






The Impact of Macroeconomic Factors and Banking Management on Bank Deposit Attraction in Iran: Evidence from the Generalized Method of Moments Panel Approach

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Abstract

Given the growth in the number of private banks in Iran over the past decades, competition among banks to attract resources and deposits has increased. To maintain profitability and sustain their position in the banking industry, banks must focus on customer satisfaction and offer services that align with customer needs. Accordingly, and considering the importance of identifying the factors influencing the attraction of bank deposits for decision-makers in the field of banking management in the country, this study aims to identify the factors affecting the attraction of bank deposits in Iran during the period from 2011 to 2022 using the panel Generalized Method of Moments (GMM) approach. The findings of this study indicate that among the macroeconomic factors affecting the attraction of bank deposits, inflation and macroeconomic instability have a positive effect on attracting transactional deposits (including current accounts, savings accounts, and other deposits) but a negative effect on attracting investment deposits (including long-term and short-term investments). Meanwhile, national income and interest rates have a negative effect on transactional deposits and a positive effect on investment deposits. Furthermore, among the banking variables affecting bank deposit attraction, the quality of electronic services, customer clubs, and the Return on Equity (ROE) of banks have had a positive and significant impact on the growth of both transactional and investment deposits.

Keywords: Bank deposits, customer club, Generalized Method of Moments (GMM), panel data.

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1. Introduction

Bank deposits are one of the most important elements upon which both Islamic and non-Islamic banks are based. A deposit is an agreement between a customer and a bank in which the customer deposits a sum of money for safekeeping or investment, and the bank commits to returning the amount to the customer upon request on a specified date or immediately [1-3]. Bank deposits represent the primary liabilities of banks. Banks use these liabilities to provide loans and earn profits. By collecting surplus savings and allocating them to investors in the form of loans, banks play an intermediary role in the money market and contribute to economic development and the financing of various economic sectors. Depositing is crucial for both developed and developing countries, as it allows depositors to earn income from funds that they do not immediately use. Furthermore, these deposits provide banks with the opportunity to allocate these funds to businesses and individuals in need [4, 5]. At the macroeconomic level, attracting bank deposits and the efficient allocation of these resources to finance the production sector and services related to Gross Domestic Product (GDP) are considered key factors in accelerating a country's economic growth. Also, at the macroeconomic level, the composition of liquidity is of significant importance. On the other hand, with the growth of the banking industry in the country, the number of private banks has significantly increased in recent decades, intensifying the inherent competition between banks and financial institutions in the country, aiming to attract more resources and deposits. In such an environment, the survival and profitability of banks are closely linked to the attraction of their resources and deposits [6].

Several studies have examined the macroeconomic factors influencing bank deposit volumes. Nathanael (2014) analyzed the determinants of bank deposit volume in Nigeria from 1980 to 2010 using the VECM approach, finding that inflation, bank investment in service provision, the number of bank branches, and interest rates were key factors influencing deposit volumes, emphasizing that these factors should be seriously considered to improve deposit conditions [7]. Abera Terefe (2019) used panel data techniques to examine the factors affecting bank deposit growth in Ethiopia from 2001 to 2017, concluding that marketing variables, exchange rates, the number of bank branches, and nominal GDP positively affected deposits, whereas money supply and inflation had a negative impact [5]. Morina and Usmani (2019) investigated the impact of macroeconomic factors on bank deposit levels in the Western Balkans from 2005 to 2017, finding that deposit interest rates and nominal GDP had a positive effect, while inflation had a negative one [8]. Yakubu and Abokor (2020) studied the key factors determining bank deposit growth in Turkey from 2000 to 2016, using the ARDL approach, and found that in the long

term, banking stability, banking sector efficiency, money supply growth, economic growth, and inflation were the most influential factors, with the number of bank branches and money supply being important in the short term [9]. Farhangi et al. (2015) examined the impact of electronic banking services on increasing resources at Bank Mellat in Lorestan Province, using questionnaire-based data collection and SPSS software for analysis, and found that the expansion of electronic banking services led to resource growth [10]. Finally, Pourmand Bakhshayesh and Pourman Bakhshayesh (2018) employed the ARDL approach to assess the effects of credit risk and market risk on the total volume of bank deposits in Iran, concluding that credit risk negatively affected and market risk positively influenced deposit volumes, with credit risk including inflation and exchange rate fluctuations [11].

In this regard, identifying the factors influencing the attraction of bank deposits is of particular importance for policymakers in the field of banking management. Therefore, this study seeks to identify the factors affecting the attraction of bank deposits in Iran during the period 2011-2022 using the Generalized Method of Moments (GMM) panel approach. It is worth noting that two key aspects have been considered in this study, which could be regarded as its unique features:

First, this study distinguishes between various types of deposits in order to provide more accurate analyses. Specifically, the factors influencing the attraction of transactional deposits (including current accounts, savings accounts, and other deposits) are examined in one model, and the factors affecting the attraction of investment deposits (including long-term and short-term investments) are analyzed in another model.

Second, in this study, the factors influencing the attraction of bank deposits are divided into two categories: macroeconomic factors (inflation, macroeconomic instability, real GDP growth, and interest rates) and bank-level factors (customer clubs, electronic service quality, and ROE) to highlight the effects of these variables separately.

This study is organized into five sections. The next section discusses the theoretical literature of the research, followed by a review of the research background both domestically and internationally in the third section. The fourth section presents the methodology and research model, and finally, the fifth section is dedicated to the conclusions of the study.

2. Methodology

This research is applied in nature and uses panel data. It examines the factors influencing the volume of bank deposits in five banks (National Bank, Mellat, Parsian, Pasargad, and Saderat) during the years 2011 to 2022 using quarterly data. The statistical information and data for the

variables used in the study were extracted from the Central Bank of Iran and the Statistical Center of Iran.

Furthermore, based on the research topic and a review of related articles, the research model was designed based on the studies of Morina and Asmani (2019), Emzel (2016), and Adibola and Dahalan (2011), with the input of academic experts:

$$LDEP_{it} = \alpha_0 + \alpha_1 LDEP_{it-1} + \alpha_2 INF_{it} + \alpha_3 LGDP_{it} + \alpha_4 INS_{it} + \alpha_5 R_{it} + \alpha_6 BM_{it} + \alpha_7 ROE_{it} + \alpha_8 BE_{it} + U_{it}$$

Where:

LDEP: In the first model, the logarithm of transactional deposits (current, savings, and other deposits) and in the second model, the logarithm of investment deposits (long-term and short-term investments)

INF: Inflation rate

LGDP: Logarithm of real GDP

INS: Macroeconomic instability

R: Interest rate

BM: Customer club

ROE: Return on equity (net income to shareholders' equity)

BE: Electronic banking index

U: Error term or residual

i: Unit (banks)

t: Time variable

3. Findings and Results

If the stationarity assumption for the time series is not valid, statistical tests based on t, F, Chi-square, etc., will be questionable. On the other hand, if the time series variables are not stationary, a problem known as spurious regression may occur. Therefore, it is essential to test the stationarity of the data before estimating the research model. Based on the results from the Levin, Lin, and Chu test reported in Table 1, all variables are stationary.

Table 1. Results of the Reliability Test of Variables (Levin, Lin, and Chu Test)

Variable	Coefficient	Probability
Logarithm of Trading Deposits	-7.05	0.000
Logarithm of Investment Deposits	-4.01	0.000
Inflation	-30.31	0.000
Macroeconomic Instability	-3.02	0.000
Logarithm of National Income	-4.08	0.000
Bank Interest Rate	-6.72	0.000
E-service Quality Index	-7.38	0.000
ROE	-9.32	0.000

Before estimating the panel model, the homogeneity of the units, or in other words, the selected banks, should be tested to determine whether a common intercept for all units is adequate or if each unit or bank has specific characteristics that are different and significant from other banks. This difference would be reflected as a separate intercept. To perform this, we use the F-Limer test statistic. If the null hypothesis, which refers to the homogeneity of individual

effects, is rejected, the model can be estimated using panel data. Otherwise (failure to reject the null hypothesis), the model can be estimated using the Ordinary Least Squares (OLS) method.

H0: Individual effects are homogeneous

H1: Individual effects are heterogeneous

The results of the Chow test (F-statistic) are shown in Table 2:

Table 2. Test for Choosing Between Pooling Method or Panel Method

Research Model	Null Hypothesis H0	Test Statistic (Cross-section F Test)	Probability	Result
Model 1: Trading Deposits	Bank-specific effects are not significant (Pooling method is suitable)	5.14	0.000	H0 is rejected (Panel data method is chosen)
Model 2: Investment Deposits	Bank-specific effects are not significant (Pooling method is suitable)	5.86	0.000	H0 is rejected (Panel data method is chosen)

As seen in Table 2, the null hypothesis of equality of all bank-specific effects is rejected for both models under study.

In equations where the unobservable individual effects for each country and the presence of lagged dependent

variables in the explanatory variables are problematic, the Generalized Method of Moments (GMM) estimator is used, which is based on dynamic panel models.

Table 3. Results of M2 Test

Model	Value	Symbol
Model 1: Trading Deposits	-2.20**	AR1
	0.92	AR2
Model 2: Investment Deposits	-2.25**	AR1
	0.83	AR2

*, **, *** represent significance at 1%, 5%, and 10% error levels, respectively.

Note that the results for the dynamic panel are estimated using the "First Difference Generalized Method of Moments." As seen in Table 3, since AR1 (with a negative correlation coefficient) is significant and AR2 is not significant, the model estimation is considered appropriate.

In the GMM method, the J-statistic tests the validity of the instrument variables. The J-statistic multiplied by the

number of observations follows a Chi-square distribution with degrees of freedom equal to the difference between the number of instrument variables and the number of estimated coefficients. Table 4 rejects the null hypothesis that the instrument variables are inappropriate at the 5% significance level. Therefore, it can be concluded that the instrument variables have been correctly selected.

Table 4. Test for the Appropriateness of Selected Instrument Variables

Model	p-value	χ^2 Statistic	J-Statistic
Model 1 - Trading Deposits	0	24.7914	20.61
Model 2 - Investment Deposits	0	8.8716	22.7

Generally, the dynamic GMM method has the following advantages over other methods:

- **Solving Endogeneity Problems:** The main advantage of dynamic GMM estimation is that all regression variables that are uncorrelated with the error term (including lagged variables and differenced variables) can potentially serve as instrumental variables.
- **Reducing or Eliminating Multicollinearity in the Model:** The use of lagged dependent variables helps eliminate multicollinearity in the model.

- **Removing Time-Invariant Variables:** This method removes many variables, such as culture, ethnicity, religion, and climate, which are fixed over time and can significantly influence per capita income and development. These variables can be associated with the institution. Removing these variables reduces bias in the model estimation. This technique allows for the removal of the impact of these factors by differencing the statistics.

Table 5. Estimation Results Using GMM Method

Variable	Model 1: Trading Deposits	Model 2: Investment Deposits
Lagged Dependent Variable (1st Lag)	0.61***	0.64***
Inflation	0.15***	-0.11**
Logarithm of Real Income	-0.05**	-0.02**
Macroeconomic Instability	0.11***	-0.09***
Bank Interest Rate	---	0.04*
Customer Club	0.07*	0.03*
Net Profit to Equity Ratio (ROE)	0.08***	0.12***
E-Banking Index	0.09***	0.02**

*, **, *** represent significance at 1%, 5%, and 10% error levels, respectively.

Hypothesis 1: As observed, inflation has a positive and significant effect on trading deposits, and a negative and significant effect on investment deposits.

Hypothesis 2: The estimation results show that macroeconomic instability has a positive and significant

effect on trading deposits and a negative and significant effect on investment deposits.

Hypothesis 3: The effect of real income growth on trading deposits is negative and significant, while it is positive and significant on investment deposits.

Hypothesis 4: The effect of bank interest rates on trading deposits is negative and significant, while it is positive and significant on investment deposits.

Hypothesis 5: The results confirm the positive and significant effect of electronic service quality on trading and investment deposits.

Hypothesis 6: The presence of a customer club has a positive and significant effect on trading and investment deposits.

Hypothesis 7: The level of ROE of banks has a positive and significant effect on the growth of both trading and investment deposits.

4. Conclusion

The results obtained from the panel model estimation in this study indicate that, as expected, inflation has a positive effect on transaction deposits and a negative effect on investment deposits. This could be attributed to an increase in the current expenses of depositors, making the returns on long-term investment deposits less attractive to economic agents in comparison to inflation. Additionally, the results of this study showed that macroeconomic instability has a positive and significant effect on transaction deposits and a negative effect on investment deposits. Macroeconomic instability leads to uncertainty among economic actors regarding future developments, preventing them from having a clear and transparent outlook on the future. As a result, the inclination towards depositing money for investment purposes in banks, as well as engaging in productive activities, decreases. This, in turn, increases the motivation to buy fixed assets, currencies, gold, and engage in speculative activities.

Another result of this study was the negative effect of national income on the growth of transaction deposits and the positive effect on the growth of investment deposits. The positive growth of national income signals to economic factors that the country's economic environment is conducive to productive activities. Consequently, the incentive for both long-term and short-term deposits for investment purposes increases. Furthermore, with the growth of national income and the positive economic environment, the incentive for speculative activities decreases, leading to a reduction in the demand for transaction deposits. Additionally, as expected both theoretically and empirically, the interest rate had a negative effect on the growth of transaction deposits and investment deposits. As the interest rate increases, the opportunity cost of holding money in transaction deposits rises, prompting

economic agents to shift transaction deposits to investments as much as possible.

The positive effect of electronic services and customer loyalty programs as tools used in banking network marketing on the growth of transaction deposits and investment deposits was another finding of this study. Electronic banking reduces operational costs and even marketing costs for banks while providing customers with an easier and better service experience, thereby increasing customer satisfaction. A customer loyalty program is a process that gathers a group of current customers and focuses on retaining and building their loyalty. These programs aim to maintain better relationships with customers, and the tools used in these programs can increase satisfaction and, consequently, customer loyalty. According to global statistics, 69% of customers are dissatisfied with their banks, and 59% of them are likely to leave. Therefore, offering special services to specific customers, along with other marketing strategies, not only increases customer retention rates but also positions the bank as a popular, credible, and trustworthy brand.

Finally, the findings of this study confirmed the positive and significant effect of the banks' Return on Equity (ROE) on the growth of transaction deposits and investment deposits. This finding implies that depositors monitor the performance of bank management in terms of profitability, and their trust is a function of the banks' efficiency.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

All procedures performed in this study were under the ethical standards.

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