Testing the Procyclicality and Financial Stability
of Islamic Banking Industry

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Abstract: The financial stability cyclical behavior is analyzed in this study which is seen as the risk taken by the Islamic banks for the period of 2013 to 2018. For this research study, researcher have used the dynamic panel data of 20 Islamic banks evaluated by the GMM (GMM) technique to investigate that whether the procyclicality in the financial stability of Islamic banks exist or not. The study found that there is no procyclicality or countercyclicality existing in the financial stability of Islamic banks which means that the risk taking behavior of Islamic banks is not influenced either by the upturns or the downturns of the economy. In addition, the borrowing activities of the Islamic banks also have no influence on the financial stability. Study found few significant results i.e. the proxy of insolvency risk i.e. Z sore of return on equity is found to be influenced by the capitalization ratio and asset growth rate, risk adjusted asset returns is found to be influenced by business cycle, capital measure i.e. CAPTA, BC*C and asset growth rate and risk adjusted market returns is influenced by the capitalization ratio ETA and capital measure (CAPR). Study conclude that out of these three, asset growth rate affect the bank's insolvency risk as compared to the others. This study is unique in nature and provide comprehensive model and added value to the previous researches. Study is helpful for the policymakers to understand the procyclicality testing and financial stability of Islamic banking sector.

Keywords: procyclicality, Financial Stability, Islamic Banking Sector, capitalization ration, asset growth rate, risk adjusted, asset returns, capital measures, risk adjusted market returns.

JEL Classification: B22, B26, E31, E44, G21, G32

1. Introduction

Procyclicality of banking system is believed to be one of important sources of financial system systemic instability need to be addressed (Mclean and Zhao, 2014). The sovereign debt crisis that has been occurred and spread around multiple countries in Eurozone progressively has added up to the financial economic crisis globally apart from increase in the credit default swaps in different countries (Amisano and Tristani, 2011). So, the banking stability is the utmost concern on every point of time. The failure of banks brings financial instability that is devastating to the real economy. So, it is important to understand the bank risks cyclical behavior. During the economic downturns, banks have a tendency to become averse to risk via tightening of credit standards that excavates the recessions in the economy. According to (Elnahass et al., 2016), forward looking model is needed under the prudential regulations in the banking industry for the credit risk since the occurrence of global financial crisis in 2008. Use of backward looking model cause the banks to aggravate the procyclical effects during the economic booms by lowering the credit standards and the chance of occurrence of the financial distress is increased (Bushman and Williams, 2012).

The financial stability cyclical behavior is analyzed in this study which is seen as the risk taken by the Islamic banks for the period of 2013 to 2018. The behavior of the risk taking of the Islamic banks exhibits counter-cyclicality during economic downturns or the procyclicality during the economic upturns over the business cycle. The association between the risk taking of bank and the business cycle is regarded as the cyclicality of the bank stability. Financial stability countercyclicality is implied when there is positive relationship between the risk taking and the cyclicality of the stability of banks. However, negative relationship among them implies the procyclicality. This study has contribution to the literature from certain angles. It uses the available data from the Islamic banks for all the countries that have undertaken Islamic banking. Furthermore, the bail out costs have been worn by the production losses and the financial crisis that has been occurred globally. Real economy is influenced by such costs and the Islamic banks risk cyclicality is important to understand. Islamic banks are being focused in this study because it is challenging for the Islamic banks to adopt the AAOIFI standards that comply with the edicts of Shariah laws. This is due to the fact that Islamic banks have certain restrictions related to the operations, have business model uniqueness and governance that has multiple layers. Also funding access for Islamic banks are limited as compared to the conventional banks (Elnahass et al., 2016). There lies differences in the accounting treatments that incur the unexpected losses in the Islamic banks (Quittanah et al. 2011).

Islamic banks are seen to have tremendous growth1 worldwide. So, the Islamic banks are the contributing factors to the economic development and it is important to understand the bank risks cyclicality that is either contributing to the procyclicality or countercyclicality. Addressing to the issues of procyclicality could benefit the Islamic banks to take preventive measures for increased risk taking at the times of economic upturns and spur the lending activities at times of economic downturns.

2. Literature Review

Procyclicality is explained as the intensification of financial cycle swings due to undertaken financial activities. The most important among such financial activities is the lending behavior of banks. Financial innovation, market participants herding behavior, expectations that are either overoptimistic or over-pessimistic, asymmetry in information and balance sheet quality fluctuations are the interconnected contributing factors to this phenomena. Apart from the aforementioned natural causes of procyclicality, accounting rules related to the revaluation of financial assets in the balance sheets of financial institutions and the financial regulations have a significant role in this regard (Geršl, & Jakubík, 2009).

There is existing literature that emphasis on lending cyclicality and the bank capital effects the lending cyclicality, financial stability and the bank risk cyclicality (Beck et al., 2012 and Bouheni & Hasnaoui, 2017). It has been found in the studies that upturns in economy lead to decrease in risk taking where risk averse behavior among the managers is less in the banks of Eurozone. There has been observed moral hazard which might have higher chances of occurrence due to the implicit insurance of banks via depot insurance. Excessive risks have been taken by the managers working in banks as these managers have either nothing or very little to lose and comparatively more to gain so there are incentives for the bank managers at times of distressed situation to take more risks (Kahneman and Tversky, 1979, Zhang et al., 2016 and Bouheni & Hasnaoui, 2017).

Increase in lending also lead to increase in financial instability and bank risk whereas financial stability is supported by the requirements associated with the capital. It has been found that the growth of credit is an influential forecaster of the crisis that occurs financially (Schularick and Taylor, 2012).

1The total assets of Islamic banks worldwide, in the year 2016, have reached to USD 1.9 trillion which is expected to be increased further in future (IFSB, 2016). In the year 2015, Islamic banks have total assets of USD 1.2 trillion (Ernst & Young, 2015) which have increased from USD 939 billion in 2010.

Capital and bank lending procyclicality boost the risk taking due to the positive co-movements observed between the lending and the business cycle and the bank capital and the business cycle. However, financial stability of commercial banks has been found negative (Guidara et al. 2013 and Bouheni & Hasnaoui, 2017). Positive relationship has been found between the bank capital buffers and the business cycles by Guidara et al. (2013)2 whereas Shim (2013)3 has found negative co-movements between the capital buffer and the business cycle. However, the size of the bank is also the determinant of the lending and the capital requirements associated with the cyclicality of the commercial banks. It has also been found that smaller banks have capital and lending procyclical whereas larger banks have lending and capital countercyclical. Hence, there are similar lines of business between the real economy and the smaller banks as at times of recession, capital requirements and the lending activities are reduced but during the upswings in the economy capital and lending activities are increased. However, for the larger banks the reverse is true (Bouheni & Hasnaoui, 2017). To protect the franchise value or the charter, larger banks avoid the risk taking on excess levels (Shim, 2013). Moreover, it has also been suggested in the literature that there are more risky lending activities in which the large banks have been involved so the hazard related to moral behavior could occur due to a safety mesh provided by the government via several implicit policies related to the too big banks to fail (Bertay et al. 2015). Also, the autonomy and the structure of markets related to the financial activities that countries have; determine the connection between the economic growth and the financial activities. Countries where the financial stability is countercyclical4 have the commercial banks followers of the business cycle that are indulged in continuous struggle. On the other side, countries which don't have Troika assistance have the financial stability procyclical in the European region which lead to decreased risk taking at times of expansions in the economy due to the expected losses that are higher and during the decline in the economy banks act as lubricants for the economy to be less affected by economic shocks (Bouheni & Hasnaoui, 2017).

The analytical description in the literature show that the changes in asset prices also lead to leverage procyclicality. The banks under the constraint of regulatory leverage and with no differences in the risk weights under regulations among assets do not have leverage procyclicality. Procyclical leverage is due to the absence of fair value, binding constraint and bank regulations. A study conducted on US commercial banks has suggested the same concept (Barth, & Landsman, 2017).

The inherent feature of the banking industry is the procyclicality which has provided the deviances from the efficient market hypothesis. The sustainability and the financial stability is hampered as banks are unable to efficiently allocate the resources. Procyclicality has impact on the banking sector and on the real economy as well. The factors associated with procyclicality include the supervisory and regulatory framework, monetary policy and financial firms' practices that includes the leverage, reports of credit rating agencies, remuneration policies and so on. According to the decisions opted by the Basel Committee and the financial crisis occurred globally, the procyclicality in the banking industry is paid attention which via mutual reinforcement process worsens the economic cycle phases. Basel III framework has also addressed the procyclicality. However, there is criticism on the Basel II framework for amplifying the procyclicality in the literature which has developed the management of risk in the banking sector and role in the financial stability. Variations in the financial statements of the banks are due to the prevailing rules of accounting. Also include the postponement of the loans portfolio losses recognition that worsens the procyclicality. Poor policies of management and trading strategies that are imprudent pose negative effect on the economy as compared to the credit reduction which is due to increase in capital requirements. To mitigate the procyclicality, it is important to take the

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[2] Guidara et al. (2013) has used the data for the six largest Canadian banks using stock market and quarterly financial statements data for the period of 1982 to 2010.

[3] Shim (2013) has used the Bank holding companies data of US for the period of 1992 to 2011

[4] Such countries, having the Troika financial assistance, include Greece, Ireland, Cyprus, Spain and Portugal.

optimal measures that can provide the benefits at the maximum level for the real economic activity and the maximum financial stability with the minimal cost associated with social and economic aspect (Athanasoglou, Daniilidis, & Delis, 2014).

In this research paper, the literature review section is followed by the data and methodology section, empirical analysis section and the conclusion section.

3. Methodology

The empirical analysis done in this paper is based on the Islamic banks sample of 20 banks operating in different countries for 2013 to 2018. Islamic banks data has been access through the World Database for Islamic banking and Finance. The data for the economic indicators such as GDP, inflation etc. has been accessed through the website of World Bank. It is important to understand that the banks operate in varying legal and institutional environment but the Islamic banks in different countries mostly follow the similar set of regulations so it is important to understand the relationship between the business cycle and bank financial stability which affects the real economy. This involves considering the risk taking behavior of Islamic banks which mostly try to take the risks at minimal level but still contributes to the procyclicality in the economy. To investigate that whether the financial stability of the banks is affected by the real economy, study applied the dynamic panel data approach provided by the Bouheni & Hasnaoui, (2017), Hsiao, Pesaran & Tahmiscioglu (2016), Bun & Sarafidis (2013) and Arellano and Bover (1995). The two step GMM estimation has been used to control the bias associated with endogeneity due to the reverse causality. It has been found that the two step GMM estimation is more efficient than the one step GMM estimation or the standard GMM estimation (Hansen, 1982 and Baltagi, 2005).

Study applied some preliminary analysis for diagnostic tests before moving onto the application of GMM. These tests include the augmented dicky fuller (ADF) test for checking the unit root, wald test for the detection of heteroskedasticity, Durbin Watson test for detecting the serial correlation and Hansen-J test for over identifying the restrictions. ADF test has shown that there is no unit root in the panel data, There has been detected the heteroskedasticity problem in the panel data and robust method has been used to solve this data problem. There has been found no order serial correlation and the over identification of restrictions is valid.

For the assessing the banking financial stability, study used the inverse of Z-score for return on assets (ROA) and inverse of Z-score for return on equity (ROE) which are used for the insolvency risk or the default risk and standard deviation of ROA and ROE for each bank (Fazio et al., 2015 and Ben Bouheni et al., 2016). Also, the bank's default probability is assessed through the inverse z-score as suggested by the literature Jiménez et al., 2013 and Ben Bouheni et al., 2016). The distance to default is measured by the size of the z-score. The greater the z-score is, the higher is the financial stability and lesser is the default probability. Risk adjusted asset profits by means of ROA i.e. RAR and risk adjusted market profits by means of ROE i.e. RER has also been used for assessing the asset risk and market risk respectively of the Islamic Banks. To check the fragility of the banks which is either due to bank assets riskiness or bank equities riskiness that affect the stability of banks and real economy subsequently, RAR and RER have been used as suggested by Bouheni, & Hasnaoui (2017). Financial stability measures have been opted as the dependent variable in this study.

For measuring the business cycle[5] procyclical affects on the financial measures, study used the natural logarithms of GDP growth and GDP per capita growth annually by following the studies of Creel. et al. (2015) and Bouheni, & Hasnaoui (2017). These are the natural indicators of the business

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[5] Financial stability has been suggested to be procyclical when financial stability and the business cycle is positively related to each other during the upturns in the economy whereas bank increases the risk taking during the downturns in the economy and there is expected a negative relationship.

cycle affect on the real economy due to risk taking of the banks. Financial leverage (FL) has also been taken to see that how much debt financing which is shariah based is used to finance the additional assets acquired by the Islamic banks. This is the borrowing measure that provides the insight into the shariah based financing attain by the Islamic banks from the other Islamic financial institutions. The banking capital measures have been taken in this study are the leveraged capital ratio (ETA6) which represents the capitalization ratio as used by Berger et al. (2009) and Guidara et al. (2013). Other banking capital measures include the regulatory total capital ratio for which the natural logarithm has been taken (CAPR) to see the soundness of bank and CAP_TA which represents the banking capital and reserves to the total assets. Similar measures have been adopted by Bouheni & Hasnaoui (2017). Certain control variable that are specific to banks and the country macroeconomic indicators have been incorporated in this study that includes the bank size, asset growth rate (AGR) and inflation (INF). The interaction terms incorporated in this paper include BC*FL and BC*C. BC*FL indicates the interaction between business cycle and borrowings whereas BC*C indicates the interaction between the business cycle and the capital.

The extended model thus formed is as follows:

$$\text{(Banks financial stability)}_{njt} = \mu n + \theta t + \beta 1 \text{ (Banks financial stability)}_{njt-1} + \beta 2 \text{(Business cycle)}_{njt} + \beta 3 \text{(Borrowing)}_{njt} + \beta 4 \text{(Banking capital)}_{njt} + \beta 5 \text{(Control)}_{njt} + \beta 6 \text{(BC*FL)}_{njt} + \beta 7 \text{(BC*C)}_{njt} + \varepsilon_{njt}$$

4. Data Analysis

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Table 1 represents the descriptive statistics for the variables opted. There has been no detection of any potential outlier as all the values are reasonable economically. Table 2 represents the correlation matrix and table 3 represents the results derived from the panel data GMM model.

Table 1. Descriptive Summary Statistics

Variable	Mean	Minimum	Maximum	Standard Deviation
Dependent Variables: Banks Financial Stability				
ZA	32.51445	0.879736	257.1399	71.62991
ZE	6.257793	1.223077	53.31635	11.9464
RAR	1.570616	-0.36603	3.596704	1.163368
RER	1.310968	-7.25832	3.661908	2.263824
Explanatory Variables				
GDP_G	0.962538	-0.91629	1.953028	0.696578
GDP_PC	9.835548	6.880384	11.77298	1.36116
ETA	3.252948	0.04272	64.87244	14.12047
CAPTA	12.53022	0.057438	161.6567	39.76404
CAPR	2.838248	2.381396	3.332205	0.240253
FL	1.245434	0	5.323495	1.436175

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[6] The higher the ETA is, the smaller is the bank risk.

Control Variables				
Size	21.95281	15.25304	25.22938	2.485312
AGR	0.049436	-0.18581	0.209054	0.10619
INF	2.919095	-0.78	7.775	1.932351

The table above illustrates the descriptive statistics summary for the variables opted. Here n=144 which shows the number of observations for each variable. Here note that no observation has been dropped from the dataset. Mean, minimum, maximum and standard deviation values are shown. The following table illustrates the results derived from applying the GMM dynamic panel data model.

Table 3. Effects on the Financial Stability of Banks

	ZA	ZE	RAR	RER
Lag ZA	0.00***			
	(15.54)			
Lag ZE		0.00***		
		(6.83)		
Lag RAR			0.00***	
			(3.47)	
Lag RER				0.65
				(-0.44)
GDP_G	0.60	0.22	0.45	0.21
	(-0.52)	(1.23)	(0.76)	(1.26)
GDP_PC	0.32	0.93	0.09*	0.41
	(-1.00)	(-0.08)	(1.72)	(-0.82)
ETA	0.73	0.01***	0.43	0.03**
	(0.34)	(2.55)	(0.80)	(-2.30)
FL	0.76	0.78	0.49	0.31
	(-0.29)	(-0.27)	(0.69)	(1.03)
CAPR	0.63	0.78	0.28	0.03**
	(0.47)	(-0.28)	(-1.09)	(2.18)
CAPTA	0.30	0.71	0.01***	0.54
	(-1.04)	(-0.36)	(-2.65)	(0.61)
BC*FL	0.90	0.22	0.53	0.30
	(-0.12)	(-1.23)	(-0.63)	(-1.05)
BC*C	0.38	0.20	0.08*	0.66
	(0.87)	(1.28)	(-1.77)	(0.43)

Size	0.53	0.76	0.83	0.15
	(0.62)	(-0.30)	(-0.21)	(-1.45)
AGR	0.12	0.04**	0.05**	0.19
	(-1.56)	(-2.04)	(-2.02)	(1.32)
INF	0.23	0.13	0.94	0.52
	(-1.20)	(-1.52)	(-0.07)	(0.64)

*, ** and *** shows the significance at 0.10, 0.05 and 0.01 levels. The probability value is depicted with the t-statistics in the bracket.

GMM technique has been adopted for the dynamic panel data. The coefficients of insolvency risk i.e. ZA and ZE are found to be insignificant with respect to the other variables of the study which means that the Islamic banks insolvency is not affected by the fluctuations in the business cycle i.e. GDP_G and GDP_PC as Islamic banks have more protective measures to deal with the business cycle shocks that do not influence the insolvency risk associated with the Islamic banks. Moreover, the proxy of insolvency risk i.e. ZA is not influenced by the capitalization ratio, financial leverage, indicators for the soundness of banks, size, asset growth rate and the inflation. The proxy of insolvency risk ZE is found to be affected by the capitalization ratio and the asset growth rate of the Islamic banks. Shim (2013) has suggested that the risk pattern of banks are influenced by the macroeconomic environment in an empirical study which contradicts the results of this study for the Islamic banks. This means that the risk taking of the Islamic banks not prompted by the stage of business cycle. Risk taking remains the same for all the phases of the business cycle for the Islamic banks. There are no procyclical implications of Islamic banking on the real economy. Risk adjusted asset profits is seem to be affected by the business cycle i.e. GDP_PC, CAPTA, interaction term BC*C and asset growth rate (AGR). The proxy for the risk adjusted market profits is influenced by ETA and CAPR. According to the authors, capital buffer seem to fluctuate cyclically for banks with capital adjustment speed. However, this capital adjustment speed is less likely to be present in the Islamic banks owing to operations based on Shariah principle that also restrict the activities of Islamic banks as compared to the commercial banks. Here, we have controlled the bank size, inflation and asset growth rate by taking the natural logarithm of each of them. The prudential requirements and regulations for the Islamic banks vary entirely from that of the non-Islamic banking. The results are in contrast with the study conducted by Kohler (2014), Carvallo et al. (2015) and Ben Bouheni et al. (2016).

5.Conclusions

For this research study, we have used the dynamic panel data of 20 Islamic banks evaluated by the Generalized method of moments (GMM) technique to investigate that whether the procyclicality in the financial stability of Islamic banks exist or not during the period of 2013 to 2018. We have found that there is no procyclicality or countercyclicality existing in the financial stability of Islamic banks which means that the risk taking behavior of Islamic banks is not influenced either by the upturns or the downturns of the economy. In addition, the borrowing activities of the Islamic banks also have no influence on the financial stability. The study found few significant results i.e. the proxy of insolvency risk i.e. Z sore of return on equity is found to be influenced by the capitalization ratio and asset growth rate, risk adjusted asset returns is found to be influenced by business cycle, capital measure i.e. CAPTA, BC*C and asset growth rate and risk adjusted market returns is influenced by the capitalization ratio ETA and capital measure (CAPR). Moreover, researcher noticed that the bank size, inflation and the asset growth rate affects the risk of the banks. Study conclude that out of these three, asset growth rate

affect the bank's insolvency risk as compared to the others. The reason behind such results are that the economic growth and the financial stability rest on the structures of the markets and financial autonomy of the countries as suggested by the Troika institutions' assistance programs. Also, the banking structure is also responsible for the economic growth and existence of cyclicality in the financial stability.

This study can be extended in different directions. The first suggestion is to carry future research on the liquidity links and the cyclicality in the Islamic banking that will apply the banking theory to the research. Second, use of time series data for long time horizons would provide more clear estimates. Also use of other methods for the analysis purpose would provide more robust results.

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