The Impact of Liquidity Asset on Iranian Bank Profitability

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Abstract—this paper analyses the impact of liquid asset holdings on bank profitability for a sample of Iranian banks. Using the Generalized Method of Moment (GMM), this study analyzes the profitability of listed banks using unbalanced panel data over the period of 2002-2009. We use the liquidity asset and liquidity asset-square for estimating liquid asset and profitability relationship.

The estimated relationship between liquid assets and bank profitability is as expected. Coefficients for the liquid assets ratio, its square, business cycle, regulation and its product of interaction business cycle and regulation are all statistically significant. As expected, we find evidence of a non-linear relationship between profitability and liquid asset holdings. An important finding of this study is that the business cycle significantly affects bank profits. The coefficient of regulation is negative and significant. Therefore if regulators reduce the constraints imposed on banks, banks obtain profit.

Keywords—Banking System, Dynamic Panel, Liquid Asset, Profitability.

I. INTRODUCTION

The emphasis of the determinants of profitability for the banking sector of a specific country is underscored by good value that most countries have a bank-based financial system. The empirical literature on determinants of bank profitability is broad. However, little is known about the Iranian banking system. There are approximately 17 commercial banks in Iran. Among these banks, eleven of them are state-owned and six of them are privately owned. All of these banks have to follow the principles of Islamic banking whereby usury is not allowed. Interest rates, profit rates depended on deposits and expected rates of profit on facilities are set on loans. Some policies have been introduced to change the structure of financial market by privatizing Iran’s banks. The Central Bank of Islamic Republic of Iran (CBI) was set up in 1960, and is in charge of formulating and implementation of the fiscal and credit policies.

In Iran, following to the completion of landmark reforms in the financial sector, banking sector has witnessed large changes with the elimination of bureaucratic controls, encouragement to foreign private and private investment and integrating the Iran's banking systems with the international economy. The entry of new foreign banks and private banks constitute a challenge to the public sector bank leadership in Iran. [19]

The Iranian Government guides the Central Bank to use specific monetary policies in support of their current affairs and fiscal policy. Thus, the Central Bank controlled of money supply. The mix of private and state banking in Iran may be considered structural problem. At the moment the market share of private banks is 22% of the whole market. Their performance and productivity are significantly higher than those of the state banks. Nevertheless, they are subject to anti-competitive interference in their affairs constantly by the government and the Central Bank to prevent their fast market share growth. Additionally, state owned banks can slash the private-owned banks’ profitability, since they tend to care less about profits [15].

Besides, they receive a large number of unfair benefits from the Central Bank. Based on international standards, Iran does not have an adequate number of private banks compared to the number of state-run banks. There are fewer private banks in Iran than that of developed countries because of the loss of a competitive state of affairs in the country [31].

II. LITERATURE REVIEW

The determinants of bank profitability have been broadly studied with the surveyed being usually divided to two main categories. The first studies focusing on a specific country in the determinant of bank profitability (e.g. Berger et al., 1987; Berger, 1995b; Barajas et al., 1999; Naceur and Goaied, 2001; Naceur, 2003; Athanasoglou et al., 2005; Aburime, 2008a; and Aburime, 2008b). Second studies survey factors in different countries (e.g. Haslem, 1968; Short, 1979; Bourke, 1989; Molyneux and Thornton, 1992; Demirgüç-Kunt and Huizinga, 1999; Bashir, 2000; Demirgüç-Kunt and Huizinga, 2001; and Abreu and Mendes, 2002).

The determinants of banks’ profitability are usually divided to internal and external factors. Internal factors focus on bank-specific and external factors consider both macroeconomic and industry characteristics. Demirgüç-Kunt (1998) has positive relationship between size and profitability. Havrylychyk et al. (2006) finds a positive relationship between capital and profits of banks. Molyneux and Thornton (1992) find that a positive relationship between efficiency and profitability. Efficient bank should have higher profits since it is able to capitalize on its net interest income. Finally, Miller
and Noulas (1997) show that a negative relationship between credit risk and profitability.

A liquid asset requirement, or ratio, show that the requirement of commercial banks to maintain a predetermined percentage of total deposits and certain other liabilities in the form of liquid assets. In a number of countries this requirement is calculated as a percentage of short-term liabilities.

Industrial countries have for the most part eliminated the use of a binding liquid asset requirement for monetary and prudential purposes. In developing countries their use mainly reflects a mix of monetary and prudential purposes. Recently, this requirement has been used in the context of currency board arrangements as a prudential instrument to help banks meet their systemic liquidity needs, given the limitations such arrangements set on the central bank’s ability to act as a lender of last resort. However, the reform with a view to improving banks’ liquidity management is necessary. Reform has included lowering liquid asset ratios to the minimum level necessary to manage cash flows and facilitate interbank settlements, allowing for averaging of liquid asset balances and including among the list of eligible assets those that can be realized in a relatively short time without significant loss of principal.[14]

While a very limited number of studies appear to include liquidity as an explanatory variable for bank profitability, this relationship is not the focus of those papers and the empirical results are mixed. For example, Bourke (1989) finds some evidence of a positive relationship between liquid assets and bank profitability for 90 banks in Europe, North America and Australia from 1972 to 1981, while Molyneux and Thornton (1992) and Goddard, et al (2004) find mixed evidence of a negative relationship between the two variables for European banks in the late 1980s and mid-1990s, respectively. Liquid assets are generally included as a control variable in these studies with very limited discussion around the estimated parameter. This paper used liquid asset squared as an explanatory variable for bank profitability.

III. DATA AND METHODS

Financial data for the Iranian banks were obtained from the Bankscope Database of Bureau van Dijk’s company, macroeconomic information from the Central bank of Iran Database. This model estimated with an unbalanced panel data for 17 commercial banks (private and own state banks). The time period 2000-2009 was partly chosen by data availability. Descriptive statistics for the variables are displayed in table I. The average of liquid asset in the sample is around 40 percent. The mean of return on equity was 21.19 during the sample period. The share of deposit in total asset is 62.8 percent.

Table II displays the correlation matrix of the variable used in the regression. Business cycle, loan-asset ratio, Herfindhal index, deposit ratio and Regulation positively correlated with return on equity. Capital ratio and liquid asset ratio is negatively correlated with profitability.

The general model to be estimated is of the following linear form:

$$\Pi_{it} = \alpha_0 + \alpha_1 \Pi_{i,t-1} + \Sigma \alpha_5 X_{i,t} + \Sigma \alpha_3 M_{t} + \epsilon_{it}$$ (1)

Where $\Pi_{it}$ is the profitability of bank $i$ at time $t$, with $i=1,...,N$, $t=1,...,T$, $X_{i,t}$’s are the bank-specific variables and $M_{t}$’s are macroeconomic variables.

Bank profits show a tendency to continue during the time depended on market competition and informational sensitivity to macroeconomic shocks. Therefore, this paper adopts a dynamic specification of the model by including a lagged dependent variable among the regresses. $\Pi_{i,t-1}$ is the one period lagged profitability and $\alpha$ the speed of adjustment to equilibrium. A value of $\alpha_1$ between 0, 1 show that profit continue and average level of profit obtained. A value close to 0 means that the industry is quite competitive and there are high speed of adjustment, while a value of close to 1 indicate that less competitive structure.

The profitability variables are represented by return on asset and return on equity. Return on asset indicates the ability of a bank’s management to generate profits from asset depended on off balance sheet activities. Return on equity indicates the return to shareholders on their equity.

Liquidity means availability of cash that how bank rapidly may convert its assets into cash to meet the need of short term. It is considered that it is life of the banks. Higher amount of the liquid assets reflect the greater liquidity of the firm. Following liquidity measures are used to measure the liquidity efficiency. Liquid Assets to Customer Deposits and Short Term Funds Ratio equal to Liquid Asset divided to Customer deposit and short term funds. It clears the position of deposits and short term funds which meets the requirements of sudden
withdrawals. Higher ratio shows the more liquid commercial bank less in danger the financial institution. Liquid asset ratio and profitability may be expected to be nonlinear. Then this paper uses the liquid assets (la) and their square in order to capture this possible non-linear relationship. Therefore the equation (1) has change to this form:

\[ \Pi_{it} = \alpha_0 + \alpha_1 \Pi_{it-1} + \alpha_2 la_{it} + \alpha_3 la^2_{it} + \alpha_4 Bcc + \alpha_5 Bcc* \text{regulation} - \alpha_6 \text{Loan} - \alpha_7 \text{Deposit} \]

Loan-asset ratio is the liquidity ratio and we will incorporate this variable in model. The loan to assets ratio measures the total loans outstanding as a percentage of total assets. The higher this ratio indicates a bank is loaned up and its liquidity is low. The higher the ratio, the more risky a bank may be to higher defaults. A positive relationship between the ratio of bank loans to total assets, Loan, and profitability was also found from using international database [17]. Bank loans are expected to impact profits positively.

The deposit ratio is defined as the ratio of all liabilities to customers to total assets. A decrease in share of deposit in total asset creates cost of borrowed financing sources and high cost decrease the profitability of banks. Bank deposits are a very attractive means to fund the bank, because of the relatively lower interest rates to be paid compared to bonds or borrowing from banks. A decreasing bank deposit ratio makes banks’ debt more expensive and reduces the current profit. This effect is controlled for by including profit into the equation. But a decreasing (increasing) deposit ratio may signal even lower (higher) net interest profits in future years.

For considering the business cycle, the real output gap used which isolates the business cycle from the economic trend. The Bcc is computed by subtracting a non-linear trend from real GDP using the Hodrick-Prescott (HP) filter. This paper explores the relationship between bank profitability and the business cycle. There are several reasons why bank profitability may be pro-cyclical, as equity tends to follow the phase of the cycle. Hence, in the absence of a business cycle variable, its effect on profitability could be partly captured by the relevant bank-specific variables. Secondly, demand for credit would be strengthened substantially during economic booms and the interest margin may widen. Therefore, revenues could grow faster than costs leading to increased profits, while the opposite may hold true during economic slowdowns. [5]

One of the most important characteristics that can affect profitability is regulation. If regulators reduce the constraints imposed on banks, banks may take on more risk. If banks taking on the higher degree of risk are profitable, then depositors and shareholders gain. If, on the other hand, the banks fail, depositors lose. To incorporate the impact of prudential surveillance and supervision, we use the regulations in credit market as proxies for financial regulation.

The data variable of regulation is derived from economic freedom index of Fraser institute from 2000 to 2009. Regulation in Economic Freedom Index is concluded regulation in credit market, regulation in labor market and regulation in business. Subcomponents of credit market regulation provide evidence on the extent to which the banking industry is dominated by private firms and whether foreign banks are permitted to compete in the market and indicate the extent that credit is supplied to the private sector and whether interest rate controls interfere with credit market operations. Countries with an open banking system where privately owned banks extend a larger share of the outstanding credit to private borrowers at interest rates determined by market forces receive higher ratings for the credit market component of the regulatory area. We used the interaction of business cycle and regulation. It is the cross product of business cycle and the regulation. We use the Herfindhal-Hirschman (H-H) Index. The H-H index is calculated as the sum square of market share of banks in Iranian banking.

The usual approach today when facing heteroskedasticity of unknown forms is to use the Generalized Method of Moments (GMM). The unobserved panel-level effects are correlated with the lagged dependent variables, making standard (fixed or random effects) estimators inconsistent. Arellano and Bond (1991) derived a consistent Generalized Method of Moments estimator for this model. The Arellano and Bond estimator is designed for situations with ‘small T, large N’ panels, and a single left-hand-side variable that is dynamic, depending on its own past realizations. Generalized Method of Moments considers first differences and using the lags of the explanatory variables as instruments.

In order to gauge the success of this procedure we use the Hansen test for the validity of the instruments. The estimation procedure then consists of finding the set of instruments that gives us the best Hansen test (checking that the coefficients are stable to different instrument specifications).

IV. RESULTS

Table III reports the empirical results of the estimation of model using return on asset as the profitability variable. We use the liquidity asset and liquidity asset-square for estimating liquid asset and profitability relationship. We use Loan-asset ratio and deposit ratio as bank specific variables. Also business cycle and regulation and their interactions use as macroeconomic variables. Finally, the relevant specification tests for each estimated equation are presented. The model seems to fit the dynamic panel data well and having the significant coefficient. The Sargan test shows no evidence of over-identifying restrictions. The results show that the negative first-order autocorrelation is present. The highly significant coefficient of lagged profitability variable proves the dynamic model. A value of \( \alpha_1 \) (the speed of adjustment to equilibrium) approximately is 0.5 which means that Iranian banking structure moves to competitive market.

According to the table I, II, the estimated relationship between liquid assets and bank profitability is as expected. Coefficients for the liquid assets ratio, its square, business cycle, regulation and its product of interaction business cycle
and regulation are all statistically significant. As expected, we find evidence of a non-linear relationship between profitability and liquid asset holdings. More specifically, the negative coefficient on liquid asset squared indicates that profitability is maximized. In other words, the relationship takes the form of a downward-concave relationship and to the extent the relationship is relatively flat around the maximum.

According to the results, profitability is improved for banks that hold some liquid assets, however, there is a point at which holding further liquid assets diminishes a bank’s profitability. The coefficient of the deposit ratio is positive and highly significant. A bank with a more deposit is able to more profitability. The coefficient of loan asset ratio is positive and significant. This positive effect implies that banks with a high proportion of loan asset ratio have a higher profitability.

An important finding of this study is that the business cycle significantly affects bank profits. Business cycle is estimated to have a positive and statistically significant impact on bank profitability; this suggests that profitability exhibit procyclical behavior. The coefficient of regulation is negative and significant. Therefore if regulators reduce the constraints imposed on banks, banks obtain profit. The empirical results show that concentration affects bank profitability negatively, but this affect is relatively insignificant. This study finds that the coefficient of H-H index is negatively and significant. The Berger (1995) show that concentration is usually negatively related to profitability.

In Table IV, Coefficients for the liquid asset ratio, its square are statistically significant. As expected, we find evidence of a non-linear relationship between profitability and liquid asset holdings. Business cycle is estimated to have a positive and statistically significant impact on profitability. The coefficient of regulation is negative and significant. Therefore if regulators reduce the constraints imposed on banks, banks obtain more profit. The results show that concentration affects bank profitability negatively, and this affect is significant. This study aims to examine determinants of bank profitability during the crisis period. To investigate the impact of recent financial global crisis, this study uses time dummy variable during the crisis period (2007-2009). Findings of this study show that the interaction of crisis dummy and liquid asset ratio is statistically and significantly affect bank’s profitability. Furthermore, crisis is arising to have significant impact on the effect of inflation toward bank profitability and decrease the bank profitability.

V. CONCLUSION

The estimated relationship between liquid assets and bank profitability is as expected. Coefficients for the liquid assets ratio, its square, business cycle, regulation and its product of interaction business cycle and regulation are all statistically significant. As expected, we find evidence of a non-linear relationship between profitability and liquid asset holdings. Profitability is improved for banks that hold some liquid assets, however, there is a point at which holding further liquid assets diminishes a banks’ profitability.

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REFERENCES