

PRIMARY RESEARCH

Performance of Islamic and Conventional Banks: The Impact of Basel III

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Keywords

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Abstract.

Purpose: To overcome the deficiencies of the Basel II and to respond the great depression of 2008, Basel III is designed to lower the default risk of banks. However, the unique business model and capital structure of Islamic banks is ignored at this point. A common banking regulation for two different types of banks may have a different impact on the profitability and cost efficiency of these banking types. In this regard, we address the question of the relative performance of both banking types in response to Basel III standards.

Methodology: The study utilizes data of 79 banks, both Islamic and conventional, for the period of 2005 to 2019 from 10 different countries. For estimation, the study uses fixed-effect regression analysis.

Findings: We find a positive impact of Basel III regulations on profitability and cost efficiency of the Islamic banks and a negative impact on conventional banks. The findings indicate that the favorable impact of Basel III on Islamic banks reduces the performance gap between both types of banks.

Originality/Significance: This is perhaps the first paper which empirically explores the impact of Basel III regulations on the comparative performance of both types of banks.

Policy Implications: The declining profitability and cost efficiency of conventional banks draw the attention of global and local banking regulators. Basel Committee on Banking Supervision (BCBS) and central banks of the countries with dual banking models should address this negative effect of the implementation of Basel III on conventional banks.

KAUJIE Classification: L12, L25

JEL Classification: G21, G32

INTRODUCTION

The severe financial collapse of 2008 exposed the Basel framework's regulatory flaws. Depositors' faith in financial institutions and the financial system was shaken by the bankruptcies of some of the most prestigious financial institutions in the world. Numerous studies claim

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that the primary causes of this crisis are excessive leverage and reckless lending by financial institutions (Ayub, 2012; Schularick & Taylor, 2012; Scott, 2010; Shin, 2009). The Basel Committee on Banking Supervision (BCBS) consequently suggested raising and improving bank capital and liquidity. Additionally, it was proposed that new capital and liquidity standards be implemented beginning in 2013 and be fully implemented by 2018 (Went, 2010). According to the Bank for International Settlements (BIS), the new criteria was to achieve a stable financial system through higher and better quality capital and liquidity. This high capital and improved liquidity would help to absorb the risk in case any further financial crisis occurs.

Islamic financial institutions have been expanding quickly, and it is estimated that the value of their assets has risen to \$1.76 trillion globally by the end of 2019 (IFSB, 2020). This industry's exceptional growth shows that Islamic banks consistently outperform conventional banks, even during the times of crisis (Sorwar et al., 2016). Less leverage in Islamic banks' capital structures than in other banks was one of the key elements responsible for their rapid performance (Hasan & Dridi, 2011; Parashar, 2010). Conventional banks finance their assets with long-term borrowing at a maximum level permissible by regulators to reduce the cost of financing (Hoque & Liu, 2021). Contrary to conventional banks, Islamic banks follow Shari'ah rules which do not allow Riba (interest) financing. Therefore, Islamic banks use profit-sharing accounts (PSA) deposits and equity to finance their assets (Al-Deehani et al., 1999).

Islamic banks differ from their conventional counterparts in their business approach, quality of assets and stability (Beck et al., 2013). The Islamic banks' capital structure is less risky because of their heavy reliance on PSA and smaller debt. The balance sheet of Islamic banks has the inherent ability to balance the portfolios automatically, which makes them more stable. Basel standards are devised to mitigate the risk arising from the capital structure and assets of conventional banks. However, the capital structure and business model of Islamic banks are not taken into account and are still required to follow these standards (Ahmed & Khan, 2007).

The theory of banking regulation is based on the economic theory of regulation which explains the beneficiaries and costs of the regulations, and the one who will bear the burden of the associated costs. A core principle of the regulation is that regulation is demanded by the industry and implemented for the benefit of the relevant industry. However, excessive regulation can also have unfavorable impact on the industry or other stakeholders. This is also evident from the history of regulations that regulation can hurt the interest of the industry in the form of profit reduction.

Based on the foregoing discussion, it is worthwhile to explore the relative impact of regulations under Basel III on the performance of both types of banks. Moreover, the study also explores the challenges that Islamic banks face to meet the minimum requirements of Basel III. For this purpose, the study uses data of 79 banks, both conventional and Islamic, for the period 2005 to 2019 selected from 10 different countries. We extend the previous work of Zins and Weill (2017), who find the impact of Basel II on the risk and performance of Islamic and conventional banks.

LITERATURE REVIEW

This section presents literature relevant to our study. We begin by outlining the theoretical and empirical underpinnings of the connection between the performance of both types of banking and banking regulations. Then we develop the hypothesis of how Basel III regulations may affect both bank types' performance.

Comparison between Conventional and Islamic Banks' Performance

Islamic banking, which is expanding quickly, has taken over a significant portion of the global banking sector and hence cannot be ignored. In the last 20 years, the Islamic banking sector has grown exponentially by about 12 percent, and it presently has operations in over 50 Muslim and non-Muslim countries, according to the World Bank's (2017) global report on Islamic Finance. The report states that there were 261 depository Islamic banks worldwide at the end of 2014, reflecting an increase of 28% from 2010. The Islamic banking sector is highly valued by global and local regulators, as seen by the industry's growing market position in global banking. The report also reveals that Islamic banks in the Middle East, Asia and GCC performed better than conventional banks during 2010-14.

Based on different capital sources, structure and investment opportunities and avenues, Islamic banks are likely to perform differently than conventional banks. According to Miah and Uddin (2017), there are two reasons why Shari'ah-compliant banks perform differently than their conventional counterparts. First, unlike traditional fixed interest rate deposits, PSA deposits are the primary funding source for Islamic banks. Second, the assets of Islamic banks are real asset-based products which are sold under various Shari'ah-compliant contracts, not just loans. Ariss (2010) finds that Islamic banks work on the basis of Shari'ah principles which are significantly different from the principles of conventional banks. This distinction results in a different risk profile for Islamic banks. The research goes on to explain that in order to meet the goals of international banking standards, regulators in nations with both types of banks should establish circulars and regulations for Islamic banks. The study reveals that establishing an Islamic bank requires significantly more capital than establishing a normal bank. In addition, unlike conventional banks, Islamic banks own an asset before leasing or selling it under *murabahah*, which has unusual tax ramifications. The researcher also discovers that Islamic banks' portfolio makeup and assets are noticeably different, which has a different impact on how well they perform.

The following studies argue that the performance of both banking types is different due to their different business models. The studies also show that regulations have a different effect on both banking types. Spinassou and Wardhana (2021) investigate the impact of Basel III requirements, particularly the newly devised leverage ratio. This study concludes that Islamic banks have an advantage of using PSA deposits rather than interest-bearing deposits. PSA deposits are more attractive to regulators because of their risk-sharing nature. The study also finds that these strict regulations boost the incentives for banks to operate under Islamic models. Bitar et al. (2018) examine 656 banks of 33 countries and conclude that though the Islamic banks are less efficient in terms of cost of the business but more efficient in meeting the capital requirement of Basel. Beck et al. (2013) show that due to high liquid cash reserves

and high capital, the profitability and cost efficiency of the Islamic banks improve during the global financial crisis.

Hassan and Bashir (2003) study the performance of Sharī'ah compliant banks in eight Middle Eastern countries and find that the profitability of these banks increases with higher capital to asset ratio. Al-Ghazzar (2014) observes that Islamic banks perform much better in terms of capital adequacy requirement. However, conventional banks show a better performance in terms of liquidity of the assets. The author suggests Islamic banks to develop Sharī'ah-compliant liquid instruments to manage the liquidity problem.

On the other hand, several studies find that conventional banks' performance is better as compared to Islamic banks. Miah and Uddin (2015) find that conventional banks are more cost-efficient due to the large size and resulting economies of scale. If Islamic banks increase their size, it will increase their cost efficiency. However, Trad et al. (2017) does not find any difference in the profitability of both banking types. In this study the profitability of Islamic banks is estimated in connection to macroeconomic and bank-specific factors. The study draws the conclusion that country-level and bank-specific factors negatively affect the risk and profitability of Islamic banks using a sizable sample of Sharī'ah-compliant banks from twelve countries. Only banks with substantial asset sizes and sufficient capital levels have the capacity to withstand negative repercussions. Furthermore, the report contends that Islamic banks are not exempt from the need to be resilient in the face of a financial crisis. Alam et al. (2019) estimate the impact of Basel III on Islamic banks' performance in Asia and GCC countries. The researchers note that though Basel regulations are brought into practice to reduce the banking risk and stabilize the financial system, these regulations can increase banks' cost and reduce their profitability. The study further suggests that the existing Basel III regulations may not be suitable for Islamic banks because adopting these conventional regulations could harm the profitability of Islamic banks. The studies of Capraru and Ihnatov (2014), Trujillo-Ponce (2013), and Vong and Chan (2009) also show that the performance of conventional banks in Spain, CEE and Macao increases with the increase in bank capital.

The above literature focuses on the two dimensions of the performance of the banks. First the relative performance of both bank types. Second the impact of any single requirement of the regulations on the performance of the banks. For example, Bitar et al. (2018) find the impact of only the capital requirement of Basel III on the performance of Islamic and conventional banks. In contrast, Spinassou and Wardhana (2021) focus on the impact of the leverage requirement of Basel III on the performance of Islamic and conventional banks. In this regard, our study contributes in the existing literature from two novel dimensions. First, we examine the impact of all three requirements of Basel III, i.e., capital, liquidity and leverage, on the bank's performance. Second, we not only observe the impact of these Basel III requirements on Islamic banks but also on conventional banks in countries with the dual banking system.

Hypotheses

Basel III requirements encourage banks to have a high level of equity and discourage debt financing. Islamic banks have superior assets as well as higher quality and quantities of

capital (Beck et al., 2013). The greater capital requirement may not affect the performance of Islamic banks because they already use larger equity and other tier 1 capital components. On the other hand, before implementing the Basel III requirements, conventional banks utilised a high level of debt and little equity. The induction of new equity may raise the financing costs for conventional banks, which would lead to reduced profitability (Zins & Weill, 2017). The aforementioned justifications support us in developing the first hypothesis that:

H1: Basel III standards of capital, liquidity and leverage reduce the performance of conventional banks relative to Islamic banks.

Moreover, conventional banks use perpetual preferred stock, long-term debt, and debentures to raise the additional capital necessary to meet Tier II requirements. However, because of the interest component in debt and debentures, Islamic banks are unable to adopt this alternative. Islamic banks fill the total capital requirement by using high equity capital or perpetual *shukūk*, which can raise the cost of Islamic banks' funding. Additionally, Basel III's liquidity requirement requires keeping high-quality liquid assets. Islamic banks must hold more cash in order to manage liquidity rules because Shari'ah-compliant liquid assets are not readily available. For this reason, conventional banks retain government securities, which brings in income for them. Cash holding, however, does not generate any revenue for Islamic banks. These logical justifications allow us to design the next hypothesis that:

H2: Basel III standards of capital, liquidity, and leverage reduce the performance of Islamic banks relative to conventional banks.

DATA AND RESEARCH METHODOLOGY

In this section, we present the data and explain the methodology of estimating the impact of Basel III regulations on the performance of both types of banks.

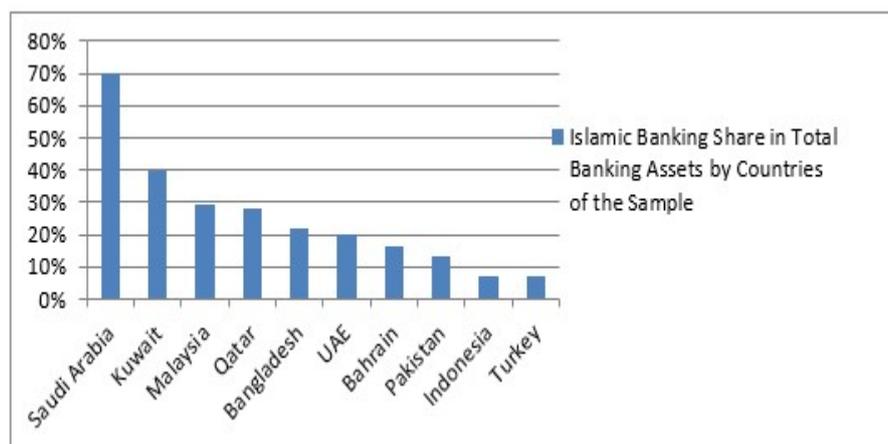


FIGURE 1. Shares of Islamic Banking in Total Banking Assets

Data

This analysis includes all commercial banks, Islamic and conventional, from ten top countries in Islamic financing. In dual banking countries around the world, these ten countries comprise

more than 95% of total assets in Islamic banking (IFSB, 2020). Iran and Sudan are not included because they solely practise Islamic banking. These countries, along with the asset (billion dollars) of the Islamic banks, are Bahrain (25), UAE (170), Saudi Arabia (430), Kuwait (90), Qatar (80), Malaysia (220), Turkey (40), Bangladesh (30), Indonesia (25), and Pakistan (18) (IFSB, 2020). Bank-specific data is taken from “Bank Focus of Bureau Van Dijk”, while the country-specific data is collected from the “World Development Indicators” of the World Bank. Further, the shares of Islamic banking assets in total banking assets of the sample countries are summarized in Figure 1.

Profitability, the first dependent variable, is measured through return on assets (ROA), return on equity (ROE) and net interest margin (NIM) (Abedifar, 2013; Bitar, 2017). To measure the second dependent variable, cost efficiency, different approaches, including “Data Envelopment Analysis (DEA)”, “Stochastic Frontier Approach (SFA)”, and traditional ratio-based analysis, are used. Although all three approaches have their advantages and drawbacks and are used consistently (Halkos & Salamouris, 2004). However, there is no consensus regarding the best approach which should be used (Bhatia et al., 2018). Using a ratio-based approach, we measured the cost efficiency through “cost to income ratio (CIR)”, “overhead to asset ratio (OVERTA)”, and “interest income to interest-earning assets ratio”. These traditional ratios of cost efficiency are consistently used by publicly traded banks (Cocheo, 2000, Hess & Francis 2004, Rashid & Rehman, 2016). We use the ratio-based approach because of its simplicity and to find the impact of Basel III regulations on the efficiency of two groups of banks (Ismail & Davidson, 2009) .

To capture the impact of Basel III on Profitability and cost efficiency, we use a dummy variable Basel III . It takes value ‘1’ for the period 2013 to 2019, which is the time period during which banks follow Basel III standards and “0” for the period 2005 to 2012, the time period before the implementation of Basel III . The dummy variable “Islamic” is equal to “1” if the bank is Islamic and “0” otherwise. The interaction term Basel III x Islamic explains the differentiating impact of Basel III implementation on Islamic banks relative to convention banks on profitability and efficiency. The addition of these dummy variables helps to analyze the impact of the regulations before and during the implementation period on Islamic and conventional bank.

Further, we also use three requirements of Basel III, as mentioned by BCBS (2013) as independent variables. These are “total capital ratio (TCR)”, “liquidity coverage ratio (LCR)”, and “leverage ratio (LR)”. Although all conventional and Islamic banks are considered for the study however, a large number of banks do not follow the Basel III standard yet. Particularly, the data on liquidity coverage ratio, net stable funding ratio and leverage ratio for these banks is not available. Therefore, we include only 79 banks which fully follow the Basel III standards. The formulas and minimum requirements under Basel III (BCBS, 2013) are as follows:

$$\text{Total Capital Ratio (TCR)} = \frac{(\text{Tier I} + \text{Tier II})}{(\text{Risk weighted assets})} = 8 \quad (1)$$

$$\text{Leverage Ratio (LR)} = \frac{(\text{Capital measure})}{(\text{Exposure measure})} = 3\% \quad (2)$$

$$\text{Liquidity Coverage Ratio (LCR)} = \frac{HQLA}{(\text{Net cash flows of 30 days})} = 100\% \quad (3)$$

Moreover, we also use two sets of control variables. The bank-specific variables and the country level macroeconomic variables. Bank-level variables are Bank size, net loans to total assets, liability to total assets and fixed assets to total assets (Cihak & Hesse, 2010; Isnurhadi et al., 2021; Wasiuzzaman & Gunasegavan, 2013). Bank size is proxied by taking log of total assets. Bank size can influence performance as larger banks can exploit the economies of scale. Following Cihak and Hesse (2010) and Zins and Weill (2017), we include GDP growth, inflation rate and regulation quality as the country-level variables. GDP growth variable is useful to control for the macroeconomic impact on the performance of institutions. The inflation rate is used to control for the variations in purchasing power and the resulting impact on efficiency and profitability. Regulations quality can also influence the performance of banks due to the confidence level of the public in institutions.

METHODOLOGY

We use an unbalanced panel dataset from 2005 to 2019 for estimating fixed effects regression analysis. Fixed effects estimation is frequently used to limit selection bias. In panel data, the fixed effect model eliminates time-invariant confounding and is preferred to control for unobservable variables (Bell et al., 2019). For the normality of the data and to fix the outliers, we use 10 percent winsorization on the upper and lower limits. The stochastic form of our fixed effect regression models are given below:

$$\begin{aligned} \text{Profitability}_{it} = & \beta_{0i} + \beta_1 TCR_{it} + \beta_2 LR_{it} + \beta_3 LCR_{it} + \beta_4 Islamic_i + \beta_5 \\ & BaselIII_t + \beta_6 aselIII_t * Islamic_i + \beta_7 Control_{it} + \mu_{it} \end{aligned} \quad (4)$$

$$\begin{aligned} \text{Efficiency}_{it} = & \beta_{0i} + \beta_1 TCR_{it} + \beta_2 LR_{it} + \beta_3 LCR_{it} + \beta_4 Islamic_i + \beta_5 BaselIII_t \\ & + \beta_6 BaselIII_t * Islamic_i + \beta_7 Control_{it} + \mu_{it} \end{aligned} \quad (5)$$

RESULTS AND ANALYSIS

Descriptive Statistics and two Sample T-test of Difference between Two Means

The descriptive statistics of all bank-level variables and the difference between their means for both groups of banks are given in Table 1.

TABLE 1
Descriptive Statistics and Two Sample T-test of Difference between two Means

Variables	Conventional Bank				Islamic Bank				Differences
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Return on assets	1.42	0.95	0.06	3.21	1.32	1.01	0.06	3.21	0.10*
Return on equity	10.9	5.05	3.75	17.21	9.29	5.05	3.75	17.21	1.68***
Net interest margin	3.78	1.73	1.14	6.94	3.28	1.73	1.14	6.94	0.50***
Cost to income	54.03	27.98	40.93	65.92	60.04	34.01	51.13	74.13	-6.014***
Overheads to TA	3.67	0.73	0.41	6.21	3.57	0.82	0.28	7.07	0.100**
Interest income to earning asset	8.58	3.48	2.93	13.38	6.28	3.53	2.93	13.38	2.30***
Total capital ratio	13.4	3.42	9.08	20.08	14.16	3.66	9.08	20.08	-0.76***
Leverage ratio	2.03	0.47	0.53	2.96	2.3	0.49	1.38	3.13	-0.26***
Liquidity coverage	95.17	18.47	43	150.12	93.67	19.03	39.67	142.59	1.5***
Size	14.6	2.92	3.57	19.46	14.25	3.6	1.46	19.05	0.349**
Net loans to assets	58.83	9.79	43.83	69.82	58.89	10.7	43.83	69.82	-0.07
Liabilities to assets	56.29	0.7	45.58	72.6	43.8	5.54	21.45	65.92	12.62
Fixed assets TA	4.5	0.21	3.14	5.21	4.42	1.43	2.73	6.15	0.08
GDP growth	4.94	3.04	-7.07	26.17	4.43	4.1	-7.07	26.17	0.50***
Inflation	6.29	3.96	-4.86	20.29	4.91	4.09	-4.86	20.29	1.38***
Regulations quality	48.11	14.44	28.85	67.31	51.97	15.66	28.85	67.31	-3.86***

For each variable for both sets of banks, Table 1 shows the mean values, standard deviation, lowest and maximum values. We observe significant variations in the data. For instance, LCR has a minimum value of 43 and a maximum value of 150. A minimum LCR of 39 and a maximum value of 139 are observed for Islamic banks. The gradual adoption of these requirements is the major reason for these greater variations in LCR. The LCR is relatively low prior to the implementation of Basel III. All banks were required, starting in 2013, to maintain 100% of LCR in accordance with Basel III standards, which caused them to quickly raise their LCR. We also find larger variations in mean value in bank-specific variables. This is due to the difference in the size of the banks in different countries and a large number of observations which is a normal trend in this kind of data (Mishra et al., 2017). The last column shows the difference in mean values of all variables for both conventional and Islamic banks.

Before estimating equations 4 and 5, we checked the correlation among independent variables. The results are summarized in following Table 2:

TABLE 2
Correlation

	TCR	LR	LCR	Size	Net loans ratio	Liabilities to asset	Fixed asset	GDP growth	Inflation	Regulation
TCR	1									
LR	0.29	1								
LCR	0.12	0.07	1							
Size	0.14	0.5	-0.03	1						
Net loan ratio	-0.09	0.3	-0.18	0.29	1					
Liabilities to asset	-0.31	-0.1	0.06	-0.01	0.09	1				
Fixed asset ratio	-0.14	-0.25	-0.17	-0.47	-0.11	-0.14	1			
GDP growth	-0.07	-0.04	0.01	-0.2	0.05	-0.01	0.04	1		
Inflation	-0.35	-0.42	-0.09	-0.18	-0.17	0.03	0.32	0.08	1	
Regulations	0.04	0.05	-0.01	0.01	0.3	-0.04	-0.09	-0.08	-0.14	1

Regression Results

Using the fixed effect model, we estimate equation 4; these results are shown in Table 3. The findings show that TCR considerably improves each of the three profitability parameters. This indicates that banks' profitability grows as overall capital ratios climb, indicating that banks with adequate capital generate larger profits due to reduced funding costs and careful lending decisions. The results are consistent with those of Berger and Bouwman (2013), Hassan and Bashir (2003), Naceur and Kandil (2009), and Zheng et al. (2017). The findings also show that the impact of the leverage ratio is insignificant on banks' profits. The liquidity coverage ratio significantly decreases the return on equity of banks. The LCR and ROE have significant and inverse relationships, which suggests that profitability, as measured by ROE, decreases as liquidity rises. These results support those of Bordeleau and Graham (2010) and Sutorova and Tepy (2014). This may be because high-quality liquid assets (HQLA) produce lower earnings due to their high liquidity. According to Basel III, banks must maintain a minimum LCR of 100 percent and must have HQLA. The requirement to hold HQLS has a negative impact on banks' profitability. The relationship between the liquidity coverage ratio, return on assets, and net interest margin, on the other hand, is not found to be particularly significant.

Dummy variable Basel III shows a significantly unfavourable association with profitability, indicating that when Basel III is put into effect, banks' overall profitability decreases. These findings are in line with those made by Beck et al. (2013) and Le et al. (2020). Dummy Islamic variable is significant and inversely related with "ROA" and "NIM". This inverse relationship shows that, on average, Islamic banks' "ROA" and "NIM" are lower than those of conventional banks. However, there is no significant difference is observed between the two types of banks' ROEs.

The interaction term Basel III*Islamic indicates the impact of Basel III on the Islamic banks' profitability compared to the conventional banks. Basel III*Islamic is significantly positive which indicates that implementation of Basel III increases the profitability of Islamic banks relative to conventional banks. An analysis of the impact of Basel III standards on both banking types reveals that conventional banks' profitability declines as these banks reduce the debt and increase the tier 1 capital to meet the capital requirement, which increases the cost of financing. Previous studies exhibit mixed results while finding the impact of Basel regulations on the performance of Islamic and conventional banks. Le et al. (2020), and Oino (2018) also observe that Basel III shrinks the profitability of UK and Australian banks. Al-Hares (2013) and Alam (2019) find a favorable impact of Basel III standards on Islamic banks' profitability compared to their counterparts, albeit opposite results are found by Alsharif et al. (2019).

According to the coefficient of bank size variable, no connection between profitability and bank size is observed. The "ROA" and "NIM", however, are notably positively impacted by net loans to assets, suggesting that as net loans to assets rises, so does profitability. While we do not notice any significant effects of fixed assets on return on assets, however, the ratio of fixed assets to total assets significantly lowers the "ROE" and raises the net "NIM".

Country-level control variable GDP growth shows a positive impact on "ROA" and "ROE" and a negative impact on "NIM". These results support the theory that when economies

grow, demand for bank loans increases, improving banks' profitability. The findings are also consistent with Bikker and Hu (2002). Inflation shows that "ROA" and "ROE" decline significantly with high inflation, while it does not significantly influence the "NIM". These results support the fact that a higher cost of businesses during inflationary times reduces profitability.

TABLE 3
Profitability

Variables	(1) Return on assets	(2) Return on equity	(3) Net interest margin
Total capital ratio	0.038*** -0.014	0.201** -0.087	0.034** -0.017
Leverage ratio	-0.052 -0.161	0.91 -0.97	0.17 -0.194
Liquidity coverage	-0.21 -0.136	-2.364*** -0.82	0.039 -0.164
Basel III	-0.375*** -0.047	-1.864*** -0.285	-0.512*** -0.057
Islamic	-1.774*** -0.534	1.047 -3.228	-2.252*** -0.646
Basel III*Islamic	0.475*** -0.102	2.830*** -0.618	0.864*** -0.124
Size	-0.08 -0.054	-0.472 -0.324	-0.054 -0.065
Nets loans to TA	0.010*** -0.004	-0.004 -0.023	0.013*** -0.005
Liabilities to TA	-0.614*** -0.086	-1.393*** -0.52	0.287*** -0.104
Fixed assets to TA	-0.076 -0.054	-1.386*** -0.327	0.255*** -0.065
GDP growth	0.018*** -0.006	0.099*** -0.035	-0.032*** -0.007
Inflation	-0.017*** -0.006	-0.106*** -0.038	-0.001 -0.008
Regulations quality	0.039*** -0.008	0.123*** -0.046	-0.002 -0.009
Constant	1.265 -1.125	20.221*** -6.796	4.624*** -1.361
Observations	966	966	966
R-squared	0.191	0.133	0.236
Number of banks	79	79	79

Standard errors in parentheses*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

TABLE 4
Cost Efficiency

VARIABLES	(1) Cost to income	(2) Overheads to assets	(3) Interest income to earning asset
Total capital ratio	-0.015*** -0.006	-0.007 -0.004	-0.002 -0.029
Leverage ratio	0.228*** -0.066	0.260*** -0.05	0.096 -0.322
Liquidity coverage	0.098* -0.056	0.095** -0.042	-0.159 -0.272
Basel III	0.107*** -0.019	-0.001 -0.015	-1.041*** -0.095
Islamic	2.064*** -0.219	2.070*** -0.167	-8.843*** -1.072
Basel III*Islamic	-0.126*** -0.042	-0.077** -0.032	1.298*** -0.205
Size	-0.095*** -0.022	-0.158*** -0.017	-0.291*** -0.107
Net loans to TA	-0.009*** -0.002	-0.006*** -0.001	-0.026*** -0.008
Liabilities to TA	0.502*** -0.035	0.335*** -0.027	-0.064 -0.173
Fixed assets to TA	0.067*** -0.022	0.153*** -0.017	0.628*** -0.108
GDP growth	-0.004 -0.002	-0.005*** -0.002	-0.091*** -0.012
Inflation	0 -0.003	-0.004* -0.002	0.091*** -0.013
Regulations quality	-0.005* -0.003	-0.002 -0.002	0.032** -0.015
Constant	5.079*** -0.46	-1.915*** -0.351	18.380*** -2.257
Observations	965	966	966
R-squared	0.479	0.661	0.444
Number of banks	79	79	79

Standard errors in parentheses*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The effect of Basel III regulations on both categories of banks' cost-effectiveness is shown in Table 4. Results show that the cost to income ratio is significantly and negatively impacted by the total capital ratio. In terms of cost to income, this shows that Basel III's overall capital ratio increases the cost efficiencies of the banks. On the other hand, the total capital ratio has no significant impact on the other two cost efficiency indicators. These

findings corroborate those of earlier studies (Bitar et al., 2018, Manlagnit, 2015; Pasiouras et al., 2009) that investigate the effects of Basel II's capital requirements on banks' cost efficiency.

The leverage and liquidity coverage ratios both depict positive and significant relations with cost to income and overheads ratios, while we do not find any impact of leverage and liquidity ratios on interest income ratio. This indicates that leverage and liquidity adversely influence the cost efficiency of the banks. These results support the findings of the previous studies which examine the relationship between leverage and the cost of banks (Barth & Miller, 2018; Gambacorta & Karmakar, 2016). The researchers hold that leverage ratio controls the credit risk but due to less lending the average cost of lending increases, and hence cost efficiency declines. The liquidity coverage ratio also decreases the cost efficiency due to an increase in the cost due to maintenance of high quality liquid assets required under Basel III. Chen et al. (2017) argue that high liquidity coverage ratio decreases the liquidity risk on the cost of banks' efficiency.

Basel III has a strong and beneficial influence on cost to income and a significantly negative impact on assets that yield interest, as shown by the Basel III dummy. According to the results, Basel III's implementation has decreased the cost efficiency of banks. Dummy Islamic demonstrates how much more profitable Islamic banks are than traditional banks. Islamic banks are less cost-efficient than their conventional counterparts, according to the positive and significant coefficient of the Islamic dummy for cost to revenue and overheads to assets. These results support the view that the smaller size of Islamic banks does not allow them to achieve economies of scale. These results are replicated when efficiency is measured in terms of interest income to earning assets.

Basel III*Islamic provides a negative and significant relationship of Basel III standards for the cost to income and overheads to assets of Islamic banks. In terms of interest income to earning assets, we find a significantly positive impact of Basel III on Islamic banks' efficiency. These findings demonstrate that Basel III enhances Islamic banks' cost effectiveness. The fact that Islamic banks typically had sufficient capital to meet Basel III's minimum capital requirement compared to conventional banks may be the cause of Basel III's positive impact on Islamic banks' cost efficiency (Ozkan & Iqbal, 2015; World Bank, 2017). Based on these findings, we conclude that Basel III narrows the cost efficiency gap by having an opposite effect on both forms of banking. Alam (2013) found similar results, however, Alsharif (2019) finds the contrary. The influence of size demonstrates that larger banks are more efficient in terms of cost to income and overhead to assets, whereas larger banks in our sample have lower interest revenue to earning assets. The idea that larger banks are more oriented toward non-interest earning operations is supported by the inverse relationship between size and interest income ratio (Delpachitra & Lester, 2013; Haubrich & Young, 2019).

We find that net loans to total assets have a negative and significant impact on cost to income ratio, overhead to asset ratio and interest income to earning assets ratio. These findings indicate that higher the net loans ratio lower is the cost to income ratio and overhead-to-asset ratio, and the higher the interest income over earning assets. In other terms, we can interpret that a higher net loans ratio improves the cost efficiency of the banks. These findings support

the view that banks prefer more loans as the cost of lending is less as compared to other assets and loans have ability to earn more yield in comparison to other non-interest earning assets.

Inflation shows a negative and significant impact on overhead to assets while a significantly positive impact on interest income to earning assets. These findings imply that during inflationary times the cost efficiency of the banks enhances which support the view of Perry (1992) who suggests that if banks forecast inflation well on time and accurately, the increasing cost due to inflation can be adjusted which results in higher interest income and better cost efficiency. The third country-level control variable, regulation quality, shows a significant and positive impact on interest income ratio, which shows that effective regulations improve the cost efficiency of the banks. The results support the view that effective regulations help to avoid unnecessary costs and improve banking efficiency (Mamatzakis et al., 2013).

Conclusion

In this research paper, the researchers investigate the resulting impact of the Basel III regulations on the profitability and cost efficiency of conventional and Islamic banks. The emergence and growth of Islamic banking raise questions about its profitability and efficiency compared to conventional banks. Basel III regulations were proposed to improve the stability of banks. Therefore, this research analyzes the impact of this stability on the performance of both types of banks.

When we estimate the impact of the indicators of Basel III on the profitability and cost efficiency of the banks, we find that the total capital ratio improves the profitability and cost efficiency of the banks. Contrary to the total capital ratio, the liquidity coverage ratio reduces the profitability and cost efficiency of the banks. The leverage ratio does not show any significant impact on the profitability but it depicts a significantly negative impact on the cost efficiency of banks. These findings illustrate that the total capital ratio which is one of the requirements of Basel III improves the profitability, but the other two requirements, liquidity coverage ratio and leverage ratio, negatively influence the profitability. The net result of Basel III with all of its requirements is explored through the result of our second model explained below.

When we estimate the differentiating impact of implementing the Basel III regulation, we find that these regulations have different impacts on the performance of both bank types. These standards adversely effect the profitability of conventional banks whereas the profitability of Islamic banks increases as a result of the implementation these standards. Our results also show that these regulations reduce the cost efficiency of conventional banks, whereas the impact is favorable for the Islamic banks' cost efficiency. Although Islamic banks are less profitable and less efficient but profitability and cost efficiency of Islamic banks improves after the implementation of Basel III. Overall, these results are favorable for Islamic banks, however, the negative impact of these standards for conventional banks should be taken into account.

The major limitation of this study is the unavailability of the data on Basel III standards for many banks. Particularly, a large number of banks do not provide data on LCR and LR. Although we selected all Islamic and conventional banks for this study but after excluding

the banks which do not show data on Basel III standards, we included only 79 banks in the study. To manage this issue, we also use dummy Basel to capture the impacts of Basel III. The findings may be useful for regulatory authorities, particularly BCBS and central banks. Relatively lower profitability and cost efficiency of Islamic banks is a matter of concern for Islamic banking industry leaders. This lower performance can lead to a decline in the market share of the nascent industry. Although, the positive impact of Basel III regulations on the Islamic banking industry is a good sign, but it should be analyzed with the impact of these regulations on the risk of Islamic banks since the purpose of Basel III standards is the banking industry stability. The declining profitability and efficiency of conventional banks due to the implementation of Basel regulations should also be addressed. Moreover, the work of this study can be extended for future research to find the impact of these regulations on the risk of banks. The comparison of the impact on profitability, cost efficiency and risk can give a clearer picture of the influence of these regulations on both banking types.

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