Loan to SME and Banking Profitability:

An Iranian Perspective

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ABSTRACT

In recent years the studies show that small and medium enterprises (SME) are the core of most economics and are a key source of economic growth and flexibility. The SMEs have the important role in creating employment Economic growth and financial services. The private sector is also involved in the promotion of SMEs through the establishment of SME branches in banking institutions.

This paper investigates the role of Small and Medium Enterprises (SMEs) in influencing the banking profitability in Iran. Making use of Dynamic panel data from 2001 to 2010, the findings exposed that SME contribute to bank profitability in Iran. This paper find negative and significant coefficient of loan to SMEs in banking profitability. The result shows that concentration Index and deposit ratio and cost ratio and size of bank influence on banking profitability in Iran. Banks are more concerned about SME financing is seen to be highly risky and are therefore constrained in terms of bank financing.

Keywords: Bank Profitability, SMEs, Dynamic Panel Data.

JEL classification: G21, C23, L33

1. INTRODUCTION

In recent years, changing market factors and policy of central banks had a substantial impact on banking sector. After decades of deregulation, globalization and financial innovation the banking sector reassessment of the banking sector is requested . Current efforts to reform regulation and supervision will lead to a new erea of reregulation and will likely impact banks' profitability. In this context, Allen, Chan, Milne and Thomas (2010) argue that Basel III will force banks to shift their business model from liability management, in which business decisions are made about asset volumes, with the financing found in short term wholesale markets as necessary, to asset management, in which asset volumes are constrained by the availability of funding.

Major changes have been found in the operating of the banks during the last two decades. The Structure, Conduct and Performance of the banks have been affected by both external and domestic factors in economy. Nevertheless the increased preference towards disintermediation experimented in the many countries; there would have been no economic activity without banks financing. It has been argued that small and medium enterprises (SMEs) are the strength of most economies, and are a key source of economic growth in recent years. SMEs in have contributed approximately 12 percent to GDP and have employed about 20 percent of the work force during 2010, (Arnold et al. 2011)

Goddard et al. (2004) indicate that the determinants of bank profits can be analyzed. For instance, the literature predominantly gives consideration to factors affecting profitability at the bank level or macroeconomic level, with variables chosen unrealizable. Also, there is a lack of analysis regarding the role of SMEs in contributing to the profitability of banks.

The Objective of this paper is to delivera role of SMEs in banking profitability and other factors can macroeconomic factors influencing the banking profitability. This paper focuses on Iranian banking profitability with determinants the role of SMEs. The section 2 provides a review of the literature. This section describes some of the theoretical literature associated with determinants of banking profitability. To assessing the relationship between SME financing and bank profitability, this paper use a set of dynamic panel estimations that describe in section 3. Finally, the section 4 and 5 include the estimation and results and conclusion.

2. REVIEW OF LITERATURE

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 (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. Demirguc-Kunt and Maksimovic (1998) and Akhavein et al. (1997 have positive relationship between size and profitability. Havrylchyk 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.

This part provide an summary of the banking profitability literature include basic profitability concepts and ratios and then continue with the theoretical determinants of bank specific, industry specific and macroeconomic indicators of banking profitability. The main direction of interest of this paper is, to develop a comprehensive model that incorporates macroeconomic, industry-specific and bank-specific determinants (of which the bank-specific determinants transmit to the balance sheet structure).The sometimes of studies show the size of bank can have a negative influence. Therefore, the impact of bank sizeis unknown. Akhavein et al. (1997) and Smirlock (1985) show that there are exists a positive and important link between size and bank profitability. Demirguc-Kunt and Maksimovic (1998) show that profitability of banks is affected by financial, legal and other factors (e.g. corruption) are very much connected to firm size. Haslem (1968), Short (1979), Bourke (1989), Molyneux and Thornton (1992) Bikker and Hu (2002) and Goddard et al. (2004), recommend that size of banks increases profitability. Molyneux and Thornton (1992) show that there is negative and significant link between the level of liquidity and profitability, such that high level of liquidity leads to lower profitability. Berger (1995), Neeley and Wheelock (1997) and Angbazo (1997) nominated the determinants of bank profitability in the USA. Berger (1995) assesses the linkbetween the profitability and the capital asset ratio for banks in the US for the period 1983-1992 using the Granger causality and illustrates a positive relationship between capital asset ratio of the commercial banks and their profitability. Barajas et al (1999) examines the determinants of bank profitability for the period 1991 to 1998 and finds the effect of financial liberalization to be significant on bank profitability for Columbia. Naceur and Goaied (2001) explore the determinants of bank profitability in Tunisia for the period 1980-1995 and show that banks which resist to labour and capital productivity improvements, strengthen their capital base and having higher deposit to asset ratios are most profitable. According to, Naceur (2003) evaluates the factors of bank profitability in the Tunisian banking sector for the period 1980-2000. This paper finds that banks appear to experience scale inefficiencies given that size has got a negative significant effect on net interest margin. Guru et al(2002) evaluate the internal determinants (liquidity, capital adequacy and expenses management) and external factors (ownership, firm size and external economic conditions) of Malaysian banks' profitability over the period 1986-1995 and find costs management is the most significant factor. They also find that while inflation has a positive association with banks' profitability, there is a negative association between high interest ratio and profitability. Vongand Chan (2009) evaluate the internal and external determinants of the Macao banking sector for the period 1993-2007 suing pooled fixed effects framework and show that capital strength is the most significant in explaining profitability as highly capitalized banks are believed to be less risky. Sayilgan and Yildirim (2009) survey the determinants of banks' profitability in Turkey for the period 2002-2007 and find that CPI inflation and lagged off balance sheet transactions to total assets have a negative association with bank profitability. (Sufian F. , Chong R.R., 2008).

Athanasoglou et al (2005) evaluate the impact of bank and industry specific as well as macroeconomic determinants of bank profitability spanning the period 1985-2001. Theyfind that determination of profits exists to a moderate extent. They also find that size; all bank specific determinants like capital, credit risk, productivity, expenses management significantly affect bank profitability.According to Barth, Caprio and Levine (2004) capital requirements and restrictions on banking activities do not have a significant impact on bank's profitability,

measured by the net interest margin. Among others, Laeven& Levine (2009) find that risk taking by banks is influenced by regulation. Moreover, it appears that the impact of regulation on risk taking is determined to some extent by the ownership structure. Empirical research towards the relationship between ownership structure and profitability, give mixed results (Saunders, Strock and Travlos, 1990; Altunbas, Evans and Molyneux, 2001; Iannotta, Nocera and Sironi, 2007 and Micco, Panizza and Yañez, 2007). Some studies find a positive relationship between private ownership and profitability while others find a negative or insignificant relationship. Finally, prior research also focuses on bank-specific determinants of performance using e.g. balance sheet ratios (Berger, 1995 and Demirgüç-Kunt and Huizinga, 1999).

Pasiouras and Kosmidou (2007) and Dietrich and Wanzenried (2011) investigates macroeconomic, industry-specific and bank-specific determinants of profitability utilizing a regression model. Dietrich and Wanzenried (2011) survey the impact of the financial crisis on determinants of banks' profitability for the Swiss banking sector between 1999 and 2009. They find that significances and coefficients altered during the financial crisis.

As mentioned before, two World Bank surveys were conducted in recent years as part of an effort to investigate the status of bank lending to SMEs. These surveys share some important common elements, but also have important differences. Both surveys provide some measurement of SME lending, investigate the main drivers and obstacles to further SME lending, the main business models developed and the main risk management techniques adopted, but with different emphasis on each of these components. The two surveys are also based on very different samples, regarding their size, the types of bank surveyed, and the regional coverage. Beck, Demirguc-Kunt and Martinez Peria (2008 and 2009) with 91 large banks in 45 countries provided the basis for two separate studies and an overall assessment of the survey results while the second provides an econometric analysis of the dataset. This survey included a quantitative component, obtain measures of the share of SME loans in total loans, the share of investment loans in SME loans, percentages of applications approved, and loan fees and interest rates. Besides comparing SME lending in developed and developing countries, and investigating drivers and obstacles, the two studies also made comparisons between government, private, and foreign banks. Schiffer and Weder (2001), and Beck et al. (2005, 2006 and 2008) show SMEs perceive access to finance and cost of credit to be greater obstacles than large firms and these factors affect their growth. Beck, Demirguc-Kunt and Martinez Peria (2008) show that the average share of SME lending is smaller in developing countries (16 percent of total lending) by comparison with the average share in developed countries (22 percent of total lending). Banks in developing and developed countries are primarily attracted by the potential profitability of the SME sector and serve SMEs primarily through dedicated SME units. Government programs are considered favorable and prudential regulations are not perceived as burdensome. Scoring models are used by most banks but they are just one of the inputs in loan decision. Banks in developing countries report that macroeconomic instability is the main obstacle to SME lending, rather than flaws in the legal and contractual framework. Beck, Demirguc-Kunt and Martinez Peria, 2009, based on the statistical analysis of the dataset concludes that the differences in SME lending between developing and developed countries are actually explained by differences in the quality of the legal and contractual environment (weaker in developing countries). Overall, their analysis suggests that the enabling environment is more important than firm size or bank ownership in shaping bank financing to SMEs.

3. DATA AND EMPIRICAL ESTIMATION

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 2000-2011 was partly chosen by data availability. Descriptive statistics for the variables are displayed in table 1. The average of loan to SME in this sample is around 68 percent. The mean of return on equity was 21.2 during the sample period. The share of deposit in total asset is 62.7 percent.

Table1: Summary Statistic

Variable	Mean	Std.Deviation
Return on equity	21.2	16.23
Loan to SME	0.68	0.034
Size	8.57	3.29
Herfindal	0.0084	0.0166
Inflation rate	16.055	3.73
Capital ratio	14.96	18.26
Cost ratio	60.12	28.1
Deposit ratio	62.7	21.8
Z-Score	14.19	11.92

To test the hypotheses on the relation between bank profitability and loan to SME, we employ the Granger-causality framework. We thus estimate the following equations to survey relations between bank profitability and loan to SME:

$$BankProfit = F\ (LoantoSME_{ilag}, BankProfit_{i,lag}, M_{i,t}) + e_{i,t} \quad (1)$$

$$LoantoSME = F\ (BankProfit_{i\ lag}, LoantoSME_{i,lag}, M_{i,t}) + e_{i,t} \quad (2)$$

Where the subscript t indicates the time, i represent the cross-sectional dimension across banks,M represents the control variables and ei and t is the error term. Equation (1) tests whether changes in loan to SME temporally precede variations in bank profitability, while equation (2) evaluates whether changes in bank profitability temporally precede variations in loan to SME. To determine what causal relationship exists between Banking Profitability and the measurement of loan to SME, dynamic model was used and define causality along the lines established by Granger (1969). We say that the variable x is causing y if we are better able to predict y using all available information than if the information apart from x had been used. That is, if we control for the information contained in past values of y and past values of x add significantly to the explanation of current y, then we say that x Granger-Causes y. this study will use return on equity as a measure of the bank profit and the loan to SME as a measure of loan to SME. We use three lags in the model for Granger-test with yearly data. In their analyses of the causal relation between non-performing loans and bank efficiency, Podpiera and Weill (2008) use three lags and Fiordelisi, Marques-Ibanez and Molyneux (2011) choose two lags with yearly data.

Table 2: The Granger-test for causing between banking Profitability and SME loan
Dependent variable:Loan to SME

Variable	Coefficient	t-statistic
SMEloan(-1)	0.8665	5.77
ROE(-1)	1267.3	1.16
ROE(-2)	359.97	0.298
ROE(-3)	2984.2	1.58
Inflation	-202.935	-2.18

R-Squared: 0.68

The result of Engel granger causality test about the relationship between loan to SME and bank profitability in Iranian banking system show that coefficient past of Return on Equity in table 2 is not significant, so there is not any reciprocal relationship. But the results represent that loan to SME cause of return on equity because coefficient lag of loan to SME in table 3 is significant.

Table 3: the Granger-test for causing between banking Profitability and SME loan
Dependent variable:Banking Profitability

Variable	Coefficient	t-statistic
ROE(-1)	0.6961	1.72
SMEloan(-1)	0.001272	3.01
SMEloan(-1)	0.000964	2.767
Inflation	4.203	2.62

R-Squared: 0.71

4. VARIABLE DESCRIPTION AND MODEL SPECIFICATION

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 $\alpha_1$the speed of adjustment to equilibrium. A value of $\alpha_1$between 0, 1 shows 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 equity. Return on equity indicates the return to shareholders on their equity.

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

$$\Pi_{i,t}= \alpha_0+ \alpha_1. \Pi_{i,t-1}+\Sigma \alpha_2.X_{i,t} +\Sigma \alpha_3.M_{i,t}+ \varepsilon_{i,t} \qquad (3)$$

Where $\Pi_{i,t}$ 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 $M_{i,t}$'s are macroeconomic variables.
Bank profitability is commonly calculated and contrasted by return on equity (ROE) and return on assets (ROA).

As a first approach to assessing the relationship between SME financing and bank profitability, we use a set of dynamic panel estimations .The dynamic panel methodology relies on the Generalized-Method of Moments (GMM) estimator suggested by Arellano and Bond (1991). This dynamic panel data procedure is employed since the lagged values of the dependent variables is likely to determine. We refer to the GMM estimator based on these conditions as the 'difference estimator'. However, there are some statistical shortcomings with this difference estimator. Blundell et al. (2000) have shown that when the explanatory variables are persistent over time, lagged levels of these variables are weak instruments for the regression equation in differences and affect the asymptotic and small-sample performance of the difference estimator. Asymptotically, the variance of the coefficients rises with weak instruments.
Additionally, in small samples, Monte Carlo experiments have shown that the weakness of the instruments can produce biased coefficients. To reduce the potential biases andinaccuracy associated with the usual difference estimator, we use a new estimator that combines, in a system, the regression in differences with the regression in levels (Arellano and Bover, 1995; Blundell et al. 2000)
Size of banks indicates specific bank risk. As governments are less likely to allow big banks to fail, a risk approach to size would predict that bigger banks would require lower profits. However, if big banks have a larger market share and operate in a noncompetitive environment, lending rates tend to be higher while deposit rates will be lower because of safety perceptions from depositors. Thus, larger banks may enjoy higher profits. Moreover, in theory predicts efficiency gains related to bank size, owing to economies of scale. In most studies, Athanasoglou et al (2005), Sam et al (2003) among others, the authors show a positive relationship between larger bank size and bank profitability.
Capital should be an important variable in determining banking profitability. In imperfect capital markets, well capitalized banks need to borrow less in order to support assets, and tend to face lower cost of funding due to lower prospective bankruptcy costs. This paper use proxy for capital with the ratio of equity to total assets. Most of the studies find a positive and significant effect of capital on banking profitability.
The higher the loan amount to SMEs, the higher will be the profitability of the banks. A positive sign is expected.
The term SME refers to the size of company, though the characteristics of a firm does not necessarily adjustment considerably through change in size. But, the firms of various sizes are different in the technology used, the pattern of employment, nature of products, market orientations, regulations and financial resources. Hence, the literature of small units is widespread and it has caused various definitions in different countries occur; these definitions are different according to age structure, demographic and cultural structure and developmental level (Keshavarz, 2005).
In this study, the term small and medium industries refers to the definition mentioned by Ministry of Industries and Mines and Trade in the National Industrial Strategic Development Plan (2006 - 2025), through which, the firms with less than 50 employees are small industries,

from 50 to 150 people are medium industries and the enterprises with more than 150 employees are large industrial firms (Ajdari, Tabatabayi, 2008).
There is little unanimity regarding the definition of SMEs in Iran. Various ministries, institutions and organizations connected to SMEs in one way or another have their own criteria to describe, categorize or define SMEs. As defined by the Ministry of Industry and Mines and Trade, the Ministry of Agricultural Jihad, SMEs are (rural) industrial and service enterprises with less than 50 employees, whereas the Ministry of Cooperatives alternately uses the criteria of the Ministry of Industry and Mines, or of the Statistical Office of Iran in defining SMEs. According to the Iranian Statistical Yearbook for 1999, categorizes businesses into four classes, i.e. businesses with 1-9 employees, 10 to 49 employees, 50 to 99 employees, and more than 100 workers. Although this categorization bears some resemblance to the definitions used by the EU, the Statistical Office of Iran only considers businesses with less than 10 employees to be SMEs; all others are regarded as "Large Manufacturing Establishments".
Herfindahl-Hirschman concentration index is computed as the sum of the squared market shares of each one of the banks operating in a given region. Existing studies offer controversial results as far as the relationship between concentration and funding availability is concerned.
Some studies introduce the relationship between bank profitability and inflation, the effect of inflation on bank profitability depends on how inflation affects both salaries and the other operating costs of the bank. In this context, Perry (1992) concludes that the extent to which inflation impacts bank profitability depends on whether the extent of inflation is expected. If the inflation rate is fully anticipated by the bank's management, the bank can adjust interest rates appropriately to increase income faster than costs, which should have a positive impact on profitability. Recent studies (Alexiou and Sofoklis, 2009; Athanasoglou et al., 2008; Claeys and Vander Vennet (2008); García-Herreto et al., 2009; Kasman et al., 2010; Pasiouras and Kosmidou, 2007) confirm a positive relationship between inflation and profitability. We therefore also expected a direct relationship between the two variables.

5. RESULTS

Table 4 gives an initial outline of the Iranian banking situation during the last decade. The estimator ensures efficiency and consistency provided that the residuals do not show serial correlation of order two (AB tests for AR (2) with high *p*-values) and that the instruments used are valid (Sargan tests with *p*-value = 1). The high statistical significances of the lagged profitability variables also confirm the dynamic character of the model specification. The values of *d* are close to 0.30, which indicates a moderate persistence in bank profitability similar to that found by previous studies in the banking sector (e.g., Athanasoglou et al., 2008).
The effect of the bank capital on profitability is different depending on whether we consider the profitability of assets or of equity. The negative effect of banks' capital on the ROE is represented. The decrease of capital ratio in Iranian banks leads to increase profitability.
In our study, we find the size of Iranian banks to be a determining factor of their profitability and the model indicate size to be a positive factor in profitability. The results show that the HHI index as a concentration index and profitability have a positive relationship.
With regard to the set of exogenous variables, our results suggest a positive relationship between deposit ratio and profitability. As expected, bank profitability is directly related to Z-score, z-score defined as the ratio of the return on assets plus the capital ratio divided by the

standard deviation of the return on assets. The Z-Score is the inverse of the probability of insolvency, i. e. a higher Z-Score indicates that a bank incurs fewer risks and is more stable.
According to the Perry (1992) concludes that the extent to which inflation impacts bank profitability depends on whether the extent of inflation is expected.in this study the relationship between profitability and inflation is negative.
According to Athanasoglou et al (2005), capital of the banks is significant in banking profitability. Our result shows that an increase in the capital of banks leads to increase in Return on Equity, suggesting that well-capitalized banks experience higher returns.
Further, the coefficient for Loans to SMES is negative and significant in the banking profitability in Iran. SMES do not contribute to bank profitability in Iran. Banks are more concerned about SME financing is seen to be highly risky as the latter do not have sufficient collateral to provide and are therefore constrained in terms of bank financing.
Size of banks is significant in banking profitability. The negative coefficient of size indicates that the larger bank cannot increase profit than smaller bank.

Financing is necessary to help them set up and expand their operations, develop new products, and invest in new staff or production facilities. Many small businesses start out as an idea from one or two people, who invest their own money and probably turn to family and friends for financial help in return for a share in the business. But if they are successful, there comes a time for all developing SMEs when they need new investment to expand or innovate further. That is where they often run into problems, because they find it much harder than larger businesses to obtain financing from banks, capital markets or other suppliers of credit.

Table 4: The Relation between Return on Equity and Loan to SME

Dependent variable	Model 1	Model 2	Model 3	Model 4	Model 5
Roe(-1)	0.218 (4.82)	0.242 (5.476)	0.201 (9.79)	0.348 (5.33)	0.229 (6.81)
Loan to SME	-0.0397 (13.72)	-0.0435 (-10.99)	-0.0345 (-7.49)	-0.0206 (-5.398)	-0.0305 (-4.57)
H-H	----	----	1.96 (3.39)	3.28 (1.71)	3.89 (3.65)
Deposit ratio	0.0993 (1.84)		---	---	----
size	-----		10.026 (6.71)	13.41 (5.57)	----
Capitalratio	-----	-0.132 (-2.001)		-0.3515 (-1.988)	----
inflation	-----			-0.227 (-2.49)	-0.37 (-11.77)
Z-score	-----	-----	-----	-----	0.42 (1.71)
Cost ratio	-0.217 (-4.66)	-0.26 (3.93)	----	----	----
J-stat (d.f)	22.17 17	23.3 17	24.02 17	22.55 17	24.64 17

6. CONCLUSION

Small and Medium Enterprises (SMEs) play a very significant role in the economy in terms of balanced and sustainable growth, employment generation, development of entrepreneurial skills and contribution to export earnings. However, despite their importance to the economy, most SMEs are not able to stand up to the challenges of globalization, mainly because of difficulties in the area of financing. With the opening up of the Iranian economy, it has become necessary to consider measures for the flow of credit to this sector. The article provides a perspective in this regard and highlights the SME lending.

Under this facility the Bank provides loans to local partner banks and other financial intermediaries which subsequently on-lend to the SMEs. The Bank is seeking co-funding from the participating financial institution in each on-lending, in order to strengthen the relationship between the intermediary and its clients, and to increase the intermediaries' interest in the good performance of the credit line. The main goal of these intermediated loans is to support growth, export and employment potentials of the SMEs. Promoting the knowledge economy/skills and innovation capacity of vibrant SMEs in Iran remains a priority for the Bank. By the end of 2012 a total of USD 110 million credit limits have been activated for the use of five partner FIs in Iran. So far, the operations of the Bank supported the availability and lengthen the maturity of funding for SMEs, underpinning job creation and growth. The total disbursements amounted to USD 52.1 million by the end of December 2012. In the coming years, through intermediated financing the Bank will continue to increase the availability of long term funding to SMEs and look for opportunities for further cooperating with banks which are active in SME financing. (Iran, Country Partnership Strategy – 2013, 2014)

Our result shows that an increase in the capital of banks leads to increase in Return on Equity, suggesting that well-capitalized banks experience higher returns.

Further, the coefficient for Loans to SME is negative and significant in the banking profitability in Iran. SME do not contribute to bank profitability in Iran. Banks are more concerned about SME financing is seen to be highly risky as the latter do not have sufficient collateral to provide and are therefore constrained in terms of bank financing.

Size of banks is significant in banking profitability. The negative coefficient of size indicates that the larger bank cannot increase profit than smaller bank.

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