,573* (0,058)	0,119* (0,033)		-0,013* (0,006)	-0,028* (0,005)	-0,019* (0,009)	
GDP growth$_{t-1}$	0,002* (0,001)	0,014* (0,004)	0,006* (0,002)	0,009* (0,002)	0,009* (0,001)	-0,007* (0,002)	0,012** (0,002)
Inflation$_{t-1}$	0,041*** (0,001)	0,046*** (0,011)	0,041** (0,002)	0,041** (0,005)	0,046** (0,002)	-0,017** (0,001)	-0,019** (0,001)
Adj. R sq.	0,667	0,533	0,552	0,501	0,339	0,664	0,597
Hansen-test	0,291	0,227	0,229	0,227	0,221	0,209	0,336
Observations	758	760	758	758	760	760	760
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability;							

Table D.7 shows the regression coefficients of the risk measurement model for the sub-sample of banks of Eastern European transitional economies. Standard errors are represented in parentheses.

Table D.7 – Regulation and risk, GMM, quarterly based, 2008-2019

Dependent variable: Z-score	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2	3	4	5	6	7	8
Variables							
Commission	-0,016* (0,001)	-0,021* (0,001)	-0,011* (0,008)	-0,044* (0,001)	-0,021** (0,005)	-0,023** (0,011)	-0,022** (0,003)
Credit risk	-2,002* (0,007)	-0,852** (0,001)	1,896* (0,002)	1,476** (0,001)	1,551** (0,009)	1,776** (0,005)	1,447** (0,001)
Equity to assets	-0,079** (0,001)	-0,082** (0,012)	-0,067** (0,009)	-0,027** (0,008)	-0,056** (0,002)	0,057** (0,008)	-0,057** (0,007)

Continuation of tableD.7

1	2	3	4	5	6	7	8
Loan growth	-0,016* (0,001)	0,021** (0,001)	-0,021* (0,005)	-0,019* (0,007)	-0,011** (0,005)	0,017** (0,004)	-0,027* (0,007)
Z-score $_{t-1}$	0,012*** (0,003)	-0,077*** (0,009)	0,061*** (0,011)	0,086*** (0,001)	0,049*** (0,001)	0,086*** (0,001)	0,042*** (0,009)
Crisis		0,693** (0,012)					
Reserve Requirements$_{t-1}$	-0,559** (0,011)	0,916** (0,001)			0,445* (0,001)		-0,567* (0,007)
Capital Requirements$_{t-1}$	-1,931** (0,014)	0,458** (0,014)				-1,558* (0,018)	-0,645* (0,011)
Activityrestrictions$_{t-1}$	-0,191** (0,008)	0,599** (0,003)		-0,453** (0,001)	-0,563** (0,015)	-0,456** (0,008)	
GDP growth$_{t-1}$	0,017** (0,001)	0,014* (0,004)	0,016** (0,002)	0,019* (0,004)	0,019* (0,004)	-0,018* (0,002)	0,012* (0,001)
Inflation$_{t-1}$	0,013* (0,001)	0,016** (0,001)	0,018** (0,001)	0,019** (0,001)	0,011* (0,001)	-0,009* (0,001)	-0,019* (0,001)
Adj. R sq.	0,645	0,661	0,441	0,885	0,667	0,579	0,778
Hansen-test	0,301	0,297	0,331	0,332	0,299	0,387	0,293
Observations	758	760	760	758	760	760	760

* – significant at 10% levels, respectively Significance levels of the probability;
** – significant at 5% levels, respectively Significance levels of the probability;
*** – significant at 1% levels, respectively Significance levels of the probability

Table D.8 shows the regression coefficients of the Return on Assets profitability measurement model for the sub-sample of banks of Balkan and Caucasus transitional economies. Standard errors are represented in parentheses

Table D.8–Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variable: ROA	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2	3	4	5	6	7	8
Variables							
Commission	-0,017** (0,007)	-0,021* (0,001)	-0,045* (0,008)	-0,014* (0,001)	-0,021** (0,005)	-0,017** (0,003)	-0,022** (0,003)
Credit risk	-0,797* (0,068)	-0,116** (0,071)	1,066* (0,082)	1,476** (0,081)	1,451* (0,069)	1,956* (0,055)	1,597** (0,045)
Equity to assets	-0,089* (0,071)	-0,597* (0,062)	-0,777* (0,049)	-0,877** (0,098)	-0,594** (0,032)	0,889* (0,059)	-0,597** (0,067)
Loan growth	-0,086* (0,001)	0,009** (0,001)	-0,027* (0,005)	-0,014* (0,007)	-0,052** (0,005)	0,071* (0,008)	-0,079* (0,007)
ROA $_{t-1}$	0,013*** (0,003)	-0,059*** (0,009)	0,018*** (0,001)	0,027*** (0,001)	0,019*** (0,005)	0,029*** (0,007)	0,097*** (0,009)
Crisis		0,003* (0,002)					

Continuation of tableD.8

1	2	3	4	5	6	7	8
Reserve Requirements$_{t-1}$	0,066** (0,001)	0,067* (0,007)			0,019* (0,008)		-0,047* (0,007)
Capital Requirements$_{t-1}$	-1,179* (0,004)	0,498* (0,004)				-1,578* (0,008)	-0,558** (0,001)
Activity restrictions$_{t-1}$	-0,011* (0,009)	0,079* (0,003)		-0,013** (0,001)	-0,031** (0,011)	-0,018** (0,009)	
GDP growth$_{t-1}$	0,477** (0,071)	0,574* (0,074)	0,596** (0,052)	0,559* (0,057)	0,569** (0,034)	-0,528* (0,067)	0,445* (0,072)
Inflation$_{t-1}$	0,023* (0,001)	0,077** (0,001)	0,018** (0,005)	0,059* (0,007)	0,051* (0,008)	-0,077** (0,007)	-0,049* (0,011)
Adj. R sq.	0,771	0,669	0,591	0,776	0,661	0,679	0,558
Hansen-test	0,338	0,201	0,229	0,225	0,228	0,227	0,223
Observations	282	282	282	282	282	282	282
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability;							

Table D.9 shows the regression coefficients of the Net Interest Margin profitability measurement model for the sub-sample of banks of Balkan and Caucasus transitional economies. Standard errors are represented in parentheses.

Table D.9–Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variable: NIM	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2	3	4	5	6	7	8
Variables							
Commission	-0,011* (0,001)	-0,041* (0,001)	-0,038* (0,008)	-0,009* (0,001)	-0,021* (0,005)	-0,029** (0,003)	-0,029* (0,090)
Credit risk	-0,459* (0,058)	-0,495** (0,041)	1,049* (0,052)	1,887** (0,031)	1,591* (0,079)	1,496* (0,075)	1,777** (0,025)
Equity to assets	-0,099* (0,001)	-0,077* (0,002)	-0,017* (0,002)	-0,017** (0,001)	-0,011** (0,002)	0,015** (0,001)	-0,017** (0,002)
Loan growth	-0,016** (0,001)	0,011** (0,001)	-0,018* (0,005)	-0,014* (0,007)	-0,012** (0,003)	0,019* (0,001)	-0,019* (0,001)
NIM $_{t-1}$	0,091*** (0,003)	-0,016*** (0,009)	0,098*** (0,004)	0,087*** (0,001)	0,029*** (0,005)	0,055*** (0,007)	0,087*** (0,009)
Crisis		0,017** (0,002)					
Reserve Requirements$_{t-1}$	-0,025** (0,001)	0,076* (0,007)			0,099* (0,002)		-0,037** (0,007)
Capital Requirements$_{t-1}$	-0,056* (0,004)	0,027* (0,004)				-1,598* (0,008)	-0,298** (0,001)
Activity restrictions$_{t-1}$	-0,049* (0,002)	0,021** (0,001)		-0,033** (0,001)	-0,023** (0,001)	-0,055** (0,002)	
GDP growth$_{t-1}$	0,007** (0,001)	0,014* (0,004)	0,017** (0,002)	0,011* (0,007)	0,009** (0,004)	-0,008* (0,007)	0,015* (0,002)

Continuation of tableD.9

1	2	3	4	5	6	7	8
Inflation$_{t-1}$	0,045* (0,001)	0,037** (0,001)	0,042** (0,006)	0,037* (0,007)	0,041* (0,008)	-0,049* (0,007)	-0,029* (0,001)
Adj. R sq.	0,665	0,559	0,501	0,558	0,555	0,677	0,631
Hansen-test	0,229	0,228	0,221	0,224	0,223	0,230	0,223
Observations	282	282	282	282	282	282	282
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability							

Table D.10 shows the regression coefficients of the risk measurement model for the sub-sample of banks of Balkan and Caucasus transitional economies. Standard errors are represented in parentheses.

Table D.10–Regulation and risk, GMM, quarterly based, 2008-2019

Dependent variable: Z-score	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables							
Commission	-0,022* (0,008)	-0,019* (0,011)	-0,025* (0,008)	-0,029* (0,011)	-0,021** (0,005)	-0,029** (0,003)	-0,019* (0,003)
Credit risk	-0,859* (0,008)	-0,915* (0,001)	1,063* (0,002)	1,789** (0,001)	1,261** (0,002)	1,776* (0,001)	1,497** (0,001)
Equity to assets	-0,097* (0,007)	-0,083* (0,002)	-0,097** (0,011)	-0,081** (0,008)	-0,049** (0,002)	0,077* (0,009)	-0,047** (0,008)
Loan growth	-0,016** (0,001)	0,011** (0,001)	-0,018* (0,005)	-0,014* (0,007)	-0,012** (0,009)	0,017* (0,008)	-0,011* (0,009)
Z-score $_{t-1}$	0,017*** (0,003)	-0,016*** (0,007)	0,016*** (0,004)	0,017*** (0,001)	0,012*** (0,005)	0,015*** (0,007)	0,017*** (0,006)
Crisis		0,206** (0,002)					
Reserve Requirements$_{t-1}$	-0,259** (0,001)	0,097** (0,007)			0,019* (0,008)		-0,077** (0,007)
Capital Requirements$_{t-1}$	-0,064** (0,004)	0,079** (0,004)				-1,358* (0,008)	-0,779** (0,001)
Activity restrictions$_{t-1}$	-0,099** (0,002)	0,096** (0,001)		-0,119* (0,001)	-0,253* (0,001)	-0,495** (0,001)	
GDP growth$_{t-1}$	0,019** (0,001)	0,014* (0,004)	0,017* (0,002)	0,017* (0,007)	0,019* (0,001)	-0,018* (0,002)	0,015* (0,002)
Inflation$_{t-1}$	0,019* (0,001)	0,017** (0,001)	0,012** (0,006)	0,017** (0,003)	0,011* (0,001)	-0,019* (0,002)	-0,019* (0,001)
Adj. R sq.	0,499	0,557	0,553	0,551	0,559	0,441	0,449
Hansen-test	0,227	0,236	0,229	0,227	0,227	0,231	0,228
Observations	282	282	282	282	282	282	282
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability;							

Table D.11 shows the regression coefficients of the Return on Assets profitability measurement model for the sub-sample of banks of Central European transitional economies. Standard errors are represented in parentheses.

Table D.11–Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variable: ROA	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables							
Commission	-0,019* (0,001)	0,011* (0,002)	-0,026* (0,002)	-0,017** (0,001)	-0,019* (0,002)	-0,019* (0,001)	-0,016* (0,001)
Credit risk	-0,558* (0,031)	-0,274* (0,037)	1,001* (0,097)	1,597* (0,021)	1,597* (0,039)	1,598* (0,001)	1,156* (0,065)
Equity to assets	-0,089* (0,057)	-0,055* (0,082)	-0,057* (0,049)	-0,098* (0,068)	-0,099* (0,019)	0,089* (0,053)	-0,078* (0,097)
Loan growth	-0,079* (0,002)	0,061* (0,001)	-0,097** (0,005)	-0,059** (0,002)	-0,062* (0,002)	0,098* (0,001)	-0,059* (0,001)
ROA $_{t-1}$	0,005*** (0,003)	-0,011*** (0,003)	0,019*** (0,001)	0,011*** (0,006)	0,019*** (0,002)	0,017*** (0,003)	0,009*** (0,001)
Crisis		0,009** (0,002)					
Reserve Requirements$_{t-1}$	0,095* (0,008)	0,059* (0,001)			0,027** (0,007)		-0,099* (0,007)
Capital Requirements$_{t-1}$	-1,009** (0,004)	-0,503** (0,001)				-1,552* (0,008)	-0,588* (0,001)
Activity restrictions$_{t-1}$	-0,015** (0,008)	-0,012** (0,003)		-0,018* (0,006)	-0,018* (0,009)	-0,018* (0,009)	
GDP growth$_{t-1}$	0,443* (0,081)	-0,053* (0,051)	0,321* (0,032)	0,552** (0,053)	0,582* (0,097)	-0,853** (0,077)	0,059* (0,082)
Inflation$_{t-1}$	0,597** (0,001)	0,027* (0,008)	0,776* (0,003)	0,269** (0,008)	0,259* (0,008)	-0,459* (0,006)	-0,639* (0,001)
Adj. R sq.	0,499	0,551	0,501	0,458	0,445	0,558	0,449
Hansen-test	0,336	0,326	0,339	0,401	0,331	0,299	0,223
Observations	416	416	416	416	416	416	416
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability;							

Table D.12 shows the regression coefficients of the Net Interest Margin profitability measurement model for the sub-sample of banks of Central European transitional economies. Standard errors are represented in parentheses.

Table D.12–Regulation and profitability, GMM, quarterly based, 2008-2019

Dependent variable: NIM	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variables							
Commission	-0,023* (0,001)	0,011** (0,002)	-0,006* (0,001)	-0,017* (0,001)	-0,019* (0,002)	-0,016** (0,003)	-0,011* (0,003)
Credit risk	-0,137** (0,017)	-0,894* (0,038)	0,991* (0,097)	1,558* (0,061)	1,559* (0,069)	1,638** (0,071)	1,006** (0,035)
Equity to assets	-0,051* (0,001)	-0,015* (0,002)	-0,019* (0,001)	-0,008* (0,002)	-0,019* (0,001)	0,029** (0,003)	-0,087** (0,002)
Loan growth	-0,087* (0,006)	0,061* (0,004)	-0,017* (0,005)	-0,069* (0,001)	-0,071* (0,001)	0,058* (0,002)	-0,059* (0,001)
NIM $_{t-1}$	-0,051*** (0,005)	-0,011*** (0,003)	0,091*** (0,001)	0,079*** (0,006)	0,083*** (0,002)	0,091*** (0,001)	0,059*** (0,002)
Crisis		0,026** (0,007)					
Reserve Requirements$_{t-1}$	-0,016* (0,001)	0,139** (0,001)			0,197** (0,017)		-0,016* (0,002)
Capital Requirements$_{t-1}$	0,003* (0,003)	-0,973* (0,001)				-1,492** (0,008)	-0,558* (0,001)
Activity restrictions$_{t-1}$	0,057* (0,007)	-0,896* (0,003)		-0,878** (0,006)	-0,055** (0,009)	-0,068* (0,009)	
GDP growth$_{t-1}$	-0,017* (0,002)	-0,023* (0,001)	0,014* (0,002)	0,012* (0,003)	0,012* (0,001)	-0,023* (0,001)	0,019* (0,002)
9Inflation$_{t-1}$	-0,041* (0,001)	0,023* (0,001)	0,025** (0,003)	0,029* (0,001)	0,039** (0,001)	-0,027* (0,001)	-0,036** (0,001)
Adj. R sq.	0,499	0,408	0,397	0,448	0,466	0,454	0,401
Hansen-test	0,331	0,299	0,339	0,391	0,338	0,335	0,332
Observations	416	416	416	416	416	416	416
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability;							

Table D.13 shows the regression coefficients of the risk measurement model for the sub-sample of banks of Central European transitional economies. Standard errors are represented in parentheses.

Table D.13–Regulation and risk, GMM, quarterly based, 2008-2019.

Dependent variable: Z-score	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	2	3	4	5	6	7	8
Variables							
Commission	-0,041* (0,008)	0,038* (0,007)	-0,066** (0,008)	-0,037* (0,001)	-0,099* (0,005)	-0,026* (0,003)	-0,051** (0,003)
Credit risk	-0,457** (0,017)	-0,104* (0,013)	0,091** (0,007)	1,598* (0,001)	1,499* (0,009)	1,558** (0,001)	1,113* (0,005)

Continuation of tableD.13

1	2	3	4	5	6	7	8
Equity to assets	-0,055* (0,001)	-0,079* (0,002)	-0,019* (0,009)	-0,018** (0,008)	-0,021* (0,009)	0,018* (0,003)	-0,014* (0,007)
Loan growth	-0,021* (0,006)	0,011* (0,004)	-0,457* (0,005)	-0,149* (0,008)	-0,892* (0,006)	0,458* (0,008)	-0,359* (0,006)
Z-score $_{t-1}$	-0,074*** (0,005)	-0,033*** (0,003)	0,441*** (0,001)	0,596*** (0,006)	0,559*** (0,002)	0,591*** (0,009)	0,499*** (0,008)
Crisis		0,036** (0,006)					
Reserve Requirements$_{t-1}$	-0,776* (0,011)	0,039* (0,011)			0,193* (0,006)		-0,811* (0,007)
Capital Requirements$_{t-1}$	0,011* (0,003)	-0,033* (0,001)				-1,552* (0,008)	-0,968* (0,001)
Activity restrictions$_{t-1}$	0,497** (0,007)	-0,806** (0,003)		-0,558* (0,006)	-0,668* (0,009)	-0,598* (0,009)	
GDP growth$_{t-1}$	-0,011* (0,002)	-0,019** (0,001)	0,016** (0,002)	0,012* (0,003)	0,012* (0,001)	-0,013* (0,001)	0,019** (0,002)
Inflation$_{t-1}$	-0,011* (0,001)	0,017* (0,002)	0,016* (0,003)	0,015* (0,001)	0,019*** (0,001)	-0,019* (0,001)	-0,014** (0,001)
Adj. R sq.	0,339	0,337	0,352	0,331	0,396	0,356	0,349
Hansen-test	0,199	0,248	0,229	0,298	0,226	0,337	0,289
Observations	416	416	416	416	416	416	416

* – significant at 10% levels, respectively Significance levels of the probability;
** – significant at 5% levels, respectively Significance levels of the probability;
*** – significant at 1% levels, respectively Significance levels of the probability;

Overall statistics

Table E.1 shows the regression coefficients of the Return on Assets profitability measurement model for the five different samples of examined banks of transitional economies. Standard errors are represented in parentheses.

Table E.1 – Profitability, GMM, quarterly based, 2008-2019

Dependent variable: ROA	Full sample	Peer countries	Balkan and Caucasus	Eastern Europe	Central Europe
Variables					
Commission	-0,009* (0,005)	-0,023* (0,008)	-0,021** (0,007)	-0,006* (0,001)	-0,021* (0,008)
Credit risk	1,475* (0,005)	0,146* (0,003)	-0,797* (0,008)	-1,223* (0,007)	-0,558* (0,001)
Equity to assets	-0,057* (0,001)	-0,017* (0,009)	-0,089* (0,001)	-0,087* (0,001)	-0,789* (0,007)
Loan growth	-0,011* (0,006)	-0,011** (0,007)	-0,586* (0,001)	-0,416* (0,001)	-0,579* (0,582)
ROA $_{t-1}$	0,033*** (0,007)	0,023*** (0,008)	0,021*** (0,003)	0,005*** (0,003)	0,005*** (0,003)
Crisis					
Liquidity risk$_{t-1}$	-0,054* (0,001)	-0,049* (0,001)	1,566** (0,001)	-0,469** (0,631)	1,495* (0,558)
Capital$_{t-1}$	-0,290* (0,060)	-0,201* (0,001)	-1,179* (0,004)	-1,231** (0,004)	-1,009** (0,074)
Fee Income$_{t-1}$	-0,021* (0,008)	-0,021* (0,005)	-0,011* (0,009)	-0,013** (0,008)	-0,015** (0,008)
GDP growth $_{t-1}$	0,123** (0,087)	0,116** (0,082)	0,477** (0,071)	0,442** (0,031)	0,443* (0,081)
Inflation$_{t-1}$	0,060* (0,002)	0,022* (0,002)	0,123* (0,001)	0,023* (0,001)	0,597** (0,001)
Adj. R sq.	0,878	0,651	0,771	0,771	0,499
Hansen-test	0,335	0,221	0,338	0,336	0,336
AB test for AR (1) p-value	0,000	0,000	0,000	0,000	0,000
AB test for AR (2) p-value	0,441	0,422	0,390	0,457	0,411
p-value (F-*test*)	0,000	0,000	0,000	0,000	0,000
Observations	1849	395	282	758	416
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability					

Table E.2 shows the regression coefficients of the Net Interest Margin profitability measurement model for the five different samples of examined banks of transitional economies. Standard errors are represented in parentheses.

Table E.2 – Profitability, GMM, quarterly based, 2008-2019

Dependent variable: NIM	Full sample	Peer countries	Balkan and Caucasus	Eastern Europe	Central Europe
Variables					
Commission	-0,025* (0,005)	-0,024* (0,007)	-0,019* (0,008)	-0,011* (0,001)	-0,019* (0,008)
Credit risk	-0,115** (0,004)	-0,101* (0,009)	-0,459* (0,008)	0,113* (0,007)	-0,137** (0,007)
Equity to assets	-0,021** (0,005)	-0,025* (0,003)	-0,029* (0,001)	-0,027* (0,001)	-0,021* (0,001)
Loan growth	0,081** (0,004)	-0,092** (0,035)	-1,596** (0,901)	-0,616* (0,041)	-1,001* (0,086)
NIM $_{t-1}$	0,025*** (0,007)	0,021*** (0,004)	0,091*** (0,003)	0,025*** (0,003)	-0,021*** (0,005)
Crisis					
Liquidity risk$_{t-1}$	0,081** (0,001)	-0,081** (0,006)	-0,225** (0,001)	-0,599** (0,001)	-0,016* (0,001)
Capital$_{t-1}$	0,029* (0,009)	-0,202* (0,002)	-0,956* (0,004)	-0,931** (0,004)	0,005* (0,003)
Fee Income$_{t-1}$	0,022** (0,008)	-0,021** (0,005)	-0,019* (0,002)	-0,023* (0,008)	0,017** (0,007)
GDP growth$_{t-1}$	0,002* (0,001)	0,003** (0,002)	0,007** (0,001)	0,092* (0,001)	-0,003* (0,002)
Inflation$_{t-1}$	-0,014** (0,001)	0,022* (0,003)	0,005* (0,001)	0,021*** (0,002)	-0,011* (0,006)
Adj. R sq.	0,791	0,449	0,665	0,667	0,499
Hansen-test	0,339	0,229	0,229	0,291	0,331
AB test for AR (1) p-value	0,000	0,000	0,000	0,000	0,000
AB test for AR (2) p-value	0,408	0,353	0,340	0,456	0,395
p-value (F-*test*)	0,000	0,000	0,000	0,000	0,000
Observations	1849	393	282	758	416
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability					

Table E.3 shows the regression coefficients of the Net Interest Margin profitability measurement model for the five different samples of examined banks of transitional economies.

Table E.3 – Risk, GMM, quarterly based, 2008-2019

Dependent variable: Z-score	Full sample	Peer countries	Balkan and Caucasus	Eastern Europe	Central Europe
Variables					
Commission	-0,088** (0,001)	-0,079* (0,002)	-0,072* (0,002)	-0,076* (0,001)	-0,081* (0,002)
Credit risk	-0,114* (0,005)	-0,059* (0,009)	-0,059* (0,008)	-0,022* (0,007)	-0,023** (0,007)
Equity to assets	-0,011* (0,001)	-0,059** (0,003)	-0,097* (0,002)	-0,079*** (0,001)	-0,021* (0,001)
Loan growth	0,010* (0,002)	-0,81*** (0,012)	-0,496** (0,301)	-0,556* (0,071)	-1,021* (0,776)
Z-score $_{t-1}$	0,011*** (0,001)	0,006*** (0,004)	0,007*** (0,003)	0,012*** (0,003)	-0,021*** (0,005)
Crisis					
Liquidity risk$_{t-1}$	0,133* (0,002)	-0,079** (0,006)	-0,259** (0,001)	-0,559** (0,161)	-0,776* (0,011)
Capital$_{t-1}$	0,012* (0,001)	-0,259* (0,002)	-0,959*** (0,004)	-1,931* (0,004)	0,011* (0,003)
Fee Income$_{t-1}$	0,010* (0,002)	-0,008* (0,002)	-0,099* (0,002)	-0,191*** (0,002)	0,497* (0,002)
GDP growth$_{t-1}$	0,013** (0,003)	0,006** (0,003)	0,009** (0,001)	0,007** (0,001)	-0,011* (0,002)
Inflation$_{t-1}$	-0,013* (0,002)	0,012* (0,003)	0,009* (0,001)	0,033* (0,002)	-0,011* (0,002)
Adj. R sq.	0,779	0,881	0,499	0,645	0,339
Hansen-test	0,301	0,301	0,227	0,301	0,199
AB test for AR (1) p-value	0,000	0,000	0,000	0,000	0,000
AB test for AR (2) p-value	0,568	0,417	0,429	0,508	0,488
p-value (F-*test*)	0,000	0,000	0,000	0,000	0,000
Observations	1849	395	282	758	416
* – significant at 10% levels, respectively Significance levels of the probability; ** – significant at 5% levels, respectively Significance levels of the probability; *** – significant at 1% levels, respectively Significance levels of the probability					