



IMPACT OF BANK REGULATORY CHANGE AND BANK SPECIFIC FACTORS UPON OFF-BALANCE-SHEET ACTIVITIES ACROSS COMMERCIAL BANKS IN SOUTH ASIA



Muhammad Farhan
Basheer¹⁺
Mohamad Helmi
Hidhiir²
Waeibrorheem
Waemustafa³

^{1,2,3}School of Economics, Finance & Banking (SEFB), College of Business (COB), University Utara Malaysia (UUM), Malaysia



(+ Corresponding author)

ABSTRACT

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In recent decades, off-balance sheet activities have emerged as an innovation in banking and finance as it is the easiest source of additional fee income that is beyond a bank's balance sheet activities that avoids regulatory costs, and so they are increasingly popular in banking industries around the world. This paper presents a discussion of the determinants of using off-balance sheet activity in commercial banks in South Asia. The paper also presents an in-depth insight of different theoretical justifications, and empirical literature answers the whys and wherefores of off-balance sheet usage in commercial banks of south Asia. The conceptual model considers the impact of capital size, profitability, loan, credit risk, market concentration, capital adequacy, reserve requirement, real GDP, interest rate spread and inflation on off-balance sheet activities of banks. The Fixed effect and Arellano-Bond GMM method are used on the balance panel of 81 banks to achieve the research objectives of the current study. The results of the bank-specific factors on the off-balance sheet activities (OBSA) support the Market Power Theory. However, the positive and significant relationship between loan ratio and OBSA also supports the market portfolio theory, which argues that the increasing loans offer a continuous risk and can enhance credit risk. Therefore, banks must diversify their portfolios. The positive relationship between the reserve ratio and OBSA provides support for the regulatory and tax hypothesis.

Contribution/ Originality: This study is a pioneer study, providing details about the factors that determine the off-balance sheet activities of South Asian commercial banks. The study has taken a comprehensive set of factors to determine the effects of these bank specific regulatory factors on the bank's off-balance sheet engagement decisions. This study would help in policy building to improve asset quality and optimal portfolio selection for income generation.

1. INTRODUCTION

During the last three decades, the banking sector has undergone dramatic changes (Buchak *et al.*, 2018). The emergence of fields like financial engineering has offered a variety of sophisticated tools to manage and mitigate banking risk (Li *et al.*, 2018). The one significant and notable development visible in the banking industry and particularly in commercial banking business is the inclusion of off-balance sheet items in firm balance sheet structure. Off-balance sheet activities (OBSA) are those activities which are not part of a bank's balance sheet but

are mentioned in footnotes. According to Nachane *et al.* (2002) the off-balance sheet activities are different from conventional banking activities and are contingent contracts which cannot be captured as an asset or liability. Simply put, the OBSA are neither assets nor liabilities, rather these are contingencies which in the end can become an asset or a liability. These activities are a free income source for commercial banks and these are activities that are not in the scope of bank balance sheet items.

The OBSA of commercial banks incorporate various types of contingent guarantees (e.g. letter of credit (LC) which is an underwritten insurance for payment to other banks and a commitment of lending to the customer), financial derivatives (e.g. future, forward, option and swap: these are contracts or agreements which drive their value from underlying assets and are used to manage and mitigate different type of risks such as currency risk and forward exchange risk) and various other loan commitments (the contractual commitment between bank and borrower to lend a certain amount at specified interest after a specific time period) (D'Avino, 2017).

The recent episode of economic turmoil known as the subprime crisis has raised certain questions on the risk management techniques applicable in the global banking industry (D'Avino, 2017). One of the main reasons behind the subprime crisis was a special purpose vehicle (gendered through securitization of mortgage loans) which was designed to manage the future risk. The federal reserve has fixed the interest rate at a historic low level (Bofondi and Gobbi, 2017). Banks to gain optimum benefits relaxed lending conditions (Berger and Bouwman, 2017).

However, bankers were aware of the risk associated with this action, so they insured their products and sold them in the derivative market. Now this action at the start was very effective and leveraged the whole financial sector. However, it turned into a crisis bubble which burst like an economic bomb. This historic economic crisis has raised many questions about risk management processes and also highlighted the sensitivity of the financial engineering profession. According to the Financial Crisis Inquiry Commission (2011) the securitization process is the main reason behind this crisis. They argued that banks' OBS items underweighted their on-balance items and helped the commercial banks in moving out from balance sheet loans which ultimately resulted in more earnings.

Securitization is the process of creating a pool of loans such as mortgage loans, car loans, and credit cards and then selling them to a third party in the form of securities or bonds (Garg, 2017). Investors who are investing in these instruments will be paid from the interest earned from the customer. The fee that the loan originator bank charged for their service from the investor who purchased the securitized asset will not be part of firm balance sheet items.

The globalization of financial markets, the ever-changing regulatory environment, and financial liberalization are placing significant pressure on the performance of South Asian banks. In such a situation, when a bank's profit ratio is not showing significant improvement, they prefer to engage in OBSA. OBSA provides an additional source of fee-based non-interest income. Because of increasing pressure from Basel regulations, banks around the world including neighbouring countries are aggressively raising their engagement in OBSA. The current research will examine the determinants of OBSA in three leading South Asian countries namely Pakistan, Bangladesh and India. The authors have divided the factors into two categories which are bank-specific factors and bank-specific regulatory factors. The Fixed effect and Arellano-Bond GMM estimates are used to achieve the research objective.

Every region has its geopolitical, economic and legal stature which significantly affects the OBSA and because of these issues, the factors which affect the OBSA vary from country to country and region to region. Given the growing role of OBS activities and their determinants, to the best of the researcher's knowledge, there is no previous research work in South Asia concerning the factors that affect off-balance sheet financing activities of banks. Less is known about the determinants of OBS activities in the South Asian banking industry context. The rest of the paper is organized as follows: in the next section we have discussed the reasons of engagement in OBSA, following which is a discussion on the OBSA in south Asian countries, and then a discussion on the determinants of OBSA. Finally, the methodology, findings and discussion are discussed.

2. WHY BANKS ENGAGE IN OBSA

Researchers (Ahmad and Misman, 2012; Duran and Lozano-Vivas, 2013; Karim *et al.*, 2013; Lozano-Vivas and Pasiouras, 2014; Perera *et al.*, 2014; Du *et al.*, 2015; Firth *et al.*, 2016; Meng *et al.*, 2017) have reported that around the world, the OBSA in commercial banking sectors has shown a rapid increase. Now, the question arises as to why commercial banks use OBSA. Banks use OBSA for different purposes. The prime reason for using OBSA is its capacity to generate additional cash inflows (Lozano-Vivas and Pasiouras, 2010). Khambata and Khambata (1989) argued that the use of OBSA helps the banks to enhance their scope of operation which increases bank income which simply cannot be earned from on-balance sheet items or traditional banking activities.

Another question is why are banks nowadays aggressive about their scope of operations? The answer is that increasing competition in the financial market is pushing the banks to explore new ways of earning (Busch and Kick, 2015). So, one can argue that from a banker's point of view, OBSA is seen as a means to improve returns and bring value to the shareholders.

The other main purpose of performing OBSA is to manage banking risk (Elian, 2012). Because of their effectiveness in managing the default, forward exchange, and growth risk, banks nowadays are aggressively using OBSA and even in some cases, they have outweighed the bank on balance sheet items. However, OBSA is very risky, and their associated risk can transform them into an opportunity or a threat. For example, guarantees which are a source of an additional income also add the risk of future payments even in acute stress situation or unfavourable circumstances whereas banks consider OBSA a risk management tool and justify their overweighted figures as a tradeoff between the risk of losses arising from interest-based or conventional banking activities (Ahmad and Misman, 2012; Aktan *et al.*, 2013; Pushkala *et al.*, 2017; Venkatesh *et al.*, 2017).

Another reason of banks engaging in these activities is to avoid regulatory costs such as the minimum reserve, the deposit insurance, and capital adequacy requirement (Ahmad and Ariff, 2007; Lozano-Vivas and Pasiouras, 2010; Ahmad and Misman, 2012). Since these activities are not shown on the bank's balance sheet under current accounting standards and reserve requirements and deposit insurance premiums that are not levied on OBS activities (Ahmad and Ariff, 2007). Even if the most frequently cited explanation for the growth of these activities is that they provide banks with a way of avoiding reserve requirements and bank capital adequacy requirements and these regulations may provide incentives to go "off-balance sheet," non-regulatory factors such as real GDP, international trade, bank size, profitability and credit risk are also important (Ahmad and Ariff, 2007; Hassan and Khasawneh, 2009; Ahmad and Misman, 2012). Addressing the aftermath of the crisis, governments around the world to avoid any such event again, imposed a certain regulatory restriction on their financial sectors. These restrictions and increasing tax rates have shrunk the net income figure of commercial banks. However, banks to avoid regulatory restrictions and income loss are increasing the level of off-balance sheet activities.

Because of the reasons mentioned above, OBSA has been growing rapidly in recent years their extents are different across the world. According to Ahmad and Ariff (2007) the ratio of the aggregated OBS activities to aggregated total assets in Eastern Europe, South and Central America, Africa and Far East and Central Asia equals 15%, 12%, 18%, 12% in 2005, respectively, compared to 60%, 63%, 41% for North America, NAFTA, and G7 countries, respectively. Similarly, studies carried out by Aktan *et al.* (2013) on Turkey, Pushkala *et al.* (2017) on India, and Ahmad and Misman (2012) in Malaysia in their findings they reported that the OBSA are showing an increasing trend. As part of the world financial system, there has been a shift in the sources of income of the South Asian commercial banks. However, the shift is against the market trend, and the relative share of income from traditional banking activities has increased, and that of non-interest income has decreased. For example, according to Firth *et al.* (2016), Du *et al.* (2016), Meng *et al.* (2017) the non-interest earning has emerged as a major source of earnings of commercial banks around the world. In the next section, we have presented a brief statistical analysis of OBSA in commercial banks of South Asia.

3. OBSA IN SOUTH ASIAN BANKING INDUSTRY

The South Asian banking system which is a diversified banking system and is comprised of local and foreign banks has also engaged in OBSA. In recent years, the exposure of South Asian banks to off-balance sheet operations including: guarantees, acceptance, letter of credit, performance bonds, trust fund, commitments and bills for collection is increasing in volume (Papanikolaou and Wolff, 2014). The off-balance sheet activities as the percentage of a total asset in Bangladesh have increased from 26 percent to 35 percent (see Figure 1.1). Whereas in India, and Pakistan the ratios have declined by 11 percent and 6 percent respectively (see Figure 1.1).

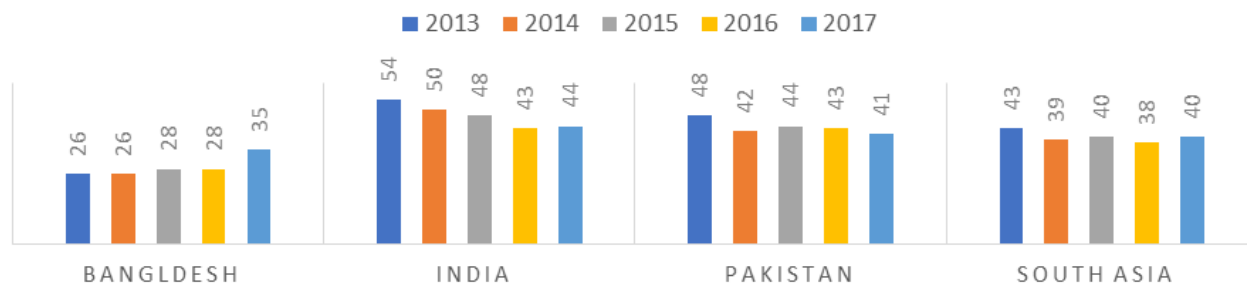


Figure-1.1. OBSA in the Commercial banks of South Asian Countries.

Source: Annual reports of the Banks.

Figure 1.1 shows the growth of off-balance sheet activities and total assets of commercial banks in South Asia since 2007. The figure clearly illustrates that the growth of off-balance sheet activities is less than the growth of total assets of the commercial banks in Pakistan and India during the period 2013-2017. Thus, the limited usage of the OBS activities in the Pakistani and Indian banking industry indicates that the banking sector in Pakistan still relies on the traditional banking businesses as the main source and use of funds, Whereas the Bangladeshi commercial banking, is moving towards financial innovation and extensively using the off-balance sheet activities.

To check how successfully countries are incorporating this financial innovation we have examined the data of fee-based income as the percentage of the total interest income of banks in South Asian countries (see Figure 1.2). Pakistan is the only country which has shown steady growth in fee and commission-based income whereas Bangladesh, which in the first two years did show an impressive increase in fee-based income now shows a negative trend. However, in India, the ratio of fee-based income to total income has declined during the sample period of the current study. It is interesting to find that despite the negative trend in off-balance sheet activities, the Pakistani banks seems more successful in managing the risk associated with the OBSA.

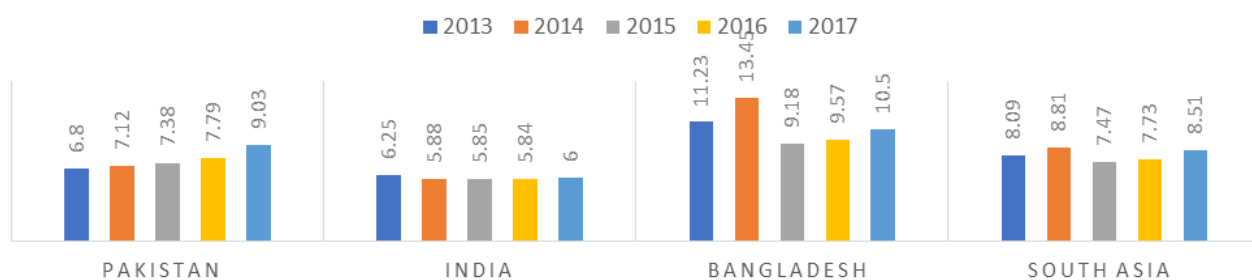


Figure-1.2. Fee-based Income of Commercial banks of South Asian Countries.

Source: Annual reports of the Banks.

Whereas overall in South Asian Banking sector the fee and commission based income remain the same. Bangladesh despite its impressive growth in OBSA seems not very efficient in managing the OBS risk. According to Ye (2015) commercial banks in different parts of the world are following the portfolio theory and diversifying their scope to include OBSA. He continued and argued that the OBSA are a means of risk diversification. Whereas the Elian (2012) and Mckee and Kagan (2018) followed the market power view and argued that the OBSA is a source of

risk and that only banks in a stable position should engage themselves in the OBSA. According to the portfolio theory, the diversification strategy of banks plays an important role in the level of off-balance sheet engagement of the banks.

4. WHAT DETERMINE THE USAGE OF OBSA IN BANKING INDUSTRY?

The banking sector has experienced major worldwide transformations in its operating environment. Both external and domestic factors have affected its structure and performance and some determining factors could affect commercial banks' OBS activities. However, in the Pakistani banking sector, we have observed a different trend as in the last twenty years the volume of OBSA is decreasing. To find out the reason behind this gradual decline we have decided to carry out a comprehensive study to explore the factors which affect the OBSA in commercial banks of Pakistan, Bangladesh and South Asia. After critically reviewing the existing literature, we have decided to study OBSA in terms of its functioning bank-specific factors, bank-specific regulatory factors, and macroeconomic determinants. The following sections discuss these factors.

4.1. Bank Specific Factors

Bank specific factors are controllable management factors, which account for the interbank differences in using OBS activities. Bank specific factors such as bank size, loan and advances, profitability, credit risk, liquidity risk, efficiency, and market concentration have a significant impact on banks' OBSA. These factors are influenced by a bank's management decisions.

Capital ratio is used as a proxy of a bank's ability to absorb the losses arising from both the OBSA and the balance sheet activities (Fungáčová *et al.*, 2017). A bank with high capitalization may be viewed as possessing more creditworthiness and as a better guarantee of OBS items. Whereas, a low capital or decreasing capital ratio raises doubts on the creditworthiness of the bank. During the last five years the capital ratio of the banking industry in the three countries has shown a decreasing trend, and in 2017 it is reported 8.13 which is the lowest for this period. This decreasing capital ratio indicates that reducing capital is an optimal strategy for a Pakistani bank. However, according to Basel III, the bank for smooth credit cycling should have a large capital ratio. So, decreasing capital ratio can be a reason for the decreasing OBSA in the commercial banks of Pakistan.

Bank size affects the usage of OBSA. Ahmad and Misman (2012) argued that the size of the bank has a significant impact on OBSA. However, bank size is a critical determinant of OBSA as according to one view, the larger banks gain more through economies of scale with regards to the OBSA. However, the other view argued that when bank size increases to a certain level, it increases the likeliness of risk diversification which ultimately reduces the level of OBSA in large banks (Mckee and Kagan, 2018). Because, the larger the size of a financial institution, the greater its potential to diversify the asset portfolio. In South Asian banks, during the last ten years, the size of commercial banks has shown exponential growth. So, it can be argued that because of the increasing bank size, commercial banks in Pakistan prefer risk diversification and avoid OBSA.

The modern portfolio theory argues that bank size is in a negative relationship with risk-taking and therefore is in a negative relationship with OBSA. Whereas the market power theory views a bank's asset growth as a function of its risk-taking behaviour and suggests that banks engage in OBSA only when they have achieved the targeted growth (Mckee and Kagan, 2018) and thus argues for a positive relationship between bank size and OBSA.

Profitability is considered as a measure of the bank's creditworthiness as viewed by customers (Al-Tamimi *et al.*, 2016). Thus, OBS activities are profit driven, and it is in this regard that the next hypothesis is formulated (Kucinskas, 2018; Mckee and Kagan, 2018). Profitability increase banks' creditworthiness which in turn offers a mixed result. Some banks view increasing profit as an opportunity to take a risk and engage more in OBSA, which is consistent with the view broached by market portfolio theory (Elia, 2012). A view offered by the market power theory argues that increasing profit is a means of risk diversification and a preference to avoid risky OBSA (Berger

and Turk-Ariss, 2015). During the last ten years, the profitability of South Asian banks has shown a decreasing trend as per our data the value has decreased from 1.44 to 1.1 from 2013 to 2017. So, the declining ROA can be a reason for decreasing the OBSA of commercial banks of Pakistan. The market power theory argues profitability as a key determinant of OBSA and predicts a positive and significant relationship between them (Ma'ina *et al.*, 2015).

Market concentration is an industry-specific factor which affects the OBSA usage of commercial banks (Elian, 2012). Market concentration is seen as a proxy of market power so market concentration increases the banks' market power which ultimately increases the likelihood of diversification to OBSA (Elian, 2012).

Loan Ratio is another important factor which places a significant effect on the usage of OBSA. It is argued that banks, to avoid risk resulting from the increasing loans on the bank balance sheet, engage in OBSA. So, a higher loan ratio will increase the interest rate risk, which will create an incentive for banks to hedge using OBSA. According to our data, the ratio of loans and advances to total assets has decreased in South Asia. This indicates that to avoid increasing interest risk arising from increasing loans banks should engage in OBSA. However, interestingly the OBSA in Pakistan during the last ten years has shown a decreasing trend (see Figure 1.1).

The **credit risk** which is a prominent risk in the banking industry is of tremendous importance (Elian, 2012). The probability of defaulting or default risk is most widely used as a proxy for credit risk. Default risk is a risk which arises when the borrower is unable to pay the principal and interest. Angbazo *et al.* (1998) has used the net charge-off ratio as a proxy of default risk and found a significant relationship between the net charge-off ratio (NCHR) and OBSA. So, the net charge-off ratio (NCHR) is another determinant of OBSA. In Pakistan, the non-performing loans write off to provision for non-performing loans is decreased from 38.36 to 2.91. This indicates that the total volume of non-performing loans of Pakistani banks has decreased significantly and is affecting their OBSA as well.

Liquidity risk is one of the important factors which affects bank performance, profitability and its non-traditional banking activities such as OBSA. It is proposed that a bank with higher liquidity risk prefers to opt for OBSA. The liquidity risk can be caused by the maturity mismatch between assets and liabilities — the liquidity risk is among the crucial risks which not only affect the expected return but also the operational performance. The appalling financial condition of the banks can lead to decreasing the value of the bank and the bank may engage in OBSA (Dahir *et al.*, 2018). The modern portfolio theory argues a positive relationship between credit risk and OBSA. According to the modern portfolio theory, the increase in risk in the form of loans and advances will offer incentives for the engagement in OBSA (Khasawneh *et al.*, 2012). The market power theory offers a contradiction to the modern portfolio theory.

4.2. Bank Specific Regulatory Factors

The protection of consumer rights and the assurance of ethical business practices to the general public are among the formal and legal responsibilities of any federal government. To fulfil these responsibilities the governments have crafted strict laws and installed them in a strict legal system. In the case of commercial banks, the strict imposition of consumer protection laws and regulations is a mandatory factor because any turbulence caused by illegal or unethical practices can lead an economy to economic turmoil (Sheikh and Qureshi, 2017). The central bank of any country regulates commercial banks (Asl and Nikouei, 2017). Commercial banks of any country are bound to comply with banking laws such as capital adequacy requirements, reserve requirements, taxation, accounting procedures and liquidity requirements. However, a strict regulatory system adds more compliance costs which reduce the profit margin. So, to counter the regulatory pressure, banks around the world are engaging in OBSA.

Theoretical and empirical literature shows that banks engage in OBS activities to avoid certain regulatory costs such as the minimum reserve and capital adequacy requirements (Elian, 2012). The following regulatory variables are reviewed from different banking area empirical studies.

Reserve requirement is measured as the ratio of required reserves (Alper *et al.*, 2018). According to previous literature (Elian, 2012) the reserve requirement is expected to have a positive impact on OBS activities. This is because, the non-interest-bearing required reserves is a regulatory tax on banks, which motivates banks to use OBS activities to generate income since OBS activities are free of the reserve requirement. The higher the required reserves, the greater the incentive that banks will engage in OBS guarantees.

The **Capital** requirement is a regulatory imposition by the central bank of the country and is measured in capital adequacy ratio (Galati and Moessner, 2018). In capital requirements to protect the depositor’s deposit and to ensure the stability of the banking sector the banks are advised to hold a buffer of capital (Elian, 2012). Generally, it is argued that banks with a greater volume of risky assets should retain a higher buffer of capital (Alper *et al.*, 2018). In support of this argument, it is also argued that an undercapitalized bank will face the excessive cost of accessing capital, and the overcapitalized bank will face the opportunity cost of holding an excessive amount of capital (Herring, 2018). All on-balance sheet or traditional banking activities are under capital reserve requirements (Alper *et al.*, 2018). OBSA is free from regulatory pressure so, to avoid risk arising from increasing regulatory pressure the banks are increasing their engagement in OBSA (Elian, 2012). Thus, it can be argued that capital reserve requirement is determined by the OBSA carried out in commercial banks of any country.

5. DATA AND METHODOLOGY

5.1. Data Source

Data of bank-specific factors and bank-specific regulatory factors for five fiscal years (2013-2017) was collected from annual reports of the companies. Initially, the target sample was all the listed banks in South Asia. However, Islamic banks because of the difference in nature of assets and liabilities (Waemustafa and Sukri, 2016) were excluded from the analysis and the final sample was 81 conventional banks and 405 bank-year observations. The final sample was composed of 21 Pakistani conventional commercial banks, 29 Bangladeshi conventional banks and 31 Indian conventional Banks.

5.2. Methodology

To achieve the objectives, the current study has adopted the panel data methodology. The panel data methodology advocates the polling of observation into smaller units of cross-sectional nature over many intervals of time or periods. One of the advantages of this method is that it provides more detailed, comprehensive, authentic findings which are not possible with other simple analysis such as time series or cross-sections. The general form of the panel model is explained in Equation 1 as follow:

$$Y_{it} = \alpha_{it} + \beta X'_{it} + \varepsilon_{it} \tag{1}$$

in our case, as our sample is spread of five years from 2013 to 2017 and the total number of banks is 81, therefore $i=1, \dots, 81, \quad t=1, \dots, 5$

The error vector is given by Equation 2

$$\varepsilon_{it} = v_{it} + u_{it} \tag{2}$$

Where v_{it} the individual is the effect of each of the industrial companies and u_{it} is the error which assumes a normal distribution.

The study used specific factors and determinants as suggested in the theoretical and empirical literature to determine the effect of bank-specific, and bank-specific regulatory factors on OBSA in commercial banks of South Asia. To answer the research questions, the proposed model is illustrated in Equation 3, 4 and 5. The model was

adapted from prior studies (Ahmad and Ariff, 2007; Ahmad and Misman, 2012; Elian, 2012; Khasawneh *et al.*, 2012; Perera *et al.*, 2014; Ma'ina *et al.*, 2015; Swain and Panda, 2017) and amended as per the research objectives.

Model 1: Impact of bank specific factors on OBSA

$$OBSA_{it} = \alpha_0 + \alpha_1 CAP_{it} + \alpha_2 SIZE_{it} + \alpha_3 LOAN_{it} + \alpha_4 PROF_{it} + \alpha_5 MC_{it} + \alpha_6 CRISK_{it} + \alpha_7 LRISK_{it} + \varepsilon_{it} \quad (3)$$

Model 2: Impact of bank specific regulatory factors on OBSA

$$OBSA_{it} = \alpha_0 + \alpha_1 CAR_{it} + \alpha_2 RR_{it} + \varepsilon_{it} \quad (4)$$

Model 3: Impact of bank specific factors, and bank specific regulatory and factors on OBSA.

$$OBSA_{it} = \alpha_0 + \alpha_1 CAP_{it} + \alpha_2 SIZE_{it} + \alpha_3 LOAN_{it} + \alpha_4 PROF_{it} + \alpha_5 MC_{it} + \alpha_6 CRISK_{it} + \alpha_7 LRISK_{it} + \alpha_8 RR_{it} + \alpha_9 CAR_{it} + \varepsilon_{it} \quad (5)$$

We started our econometric analysis by pooling the panel dataset and estimating it using the ordinary least squares (OLS) regression. This method, however, ignores the panel structure of the data and countries heterogeneities, treating all observations as one sample and thus yields a biased and inconsistent estimator (Gujarati, 2009). This finding was also supported by the results of the Breusch-Pagan Lagrange multiplier test, whose null hypothesis is that the variance of the unobserved fixed effects is zero. The test results imply the rejection of this null hypothesis and suggesting that the Pooled OLS is not the appropriate estimation methodology.

To correct for this bias in the pooled OLS estimator, a panel fixed effect (FE) approach was used to account for the distinct nature of each country and control for the unobserved heterogeneity that is constant over time and correlated with the dependent variable (Baltagi, 2008). This method uses time and country dummies to capture the within-variation across countries and time-related stocks that are common to all countries, such as global financial crises (Hassan and Mahabir, 2018). This approach is also used to overcome issues with omitted variable bias, which can occur if one measures for time-invariant country characteristics that affect bank off sheet activities. One concern in the developed model was the endogeneity of credit and liquidity risk on the OBSA. We tested the robustness of results by using the GMM method.

Arellano-Bond GMM method is useful in two ways. First, it will allow us to estimate a dynamic model wherein we include the lagged of the dependent variable at the right-hand side, as the off-balance sheet activities are likely to be affected – besides other variables- by activities in the previous period. The second way is that it is useful to deal with endogenous variables like those mentioned previously. This two-way directional relationship is not considered when using pooled OLS, FE or RE, rather GMM deals with this problem by using lags of the endogenous variable as instruments. The argument is that the lags of the variables tend to be less affected by the dependent variable in the current period.

6. FINDINGS AND DISCUSSION

The summary statistics of the current study is shown in Table 1. The results indicate that on average the South Asian banks' volume of OBSA accounts for 37 percent of total assets. The mean value of a market share is 1.25 which indicates that the banking market in South Asia is highly competitive.

Table-1. Summary Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
OBSA	405	0.3709657	0.346542	.0000356	2.500444
CAR	405	14.35047	6.24242	1.6	53.86
RR	405	0.0391911	0.0383813	-0.0270628	0.3296318
LR	405	0.7436804	0.4823027	0.0206659	7.149256
CR	405	0.0178817	0.0300531	-0.0075649	0.4649448
MS	405	1.258877	3.010468	0.0009895	24.36974
PROF	405	0.0121385	0.0111447	-0.0354528	0.0419094
LOAN	405	0.5449467	0.1399812	0.0000114	0.8242846
SIZE	405	21.75512	3.530273	9.504353	27.8464
CAP	405	0.0950647	0.0918589	0.0000774	0.8024189

Source: Bank's audited annual accounts.

Table 2 highlights the results of bank-specific factors on OBSA Equation 1. The findings of the fixed effect model show that the market share, profitability, loan and advances, and capital are significant determinants of OBSA. Whereas the capital is a negative and significant relation with OBSA. While capturing the within variation across the country, the fixed effect has results show that the market share and loan are only significant determinants of OBSA in South Asia. While controlling the possible endogeneity from liquidity and credit risk, the results of system GMM confirmed the time fixed effect and showed consistency with the proposed results. In GMM analysis the market share, profitability, loan, size and capital are in a significant relationship with OBSA. The lag of OBSA is insignificant which is revealing as there is no endogeneity issue.

Table-2. Bank Specific factors and OBSA.

Dependent: OBSA	Model-1	Model-1	Model-1
	Time fixed effects	Time and country fixed effects	GMM
LR	-0.0550 (-0.36)	-0.0550 (-0.47)	
CR	0.00663 (0.20)	0.00663 (0.15)	
MS	0.184* (1.82)	0.184** (6.38)	0.186* (1.80)
PROF	0.248*** (4.36)	0.248 (1.21)	0.110* (1.72)
LOAN	0.572*** (4.12)	0.572* (3.05)	0.477*** (5.94)
SIZE	1.970 (0.77)	1.970 (0.50)	5.112** (2.08)
CAP	-0.289*** (-3.41)	-0.289 (-1.33)	0.186* (1.80)
L.OBSA			-0.819 (-1.34)
R-Square	0.271	0.271	-

***, ** denote statistical significance the 0.10, 0.05 and 0.01 level respectively.

The impact of bank-specific regulatory factors on OBSA Equation 2 is reported in Table 3. The results of reserve ratio in fixed effect are significant and positive whereas the results of GMM are revealing a negative significant relationship of CAR with OBSA.

Table-3. Bank Specific regulatory factors and OBSA.

Dependent: OBSA	Model-2	Model-2	Model-2
	Time fixed effects	Time and country fixed effects	GMM
RR	0.466*** (4.97)	0.466** (4.60)	0.169 (1.14)
CAR	-0.299 (-1.61)	-0.299 (-2.00)	-0.640* (-1.89)
L.OBSA	-	-	-0.259 (-0.73)
R-Square	0.1	0.1	-

*,**,*** denote statistical significance the 0.10, 0.05 and 0.01 level respectively.

The results of a general model consisting of bank-specific factors and banks specific regulatory factors Equation 3 are shown in Table 4. The results have shown consistency with Table 2 and Table 3. We have dropped the Cap variable from the general models because its core grated with CAR variable and thus using them together in the list of independent variables could be problematic due to the presence of collinearity.

Table-4. Bank Specific, Bank specific regulatory factors and OBSA.

Dependent: OBSA	Model-3	Model-3	Model-3
	Time fixed effects	Time and country fixed effects	GMM
LR	-0.0454 (-0.30)	-0.0454 (-0.45)	
CR	0.00767 (0.23)	0.00767 (0.18)	
MS	0.151 (1.47)	0.151* (3.62)	0.186* (1.80)
PROF	0.164*** (2.73)	0.164 (1.19)	0.110* (1.72)
LOAN	0.520*** (3.62)	0.520* (3.82)	0.477*** (5.94)
SIZE	2.355 (0.91)	2.355 (0.38)	5.112** (2.08)
CAP			
RR	0.230** (2.23)	0.230** (8.61)	0.169 (1.14)
CAR	-0.190 (-1.00)	-0.190 (-1.66)	-0.640* (-1.89)
L.OBSA			-0.00749 (-0.14)
R-Square	0.271	0.271	-

Source: Banks audited annual accounts.

Overall the findings of the current study have provided a great amount of support with the proposed results. In our analysis, we also have also tested the validity of overidentification restrictions in GMM by reporting the p-value of J-statistic which is simply the Sargan statistic (Millimet and Roy, 2016). Our results imply the acceptance of the test's null hypothesis that the instruments are exogenous.

7. CONCLUSION

From the literature, it is clear that the usage of OBSA has seen tremendous growth. The reasons why South Asian commercial banks engage in OBSA are the same as some of the commercial banks around the world. However, every region has its geopolitical, economic and legal stature which significantly affects the OBSA and because of these issues, the factors which affect the OBSA varies from country to country and region to region. For example, given the differences between the banking system in Africa and the banking system in Europe, different

factors will affect the banks' decision about the use of OBS activities in both regions. Therefore, it is clear that the determinants of bank's OBS activities and practice of OBS activities will be different from one region to another based on the distinguishing characteristics of each region.

Ahmad and Ariff (2007) indicated that bank size is statistically significant for Africa, the Middle East, NAFTA, the Far East and Central Asia, North America, and The European Union and statistically insignificant for G7, Western Europe, and Eastern Europe. He also suggested that regulatory factors are influencing OBS activities of banks in Africa and the Far East and Central Asia, but not banks with the rest. This is consistent with Ahmad and Misman (2012) who rejected the regulatory tax hypothesis in Jordan's banking industry and banks in MENA countries respectively. This study is, therefore, undertaken because of the motivation and drivers of off-balance sheet activities across countries could be different, and a theory that works in one country may not work in another. Thus, this study is carried out to start a debate on the issue of decreasing OBSA in South Asian.

The results of the bank-specific factors on the off-balance sheet activities (OBSA) supports the market power theory. However, the positive and significant relationship between loan ratio and OBSA also supports the market portfolio theory, which argues that the increase in loans offers a continuous risk and can increase credit risk. Therefore, banks must diversify their portfolios. The positive relationship between the reserve ratio and OBSA is providing support to the regulatory and tax hypothesis. Although much literature is available on off-balance sheet (OBS) activities in the banking system, this is the first paper that is carried out to explore the determinants of usage of a balance sheet activity in commercial banks in South Asia.

Most research on off-balance sheet activities has been dominated by studies conducted in developed countries such as the USA and Europe. Even the wave of studies (Ahmad and Misman, 2012; Aktan *et al.*, 2013; Pushkala *et al.*, 2017) is carried out on the emerging economies and in the authors have argued that the financial structure, institutional and legal environment of developed and developing countries are not comparable. It is, therefore, a critical contemporary issue in financial and regulatory institutions and markets to understand the factors which affect the OBS decision in commercial banks in Pakistan, India, and Bangladesh.

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