



Investigating the Effect of Shadow Banking on the Banks' Risks in Terms of Capital Adequacy in Tehran Stock Exchange

Mehdi Fadaee^{1*}, Saeid Yousefizadeh Naeini²

¹ Assistant Professor of Economics, Payame Noor University, Iran.

² Ph.D. student in Public Administration, Faculty of Humanities, Islamic Azad University, Khorasgan Branch, Iran.

*Corresponding Author

Abstract: *The aim of the current study was to investigate the effect of shadow banking on the banks' risks in terms of capital adequacy in the Tehran Stock Exchange. This research was conducted during 2011 to 2016 and the accepted banks were selected as the samples. In order to analyze the research data through a mixed method, a multivariate regression model has been used in EViews econometric software. In this research, the dependent variable was risk-taking and the independent variable was capital adequacy, the mediator variable was governance system and the control variables were financial leverage, size and return on assets. The research findings showed that there was a significant relationship between risk-taking and banks' capital adequacy in shadow banking. Moreover, there was a significant relationship between risk-taking and banks' governance system in shadow banking. However, the bank governance system did not play a mediating role with regard to the relationship between risk-taking and capital adequacy of banks in shadow banking.*

Keywords: *Shadow Banking, Risk-taking, Capital adequacy, Tehran Stock Exchange.*

INTRODUCTION

Markets and financial institutions growth and, as a result, varied products in this context, in a fast and reliable manner, have made the process of financing and procurement of the necessary credits for the affairs' improvement as a requirement and priority of the country's economy at the level of the company and individuals. In the meantime, developed countries have been able to afford the necessary infrastructure in this regard very well. While, developing countries have a long way to go, so that, the World Bank facts and figures designate that nowadays, less than 25 percent of the people living in developing countries have access to official financial services. In developed markets, this ratio is more than 90 percent (Jalili, 2010). As the economy of a country grows the share of financial services and banking increases. Fundamentally, the financial and banking sector of the country plays a chief role in realizing the goals and future prospects with its own internal growth. The banking system supports entrepreneurship and enables thoughts to be linked with capitals and financial capabilities, whose product is innovation and progress in the country (Jalili, 2010).

In recent times, studies are increasingly interested in scrutinizing the probable effects of shadow banks on the economic system. The term "shadow bank" refers to an institution that does not embrace the supervision that banks must observe to participate in financing. Supporters consider shadow banking as an innovation that

enriches financial channels and helps a fully market-based financial system. The International Monetary Fund (IMF) (2014) declared that shadow banking could increase credit access that supports market liquidity, maturation transformation, and risk sharing. However, critics should not be worried that shadow banking might lead to a high level of debt and lower levels of transparency, which may have a major risk (Allen et al., 2016). The Independence Fund (2014) warns that, in emerging markets, shadow banks create the greatest risk to the global economy.

Researchers divide the credit activities of the shadow banking system into two types. The first type refers to non-bank financial institutions that are outside the banking system. This system is evident typically in European and American countries. The second type primarily occurs within the banking system in order to avoid any legal constraints. Elliott et al. (2015) believed that two-thirds of the trade flows in shadow banking are related to the inside of the banks and the third part is related to outside of the banking system. Yin and Wang (2013) also argued that, due to contractionary monetary policy, the second type of shadow banking has increased since 2010. Furthermore, due to the strict capital adequacy ratios in Basel new agreement and the limitation of 75 percent debt-to-deposit ratio, banks were not able to lend to final users through the normal system. In order to avoid these legal restrictions, banks use interbank credits, credit bonds, and other items to hide the loans that they lend to companies.

Suitable and sufficient capital is one of the obligatory conditions for maintaining the health of the banking system, and each bank and credit institution in order to ensure the stability and sustainability of its operations must always maintain a good relationship between capital and risk in its assets. The foremost function of this ratio is the protection of the bank against unexpected losses and the protection of depositors and creditors. Due to the protection that this ratio has made against the incurred losses, preserving and maintaining sufficient and adequate capital with the existing risks is the main source of public confidence in the banks in particular and the banking system in general. In that sense, in the monetary and banking law of the country this necessity has been emphasized and in the Article 14 of this law, to the same extent, capital is explicitly referred to the asset types.

Most of the bank's activities face risks, but among these activities of the bank, loans services have more risks. In different countries, to address this type of risk, numerous regulations, such as deposit insurance (to protect depositors against bank risks) and capital constraints have been enforced. Though due to the numerous banking crises, such as the 2007-2008 credit crises in US banks, originated from unsupported loans, it is known that the banking sector needs more financial regulation and special attention to the risks ahead. Reuters (2013) claimed that banks, by the means of credit owners' rights, hide their risky corporate loans as interbank loans. The Wall Street Journal (2013) claimed that: "More importantly, the bank is allowed to set aside less capital to deal with losses, because a loan to a bank is safer than a loan to a company".

The Economist (2014) defined the rights of creditors as another method of restraining banking transactions and trust. Due to the fact that interbank loans apply a lower risk in the Basel agreement, those banks holding a large percentage of the rights of creditors lead to a large estimate compared to the value of capital adequacy. On the other hand, the fact that good corporate governance can increase the positive relationship raised by the risk-taking hypothesis has been confirmed in numerous studies. When the board of directors accept shadow banking and risk-taking, a bank with good management implements these activities effectively. Consequently, this implementation increases the effect of shadow banking on risks. The opposite opinion argues that suitable management may reduce the positive relationship. The desirable management of the bank tries to coordinate the managers and shareholders' interests. When a manager performs shadow banking and shows a desire to risk, a bank with strong independent managers is prone to risk-taking, or even uses a senior risk employee to protect themselves from this potential possibility. Henceforth, good governance reduces the managers' behavior to overuse their power to take risks. Hence, such governance avoids reducing the welfare of shareholders.

Due to the importance of banking and macroeconomic system, founding a governance system in banks is important. Obviously, it should be accredited that setting up a banking system in banks is different from establishing it in other financial institutions. The complexity of banks' activities raises the information asymmetry and reduces shareholders' power toward managing the banks. Banks play a major role in financing of the developing countries. They are also cooperatives that due to the deposits received from customers, have high debt ratios. According to the stated reasons, they are more affected by regulations, so that they must be more responsive to depositors' rights, reduce their risk and ensure the stability of the payment system.

According to what was said, the current research tried to answer this question "whether the bank governance system had a mediating role in line with the relationship between the risk-taking and the adequacy of banks' capital in shadow banking?"

Theoretical foundations and experimental research background

Banks play a key role in the financial services of developing process, though banks offer their resources mainly to large corporations. Since providing services to small and medium-sized businesses is very costly, these sectors are less considered. Designing and applying a credit assessment system as a very important factor in financial services development in a fair manner plays an essential role in all sectors. If granting credit facilities in the community be more comprehensive and systematic, the economic sectors would be able to access financial resources in a better and more secure method and they would be able to use these resources in an optimal way (Jalili, 2010).

The Financial Stability Board (2013) have offered a comprehensive new definition of shadow banking. Based on this definition, financial intermediary includes all financial activities outside the banking network. Shadow banking is a set of non-bank financial intermediaries such as investment funds, mortgage institutions, joint venture funds, money market mutual funds and hedge funds as well as leasing companies. In shadow banking, there are products such as asset-backed securities, proxy loans, wealth management products, structured finance, and so on. To measure shadow banking, different criteria have been presented. Some of these criteria are shadow banking definitions based on activity, entity or entity and activity. In order to measure shadow banking, the funds' flow in non-bank financial institutions can be used. In this measurement criterion, statistical information on the flow of funds of financial assets of non-bank financial institutions is calculated. This criterion is offered based on entity-based definitions. Another measurement criterion offered by the financial stability board is the use of cash flows and accounts in shadow banking, with a focus on the type of shadow banking activity, and according to the type of activity and institution, the third criterion is offered based on non-core debts. This criterion has been introduced in recent studies of the financial stability board as a benchmark for shadow banking measurement, which is essentially the traditional financial intermediaries' financing including non-core debts of banks and other financial institutions. The criteria of funds' flow and non-core funds of the money market mutual funds have not been considered, that is while this also includes financial stability board criterion.

In the shadow banking, money market mutual funds are active in purchasing debt securities such as treasury bills and short-term bills; issuing deposit certificates and repurchasing contracts. Investment funds also invest in a vast range of assets on the behalf of their clients as a proxy. Real estate investment trusts are also among other shadow banking activists whose real aim is to make revenues in the real estate sector. They are active in investing in real estate, or buying and selling them and mortgage loans, as well as funding for the financing of mortgage companies. The hedge fund is, in fact, liquidity pools that have been established to reduce the risk of investment. They are able to achieve high returns through a variety of financial tools such as transaction options and future operations and have to manage the ahead risks better. Securitization is also another activity that is important in shadow banking. In securitization process, financial intermediaries, lend directly to investors through assets, and funding is done by investors who buy exchangeable financial

instruments. Consequently, in the process of converting assets into securities, institutions that need financing, aim at setting up a company with specific purposes, and sell those financial assets that have future cash flows to the company having a special purpose. These companies with a specific purpose, issue debt securities with the backing of assets to raise funds for financial assets' purchasing, and it is offered to the public. From now on, having earned the funds from selling debt securities, the company buys financial assets to the main company and pays the buyer investors of asset-backed debt securities through company financial asset cash flows with the specific purpose of efficiency.

However, the used definition of banking in this study is slightly different from the above-mentioned studies because banks themselves play an inseparable role in the shadow banking system. This issue has been stated in China, so that the General Office of the State Council (2013) has identified the three categories of shadow banking in China. The first category includes illegal entities that do not have financial services' licenses (for example, Internet financial corporations and wealth management institutions), and the second category includes poor financial intermediaries that do not have financial services licenses. The third category covers financial institutions that are fully licensed and well monitored, but they tend to control poor or illegal businesses (for example cash funds, asset wealth segmentation, and some wealth management products).

Because of the information asymmetry, some large banks are afraid of providing financial backing to small and medium-sized enterprises since it could create distorted financial Statements for these companies. For any reason, shadow banking creates new products through offering corporate loans that go away from loan regulations. For example, banks can cooperate with non-bank financial intermediaries or use interbank accounts that have restrictions on lending in line with funding. Put simply, shadow banking mentions conditions that Chinese banks to violate various loan regulations and to provide the validity of the system deviate from their way without increasing the loans. Such activities occur within the banking system and banks play a significant role.

Due to the fact that this type of shadow banking is a new type, Yin and Wang (2013) called the third type of shadow banking as "shadow bank", which has been used in different countries, of course, it is also referred as "Chinese shadow banking style". Later, more and more reports have been offered by investment banks that have adopted these conditions for Chinese shadow banking.

Taghavi et al. (2013), in their study, with an emphasis on bank ownership indexes, scrutinized the effect of corporate governance on the stability of the banking system in developing countries. In this research, the effect of the ownership structure of banks has been investigated as a corporate governance measure on bank stability indicators in some developing countries. The ownership structure of banks has been investigated as a variable, independent of state ownership, private property, and foreign ownership. The statistical sample included 40 selected countries from developing countries during 2000-2011. To test the hypothesis, the method of random effects of panel data was used. The results of the survey indicated that the banks state ownership had a greater effect regarding the increase of overdue claims on private and foreign ownership. However, foreign ownership acted better than other ownership types in terms of bank profitability ratios.

Bozorg Asl et al. (2018) examined the effect of liquidity risk and credit risk on financial sustainability in the banking industry in Iran by the means of a quantile regression approach. This research examined credit risk and liquidity risk together in banks and its effect on financial stability in the banking industry in Iran from 2005 to 2014 through the Panel Data method. The research results indicated a negative and significant effect of these two risks on financial sustainability in most of the studied quantile, so that, with increasing financial sustainability, the effect of these two risks on sustainability decreased.

Simper et al. (2017) in a study investigated the way of controlling risk management variable through having an analysis of bank profit efficiency in the banks of South Korean having a profit-based approach for estimating banks' efficiency during 2007-2011. They determined that it would be possible to determine the rate of return by considering the variables and indicators explaining bank risk, such as the ratio of non-performing loans as input variables in the DEA method.

Having considered the number of bank branches and the number of personnel as inputs, investment and volume of deposits as output, Dang et al. (2017), in a research entitled " Management, efficiency and risk-taking in the banking Chinese", and obtained the effect of banks' efficiency through considering the credit risk and total risk by means of the DEA model. Accordingly, they ranked banks and obtained a significant relationship between risk and asset.

Zhang et al. (2012) in a study entitled "Bank risk-taking, efficiency and strengthening laws in Chinese banks" indicated that stronger and rigorous execution of bank rules has led to an increase in bank risk. Moreover, they showed that the performance of commercial banks was better than other banks influenced by law enforcement.

San and Chang (2011) in a study entitled "Comprehensive analysis of the effects of risk measures on bank productivity: evidence from emerging Asian countries" examined three types of credit, operational, and market risk in Thai banks. They stated that there was a significant relationship between the risk and efficiency of the bank.

Chen et al. (2016) confirmed that shadow banking was the result of two unique legal restrictions for the banking system in China: the first was due to a legal limit of 75% ratio of the loan to the deposit, and another was the regulations that prohibited business banks from lending to risky industries.

Theoretical and empirical literature of this research led to the extraction of a series of hypotheses that have been developed in the next section.

Research hypotheses

The first hypothesis:

There is a significant relationship between the risk-taking and capital adequacy of banks in shadow banking.

The second hypothesis:

There is a significant relationship between risk-taking and banks' governance system in shadow banking.

The third hypothesis:

Bank's governance system has a mediating role in the relationship between the risk-taking and capital adequacy of banks in shadow banking.

Variables and research model

To test the research hypotheses, the variables were divided into four groups of independent, dependent, mediator and control variables.

$$\text{Risk}_{i,t} = \beta_0 + \beta_1 \text{CAR}_{i,t} + \beta_2 \text{CG}_{i,t} + \beta_3 \text{CAR}_{i,t} * \text{CG}_{i,t} + \beta_4 \text{SIZE}_{i,t} + \beta_5 \text{Lev}_{i,t} + \beta_6 \text{ROA}_{i,t} + \varepsilon_{i,t}$$

Relation (1)

Where in this model:

The dependent variable:

The independent variable of the research was risk-taking, which used the Zscore criterion as the proxy variable.

Z-score was the bank's financial capability or bankruptcy criterion, which was calculated as follows:

$$z = 0.717x_1 + 0.847x_2 + 3.107x_3 + 0.42x_4 + 0.998x_5$$

Relation (2)

Working Capital/ Total Asset= x_1

Retained Earnings/ Total Asset= x_2

EBIT/ Total Asset= x_3

Market Value of Equity/ Book Value Debt= x_4
 Sales/ Total Asset= x_5

In this model, if the calculated z for a company was less than 1.21, it was bankrupted and if this criterion was more than 2.9, the company was not bankrupted. Moreover, if the z value was between 1.21 and 2.9, there were no certain category and the probability of bankruptcy would be weak.

The independent variable:

Capital Adequacy Ratio (CAR): This was the result of the division of the bank's capital into risk-weighted assets. According to Basel I, this ratio had to be at least 8% for banks.

The mediator variable:

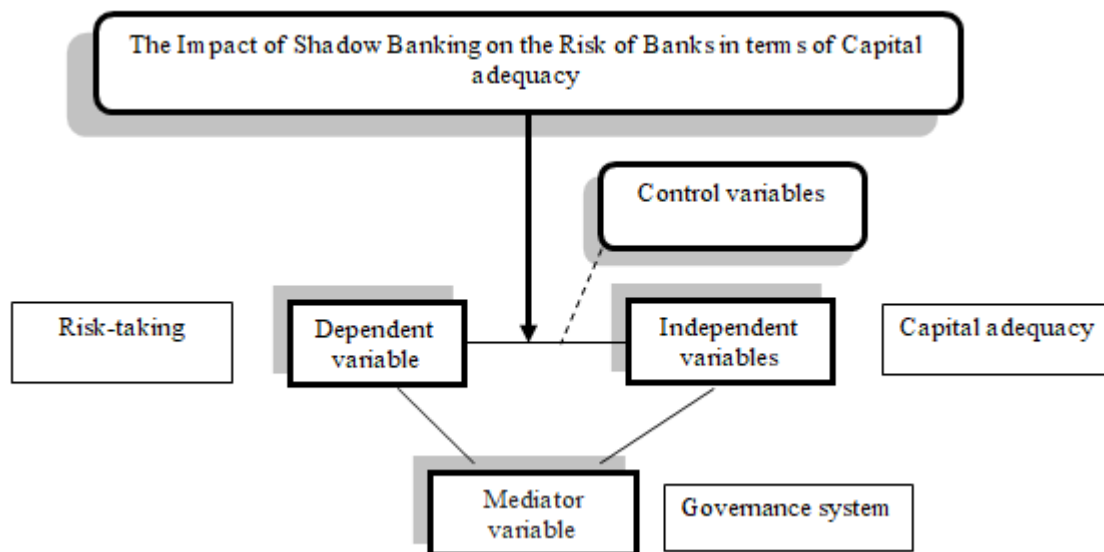
The mediator variable was the governance system in which the proxy variable of the board of directors' independence was used in such a way that a dummy variable for this variable could be used. If the ratio of the members of the independent board was greater than the ratio of independent members, this variable would be 1 and otherwise it would be 0.

The control variables:

The control variables used in the current study were as the previous research:

1. Size (SIZE): Bank size equal to the natural logarithm of the bank assets
2. Financial Leverage (Lev): This variable was obtained by dividing the total book value of debts by the book value of total assets at the end of the fiscal year.
3. Return on assets (ROA): This variable was obtained through the ratio of operating profit to total assets.

The conceptual model of research



Statistical population and sample

The statistical population included all banks accepted in Tehran Stock Exchange during 2011-2016.

The sampling method was screening. The statistical sample of the current research included a limited number of members of the statistical community that represented the main characteristics of the society (December 2005). In this research, the research sample was selected by the means of a sample screening method. Member banks should have had the following features.

The end of their fiscal year was March 20th.

They had to be accepted in Tehran Stock Exchange prior to 2011.

During the studied period (2011-2016) they shouldn't have had any changes in the fiscal year.
During the studied period, their information must be available continuously.

Research method and data collection

In terms of purpose, this research was applied, because its results could be used in managers', investors' and analysts' decisions. Additionally, in terms of the method of inferring about the research hypotheses, the current research was descriptive-correlational research, since in order to discover the relations between the variables of the research, regression and correlation techniques were used. Thus, in terms of reasoning, it was inductive reasoning. Moreover, due to the fact that the conclusion of this study was obtained through examining the available data, this research was included in the category of positive theories.

In the current research, the research data were collected and analyzed through financial statements, attached notes and Rahavard Novin software.

Research data analysis

The research findings have been presented in two sections: 1-Descriptive statistics and 2-Inferential statistics.

Descriptive statistics

Regarding descriptive statistics, using descriptive statistics tables and indexes such as central tendency and measures of variation, the researcher described the collected data of the research. This fact contributed to the clarity and explanation of research data. Research sample data have been extracted from sources such as Rahavard Novin, Tadbir Pardaz and the website of the Exchange.

Table 1: Descriptive indexes of the research variables

Research variables	Symbol	Mean	Median	SD	Max.	Min.
Risk taking	RISK	4.216	4.154	2.356	11.552	0.744
Capital adequacy	CAR	0.635	0.524	0.621	2.529	0.001
Governance system criterion	CG	0.788	1	0.406	1	0
Financial Leverage	Lev	0.516	0.403	0.586	1.344	-4.194
Size	SIZE	8.211	7.154	1.352	18.552	-0.744
Return on assets	ROA	0.011	1.258	6.024	0.003	0.001

The mean was the main and most important measure of central tendency, which represented the equilibrium point and distribution center. As it is evident in Table 1, the mean of risk-taking was 4.216. The median is a point that divides a sample into two equal parts. In other words, 50% of the observations were before this point and 50% of the observations were placed after this point.

As shown in the table above, the risk-taking median was 4.154. Generally, the measures of central tendency were those measures investigating and comparing the distribution of observations around the mean. One of the most important measures of central tendency was the standard deviation. With regard to the above table, this criterion for risk-taking was 2.356. The highest level of risk-taking was 11.552 and the lowest was 0.774.

Inferential statistics

The inferential statistics used in the current study included multivariate regression to discern the relationships between independent and dependent variables through control variables. In the meantime, to warrant the reliability of the results, regression pre-test tests have been used. In the following, after stating the research hypothesis, the regression model have been tested.

- **Multiple-regression test**
 - Normality test of the dependent variable

The Jarque-Bera test has been used to check the normality of regression error terms. The results of this test were presented in Figure 3. According to this test, since the significance level was greater than 0.05, the distribution of regression error terms was normal.

Table 2: Jarque-Bera test

Research variables	Jarque-Bera statistics	Sig.
Risk-taking	2.237	0.557

- Correlation test of variables

At first, the Pearson correlation of the research variables was investigated. Pearson correlation test results have been presented in Table 3.

As it is evident in Table 3, regarding Pearson correlation, there was a significant correlation between the research variables in the accepted banks in Tehran Stock Exchange. Furthermore, in Table 3, it is evident that the research's independent variables did not have a strong correlation with each other. Consequently, there was no problem in model estimation.

Table 3: Pearson correlation

Variables		Risk-taking	Capital adequacy	Governance system criteria	Financial Leverage	Size	Return on assets
Risk-taking	Correlation	1	0.01	0.33	0.04	0.08	0.03
	Sig.		0.79	0.00	0.39	0.05	0.49
Capital adequacy	Correlation		1	0.15	0.27	-0.29	0.02
	Sig.			0.00	0.00	0.00	0.57
Governance system criteria	Correlation			1	0.37	-0.34	0.16
	Sig.				0.00	0.00	0.00
Financial Leverage	Correlation				1	-0.40	0.23
	Sig.					0.00	0.00
Size	Correlation					1	-0.18
	Sig.						0.00
Return on assets	Correlation						1
	Sig.						

** = Significant at 99% level; * = Significant at 95% level

- The research hypothesis test

At first, to determine the method of pooled mixed data and detecting their homogeneity or heterogeneity, Chow test and F-limer statistic were used.

According to what was mentioned in the method section, initially, the Chow test and the F-limer statistic were used to determine the pooled data method and their homogeneity or heterogeneity. The results of this test have been presented in Table 5.

Table 4: The results of the Chow test in order to detect homogeneity or heterogeneity of sections

Null hypothesis	F	Sig. level	Chow test result
Cross-sectional and time effects are not significant (the pooled data method is appropriate)	3.425	0.000	H0 hypothesis is rejected

As it is evident in Table 4, the results of the Chow test indicated that the probability obtained for the F statistic was less than 5%, so the panel data were used to test this hypothesis. Now to determine whether

constant effects or random effects models have been used to estimate parameters, the Hausman test has been used. The result of this test have been presented in Table 5.

Table 5: Hausman test to determine the fixed or random effects model

Null hypothesis	Chi ² statistic	Sig. level	Test Result
Using a random effects model	3.11	0.701	The hypothesis H0 is not rejected

The significance level of the Hausman test was more than 0.05. Therefore, to test the hypothesis, the random effects model had to be used. The results of the research hypothesis test by the means of the random effects model and the estimated generalized least square (EGLS) method have been presented in Table 6.

$$\text{Risk}_{i,t} = \beta_0 + \beta_1 \text{CAR}_{i,t} + \beta_2 \text{CG}_{i,t} + \beta_3 \text{CAR}_{i,t} * \text{CG}_{i,t} + \beta_4 \text{SIZE}_{i,t} + \beta_5 \text{Lev}_{i,t} + \beta_6 \text{ROA}_{i,t} + \varepsilon_{i,t} \quad \text{Relation (3)}$$

Table 6: Results of the research hypothesis testing

Variable	Coefficient	Standard error	T statistic	Sig. level
Constant	0.239	0.075	3.171	0.345
Capital adequacy	0.048	0.021	2.285	0.006
Governance system criteria	-1.691	0.416	4.062	0.000
Product of capital adequacy and governance	0.006	0.012	0.518	0.412
Financial Leverage	5.362	2.351	2.282	0.000
Size	-0.033	0.012	-2.806	0.001
Return on assets	1.065	0.342	3.116	0.087
F statistic	11.572	Coefficient of determination		0.462
		Adjusted coefficient of determination		0.395
F statistic prob.	0.000	Durbin-Watson		2.004

The results obtained from the research hypothesis testing showed that the significance level of the capital adequacy variable was less than 0.05, i.e. it was equal to 0.006 and its t statistic was greater than ± 1.96 (that is, 2.285), its relationship with risk-taking was significant and positive. As a result, the first research hypothesis was approved indicating that there was a significant relationship between risk-taking and capital adequacy of banks in shadow banking.

On the other hand, due to the fact that the significance level of the bank's governance system variable was less than 0.05, and it was equal to 0.0000 and its t statistic was more than 1.96 (that is, 4.062), its relationship with real profit management was significant. For that reason, the second research hypothesis was approved, indicating that there was a significant relationship between risk-taking and the bank's governance in shadow banking.

That's while, for the product of capital adequacy variable and the governance system, summarized figures in Table 6, indicated a lack of significant relationship between risk-taking and the product of capital adequacy and governance system. Therefore, the third formulated research hypothesis was not confirmed.

As it is evident, the Durbin-Watson statistic was 2.004, which was between 1.5 and 2.5. Meanwhile, the significance level of the F statistic was 0.000, which was below 0.05, indicating that the model was significant. Another distinguished point in Figure 6, was the determination coefficient of the model. The determination coefficient of the above model was about 46%, indicating that independent and controlling variables could explain about 46% of the variations of the dependent variable.

Discussion and Conclusion

Banking in Iran, economic and political conditions, are consistent with the policymakers' and economic planners' developmental perspectives. On the other hand, nowadays the environment in which banks operate, is a developing and highly competitive environment, and banks have to compete with many factors at the national and international levels to survive. To do so, they have to expand their activities through new investments.

Shadow banking leads to the development in the credit flows in parts of the financial system that is not well-monitored. For example, if a limit is set for the interest rate at which the banks could pay interest to depositors, the bank's investment cost would be reduced and banks would have a good motivation to lend. From banks monitoring sector, limitations can be imposed on banks' lending to reduce such incentives. These limits can be considered from the conservative ratio of loans to deposits and legal reserves. So, in spite of strict rules and regulations, its escape routes have also been created, and in this field, the shadow banking sector would help banks pass this limit for deposits and lending barriers. In spite of the higher risk in shadow banking, there is still a great interest in using shadow banking facilities for investors. Shadow banking, with a modification in the structure of assets and liabilities in the balance sheet and business models, offers easy access to credits for investors and, regardless of the various ways to provide credits, competitiveness and high efficiency are evident in shadow banking financial activities. Central Bank regulatory and supervisory regulations on banks eliminate the flexibility in the banks' balance sheet structure and, by reducing the financial risks in banks, leads to a decrease in investment and banking activities. Consequently, appropriate conditions for effective shadow banking activities are created in those sectors where banks do not enter. Shadow banking needs banks' support for their funding, and banks need shadow banking funding. Banks regularly act very interconnected, although this interconnectedness can have advantages in terms of financial stability and risk aversion, because of the supportive relationship that can be found between shadow banking and banks in line with funding, the financial risks of the shadow banking sector are transferred to the banking sector. Consequently, more attention should be paid to the risks inherent in shadow banking and the risks that can be controlled and monitored.

It should be noted that the weaknesses of shadow banking and traditional banking have often been similar and have been well manifested in financial crises. The vulnerability of shadow banking and traditional banking is very high in crisis. Having increased the mutual risk, bankruptcy also increased in these financial institutions. In recent research, shadow banking has been preferred by researchers, while, in this research, another dimension of shadow banking, the banks that themselves do shadow banking activities, has been considered. The aim of the current research was to examine the effect of shadow banking on the risk of banks in terms of capital adequacy in the Tehran Stock Exchange. To conduct this research, Stock Exchange banks were studied as a sample during 2011-2016.

The governance system regulations in the field of bank ownership restructuring reduce systematic risk and can be different from the main purpose of shareholders to increase share value. There is a conflict of interest between depositors and shareholders within the bank. The shareholders want to enter into risky projects and increase their shares value against the rising cost of depositors. To stop the banking crisis and increase the depositor's confidence also prevent banking system bankruptcy, small depositors have become insured and banks have become more systematized. It seems that implementing the governance system in the banks help to improve the banks' performance. However, establishing and executing a good governance system without establishing an appropriate internal control mechanism, such as having a strong supervisory authority and exercising control by the independent board of directors and shareholders, is not possible.

Banks involved in shadow activities are more probably risk-takers than other financial firms. This subject has been neglected in earlier studies, but it has been empirically investigated in this study. That is while, according to research literature, it was expected that the governance system might affect this relationship, which was also subject to empirical testing.

The results have indicated that:

- ✓ There was a significant relationship between the risk-taking and capital adequacy of banks in shadow banking.
- ✓ There was a significant relationship between risk-taking and banks' governance system in shadow banking.
- ✓ Bank's governance system did not play a mediating role in the relationship between the risk-taking and capital adequacy of banks in shadow banking.
- ✓ The results obtained in this study were similar to Wu and Shen (2018) research.

Recommendations

The following points have been also suggested for future research:

1. Reviewing and testing the effect of shadow banking on the risk of banks in terms of capital adequacy in the Tehran Stock Exchange for non-profitable banks compared to profitable companies by the means of the dummy variable in future research.
2. Repeating this research by the means of time lags and reviewing the effect of lag increasing on the improvement of the prediction model.

Reference

1. Allen, F., Qian, Y. Tu, G. and Yu, F., 2016. Entrusted Loans: A Close Look at China's Shadow Banking System. Working Paper, Imperial College London.
2. Bozorg Asl, M., Berzadeh, F., Samadi, M.T. (2018). The Effect of Liquidity Risk and Credit Risk on Financial Stability in the Iranian Banking Industry, *Journal of Financial Science*, 11(38)
3. Chen, K. Ren, J. and Zha, T., 2016. What We Learn from China's Rising Shadow Banking: Exploring the Nexus of Monetary Tightening and Banks' Role in Entrusted Lending. NBER. Working Paper.
4. China Banking Regulatory Commission, 2011, Guideline on Capital Management of Commercial Banks.
5. Elliott, D., Kroeber, A. and Qiao, Y., 2015, Shadow banking in China: A primer, The Brookings Institution: Economic studies, 1-29
6. Financial Stability Board, 2011, Shadow Banking: Scoping the Issues. Basel, Switzerland: Bank for International Settlements.
7. Financial Stability Board, 2012, Progress Report to the G20 on Strengthening the Oversight and Regulation of Shadow Banking.
8. Financial Stability Board, 2014. Global Shadow Banking Monitoring.
9. General Office of the State Council, 2013, The Notice of Strengthening Shadow Banking Regulation
10. Jalili (2010), Validation System for Bank Customers and Insurance - Case Study: The Advisory Company of Iranian Credit Rating, *Quarterly Journal of Money and Economy*, 2(4), pp. 221-242.
11. Reuters., 2013. China Regulator Drafts New Rules to Tame Shadow Banking.
12. Shen, C. H. & Huang, Y. L., 2018, Effect of Interbank Activities on Bank Risk: Why is China Different? Manuscript
13. Taghavi, M., Ahmadian, A., Kianvand, M. (2013). Analysis of the Effect of Corporate Governance on the Stability of the Banking System in Developing Countries, *Financial Science Journal*, 6 (19)
14. Yin, C. F. and Wang, J. W., 2013, Shadow Banking and Bank's Shadow the Development and Evaluation of Chinese Wealth Management Products (in Chinese). Chinese Social Sciences Academic Press.