

# Financing restrictions and changes of corporate bonds yield according to political relations and financial crises on the improvement of performance in the Tehran Stock Exchange

Mohammad Bavi, Samad Ayazi\*, Jamadori Gorganli Doji, Ali Khamaki

*Department of Accounting, Aliabad Katool Branch, Islamic Azad University, Aliabad Katool, Iran*

*(Communicated by Farshid Khojasteh)*

---

## Abstract

Banks are the engine of providing financial resources in the economy and have special importance for governments. Accordingly, presenting the factors and components affecting financing restrictions and changes in the corporate debt bonds yield, risk management, as well as changes in their stock prices, in terms of bank management and from a macroeconomic perspective, can be considered as the leader of the economy and government. On the other hand, the proper management of banking challenges and the improvement of factors affecting the efficiency and effectiveness of banking resources can move the economic cycle in the right direction, considering that the banks' primary activity is to grant loans and provide them to applicants. Accordingly, the researcher addressed the effect of the ability to manage political relations and financial crises on performance improvement. Therefore, a combination of Data Envelopment Analysis (DEA) and Two-Stage least squares (2SLS) regression analysis was used. This study is descriptive research with the correlational and post-event approach. In this way, the information about 11 banks in a period of 9 years (2014-2023) was analyzed. The results showed that the improvement of ability level and proficiency in bank management will lead to the improvement of financing constraints, changes in corporate bond yield, and the growth rate of stock and non-shared incomes. The management authority not only affects credit risks, credit risk management and liquidity risk but also does not affect the stock price drop.

Keywords: financing constraints, Changes in corporate bonds yields, Political relations, and financial crises  
2020 MSC: 91G15

---

## 1 Introduction

In today's global economy, no country can benefit from development unless it has an up-to-date and efficient economic banking system; Because the role of banks has been developed from the mere financial intermediary to many fields, including resource allocation and risk management of organizations in the economic system, consulting, and facilitation of complex financial transactions has been developed. Therefore, improving the performance of banks can be of particular importance due to their outstanding performance in the economic development of the evaluation country [2]. The main factor of the vulnerability of the banking sector and a justification for developing a basic

---

\*Corresponding author

*Email addresses:* [mbavi96@gmail.com](mailto:mbavi96@gmail.com) (Mohammad Bavi), [ayazi@aliabadiu.ac.ir](mailto:ayazi@aliabadiu.ac.ir) (Samad Ayazi), [jgorganli@yahoo.com](mailto:jgorganli@yahoo.com) (Jamadori Gorganli Doji), [alikhhamaki@gmail.com](mailto:alikhhamaki@gmail.com) (Ali Khamaki)

framework for banks due to the large volume of financial transactions of banks [7]. Suitable financial transactions and information exchange between financial and production systems in every country are one of the major factors of economic growth and development. Countries with an efficient framework for allocating capital to different economic sectors have often benefited from economic development as a result of higher social welfare. Equipping and allocating financial resources to the activities of economic enterprises is performed through the financial market, and the bank credit market is a part of this market [15]. The performance of banks during financial crises cannot be described only by the development and efficiency of the economy and stability in earning a profit, but there are also other effective factors and components.

The business challenges during the economic boom led to different strategies, different investment opportunities, and even different management approaches. In general, the impact of financial crises or periods of recession and economic prosperity on the performance of corporations can be investigated and confirmed by three factors. First of all, in financial and economic crises at the global level, there is a risk of disputes in the legal economic management develops, when the possibility of an unexpected decrease in the stock market price, as a result of the decrease in economic growth leads to legal dispute by the parties. Conservative reporting and providing evaluation reports and better performance are one of the ways to reduce legal disputes in economic activities so that managers are not prosecuted for opportunistic behavior and profit-seeking management practices. Secondly, the demand for performance stability during financial crises arises due to uncertainty in investment. Investors are looking for stability in performance or the absence of many reductions during periods of recession because unfavorable outputs increase during recessions. Of course, the willingness of investors and owners during the boom period is influenced by the uncertainties in the Contrarian. They requested performances with a high upward slope so that they could get the most value in the opportunity. Third, banks always demand to provide internal financial resources compared to providing external financial resources. They request to get more investors' resources when providing external financial resources. In the financial crisis, the interest rates of the bank deposits decrease and the withdrawal of the deposit resources of the banks also occurs due to the downward trend of the profitability of the banks. On the other hand, in underdeveloped countries, a recession usually occurs with inflation, and Stagflation becomes another obstacle to the transfer of monetary funds to banks. Therefore, financial crises lead to the withdrawal of bank depositors by reducing the ability to pay interest and creating inflationary stagnation, and causing many problems in the supply of bank resources.

Financial institutions seek to increase profitability and the interests of their stakeholders, like any economic enterprise. In addition, economic enterprises are trying to optimize their incomes and minimize their operating and executive costs, considering the increase in competitive pressure and resource restrictions. The source of the bank's income is mainly the interest on loans and investments, which are in the balance sheet as assets, and expenses sources are mainly the sources of bank deposits, which are recorded as liabilities in the balance sheet. Of course, the goal of optimizing profit is always affected by various risks of financial institutions. These risks affect the profitability of the bank through the impact on the expenses and income of the bank and even threaten the banks [11]. The main activities of financial intermediation institutions, such as banks, are attracting deposits and credit loans. Therefore, financial intermediary institutions such as banks have a bilateral activity in the capital market. On the one hand, they are demanders of monetary resources of depositors, and on the other hand, they are suppliers of monetary resources to investors, and in this way, they earn income from the transaction process. Banks are trying to achieve the maximum profit strategy by taking steps to implement this strategy with minimum risk. The first step is to determine and choose the appropriate strategy for the optimal combination of resources and loans considering the two limit states of profit optimization and risk minimization. This is met by valuing the importance of components of resources and loans based on their impact on maximum profitability and minimizing bank risk [20].

The importance of management's ability to guide and lead corporations is such that they are effective in all departments of the corporation. The improvement of human resources management, the correct use of resources, and the increase of efficiency in the corporate hierarchy affected managerial abilities. The current research is interesting and important both in terms of evaluating management abilities and the importance of the quality of profits of corporates in the capital markets. The importance and necessity of evaluating political relations on various dimensions of banks' performance can be found in various factors. First, a significant part of the management of banks active in the capital market, either directly or indirectly, is influenced by political management, because the government and its representatives exercise their power through government-affiliated institutions and corporations. It influences many banks and can influence operational and internal processes as well as policies and methods so that it can guide the performance and policies of the banks. This process is especially visible in banks whose stocks are traded through the transfer of state corporations according to Article 44 of the Constitution, because the government management in these corporations, which still belong to the government, tries to formulate bank policies under the control of the government.

Secondly, political relations are influenced by political events so the managers of big banks under the influence of political events act as a kind of political management, even though they do not have government management, and change their goals, strategies, and functions. This problem led to a change in the corporation's current and operational procedures and ultimately can affect the conflict of interest between managers and owners, and even the conflict of interest between the government and owners, or the conflict of interest between society and owners. Therefore, political relations are the ability to influence the strategies, goals, and management methods of banks in the Tehran Stock Exchange. In general, financial crises are part of the reality in the economy of all countries. In this regard, Iran is under the influence of various factors that cause crises due to various political conflicts. In the past decades, the sanctions imposed by the US and the EU against mainly Iranian banks have been one of the main causes of the financial and economic crisis. These sanctions and subsequent crises have a direct impact on the performance of banks and their profitability in the first stage. In research, it is necessary to compile the effects of these financial crises in developing plans to deal with the considering the importance and necessity of financial crises caused by international sanctions against the economy and especially the banking industry.

It should be mentioned according to the theoretical literature related to the influence of various factors on the functional aspects of banks that the special conditions of the banking industry in Iran and the effects of various factors such as dependence on the government, existing political risks, the macroeconomic conditions and also the relations of the economic system of Iran with the outside world, (Especially due to economic sanctions) has caused various dimensions of banks' performance to be affected by these indicators. Moreover, it is important to consider the impact of fake news, which has become a concerning issue in various countries, including Iran [17]. Therefore, in addition to the state of profitability and the ability to earn money, the risk management ability of banks has also been greatly affected by the above-mentioned conditions. It can deal with the impact of these aspects on various characteristics of their performance by evaluating the important guiding aspects of bank management to finally analyze the fluctuations of the banking condition. Accordingly, the main question of the current research is raised in three axes:

Does the ability to manage political relations and financial crises affect the improvement of banks' performance? This article is organized as follows. In the third part, the model and operational definition of the variables are presented. In the fourth part, the data will analyze, and finally, discussion and conclusions are presented.

## 2 Literature review

Reviewing the literature on obtaining the maximum output from limited income that is the input of the nature of economics and the appropriate allocation of limited resources. It is the purpose of these sciences.

Therefore, the effectiveness and evaluation of the performance in the simplest sense can be the optimization of the output according to the inputs of the process on a micro and macroeconomic scale. So, in the monetary and financial system, it is obtained through proper management of financial resources and costs. An effective and efficient monetary and financial system is one of the most essential needs of banks, the improvement of its performance leads to the improvement of the economic performance of the total system. Measures to improve and improve the performance of the banking system lead to the development of deposit flows, investment, and improved allocation of resources, as well as the use of potential, scattered, and hidden loans for development and public welfare. In this section, the most important factors affecting the improvement of banks' performance are introduced according to the results obtained from the research literature:

a) Mobilizing financial resources in modern banking services: mobilizing financial resources has been created since the beginning of today's social life. It has caused trade and exchange of goods and has always been the main function of banking services. Therefore, banks have collected people's surplus financial resources. They accelerate the intermediation between investors and borrowers by granting loans to qualified people for their special tasks.

b) Information and communication technology: in the banking services sector, innovations such as Cryptocurrency, transfer terminals, receiving and payment systems, mobile banking, and real-time internet banking have developed a tremendous transformation in this sector. it has improved efficiency, productivity, and speed of transaction processing, and reduced operational costs for banks.

c) Manpower skills: Most of the services in banks and financial institutions are provided by bank personnel and equipping resources at the scale of global standards requires skilled personnel and training.

d) Banking self-service: Banks need to develop new scientific self-service technologies to provide new services and new products. It is possible to identify customers and their diverse needs by developing self-service services. In modern self-service banking, banks perform one-on-one evaluation and marketing based on databases and according to the self-service technology to identify customers and their needs.

e) The profitability of financial institutions, especially state banks, which have the largest part of the banking industry in Iran's economy, are affected by various financial and non-financial factors, in which the effectiveness of banks' profitability is greater than financial factors. These key variables can include income diversity, asset adequacy, operational risks of the bank, stock of the bank in the financial industry, and also the macroeconomic condition. Each of the above financial components affects the performance and as a result the profitability of state banks from a specific dimension [11].

Managers have the authority to implement the principles of realization and compliance and influence the corporation's performance using estimates and forecasts. Managers have the authority to implement the principles of realization. On the one hand, top managers are expected to have a better understanding of their business due to access to the corporation's internal and confidential information, which makes them make better estimates and judgments. In addition, it is expected to the management team can accurately predict the future performance of the corporation and investment opportunities. Therefore, capable managers act on the optimal allocation of limited resources to available opportunities through the accurate identification of available resources as well as available investment opportunities and take steps in the direction of increasing value creation for the corporation [6]. On the other hand, the ability of each manager inaccurate judgments and estimations is different. Managers have high decision-making ability and have more knowledge about the corporation and the industry. They can also evaluate and analyze more profits by combining information with reliable estimates [18]. In addition, managers with high ability compared to managers with lower ability make more accurate estimates of the state of the corporation [14].

Political relations not only affect the financial condition of economic organizations, but also affect the motivations of managers for financial reporting, preparation of financial statements, and implementation methods of affected executive contracts. This ultimately causes significant differences in the credit risk of banks with political relations compared to banks without political relations. Chen et al [5] argue that political relationships add a new dimension to firm earnings that complicate its creation. This complexity can lead to another type of conflict of interest between owners and managers and create special risks, especially credit risk. Salma et al. [14] showed that the opportunistic behavior of managers of private corporations with political relations is less than that of corporations without political relations. Therefore, their credit risk has decreased based on political relations level [17]. Sirus et al. [18] investigated the effect of ownership structure and size of banks on their operational risk management in Indian banks during 2010-2013. They showed that the size of Indian banks has an inverse effect on the level of excess capital to improve risk management. The above reverse effect is more severe for banks with smaller sizes. Their results showed that there is no significant relationship between ownership structure indicators (centralized ownership, state ownership, and foreign ownership) with the level of additional capital to improve risk management [4]. Gallemore et al. [8] evaluated the effective tax factors on the performance of different hub aspects of banks. They found that the effective tax rate on average does not have a significant effect on performance, but the evaluation of tax factors on various dimensions of performance showed that the effective tax rate has a significant effect on risk-taking during economic recession. In addition, regardless of economic periods, the results showed that effective tax rates have a significant effect on lending ability and financial leverage [8]. García-Meca and García-Sánchez [9] analyzed the impact of managerial abilities on the quality of profit performance in banks in a sample of 159 large banks in 9 South American countries between 2004 and 2010. They found that managerial abilities play a valuable role in improving the quality of profits, and capable managers are less likely to engage in opportunistic behaviors to change profits [9].

Liu and Zhong evaluated the impact of relationships and political uncertainty on credit risk. They proved that credit risk fluctuations decrease in periods of political elections. Moreover, changes in credit risk when elections are influenced by the ranking of corporations' contracts, the characteristics of corporations, and well as the political influence of government on corporations [13]. Alimoradi et al. investigated the influence of decision-maker optimism and risk-taking on investment sales decisions focusing on fair value accounting. The results of the research showed that the level of optimism and risk tolerance of decision-makers does not affect their investment sales decisions. Conservatism in fair value assessment affects investment sale decisions, but fair value fluctuation does not affect the said decisions. In addition, the level of optimism and risk-taking of decision-makers does not affect the relationship between the scale of conservatism and the scale of the volatility of the fair value of an investment with investment sale decisions [1].

Ashtab and Piri predicted the profit of one of the most important communication channels to convey information to investors. The results of the survey of 155 corporations using the screening method (2007-2018) showed that the disclosure of the profit forecast had a negative and significant effect on the corporation's risk-taking. In addition, the results showed real profit management significantly weakens the relationship between profit forecast and risk-taking [2].

Soleimani et al. investigated the inverse and strong relationship between value and momentum factors and the

lack of simultaneous use of them in pricing models, as well as the lack of use of stock quality as a representative of profitability and investment factors in the models. For these reasons, 120 corporations were selected for the sample by systematic elimination method by applying restrictions during 2007-2016 and also the necessary tests were performed with the portfolio analysis method. The results of testing the models and hypotheses show the correlation between the variables of value, momentum, and stock quality with excess stock returns, and these three factors have led to taking risks in feature-based hedging portfolios. In addition to the aforementioned four-factor model, it has provided the highest explanatory power and the best performance compared to capital asset pricing models such as the CAPM model and the Fama–French three-factor model [19]. The following questions have been presented considering that the ability of management, political relations, and financial crises can affect bank performance and also to investigate this effect. We are looking for their answers:

- Does management ability have a significant effect on improving the performance of banks?
- Do political relations have a significant effect on improving the performance of banks?
- Do financial crises have a significant effect on improving the performance of banks?

### 3 Methodology

This study is descriptive research with the correlational and post-event approach. It has been performed based on the real information of the stock market and the financial statements of the banks in the stock exchange. This research is correlation research because the relationship between the variables is investigated. The basic information of this research is about disclosure and transparency and information related to the financial statements of banks. In this research, the correlation between the independent variable (management ability, political relations, and financial crisis) with the dependent variable (performance improvement, risk management, and bank stock fall) has been analyzed through panel data analysis [10].

In this study, different models are used to evaluate the hypotheses according to the hypothesis, which is introduced below. The model used to test the first sub-hypothesis of the first main hypothesis is as the equation (3.1) and (3.2):

$$ROA_{it} = \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it} + \beta_6 DEPMARKET_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_8 LOANGRTH_{it} + \beta_8 DEPGRTH_{it} + \beta_8 \Delta NI_{it} + \beta_8 LOSS_{it} + \varepsilon \quad (3.1)$$

$$ROE_{it} = \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it} + \beta_6 DEPMARKET_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_8 LOANGRTH_{it} + \beta_8 DEPGRTH_{it} + \beta_8 \Delta NI_{it} + \beta_8 LOSS_{it} + \varepsilon \quad (3.2)$$

The first model for shared incomes is calculated from equation (3.3):

$$PIS_{it} = \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it} + \beta_6 DEPMARKET_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_8 LOANGRTH_{it} + \beta_8 DEPGRTH_{it} + \beta_8 \Delta NI_{it} + \beta_8 LOSS_{it} + \varepsilon \quad (3.3)$$

The second model for non-shared incomes is calculated from Equation (3.4):

$$NONPIS_{it} = \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it} + \beta_6 DEPMARKET_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_8 LOANGRTH_{it} + \beta_8 DEPGRTH_{it} + \beta_8 \Delta NI_{it} + \beta_8 LOSS_{it} + \varepsilon \quad (3.4)$$

In this study, a two-step process was used to analyze the bank's efficiency based on the data envelopment analysis method to evaluate the management ability according to the research of García-Meca and García-Sánchez [9]. In the first stage, the bank's efficiency score is defined through data coverage analysis based on inputs and outputs. Data envelopment analysis is a linear programming method based on the efficiency line methodology of all banks and the performance level of each bank and assigns the efficiency level to each bank in the form of points (0-1). The efficiency of each bank is evaluated according to the input (input) and output (output) of each bank and the optimal efficiency of all banks. Therefore, first, the efficiency of the bank is evaluated by the data envelopment analysis method, and then the calculated efficiency is entered as a dependent variable into the main management ability evaluation model,

Table 1: Research variables to evaluate management ability through data coverage analysis

Input variables	output variables
Total bank deposits	Total Tangible Assets
Total bank loan	Net profit
Total investments	General and administrative costs
Total incomes	Financial costs
–	Rent costs

and the management ability is estimated. The model to determine efficiency through data coverage analysis is shown in Table 1:

Therefore, in the above input and output pattern, the ratio of outputs to inputs indicates a pattern to decision improvement units, which are as Equation (3.5):

$$\max \theta = \frac{u1 \text{ Deposite} + u2 \text{ loans} + u3 \text{ Investment} + U4 \text{ IntLnco}}{v1 \text{ PPe} + v2 \text{ Int} + v3 \text{ Labor} + v4 \text{ InrExp} + v5 \text{ RentalExp}} \quad (3.5)$$

where,

Deposits Total bank deposits

Investment: Investment

Loans: Total bank loan

Intinco: Total incomes

PPE: fixed assets

Int: net profit of the bank

Labor: General and administrative costs

Int Exp: total financial costs

Rental Exp: Rental costs

The management efficiency index based on bank inputs and outputs is a number between 0 and 1, where 1 indicates full management efficiency and 0 indicates lack of management efficiency.

The following regression model is fitted for all bank years based on equation (3.6) after performing the first step and estimating the data coverage analysis score for each bank:

$$DEA \text{ Score}_{it} = \beta_0 + \beta_1 \text{ size}_{it} + \beta_2 \text{ Market\_Share}_{it} + \beta_3 \text{ Cash\_Flow}_{it} + \beta_4 \text{ Age}_{it} + \beta_5 \text{ Br}_{it} + \Upsilon \text{ Country} + \text{Year} + \varepsilon \quad (3.6)$$

where,

DEAScore: efficiency score of bank i in year t,

SIZE: the size of bank i in year t,

Market.Stock: Bank i's market stock in year t of the total deposits of the banking industry

Cash.Flow: cash flow resulting from the operational activities of Bank i in year t,

Age: age of bank i in year t,

BR: independence of the board of directors of bank i in year t and

$\varepsilon$ : The remaining items of the model which is the index of evaluation of management ability in the current research, in which the positive remaining items indicate more management ability and the negative remaining items indicate less ability of the manager [16].

Periods of the financial crisis (Crisis 1) consist of fluctuations in economic activity and usually national production and per capita national production, which finally shows in the form of economic growth rate. Every business cycle includes phases of improvement, boom, recession, and recession. In this research, the business cycle variable, which is a virtual variable, has two modes, including periods of recession and economic prosperity, which assigns 0 to economic prosperity and 1 to the state of economic stagnation. Therefore, the period of recession is used as a financial crisis, considering that recession represents the existence of a financial crisis in the economy. The current research along with the research of Ashtab [2] and Soleimani et al. [19] and using the statistics and information published by the

Statistics Center of Iran and Central Bank is divided as follows as recession and boom periods. First, the average economic growth rate of the research period (2009-2017) is calculated (Table 2):

Table 2: The average economic growth rate of the research period (2009-2017), (Parliament Research's Center according to the growth rate up to 9 months of 2017)

Years	2009	2010	2011	2012	2013	2014	2015	2016	2017	Average
Rate	3.16	6.36	3.2	-5.4	-1.9	0.3	0.9	7.2	*4.6	2.05

In the present study, two variables are used to evaluate the bank stock fall. First, the specific return is used to measure the bank stock fall. The above variable is a variable of 0,1 so that if the price falls during the year for a share, the number is one and otherwise it is 0. In line with Hajer et al [21] research, regression based on the market model has been used to identify the periods in which price falls occurred. The regression model based on the market model to determine the periods of falling prices is as equation (3.7):

$$R_{i,t} = \beta_0 + \beta_1 R_{m,t-2} + \beta_2 R_{m,t-1} + \beta_3 R_{m,t} + \beta_4 R_{m,t+1} + \beta_5 R_{m,t+2} + \varepsilon_{i,t} \quad (3.7)$$

where

$R_{i,t}$ : the weekly return of bank i in month t

$R_{m,t}$ : the weekly return of the market in month t

The remaining items of the above model show the specific returns of banks compared to the market, but, likely, the distribution will not be close to the normal range. The normal distribution is important because it is possible to correctly identify the biggest reductions in share returns, which represent the stock price fall, with the characteristics of the normal distribution (including the mean and standard deviation). Therefore, in the present study like Hajer [21], the distribution of the residuals of the above regression model approaches the normal distribution using equation (3.8):

$$W_{i,t} = \ln(1 + \varepsilon_{i,t}) \quad (3.8)$$

The stock price fall periods for a share are calculated as follows based on previous research [21]. In the first stage, specific returns ( $W_{i,t}$ ) are obtained through the remaining items of the introduced model and its adjustment. In the second step, the standard deviation and average monthly returns of each share are calculated. Then, in the third step, the standard deviation of the return is minus the average.

Finally, in the fourth step, it means that the stock price fall occurs if the specific returns- $W_{(i,t)}$  (calculated in the first step) are less than 2/3 standard deviations minus the mean (calculated in the third step). In this case, the virtual variable representing the stock price fall (crash) in the main hypothesis test models will take the numerical value of one and otherwise, it will be zero.

In the second criterion to measure the stock fall, the stretch of the stock price during the current year is used in such a way that the stock price fall is taken for all the transaction days and the stretch of these prices is calculated and considered as a measure of the stock price fall operational. The operational definition of other variables is given in Table 3.

Table 3: operational definition of variables

Variable name	Variable type	Mark	Description
Total tangible assets	Variable input- envelopment analysis	PPE	The total tangible assets of the bank that can be extracted from the balance sheet.
Total intangible assets	Variable input- envelopment analysis	INT	The total intangible assets of the bank can be extracted from the balance sheet.
General and administrative costs	Variable input- envelopment analysis	LABOR	Public and administrative costs can be extracted from the profit and loss statement.
Financial costs	Variable input- envelopment analysis	INTEXP	Financial costs can be extracted from the profit and loss statement.
Rental costs	Variable input- envelopment analysis	RENDALEXP	Rental expenses can be extracted from the profit and loss statement.
Bank deposits	Variable output- envelopment analysis	DEPOSITS	Total bank deposits that can be extracted from the balance sheet.
Total bank loans	Variable output- envelopment analysis	LOANS	Total bank loans that can be extracted from the balance sheet.

Total investments	Variable output- envelopment analysis	INVESTMENT	The total investments of the bank can be extracted from the balance sheet.
Total income	Variable output- envelopment analysis	INTINCO	The total shared and non-shared income of the bank can be extracted from the profit and loss statement.
Bank performance-return on capital	Dependent	ROE	Corporation net income divided by its shareholders' equity
Bank performance-return on capital	Dependent	ROA	Divide net profit by total assets
The growth rate of shared revenues	Dependent	PIS	The sum of the joint income of the bank, which can be extracted from the profit and loss statement of the sample banks, and its growth compared to the shared income of the previous year.
The growth rate of non-shared revenues	Dependent	NONPIS	The sum of the joint income of the bank, which can be extracted from the profit and loss statement of the sample banks, and its growth compared to the non-shared income of the previous year.
Credit risk - allowance for doubtful	Dependent	CREDIT1	The ratio of doubtful claims to granted loans that can be extracted from the notes of the financial statements
Credit risk - overdue receivables	Dependent	CREDIT2	The ratio of outstanding bank claims to granted loans, which can be extracted for each bank based on the information from the Higher Banking Institute
Liquidity risk - deposit ratio	Dependent	LIQUIDITY1	Demand deposits show the division of time deposits and the amount of fixed funds of each bank. A decrease in this ratio indicates an increase in long-term deposits and a decrease in liquidity needs [20].
Liquidity risk - deposit-loans ratio	Dependent	LIQUIDITY2	Net loans and rents are divided by total deposits. This ratio shows a part of deposits that are the basis of paid loans. This ratio shows the degree to which a bank can finance its lending business from its deposits [3].
Liquidity risk - net of loans to total assets	Dependent	LIQUIDITY3	It specifies the ratio of the number of assets allocated for loan payment to the total assets. Management should define a maximum value for this ratio to prevent liquidity problems [12].
Operational risk - technical efficiency	Dependent	OPERATION1	Total income relative to the number of bank branches
Operational risk - cost efficiency	Dependent	OPERATION2	Dividing financial and non-financial expenses over total income
Bankruptcy risk - non-repayment of debt	Dependent	INSOLVENCY1	It is calculated through equation (3.9): $Z - Score = (ROA + E/A)/(\sigma ROA) \quad (3.9)$ where in: ROA: It is calculated from the return on assets and is obtained from the ratio of net profit to total assets. E/A: It is the ratio of capital to total assets
It is calculated through equation (3.10): $RAROA = (ROA)/(\sigma ROA) \quad (3.10)$ where in: ROA: It is a measure of the return on assets and the ratio of net profit to total assets	Dependent	INSOLVENCY2	Bankruptcy risk-fluctuations in bank performance
Falling stock prices - the occurrence of falling prices	Dependent	CRASH1	Virtual variable: If the price has fallen based on the introduced pattern, the value is one, otherwise, zero is given.
Stock price fall - a negative stretch of stock price	Dependent	CRASH2	In the second criterion to measure the fall of the stock, the stretch of the stock price during the current year is used so that the stock price of each share is taken for all the trading days and the stretch of these prices is calculated and considered as a measure of the fall of the stock price. to be
Management ability	Independent	MA	The data is obtained by the enveloping analysis method based on the defined pattern.
Political relations-political management	Independent	POLITIC1	Virtual variable: If there is a government representative among the members of the board of directors, the number is one, otherwise, the number is zero.
Political relations-government influence	Independent	POLITIC2	The percentage of shares directly or indirectly owned by the government

The mentioned model is tested for all banks and during the research period, and the coefficient of the independent



Financial crisis-period of recession and economic boom	Independent	CRISIS1	Virtual variable; For the years of the research period that is during the economic crisis, the number one is assigned, otherwise, the number zero is assigned.
Financial crisis-financial stress	Independent	CRISIS2	Altman's criterion is used to evaluate financial pressure. Altman's criterion in this research is calculated through equation (3.11): $EM\ Score = 6.56x_1 + 3.26x_2 + 6.72x_3 + 1.05x_4 + 3.25 \quad (3.11)$ where: $x_1$ ratio of working capital to total assets, $x_2$ ratio of accumulated profit to total assets, $x_3$ ratio of profit before interest and tax to total assets, $x_4$ ratio of book value to total debt. Banks whose Altman criterion is less than 1.1 (banks with financial pressure) are evaluated as banks with financial pressure and banks whose Altman criterion is greater than 2.6 (healthy banks) are evaluated as banks without financial pressure.
The share of bank deposits from the entire banking system	Control variable	DEPMARKET	The ratio of bank deposits to the total deposits of the banking industry in Iran
Life expectancy	Control variable	AGE	The number of years the bank has been established
Size	Control variable	SIZE	The natural logarithm of total bank assets
Bank loan growth rate	Control variable	LOANGRTH	The loan growth rate compared to the previous year
The growth rate of deposits	Control variable	DEPGRTH	The growth rate of deposits compared to the previous year
Change in net profit	Control variable	$\Delta NI$	Change in net profit compared to the previous year
Loss virtual variable	Control variable	LOSS	virtual variable so that if the bank has made a loss this year, the number 1 is assigned, otherwise, the number 0 is assigned.

variable related to each of the sub-hypotheses is examined and analyzed to test the sub-hypotheses of each of the main hypotheses and to evaluate each of the Sub-hypotheses. In this way, the significance of the coefficient of the independent variable in the model shows the influence of the independent variable on the dependent variable and the direction of the above coefficient also shows the influence mode of the independent variable on the dependent variable. This article tries to fix the flaws in previous studies as much as possible by using the latest estimation methods in panel data and providing consistent and reliable results. The period of research in the stock market was 2009-2017. In total, 11 banks in the Tehran Stock Exchange were selected as a sample by a systematic elimination method.

## 4 Findings

### 4.1 Descriptive statistics

The first step in statistical analysis is determining the summarized properties of the data and calculating the descriptive variables. The purpose of this analysis is to understand the internal relationships of the variables and to show the behavior of the subjects so that the preparations for statistical analysis are provided and descriptive characteristics are revealed for further analysis [2]. In the data analysis, the central indicators such as mean and median, and dispersion indicators such as standard deviation, and maximum and minimum value of the variables are introduced (Table 4).

Average is the main and most used central indicator. The average is exactly at the equilibrium point and the center of gravity of the data. This article tries to fix the flaws in previous Variables are of suitable quality if: firstly, there is not much difference between their mean and median, and on the other hand, their skewness and elongation are not significantly different from the skewness and elongation of normal distribution and are approximately equal to 0 and 3, respectively. As can be seen, all variables have skewed and elongated distributions.

### 4.2 Normality test of research variables

In this research, the ordinary least squares method is used to estimate the parameters of the model. The ordinary least squares (OLS) method is based on the assumption that the variable has a normal distribution and its non-normal distribution leads to a violation of the assumptions of this method for parameter estimation. Therefore, it is necessary to test the normality of the variables. In addition, the test of normality is investigated through the Jarque-Bera statistic. If the statistical significance level of this test is greater than 0.05, then the null assumption that the distribution of the variables is normal is accepted. The results of the Jarque-Bera test for the variables are presented in Table 5.

Table 4: Descriptive statistics of research variables

Variable name	Noun	Observation	Average	Middle	Max	Min	Std	Skewness	Elongation
Return on equity	ROE	99	0.158504	0.160021	0.313785	0.005899	0.085670	-0.04192	1.868048
return on assets	ROA	99	0.014338	0.014136	0.045837	0.001464	0.012203	0.040820	3.171840
Shared income growth rate	PIS	99	0.195363	0.190710	0.746176	-0.28592	0.227610	0.301870	2.838226
The growth rate of non-distributed income	NONPIS	99	0.177513	0.187095	0.503960	-0.22628	0.139628	-0.12263	3.318387
Management ability	MA	99	0.114399	0.117829	0.232701	0.011388	0.053577	0.019792	2.443970
Political relations-political management	POLITIC1	99	0.323232	0.000000	1.000000	0.000000	0.470091	0.755885	1.571362
Political relations-government influence	POLITIC2	99	18.75646	0.000000	81.01000	0.000000	27.34112	1.278639	3.214291
Financial crisis-period of recession and economic boom	CRISIS1	99	0.444444	0.000000	1.000000	0.000000	0.499433	0.223607	1.050000
Financial crisis-financial stress	CRISIS2	99	1.636163	1.190168	5.847687	-0.68975	1.343088	1.415651	4.539090
The share of bank deposits from the entire banking system	DEPMARKET	99	0.036656	0.032028	0.108430	0.002066	0.027329	0.912136	3.283154
Life	Ln Age	99	3.073619	2.995732	4.276666	1.791759	0.584459	0.358906	2.523223
Size	SIZE	99	19.36852	19.49557	21.52017	16.44080	1.182280	-0.37713	2.493456
Loan growth rate	LOANGRTH	99	0.201801	0.217356	0.654583	-0.12828	0.193107	0.336261	2.318543
The growth rate of deposits	DEPGRTH	99	0.084092	0.125979	0.387624	-0.40366	0.215192	-0.80286	2.646402
Change in net income	$\Delta NI/TA$	99	0.000857	0.001077	0.008777	-0.0084	0.003893	-0.27332	2.582213
Loss virtual variable	LOSS	99	0.060606	0.000000	1.000000	0.000000	0.239821	3.683004	14.56452

Table 5: Jarque-Bera test for the dependent variables

Dependent variable	Jarque-Bera statistic	P-Value	Results
ROE	5.314417	0.070144	The null hypothesis is accepted, that is, the data are normal.
ROA	1.395439	0.497719	The null hypothesis is accepted, that is, the data are normal.
PIS	1.611524	0.446747	The null hypothesis is accepted, that is, the data are normal.
NONPIS	0.666294	0.716665	The null hypothesis is accepted, that is, the data are normal.

Proof method: As seen in the above image, the P-value calculated for the dependent variables is greater than the significance level of 0.05, so it can be said that at a significance level of 5%, the hypothesis 1 H is rejected and hypothesis 0 H is accepted, that is, the data is normal.

### 4.3 Significance test of variables (unit root test)

Phillips-Perron unit root test is used for the research variables to assess the significance of the research variables. If the time series used in the regression is not stable, we may have a false regression. The result of the Phillips-Perron unit root test for the variables of the studied model is shown in Table 6.

According to Table 6, since the P-value of the Dickey-Fuller (ADF) statistic is less than 5%, therefore, the null hypothesis of the absence of a single root and, in other words, the lack of significance of all variables, is rejected, and null.

Table 6: the study of variables' significance

Dependent variable	Dickey-Fuller test statistic	P-Value	Results
ROE	-4.98836	0.0001*	Stationarite
ROA	-4.63785	0.0002*	Stationarite
PIS	-2.97201	0.0414*	Stationarite
NONPIS	-8.68303	0.0000*	Stationarite
MA	-3.83397	0.0160*	Stationarite
POLITIC1	-3.22563	0.0214*	Stationarite
POLITIC2	-10.3706	0.0000*	Stationarite
CRISIS1	-9.69455	0.0000*	Stationarite
CRISIS2	-8.19765	0.0000*	Stationarite
DEPMARKET	-5.82617	0.0000*	Stationarite
Ln Age	-3.25045	0.0200*	Stationarite
SIZE	-3.85662	0.0034*	Stationarite
LOANGRTH	-7.64386	0.0000*	Stationarite
DEPGRTH	-9.73743	0.0000*	Stationarite
$\Delta NI/TA$	-7.70962	0.0000*	Stationarite
LOSS	-5.90292	0.0000*	Stationarite

#### 4.4 Model diagnosis test

First of all, the type of estimation method should be determined to estimate the model related to the hypotheses. Therefore, first, Chau's statistic (Limmer's F) is calculated to distinguish whether the pooling data method should be used or the pooled data method should be used. According to the assumption that the coefficients of the variables are constant, is the starting width constant in all years or not? In general, we use the following test to choose between Pooled and Panel models:

$$\begin{cases} H_0 : \alpha_1 = \alpha_2 = \alpha_3 = \dots = \alpha_{t-1}, & \text{(pooled model) The entire width from the origin is equal to} \\ H_1 : \alpha_i \neq \alpha_j, & \text{(panel model) At least one of the widths of the sources is different from the others.} \end{cases}$$

Table 7: The results of Limer's F test

Model	Limer's F test	P-Value	Model number	Results
Panel	11.61172	0.0000	1	The widths of the origins are not equal
Panel	7.865391	0.0000	2	The widths of the origins are not equal
Pooled	0.976462	0.4709	3	The widths of the origins are equal
Pooled	0.372773	0.9548	4	The widths of the origins are equal

The null hypothesis that the width of the sources is equal has not been rejected, and the pooled method should be used to test the hypotheses, considering that the P-Value values are more than 5% in model numbers 3, 4, and 7. While in other models, the panel method is used to fit the model. Now, in the Panel model, the fixed effects model should be tested against the random effects model. For this purpose, the Hausman test is used. In other words, the answer to this question is lets that the coefficients related to the variables are constant, with width from the origin constant for different sections. In other words, does the difference in the width from the origin of cross-sectional units work consistently, or can random functions express this difference between sections more clearly, which are known as fixed methods and random effects in the literature of combined data respectively? The methods mentioned below are briefly discussed.

#### 4.5 Model estimation with fixed or random effects

Now, the fixed effects model should be tested against the random effects model in the pooled data model (panel). For this, the Hausman test is used. In other words, the answer to this question, assuming that the coefficients of the variables are constant, is the width from the origin constant for different sections? That is, the difference in width from the origin of the cross-sectional units works consistently, or random functions can express this difference between sections more clearly, which is known in the literature of integrated data as fixed methods and random effects, which are the aforementioned methods are briefly discussed.

A usual method in formulating the integrated data model is based on the assumption that the differences between units can be considered as the difference in width from the origin. The width from the origin is different for each coefficient.

### 4.5.1 Random effects

A population is made up of infinite decisions, not infinite individuals. In this case, we should not consider the width of the sources to be conditional and bound, that is, it is better to call them random rather than fixed. The random effects method assumes that the fixed component characterizing different sections is randomly distributed among different units. The question that arises is that in practice we should use which one of the mentioned methods is used to decide the Hausman test by introducing these two methods.

The test of this assumption is as follows:

$$\begin{cases} H_0 = \text{random effects model} \\ H_1 = \text{Fixed effects model} \end{cases}$$

Table 8: The results of the Hausman F test

Model number	Hausman F test	P-Value	Degree of freedom	Results
1	51.655841	12	0.0000	Fixed effects
2	40.596121	12	0.0000	Fixed effects

As Table 8 shows, the value of the Hausman statistic calculated for all the above models is greater than the standard value of the chi-square statistic with 12 degrees of freedom (the number of independent variables in the model) and their P-value is less than 5%. The null hypothesis is rejected in these models and the fixed effects method is used to fit the model.

### 4.6 Collinearity of variables

In econometrics, collinearity occurs when two or more explanatory (independent) variables in a multivariate regression have a high correlation with each other. Here the correlation is a linear relationship between independent variables. The amount and type of collinearity will be different depending on the intensity of correlation between independent variables. Collinearity is more or less present in all regression models; What is important is the degree of collinearity between the independent variables. The presence of perfect collinearity violates the classical assumptions of the regression model. In this study, the correlation coefficient was used to assess the collinearity between the explanatory variables. The results are shown in Table 9.

Table 9: The absolute value of the correlation coefficient

Correlation	ROE	ROA	PIS	NONPIS
MA	24.17%	6.43%	15.52%	-16.17%
POLITIC1	-24.62%	-26.10%	9.83%	-7.65%
POLITIC2	-28.88%	-29.52%	-6.00%	-7.63%
CRISIS1	3.87%	-1.21%	25.56%	12.16%
CRISIS2	-12.60%	1.73%	6.74%	-10.57%
DEPMARKET	3.54%	-5.70%	-2.17%	6.00%
Ln Age	17.46%	18.75%	-9.41%	7.61%
SIZE	-17.59%	24.15%	-22.10%	-6.67%
LOANGRTH	28.72%	-18.54%	30.23%	20.61%
DEPGRTH	26.03%	13.31%	17.84%	19.79%
$\Delta NI/TA$	56.73%	39.63%	26.59%	13.89%
LOSS	8.78%	12.05%	-13.69%	-10.57%

The test of correlation results proves that the relationship between management ability and bank performance-return on capital is 24.17%, bank performance-asset return is 6.43, the shared income growth rate is 15.52%, and the non-shared income growth rate is -16.17%.

### 4.7 Model estimations

1. The following hypotheses examine the impact of management ability, political relations, and financial crises on asset returns.

The MA variable coefficient,  $\beta_1$ , is used to test this hypothesis. The results of the regression test show that the coefficient of the MA variable in the model is positive, that is, with the increase in management ability, the value of the banks' asset return variable also increases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level because firstly the obtained t value is lower than its corresponding

Table 10: The results of the test of the impact of management ability, political relations, and financial crises on asset returns based on Model 1

Model	$ROA_{it} = \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it} + \beta_6 DEPMARKET_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_9 LOANGRTH_{it} + \beta_{10} DEPGRTH_{it} + \beta_{11} \Delta NI_{it} + \beta_{12} LOSS_{it} + \epsilon$			
Descriptive variables	Variable coefficients in the model	t-test	P-Value	Results
Constant Value	0.095939	4.223561	0.0001*	Significant in the model at the 95% level
MA	0.019552	0.913903	0.3633	Lack of significance in the model
POLITIC1	-0.007346	-1.377737	0.1719	Lack of significance in the model
POLITIC2	-0.000150	-1.971927	0.0518	Lack of significance in the model
CRISIS1	0.002170	0.972461	0.3335	Lack of significance in the model
CRISIS2	-0.000355	-0.431811	0.6670	Lack of significance in the model
DEPMARKET	0.068487	1.381989	0.1706	Lack of significance in the model
AGE	0.006465	1.968254	0.0523	Lack of significance in the model
SIZE	-0.005390	-3.913088	0.0002*	Significant in the model at the 95% level
LOANGRTH	0.003421	0.565696	0.5731	Lack of significance in the model
DEPGRTH	0.002238	0.408438	0.6840	Lack of significance in the model
ΔNI	1.118096	3.741101	0.0003*	Significant in the model at the 95% level
LOSS	0.019025	4.027087	0.0001*	Significant in the model at the 95% level
F test values		5.420834	Watson camera test	1.797598
P-Value values		0.000001*	The values of the determination coefficient R <sup>2</sup>	0.330652
			Values of adjusted coefficient of determination R <sup>2</sup>	0.321208
The result of model adequacy	According to the values of the F test and P-value which is less than 5%, the model is significant.			

**Significant at the 95% level**

value in the table ( $\alpha t = 0.975 = 1.96$ ). In addition, the P-Value calculated in this variable is more than 5%. The results are consistent with the correlation coefficient results. Therefore, the assumption that management ability has a significant effect on banks' asset returns is rejected at the 95% confidence level.

- The following hypotheses examine the impact of management ability, political relations, and financial crises on the return on equity (return on capital)

In the model, the probability value (or P-Value) of F is equal to 0.00. Therefore, the null hypothesis is rejected at the 95% confidence level because these values are less than 0.05. It means that there is a meaningful model and there is a linear relationship between independent and dependent variables. To test this hypothesis, the MA variable coefficient,  $\beta_1$ , is used. The results of the regression test show that the coefficient of the variable MA in the model is negative, that is, with the increase in management ability, the variable value of banks' return on capital decreases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level because firstly the obtained t value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the calculated value of this variable is more than 5 percent. The results are consistent with the correlation coefficient results. Therefore, the hypothesis that management ability has a significant effect on a bank's capital returns is rejected at the 95% confidence level.

The results of the regression test prove that the coefficient of the POLITIC1 variable in the model is negative, in other words, with the increase in political relations-political management, the variable value of banks' return on capital decreases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level. Because firstly, the obtained t-value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the P-Value calculated in this variable is more than 5%. The results of this article are consistent with the results of the correlation coefficient. In addition, the coefficient of the variable POLITIC2 in the model is negative, in other words, with the increase in political relations-government influence, the variable value of banks' return on capital decreases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level because firstly the obtained t-value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the P-Value calculated in this The variable is more than 5%. The results are consistent with the correlation coefficient results. The results of the regression test show that the variable coefficient of CRISIS 1 in the model is positive, in other words, with the increase of the financial crisis-recession

Table 11: The results of the test of the impact of management ability, political relations, and financial crises on the return on equity based on Model 2

Model	$ROE_{it} = \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it} + \beta_6 DEPMARKET_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_9 LOANGRTH_{it} + \beta_{10} DEPGRTH_{it} + \beta_{11} \Delta NI_{it} + \beta_{12} LOSS_{it} + \varepsilon$			
Descriptive variables	Variable coefficients in the model	t-test	P-Value	Results
Constant Value	0.489208	3.193775	0.0020*	Significant in the model at the 95% level
MA	-0.017292	-0.119859	0.9049	Lack of significance in the model
POLITIC1	-0.039655	-1.102883	0.2732	Lack of significance in the model
POLITIC2	-0.000874	-1.698457	0.0930	Lack of significance in the model
CRISIS1	0.008064	0.535904	0.5934	Lack of significance in the model
CRISIS2	-0.009583	-1.727566	0.0877	Lack of significance in the model
DEPMARKET	0.447447	1.338961	0.1841	Lack of significance in the model
AGE	0.035748	1.614063	0.1102	Lack of significance in the model
SIZE	-0.022449	-2.416935	0.0178*	Significant in the model at the 95% level
LOANGRTH	0.033315	0.816917	0.4162	Lack of significance in the model
DEPGRTH	0.029495	0.798112	0.4270	Lack of significance in the model
$\Delta NI$	10.51733	5.218587	0.0000*	Significant in the model at the 95% level
LOSS	0.047660	1.496093	0.1383	Lack of significance in the model
F test values		6.476435	Watson camera test	1.912805
P-Value values		0.000000*	The values of the determination coefficient R2	0.174704
			Values of adjusted coefficient of determination R2	0.161407
The result of model adequacy	According to the values of the F test and P-value which is less than 5%, the model is significant.			

\*Significant at the 95% level

period, the value of the bank's return on capital variable increases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level because firstly the obtained t value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the calculated value of this variable is more than 5 percent. The results are consistent with the correlation coefficient results. Also, the variable coefficient of CRISIS2 in the model is negative. In other words, with the increase of financial crisis-financial pressure, the value of the bank's return on capital variable decreases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level because firstly the obtained t value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the calculated value of this variable is more than 5 percent. The results are consistent with the correlation coefficient results. Therefore, the hypothesis that there is a significant relationship between financial crises and banks' return on capital is rejected at the 95% confidence level.

- The following hypotheses examine the impact of management ability, political relations, and financial crises on the growth of shared incomes.

D model is the probability value (or P-Value) of F with 0.00. Because these values are less than 0.05, therefore, the null hypothesis is rejected at the 95% confidence level. It means that there is a meaningful model and there is a linear correlation between independent and dependent variables. The results of the regression test showed that the coefficient of the variable MA in the model is positive, that is, the increase in management ability causes the variable value of the growth of the shared income of banks increases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level because firstly the obtained t-value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the P-Value calculated in this table

Table 12: The results of the test of the impact of management ability, political relations, and financial crises on the growth of shared incomes based on Model 3

Model	$PIS_{it} = \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it} + \beta_6 DEPMARKET_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_9 LOANGRTH_{it} + \beta_{10} DEPGRTH_{it} + \beta_{11} \Delta NI_{it} + \beta_{12} LOSS_{it} + \epsilon$			
Descriptive variables	Variable coefficients in the model	t-test	P-Value	Results
Constant Value	0.835025	1.734561	0.0864	Lack of significance in the model
MA	0.344246	0.759251	0.4498	Lack of significance in the model
POLITIC1	0.249021	2.203673	0.0302*	Significant in the model at the 95% level
POLITIC2	-0.002425	-1.499283	0.1375	Lack of significance in the model
CRISIS1	0.141078	2.983013	0.0037*	Significant in the model at the 95% level
CRISIS2	0.001261	0.072351	0.9425	Lack of significance in the model
DEPMARKET	-0.089965	-0.085660	0.9319	Lack of significance in the model
AGE	-0.039055	-0.561068	0.5762	Lack of significance in the model
SIZE	-0.035859	-1.228409	0.2226	Lack of significance in the model
LOANGRTH	0.150497	1.174213	0.2436	Lack of significance in the model
DEPGRTH	0.048335	0.416156	0.6783	Lack of significance in the model
$\Delta NI$	12.03151	1.899534	0.0608	Lack of significance in the model
LOSS	-0.093981	-0.938690	0.3505	Lack of significance in the model
F test values		2.583258	Watson camera test	2.014047
P-Value values		0.005622	The values of the determination coefficient R2	0.164952
			Values of adjusted coefficient of determination R2	0.162387
The result of model adequacy	According to the values of the F test and P-value which is less than 5%, the model is significant.			

\*Significant at the 95% level

is more than 5%. The results are consistent with the correlation coefficient results. Therefore, the hypothesis that the ability of management has a significant effect on the growth of shared revenue of banks is rejected at the 95% confidence level.

The variable coefficient of POLITIC1 in the model is positive, which means, with the increase in political relations-political management, the variable value of the growth of the shared income of banks also increases and vice versa. This correlation is statistically significant at the confidence level of 95% because, firstly, the obtained t-value is more than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the P-Value calculated in this variable is less than 5. The results of the present research are consistent with the results of the correlation coefficient. In addition, the coefficient of the POLITIC2 variable in the model is negative, in other words, with the increase in political relations-government influence, the variable value of the growth of the common income of banks also decreases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level because firstly the obtained t-value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the P-Value calculated in this table is more than 5%. So, the results are consistent with the correlation coefficient results.

- The following hypotheses examine the impact of management ability, political relations, and financial crises on the growth of non-shared incomes

In the model, the probability value (or P-Value) of F is equal to 0.67. Because these values are more than 0.05, therefore, the null hypothesis is not rejected at the 95% confidence level. It means that there is no significant model and there is no linear relationship between independent and dependent variables. The results of the regression test showed that the coefficient of the variable MA in the model is negative, that is an increase in management ability leads to the variable value of the growth of non-shared income of banks decreasing and vice versa. This correlation is statistically so weak that it is not significant at the 95% confidence level because firstly the obtained t-value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the P-Value calculated in this The variable is more than 5%. The results are consistent with the correlation coefficient results. Therefore, the claim that management ability has a significant effect on the growth of non-shared income

Table 13: The results of the test of the impact of management ability, political relations, and financial crises on non-shared income based on Model 4

Model	$NONPIS_{it} = \beta + \beta_1 MA_{it} + \beta_2 POLITIC1_{it} + \beta_3 POLITIC2_{it} + \beta_4 CRISIS1_{it} + \beta_5 CRISIS2_{it} + \beta_6 DEPMARKET_{it} + \beta_7 AGE_{it} + \beta_8 SIZE_{it} + \beta_9 LOANGRTH_{it} + \beta_{10} DEPGRTH_{it} + \beta_{11} \Delta NI_{it} + \beta_{12} LOSS_{it} + \epsilon$			
Descriptive variables	Variable coefficients in the model	t-test	P-Value	Results
Constant Value	0.369003	1.127878	0.2625	Lack of significance in the model
MA	-0.129325	-0.419702	0.6757	Lack of significance in the model
POLITIC1	-0.035601	-0.463573	0.6441	Lack of significance in the model
POLITIC2	-0.000174	-0.158644	0.8743	Lack of significance in the model
CRISIS1	0.022621	0.703791	0.4835	Lack of significance in the model
CRISIS2	-0.007624	-0.643511	0.5216	Lack of significance in the model
DEPMARKET	0.512530	0.718070	0.4747	Lack of significance in the model
AGE	0.019173	0.405300	0.6863	Lack of significance in the model
SIZE	-0.013407	-0.675822	0.5010	Lack of significance in the model
LOANGRTH	0.079031	0.907308	0.3668	Lack of significance in the model
DEPGRTH	0.078016	0.988369	0.3257	Lack of significance in the model
$\Delta NI$	1.018583	0.236627	0.8135	Lack of significance in the model
LOSS	-0.015119	-0.222206	0.8247	Lack of significance in the model
F test values		0.777469	Watson camera test	1.898050
P-Value values		0.671794	The values of the determination coefficient R2	0.037867
			Values of adjusted coefficient of determination R2	0.028012
The result of model adequacy	According to the values of the F test and P-value which is less than 5%, the model is significant.			

of banks is rejected at the 95% confidence level.

The results of the regression test show that the coefficient of the POLITIC1 variable in the model is negative, in other words, with the increase in political relations- political management, the variable value of the growth of non-shared income of banks decreases and vice versa. This relationship is statistically so low that it is not significant at the 95% confidence level because firstly the obtained t-value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the P-Value calculated in this. The variable is more than 5%. The results are consistent with the correlation coefficient results. Also, the coefficient of the POLITIC2 variable in the model is negative, in other words, with the increase in political relations-government influence, the variable value of the growth of non-shared income of banks decreases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level because firstly the obtained t-value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ) and also the P-Value calculated in this table is more than 5%. The results are consistent with the correlation coefficient results.

The variable coefficient of CRISIS1 in the model is positive. In other words, with the increase of the financial crisis-recession period, the return on the capital variable of banks increases and vice versa. This relationship is statistically so weak that it is not significant at the 95% confidence level because at first, the t value is lower than its corresponding value in the table ( $\alpha t = 0.975 = 1.96$ ). In addition, the P-Value calculated in this variable is more than 5%. The results are consistent with the correlation coefficient results.

## 5 Dissuasion and conclusion

It is important to understand the factors affecting the performance, risk, and price of banks both from the shareholder's perspective and depositors and also from the sight of active elements in the market. The financial market includes the two main pillars of the money market and the capital market. The most important task of the capital



market is to attract dispersed capital and allocate it optimally to units that move both in line with economic development and maintain the expected benefits of investors. Banks, as the engine of financial resources of the economy, have special importance for other corporations active in the economy, for the government, and the banks themselves. Accordingly, being familiar with the factors and indicators affecting performance and profitability, risk management, and also their stock price changes, both from the bank's management point of view and from the macroeconomic point of view, can guide the economy and governments. On the other hand, the correct management of banking challenges and improvement of factors affecting the efficiency and effectiveness of banking resources can move the economic cycle in the right direction, considering that the main activity of banks is to grant loans and provide loans to applicants. In this regard, the suitable management of banking challenges and improvement of factors affecting the efficiency and effectiveness of banking resources can move the economic cycle in the right direction, considering that the main activity of banks is to grant loans and provide loans to applicants. Accordingly, the research has evaluated the impact of management ability on improving the performance of banks in the Tehran Stock Exchange using the combined method of data coverage analysis and 2 SLS regression estimation. Moreover, the results show that improving the level of ability and expertise in bank management will not necessarily lead to improving the level of return on assets. This result is caused by three main factors. First of all, management ability is not considered one of the main factors and indicators affecting asset returns and is not able to explain the direction of banks. Secondly, banks, as enterprises that affect many sectors of the economy, are influenced by various sectors of the economy, government decisions, and the state of political management of the country, so that even efficient and capable managers can moderate these governmental and political effects of the banking industry to influence the returns on banks' assets. Thirdly, a major part of the banking activity has been affected by special economic conditions, and these conditions (economic sanctions and lack of trade with the outside world) have led to the greatest damage to the banking system, which has caused the ability of management to be one of the effective factors. It cannot work with all its abilities and available capacities on the return of banks' assets.

The results show that improving the level of ability and expertise in bank management will not necessarily lead to an improvement in capital return. This result is from four main factors. First, the increase in the profitability of banks concerning the capital they have is not influenced by the ability of the management but is caused by the central bank's policies regarding capital adequacy and applicable regulations that determine the limits and value of banks' capital. Second, the ability of management is not considered one of the main factors and indicators affecting the bank's capital return, and it is not able to explain the direction of the banks. Third, banks, as enterprises that affect many sectors of the economy, are influenced by various sectors of the economy, government decisions, and also the state of political management of the country in such a way that even efficient and capable managers can moderate these governmental and political effects of the industry. They are not banking so they can increase the capital return of banks. Fourth, a major part of the banking activity has been affected by special economic conditions in recent years, and these conditions (economic sanctions and lack of exchange with the outside world) have led to the greatest damage to the banking system. It has caused the ability of management, as one of the factors affecting the capital return of banks, to be unable to work with all its abilities and existing capacities.

According to the results obtained, the following recommendations are presented to managers on one side and owners on the other side in their decision-making processes.

1. It is recommended to the shareholders, investors, and depositors of the banks that do not consider the ability of the management to evaluate the level of performance of the banks and emphasis on other indicators other than the ability of the management to evaluate the return on assets, return on capital, joint and non-joint incomes. Therefore, shareholders, investors, and depositors do not assign significant weight to management ability when evaluating performance and try to make their predictions through the main performance indicators of banks.
2. It is recommended that political relations can be used in their decision models only to evaluate common incomes. The results show that political relations only have a significant effect on the growth rate of common incomes. Therefore, shareholders, investors, and depositors should not assign significant weight to political relations when evaluating performance (other than common income) and try to predictions through the main indicators of banks' performance evaluation.
3. It is recommended to the shareholders, investors, and bank depositors that they can use political relations in their decision models only to assess the risk of liquidity and bankruptcy. The results show that political relations only have a significant effect on liquidity risk and bankruptcy. Therefore, when evaluating risk management (including credit and operational risks), shareholders, investors, and depositors should not assign significant weight to political relations and try to identify and evaluate banks' credit and operational risks through common risk management models.

## References

- [1] M. Alimoradi, A. Ahmadi Saeed, and D. Foroghi, *The effect of the level of optimism and risk tolerance of decision makers on investment sales decisions with an emphasis on fair value accounting*, *Financ. Account. Quart.* **12** (2020), no. 45, 1.
- [2] A. Ashtab and P. Piri, *The effect of profit forecast disclosure features on company risk concerning real profit management*, *Financ. Account. Quart.* **12** (2020), no. 45.
- [3] J.L. Banks, H.S. Beard, Y. Cao, A.E. Cho, W. Damm, R. Farid, A.K. Felts, T.A. Halgren, D.T. Mainz, J.R. Maple, and R. Murphy, *Integrated modeling program, applied chemical theory (IMPACT)*, *J. Comput. Chem.* **26** (2005), no. 16, 1752–1780.
- [4] P. Chalermchatvichien, S. Jumreornvong, P. Jiraporn, and M. Singh, *The effect of bank ownership concentration on capital adequacy, liquidity, and capital stability*, *J. Financ. Serv. Res.* **45** (2014), 219–240.
- [5] C. Chen, *Bank efficiency in Sub-Saharan African middle income countries*, International Monetary Fund, 2009.
- [6] A. Dietrich and G. Wanzenried, *The determinants of commercial banking profitability in low-, middle-, and high-income countries*, *Quart. Rev. Econ. Financ.* **54** (2014), no. 3, 337–354.
- [7] X. Freixas and J.-C. Rochet, *Microeconomics of Banking*, MIT press Cambridge, 2014.
- [8] J. Gallemore, M. Mayberry, and J. Wilde, *Corporate Taxation and Bank Outcomes: Evidence from US State Taxes*, University of Chicago, Florida and Iowa Graduate School of Business, 2017.
- [9] E. García-Meca and I.-M. García-Sánchez, *Does managerial ability influence the quality of financial reporting?*, *Eur. Manage. J.* **36** (2017), no. 4, 544–557.
- [10] M.R. Homaeinezhad, M. Homaeinezhad, S. Akbari and D.N.G. Hosseini, *Input-decoupled discrete-time sliding mode control algorithm for servo multi-field multi-armature DC machine*, *ISA Trans.* **127** (2022), 283–298.
- [11] S.M.R. Hosseini Moghaddam and S.R. Hejazi, *The effect of entrepreneurial orientation on the performance of banks with the mediating variable of market orientation*, *J. Entrepr. Dev.* **7** (2013), no. 2 (24 consecutive), 211–229.
- [12] S. Jaiswal, M.P. Chao, R. Majeti, and I.L. Weissman, *Macrophages as mediators of tumor immunosurveillance*, *Trends Immun.* **31** (2010), no. 6, 212–219.
- [13] J. Liu and R. Zhong, *Political uncertainty and a firm's credit risk: Evidence from the international CDS market*, *J. Financ. Stabil.* **30** (2017), 53–66.
- [14] S. Louati, A. Louhichi, and Y. Boujelbene, *The risk-capital-efficiency trilogy: A comparative study between Islamic and conventional banks*, *Manag. Finance* **42** (2016), no. 12, 1226–1252.
- [15] M. Mehrara and M. Mehranfar, *Banking performance and macroeconomic factors in risk management*, *Econ. Model. Sci. Res. Quart.* **7** (2015), no. 21, 21–37.
- [16] M. Rahimkhani, M. Saberian, A. Mordadi, S. Varmazyar, and A. Tavakoli, *Urinary tract infection with *Candida glabrata* in a patient with spinal cord injury*, *Acta Medica Iran.* **53** (2015), no. 8, 516–517.
- [17] M. Sabzali, M. Sarfi, M. Zohouri, T. Sarfi, and M. Darvishi, *Fake news and freedom of expression: an Iranian perspective*, *J. Cyberspace Stud.* **6** (2022), no. 2, 205–218.
- [18] S. Sharifi, A. Haldar, and S.N. Rao, *Relationship between operational risk management, size, and ownership of Indian banks*, *Manag. Finance* **42** (2016), no. 10, 930–942.
- [19] G. Soleimanian, D. Foroghi, and H. Amiri, *Development of capital asset pricing factor models through the pricing of value, momentum, and stock quality factors*, *Financ. Account. Quart.* **11** (2019), no. 44, p. 37.
- [20] R. Vaidyanathan, *Asset-liability management: Issues and trends in Indian context*, *Sci. J. Manag.* **29** (1999), 39–48.
- [21] H. Zarrouk, K. Ben Jedidia, and M. Moualhi, *Is Islamic bank profitability driven by same forces as conventional banks?*, *Int. J. Islamic Middle Eastern Finance Manag.* **9** (2016), no. 1, 46–66.