**Impact of Ownership Structure and Cost Efficiency on Profitability of US Banks**

**Abstract**

*This study examines the impact of ownership structure and cost efficiency on the profitability of U.S. commercial and savings banks and provides recent empirical evidence. In doing so, we control for other important bank-specific, industry-specific, and macroeconomic determinants of bank profitability. To this end, we apply the System Generalized Method of Moments (SGMM), a dynamic panel data model estimation procedure, to a panel data set of 5174 observations from 454 U.S. banks, including 394 commercial banks and 60 savings banks. We find that foreign banks are less profitable than domestic banks, that listed banks are more profitable than unlisted or privately owned banks, and that the cost efficiency of the banks in question is positively associated with their profitability. Our results show that commercial banks are less profitable than savings banks and that bank profitability was lower during the crisis than during the normal period, which in turn sheds light on the effects of bank specialization and the crisis period. As for the other controlled variables, profitability is significantly positively affected by the return on equity in the previous year, the size of the bank in the current year, and inflation, while the capital level of banks, market capitalization, and the growth rate of money supply in the economy have a significantly negative effect on the profitability of U.S. commercial and savings banks.*

*Keywords: Bank Profitability, SGMM, Cost Efficiency, Dynamic Panel Data.*

*JEL Classification: G21, C23*

**1.0 Introduction**

The welfare of the banking sector is an engine of economic growth (Rajan and Zingales, 2003; Levine, 1997, 1998). Golin (2001) states that banks must earn enough to grow, survive, prosper, and maintain solvency. Anber and Alper (2011) and Athanasoglou et al. (2008) find that a well-functioning banking sector is better able to combat risk and ensure financial stability. Current knowledge of the factors affecting bank profitability is very important for bank managers and other stakeholders such as the regulators and other financial authorities because information about these factors would help them make informed and efficient decisions in an environment of changing banking systems. Therefore, analyses of bank profitability have attracted the interest of researchers and bank regulators. Short (1979) and Bourke (1989) provide the early studies of bank profitability. Since then, many studies have been conducted to identify the factors affecting bank profitability, not only in the U.S. and Europe, but also in other countries around the world.

As far as we know, very few studies have looked at the impact of ownership structure and management efficiency on bank performance. Ownership structure has been shown to have a significant impact on bank profitability. On the one hand, foreign banks are more profitable than domestic banks because of their economies of scale and scope (see, e.g., International Monetary Funds, 2000; Detragiache and Gupta, 2004). On the other hand, listed banks are more profitable than unlisted private banks because they have good and effective corporate governance. In addition, management efficiency has a positive effect on profitability because efficient management brings more business to banks and achieves higher output with less resources. Analysing the determinants of profitability without considering the effects of ownership structure and management efficiency is not only incomplete, but also suffers from omitted variable bias. Therefore, we consider ownership structure as one of the main determinants in this study. Moreover, in today's complex banking sector, the effective and efficient management of banks depends solely on ownership structure. As mentioned earlier, foreign banks that have better economies of scale and scope than their domestic counterparts are more profitable because the operations of these banks are managed by prudent individuals. First of all, if a bank is a public bank, it has to follow the corporate governance, internal compliance structure and various regulations of the Securities and Exchange Commission and the Registrar of Companies, which in turn makes a bank manage its business more carefully and become profitable to survive in the market. Finally, management efficiency, the critical element of a bank's operations, contributes to a bank's profitability by reducing operating costs and achieving higher output with limited resources.

Therefore, we are investigating the impact of ownership structure and managerial efficiency (measured by cost efficiency using the SFA method) on profitability by analysing recent data from U.S. banks. Our main hypothesis is simply that foreign and listed banks are more profitable than their domestic and unlisted counterparts respectively and that efficiency positively affects bank profitability. The remaining sections of the study are organised as follows: Section two provides a brief review of the literature; section three discusses the details of the methodological aspects of the study; section four discusses the empirical results and our findings; and finally, section five concludes our overall analysis and findings with an indication to the limitations and the scope of further research.

**2.0 Literature Review**

The analysis of the impact of ownership structure on bank profitability has attracted many researchers because ownership structure rationalizes various qualitative aspects of an organization, including moral hazard problems of managers, agency problems, and internal control and compliance mechanisms. Belkhir (2005) argues that concentrated ownership reduces the agency problem between managers and owners by separating ownership and control. They also add that shareholders' interests are best served by managers when there is a high equity stake in a firm, as this constrains their moral hazard behavior. Most studies have found that there is a relationship between the ownership status of banks and their performance. The International Monetary Fund (2000) reports that in Poland, Hungary, and the Czech Republic, foreign banks significantly outperformed domestic banks in profitability (ROE). Detragiache and Gupta (2004) claim that foreign banks had higher profitability, better capitalization, and lower nonperforming loans than domestic banks during the Asian crisis. In addition, Micco et al. (2004), DeYong and Nolle (1996), and Bonin et al. (2005) find that foreign-owned banks perform better than domestic banks in developing countries. The researchers point out that foreign banks cite economies of scale and scope, better organizational structure, better ability to diversify risk, and better corporate governance as reasons for their better profitability compared to domestic banks. Awdeh (2005) notes that there is a difference between the organization and structure of foreign banks and domestic banks, which leads to differences in the economies of scale and scope and cost structure of these two groups of banks.

However, Claessens et al. (2001) report higher overhead costs, lower profitability, and lower interest margins for foreign banks in developing countries. They also argue that the presence of foreign banks puts pressure on domestic banks to increase their efficiency in order to protect their market share, and that domestic banks therefore become more efficient than foreign banks. In addition, DeYong and Nolle (1996) find that domestic banks were significantly more efficient than foreign banks operating in the United States. In addition, Sturm and Williams (2004) find that domestic banks were less efficient in inputs than foreign banks due to greater scale efficiency but were superior in profitability. Finally, Bourke (1989) and Molyneux and Thornton (1992) contend that ownership status is not relevant as an explanatory variable for bank profitability.

Moreover, there are listed banks compared to privately owned banks. The profitability experience of listed banks is also mixed. On the one hand, publicly financed or listed banks, which are more regulated and subject to more disclosure requirements and corporate governance, earn less profit; on the other hand, these banks, which are more disciplined and efficient, may also earn higher profits. In addition, we can assume that the listing of banks has an impact of corporate governance on the profitability of banks. Good corporate governance helps to reduce the agency problem and make managers work more efficiently to achieve the goal of asset maximisation. Many studies (e.g., Johnson et al. 2000; and Becht et al. 2002) have blamed the failure of corporate governance as one of the main reasons for the Asian financial crisis, the recent global financial crisis in the U.S. and worldwide. Zulkafli and Samad (2007) and Barth et al. (2006) cite numerous studies emphasising the importance of corporate governance for banks. A sound governance mechanism faced by managers ensures that they use the capital and savings of the society efficiently (Caprio et al., 2007).

Finally, very few studies have examined the impact of efficiency or managerial effectiveness on profitability. In order to analyse the effect of efficiency, the studies mainly use the ratio of costs to revenues, which does not capture the efficiency of banks' management. According to Demirgueç and Huizinga (1999), 83% of banks' operating costs have a direct negative impact on profits, while the remaining 17% is passed on to lenders and depositors. Berger (1995) finds a positive relationship between efficiency (cost efficiency) and profit for banks. Therefore, there is a dearth of studies analysing the impact of management efficiency on profitability.

Among the other determinants (used as controlled variables) of bank profitability, size, measured by the natural logarithm of total assets, is an important bank-specific determinant of profitability. Boyd and Runkle (1993) find that larger banks can benefit from economies of scale by reducing the cost of information acquisition and processing. However, the nature of the relationship between size and profitability found in the literature is inconsistent (Kosmidou, 2008). Altunbas et al. (2001) and Berger and Humphrey (1997) find economies of scale for large banks. Bank asset quality, which also indicates credit risk, is another determinant, as poor asset quality, as measured by increased nonperforming loans (NPLs) as a share of gross loans, negatively affects profitability by limiting the funds that can be lent (Garcia-Herrero, et al. 2009). Moreover, Brock and Rojas-Suarez (2000) confirm the same relationship and argue that this is since banks try to distort the inappropriate regulations by misreporting their credit losses. Moreover, the liquidity ratio, as measured by the ratio of liquid assets to deposits, also affects profitability because more liquidity means more inactive assets and less loans. According to Pasiouras and Kosmidou (2007) and Kosmidou (2008), higher liquidity lowers return and negatively affects profitability. Finally, among bank-specific determinants, higher capitalization, as measured by total equity relative to total assets, promotes bank profitability. According to Gracia-Herrero et al. (2009), there are several reasons for this. First, capital serves as a risk buffer, and when the market allows, well-capitalised banks make reasonable loans, and as loans increase, so does profitability. Second, banks with sufficient capital, which is a sign of creditworthiness, can lower funding costs because of the market discipline exercised by depositors. Similarly, Berger (1995) and Goddard et al. (2004) find a positive relationship between capital and profitability for U.S. banks.

Among industry-specific factors, bank concentration or market power ranks first. According to the structure-behaviour-performance hypothesis, concentration, which is a proxy for market power, positively affects bank profitability, as the positive relationship between interest margin and concentration suggests non-competitive pricing behaviour (Gracia-Herrero, et al. 2009). Berger (1995) admits, and the efficient structure hypothesis explains, that banks with higher market shares and efficiency gains gain concentration power and become more profitable. Short (1979), Gilbert (1984), and Bourke (1989) have found a significant positive relationship between bank concentration and profitability. In addition, the development of the stock market, measured by market capitalization as a percentage of GDP, is also a factor affecting bank profitability, since a developed and active stock market, which is a substitute source of funds, reduces the demand for bank loans and affects bank profitability. Similarly, Demirguç and Huizinga (1999) find a negative relationship between stock market development and profitability.

Finally, there are macroeconomic factors that affect bank profitability. Economic growth, as measured by the growth rate of gross domestic product (GDP), affects banks' credit risk, borrowers' ability to repay, and the value of collateral, and thus banks' profitability. Kosmidou (2008) also finds a positive relationship between economic growth and bank profitability as measured by return on assets. Demirgueç and Huizinga (1999) find that rapid economic growth increases bank profitability. In addition, a higher interest rate can also positively affect profitability due to higher interest income (Gracia-Herrero, et al. 2009). However, higher interest rates can reduce the demand for bank loans and affect profitability. In addition, inflation affects profitability because stable and lower inflation, which lowers interest rates and affects productivity in the economy, can increase the demand for bank loans. Athanasoglou et al (2008), Demirgueç and Huizinga (1999) and Bourke et al (1989) have found a positive relationship between inflation and profitability. According to Perry (1992), the nature of the impact of inflation on profitability depends on the ability of bank managers to correctly anticipate inflation. Kosmidou (2008), who finds a negative relationship between inflation and profitability, states that inflation will positively affect profitability if it is properly anticipated and revenues are adjusted more quickly, otherwise the opposite will be true. Moreover, the quantity theory of money states that the level of money supply has a direct impact on the price level and nominal GDP. When the money supply increases, interest rates fall and corporate demand for bank credit is high. Mamatzakis and Remoundos (2003) find a significant positive relationship between profitability and money supply. However, due to the increased money supply in the economy, the demand for bank loans may also decrease and thus the opportunity for banks to make profits.

An examination of the existing literature on profitability determinants reveals some interesting gaps in the literature. First, very few studies focus on analysing the impact of foreign and public ownership of banks on profitability. Second, the use of managerial efficiency (measured with an SFA model) as a determinant of bank profitability is very rare, especially in the studies that focus on U.S. banks, as most studies use the cost-to-income ratio as a proxy for cost efficiency, which is not a good proxy for managerial efficiency. Therefore, this study is significant as it attempts to fill these gaps in the literature.

**3.0 Methodology and Data**

In our study, we attempt to examine the effects of ownership structure and cost efficiency on U.S. bank profitability by modelling the determinants of bank profitability. We use a panel data set to achieve our objective. However, modelling bank profitability with panel data is always challenging for the researcher because the combination of cross-sectional and time-series data can lead to unobserved heterogeneity in the dataset. Moreover, with a dynamic panel data model (models with at least one lagged dependent variable as the independent variable), which allows for time persistent gradual adjustment of profitability considering the effects of the remaining lagged information, the model is more prone to the problem of endogeneity since the lagged values and their lagged error terms have a greater chance of being correlated with the current error term. Moreover, the problem of endogeneity is exacerbated using efficiency values in the profitability model because there is substantial reverse causality between bank efficiency and profitability. For example, more cost-efficient banks are more profitable, but the level of profitability or profit target also affects efficient cost management. Therefore, we should carefully consider unobserved heterogeneity and the endogeneity problem when modelling bank profitability.

Much work has subsequently been done to solve the heterogeneity and endogeneity problem in DPD. Among these works, Anderson and Hsiao (1981 and 1982) are the pioneers who proposed a first differenced two-stage least squares (2SLS), which helped to eliminate individual effects and used the instrumental variable method (IV) to solve the endogeneity problem. However, this method is not able to capture all the information in the sample (Arrelano and Bond, 1991). In addition, Arrelano and Bond (1991) proposed the generalized difference method (GMM). GMM combines the information in the moment population and economic data to produce estimates of the unknown parameters. It uses the lagged values of the explanatory variables as instrumental variables so that the IVs always remain internal. GMM estimates ensure that the sample moment conditions are as true as possible by minimizing the objective function (Baum, 2007). However, difference-in-differences GMM suffers from reduced test power because first differencing of level values reduces variation in explanatory variables and bad IVs when variables approach a random walk (Arrelano and Bover, 1995; Blundell and Bond, 1998). As a solution to these problems, Arellano and Bover (1995) and Blundell and Bond (1998) propose the SGMM, which estimates regression in differences jointly with regression in levels as a system of equations. Therefore, this study uses the SGMM method proposed by Arellano and Bover (1995) and Blundell and Bond (1998) to estimate and analyze the determinants of profitability and reports the results in accordance with the suggestions of Roodman (2009). The method was also chosen in accordance with Bond's (2001) guidelines that SGMM provides more efficient estimates than difference-GMM because it controls for unobserved heterogeneity and endogeneity and in a data set with small time dimension and large cross-section as in this study.

***The Model***

The following econometric model is estimated to analyse the effects of ownership structure, cost efficiency, and other determinants of bank profitability.

$$ROAE\_{it}=C\_{0}+aROAE\_{it-1}+ β\_{1}OwnershipForgn\_{i}+β\_{2}OwnershipListed\_{i}+ β\_{3}CostEffi\_{it}+\sum\_{j=1}^{12}∂\_{j}X\_{jit}+ ε\_{it}$$

Where, $ROAE\_{it}$ is the dependent variable,$ ROAE\_{it-1}$, is the lagged values of dependant variable, $X\_{jit}$ is the vector of total twelve bank-specific, industry-specific, and macroeconomic controlled determinants which are listed and described in table 1 along with their expected impact on bank profitability. $C\_{0}$, $a$, $∂\_{j}$,$ β\_{1}, β\_{2}, and β\_{3}$ are parameters to be estimated. The two most common profitability measures found in literature are Return on Assets (ROA) and Return on Equity (ROE). ROA represents the level of profit generated by utilising the assets whereas, the ROE measures the effectiveness of utilising the shareholders’ investment or funds. Kosmidou et al. (2007) and Kosmidou (2008) utilised ROA as a profitability measure. However, Athanasoglou et al. (2008) and Goddard et al. (2004) state that, ROA disregards the off-balance-sheet activities of the bank and may not yield consistent results, therefore, ROE is the better option. Therefore, Return on Average Equity (ROAE) is used in this study to average out the fluctuations in the equity levels in an accounting period. The lagged value of ROAE is considered to represent the persistence of bank profitability. Athanasoglou et al. (2008) states that the coefficient of lagged profitability variable measures the speed with which banks adjust to the equilibrium profit or it captures the dynamic effect of profit. According to Tan and Floros (2012), a value of the coefficient close to zero means that the banks have a high speed of profit adjustment, and the industry is highly competitive.

***Data Sources***

The study uses data from 2003-2018. Of the banks currently operating in the U.S., a total of 454 banks, including 394 commercial banks and 60 savings banks, were selected for the study because they share the same characteristics and conduct similar banking activities (Manghetti, 2011). These banks were selected based on the availability of their financial data for the period 2003-2018 in the Orbis Bank Focus database. The main source of bank-specific information is the Orbis Bank Focus database. The industry-specific information is calculated for the required variables using the information from the Orbis Bank Focus database. Finally, for the macroeconomic variables, the World Bank, International Monetary Fund, and Federal Reserve System databases are used when deemed necessary.

***Summary Statistics***

Table 2 presents the summary statistics of the data and variables used in this analysis. The observations in monetary values, are in billion dollars and deflated by the GDP deflators with a base year of 2003 to make it more comparable during the period considered. The ratios are in percentage. Overall, the data shows a good consistency with few extreme values. The extreme values have not been treated as the measurement of efficiency involves error terms and taking account of the extreme value may lead to biased results.

Table 1: Measurement and Expected Impacts of the Profitability Determinants

|  |  |  |
| --- | --- | --- |
| **Variables** | **Measurement Methods** | **Expected Impact** |
| ROAE | Net Income ÷ Average Total Equity  | N/A |
| $ROAE\_{it-1}$  | Lagged values of ROAE | Positive |
| O$wnershipForgn$ | Dummy Variable, takes value 1 for foreign banks and 0 otherwise | Positive/negative |
| $$OwnershipListed$$ | Dummy Variable, takes value 1 for Listed banks and 0 otherwise | Positive/negative |
| *CostEffi* | Cost efficiency scores obtained using Stochastic Frontier Analysis[[1]](#footnote-1) | Positive |
| Commercial Banks  | Dummy Variable, takes value 1 for Commercial banks and 0 otherwise | Positive |
| Crisis  | Dummy Variable, takes value 1 for years 2007-2009 and 0 otherwise | Negative |
| Size | Natural logarithm of the value of total assets | Positive |
| Credit Risk | Impaired Loans ÷ Gross Loans  | Negative |
| Liquidity  | Liquid Assets ÷ Deposits  | Negative |
| Capitalization  | Total equity ÷ Total assets  | Positive |
| Concentration | Herfindahl-Hirschman Index (HHI) | Positive |
| Market Capitalization | Market Capitalization of listed companies ÷ GDP | Negative |
| Economic Growth  | Growth rate of real GDP  | page7image3094400Positive |
| Interest Rates | Prevailing Real interest rates during 2003-2018 | Positive/negative |
| Inflation | Annual percentage change in CPI  | Positive/negative |
| Money Supply  | Growth rate of broad money supply (M3)  | Positive/ negative |

Table 2: Summary Statistics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variables | No. of Observations | Mean | Std. Dev. | Min | Max |
| ROAE % | 5,819 | 11.2662 | 8.7029 | -8.8180 | 80.3530 |
| Cost Efficiency % | 5,819 | 92.10 | 19.54 | 87.30 | 99.70 |
| Log of Equity | 5,819 | 2.7426 | 14.7325 | 0.0032 | 214.3430 |
| Log of Total Assets | 5,819 | 25.8079 | 145.9643 | 0.0319 | 2218.9600 |
| Equity to Total Assets % | 5,819 | 10.9918 | 3.9873 | 4.0910 | 73.6320 |
| Non-performing loan Ratio % | 5,819 | 1.4394 | 2.0967 | 0.0160 | 100.0000 |
| Liquidity % | 5,819 | 8.0129 | 10.0567 | 0.2760 | 133.5760 |
| Net Interest Margin % | 5,819 | 3.8668 | 1.7237 | -0.3440 | 34.9360 |
| ROAA % | 5,819 | 1.2355 | 2.0035 | -1.7290 | 76.0970 |
| Cost-to-Income Ratio % | 5,819 | 63.5927 | 16.4332 | 9.8040 | 314.5750 |
| Market Capitalisation to GDP | 5,819 | 131.4930 | 20.4287 | 78.7800 | 164.8450 |
| Market Concentration (HHI) | 5,819 | 699.1410 | 184.2082 | 451.9770 | 949.1664 |
| Money Supply Growth Rate % | 5,819 | 5.3786 | 2.9177 | -2.7412 | 11.7135 |
| GDP Growth Rate % | 5,819 | 2.1005 | 1.3472 | -2.7755 | 3.7857 |
| Unemployment % | 5,819 | 6.1022 | 1.7243 | 3.8956 | 9.6334 |
| Inflation % | 5,819 | 2.0794 | 1.0503 | -0.3556 | 3.8391 |
| Real-Interest Rates % | 5,819 | 2.3209 | 1.1288 | 1.1373 | 5.2490 |

**4.0 Empirical Results**

The results of the analysis are shown in Table 3. The value of the coefficient of the lagged dependant variable ROAEL1$ $from the SGMM model is lying between the coefficient of the coefficient of the lagged dependent variable from OLS and Fixed Effects Models. This means that in this case, the SGMM is most appropriate as OLS and Fixed Effects Models produce overstated and understated estimations respectively (Nickell, 1981). The acceptance of Hansen J test shows no evidence of over-identifying restrictions and confirms the validity of the used instruments and there are less instruments than the number of groups (as suggested in Roodman, 2009). The rejection of AR (1) and acceptance of AR (2) tests indicate the presence of first-order serial autocorrelation (as expected in SGMM method) and no second-order serial autocorrelation in the error terms. The ROAEL.1 is very significant at 1% level, meaning that a specific year’s profit is significantly influenced by the level of its previous year’s profit. The coefficient of ROAEL.1 between 0 and 1 reveals the dynamic characteristics of the specified model and the value of 0.528 indicates that the banking industry of the USA is a little competitive.

Starting with our variables of interest, the results for foreign bank dummy variable with a negative coefficient indicate that they are less profitable than domestic banks as found by Staikouras and Wood (2003). In USA foreign banks, establish their representative offices rather than the entire bank, are highly regulated, and their activities are very restricted which limits their profitability. Furthermore, the listed banks are found to be more profitable than unlisted ones. The listed banks face greater pressure from their various stakeholders in terms of increased disclosure requirements, enhanced corporate governance and follow more regulations and restrictions. This increases the efficiency of those banks and eventually their profitability get improved (Dietrich and Wanzenried, 2011). Finally, the cost efficiency, measured by SFA, as a proxy of management efficiency, positively influences the profitability of US banks but insignificantly and conforms to the results of the previous studies (e.g., Kosmidou 2008; Berger 1995; and Garcia-Herrero 2009). The results are unsurprising as better expense management enhance the profitability of the banks as can be observed by the high coefficient. Demirgüç and Huizinga (1999) states that profit is directly and negatively influenced by operating costs.

Moving towards the controlled variables, the negative coefficient for the commercial dummy variable shows that commercial banks are less profitable than the savings banks in the USA as found by Koushik and Lopez (1996). The extent of competition in the commercial banking market and maintaining safety and soundness of savings banks by the regulators may be the main reasons of this outcome. The negative coefficient of the crisis variable confirms the reduced profitability of US banks during the crisis period because of the increased defaulted loans and economic recession. However, banks with higher core capital can enjoy higher returns during the financial crisis (Beltratti and Stulz, 2009). Then bank size is found to be positively and significantly influencing the profitability of US banks during the studied period which is in line with the previous studies (e.g., Kosmidou, 2008; Boyd and Runkle, 1993; Pasiouras and Kosmidou, 2007). The size influences profitability positively as with the increased assets banks enjoy economies of scale because of the reduced costs of gathering and processing information (Boyd and Runkle, 1993; Altunbas, et al. 2001; and Berger and Humphrey, 1997). Therefore, the banks in the USA can increase their profitability by increasing assets. Furthermore, the ratio of impaired loans to gross loans, a proxy for credit risk and asset quality, measures the level of loan losses. The exposure to increased credit risk and increased non-performing loans reduce banks’ income as impaired loans are charged against accounting profits. Dietrich and Wanzenried (2014), Miller and Noulas (1997), and Athanasoglou et al. (2008) all have found a similarly negative association between credit risk or poor asset quality and bank profitability and predictably, this study has also found the same results. Thereafter, the result shows that liquidity has an insignificantly negative relationship with the profitability which is a usual case. The banks in the USA are obliged to maintain the Net Stable Funding Ratio (NSFR) at any cost since the implementation of BASEL III and the associated risk in meeting this liquidity requirement comes at the cost of reduced profitability. Said (2014) indicated that NSFR increases cost of banks in terms of balance sheet adjustments and maturity mismatch. Moreover, more liquidity means more idle funds and reduced profitability. Furthermore, capitalisation or equity to assets ratio, a proxy for banks’ capital adequacy which provides the banks with the ability to absorb shocks, is expected to be positively related to profitability. However, this study found a negative but very significant relation like the results of Goddard, Molyneux, and Wilson (2004), and Athanasoglou (2008). Goddard, Molyneux, and Wilson (2004) emphasise that banks may ignore some good-return investment opportunities being more conservative with their high level of capital adequacy. Moreover, Demirgüç and Huizinga (1999), analysing the profitability of banks in developing countries, support the negative association between capitalisation and profitability stating that it can happen because of the inflationary environment.

Among the industry-specific factors, concentration ratio measured by HHI, is positively associated with the profitability which matches with the results of Short (1979), Gilbert (1984), and Brouke (1989). Gracia-Herrero et al. (2009) state that concentration propounds non-competitive pricing behaviour and adds to the bank profitability. According to Berger (1995), concentration increases profitability by increasing banks’ market share and efficiency gains. Tregenna (2009) emphasises that concentration of large banks in the USA not only improves profitability but also positively influence the rest of the banking sector. Moreover, market capitalisation, an indicator of capital market development, is negatively and very significantly influencing US banks’ profitability. We know that the USA has the most developed capital markets and hundreds of companies go public each year which reduces demand for bank provided capital and affects banks’ profitability negatively (Demirgüç and Huizinga, 1999).

Finally, from the results of the macroeconomic controlled determinants, economic growth, measured by GDP growth rate is negatively influencing US banks’ profitability. The result is not as expected but is similar to the results found by Tan and Floros (2012) and Sufian (2009). They argue that the favourable business environment and lower entry barriers intensify the competition among banks and lower their profitability. However, as we have seen that the

*Windmeijer Robust Standard errors (Windmeijer, 2005) are reported in parentheses.*

*\*\*\*p<0.01, \*\*p<0.05, \*p<0.1*

Table 3: Results of Bank Profitability Analysis

|  |  |
| --- | --- |
| **Dependant Variable ROAE** | **Profitability Models** |
| **Categories of Determinants** | **Determinants** | **Pooled OLS** | **Fixed Effects** | **System GMM** |
| Profitability Persistency | $$ROAE\_{t-1}$$ | 0.8576\*\*\*(0.102) | 0.4191\*\*\*(0.103) | 0.5280\*\*\*(0.1618) |
| Explanatory Variables | $$Foreign Banks\_{it}$$ | -0.34687(0.3916) | Omitted | -7.2543(28.7897) |
| $$Listed Banks\_{it}$$ | 0.0959(0.2896) | Omitted | 37.572(38.8472) |
| $$Cost Efficiency\_{it}$$ | 0.0272(0.027) | 0.007(0.057) | 0.6689(0.65202) |
| Bank-Specific, Industry-Specific, and Macroeconomic Control Variables influencing Bank Profitability | $$Commercial Banks\_{it}$$ | -0.0998(0.291) | Omitted | -3.2485(9.1462) |
| $$Crisis\_{t}$$ | -1.771\*\*\*(0.3636) | Omitted | -1.9345(3.342) |
| $$Size\_{it}$$ | -0.197\*\*\*(0.073) | 0.138(0.346) | 0.19611\*\*(1.9685) |
| $$Credit Risk\_{it}$$ | 0.1107(0.093) | 0.0144(0.060) | -2.2083(1.5627) |
| $$Liquidity\_{it}$$ | 0.0697\*\*(0.034) | -0.073(0.063) | -0.5897(0.4114) |
| $$Capitalization\_{it}$$ | -0.045(0.030) | -0.417\*\*\*(0.150) | -1.3222\*\*\*(0.4555) |
| $$Concentration\_{t}$$ | -0.0007(0.002) | 0.003(0.002) | 0.0339\*\*(0.0159) |
| $$Market Capitalization\_{t}$$ | -0.005(0.009) | 0.008\*(0.009) | -0.1199\*\*\*(0.0459) |
| $$Economic Growth\_{t}$$ | 0.090(0.130) | 0.241\*\*(0.098) | -0.0629(0.4401) |
| $$Money Supply\_{t}$$ | -0.010(0.059) | 0.109\*\*(0.054) | -0.1973\*\*(0.8851) |
| $$Inflation\_{t}$$ | -0.148(0.129) | -0.176(0.100) | 1.1484\*\*\*(0.3121) |
| $$Interest Rate\_{t}$$ | 0.121(0.146) | -0.047(0.107) | 2.0376(0.6413) |
| AR (1) | 0.001 |
| AR (2) | 0.192 |
| Hansen J p-value | 0.221 |
| No. of Instruments | 185 |
| No. of Observations | 5174 |
| No. of Banks/groups | 454 |

banking sector of USA is not very competitive, the result can be due to the overflowing loans during the economic boom and a large amount of non-performing loans before, during and after the global financial crisis. This reason is also confirmed by Shen and Liu (2008) and Sufian (2009). Similarly, the money supply growth rate is also significantly and negatively influencing the profitability of US banks. Kosmidou (2008), Mamatzakis and Remoundos (2003), and Sufian and Habibullah (2009) all find a positive relationship between money supply and profitability. The reason of such negative relationship can be the case of reduced demand for bank loans and advances due to increased money supply in the economy and the US banks may not be able to reduce the funding cost that much as they are mostly dependent on the wholesale source of funding. On the other hand, inflation and interest rate are positively influencing the profitability of US banks and the impact of inflation is very significant. The positive relation between inflation and profitability indicates that banks in the USA could anticipate the inflation beforehand and adjust the interest rate to stabilise profit as USA experienced a fluctuating interest rate during the studied period. The increased inflation increases the nominal interest rate charged on loans (Fisher’s theory) and increase the interest income for banks. Further, if inflation is predicted by households, their current demand for consumption and hence the demand for banks’ money for example use of credit cards, which again increases the bank profitability. Overall, the results for the controlled variables are matching with our expected results.

**5.0 Conclusion**

The objective of this study was to examine the impact of ownership structure and cost efficiency on profitability of US commercial and savings banks. This analysis has used a total of 5,174 observations from a total of 454 banks and 16 years’ annual data from 2003 to 2018. We find that the foreign banks are not very much dominant in the commercial banking sector of USA. The econometric investigation reveals that the profitability of foreign banks is less than the domestic banks, the profitability of the listed banks are higher than the unlisted or privately-owned banks, and that the profitability of the US banks increase with the increase in cost efficiency. Moreover, the profitability of the US banks is significantly positively influenced by the previous years’ ROAE, bank size and inflation when banks’ capital level, market capitalisation and growth rate of money supply in the economy found to be having significantly negative impact on the profitability. Finally, the analysis also uncovers that the commercial banks are more profitable than their savings counterparts in the USA and that the banks have experienced a lower profitability during the crisis period of the GFC.

The findings of the study have some important implications. From the bank managers’ perspective, to be profitable, the banks should be well capitalised, of decent sized, less aggressive in risky investments, more concerned in underwriting, monitoring, and controlling lending, and with a perfect amount of liquidity level. The regulators, on the other hand, although enacted a great number of one-size-fits-all laws and regulations after the GFC to Silverline the banking industry of the USA, should come up with more customised and classified policies to bring back the confidence of the people on the banking sector.

The main limitation of the study is the sample selection bias because the banks are selected merely based on the availability of the required information and forms only approximately 8.7% and 15.23% of the currently active commercial and savings banks respectively. A further investigation with a larger sample is therefore required. Finally, there may be some effects of extreme values on the estimates and differences in inter-state regulations and characteristics have not been taken into consideration.

1. The value of the cost efficiency is measured with the help of single step Stochastic Frontier Analysis model, Battese and Coelli (1995). [↑](#footnote-ref-1)