The effect of banking monetary law and capital requirements on lending and financial stability of banks admitted to Tehran Stock Exchange

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Abstract

According to Ball's principles, the most important weakness and shortcoming in the banking sector is the lack of financial resources and lending by banks to other economic sectors. Banks need liquidity to cover fluctuations and expected or unanticipated changes in balance sheet items, as well as to attract new resources for allocation and as a result to earn income. In this regard, in this research, the asymmetric effects of banking monetary law requirements on lending and financial stability of banks admitted to the Tehran Stock Exchange have been investigated. For this purpose, the data of 19 selected banks and financial institutions were used during the period of 2012-2020. The findings of the research showed that the banking monetary law and capital requirements had negative and significant effects on bank lending. It was also observed that the banking monetary law and capital requirements had positive and significant effects on the financial stability of banks. Finally, it was observed that there is a symmetrical convergence relationship between lending power and banking stability with capital requirements and banking monetary law.

1 Introduction

After the financial crisis of the 1990s coincided with the initial years of the implementation of the Bal One Capital agreement, the attention of scientific studies was directed to the role of banks' capital in the mechanism of monetary transfer through the crediting channel. After this crisis, the re-experience of the formation of a financial crisis (recent financial crisis) shortly after the implementation of the capital agreement of Basel III Two, led to the emphasis on the role of the bank capital channel in the above mechanism. To be more precise, the bank capital channel introduced in early 2000 based on the dynamic role of bank capital in the bank lending decision was emphasized in the practical arena. In fact, banks' capital was not only identified as a key variable in their portfolio decision but its importance in the efficiency of the monetary policy transmission mechanism was also considered.

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To be more precise, the banks that did not have enough capital to cover their risk-weighted assets based on the capital agreement, changed the composition of their asset portfolios in the short term to maintain the required legal capital ratio and due to the lower risk-weight of the bonds Securities compared to loans, they paid attention to the change in the composition of the asset portfolio from loans to securities. This explains to some extent the desire of most banks to be present in the securities market instead of operating in the credit market in the condition of low bank capital.

On the other hand, in the lending channel, the bank's capital variable is considered as a static variable in the lending decision. To be more precise, banks are evaluated based on their legal capital ratio in the market. Therefore, the lower the ratio of bank capital adequacy compared to the amount of legal capital, it will be classified in the group of banks with less financial health and therefore will have a lower credit rating and less access to the external financing market. The contractionary monetary policy cannot provide the reduction in deposit resources through the financial market and will be faced with a greater reduction in resources compared to another bank with a higher capital ratio, and will be required to further reduce its lending decision.

Therefore, in the bank lending channel, considering the stability of the bank's capital, in addition to paying attention to the binding effect of capital constraints and liquidity constraints in the lending decision, attention is paid to the role of the legal capital ratio in the external financing of the resources needed for bank lending activities. However, in the capital channel, the main emphasis is on the dynamics of the bank's capital and the dynamic change of the ratio of legal capital with the application of monetary policy, which can play a key role in the bank's lending decision by making the legal capital mandatory.

Based on this, it is clear that the variables of banking monetary law, capital requirements, lending power and banking stability are continuously related and it is necessary to investigate their relationship. Accordingly, in the present research, the asymmetric effects of banking monetary law and capital requirements on the lending and financial stability of banks admitted to the Tehran Stock Exchange have been investigated.

In the continuation of the article, in the next section, the theoretical foundations and the empirical background of the research are discussed. Then the research methodology model and variables will be presented. After that, the data is analyzed and finally, the results are analyzed and the content is summarized.

2 Theoretical

2.1 Banking monetary law

The Basel III Committee has required the use of two types of liquidity ratios to evaluate the adequacy of banks' liquidity in short-term and long-term crises in the requirements section of the Banking Monetary Law of Basel III 3 statement. One of those ratios is the liquidity coverage ratio and the second is the stable financing rate. The liquidity coverage ratio is proposed to evaluate the adequacy of liquidity in the short term and it shows the ratio of the amount of liquid and quality assets required by banks to settle the net outflow of cash in the next 30 critical days, which is obtained according to the folloBasel III formula:

In general, to calculate this ratio, quality liquid assets are weighted according to the probability of turning into cash in the desired time interval and on the net outflow of cash within the next 30 days, which is predicted through the net outflow of deposits and Other resources are obtained and distributed. be made Quality assets are assets that can easily be converted into cash in emergencies.

According to Basel III 3, the issue of net sustainable financing is also taken into account, which is calculated through the difference between the required amount of financing and the amount of available financing. This amount is assets that cannot be liquidated through sales or as collateral for long-term debts; Therefore, stable sources of financing should be used. The profitability of liquidity creation activities should be evaluated against the risk that arises. The effect of liquidity in financial markets and valuation of assets and available financing is evaluated through transfer risk; If it is negative or zero, the amount required for stable financing is less than or equal to the amount of stable financing available, and this means that the bank has not been able to control the risk of asset sales and debt repayment at present. Therefore, the bank cannot create liquidity and net stable financing clearly indicates the risk tolerance threshold caused by the inability to deal with transfer risk. It is assumed that the transfer risk and non-cash debt will increase with the creation of liquidity. The net amount of stable financing is measured through the risk-proportioned cash portfolio for the bank, which is calculated simply in two indicators of liquidity conversion gap and liquidity creation. In fact, in stable financing, the transfer risk inherent in different levels of liquidity creation is emphasized, and it requires to evaluation of the bank's ability to control the transfer risk at the time of liquidity creation. This level of liquidity creation is related to the issue of losses and correspondingly maintaining sufficient

assets to cover these losses. Transfer risk creates fragility (vulnerability) and creates creative financial ways to manage liquidity and pressures of lack of liquidity. Stable financing is done through capital and debt according to the maturity date, and the contribution of stability in financing is to undated deposits. Maturity or deposit with a maturity date of less than one year is dependent on the bank's expectation of liquidity for the same short period [27]. The ratio of stable financing to one of the indicators emphasized by Bal 3 will be effective until 2018. Calculation method It is calculated from the division of debt to risk-weighted assets. This ratio shows the amount of financing available to the amount of financing needed. The bank's goal is to create stable financing and its dynamics on the other side of the balance sheet (assets); therefore, is a suitable tool for liquidity risk management. The stability of financing can be seen in the place of liabilities and the required financing in the place of assets of the balance sheet.) In other words, the ratio of stable financing shows the stable financing situation of the bank against various types of evaluates the assets held by the bank. Based on this, the long-term debt and the financing capital are completely stable with a factor of one hundred, and in contrast to the fixed assets, the assets are one hundred percent secured [6].

As the coefficients of balance sheet items move away from 100% of the deposit weight and approach zero, the amount or intensity of stability in reliable and required financing is reduced, and the sum of the items on the asset and liability side is weighted to the risk of each item in the calculation of the stable financing ratio is entered; But because banks usually need liquidity to finance the assets side of the balance sheet, in practice the inverse ratio of stable financing has been considered, and in this ratio, a figure higher than one indicates a crisis in stable financing and an increase in the bank's liquidity risk. Contains this ratio is the opposite of the stable financing ratio and shows the ratio of required financing to available financing. In other words, based on the weighting of balance sheet items to risk, the higher this ratio is and closer to one, the higher the level of the bank's risky items and the bank's balance sheet is less stable against financial shocks [9].

2.2 Capital adequacy requirements

The capital adequacy ratio (CAR) stands as a crucial yardstick for assessing a bank's financial health. As mandated by the Basel Committee, it measures the capital buffer available to absorb potential losses arising from inherent risks in a bank's core business. One such risk is credit risk, associated with lending activities. When granting commercial facilities, banks face the possibility of loan defaults due to various factors, including borrower insolvency. While credit analysis, collateral, and guarantees can mitigate these risks, they cannot eliminate them entirely. Unexpected losses can still occur, necessitating sufficient capital as a cushion. Therefore, within the banking system, determining the appropriate capital adequacy based on a bank's risk profile (reflected in its loan and investment portfolio) is a paramount responsibility of both bank managers and superv [10]. In general, the capital adequacy ratio is obtained by dividing the base capital, which is the bank's acceptable capital (first-tier capital + second-tier capital) by the total risk-weighted assets (including risk). For example, if a bank directs its assets towards high-risk assets, the denominator of the deficit, i.e. risk-weighted assets, will increase and as a result, the capital adequacy ratio will decrease. Each of the approaches to estimating banks' capital adequacy (how to determine the risk weight of assets) depends on the size and volume of the bank's activity and the level of access to accurate data and information to estimate the risk weight of each of the assets in their portfolio. It is necessary to explain that in the previous statements, the use of internal methods of banks and the use of past information and historical experiences, the results of risk-weighted assets calculations faced problems. For this reason, in addition to the capital adequacy ratio, this statement introduced the leverage ratio as a complementary criterion to support banks more against the problems related to the correct allocation of risk weight to assets. In fact, this ratio is used as a non-risk sensitive measure to reduce the risk of creating high leverage [30].

2.3 Bank lending

Introduction after the simultaneous occurrence of the financial crisis of the 1990s with the initial years of the implementation of the Bal One Capital Agreement, the attention of scientific studies was directed to the role of banks' capital in the mechanism of monetary transfer through the crediting channel. After this crisis, the re-experience of the formation of a financial crisis (the recent financial crisis) shortly after the implementation of the capital agreement of Basel III two, led to the emphasis on the role of the banking capital channel in the above mechanism. To be more precise, the bank capital channel introduced in early 2000 based on the dynamic role of bank capital in the bank lending decision was emphasized in the practical arena [3]. In the lending channel, the bank's capital variable is considered as a static variable in the lending decision. To be more precise, banks are evaluated based on their legal capital ratio in the market. Therefore, the lower the bank capital adequacy ratio compared to the amount of legal capital, the lower it will be classified in the group of banks with financial health, and therefore it will have a lower credit rating and less access to the external financing market. In the conditions of applying a contractionary

monetary policy, it cannot provide a reduction in deposit resources through the financial market and will face a greater reduction in resources compared to another bank with a higher capital ratio and will be required to further reduce its lending decision. Describing the cause of the credit crisis of the early 1990s, and great importance is considered for it [17]. In the bank capital channel, which was fully introduced by Chami and Cosimano [7], the bank capital variable is considered as a dynamic variable that has a key role in the ratio of legal capital and the bank's lending decision. In this approach, the imperfection of the banking capital market and the mismatch between the maturity of assets and liabilities play an important role. Therefore, in the bank lending channel, considering the stability of the bank's capital, in addition to paying attention to the binding effect of the capital requirement in the lending decision, attention is paid to the role of the legal capital ratio in the external financing of the resources needed for the bank lending activity. However, in the capital channel, the main emphasis is on the dynamics of the bank's capital and the dynamic change of the ratio of legal capital with the application of monetary policy, which can play a key role in the bank's lending decision by imposing legal capital restrictions [25].

2.4 Banking stability

According to the definition of Frederick Myshkin [22], "Financial instability occurs when shocks to the financial system interfere with the flow of information in such a way that this system is no longer able to perform its task, which is to direct financial funds to productive investment opportunities." In this definition, the intermediary role of the financial system in providing credits for the financial and real sectors of the economy and the main role of information asymmetry in the emergence of financial instability are emphasized. Farhi also defines financial instability as a state in which these three characteristics exist: 1- the price of some of the most important assets deviates greatly from their original prices, 2- market performance and the availability of financial resources and credits are severely disrupted in such a way the result of which is that 3- the total expenses were not able to meet the needs of the economy to cover production, and this deviation can be higher or lower than the amount of expenses necessary to cover economic production [11]. According to the experiences of different countries and the above definition of the components of a financial system, currently, in most countries of the world, periodic reports (quarterly and annual) regarding the stability of the financial system (an FRS) and its evaluation are published by central banks and often It contains important points regarding supply and demand, price fluctuations, boom and bust in most financial markets and institutions involved in these markets. For example, financial health indicators in banks, the insurance sector, non-bank deposit takers, financial markets, payment systems, the real estate market, the commercial sector and the agricultural sector (agricultural commodity exchange) are examined. Although financial stability does not have a defined and standard index like some of the variables considered by central banks such as inflation or economic growth, in some countries the form of financial stability reports, is tried by combining the weight of some variables from inflation in the goods and services sector. To account for fluctuations in the housing market and some variables of the stock market, banking sector, etc., an index called the financial stability index was created and by examining it, the changes made in the country's financial stability over many years can be monitored [12].

2.5 Asymmetric effects of banking monetary law and capital requirements on lending and financial stability of banks

About the impact of the banking monetary law on bank lending and banking stability, in December 2010, the Basel III committee, which is responsible for supervising the banking sector, for the first time introduced two liquidity requirements in the Basel III three agreement: Ratio coverage liquidity that this ratio ensures that the bank has a sufficient amount of assets with high liquidity for 30 days of resistance in crisis conditions and a stable net investment ratio that this ratio creates an incentive to finance banking activities with resources more stability increases the bank's resistance in longer time horizons. In this ratio, the bank's resources are classified in terms of stability, and on the other hand, the bank's need for stable or long-term resources is measured. The bank's stable resources should provide sufficient coverage for its long-term needs [24]. Regarding the effect of capital requirements on lending and banking stability, theoretically, the greater effect of capital on banks' balance sheets is clear. Higher capital acts as a buffer against losses. They also provide incentives for better supervision and borrowers to make the bank more likely to survive. However, the empirical literature is inconclusive on whether better capitalization is beneficial for bank stability [24]. Mora and Reggio [23] use panel data for 2, 210 banks in 47 European countries over the period 2000-2016 to examine how capital requirements affect bank stability. They confirm the positive relationship between capital requirements and banking sector stability [23].

2.6 Research background

In a study, Mahboubi [21] investigated "the effect of capital adequacy index and banking risks on stability index and financial performance in Parsian Bank with emphasis on credit risk and liquidity". The statistical population of the current research is Parsian Bank and the period under investigation is 2001 to 2019 and seasonally. To estimate the model, the autoregressive model with distributed intervals (ARDL) is used. According to the estimation results, it was observed that the index of capital adequacy and credit and liquidity risks had significant effects on the index of stability and financial performance in Parsian Bank [21]. Sheikh Ali [28] in a study has investigated the effect of liquidity risk and credit risk on the level of banking stability index and banking performance in Bank Mellat. For this purpose, the data of Mellat Bank between 1971 and 2017 are analyzed using the vector autoregression model with wide credit breaks and liquidity risk on the stability and performance of the bank, and the evidence shows a significant relationship between the mentioned variables [28]. Jafari and Malekian [16] in a study have investigated the effect of the inflation rate and the minimum capital requirement of banks on the amount of lending of banks admitted to the Tehran Stock Exchange. The results of the Generalized Least Squares (EGLS) regression test showed that inflation is effective on the amount of bank lending, but the average capital adequacy has no relationship with the amount of bank lending [16]. In a study, Golijani et al. [14] investigated the relationship between capital adequacy ratio and liquidity ratio with financial distress. The research results show that there is a significant relationship between the ratios of capital adequacy and liquidity with financial distress in banks admitted to the Tehran Stock Exchange [14]. In a study, Mutarindwa et al. [24] investigated the "effects of banking and capital law on lending and stability of African banks". A detailed analysis shows that compliance with the capital threshold increases the Z-rank and the non-performing loan ratio (NPL ratio) only for those banks with a stability level higher than the sample average [24]. In a study, LanLe et al. [19] investigated capital requirements and bank performance under the Basel III Three Treaty: a comparative analysis between Australian and German banks. The results suggest that a tighter capital ratio increases operating profits, while it fails to improve bank profitability and efficiency [19]. In a study, Grundke and Kühn [15] investigated the effects of the liquidity ratios of the three-Basel III agreement on banks. The findings of the research showed that first, the introduction of liquidity ratios has no clear effect on bank stock returns and balance sheet growth. Second, the introduction of a liquidity ratio helps to reduce default risk. Third, it is more difficult for banks to meet the ratio thresholds in macroeconomic stress scenarios than in other scenarios. Fourth, reducing maturity transformation can effectively close the liquidity gap within one year [15]. Ben Naceur et al. [4] in a study examining the three-Basel III contract and bank lending: evidence from American and European banks. The findings of the research showed that American banks strengthen their risk absorption capacities when expanding their credit activities. Capital ratios have had significant negative effects on the growth of bank lending and other loans for large European banks in the context of settlement and the "credit crunch" in Europe during the post-2008 financial crisis. In addition, liquidity indicators have positive effects on the growth of bank lending, which supports the need to consider the characteristics and behaviours of heterogeneous banks when implementing new regulatory policies [4].

Based on the investigations, it is clear that so far no research in the country has investigated the effect of the banking monetary law and capital requirements on lending and financial stability of banks admitted to the Tehran Stock Exchange, which is the most important aspect of innovation. The research is present.

3 Research methodology

The current research is applied in terms of its purpose because the results obtained from it are used by a wide range of users. In terms of its nature, it is correlational research because it tries to investigate the relationship and impact of several variables on each other. In terms of time, it is a retrospective research; Because the information about the past events of the sample members is used in it. In terms of logic, it is an inductive research. Because of that, we try to generalize the result to the whole society based on limited observations (sample). In terms of the nature of the data, it is also quantitative research; Because the research variables have been measured and used as numbers.

The statistical population of this research is the banking sector of the country including commercial banks and credit financial institutions active in the stock market (19 companies including Ansar Bank, Saman Bank, Pas Bank, Iran Zameen Bank, Capital Bank, Mellat Bank, Saderat Bank, Tourism Bank, Pasarguard, Tejarat Bank, Sina Bank, Entrepreneur Bank, New Economy Bank, Bank D, Hikmat Iranian Bank, Eindho Bank, Parsian Bank, Middle East Bank and Shahr Bank) from 2012 to 2020.

In order to investigate the effect of banking monetary law and capital requirements on lending and financial stability of banks, according to Mutarindwa et al [24], the estimation of the follow Basel III regression models has been used:

Lending $it = c_0 + c_1$ Liquidity $it + c_2$ Capital $it + c_3$ Size $it + c_4$ NPL $it + c_5$ Ownership $it + c_6$ inflation $it + c_7$ Growth Rate $it + c_8$ EXRV $it + e\ it$.

Z-Score $it = c_0 + c_1$ Liquidity $it + c_2$ Capital $it + c_3$ Size $it + c_4$ NPL $it + c_5$ Ownership $it + c_6$ inflation $it + c_7$ Growth Rate $it + c_8$ EXRV $it + e\ it$.

Dependent variable:

Lending: It is defined and calculated as the growth rate of bank loans.

Index (Z-Score): It is calculated based on the folloBasel III relationship:

$$\text{Z-Score} = \frac{ROI + \text{capital ratio}}{\sigma(ROI)}.$$

In which, ROA represents the rate of return on assets, which is defined as the ratio of net income to total assets of the bank. Capital ratio is defined as the ratio of equity to total assets and represents the standard deviation of the rate of return on assets.

Independent variables:

The requirements of the banking monetary law (Liquidity): It is defined as a virtual variable that has a value equal to one for banks whose Net Stable Funding Rate (NSFR) is greater than 100% and otherwise has a value equal to zero. The net fixed rate is calculated as follows:

NSFR = ASF / RSF

ASF = total available stable funds, which is calculated as the sum of equity + liabilities with a maturity of more than one year.

RSF = total stable funding requirement, which is calculated as the sum of the bank's capital + liabilities with a maturity of more than one year.

Capital requirements (Capital): It is defined as a virtual variable that has a value equal to one for banks whose capital adequacy ratio (TCR) is greater than 8% and otherwise has a value equal to zero.

Control variables:

Bank size (Size): defined and calculated as the natural logarithm of total bank assets.

Non-operating loans (NPL): It is defined and calculated as the ratio of non-operating loans to total loans.

Ownership concentration: It is defined as a virtual variable so that if the ownership ratio of the company's major shareholder is greater than 10%, it will have a value of one and otherwise it will have a value of zero.

Inflation rate (Inf): The annual inflation rate is defined and calculated as a logarithm.

Economic Growth Rate: It is defined and calculated as the country's GDP growth rate.

Exchange Rate Fluctuations (REXV): To calculate the exchange rate fluctuation index, the actual exchange rate data is first extracted from the WDI site, then based on Arch and Garch econometric methods, its fluctuations are calculated and used as a fluctuation index. the exchange rate is used.

To estimate research patterns, the panel data method is used.

4 Model estimation and data analysis

4.1 Description of the statistical sample

Table No. 1 shows the statistical description of dependent, independent and control variables for all the observations of this research.

Table 1: Statistical description of research model variables

LENDING	ZSCORE	LIQUIDITY	CAPITAL	SIZE	symbol Variable
0.080745	0.594729	0.573099	0.77193	13.89045	Average
0.050854	0.606321	0.552124	0.665458	13.81319	Middle
0.659049	2.124316	1	1	19.20057	Maximum
0.000391	0.061063	0	0	11.03528	minimum
0.09387	0.258445	0.49608	0.42082	1.806564	standard deviation
3.042334	1.83993	-0.295574	-1.296175	0.763128	skewness
4.670594	2.737582	1.087364	2.68007	3.589826	kurtosis

Table 1b: Statistical description of research model variables

Non-operating loans	Concentration of ownership	Inflation	Economic Growth	Exchange rate fluctuations	Variable
NPL	OWNERSHIP	INF	GROWTHRATE	REXV	symbol
0.077283	0.818713	22.8	0.18302	8.345757	Average
0.03982	0.792424	21.5	-0.194073	3.187439	Middle
0.904231	1	41.2	13.39624	19.28389	Maximum
0.00375	0	9	-7.444557	0.542456	minimum
0.114954	0.386387	11.32248	6.314464	7.489199	standard deviation
4.100675	-1.654557	0.182665	0.630992	0.316943	skewness
3.872563	3.737558	1.550071	2.705765	1.274501	kurtosis

Source: Research findings

As can be seen in the above table, the average inflation rate is equal to 22.8 and its median is equal to 21.5, which shows that most of the data related to this variable are concentrated around the average. Dispersion indices are generally a measure to determine the extent of data dispersion from each other or the extent of their dispersion relative to the average. One of the most important dispersion indices, which is the ideal condition for entering the variable into the regression model, is the standard deviation. As can be seen in table 1, the standard deviation of the variables is not zero and they have this condition. The skewness parameter shows the degree of asymmetry of the frequency curve of the variable. If the coefficient of skewness is zero, the society is completely symmetrical, and if the coefficient is positive, there will be a skew to the right, and if it is negative, there will be a skew to the left. For example, the coefficient of skewness of the inflation rate variable is positive and equal to 0.18, which means that the frequency curve of this variable in the studied society is skewed to the right and deviates from the centre of symmetry to this extent. Also, the elongation of this variable is equal to 1.55, which is less than the number 3 corresponding to the normal distribution, and as a result, it is wider than the normal distribution.

4.2 Diagnostic tests

To analyze the data of each of the stated models, it is necessary to test the classical assumptions of the model before processing them and testing the hypotheses. One of the classic statistical assumptions is the homogeneity of variance of the residuals, which is considered one of the basic hypotheses of any relationship. White's test was used to investigate the assumption of heterogeneity of variance in this research, the results of which are presented in Table 2.

Table 2: The results of the heterogeneity of variance test of the residuals

Result	Test statistics	Significance level	H_0	Model
H0 is not rejected	0.309	0.775	Homogeneity of variance	The first model
H0 is not rejected	0.311	0.762	Homogeneity of variance	The second model

Source: Research findings

The results listed in Table 2 shows that the probability statistic calculated in White's test for research models is greater than the error level of 0.05. Therefore, the hypothesis H0 of this test that the variances are equal is not rejected, which shows that there is no heterogeneity of variances.

In order to check the lack of autocorrelation, the LM test is used, and if the model has autocorrelation, the Generalized Least Squares method is used to estimate the model.

Table 3: LM test results

Result	probability	Test statistics	Model
No autocorrelation	0.630	2.11	The first model
No autocorrelation	0.618	2.56	The second model

Source: Research findings

Because the probability statistic of this test in the first, second and third models is more than the 5% significance level, the models were done after adding autoregressive and eliminating correlation. Also, to measure the validity of the model and check the assumptions of classical regression, in addition to checking the heterogeneity of variance and the lack of autocorrelation between the residuals in the model, tests related to the normality of the residuals, the independence of the residuals and the absence of model specification error (linearity of the model) can also be done. Different tests can be used to test the normality of error sentences. One of these tests is the Jarko-Bera test, which is also used in this research.

Table 4: Normality test results

Result	probability	Jarek statistics	Model
being normal	0.3327	2.20	The first model
being normal	0.3118	2.71	The second model

Source: Research findings

The results of the Jarkio-Bera test indicate that the residuals obtained from the estimation of the research models have a normal distribution at the 95% confidence level, so that the probability of these tests is greater than 0.05.

Finally, to detect the presence of collinearity, the variance inflation factor (VIF) index is used. If the VIF index of an independent variable is greater than 5, it is probably in line with other variables. In this case, it should be further investigated. Otherwise, there is no collinearity problem between the independent variables. The test of collinearity (VIF) of the research variables is as described in the folloBasel III table:

Table 5: Collinearity test

VIF	Variance coefficient	symbol
4.25	1.55	LIQUIDITY
7.41	2.17	CAPITAL
1.31	1.10	SIZE
1.15	2.12	NPL
1.83	1.45	OWNERSHIP
1.11	1.30	INF
2.09	2.55	GROWTHRATE
1.36	8.95	REXV

Source: Research findings

Collinearity values greater than 10 indicate the possibility of collinearity between independent variables, and values greater than 15 indicate a serious problem in using regression in the current situation. On the other hand, all collinearity values are smaller than 10, which indicates the absence of collinearity between independent variables.

4.3 Leimer and Hausman's F test

The results of Limer's F test are shown in table 6 for the research hypotheses, to estimate the model, the method of using data is pooled or tabular.

Table 6: The results of Limer's F test for the research model

Result	Statistical probability	statistics	Test type	Model
Panel method	0.0026	2.36	F Limer	The first model
Panel method	0.000	4.69	F Limer	The second model

Source: Research findings

The probability value of this statistic for the research model (based on the analysis of hypotheses) is less than 0.05, as a result and based on these results, the null hypothesis of the test that the data is integrated is rejected and the research models are estimated in a tabular form. to be

According to Limer's F test, it is necessary to perform the Hausman test to determine the type of panel data. The results of this test for research models are presented in the follow Basel III table:

Table 7: Hausman test results

Result	P	Degrees of freedom	statistics	Test type	Model
Panel method with fixed effects	0.0000	8	11.25	Hausmann	The first model
Panel method with fixed effects	0.0001	8	8.241	Hausmann	The second model

Source: Research findings

As can be seen in table 7, the result of the Hausman test for the first and second models of the research shows that the data is a panel with fixed effects, the probability value of this statistic is less than 5%, so the first and second models of the research It is estimated on the desired variable based on the panel data approach with fixed effects.

4.4 Estimation of the relationship between variables

In the follow Basel III, the estimation results of the research models will be presented.

4.4.1 The first model

Based on the results of Limer's F test, the first research model was estimated based on the panel data approach with fixed effects. The results of the estimation of this model are presented in table 8. The regression F value, which shows the explanatory power of the model, for this model, the statistical probability is greater than 0.01, which can be said to be significant and valid at the 99% confidence level. Based on the same results, observing the value of Durbin Watson's statistic (1,87) also confirms that there is no correlation between the self-disruption components because this value is between 1.5 and 2.5. Also, the coefficient of determination is equal to 0.88, which shows that 88% of the changes in the dependent variable are explained through the regression model.

Table 8: The results related to the estimation of the first research model

probability	t statistic	standard error	Coefficients	symbol	Variable name
0.1867	1.326856	0.007460	0.009898	C	y-intercept
0.0000	-14.22026	0.625366	-0.889286	LIQUIDITY	Banking monetary law
0.0000	-14.20983	0.149067	-0.211821	CAPITAL	Capital requirements
0.0442	2.030149	0.008988	0.018246	SIZE	Size
0.0019	-4.525348	0.150044	-0.678899	NPL	Non-operating loans
0.0990	1.660399	0.005380	0.008933	OWNERSHIP	Concentration of ownership
0.3059	-1.027462	0.000207	-0.000212	INF	Inflation
0.2605	1.129583	0.000419	0.000473	GROWTH RATE	Economic Growth
0.0003	3.733021	0.000294	0.001097	REXV	Exchange rate fluctuations
0.88	R squared		F statistic	2.24	F statistic
0.73	Adjusted R squared		0.0013	1.83	Watson camera test

Source: Research findings

In summary, the research findings show that the variable of banking monetary law (Liquidity) had a negative and significant effect on the variable of lending power (coefficient 0.88 - with a probability of 0.0000). Also, the variable of capital requirements (Capital) has had a negative and significant effect on the variable of lending power (coefficient 0.21 - with a probability of 0.0000).

The second model

Based on the results of Limer's F test, the second research model was estimated based on the panel data approach with fixed effects. The results of the estimation of this model are presented in Table 9. The regression F value, which shows the explanatory power of the model, for this model, the statistical probability is greater than 0.01, which can be said to be significant and valid at the 99% confidence level. 1.83) also confirms that there is no correlation between the self-disruption components because this value is between 1.5 and 2.5. Also, the coefficient of determination is equal to 0.64, which shows that 64% of the changes in the dependent variable are explained through the regression model.

Table 9: The results related to the estimation of the second research model

probability	t statistic	standard error	Coefficients	symbol	Variable name
0.0000	4.304580	0.309001	1.330119	C	y-intercept
0.0389	2.084149	0.015834	0.033001	LIQUIDITY	Banking monetary law
0.0874	1.720948	0.025393	0.043700	CAPITAL	Capital requirements
0.0300	2.191886	0.021739	0.047648	SIZE	Size
0.9790	0.026350	0.067289	0.001773	NPL	Non-operating loans
0.3838	-0.873641	0.013489	-0.011784	OWNERSHIP	Concentration of ownership
0.0013	3.288880	0.000592	0.001948	INF	Inflation
0.0065	-2.762285	0.000933	-0.002577	GROWTH RATE	Economic Growth
0.0001	4.157350	0.000938	0.003901	REXV	Exchange rate fluctuations
0.64	R squared		F statistic	10.13	F statistic
0.58	Adjusted R squared		0.000	1.83	Watson camera test

Source: Research findings

In summary, the research findings show that the variable of banking monetary law (Liquidity) had a positive and significant effect on the variable of banking stability (ZScore) (coefficient 0.03 with probability 0.0389).

Also, the variable of capital requirements (Capital) has had a positive and significant effect on the variable of bank stability (ZScore) (coefficient 0.04 with probability 0.0874).

4.5 Test for the presence of asymmetric effects

In order to estimate the asymmetric effects, the folloBasel III equation is formed based on the components of disturbances in the first and second equations of the research that were introduced:

$$\Delta u_t = I_t \rho u_{t-1} + (1 - I_t)\rho_2 u_{t-1} + \Sigma \gamma_t \Delta u_{t-1} + \varepsilon_t$$

Then the above relation is estimated. In this regard, two coefficients ρ_1 and ρ_2 should be estimated, and the number of breaks that make up the third term of the equation should be determined. is (the model that had the lowest value of Akaike's statistic). The ρ_1 and ρ_2 values estimated for the first and second models of the research are presented in the folloBasel III tables.

Table 10: Results of asymmetric convergence test using TAR model

Test hypotheses	Model	P1	P2	Chi square	F	Df
$H0 = \rho1 = \rho2 = 0$	First	-0.36	- 0.14	0.1215	1.25	1.56
	Second	- 0. 42	-0.27	0.0855	2.98	1.73
$H1 = \rho1 = \rho2$	First	- 0.36	-0.14	0.0912	2.50	1.71
	Second	-0.41	-0.24	0.1025	1.46	1.68

Source: Research findings

Based on the results obtained from the above table, for the first model (lending power as dependent variable), it is $0.1215 < 0.05$ and for the second model (bank stability as dependent variable), it is $0.0855 < 0.05$. They indicate the confirmation of the null hypothesis $H0 = \rho1 = \rho2 = 0$. The second hypothesis i.e. $H1 = \rho1 = \rho2$ is also confirmed considering that the probability level for the first and second models of the research is greater than 0.05, therefore, based on the results of the above table, it can be concluded that between the strength of the loan. There is a symmetric convergence relationship between bank lending and stability with capital requirements and banking monetary law.

5 Summary and conclusion

The findings of the research showed that the banking monetary law has symmetrical effects on the lending of banks admitted to the Tehran Stock Exchange. In this regard, it is argued that in the bank capital channel, the bank capital variable is considered a dynamic variable that has a key role in the legal capital ratio and the bank's lending decision. In this approach, the imperfection of the banking capital market and the mismatch between the maturity of assets and liabilities play an important role. Therefore, in the bank lending channel, considering the stability of the bank's capital, in addition to paying attention to the binding effect of the capital requirement in the lending decision, attention is paid to the role of the legal capital ratio in the external financing of the resources needed for the bank lending activity. However, in the capital channel, the main emphasis is on the dynamics of the bank's capital and the dynamic change of the ratio of legal capital with the application of monetary policy, which can play a key role in the bank's lending decision by imposing legal capital constraints. Therefore, a bank with a strong financial foundation can obtain a high level of stable net financing ratio, which increases the price of bank assets; But the bank with a weak financial base will be helpless in this competition. In this case, the level of competition in the banking system will decrease. In the discussion of risk, determining the degree of uncertainty in the final capital affects the value of credits and its adjustment, which can reflect negative effects on the market. The control and quality of risk management of interbank transactions in critical conditions focuses on the internal structures of banks, which, if not managed, may cause problems in the banking industry. In addition, usually risk management and determining the best risk management method is costly and time-consuming and affects profitability, which can ultimately affect banks' lending power. This conclusion is consistent with the findings obtained by Nachane et al. [25], Farhi and Tirole [11].

In addition, it was observed that the banking monetary law has symmetrical effects on the financial stability of banks admitted to the Tehran Stock Exchange. In this regard, it is argued that in December 2010, the Basel III Committee, which is responsible for supervising the banking sector, for the first time introduced two liquidity requirements in the Basel III Three agreement: Liquidity Coverage Ratio, which ensures that the bank It has sufficient assets with high liquidity to withstand crisis conditions for 30 days and a stable net investment ratio, which increases the bank's resistance by creating an incentive to finance banking activities with more stable sources. Time horizons are getting longer. In this regard, according to the theories of financial intermediation, the role of banks in the economy is to provide the necessary liquidity through long-term financial resources, non-cash assets and cash liabilities. In this way, banks create liquidity and finance non-cash assets through bank deposits. Economic agents have unexpected liquidity needs and banks provide these liquidity needs by providing loans and facilities. By creating liquidity in the economy, banks will have to accept risk for economic agents, however, the role of banks through the creation of liquidity is very important in the economy and the role of banks' resources is much more important in this case. By using the powerful money of the central bank, banks can continue this intermediary role in the absence of financial supervision by the central bank, which can lead to irreparable effects on the economy, which can endanger the financial stability of banks. throw This conclusion is consistent with the findings obtained by Rauch et al. [26] and Mutarindwa et al. [24].

In the following Basel III, it was observed that the capital requirements have symmetrical effects on the lending of banks admitted to the Tehran Stock Exchange. In this regard, it is argued that the banks that did not have enough capital to cover their risk-weighted assets based on the capital agreement changed the composition of their asset portfolios in the short term to maintain the required legal capital ratio. The lower risk weight of securities compared to loans, and the change in the portfolio composition of assets from loans to securities were considered. This explains to some extent the tendency of banks to be present in the securities market instead of operating in the credit market in the condition of low bank capital, and based on many studies such as Berger, Haring and Szego [5], the above process properly explains the arbitrage behaviour of legal capital of banks after the application of capital Basel III one agreement. On the other hand, the above approach in recessionary conditions and the application of expansionary monetary policy can lead to a decrease in the efficiency of monetary policy and bring about changes in the usual mechanism of monetary policy transmission. To be more precise, the decrease in bank profit as a result of expansionary monetary policy and a decrease in interest rate leads to the contraction of bank capital. Therefore, the reduction of the ratio of legal capital due to the reduction of capital can lead to the ineffectiveness of the expansionary monetary policy in encouraging the lending activity of banks; Because banks will be required to reduce their risk-weighted assets and shrink their lending activity to maintain their legal capital ratio. In this case, the effectiveness of monetary policy on the lending decision through the capital channel can be somewhat impaired. This issue is depicted to some extent in Tucker's study on the cause of the slow growth of the American economy in the presence of expansionary monetary policy by the monetary authorities. On the other hand, in the lending channel, the bank's capital variable is considered as a static variable in the lending decision. To be more precise, banks are evaluated based on their legal capital ratio in the market. Therefore, the lower the bank capital adequacy ratio compared to the amount of legal capital, the lower it will be classified in the group of banks with financial health, and therefore

it will have a lower credit rating and less access to the external financing market. In the conditions of applying a contractionary monetary policy, it cannot provide a reduction in deposit resources through the financial market and will face a greater reduction in resources compared to another bank with a higher capital ratio and will be required to further reduce its lending decision. This issue has been confirmed in [29]. The static role of banks' capital in the bank lending channel has even been depicted in the studies conducted by Berger et al. [5] in describing the cause of the credit crisis of the early 1990s, and great importance is considered for it. Therefore, theoretically, the relationship between capital requirements and banks' lending power is confirmed. This conclusion is consistent with the findings obtained by Jafari and Malekian [16], Junxun [17], Liu [20], Karimi et al. [18], Gambacorta and Marques-Ibanez [13].

Finally, it was observed that the capital requirements have symmetrical effects on the financial stability of banks admitted to the Tehran Stock Exchange. In this regard, it is argued that higher capital acts as a kind of buffer against losses. They also provide incentives for better supervision and borrowers to make the bank more likely to survive. Recent studies show that the provisions related to the capital requirements of the Third Party Treaty protect banks from failure and financial stress because it makes them reduce their risk. In this regard, banks change the content related to the weight of risky assets. During this process, corporate loans are risky at first; By turning into interbank loans, their risk is reduced, and using new accounting rules, the weight of risky assets (RWAs) is underestimated. Accordingly, during this process, the capital adequacy ratio and other capital measures are overestimated because they underestimate the risk-weighted assets and thus can affect bank stability. And also bank lending has an effect. This conclusion is consistent with the findings obtained by Sheikh Ali [28], Chiaramonte and Casu [8], Mora and Reggio [23] and Mutarindwa et al. [24].

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