

The Role of Rate of Return on Loans in the Islamic Banking System of Iran

Seyed-Nezamaddin Makiyan

Since 1984 Iranian banks has been operating under Shari'ah principles. This paper aims at the dynamics of loans and the difficulties that the banking system is facing. During the period of Islamic banking in Iran, banks experienced a significant increase in the supply of loans. Many factors could affect the behaviour of lending activities including rate of return, inflation, and government intervention. In this paper, a statistical model is developed to investigate the behaviour of supply of loans in Iranian banks in terms of the causal relationship between the main factors, which affect the supply of loans. The results indicate that government intervention has played a more important role than that of economic factors.

1. Introduction

This paper concerns with the dynamic of loans in the Iranian Banking system which operates under *Shari'ah* principles. It involves a case study that explains and analyses the operations of loans in Iranian banks. The analysis covers the period from 1363-1373 HS (1984-1994) at a national level. The data period begins in the first quarter of 1984 and runs to the fourth quarter of 1994.

The paper evaluates the rule of rate of return on loans after the basis of bank operations had been transformed by the introduction of Islamic principles. The method which is employed to analyse the data is a regression analysis. To this end, a model is developed to connect the supply of loans with the rate of return to banks, total deposits and the rate of inflation. In this paper the problems that have restrained or could restrain the efficiency of the system will be explained.

2. Analysis the Supply of Loans

The banking system consists of the Central Bank (the Bank Markazi), six commercial banks and four specialised banks. By law, all banks are nationalised. The objectives and functions of the banking system were declared to be those of a monetary system based on morality and justice and to systematise the issue of money and credit for a healthy and progressive economy. Credit must be used to promote the creation of a just and equitable society, eliminate poverty, and attain self-sufficiency. It must also be used in activities conducive to the attainment of the economic goals, policies and plans of the government. Moreover, the conventional functions of the banking system were incorporated in the law on interest-free banking. The law specified the types of contracts that must constitute the basis for the liability and asset sides of banks.

As part of the implementation of interest-free banking in Iran, the Bank Markazi established the 'minimum and maximum expected rate of return' in various economic sectors, and also each mode of financing for lending operations of banks. These rates were from 4% to 24% depending on the year and the type of contract between banks and clients. Table 1 (see all tables in the Appendix) illustrates the ranges of the expected rates of return from various economic sectors.

Table 1 shows, the lowest expected rate of return was associated with the agricultural sector and the highest rate was related to the trade sector. Table 1 states that the average expected rate of return to banks on their loans was about 14% a year. The low expected rates of return in the agricultural sector were set at 4-8% and the high expected rates of return were charged in the service sector at 10-12% annually for 1984-1989. Beginning in 1990, these rates were raised to 6-9% in the agricultural sector and 18-19% for the service sector. From 1992 the rates for the trade and service sectors were allowed to be relatively market-determined, reaching a maximum of 24%. However, these expected rates of return on bank loans were generally less than the inflation rates. There was also a minimum and maximum expected rates of return for each mode of financing.

In order to compare the average expected rate of return to banks supplying loans to clients with the average rate of inflation, Table 2 shows the rates of inflation during the period of investigation. Table 2 indicates, that the average rate of inflation during 1984-1994 was around 20% per year. It should be noted that the official rate of inflation was lower than the actual rate, mainly due to the subsidy of foodstuffs by the government. Nevertheless, this indicates that borrowers on average benefited by approximately 6% from bank loans. This means that the market rates of return were not considered in banking operations.

The expected rates of return on loans have since 1984 been heavily influenced by regulation rather than market information, though the latter could lead to a more appropriate allocation of resources. This influential has resulted in a situation whereby borrowers have benefited from obtaining loans from banks because the rates of return on loans were lower than the rate of inflation. In other words, the market rates of return were not considered in connection with loans in the Iranian banking system. Expected rates of return on loans should ultimately be market driven. The descriptive analysis of rates of return on loans shows that lending operations of banks were in accordance with the needs of the economy and not related to the rates of return to banks.

To see whether the descriptive discussion of rates of return on loans is confirmed by a regression analysis, a model for the supply of loans is examined. In pursuit of this goal, the loan supply performance of Iranian banks is regressed against the average rate of return, total deposits and the rate of inflation during the period considered.

According to the theory of banking, it is expected that the supply of loans has a positive relationship with rates of return and the size of total deposits in banks, and a negative relationship with the rate of inflation. This means that with an increase in the rates of return on loans and the size of deposits, the supply of loans will increase. On the other hand, with an increase in the rate of inflation, the supply of loans will decrease.

Thus, the behavioural assumptions require that $b_1, b_2 > 0$ and $b_3 < 0$. According to the above, the equation for the regression model is as follows:

$$SL_t = b_0 + b_1R_t + b_2TD_t + b_3I_t + e$$

Where

SL_t = Supply of loans as the dependent variable

R_t = Average rate of return on loans as the independent variable

TD_t = Total deposits in banks as the independent variable

I_t = Rate of inflation as the independent variable

b_i = Parameter to be estimated

e_t = Stationary disturbance term

Since the data is a time series, the Dickey-Fuller and Augmented Dickey-Fuller Unit Root Tests are implemented to investigate the order of stationary of the variables.

The results show that all the series, i.e. the supply of loans, average rate of return on loans, total deposits and the rate of inflation are integrated of order one, or $I(1)$. Then, the Johansen methodology is applied for the cointegration test. This leads us to the long-run relationship of the chosen vector which is:

$$SL_t = -5950 + 294.1 R_t + 1.278 TD_t - 88.41 I_t$$

Having found an appropriate cointegrating vector, the short-run dynamics model (ECM) is performed which is compatible with the theory and the certain criteria. This short-run dynamics model can be generated by the following error-correction form:

$$\Delta SL_t = \beta_0 + \beta_1 \Delta R_t + \beta_2 \Delta TD_t + \beta_3 \Delta I_t + \sum_{i=1}^n \alpha_i \Delta SL_{t-i} + \sum_{i=1}^m \lambda_i \Delta R_{t-i} + \sum_{i=1}^j \gamma_i \Delta TD_{t-i} + \sum_{i=1}^k \eta_i \Delta I_{t-i} + \beta$$

If the ECM equation for the supply of loans is estimated, it produces the result in Table 3. The result shows that the sign and probability of the coefficient of the error term are as expected. In other words, the coefficient of the error term (EC(-1)) is negative and significantly different from zero. The speed of adjustment (the coefficient of the error term) in the ECM equation is 0.30. This indicates a relatively rapid adjustment towards long-run equilibrium

The same method should be used to estimate all the other variables in the selected cointegration vector. In this way, it is possible to investigate causality through the statistical significance of the error-correction term. Thus, following the above ECM equation, we should perform another three ECM-causality equations to find the exogeneity or endogeneity of the variables. These equations are implemented and the results are summarised as follows:

In Table 4, the figures in columns 2-5 represent the number of the lag length(s) of the variables at the head of the column that appeared in the ECM equations for causality findings.¹ The term EC(-1) is the lagged error-correction term. The t-statistics of the EC terms are given in parentheses below them. The sixth column of Table 4 shows the adjusted R-squared. The last column is related to the LM test (which is a χ^2 test with 1 degree of freedom). The figures in the square brackets are the probabilities of the LM tests.

We can now explain the results obtained from the four ECM equations in terms of the causal relationships that they exhibit. The error-correction term can show the exogeneity or endogeneity of a variable and its long-run causality in terms of the indirect causal relationship between the variables; the 'causal' variable in this framework is described in the literature as being weakly exogenous. The ECM for the supply of loans shows that the error-correction term has a negative sign and is significantly different from zero. This means that the supply of loans is weakly-caused by the other variables. The subsequent equations which are summarised in the table for causality findings (Table 4) indicate that only the error-correction term for the variable of total deposits is negative and significant. This indicates that total deposits are also weakly-caused by the other variables, i.e. the supply of loans, the rate of return and the rate of inflation. These causal relationships indicate that both the supply of loans and total deposits are caused by the variables of the rate of return and the rate of inflation. Thus, the variables of the rate of return and the rate of inflation are 'weakly exogenous' for the supply of loans and also total deposits in the long-run. To put it another way, it is changes in these two variables that generate changes in the levels of the supply of loans and of total deposits. The ECM for the supply of loans also passed the diagnostic tests for the residuals. Finally, the estimated ECM can be written as follows:

$$DSL_t = 17.32 \times DR_t + 0.22 \times DTD_t + 33.43 \times DI_t + 0.29 \times DSL_{t-1} + 0.53 \times DSL_{t-4} - 0.70 \times DR_{t-4} - 0.30 \times EC(-1)$$

From the result of the ECM equation implemented for the supply of loans, it can be seen that the changes in the average rate of return on loans (D(R)) is not significant. This means that the supply of loans in this case has no relationship to the rates of return. The other explanatory variables, i.e. the changes in total deposits (D(TD)), the changes in the rate of inflation (D(I)), and the changes in the time lags of variables, are significant. However, the sign of the variable of changes in the inflation rate (D(I)) is positive which is opposed to the theory. The above may be interpreted as follows; given the financial needs of the economy, the constraints imposed by the government on banks to grant low-cost loans and the inflationary situation of the Iranian economy, it is not unexpected that the rate of return on loans is insignificant, and that there is a positive relationship between the changes in the supply of loans and the changes in the rate of inflation in the result of the ECM equation.

3. Concluding Remarks

This paper explained that the supply of loans was largely influenced by the government intervention. The granting of loans has not been encouraged by their rates of return. The related model which connects the supply of loans to the rates of return, total deposits and rate of inflation shows that the changes in the supply of loans are not related to the changes in the rates of return on loans. The evidence on indirect causality observed from the ECM shows that weakly exogenous variables are those of the rate of return and the rate of inflation for both the supply of loans and of total deposits.

This indicates that changes in the rate of return and the rate of inflation generate changes in the levels of the supply of loans and of total deposits. Moreover, the positive sign of the variable of inflation in the ECM denotes that the supply of loans does not follow the theory, according to the market mechanism point of view, and is related rather to the financial needs of the economy.

The general conclusion is that, banks must be allowed to be reasonably free in their asset acquisition and in lending activities in terms of the market determination of rates of return. This also leads to the payment of a suitable return to depositors. A further step for the improvement of banks could be to allow the establishment of private financial institutions even in partnership with foreign shareholders. This can provide an environment of competition between the banks and these institutions, leading to the improvement of banking services and also helping market forces to be reflected in both loans and deposits.

Notes

¹ For example, for the variable of average rate of return on loans as the dependent variable, apart from the inclusion of the changes in all the other variables, only lag 1 of the variable of the supply of loans is incorporated in the equation.

References

- Baillie, R. T. & T. Bollerslev (1994), "Cointegration, Fractional Cointegration and Exchange Rate Dynamics", *Journal of Finance*, Vol. 49, pp. 737 -745.
- Berger, A. N. (1995), "The Profit-structure Relationship in Banking, Tests of Market-Power and Efficient-structure Hypothesis", *Journal of Money, Credit and Banking*, Vol. 27.
- Crowder, W. J. & D. L. Hoffman (1996), "The Long-Run Relationship Between Nominal Interest Rates and Inflation: the Fisher Equation Revisited", *Journal of Money, Credit and Banking*, Vol. 28, No. 1, pp. 103-118.
- Enders, Walter (1995), *Applied Econometric Time Series*, New York, John Wiley & Sons.
- Gonzalo, J. (1994), "Five Alternative Methods of Estimating Long-Run Equilibrium Relationships", *Journal of Econometrics*, Vol. 60, pp. 203-233.
- Hendry, David F. (1995), *Dynamic Econometrics*, Oxford, Oxford University Press.
- Johansen, S. (1988), "Statistical Analysis of Co-integrating Vectors", *Journal of Economic Dynamics*, Vol. 12, pp. 231-254.
- Maddalla, G. S. (1992) *Introduction to Econometrics*, 2nd edn., London, Prentice Hall International.
- Murinde, V., K. Naser and R. S. O. Wallace (1995) "Is it Prudent for Islamic Banks to Make Investment Decisions Without the Interest Rate Instrument?" *Research in Accounting in Emerging Economies*, Vol. 3, pp. 123-148.

Phillips, P.C.B. and P. Perron (1988), "Testing For a Unit Root in Time Series Regression", *Biometrika*, Vol. 75, pp. 335-346.

Shirazi, Habib (ed.) (1990), *Islamic Banking*, London, Butterworths.

Appendix

Table 1: Sectoral expected rates of return to banks (in per cent)

Source: the Bank Markazi

| Year/Sector | 1984-1989 | 1990 | 1991 | 1992 | 1993-1994 |
|--------------|------------|---------|---------|-------------|-------------|
| Agricultural | 4 - 8 | 6 - 9 | 6 - 9 | 9(minimum) | 12 - 16 |
| Industry | 6 - 12 | 11 - 13 | 11 - 13 | 13(minimum) | 16 - 18 |
| Housing | 8 - 12 | 12 - 14 | 12 - 16 | 12 - 16 | 12 - 16 |
| Trade | 8 - 12 | 17 - 19 | 17 - 19 | 17 - 24 | 18 - 24 |
| Services | 10 - 12 | 18 - 19 | 17 - 19 | 17 - 24 | 18 - 24 |
| Export | 8(minimum) | - | - | - | 18(minimum) |

Table 2: Rates of inflation in Iran based on the year 1990 (in per cent)

Source: the Bank Markazi

| Year | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| I.F | 10.4 | 6.9 | 23.7 | 27.7 | 28.9 | 17.4 | 9.0 | 20.7 | 24.4 | 22.9 | 35.2 |

Table 3: Estimation of the supply of loans

| Dependent Variable is $D(SL_t)$ | | | |
|---------------------------------|-------------|-------------|--------|
| Variable | Coefficient | t.Statistic | Prob. |
| (R) | 17.32096 | 0.481935 | 0.6331 |
| D(TD) | 0.228957 | 4.185879 | 0.0002 |
| D(I) | 33.43566 | 2.073116 | 0.0463 |
| D(SL(-1)) | .297459 | 3.610730 | 0.0010 |
| D(SL(-4)) | 0.532199 | 4.250384 | 0.0002 |
| D(R(-4)) | -70.16207 | -2.114172 | 0.0424 |
| EC(-1) | -0.309308 | -3.602068 | 0.0011 |
| R-squared | 0.948358 | | |
| Adjusted R-squared | 0.938675 | | |
| Durbin-Watson stat | 1.911871 | | |
| F-statistic | 97.94190 | | |
| Prob (F-statistic) | 0.000000 | | |

Table 4: Summaries of the ECM equations for cau

| DV | ΔSL | ΔR | ΔTD | ΔI | EC(-1) |
|-------------|-------------|------------|-------------|------------|--------------------|
| ΔR | 1 | 0 | 0 | 0 | 2.93E-05 (0.43) |
| ΔTD | 4 | 2 | 1,5,6 | 0 | -1.482 (-4.34) |
| ΔI | 0 | 0 | 0 | 1 | 0.0001 (1.14) |

Figure 1: Actual and fitted values of the ΔI in the supply of loans

