Influence of COVID-19 on the Default risk of the banking sector: A Comparison between Conventional and Islamic Bank of Developing Countries

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Abstract

Purpose: The main purpose of the following research is to examine the influence of Covid-19 on the default risk of the banking sector while comparing it between conventional and Islamic banks

Methodology: Secondary data collection approach has been used in which data is gathered from banks from 2016 to 2020. The total banks comprise of 20 banks where 10 banks represents Islamic banks while the other 10 are the conventional banks. Therefore, these 20 banks are from 10 different countries. The statistical analysis software used for this type of data is STATA where the statistical tests that is applied in the dataset includes descriptive statics, correlation analysis and GLS.

Results: The GLS regression technique is applied on the dataset due to issue of heteroscedasticity and autocorrelation. The findings has revealed that long term debt of the banks has directly influenced on the default risk of the banks at the period of Covid-19. Furthermore, the interest rate causes decline to the NPL of total loans for the Islamic banks whereas the liquidity causes incline to the NPL of total loans for the Islamic banks.

Keywords: *Covid-19; banking sector; Islamic banks, Conventional banks; NPL; Default risk ;Comparison; Coronavirus*

Introduction

The COVID-19 pandemic is resulting in havoc among the international financial and economic sphere, as it develops as the massive test for financial systems across the globe after financial crisis of 2008 and 2009. It has been predicted by Asian Development Bank (ADB) that the international economic cost of the disease is probably to be amid $5.8 and USD8.8 trillion that is almost 6.4 to 7% of the total GDP of the World (Park et al., 2020). Above that, the unparalleled macroeconomic and health systems shocks are probably to have

spill over impacts on the entire financial system of every country in a broader range of channels. As aggregate demand is pushed by pandemic, trade, production, and economic activities to become slow and rise in unemployment, baking sector in any nation fear a rising risk of fallout in terms of default risk (IMF, 2020). In the post-pandemic and pandemic ridden world, such losses and damage might threaten the sustainability and survival of banks, security, and financial stability and regulatory discipline across nations, whether they are developing or developed as stressed by (Stiller and Zink, 2020; Cecchetti and Schoenholtz, 2020). Above all, severest blow would be confronted by financial institutions. Financial institutions conventionally deal with a wide variety of risks and the disease might enhance severity of the banks in terms of credit squeeze, liquidity crunch, and upstage in non-performing assets and rates of defaults, decreasing returns from investments and loans, reducing market interest rates and causing transmissible bank-run as argued by (Stiller and Zink 2020).

As such, financial institutions are probable to observe the enhancement in a number of threats for instance liquidity risk, credit risk, and interest rate risk. This is probable to be worse in emerging countries where commercial banks serve millions of individuals and organisations with comparatively less economic and financial capacity under a feeble policy environment and aggressive competition in the market.

A rising volume of literature signifies potential implications as consequence of COVID-19 for banks, though, much of their emphasis mostly remains on the developed countries like UK, USA and European countries and only conventional banks are targeted in these studies. Considering this research gap, the present research aims to analyse and estimate the COVID-19 on default risk of both conventional and Islamic banks as comparative analysis. Also, this studies targets from developing region that is Asian countries.

Considering massive impacts of the disease, the pandemic tends to substantially threaten the survival, performance and growth of banks in developing countries, specifically in those where commercial banks are probable to play to leading role in the economic growth (Damak et al. 2020). Therefore, understanding the impacts on banks of Asian countries could render helpful and valuable information about the implications of the COVID-19 crisis for banks' management. Thus, following objectives are devised

- To examine the impacts of COVID-19 on default risk of conventional banks
- To explore the impacts of COVID-19 on default risk of Islamic banks
- To compare impacts in the case of both types of banks

Literature review

As of diverse shocks resulted from disruptive macroeconomic environment, commercial banks, their borrowers both individuals and corporate are confronting higher default risk (Vidovic and Tamminaina 2020). The banking industry might observe a steep rise in default risk and rates as of cash inflows and earnings to their borrowers as a result of economic slow-down and enforced shut-down of commercial activities to avoid social interactions. The crisis are still expected to be worse for borrowers depending on exports to global markets as the economy of the world struggles to survive from the pandemic. These impacts could also be severe for small businesses who just rely on day-to-day business operations and earnings sufficient cash inflows for their survival (Dua et al. 2020). Likewise, small enterprises have little support of capital and cushion to shelter them from economic and financial adversities. Throughout, and after the pandemic, financial institutions have a significant exposure to lending, specifically to industries that are oriented to exports and small business, might observe a major rise in rates of default. Moreover, the overall circumstance might turn several borrowers into defaulters posing major credit risk banks. It is also probable that collaterals' market value against secured loans might reduce in value, moreover, improving the default and credit risk for financial institutions (Baret et al. 2020).

In addition to risk of default, financial institutions might also confront crises of liquidity as several of their depositors might choose to withdraw their funds to provision their living as a consequence of job loss and supporting medical expenditures (Baret et al., 2020). Further, due to pandemic, income prospects for individual and organisations have become progressively restricted, which might force depositors to spend their savings. In specific, individuals losing job greatly try to survive relying on their savings. This cycle is then converted into debt circle like financial crisis of 2007 and 2008 posing massive default risks to banks (Damak et al., 2020).

As a result of economic slow-down nationally and internationally, loans demand has been reduced, as is now occurring in several countries. As companies restrict their operation and manufacturing capacity, demand for both long and short-term loans decays considerably with no likelihood of reverberation till the economy as a whole recuperates (Ryan et al. 2020). It hurts banks' fundamental business model and generation of revenue and might generate a big revenue shock in developing countries where lending controls the business portfolio of financial intuitions, as is the case for numerous emerging and developing economies. The difficulty might be further strengthened by the limits in lending capacity faced by banks due to liquidity shortage because of augmented drawings (Cheney et al. 2020).

It has been argued by McKinsey, (2020) that banking sector might be negatively impacted by pandemic. Further, it was concluded by Korzeb and Niedziółka, (2020) that largest financial institutions in Poland have remained resilient in the COVID-19 triggered crisis and that these crisis would influence the entire banking system as it tends to increase the number of write-ups and non-performing loans. It is expected that the effects are generalised outside Poland particular in developing countries. Cecchetti and Schoenholt, (2020) argued that, the most significant effects of COVID-19 could be observed on liquidity, solvency and debt position of the banks. This is because decreased repaying capacity of the borrowers and reduced deposits rates could limit earning spread of the banks.

According to the facts presented by VOX EU, Figure 1 depicts that a general rise in provisions of loans loss and NPLs, however, increased number of financial institutions are exposed more to COVID-19. The first set of results posed by study after applying regression analysis depicted that financial institution exposure to the disease and to NPLs can illustrate variation in the loan loss provision of the bank and NPLs during the period. The fallouts not just statistically, but likewise economically significant. In the 2020's second quarter, there was 69% increase on an average in provisions of loans loss in the case of all banks in the study. The rate of growth of provisions of loan loss upsurge by 5% when exposure of bank towards the pandemic caused death doubles, whereas enhancing the index of NPL by one notch. It is also signifies 20% upsurge in the rate of growth of provisions of loan loss.

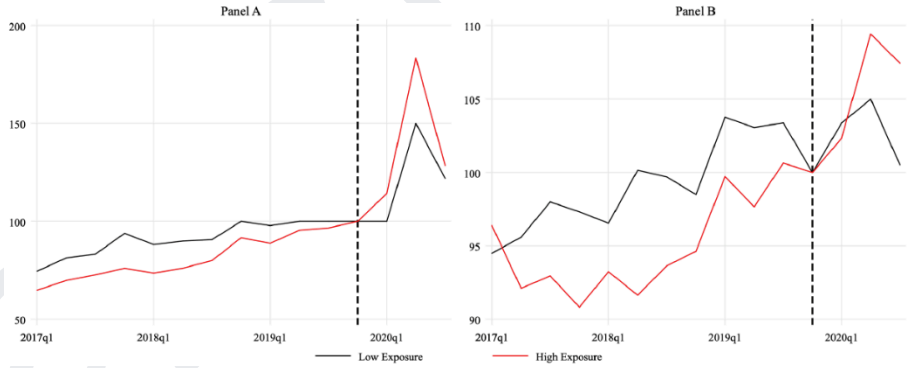

Figure 1. Health of financial institutions with differential COVID-19 exposures.

Source: VOX EU

The results produced by VOX are steady with an upsurge in demand of loans throughout the COVID-19 pandemic that overshadowed any probable adverse impacts of the disaster on supply of loan, and are steady with results peoduced by Acharya and Steffen (2020), Li et al. (2020) and Chodorow-Reich et al. (2020). The considerably greater impacts for small business in comparison to overall loans (comprising PPP) are a sign that supply of loan to

this particular group was reinforced by policy measures rendering to findings proposed by Chodorow-Reich et al. 2020), whereas smaller companies also depend more on financial instructions in comparison to larger organisations that have accessibility to public capital markets.

Further, Park et al., (2020) concludes that initial impacts on the banking industry are largely a failure in profitability, control of costs, deprived of signs of asset quality worsening and liquidity levels and sound capital. The investigator recognised four crucial features that are recognised for post COVID-19 conquerors in the banking sector: a) hold digitalization; b) acclimatise to customers' needs; c) upsurge efficiency; d) diversification of revenue.

Research methodology

Research design

In this article as the primary aims is to analyse the effects of COVID-19 on default risk bank and the researcher aims to compare the impacts between conventional banks and Islamic banks, this makes it a exploratory study and of empirical nature. Therefore, appropriate research design for this study is quantitative research design. The research is based on collection of numeric data for financial variables form selected bank's annual reports which is panel data, this requires application of positivism research philosophy and deductive research approach. This is because these approaches allows to develop hypothesis on past researches and then applying statistical models to test the hypothesis in order to analyse cause and effect between variables.

Data collection and sources

In order to collect panel data, secondary data collection approach has been used, the sources accessed includes Annual reports of the banks for the period of five years from 2016 to 2020. Other sources for the collection of secondary data includes Reuters, and Yahoo Finance. For secondary articles to support results, studies are extracted from Google Scholar, Emerald, Jstor, Wiley and Taylor and Francis. Inclusion and exclusion criteria is used is also used for instance date customization tool is used to only incorporate latest studies in the research and online those articles are included which have topic and variable relevancy to maintain consistency and reliability in the findings.

Data Analysis Techniques

In terms of data analysis technique, used in this study, panel data analysis is applied because the study is quantitative and aims to conduct comparative analysis on the impacts of

COVID-19 on bank's default risk between conventional and Islamic banks of five countries. The statistical analysis software used for this type of data is STATA. In the initial stage, descriptive statistics are analyzed to summarise the data based on standard deviation and mean. In the next step, correlation analysis is carried out that signifies the strength of association amid variables. In the next step panel data regression is applied in order to indicate effects on COVID-19 on default risk of the banks.

In the first step of panel data regression, random effects model is applied in store for further diagnostics. Further, fixed effect model is also estimated and results stored for further diagnostics of the data. In the next step, Hausman's test is applied to analyse the suitability of fixed or random effects, where, hypothesis suggested to use fixed effect model. The tests of diagnostics are further carried out to analyse if the assumptions of regression are achieved and that there is no above models are used. Then heteroskedasticity is examined using Wald test where existence of heteroskedasticity was indicated by null hypothesis. Then serial correlation is checked by using test of Wooldridge for autocorrelation. On identifying the glitches, GSL model is used for estimation because it relaxes the assumption of heteroscedasticity and serial autocorrelation. Thus, this model is applicable in the case of auto-correlation and heteroskedasticity for improved results of the estimation. The equations derived for the analysis are as follows;

$$NPL_{it} = \beta_0 + \beta_1 LTD_{it} + \beta_3 SP_{it} + \beta_4 IR_{it} + \beta_4 U_{it} + u_{it}$$

Though, in the case if the data is discovered to have a problem of autocorrelation and heteroskedasticity, the GLS method would be further used for countering the issues. The GLS equation is following:

$$\hat{Y_t} = \hat{\beta_0} + \beta_1 \hat{X_{1,t}} + \beta_2 \hat{X_{2,t}} + \ldots\ldots \beta_n \hat{X_{n,t}} + \mu_t$$

Results and Analysis

Descriptive Statistics

The descriptive statistics is a common tool of statistics where its main purpose is to summarize the raw data into meaningful and interpretative form. The descriptive statistics mainly investigates 3 aspects on the dataset which comprises of dispersion, central tendency and range (Kaur, Stoltzfus and Yellapu, 2018; Kaliyadan and Kulkarni, 2019). Table 1 represents the results of the descriptive statistics where it evaluates several variables that are involved in the research. The data is gathered from 2016 till 2020 where the total banks comprise of 20 banks where 10 banks represents Islamic banks while the other 10 are the conventional banks. As per the results, the mean value of NPL % of total loans is computed as 0.04 which depicts that the average NPL among the banks is 4%. The standard deviation is computed as 0.05 which indicates that there can be incline or decline by 5% on NPL. In terms of capital adequacy, the mean value is computed as 0.16 whereas the standard deviation is computed as 0.03 which indicates that there is an increase or decrease of capital adequacy by 0.03. Similarly, the other variables can be investigated from the table below:

Variable	Obs	Mean	Std. Dev.	Min	Max
NPL of total loans	96	0.04	0.05	0.00	0.37
LTD	100	2449365	10700000	0	58100000
Capital Adequacy	93	0.16	0.03	0.10	0.24
Interest Rate	100	3.58	2.33	0.96	13.25
Liquidity Risk	100	0.02	0.11	-0.01	1.02
Firm Size	100	77100000	285000000	516	1510000000
Debt to Equity	96	0.69	1.26	0.00	6.77
ROA	100	0.73	0.73	-0.29	2.78

Table 1: Descriptive Statistics

Correlation Analysis

The correlation is a useful statistical technique that is utilized for examining the association of the variables with each other. The main components that are assessed through the correlation technique are the strength, level and significance (Cleophas and Zwinderman, 2018; Gopal, Salim and Ayub, 2018). Table 2 represents the results of correlation analysis where the relationship of the main variable of the study i.e. NPL % of total loans is examined

with the other variable. In respect to the results shown in the table, it is identified that the only variable that is found to have significant interrelationship with NPL is debt to equity based on the 5% significance level. In addition to this, the coefficient value is computed as 0.328 which is above 0.1 and below 0.4; therefore, this indicates that the strength of the association is low whereas the interconnection is found to be positive. Thus, NPL (% of total loans) is determined to have positive interconnection with debt to equity.

	NPL of total loans
LTD	-0.102
Capital Adequacy	-0.096
Interest Rate	0.011
Liquidity Risk	0.007
Firm Size	-0.050
Debt to Equity	0.328*
ROA	0.167
Covid-19	-0.142
Islamic Bank	-0.140
* Significance at 5%	

Table 2: Correlation Analysis

Preliminary Testing

Before proceeding towards conducting the regression analysis, it is vital to investigate the heteroscedasticity and autocorrelation of the dataset. These tests are signified as the preliminary testing where the modified Wald test is conducted to examine the heteroskedasticity whereas the Woolridge test is applied for assessing the autocorrelation. The null hypothesis of both test is that there is no issue of heteroskedasticity and autocorrelation (Ye and Sun, 2018). In case there is an issue of autocorrelation and heteroskedasticity, the OLS regression technique is not feasible whereas the GLS technique is applied on the regression. The GLS technique is commonly applied for addressing the issue of heteroskedasticity and autocorrelation (Di Cecco and Gouhier, 2018). Table 3 represents the results of modified Wald test and Woolridge test where the p-value is computed as 0.000 and 0.023, respectively. Thus, this leads to the rejection of the null hypothesis on 5% significance where there is an issue of heteroskedasticity and autocorrelation on the dataset in which the GLS regression technique is feasible with the dataset.

	P-value
Modified Wald Test	0.000
Woolridge test	0.023

Table 3: Preliminary Testing

Regression Analysis

Pertaining to the regression analysis, there are particularly three models that are involved in the following research where the first regression is applied to investigate the basic model which examines the influence of the variables on the overall NPL of total loans. The second model examines the influence of NPL at the period of Covid-19 while the third model investigates on the Islamic bank.

GLS regression technique on basic model

Table 4 represents the GLS regression technique on the basic model where the probability value is computed as 0.000 (below 0.05) which indicates that the model of regression is significant. Pertaining to the results, the variables that are determined to have significant influence on NPL (% of total assets) are interest rate [C=0.002; p=0.016<0.05], liquidity risk [C=-0.041; p=0.04<0.05], FS [C=-0.004; p=0.090<0.10], debt to equity [C=0.035; p=0.001<0.01], Covid-19 [C=-0.010; p=0.044<0.05] and Islamic bank [C=-0.034; p=0.005]. Therefore, this shows that liquidity risk, FS, Covid-19 and Islamic bank has significant and negative influence on NPL of total loans. On the other hand, interest rate and debt to equity has positive influence on NPL of total loans.

NPL of total loans	Coef.	Std.Err.	z	P>|z|
LLTD	0.001	0.004	0.220	0.823
Capital Adequacy	-0.187	0.186	-1.010	0.314
Interest Rate	0.002**	0.001	2.400	0.016
Liquidity Risk	-0.041**	0.020	-2.060	0.040
FS	-0.004*	0.002	-1.700	0.090
Debt to Equity	0.035***	0.011	3.220	0.001
ROA	0.009	0.007	1.320	0.186
Covid-19	-0.010**	0.005	-2.010	0.044
Islamic Bank	-0.034***	0.012	-2.830	0.005
_cons	0.096	0.035	2.720	0.006

Prob > Chi-2	0.000

*** Significance at 1%; ** Significance at 5%; *Significance at 10%

Table 4: GLS regression technique on basic model

GLS regression technique during Covid-19

Table 5 reflects to the GLS regression that is examined amid Covid-19 where several interaction of other variables amid Covid-19 were developed and assessed. The variables comprises of COVIR (covid-19 interaction with interest rate), COVLTD (covid-19 interaction with LTD), COVCAR (covid-19 interaction with capital adequacy ratio) and COVLR (covid-19 interaction with liquidity risk). As per the results of the model, it was identified that FS [C=-0.002; p=0.01<0.05], debt to equity [C=0.037; p=0.029<0.05], Covid-19 [C=-0.077; p=0.023<0.05] and COVLTD [C=0.002; p=0.021<0.05]. In this respect, firm size and Covid-19 is found to have positive influence on NPL whereas debt to equity is found to have positive effect. Pertaining to results of variable interaction, COVLTD is found to have significant and positive influence on NPL. This suggests that the increase on long term debt at the period of Covid-19 would cause the NPL to increase for the banks. The prob<Chi-square value is computed as 0.000 which indicates that the model of regression is significant.

NPL of total loans	Coef.	Std.Err.	z	P>|z|
LLTD	-0.003	0.002	-1.540	0.124
Capital Adequacy	-0.050	0.181	-0.280	0.782
Interest Rate	0.000	0.003	0.130	0.895
Liquidity Risk	0.275	0.210	1.310	0.191
FS	-0.002**	0.001	-2.540	0.011
Debt to Equity	0.037**	0.017	2.190	0.029
ROA	0.011	0.008	1.350	0.176
Covid19	-0.077**	0.034	-2.280	0.023
COVIR	0.000	0.003	-0.170	0.868
COVLTD	0.002**	0.001	2.310	0.021
COVCAR	0.340	0.212	1.610	0.108
COVLR	-0.281	0.199	-1.410	0.158
_cons	0.081	0.030	2.680	0.007

Prob > Chi-2	0.000
*** Significance at 1%; ** Significance at 5%; *Significance at 10%	

Table 5: GLS regression technique during Covid-19

GLS regression technique on Islamic Bank

Table 6 reflects to the GLS regression that is examined on Islamic banks for determining the difference with conventional bank. Several interaction of other variables with Islamic bank were developed and assessed. The variables comprises of IBIR (Islamic Bank interaction with interest rate), IBLTD (Islamic bank interaction with LTD), IBCAR (Islamic Bank interaction with capital adequacy ratio) and IBLR (Islamic bank interaction with liquidity risk). The prob>Chi-square value is computed as 0.000 and is below 0.05 which indicates that the model of regression is significant. As per the results, the variables that are identified to have significant influence are capital adequacy [C=-0.373; p=0.026<0.05], interest rate [C=0.005; p=0.000<0.01], debt to equity [C=0.025; p= 0.015<0.05], ROA [C=0.023; p=0.00<0.01], IBIR [C=-0.009; p=0.000<0.05] and IBLR [C=2.277; p=0.000<0.01]. The results thus suggests that the capital adequacy has negative influence on NPL of total loans whereas interest rate, debt to equity and ROA has positive influence on NPL of total loans. Pertaining to the special effects, IBIR has negative influence on NPL of total loans which indicates that the interest rate causes decline to the NPL of total loans for the Islamic banks whereas the liquidity causes incline to the NPL of total loans for the Islamic banks.

Table 6: GLS regression technique on Islamic Bank

NPL of total loans	Coef.	Std.Err.	z	P>|z|
LLTD	-0.005	0.003	-1.570	0.117
Capital Adequacy	-0.373**	0.167	-2.230	0.026
Interest Rate	0.005***	0.001	3.790	0.000
Liquidity Risk	-0.034	0.025	-1.350	0.178
FS	0.000	0.002	0.170	0.868
Debt to Equity	0.025**	0.010	2.440	0.015
ROA	0.023***	0.006	3.740	0.000
Islamic Bank	-0.022	0.033	-0.680	0.498
IBIR	-0.009***	0.002	-4.980	0.000
IBLTD	-0.001	0.003	-0.400	0.689

IBCAR	0.114	0.260	0.440	0.661
IBLR	2.277***	0.450	5.060	0.000
_cons	0.108	0.026	4.090	0.000
Prob > Chi-2	0.000			
*** Significance at 1%; ** Significance at 5%; *Significance at 10%				

Conclusion

The results of the study indicate that debt-to-equity of the company has a significant and positive association with non-performing loans of the banks. Therefore, it can be said that NPL of the banks can affect the debt and equity of both conventional and Islamic banks. Moreover, interest rate, liquidity risk has a negative impact on the Islamic banks and the pandemic of Covid-19 has further affected the Islamic banks in a negative manner. However, the conventional banks have a positive impact and it causes the default risk in the banks to decrease. Moreover, to conclude, it can be said that NPL has a negative impact on the functionality and default risk of banks, however, it has a positive impact on conventional banks. The pandemic has affected the risks of banks in a negative manner and has led to the overall liquidity risk to increase. The banks have observed a steep price in default risk due to the pandemic and the crisis for banks have increased and has affected the day-to-day operations of the banks. Financial institutions have a significant exposure to lending and there has been a rise in interest rates that has affected the overall functions of Islamic bank. The banks have restricted their operations due to the pandemic and it has led to default risks of banks to increase. The demand for short term and long-term loans have been affected in both the banking systems and the pandemic has caused the overall operations of the banks to be affected.

Future implications

This study will increase the scope of future researchers and will help to develop certain policies and frameworks that will help to decrease the default risk in banks. Moreover, this research discusses the importance of default risk on the banking sector of various countries and it has compared Islamic and conventional banks through different variables. This study will further increase the scope of future studies and will assist in practitioners to develop guidelines for banks. This study will help to counter the issues of the pandemic and have an influence on the policy of banks and will increase the issuance of non-performing

loans. The banks should take guidance from firms and the managers of banks should ensure that loans are being in an efficient manner. Moreover, the interest rates of the banks should be set as per the benchmark of each to counter the issues of the pandemic and enable default risk to decrease.

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