Int. J. Nonlinear Anal. Appl. 13 (2022) No. 1, 2151-2162
ISSN: 2008-6822 (electronic)
http://dx.doi.org/10.22075/ijnaa.2021.25052.2900

Analysis of central bank policies and supervision tools on financial stability in the Iranian banking system

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(Communicated by Madjid Eshaghi Gordji)

Abstract

The purpose of this article is to analyze the policies and regulatory tools of the Central Bank on financial stability in the Iranian banking system. The method of analysis is a descriptive survey. Data were collected through interviews with experts. The validity and reliability of the research tool were confirmed by marketing professors and experts. Data analysis was performed using Lisrel software. Seven main influential factors from the perspective of experts, which include; Ratio of non-current receivables to total payment facility (NP), cash reserves to bank assets (CR), capital adequacy (AC), the real exchange rate (RER), liquidity (LY), debt to asset ratio (DA), internal credit The private sector was agreed upon by the banks (DCP). The results of the KMO test showed that the adequacy of the samples was selected correctly. Bartlett sphericity test is also significant at the level of 99%, which shows that the correlation of data in the community was not zero. That is, the seven factors studied had a significant impact on the financial stability of the banking system. Also, the results of varimax rotation of seven factors showed that their eigenvalues are higher than one. And their materials have an operating load higher than 0.35. In order to confirm the homogeneity of the constituent items of each factor in the scale in terms of content and underlying dimensions, five-factor confirmatory factor analysis was performed on the factors. There are several fitness features to evaluate factor analysis models. In the present paper, the ratio of chi-square or chi-square to freedom ratio (x2/df) of the mean of the RMR residual squares, as well as the goodness-of-fit index of GFI and the adjusted value of the fit index of AFGI for a degree of freedom were used. The

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Received: August 2021 *Accepted:* October 2021

results showed that all the fit characteristics are significant at an acceptable level, the data of this paper fit well with the factor structure of this scale and the items of this scale are consistent with the underlying structure.

Keywords: Financial Stability, Regulatory Policies and Instruments, Central Bank.

1. Introduction

Instability in the economy can lead to adverse consequences and periods of instability in the macroeconomy and the banking network of the country, which result in various forms such as increases in inflation, bank interest rates, interest rates on interbank loans and Deferred receivables of banks appear [11]. Studies of economists show that paying attention to the balance sheet variables of banks is a necessary condition for examining banking stability, and to achieve a sufficient condition for stability, it is necessary to reflect on macroeconomic variables [9]. The global financial crisis was a wake-up call for the world's central banks. While neglecting financial stability, they aimed solely at price stability. Therefore, the dual role of central banks has historically always been: maintaining the stability of the general level of prices and financial stability [5]. In financial systems, it is easy in theory to assess and classify financial conditions and potential problems, but in practice it is difficult to determine issues such as how to define and measure the stability of the financial system and whether a small disruption. Whether it becomes a systemic risk or not is essential [2]. Therefore, assessing financial stability requires identifying and analyzing sources of systemic risk. Central banks have traditionally pursued two goals: financial and monetary stability. In other words, these two goals are on the same coin. Bankruptcy of the financial system affects the real sector of the economy. And its effects are reflected in the gap between production and inflation [8]. The purpose of this study is to identify the factors affecting the instability of the central bank and evaluate each of the indicators on the degree of financial stability of others.

2. Background Research

Samanipour et al. [6] conducted a study entitled "Macro-prudential supervision requirements and its effect on the stability of the Iranian banking system." Equity, the ratio of capital to facilities and the growth rate of the world economy have a positive effect on the stability index. Also, the financial index of the stock exchange, oil prices, the ratio of liquidity to GDP and non-current receivables have a negative effect on banking stability. To conduct this research, the data of 31 banks in the period from 2006 to 2016 have been used by the generalized torque method as a dynamic panel.
Akbarian and Khordsoo [1] conducted a study entitled The Impact of Islamic Banks on Financial Stability in the Globalization Process. Research shows that in the process of globalization of Islamic banks through proper management in crisis situations, having market power and the ability to influence prices, moving on the real sector and having a participatory system, the impact on global financial stability has it. In contrast, globalization increases the financial stability of Islamic banks. Increasing efficiency, using global ranking and regulatory institutions, and expanding investment diversity can be considered as positive effects of globalization on Islamic banks.

Mozaffari et al. [4] aimed at the effect of financial structure on the instability of Iran's economic growth. GARCH and ARDL. The experimental results of the present study showed that the variable of financial development index had a negative effect on economic growth instability, while the effect of the financial structure index on economic growth instability was positive, indicating that Iran's financial structure was associated with a series of problems. Despite the positive impact of financial

development on stabilizing economic growth, its financial structure has led to instability of economic growth. Also variables of oil revenues, government spending and formation Capital had a significant negative effect on the instability of Iran's economic growth in the period under review.

Sere-Ejembi et al. [7] developed the stability index of the Nigerian banking system by using quarterly data for Nigerian banks during the period 2007 to 2012. For this purpose, by combining three indicators a- Banking health (including capital adequacy ratios, delinquent receivables to capital, delinquent receivables to total loans, cash assets to total assets, loans to deposits, return on assets, margin Gross interest income and non-interest expenses to gross income), b- Bank vulnerability (including current account balance ratios to GDP, money supply to foreign reserves, foreign assets to government assets, foreign assets to liabilities) Foreign, domestic credit to GDP, inflation and GDP growth rate), c- Economic climate (such as GDP growth rate of US, UK and China) calculated the banking stability index.

Storbel [10] developed a measure of the likelihood of bank failures using the Z-Score. For this purpose, he used the average of rhythmic Z-scores that have a downward bias.

Deltuvaite [3] to study the stability of the banking sector, the vector of macroeconomic variables (including inflation and GDP), the vector of variables of development and structure of the banking sector (including bank concentration and deposits), the vector of profitability variables and the efficiency of the banking sector (e.g. Assets and returns on assets) and return on equity.

3. Research Method

In this study, the analysis of the effects of the factors and components of the financial instability of the Central Bank using confirmatory factor analysis was used. In this study, the main factors affecting the central bank's supervision on financial stability in the Iranian banking system. The survey was conducted and then provided to 20 experts, managers and senior experts of the bank to provide their views on the relationship between these indicators. Lisrel software was used to analyze the data. In another part of the analysis of factors affecting the financial instability of the central bank such as (ratio of non-current receivables to total payment facilities (NP), cash reserves to bank assets (CR), capital adequacy (AC), real exchange rate (RER) Liquidity (LY), debt to asset ratio (DA), domestic credit paid to the private sector by banks (DCP) were examined through Lisrel and through exploratory and confirmatory factor analysis.

3.1. Exploratory factor analysis

First, in order to investigate whether the scales studied to determine financial stability in the case study (Iranian banking system) to repeat the factors under investigation from heuristic factor analysis with varimax rotation was performed on the data. In order to perform factor analysis, first the sampling adequacy test (KMO) was calculated to ensure the adequacy of the sample size. Then, since the correlation between the test questions is the basis of factor analysis, to determine the correlation between the variables is not zero, Bartlett spherical test was used, the results of which are shown in the following tables. Results from Table 1; Indicates that the KMO test indicates the adequacy of the selected sample. Bartlett sphericity test is also significant at the level of 99%, which shows that the correlation of data in the community is not zero.

3.2. Exploratory factor analysis of the factor scale

In this analysis, using Varimax rotation, seven factors were obtained that had specific values higher than one and their materials had a factor load greater than 0.35. Table 2; Eigenvalues indicate the percentage of variance explained and the percentage of cumulative variance of each factor.

Table 1: Bartlett's test of sphericity of sampling sufficiency and operating scale - Display

Factor - Display	**KMO**	**Split Bartlett**	**Degrees of freedom**	**Significance level**
Ratio of non-current receivables to total payment facilities (NP)	0.638	342.4	20	$P < 0.01$
Cash reserves in assets - bank (CR)	0.607	312.7	20	$P < 0.01$
Capital adequacy (CA)	0.624	479.3	20	$P < 0.01$
Real exchange rate (RER)	0.607	371.6	20	$P < 0.01$
Liquidity (LY)	0.625	395.8	20	$P < 0.01$
Debt to asset ratio (DA)	0.612	354.7	20	$P < 0.01$
Domestic loans paid to the private sector by banks (DCP)	0.609	367.5	20	$P < 0.01$

Table 2: Exploratory factor analysis of the scale - affecting financial stability, the central bank

Factor-Display	**eigenvalues**	**Percentage of variance explained**	**Degrees of freedom**	**Cumulative variance**
Ratio of non-current receivables to total payment facilities (NP)	2.48	16.56	20	2.85
Cash reserves in assets - bank (CR)	2.37	15.83	20	32.39
Capital adequacy (CA)	2.85	19.01	20	19.01
Real exchange rate (RER)	2.20	14.69	20	33.71
Liquidity (LY)	2.14	14.31	20	46.71
Debt to asset ratio (DA)	1.82	12.13	20	58.85
Domestic loans paid to the private sector by banks (DCP)	1.79	11.98	20	70.84

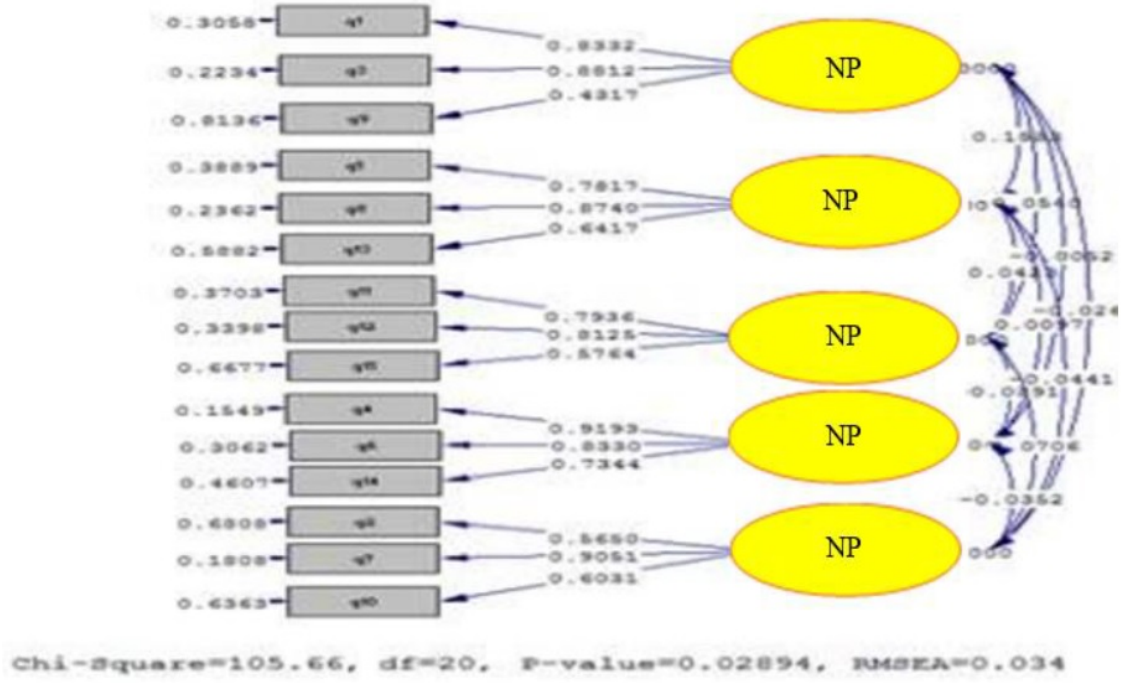

Figure 1: Chart of standardized coefficients of the five-factor structure of the Central Bank Financial Stability Scale in the ratio of non-current receivables to total payment facilities (NP)

3.3. Confirmatory factor analysis of factors affecting the financial stability of the central bank

In order to confirm the homogeneity of the constituent items of each factor of the scale in terms of content and underlying dimensions, a five-factor confirmatory factor analysis was performed on these factors. There are several fitness features to evaluate factor analysis models. In the present dissertation, the characteristic ratio of chi-square or chi-square to freedom (x2 / df) is the root mean square of the residuals (RMR) as well as the goodness-of-fit index (GFI) and the adjusted fitness index for the degree of freedom (AFGI). Used. Chi-square tests test the hypothesis that the model is consistent with the pattern of interaction between the observed variables. The small values of the chi-square ratio to the degree of freedom indicate the greater fit of the model. The mean root of the RMR residual squares means the difference between the elements of the matrix observed in the sample group and the elements of the estimated or predicted matrices assuming the model is correct.

Table 3, shows that all specifications are acceptable fitness level, the data of the factor structure of this scale is a good fit and statements in this scale are consistent with the underlying structures.

Table 3 shows that all fit characteristics are at an acceptable level, the data of the present dissertation fit well with the factor structure of this scale, and the items of this scale are consistent with the underlying structure.

Estimation of the research model in the form of a dynamic model by generalized torque (GMM) method:

In this regression model, the effect of independent, mediating and intervening variables on the dependent variable is measured. The research model is presented as the following regression equation (3.1).

$$\begin{aligned} FI_t &= \alpha + \mu IFI_{(t-1)} + \beta_1 CR_t + \beta_2 AC_t + \beta_3 NP_t + \beta_4 LY_t \\ &\quad + \beta_5 RER_t + \beta_6 gDCP_t + \beta_7 gDA_t + \varepsilon_t \end{aligned} \tag{3.1}$$

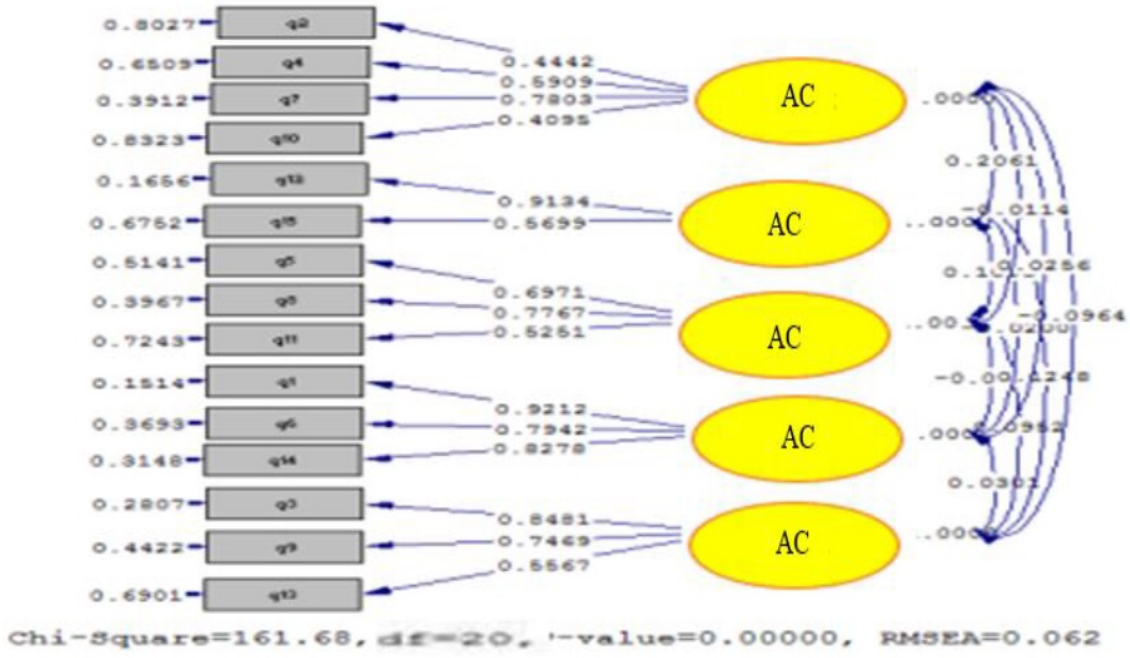

Figure 2: Chart of standardized coefficients of the five-factor structure of the Central Bank Financial Stability Scale in cash reserves to bank assets (CR)

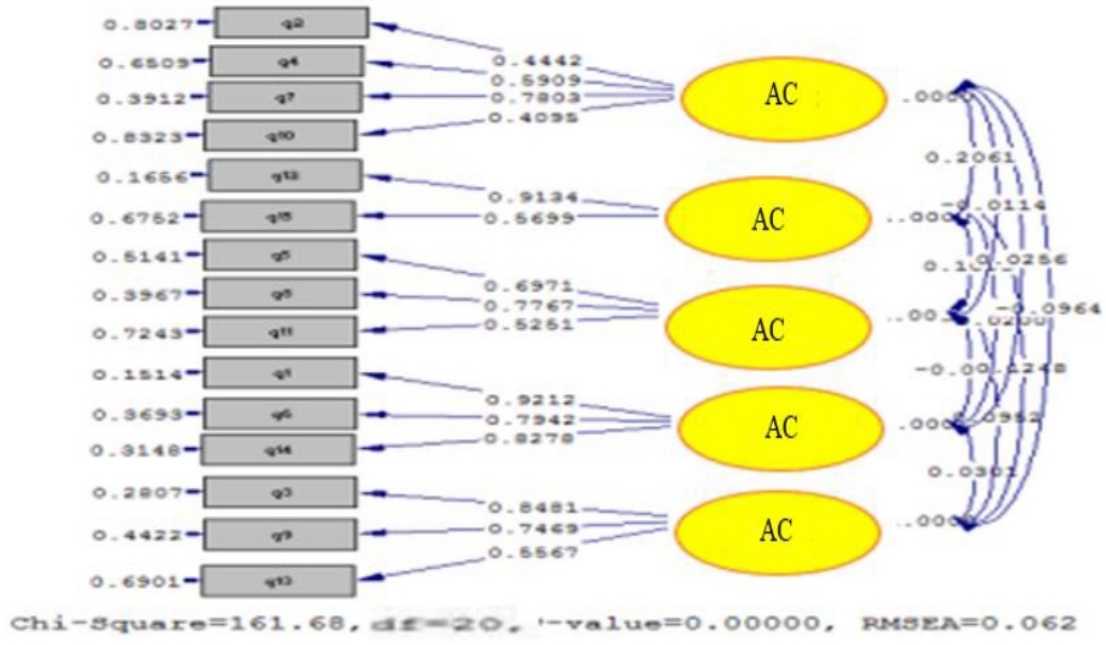

Figure 3: Chart of standardized coefficients of the five-factor structure of the Central Bank Financial Stability Scale in the Capital Adequacy Factor (AC)

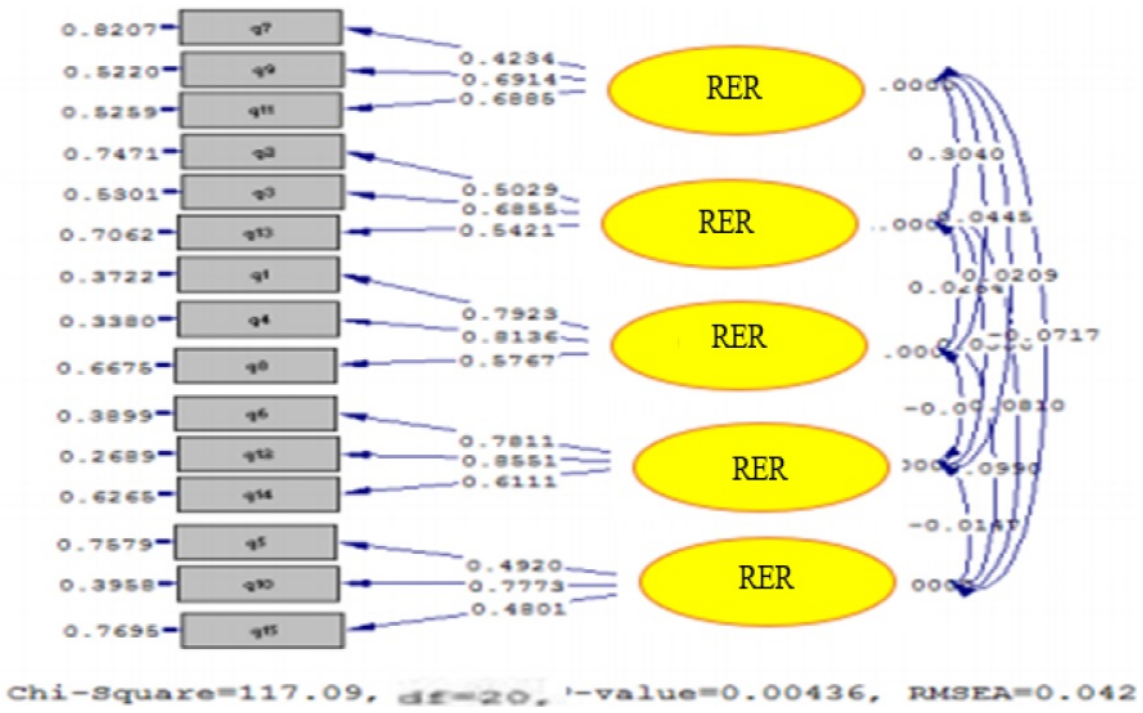

Figure 4: Chart of standardized coefficients of the five-factor structure of the Central Bank Financial Stability Scale in the real exchange rate factor (RER)

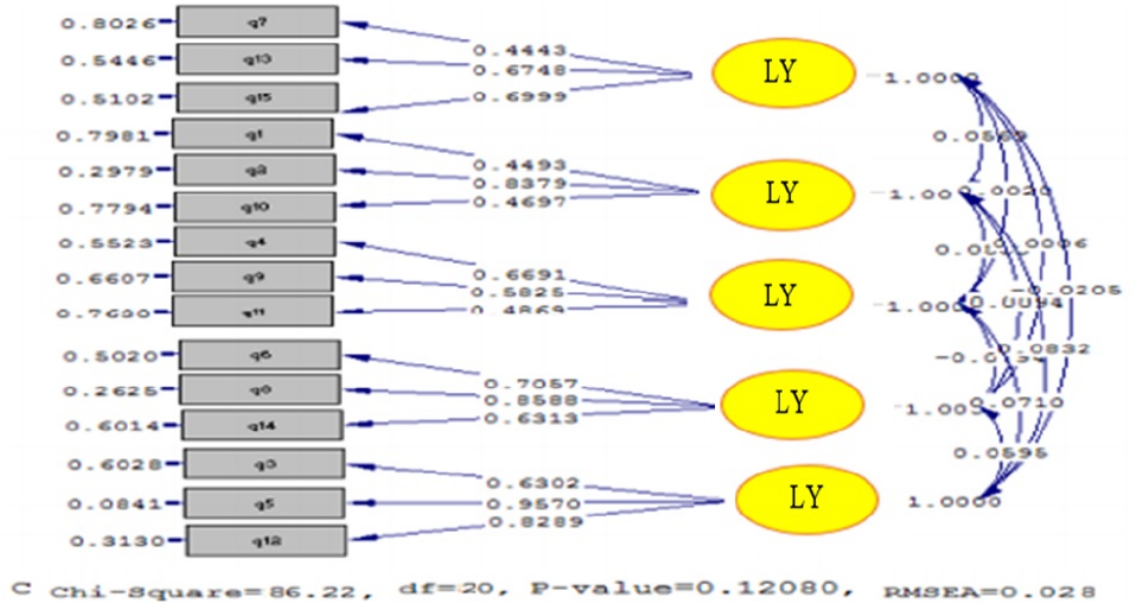

Figure 5: Chart of standardized coefficients of the five-factor structure of the Central Bank Financial Stability Scale in the Liquidity Factor (LY)

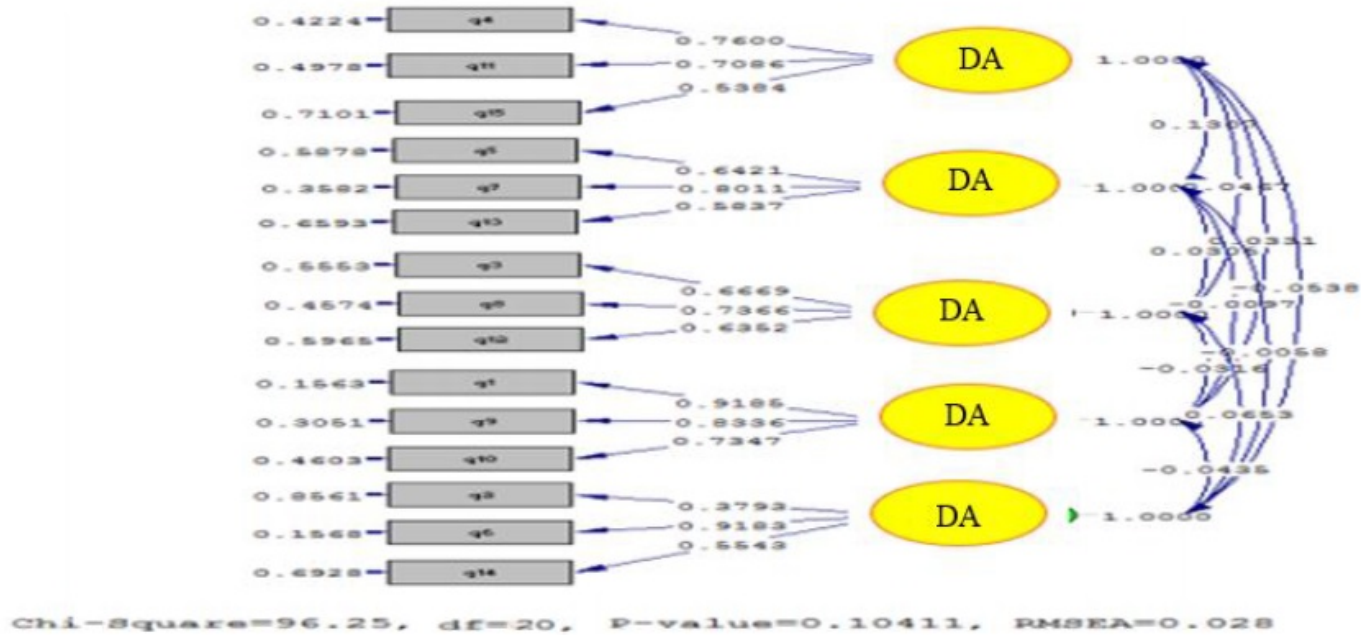

Figure 6: Chart of standardized coefficients of the five-factor structure of the central bank's financial stability scale in the debt-to-asset ratio factor (DA)

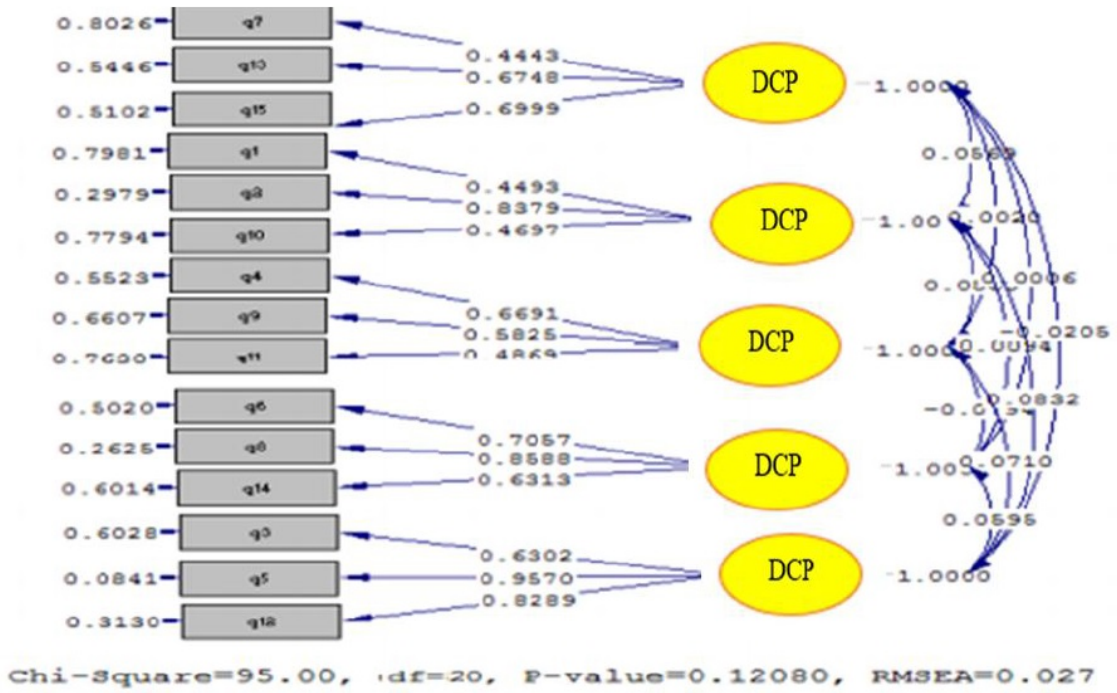

Figure 7: Chart of standardized coefficients of the five-factor structure of the Central Bank Financial Stability Scale in the factor of domestic loans paid to the private sector by banks (DCP)

Table 3: Exploratory factor analysis of the scale - Effective Financial Stability Central Bank

Factor-Display	**Root mean square residual - and (RMR)**	**Good fit (GFI)**	**Adjusted Fit Goodness Index (AGFI)**
Ratio of non-current receivables to total payment facilities (NP)	0.041	0.95	0.92
Cash reserves in assets - bank (CR)	0.051	0.92	0.88
Capital adequacy (CA)	0.059	0.92	0.88
Real exchange rate (RER)	0.0491	0.94	0.91
Liquidity (LY)	0.0424	0.94	0.93
Debt to asset ratio (DA)	0.0446	0.95	0.93
Domestic loans paid to the private sector by banks (DCP)	0.0435	0.95	0.92

Table 4: Test the significance of regression coefficients of independent variables with statistics t In the research model

Factor - Display	Regression coefficient (B)	Standard deviation of regression coefficient estimator	Statistics t	Probability value	Sargan test probability value	Explanation coefficient R
Constant	-0.37	0.805	-7.125	0.0187	0.175	0.746
$FI_{(t-1)}$	-0.039	0.423	-9.220	0.0362		
Cash reserves in assets - bank (CR)	3.25	1.764	2.153	0.0942		
Capital adequacy (CA)	-3.74	3.184	-3.187	0.0874		
Ratio of non-current receivables to total payment facilities (NP)	-0.352	1.014	-7.520	0.0425		
Liquidity (LY)	1.512	1.025	3.176	0.0346		
Real exchange rate (RER)	-0.542	0.573	-3.274	0.042		
Domestic loans paid to the private sector by banks (DCP)	1.264	1.036	3.179	0.0374		
Debt to asset ratio (DA)	-0.592	0.547	-3.241	0.0844		

In this model, FI_t variable of financial instability in the year t (from 2008 to 2018), $FI_{(t-1)}$ intermittent financial instability (factor of model dynamics), other independent model variables related to the index under discussion in the year t, and ε_t, including model disruption in the year t. The generalized torque (GMM) method has been used to analyze this model. In order to determine the appropriate variables to replace the linear variables among the independent variables of the model, in this method called a tool, the third power of the independent variables provided a more favorable result in terms of Sargan test. Therefore, it was used as a tool. The results of the research model analysis are presented in Table 4. In this table, regression coefficients, the standard deviation of estimated regression coefficients, t-statistic and the probability of assuming zero regression coefficient in the statistical population are discussed.

$$\log\left(\frac{TC_{32}}{PK_{32}}\right) = c(1) + c(2) \times \log(q_{32}) + 0.5 \times \log(q_{32})^2 + c(4) \times \log\left(\frac{PL_{32}}{PK_{32}}\right) + c(5).$$

At this level of error, the significance of the effect of these variables and the presence of a constant value in the model is not denied. The probability values related to the validity of the null hypothesis that the coefficient of debt to assets ratio (DA), capital adequacy (AC), cash reserves to bank assets (CR) are zero are equal to 0.0844, 0.0844 and 0942, respectively. 0 and less than the probability of error of the first type is 0.1. Therefore, at this level of error, the significance of the effect of these variables is not denied. The value of the probability of zero assumption based on the validity of alternative variables of independent variables if there is a linear relationship between them according to Sargan test is equal to 0.175 and greater than the probability of error of the first type is equal to 0.05. Therefore, at this level, the probability of error of this assumption is not rejected and the

Table 5: The results of the analysis of assumptions related to the remnants of the regression model of the first research model

Index title	**Index size**
Average	0.00251
Jarco Statistics - Bra	1.425
Jarkko test probability - lift	0.5213
Watson Camera Statistics	2.47

tools used have the necessary validity. The coefficient of explanation of the model is equal to 0.746 and is larger than the standard limit of 0.7. Therefore, predicting the financial instability variable according to the independent variables considered in the model has relatively high accuracy. Based on this, the financial instability model for the year t is presented as follows.

$$\begin{aligned} FI_t &= -0.37 - 0.39FI_{(t-1)} + 3.25CR_t - 3.74AC_t - 0.352NP_t + 1.512LY_t - 0.542RER_t \\ &= +1.264GDCP_t - 0.592gDA_t + \varepsilon_t \end{aligned}$$

As mentioned, these assumptions are made about the remnants of the regression model, which is obtained by calculating the difference between the observed values of the dependent variable of financial instability and estimating it according to the variables affecting it according to the model. Another name for model residues is also called model distortion or error. Defaults include zero mean, uncorrelated, and normal variable probability distributions for model residuals.

According to the results of Table 5, the average of the residuals of the model is equal to 0.00251 and approximately equal to zero; The probability value of the Jarco-Bara test statistic is 0.5213 and greater than 0.05. Therefore, at the level of the first type error probability equal to 0.05, the normality of the residual variable distribution is not rejected. Watson's camera statistics for residual independence are also 2.47 and ours are between 1.5 and 2.5. Therefore, the uncorrelation of the residues is accepted. These results indicate that all assumptions made about model residues are valid.

4. Conclusion

Studies of economists show that paying attention to the balance sheet variables of banks is a necessary condition for examining banking stability, and to achieve a sufficient condition for stability, it is necessary to reflect on macroeconomic variables. In the present study, the factors affecting banking stability were examined by explaining macro-prudential supervision frameworks and the concept of banking stability for a set of macroeconomic variables such as inflation, exchange rate, GDP growth, world economic growth rate and bank variables. Including interest, equity, non-current receivables, loans (facilities), capital-to-facility ratio, interest rates on deposits and facilities, current and previous bank stability to estimate the model using the generalized torque method.This article to determine the factors affecting the financial stability of the banking system from seven main factors that include; Ratio of non-current receivables to total payment facility (NP), cash reserves to bank assets (CR), capital adequacy (AC), a real exchange rate (RER), liquidity (LY), debt to asset ratio (DA), internal credit Used by the private sector by banks (DCP). Data analysis was analyzed using qualitative analysis using exploratory factor analysis and validation. The results of the KMO test showed that the adequacy of the samples was selected correctly. Bartlett sphericity test is also significant at the level of 99%, which shows that the correlation of data in the community was not zero. That is, the seven factors studied had a significant impact on the financial stability of the

banking system. Also, the results of varimax rotation of seven factors showed that their eigenvalues are higher than one. And their materials have an operating load higher than 0.35. In order to confirm the homogeneity of the constituent items of each factor in the scale in terms of content and underlying dimensions, five-factor confirmatory factor analysis was performed on the factors. There are several fitness features to evaluate factor analysis models. In the present paper, the ratio of chi-square or chi-square to freedom ratio (x2 / df) of the mean of the RMR residual squares, as well as the goodness-of-fit index of GFI and the adjusted value of the fit index of AFGI for a degree of freedom were used. The results showed that all the fit characteristics are significant at an acceptable level, the data of this paper fit well with the factor structure of this scale and the items of this scale are consistent with the underlying structure. The results of regression analysis showed that the probability value related to the validity of the null hypothesis that the coefficient of variables $FI_{(t-1)}$) is zero, cash reserves to bank assets (CR), capital adequacy (AC), the ratio of non-current receivables to Total payment facility (NP), liquidity (LY), the real exchange rate (RER), internal credit paid to the private sector by banks (DCP), debt to asset ratio (DA), a fixed amount of the model equal to 0.0362, respectively. 0, 0.042, 0.074, 0.025, 0.046, 0.042, 0.074, 0.074, and 0.023 and less than the probability of the first type of error is 0.05, so at this level the error is significant. The effect of these variables and the presence of a constant value in the model is not ruled out. The probability value related to the validity of the null hypothesis that the coefficient of debt to assets ratio (DA), capital adequacy (AC), cash reserves to bank assets (CR) is zero is equal to 0.0844, 0.0444 and 0942, respectively.0 and less than the probability of error of the first type is 0.1. Therefore, at this level of error, the significance of the effect of these variables is not denied. The value of the probability of zero assumption based on the validity of alternative variables of independent variables if there is a linear relationship between them according to the Sargan test is equal to 0.175 and greater than the probability of error of the first type is equal to 0.05. Therefore, at this level, the probability of error of this assumption is not rejected and the tools used have the necessary validity. The coefficient of explanation of the model is equal to 0.746 and is larger than the standard limit of 0.7. Therefore, predicting the financial instability variable according to the independent variables considered in the model has relatively high accuracy. Based on this, the financial instability model for the year t is presented as follows. The results of regression analysis showed that the mean of the residuals of the model is equal to 0.00251 and approximately equal to zero; The probability value of the Jarco-Bara test statistic is equal to 0.5213 and greater than 0.05. Therefore, at the level of the first type error probability equal to 0.05, the normality of the residual variable distribution is not rejected. Also, the Watson camera statistic for the independence of the survivors is 2.47 and we are between 1.5 and 2.5. Therefore, the uncorrelation of the residues is accepted. These results indicate that all the assumptions made about the model residues are valid.

Suggestions

Money growth rate volatility in addition to stabilizing the inflation rate and disrupting the central bank's financial instability, is also a major factor in economic growth rate instability. In other words, monetary instability has been one of the main factors in creating business cycles and instability of economic growth in Iran, so controlling the growth of liquidity in order to reduce the movement of liquidity to speculative activities and also reduce inflation and increase macroeconomic stability.

Monetary and banking system due to the role of determination Monetary and credit policymaker in the process of production and national income is one of the most important tools of government intervention in economic affairs; In such a way that monetary and banking instruments, along with budget and program instruments, provide the government with important economic power and can

affect the whole economic life of the society and by increasing the stability of the macro-economy, the growth and development requirements of the economy. Create. In other words, the banking system can, by adopting appropriate policies and in line with macroeconomic objectives and the use of precise and effective control tools, direct liquidity to productive economic activities and increase the economic stability of the field. Provided the process of investment, employment, production, etc.

Fluctuations in oil revenues can, directly and indirectly, affect monetary figures through shock financial responses to the central bank, causing financial instability and leading to inflation, and the structure of production and employment. It threatens the country's economic growth, so proper planning to control the use of oil revenues in proportion to the foreign exchange earnings from oil exports can prevent shocks to the country's economy. Therefore, in order to reduce the effect of oil price fluctuations on the country's economy, it is necessary to strengthen the position of the National Development Fund to reduce the effect of transmitting oil price shocks to monetary policy and ultimately prices and exchange rates.

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