DETERMINANTS OF FINANCIAL STABILITY OF CONVENTIONAL AND ISLAMIC BANKS IN GCC AND SELECTED NON-GCC COUNTRIES

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ABSTRACT

The study is conducted to explore the determinants of stability in the banking sector of ten Middle East countries, both members and non-members of the Gulf Cooperation Council (GCC). Financial instability is identified to be the major weakness of the banking sector in performing the intermediation role due to several factors, such as bank-specific, institutional, or macroeconomic factors. In this study, banking stability is measured using the z-score and probability of default. A sample of 167 conventional banks and Islamic banks covering the period from 2008 to 2016 is employed. The generalized dynamic method of moment (GMM) estimator shows that capital adequacy, liquidity, control of corruption, inflation, GDP, and oil price have significant effects on the banking stability in the ten Middle East countries. The results remain consistent when the impacts of the bank-specific, institutional, and macroeconomic factors on conventional and Islamic banks are compared. The result suggests that capital adequacy and liquidity have a positive and significant effect on banking stability in all the subgroups except the liquidity of Islamic banks in non-GCC countries. Proper measures to strengthen the corruption control will transmit a substantial impact on improving banking stability in the GCC member and non-member countries in the Middle East. The results of the macroeconomic factors indicate that protection measures are needed to mitigate the negative effect of inflation and GDP on banking stability, as the oil price shows a significant positive impact on banking stability in all subgroups except in Islamic banks in non-GCC countries.

Keywords: banking stability, z-score, probability of default, generalized method of moment, Gulf Cooperation Council

ABSTRAK

Kajian ini dijalankan untuk meneroka penentu kestabilan sektor perbankan di sepuluh negara Timur Tengah, yang terdiri daripada anggota dan bukan anggota Majlis Kerjasama Teluk (GCC). Ketidakstabilan kewangan dikenal pasti menjadi kelemahan utama sektor perbankan dalam melaksanakan peranan perantaraan disebabkan oleh beberapa faktor seperti faktor khusus bank, institusi, atau makroekonomi. Dalam kajian ini, kestabilan perbankan diukur menggunakan skor-z dan kebarangkalian lalai. Sampel yang digunakan terdiri daripada 167 buah bank konvensional dan bank Islam yang meliputi tempoh 2008 hingga 2016. Kaedah dinamik umum penganggar momentum (*generalized dynamic method of moment estimator*) menunjukkan bahawa kecukupan modal, kecairan, kawalan rasuah, inflasi, KDNK, dan harga minyak mempunyai kesan yang signifikan terhadap kestabilan perbankan di sepuluh negara Timur Tengah. Penemuan ini tetap konsisten apabila kesan faktor khusus bank, institusi, dan makroekonomi antara bank konvensional dan bank Islam dibandingkan. Ini menunjukkan bahawa kecukupan modal dan kecairan mempunyai kesan positif dan signifikan terhadap kestabilan bank dalam semua sub-kumpulan kecuali kecairan bank Islam di negara-negara bukan GCC. Langkah-langkah yang tepat untuk memperketatkan kawalan rasuah akan memberikan kesan yang besar terhadap peningkatan kestabilan perbankan di negara anggota dan negara-negara bukan anggota GCC di Timur Tengah. Hasil kajian mengenai faktor makroekonomi pula menunjukkan bahawa langkah-langkah perlindungan diperlukan untuk mengurangkan pengaruh negatif inflasi dan KDNK terhadap kestabilan perbankan memandangkan harga minyak menunjukkan kesan yang signifikan terhadap kestabilan bank dalam semua sub-kumpulan kecuali bank Islam di negara-negara bukan GCC.

Kata kunci: kestabilan perbankan, skor-z, kebarangkalian lalai, kaedah momen umum, Majlis Kerjasama Teluk

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LIST OF ABBREVIATIONS

AIC	Akaike Information Criteria
CAMEL	Capital Asset Management Equity Liabilities
CB	Commercial Banks
CIR	Cash to Income Ratio
CPI	Consumer Price Index
CPI	Corruption Perception Index
DD	Distance to Default
EQTA	Equity to Total Assets
GCC	Gulf Cooperate Council
GDP	Gross Domestic Product
GFC	Global Financial Crisis
GMM	Generalised Method of Moment
ICRG	International Country Risk Guide
IFSB	Islamic Financial Service Board
IMF	International Monetary Fund
INF	Inflation
IPS	I'm, Pesaran and Shin
IS	Islamic Banks
KPMG	Klynveld Peat Marwick Goedeler
LLR	Loan Loss Reserve
MENA	Middle East and North Africa
NI	Net Income
NLA	Net Loan to Assets
NPL	Non-Performing Loans
OLS	Ordinary Lest Square
PD	Probability to Default

PSI	Political Stability Index
ROA	Return on Assets
TA	Total Assets
TI	Transparency International
UAE	United Arab Emirates
US	United State
WB	World Bank

CHAPTER ONE

INTRODUCTION

1.1 Introduction

This part of chapter discourses the wide-ranging presentation of the thesis. It starts with 1.2 Background and motivation of the study. The section tries to link the conception of banking stability with conventional and Islamic financial models. It further highlights how the system diffused to the geographical region of our study. 1.3 hooks at the state of the problem; 1.4 represents the research question; 1.5 handles the research objectives; 1.6 is on the significance of the study. 1.7 contains the scope of the study. Finally, 1.8 presents the organization of the succeeding chapters.

1.2 Background of the Study

The broader concept of stability is latterly correlated to countless segments of life such as education, energy, transitional development, and finance and banking, among other related parts. In a more specific perspective, the global financial crunch of 2008/09 and its aftermath have necessitated banks and other similar financial organizations to for long-term financial stability rather than concentrating on ordinary profit maximization (Banejee, & Velamuri, 2015). This makes banks financial stability as one of the hottest themes in the policymaking agenda of advanced and emerging nations (Beck et al., 2009). The crisis period has been characterized by the banking sector restriction of credit supply. This arguably contributes to financial instability. The global recession put an end to the long-term financial booming in Gulf Cooperate Council (GCC) and Non-Gulf Cooperate

Council (Non-GCC) countries by weakening oil returns, reversing the capital inflows, and even contributing to the bank insolvency and default (IMF, 2010).

The GCC is an economic and political coalition of six states in the Middles East, which contained Bahrain, Kuwait, Sultanate of Oman, Qatar, Kindom of Saudi Arabia and the United Arab Emirates. While the Non-GCC is of countries that are not part of Gulf state but are parts of the Middle East political and economic alliance, such as Algeria, Egypt, Jordan, Lebanon and Tunisia. The GCC countries hold over 42.67 percent of the global Islamic bank finance assets, while the Non-GCC hold 29.1 percent of the global Islamic bank finance asset (IFSB, 2019).

The effectiveness of the financial intermediation in GCC and Non-GCC depends on the soundness and stability of the banking industry. As reported by Warjiyo (2006), the stability of the banking system significantly influenced the effectiveness and conduct of the monetary policy. It indicated the role of the banking system as an intermediary sector which allocates financial resources from one industry to another to make the funding area/sector to work as expected. This makes it necessary to understand the stability of the banking sector to accommodate the demeanour of monetary policy.

The stability of the banking sector is measured with Z-score, NPL-score: all are historical data-based indicators. Probability to default (PD) and Distance to default (DD-score) as a market-based indicator (Beck et al., 2009). In measuring stability using the Z-score indicator, a higher value signifies banking sector stability, while the lower figure represents instability and higher bankruptcy tendency (Cihak & Hesse, 2008). In the vast majority of banks in the GCC and Non-GCC countries, the stability index shows a feeble movement. This is part of the efforts and recommendations from experts and empirical scholars to address the financial instability to an absolute limit and to ensure a meaningful financial and economic progress (Agresti, Baudino, & Poloni, 2008; Almarzoqi, Naceur, & Scopelliti, 2015). However, the stability trend of traditional and Islamic banks in the GCC and Non-GCC region remains weak.

Building on the cut-off point of Z-score, a value less than 1.21 indicate the firm is in a financial situation heading to the likelihood of bankruptcy. A bank with Z-score point ranging between 1.23 to 2.90 is a grey point indicating an element of weak stability and chance of the bank going to default. Similarly, the cut-off point above 2.90 is the stability point where a firm is far away from the default (Altman, 2013; Matey, 2019).

Table 1. 1
The ratio of the probability of banking default (Z-score)

GCC	**Bahrain**		**Kuwait**		**Qatar**		**Saudi**		**UAE**	
Years	IB	CB	IB	CB	IB	CB	IB	CB	IB	CB
2009	1.17	1.39	1.78	1.08	1.38	1.77	1.8	1.17	1.47	1.45
2010	1.1	1.61	1.8	1.36	1.39	1.68	1.68	1.44	1.48	1.53
2011	1.23	1.72	1.84	1.82	1.55	1.82	1.68	1.85	1.72	1.97
2012	1.59	1.9	1.89	1.7	1.61	1.98	1.85	1.95	1.83	2.02
2013	1.76	2.14	2.00	1.64	1.57	1.91	1.75	2.00	2.02	1.98
2014	1.7	2.07	1.74	2.17	1.81	1.76	2.06	2.33	1.99	2.00
2015	1.68	2.15	1.86	1.99	2.09	1.8	2.15	2.32	1.95	1.82
2016	1.72	2.23	1.99	2.37	2.41	1.84	2.24	2.33	2.03	2.2

Non-GCC	Algeria		Egypt		Jordan		Lebanon		Tunisia	
Years	IB	CB	IB	CB	IB	CB	IB	CB	IB	CB
2009	1.66	1.68	1.1	1.59	2.21	1.67	0.9	1.99	1.43	1.7
2010	1.58	1.73	1.00	1.54	2.25	1.69	0.76	1.99	1.29	1.71
2011	1.13	1.81	1.03	1.46	2.3	1.9	1.1	1.95	0.94	1.68
2012	1.05	1.84	1.24	1.68	1.67	2.00	1.48	1.98	0.84	1.61
2013	1.24	1.75	1.48	1.71	1.65	2.04	1.35	1.94	0.62	1.55
2014	2.16	1.83	1.31	1.64	1.7	2.00	1.35	2.05	0.72	1.66
2015	1.4	1.84	1.61	1.7	2.05	1.94	1.31	2.08	1.37	1.76
2016	1.91	1.85	1.98	1.76	2.47	2.06	1.39	2.11	2.61	1.87

Source: Bank Scope/Bloomberge (2018)

The trend of banking stability (for both the conventional and Islamic banks) in GCC and Non-GCC countries for a given period 2008-2016 are monitored. In case of Bahrain, in Table 1.1, both banks responded differently to financial instability. The conventional banking system appeared to have higher Z-score value compared to Sharia Islamic banks which ideally supposed to be more stable because of it is a non-interest policy (Miah & Uddin, 2017; Ftiti et al., 2013; Mat Rahim & Zakaria, 2013). Furthermore, a similar trend is obtained in the majority of GCC countries from 2009-2015. On the average, the Z-score stability trend of conventional banks is higher than that of Islamic counterparts. However, based on the Altman cut-off point, on average, both conventional and Islamic banks stability is above the lower boundaries of 1.10 percent. But the concern here is that the stability index of the dual banks remain within the range of 1.10 to 2.66 indicating level of stability but not safe. This could be due to oil price fluctuation (Al-Khouri & Dhade, 2014; Gazdar, Hassan, Safa, & Grassa, 2019).

On the other hand, the bank stability indicator Z-score of conventional and Islamic banks in Non-GCC countries in Table 1.1 shows a sign of instability, with a value less than 1.10 cut-off points in Egypt and Tunisia in 2011 and 2012. This could be due to the political instability experienced in those countries (Zguric, 2012). Moreover, on the average, the stability index of conventional banks is increased above that of the Islamic banks in Non-GCC region. This indicates that conventional banks could be more stable than the Islamic counterparts. Recently, several empirical literature have examined the impact of multiple factors on the stability of the banking sector in GCC and Non-GCC sub-regions (Alandejani, Kutan, & Samargandi, 2017; Alqahtani & Mayes, 2018; Alqahtani, Mayes, & Brown, 2017; Bitar, Ben Naceur, Ayadi, & Walker, 2017; Bitar, Hassan, & Walker, 2017; Cham, 2017; Ghenimi, Chaibi, & Omri, 2017).

The stability of the banking sector in the GCC region has been determined by a combination of specific factors surrounding the banking environment and the essential external indicators (Alandejani et al., 2017). The composition of bank-specific variables is built on selected internal factors under the control of the management. This comprises Capitalization ratio, Asset quality, Management competence, Earnings, and Liquidity (Evans et al., 2000; Momirovic & Zdravkovic, 2012). The indicators serve as internal bank drivers to stability. To examine the effects of the banking stability of GCC and Non-GCC banks, key regulatory, internal components of Basel III are put to a significant test from the banks' collection of a portfolio in the financial statement. The capital requirement and liquidity recommendations proposed by the Basel Accord provide a cushion to protect banking activities from the external shocks.

Therefore, it remains essential to monitor the fitness of capital as it deals with various financial hazards such as credit risk and market risk traceable to banking stability. A decreasing trend in the indicator signal enlarged bank exposure to risk and tendency of capital adequacy difficulties (Ghosh, 2015; Kohler, 2015). However, for a bank to escape such a risk, a financial institution needs to preserve a sufficient buffer of capital. In the event of losses, the lending firm will moderate capital accordingly to maintain solvency (Almarzoqi et al., 2015).

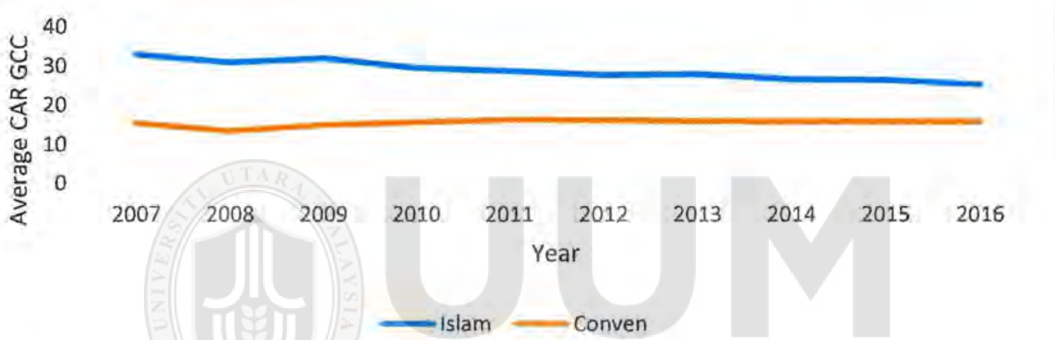

Figure 1. 1
GCC Average Capital Adequacy Ratio
Source: Bank Scope/Bloomberge (2018)

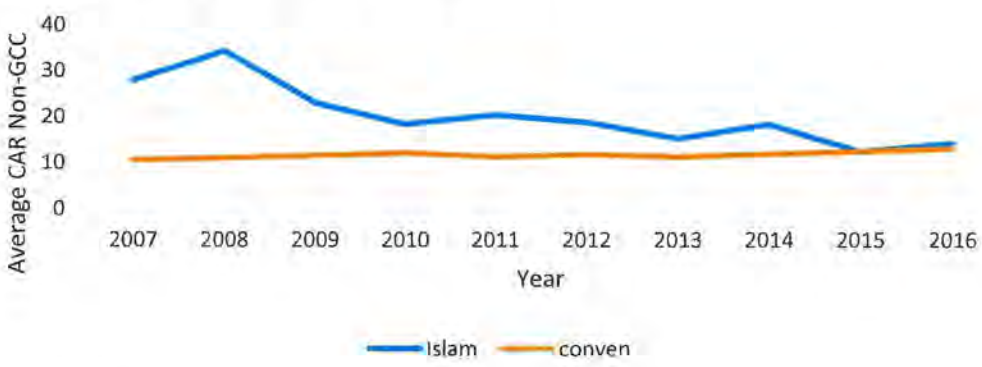

Figure 1. 2
Non-GCC Average Capital Adequacy Ratio
Source: Bank Scope/Bloomberge (2018)

Figure 1.1 depicts that the majority of the banks conventional and Islamic capital ranged between 15 percent and 32 percent, given that the ratios are above the threshold of capitalization requirement of Basel agreement of eight percent (Allen, Chan, Milne, & Thomas, 2012; King, 2013; Alsharif, Arabia, Kamarudin, & Zariyawati, 2016). The change in capital structure might reduce the strength of the stability of the banks, mainly in the event of economic shocks. Similarly, Figures 1.1 and 1.2 show a steadily decreasing trend of average capitalization ratio of GCC and Non-GCC banks for the period under review 2008-2011, especially on the part of Islamic banks. In Bahrain, Kuwait finance bank recorded a significant decrease in capital adequacy ration from 25.56 in 2009 to 24.9 in 2010. Similarly, Albaraka Islamic bank also recorded a decrease in capital adequacy from 13.19 in 2009 to 11.44 and 10.33 in 2010 and 2011, respectively. Although the Islamic banks appeared to be more capitalized than the conventional equals but experiencing a continuous decrease of the capital buffer. This may lead to bank instability if the capital strength cannot absorb shocks and limit the signal of moral hazard. In line with Islamic philosophical ideas, the proposed capital adequacy ratio of Islamic banks should be much higher in order to replicate additional risks assumed by the Sharia bank due to the nature of its business practice (Beck et al., 2013; Khedir et al., 2015; Louati, Abida, & Boujelbene, 2015).

The reliability of sufficient bank capital depends on the consistency of asset quality parameters. Hazards to the liquidity and insolvency of banking institutions are often generated from the wound sustained in the quality of the asset. So, it is significant to observe asset quality as a predictor of the dual banks to assess their stability. A continuous increase in bank provision for loan loss will course dissipation of bank profit and capital erosion. This could be the reason why the stability of the banks is weak. This means that bank management is making provision for controlling all possible and potential credit risks. This could be generated as a result of bank operations, such as credit creation (Alandejani et al., 2017; Alhassan, Kyereboah-Coleman, & Andoh, 2014).

Figure 1. 3
Asset Quality GCC
Source: Bank Scope/Bloomberge (2018)

Figure 1. 4
Asset Quality Non-GCC
Source: Bank Scope/Bloomberge (2018)

Figure 1.3 and Figure 1.4 show the Asset Quality of Islamic banks in GCC countries having slightly higher loan provision ratio than conventional banks over the period 2009-2016. The behaviour pattern of Asset Quality, in most states, is trending up, showing a continuous provision of loan loss in banks (Boulila Taktak, Ben Slama Zouari, & Boudriga, 2010; IMF, 2014; Ramli, Nazar, & Mat Rahim, 2015). Loans with payment delays were restructured and not downgraded to nonperforming status (IMF, 2017). This could be a reason why the stability of the banking sector in the region is weak. For example, Albarka Islamic Bahrain reported an increase in loan loss provision from 3.32 in 2009 to 3.36 and 3.55 in 2010 and declined in 2011 (OBG, 2012). Also, Ibdar bank Bahrain reported similar provisions from 5.33 in 2009 to 11.85 in 2010.

Poor short-term liquidity management may force a banking institution into default. This can take effect when a bank can not easily convert their assets into the loan (Kashyap et al., 2002). A downward trending of bank loans to asset indicator reflects a possible critical point which has positive consequences on the financial institution failure (Jeon & Lim, 2013; Nguyen & Nghiem, 2015). The liquidity ratio measures the ability of a financial institute to meet its short-term financial obligations. In general, the higher figure of the ratio indicates that the bank has a higher margin of safety to overcome its financial obligations and improve stability.

The trend of liquidity for GCC and some Non-GCC countries, from 2008 to 2016, exhibits different patterns in terms of conventional and Islamic banks. Linking this to Middle East, an oil-driven economy, the recent drop in oil prices has caused the liquidity weakness at both national and banking. Following this, the GCC banks have been downgraded on the rating scale of Moody's and Fitch (Shamas, Zainol, & Zainol, 2018). Similarly, looking at the importance of the new Basel banking requirements on liquidity. This changes will have a significant effect on both banks conventional and Islamic, since they obliged to preserve huge capital and liquidity, which could affect the stability and performance of the banks. On the other hand, the case of significant drop in profit and loss sharing investments of Islamic banks by 50% around 2013 to 2015 (El-Ansary, El-Masry, & Yousry, 2019; IFSB, 2015).

After observing the behaviour of internal banking indicators and how they could affect banking stability in GCC, bank external factors are another set of variables that could be responsible for the weak banking stability in the GCC and in the Non-GCC region. Bank, as an independent organization, can archived stability level by manipulating both internal and external variables. Rapid changes in the economic cycles, business operating environment and institutional quality have also conveyed significant challenges in the form of risk and gains posing countless financial breaks as well as a severe threat to banking stability.

Institutional quality is characteristics that guide and uplift the standard of an organization or institution which could enhance its stability. North (1990) view institutional quality as of human-made rules established by the authority to guide institutional business operations among parties and serving as primary attributes that cause of financial development. The quality institutions play a significant role in the development of the financial sector because they help in reducing the cost of operation (Acemoglu, Johnson, & Robinson, 2001). On a practical account, political stability index and corruption control index provided by World Bank and Transparency International on GCC and Non-GCC countries have revealed a downward trend below the threshold 43 corruption control from the year 2009 to 2016 (The Economist, 2018). Similarly, the episode of regional political instability increasing from 52 figures of an uprising in 2001 to 168 cases in the year 2016, with an assessment for further intensity (Arab Development Report, 2016; Center for Systemic Peace, 2017). The incidence of Arabs Spring, political tension between Qatar and the rest of GCC countries and many more incidents that had affected the stability of the banking industry (Bae & Goyal, 2009; Bermpei, Kalyvas & Nguyen, 2018; Schiantarelli et al., 2016).

According to Brown, Harlow and Tinic (1989), the market always reacts dramatically following the news of dramatic financial and political events. Mutually risk and prospective returns of the concern institution upsurge systematically. Hence, the market will respond more strongly to unfavourable information than to the favourable one. In essence, news of political turbulence and corruption cases in the country are sensitive and robust enough to reduce investors' confidence, and eventually, they cause the withdrawal of capital and virtually affecting banking stability (Alesina & Perotti, 1996; Biglaiser, DeRouen Jr., & Archer, 2011). In total, an unstable atmosphere alarms the global market to heightened risk in the country.

Table 1. 2

Gross Domestic Product

Year	GDP GCC	GDP Non-GCC	GCC Variation	Non-GCC Variation
2007	7.460543	6.942819	-29.3%	47.2%
2008	7.165352	6.055062	-4.0%	-12.8
2009	0.023766	4.969621	-99.7%	-17.9%
2010	5.64017	4.521297	23632.2%	-9.0%
2011	8.382851	1.250375	48.6%	-72.3%
2012	4.987586	2.999039	-40.5%	139.9%
2013	3.74575	2.661783	-24.9%	-11.2%
2014	3.353419	2.933585	-10.5%	10.2%
2015	3.265133	2.414658	-2.6%	-17.7%
2016	2.652508	2.483686	-18.8%	2.9%

Source: World Bank (2018)

The trend of a macroeconomic factor such as GDP, inflation and change in the oil price is another set of determinants that are sensitive to affecting banking stability in GCC and Non-GCC countries (Korbi & Bougatef, 2017). The decline in the trend of aggregate GDP is often linked to the deteriorating of the debt servicing ability of home-based debtors. Again, oil prices contribute to the growing bank insolvency. Table 1.2 indicates a change in the economic growth of GCC and Non-GCC countries. The trend in the majority of the countries is declining from 2008-2009 due to the Global financial meltdown in that period. However, the majority of states witnessed an increase in Gross Domestic Product (GDP) from 2009-2011. After that, a decrease in GDP followed, that is, it was below what the countries targeted to achieve from 2013 onwards. This could be due to a decrease in the price of global hydrocarbons. This mostly affected the GDP of oil-producing countries (Khandelwal et al., 2016) except Egypt, Jordan, and Lebanon. It is believed that the increase in economic growth minimises the tendency of a crunch affecting the vector of banks stability (Demirgüç-Kunt & Detragiache, 1998; Duttagupta & Cashin, 2011).

In the context of the influence of macroeconomic variables on banking stability, the price index is another variable of vital importance (Delis, Tran, & Tsionas, 2012; Köhler, 2015). However, inflationary conditions can interfere with the capacity of the banking institutions to allocate funds efficiently as their debtors gain more while creditors loss significantly (Boyd, Levine, & Smith, 2001; Huybens & Smith, 1999; Issing, 2003), thus as inflation increases the level of uncertainties on the possibilities of future bank earnings. However, higher inflationary volatility is connected to the inability to predict the actual returns and consequently the stability of the banking sector on which, in its intermediation role, supports small and other medium investments (Dhal, Kumar, & Ansari, 2011).

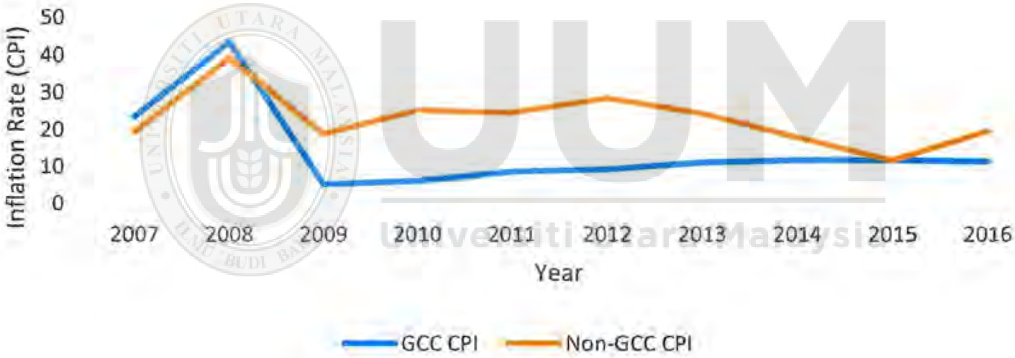

Figure 1. 5
Inflation Rate
Source: World Bank (2018)

Inflation has become a growing concern in the GCC region (Figure 1.5). As from 2011 to 2016; the inflationary rate keeps on increasing by 2.01 percent in 2011, 0.57 percent in 2012, 1.88 percent in 2013, and 0.58 percent in 2014 respectively. Similarly, the International Monetary Fund (IMF, 2013) predicted that general price index would be impacted in the majority of GCC countries because of continuous reforms targeting at rationalizing government subsidy packages and adoption of value-added tax. While on the part of Non-GCC countries the inflationary rate in Figure 1.5 represents an increase of 6.9 percent, although the following year reduced by merely 0.71 percent, and rose by 3.84 percent, respectively from 2009 to 2012, but suddenly decrease in 2014 and 2015, respectively to follow the same trend of oil price change (International Monetary Fund-IMF, 2017; O'Sullivan, Rey, & Mendez, 2011; World Bank, 2014).

Table 1.3 designates the trend of oil price, which shows a fall in the global price of hydrocarbons between 2008-2009, this is the period of the financial crisis and after that recorded a significant increase in the cost of hydrocarbons from 2009- 2012, followed by a continuous decrease in the global oil price from 2013 onwards. The price of oil has a significant influence on the economy directly and indirectly (Khandelwal et al., 2016; Vohra, 2017). On the direct impact, change of oil price could influence banks stability through the enlargement of oil associated credits and an increase in the liquidity of the banking industry of the exporting nations. On the aspect of indirect influence, oil has continued to constitute a significant part of the revenue of those countries. As such, its prospects influence the volume of public spending, the banking credit down to other business environments. On the opposite, the lower prices of oil could lead to a decrease in a domestic claim, which will result in weak lending and accumulation of credit facilities default.

Table 1. 3
Change in Global oil Price

Year	Oil Price	Annual variation (%)
2007	69.04	13%
2008	94.1	36%
2009	60.86	-35%
2010	77.38	27%
2011	107.46	39%
2012	109.45	2%
2013	105.87	-3%
2014	96.29	-9%
2015	49.49	-49%
2016	40.76	-18%

Source: World Bank (2018)

The work of Bruno and Sachs (1982) has posted that growing demand in the production of a natural resource like oil leads to a degeneration of productive resources from the tradeable goods sector to non-tradeable sector of the economy. Therefore, both the boom and shock in the price of the natural sector (oil) may course banking stability issues in oil-producing countries (Alodayni, 2016; Donayre & Wilmot, 2016).

After critically analysing the effects of internal and external factors to banking stability difference, researchers have divergently viewed banking stability from a dual perspective: the accounting-based and market-based (Alquahtani & Meyas, 2017; Kabir et al., 2017). The accounting approach views banking stability through historical financial information to measure the strength of banking stability (Beck et al., 2013). The primary concern of the market approach views banking stability measures from the real market perspectives. This is closer to Islamic principles that place a priority on equity rather than debt financing. The issue depends on operational frameworks between Islamic and conventional banks.

1.3 Problem Statement

The stability of the banking system becomes an issue of great concern, more especially in the context of commercial banks after the 2008/2009 Global financial meltdown (Alqahtani et al., 2016; Hidayat, Abdul Rashid, & Htay, 2014). The economies of the member states of GCC and Non-GCC share a common attribute. Majority of the countries are oil dependent. At the same time have considerable investments in the real estate business and oil fields which are mainly funded by the banking industry in the region. Thus, the countries are exposed to banking instability which is visible from the drop in the growth rates of bank deposit and credit. The instability could be from three sides: the demand for financial reforms, political instability and the drop in oil prices, which triggered the economic recession (Khandelwal, Miyajima & Santos, 2016). The weakness of banking stability has been the major challenge of the banking sector in GCC and Non-GCC states for a very long time. This could be traced to the difference between conventional and Islamic bank stability related to the bank-specific predictor, external factors. It could be due to changing the perspective of measuring bank stability. This matter raises more concern about the effectiveness of the banking sector to perform its intermediation functions in the regions. The period under review shows how the disbursement of domestic credit to the private sector by banks has become a source worry over the years. Credit supply to local firms declined by an average of 11.7 percent from 2010 down to 2013. It also decreased by 7.5 percent in 2014 down to 2016 respectively. Meanwhile, the credit supply to the private sector in Non-GCC countries has shown a similar trend with that of GCC states with a five percent consecutive decrease in credit facilities 2010 and 2014. The result of the pattern goes in line with the statement of International Monetary Fund-IMF (2014, 2017) that there is a gap between the outreach and those firms looking for bank funding in GCC countries. Eventually, following these circumstances, there are specific issues to be emphasized.

Primarily, the issue of bank-specific factors which comprise of capital adequacy, assets quality, and liquidity have become the determinants of the banking stability between conventional and Islamic banks. Theoretically, a well-capitalized bank with liquidity and quality assets is expected to be safer from financial instability. In practice, the hypotheses may generate the requirement for risk management, reduction in banks earnings and ultimately upsurge the propensity of banks to embrace risk, this will eventually, triggers the bank stability problem (Allen, Chan, Milne, & Thomas, 2012). Theoretically, and in practice, the capital and liquidity are supposed to be high and increasing over time. But contrary to the regulatory directives, the capital adequacy of Islamic banks in GCC is consistently failing over the period from 2008 to 2016. These decreasing patterns seem to be threatening the stability of Sharia banks seriously. Islamic banks need to keep higher capital as the bank cannot patronize the debt market for short term liquidity demand. On the part of conventional banks, capital adequacy is continuously increasing in the majority of the GCC countries. This could be among the reasons why the stability of the banks differs, which needs to be investigated empirically. Therefore, the bank with lesser stability can be advised to take corrective measures and the bank with higher stability to reinforce performance.

After observing the decreasing rate of bank capital ratio in GCC, another bank-specific factor of significant influence on banking stability is the liquidity ratio (King, 2013).

However, Islamic banks are expected to hold liquidity assets higher than their conventional bank's counterparts, as Islamic banks cannot invest in the money market products because it violates the Sharia practice. Based on this, they face challenges concerning their liquidity management (Khan & Bhatti, 2008; King, 2013). The problem of low credit facilities to small and medium-term industries in the region could be due to the deterioration in the liquidity quality of Islamic banks in GCC and Non-GCC regions. More so, within the period 2012 to 2015 some of the Islamic banks defaulted in the region especially in Bahrain (Capivest Bank in 2012, Elaf 2013, BMI in 2014); UAE (Dubai World in 2012, Zawya Bank in 2015) all because their asset side of their balance sheets composed of illiquidity of assets. Similarly, following the decrease in the asset quality, the region has increased its default loan provisions which varies from 20 to 50 percent from 2011 (Ghosh, 2016). Therefore, assessing the practical effect of bank-specific variables on the stability of the banks in GCC and Non-GCC is necessary. This is to know the nature of their effects on stability in guiding the policymaking process towards ensuring and enhancing the stability of the banks.

Similar after bank-specific determinants, macroeconomic factors such as GDP, inflation, change in oil price and other institutional factors such as political stability and corruption control also affect banking stability (Demirguc-Kunt & Detragiache, 1999; Marcucci & Quagliariello, 2009). Table 1.2 and Figure 1.5 reflects the upward trending and downward trending of cyclical factors flowing the same trend with oil price fluctuation in GCC and Non-GCC countries. This could be sensitive in affecting the stability of the banking sector. From 2012 onward, the GDP of most countries started decreasing. This decline in economic progress and public revenue could lead to low government spending and borrowing from the banking sector and may cause a reduction in banking solvency (Mahmah & Kandil, 2019; Sidlo, 2017). Determining the effect of economic growth on the stability of the banking sector, empirically, will help in enlightening the banks to find alternative ways of utilizing their surplus funds. Moreover, oil price instability may likely affect the stability of banks adversely. This is in the sense that debtor may found it very difficult to sustain their business during the inflation period, and this could affect their ability to meet financial obligations.

Figure 1.7 shows the price of oil trending downwards from 2013 onwards, after recording a significant upward trending from 2010 -2012. As oil-driven economies, lower cost of the natural resource constitute a challenge by weakening the financial statements of the oil firms and state authorities. This indicates the evident influence of oil on the entire economy. The IMF (2017) reported that due to the oil price change, the entire GCC countries had witnessed a significant decrease in the growth rate of bank deposit from the highest figure of 16 percent in 2013 and first quarter of 2014 to the lowest value of six percent low in the second quarter of 2014 and 2015, respectively. Similarly, banks' credit growth rate of GCC countries also decreases by 11.7 percent high in 2012, to the first quarter of 2014 and the lowest figure of eight percent in 2015 and 2016. The study employed the influence of oil price change on banking stability. This is an issue which previous literature has overlooked, that influence in GCC and Non-GCC countries. Also, it claimed that appreciation in the price of oil contributed towards the expansion of Sharia banking services in the Middle East (Gazdar et al., 2019; Imam & Kpodar, 2013).

The Middle East is one of the well-known regions of high dependence on oil revenue, poor control of corruption coupled with political instability, such as Arab Spring 2011 which worsened the political environment in the majority of the countries. In Egypt and Tunisia, it resulted in the ousting of the political leadership of those nations. Furthermore, the political upswing spilt over to Algeria, Bahrain, Jordan, Lebanon, and Saudi Arabia demanding a change of political structure in the states (Zgurić, 2012). The political crisis resulted in the enormous loss of income and investment in the region (Khan, 2014). Moreover, the report of Transparency International (2017) ranked out GCC and Non-GCC countries very low in the corruption control index. Majority of the countries scored below the average index of 50, demonstrating a weak control of corruption in their political and economic environment. Therefore, we need to conduct an empirical investigation to shed more light on how the bank's balance sheets will respond to the effect of political instability and poor corruption control in GCC and Non-GCC state so that it will guide the policymakers in the policy design and implementation process.

Though conventional and Islamic banks have responded differently to financial shocks, the pattern of response of the Islamic banks to financial shock clearly shows that they are more resilient to financial shock than their conventional counterparts in the aftermath of the global crunch period. As sharia banks predominantly relying on sale-types instruments, which are more real and equity base (for example, Mudarabah, Musharakah, and Murabaha), then the instruments of conventional which are debt-based interbank money market, discount house instruments through which the conventional and Islamic banks share stability (Pappas, Ongena, Izzeldin, & Fuertes, 2017). This could result in a variation of stability persistency and measurement between the dual banks. This study will explore the existence of stability variation using different banking stability measurements.

1.4 Research Questions

Based on the understanding of the problem statement above, the broad research question of this study will endeavour to answer the following. Do conventional banks appear more financially stable than Islamic banks in GCC and Non-GCC selected countries? To guide the research, the succeeding specific questions emerged.

1. What are the effects of bank internal factors (Capital adequacy, Asset quality, and Liquidity) on banking stability of conventional and Islamic banks?
2. How do institutional factors (Corruption Control, Political instability) affect the stability of the conventional and Islamic banking system?
3. How do macroeconomic variables (Inflation, GDP and Change in oil price) affect the banking stability of conventional and Islamic banks?
4. Is there any stability differences between conventional and Islamic banks in terms of accounting or market-based stability measurements?

1.5 Objectives of the Study

The study aims to compare the level and extent of banking stability in conventional and Islamic banks in the GCC and Non-GCC countries. In this regard, the study will pursue following specific objectives:

1. To analyze the effects of internal bank factors (Capital adequacy, Asset quality, and Liquidity) on conventional and Islamic bank's stability.

2. To examine the impact of institutional factors (Corruption Control, Political stability) on the stability of the dual banking system.
3. To investigate the influence of macroeconomic variables (Inflation, GDP and Change in oil price) on banking stability between conventional and Islamic banks.
4. To compare the differences between conventional and Islamic banks in terms of accounting-based and market-based stability measures.

1.6 Significance of the Study

This work will contribute to the literature by identifying the combined efforts of bank-specific, and external factors which entailed institutional and macroeconomic elements which are linked to improvement in banking stability.

Furthermore, this study will expand on banking stability literature in GCC and Non-GCC nations, by exploring the relevance of market-based banking stability predictors. Moreover, understanding the influence these factors have on bank stability is meant for investors, policymakers on Islamic and conventional banks in adopting appropriate strategies to avoid financial risk and safeguard revenue and stability of the dual banking system.

Moreover, the study intended to enlarge the understanding of the early sign of banking default and will offer assistance in guiding regulators in clearly understanding the existing banks stability pattern as it relates to expected banking stability and to adopt the appropriate measures for improvement or corrections where necessary. The study looks forward to highlighting a supplemental test of predicting the stability of the banking system as another alternative in assessing banks solvency.

To find an alternative approach to the above historical data problem, the research intends to extend the works beyond historical records and venture into market information to evaluate various stability techniques. Islamic finance and Sharia scholars have theoretically argued that Islamic investment is financed through the "real economy" mechanism, since some of its products (such as *Murabaha, Ijara*, and *Istisna*) demand the involvement of investors in real assets. This gives them a higher tendency to absorb the shock of any financial instability (Berg, El-Komi, & Kim, 2016; Khan, 1991). Thus, this study attempts to adopt the Probability to default introduced by Black and Scholes (1972) and Merton (1974), to empirically, examine how the market measure will predict banking stability. This perspective will supplement the number of problems related to historical accounting information.

Additionally, the study will be valuable to the academic information in evaluating and assessing how change in oil prices influence Islamic and conventional banks' stability in GCC and Non-GCC states using Z-scores and Probability to Default. The previous reviews have established a relationship between banking stability determinants such as Non-performing loans and oil price fluctuations (Alodayni, 2016; Khandelwal et al., 2016). Thus, this is an attempt to create a relationship between the stability index of Z-score and a change in the price of hydrocarbons in energy-producing countries using conventional and Islamic banking data. Consequently, the study will positively add significantly to the general literature as it can serve as a material for reference and further investigation of oil and banking stability nexus.

Finally, the study will be carried out using panel information from ten different homogeneous nations within the cluster of GCC (Bahrain, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates) and Non-GCC countries (Algeria, Egypt, Jordan, Lebanon, and Tunisia). This may give the states an opportunity to team-up in making a collective decision to booster their financial system and strategy to deal with the persistent banking instability.

1.7 Scope of the Study

This study attempts to compare the variation in stability between traditional and Islamic bank financial institutions. According to Hussain, Shahmoradi, and Turk (2015), as of 2013, there are 410 Islamic banks worldwide. Assessing their financial data is an arduous task. However, this study focused on only ten countries with 281 banks, 233 conventional and 53 Islamic banks, based on the database available in Bloomberg and Bank scope from 2008-2016. An episode of political instability characterizes the period, drop in oil prices and the fall of Dubai World (Ghosh, 2016; IMF, 2013). Similarly, the International Country Risk Guide (ICRG) data is used for the institutional quality, for the macroeconomic data, the World development indicators are used as it is consistent with (Beck et al. 2013). Consequently, this is due to the limited availability of data, more especially in GCC countries (Bahrain, Kuwait, Qatar, Kingdom of Saudi Arabia, and United Arab Emirate) excluding Oman. As for the five Non-GCC, selected nations are Algeria, Egypt, Jordan, Lebanon, and Tunisia.

Furthermore, the GCC and Non-GCC set of countries have some common economic, political, and cultural structures as they are predominately Muslims. Similarly, the states are located in the Middle East and North African sub-region, regaining their independence relatively in the same period. They were operating a dual banking system of traditional and Islamic modes. The two regions remain the most significant home of Islamic banking (World Bank, 2018). The ownership structure of the banking system in the region consist of significant public control and private ownership, which take the form of domestic and foreign banks.

1.8 Organisation of the Remaining Chapters

The study contains five chapters and begins with introduction. The introduction consists of eight sub-headings that comprise the background of the study, together with the problem statement. Similarly, the research questions plus the objectives are drawn from the established section of the problem statement. The scope treats the entire picture and the coverage of the research of the study. Significance of this study is offered to identify the relevance of the study to literature and practice. Finally, the organisation of the study explains the summary of the remaining chapters of the study. Meanwhile, chapter two focuses on the review of the relevant literature of the banking stability from the conventional and Islamic viewpoints.

Chapter three discusses the theoretical framework, which is anchored on the financial intermediation theory, assets management and resource curse theories from the perspectives of conventional and Islamic banks. To attain this, the designed conceptual framework is presented in this section to summarise the idea on which the study was built. After that, the methodology and variable measurements are discussed. This followed by a hypothesis, estimation procedure and model specification. Meanwhile, the fourth chapter utilised the method for the conduct of the research. The last in the chapter is the study analysis of each specific model identifies in chapter three. Finally, five give a summary, conclusion, and even provide policy recommendations and give directions for future studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter will provide an insight into the related theoretical and empirical literature on the study area. This research work begins by looking at the concept of banking stability. Section 2.2 is the theoretical review. Under this, the underpinning theories related to the study such as theories of Financial intermediation, Asset management theory, Resource curse theory and Theory of Islamic banking system, are elaborated. Section 2.3 treats the financial structure of the GCC and Non-GCC countries. 2.4 look at banking stability determinants, which include Z-score and distance default. 2.5 presents bank stability predictors. Section 2.6 is the summary of literature gaps.

2.2 The Concept of Bank Stability

Stability in the banking system can be seen as a situation whereby the money market can supply capital funds to the needed business environment without turbulence in the system. A banking system is said to be in a stable condition if it can accommodate any market shocks without destabilizing the intermediation process of the financial institutions. Therefore, if financial sector fails to accomplish its fundamental role as a result of the detrimental influence of the shock on the financial economy, such institutions will fail to be stable (Babecký, Komárek, & Komárková, 2013).

The bitter experience of the global financial crisis (GFC) in 2008/2009 is still free in the minds of bank managers, shareholders, and state governments. During the crisis, as so many banks suffered severe losses and even total bankruptcy. That is why it becomes necessary to pay more attention to the bank analysis of insolvency and liquidity risk. In the period of the banking crisis, due to banking liberalization and globalization link, the distress of one bank in a particular country may spread to other nations, more especially if the banks are large. This will, undoubtedly, undermine the performance of the entire banking industry and the productivity of the whole economy. Thus, the banking crisis and financial crisis spillover usually give birth to systemic risk. Benoit, Colliard, Hurlin, and Pérignon, (2017) have viewed systemic risk as endemic as will spread through the network and engulf the entire market and its partakers will experience severe losses and bankruptcy.

The prominent bank stability measures are the capital ratio (equity/assets) Steinbacher and Steinbacher, (2014) and Z-score (Ghosh, 2014). The standard of the Z-score come as a result of the effort of Roy (1950) and further modified by (Boyd, Graham, & Hewitt, 1993). The tool indicates the possibility of bankruptcy and financial crisis. The lower the Z-score, the higher the tendency of crisis. Higher Z-score signifies lower tendency bank liquidation. It also indicates upper stability position of a bank. Because of its computational simplicity, the Z-score has become widely accepted among academics, as it can be used as the market share complementary tool. The simple logic of the Z-score is to measure bank liquidity level about its earning variability. This will indicate that capital can engage the volume of variability in earnings without the bank becoming bankrupt. With the capital ratio measure of bank stability, a bank with adequate capital will designate better value and more stability.

The study will make some comparisons between conventional and Islamic banks stability system to further find the significant determinant of stability. As the primary component of stability can be bank-specific, institutional, or macroeconomic, these variables have a substantial influence on bank stability. This is to escape further risk of insolvency and banking distress. A combination of stability and its determinants will serve as guide in the future on which set of variables will be used and at what volume, or it will be eliminated to evade crisis. Identification of the militating factors will ease the work of policymakers to jump into conclusions on how to maintain stability in the banking industry.

A financial system is said to be in a stable condition if it can direct financial resources to the needed and profitable business ventures without any predetermine hindrance. On the other hand, a stable financial system is capable of withstanding financial shocks without leaving funds seekers in limbo. However, the inability of the financial system to discharge its intermediation function makes it a failure, with grave consequences to economic development (Ashcraft, 2005; Babecky et al., 2010; Kandrac, 2014).

A sustainable financial system is the one that is capable of allocating funds effectively among business units within the passage period and accommodating financial turmoil. However, the distinguishing features between the financially stable system and banking sector is stability. The entire idea of stability comprises steady money and capital market of bank stability, a bank with adequate capital will designate better value and more stability.

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A sustainable financial system is the one that is capable of allocating funds effectively among business units within the passage period and accommodating financial turmoil. However, the distinguishing features between the financially stable system and banking sector is stability. The entire idea of stability comprises steady money and capital market and liquidy foreign market (Boumediene and Caby, 2009). Thus, to have a critical look at banking system stability, distinguishing between the typical kinds of banks becomes necessary, and this classification depends on the assets structure in the bank statement of financial position. The Islamic banking system has been sharia complying as it operates under the stratum of Muddaraba where profit and loss are shared among the parties (Ghassan & Taher, 2013). According to Ahmed (2010), the existing relationship between financing and production in the Sharia banking system keeps it away from financial jeopardies attributable to extreme leveraging and speculative dealings.

2.3 Theoretical Review

This section deliberates on the three relevant underpinning theories of the study. The combination of the arguments is the Financial Intermediation Theory which discussed how the bank, as an entity, intermediate financial resources in the economy. The Assets Management Theory looks at how banks as a financial entity use different mixtures of resources at its disposal to ensure the stability is affected when a party defaults in a contractual obligation. The Resource Curse hypothesis stresses how the bank is affected by natural endowments and institutional qualities in achieving better stability. Lastly, the Foundation Theory of Islamic Bank shows how the Sharia system guides the operation of the Islamic banking industry in performing their intermediation function. It shows how the operational framework of two banks that operate hand in hand in the study area varies.

2.3.1 Financial Intermediation Theory

This study is built on the argument of the financial intermediation model, the theory serves as the foundation theory. The theory of financial intermediation has outlined four significant roles that banks as financial intermediators play. These are the financial transmission, information management, investment supervisors and payments and as resource provider (Jaffee & Russell 1976; Leland & Pyle 1977; Hirschleifer & Riley 1979; Campbell & Kracaw 1980; Staglatz & Weiss 1981; Diamond & Dybvig 1983 Diamond, 1984 Williamson 1986; Allen & Santomero 1996). Banks, as a financial intermediators, take the task of intermediating funds from the surplus lenders to the borrowers. Deposit taking from different savers and channel it as loan facility to investors demanding capital and the interest spreads give a chance for the bank to generate revenue. The intermediary bank role that banks play emerged in an attempt to slash down the information and operation cost that increases as a result of information asymmetry that exists between bank lenders and borrowers (Pagano, 2001). However, with the advancement in banking operation and the sophistication of financial products, the function of business intermediation becomes more complicated and critical. In discharging their intermediation roles, banks may grant loans to higher risk debtor in anticipation of higher earnings. Pinteris (2002) has argued that this behaviour is widespread among banks in a highly concentrated environment in an attempt to maximize earning to the detriment of the creditors.

Benston and Smith (1976) have noted that banks, as information managers, in discharging of their function, have to obtain vital data about their clients (creditors and debtors). The colossal information that the bank acquired about their customers makes them information producers and managers. Therefore, it is obligatory on the banks to keep all information regarding their customers secret and confidential (Campbell & Kracaw 1980).

Another function of bank is supervising investment for banks creditors or delegated monitoring. Banks work as the agent that represents their creditor in investing financial resources on their behalf. Diamond (1984) claimed that banks performed intermediation role to reduce the cost attached to information monitoring. Diamond, in his theory of Delegated Monitoring, labels banks as an agent that is assigned to act on creditors' behalf and similarly represent creditors in tackling information asymmetry hitches. For banks to protect creditor interest and performed their trade diligently, they have to conduct monitoring roles in the mode of business operations of their borrowers. In attaining this goal, the bank needs to exhibit professionalism in distributing creditors' funds to productive and profitable ventures with limited attached business risk. Going by these rules would guarantee the stability and liquidity of the bank (Buston, 2016). Similarly, failure by the bank to manage both human, material and information increase tendency of default.

The function of the payment system and financial resource provider, according to Schuh and Stavins (2010) include the provision of financial services that will lead the banking industry to the domination of the financial system. The payment system role allows the bank to transfer funds in liquid form or in the form of electronic transactions from one person to another. In performing the financial service provider role, banks undertake services like accepting a deposit, granting loans, money transfer, international currency swap, among other prescribed by law. Since banks performed such excellent functions in the financial industry, it is essential for the bank to operate in a quality environment. Levine, Loayza, and Beck (2000) and Shaw (1955) acknowledges the relevance of financial intermediation in real economic activities. The qualitative sector will improve bank stability as it will also enhance the productivity of the entire system. On the opposite, poor institutional quality could create instability in the banking industry, which could destabilize the economy. Financial intermedation looks at the effects of the financial structure on economic progress in different ways (Levine, 2000). Bank centered view see banks as an institutions that foster economic progress to a greater point than market-centered system, especially at the early stage of economic growth. Secondly, from the market-centered view, the emphasis is on how the markets provide a financial support services which can stitmulate competitation and a longer horizon growth. Thirdly, from the legal-centred view, it is argued that sound institutional quality shapes the financial serves such as legal system La porta et al. (1998) and political factors (Fohlin, 2000).

2.3.2 Asset Management Theory

The portfolio asset management theory has stated that lending institutions must require higher returns by slashing the level of risk and making the appropriate provisions to hold liquid resources. The theory is in support of the need to maintain a short-term liquid asset to soften the consequence of market uncertainties during the intermediation function of the bank and to request for further liquidity. However, banks lend to customers who are keen to repay interest at the higher rate and are not expected to default on their obligation. Banks can meet liquidity requirements without the need to bear enormous costs. According to

Brunnermeier and Pedersen (2008), banks did not only dependent mainly on the asset to finance its operations but, also, they are hugely funded by collateralized borrowings that do not depend on at the period of financial misery. This is the type of facility that offers the lender a priority claims on a given asset and a general entitlement on the borrower 's other assets. The quantity of liquid assets supposed to be held by the banks depends on the apparent requirement for liquid funds and deposit stream; the situation depends on the financial market and the country direction of the commercial strategy (Edem, 2017).

From a theoretical account, Sharpe (1964) has asserted that a well manage portfolio, bank internal factor risk ($\delta^2 e_{it}$) can be minimised to the point which is equals to zero, leaving the systematic risk or the external factors ($\gamma_1^2 \delta mt^2$). The systematic factors changes is accompanied with the instability in cyclical factors whereas the haphazard factors rely on the bank internal factors ($\delta^2 e_{it}$).

Banking Stability = Internal factors + External factors

BS = $\delta^2 e_{it} + \gamma_1^2 \delta mt^2$

2.3.3 Resource Curse Theory

Richard Auty, in 1994, first highlighted the concept of the resource curse. The theory express the phenomenon of how the economic performance of the natural abundance resource nations worsens compared to nonnatural resource-based countries (Auty, 1994). The general idea is that the natural resources can be transformed to be more of an economic curse to the nations than a blessing to middle-income economies. The paradox presents robust evidence that mineral resource exportable (oil wealth) transmits three adverse effects such as political instability, corruption and eventually trigger violent confrontation in the law and middle-income nations (Ross, 2015). This evidence was further reaffirmed when mineral resource abundance was related to inadequate economic progress (Sachs & Warner, 2001).

However, most scholars believed that the influence of the resource curse theory is not universal. In essence, a specific set of countries or regions express the condition (Venables, 2016). Natural mineral is the crucial source of commercial rent, which creates colossal income to control group even with an absolute presence of political stability and broader commercial progress. They exist a potential move for resource control from government agencies or parastatals for access to more significant resource share or element of corrupt practices. Such behaviour is capable of eroding the capacity of the authority to efficiently perform (Ross, 2012). Moreover, even with the level of political stability in countries with natural resource, exporting advantage tend to be undemocratic and mostly corrupt (Ross, 2011). This theory relates to political instability, conflict, and corruption with primarily oil-producing countries. This has a significant influence on all economic and financial activities in the states.

The resources curse theory drove its origin from the works of Corden and Neary (1982) in their Dutch Disease hypothesis. Firstly, the Dutch Disease theory was popularised through the effort of Sachs and Warner (1995). The model statistically established an antagonistic relationship between mineral resources abandonments and economic progress. In a financial world, the Dutch Disease is denotes the simultaneity of boosting one sector of the economy and lagging behind in the areas of traded products in the economy. The sector that is booming pressures the sub-sectors that are lagging behind through the pulling of resources and causing a relative rise in the price of non-traded merchandise (Corden & Neary, 1982).

2.3.4 Foundation Theories of Islamic Banking

According to the Islamic Development Bank (2015), Islamic banking system recognizes only two sources of Islamic legal system (Sharia law). These are:

a. The Holy Quran and Sunnah: these serves as the primary source of law since they derived their origins from divine revelations and the work of the Holy Prophet (P.B.U. H).
b. The interpretation (Ijtihad): this is the second source which refers to the collective understanding of religious matters by scholars.

The Sharia law guides all the operations and undertakings of the Islamic banking sector. An Islamic bank is seen to be very much alike with banks in the traditional banking industry but it varies on only in the principles followed by the Islamic banks (Chong & Liu, 2009). Such areas of variations are:

I - The Prohibition on *riba* (usury means excessive interest rate).

II - The prohibition on *gharar* (uncertainty means speculations).

III- The prohibition on funding illicit sectors (for example, alcohol, drug trafficking, and pork trading).

IV- The dominance of justice.

Thus, the traditional banking system does not observe the values above. More so, profit maximization is the only motive of the conventional banking system.

The operations of Islamic banking is separated into ten products and services as given below:

1- *Mudarabah* contract (benefit-sharing): these services take effect when a bank grants the entire capital. Profits are shared based on the prearranged ratio. On the whole, the bank is responsible for any business losses (Beck et al., 2013). This indicates that a limited liability clause protects the investor. While the customer will benefit from the absolute possession of his business, but the bank has to agree on all significant investment decisions.

2- The *Musharaka* agreement (joint venture): this mode of service happens when the bank is presented as shareholders, while the profit and losses are borne by all investors, respectively. Though, this depends on the volume of assets and equity of the partnership.

3- *Murabaha* contract (Cost-plus sale contract): the Islamic bank perform this service when it purchases given merchandise on behalf of a client. It then retains ownership of the assets or facility and then offers a rental fee paid for the usage based on available deals under Sharia legal system. With staggered fee payment or full payment of the agreed sum, the customer takes the position of the assets. Operating leasing (*Ijarah*) is very similar to a commercial banking leasing contract.

4- *Wadea'a* (safekeeping): this is a form of loan deposit to the bank (*Amanah or Qard*). It is seen to be very similar to demand deposit in the traditional banking environment globally. The deposit does not attract any interest rate, but it becomes part of the bank's earnings. More so, some scholars have argued that such a deposit might attract bonus payments to customers.

5- *Bai ul muajjal* (credit sales): this service is a form of contract bank as the client can demand specifications as guided by the Sharia system on the types of goods or services. The bank can make an advance payment while the merchandise follows shortly.

6- *Qard Hassan* (non-interest credit or benevolence finance): this service deals with entirely non-interest loans. The only benefits to the bank are loan processing fees.

7- Ordinary loan agreement: Islamic law does not allow the payment of interest on loan facilities. Under this service, the bank will acquire the assets for the client and retains the ownership of the assets until the customer made the last instalmental payment. At that moment, the customer becomes the outright owner of the assets.

If the client fails to meet the agreement by default payments, the bank has the right to dispose of the assets.

8- *Ijarah* (operating leasing) that terminates without ownership: this service allows the bank customer to utilize fixed assets of the bank or service for a given time based on price as guided by Sharia legal system.

9- *Ijarah* (leasing) that carries possession: under this service, both the bank and client contribute to the purchase of the assets, but the bank takes the lion share payment. The client pays a rental fee for utilizing the assets. But they both share any improvement in equity as well as the decrease. The last payment guarantee transfer of full ownership of the property to the client.

10- *Sukuk* funds (Islamic bonds): This service provides Islamic bonds with a guaranteed return on investment. This is done with full adherence to Islamic law by prohibiting interest rate. Sukuk certificate indicates full possession of assets involving a specific project or business venture. The Sukuk investor is entitled to all benefits generated by the issued assets. The trading of Sukuk bonds is similar to the disposing of a share of the given tangible assets. A Sukuk investor holds an ordinary share of the ownership of the property or asset. But this does not signify any debt owed by the bank that sells the bonds. Similarly, contrary to conventional obligations where the investor has the right to receive his claims at a given time, the Sukuk holder benefits in all the profits made in the relationships. The sale of the Sukuk bonds is equivalent to the disposal of a share in the property (Abedifar, Ebrahim, Molyneux, & Tarazi, 2015).

Finally, the Islamic banking system performed its activities utterly without attracting any interest rates compared to what obtains in the conventional type of banking. The ability of the Islamic bank's products to compete with that of conventional banks determines their stability in the market. However, most of the recent empirical studies on bank performance and stability were carried out on the conventional system of banking because of the availability of data compared to the studies on interest-free Islamic banking which new and data for its study remain insufficient. More so, even in most countries that possess the dual banking system operating in there, the conventional banks outnumbered the proportion of Islamic banks (Bank scope, 2013).

Table 2.1 outline some of the areas of comparison between Traditional and Islamic banks

Table 2. 1
The Comparison between Conventional and Islamic Banking Industry.

Criteria	Conventional Banks	Islamic Banks
Alternative names	Conventional banks	Non-interest bank
	Commercial banks	Sharia compliance bank
The main objectives	Profit maximization	Islamic legal compliance
Committee on Supervisory	Board of Directors	Sharia Supervisory Board of Directors
Sources of regulation	Central banks	Quran, Sunnah, and Ijmah
Product and services	Commercial funding	Murabaha
	Profit and loss	Mudharaba
	Joint venturing	Mousharaka
	Operation leasing	Ijara
	Accepting deposit	Amanah, Quard or Wadeea
	Issuing bonds	Sukuk bonds
	Insurance services	Islamic insurance
	Delayed payment and late delivery	Istisnah

Sources: Standing Committee for Economic and Commercial Cooperation (2016)

There are conceptual differences that exist between conventional and Islamic banks. Islamic banking does not allow paying and receiving of interests (Riba) as it forbid all forms of immoral operations (such as alcoholism, gambling, and drug trafficking). In the context of conventional banking, these are factors that do not attract any significant attention. So it is expected to accumulate more profits compared to Islamic banks. Similarly, Islamic banks venture more on equity financing rather than to invest in debt financing. This gives Islamic banks an adge over their conventional ones as they are more adequately capitalized (Al-gazzar, 2014; Beck, Demirguc-Kunt, & Merrouche, 2013a).

2.4 Profile of the GCC and Non-GCC Financial Structure

This segment explains the financial background of the GCC and Non-GCC set of countries. The sampled countries fall within the amalgamation of the Middle East and North African (MENA) countries. The countries serve as the hubs of both Islamic and traditional conventional banking system. MENA is the leading region in terms of global petroleum resources export, especially the Gulf countries whose economic growth relies on the export of oil. Eight out of the 12 Organisation of Petroleum Export Countries (OPEC) are from the Middle East set of states (OPEC, 2019). According to World Bank report (2015), the Middle East banking assets accounted for 85 percent of the financial assets higher than any region, with 48 percent for emerging Asian states, 41 percent for developing European countries and 35 percent for the Latin Americas.

2.4.1 An Overview of GCC Countries

The meeting of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates in May 1981, led to the formation of the Gulf Cooperate Council (GCC). The region holds a significant portion of 30 percent of the global petroleum resources reserves. As a result, the region supplies more than 25 percent of the world's demand for hydrocarbon (Srairi, 2010). The Gulf countries share features of socio-economic and political commonalities. The exploration of hydrocarbon drives all the member nations' economies. Bahrain is the major financeir of the council. Since the countries are oil-dependent business structures, the macroeconomic strength of the regional states is tremendously sensitive to global petroleum product price variations. As severe consequence of this is that the present trade in balance has exposed them to uncertainties in oil price fluctuations. Such have significant impact on the countries' real sector activities and, ultimately, on the implementation of government financial obligations (Khamis et al., 2010).

Historically, the oil prices depressions of the 1980s left the region with nasty experiences and negative economic growth (Srairi, 2010). It remains evident to note that since the Gulf region countries heavily rely on the price of gas and oil; they are more exposed to symmetrical shocks (Al-Hassan, Khamis, & Oulidi, 2010). Consequently, the similarities in the financial structures of the Gulf nations suggest comparable strengths as well as weaknesses in their economic systems. However, the region has transformed into a universal financial giant as an effect of the rise in hydrocarbon prices. Thus, the aggregate economic growth has exceeded the average world rating (IMF, 2010).

The GCC is the union of nations with standard features. In 2001, the union indicated its commitment to establish a joint economic and monetary policy. In the year 2008, they proposed a single currency and market structure very close to that of the European Union (EU). Though the dream is not yet to be realized, all member nations are committed towards the execution of policies coordination through reduction of transaction cost and to create a stable financial environment for foreign investment (McDonald & Al Faris, 2010). To achieve such predetermined objectives and respond to global financial challenge, the regional regulators have adopted a financial liberalization scheme to soften the free flow of financial resources such as trade deregulation and promotion of support for foreign investments throughout the member countries.

The financial system of the GCC nations is mostly banking based, which is dominated by a small number of national banks that are owned by governments and their cooperating agencies (Al-Obaidan, 2008; Čihák & Hesse, 2010; Hasan & Dridi, 2011). The financial system in the GCC and Non-GCC countries are dominated by combined conventional and Islamic banks contributing over 65 percent to the financial system (Alqahtani and Mayes, 2018). The average annual growth rate of the financial institutions in the region was about 8.5 percent from 2010 down to 2017 (IMF, 2018). The banking system is regulated by enforced entry restrictions and license restrictions against foreign players in the region. However, Bahrain remains an exceptional country with flexible rules that entertain foreign ownership and operation. Subsequently, cross country banking is still comparatively weak in the Gulf region as it is financially managed by a few or single branch networks (Turk-Ariss, 2009). However, restriction to entry consequently limits the capacity of banking operation and its competition. Banks are likely to experience higher profit and capital structure cushions. This is similarly to bearing excessive risks with a positive consequence for banking stability (Beck, Jonghe, & Schepens, 2013).

The primary source of funds in the GCC region is the traditional deposit and credit. But the availability of foreign liabilities as another source of finance is still constrained. In 2006-2007, the region experienced sharp growth in the interbank liabilities in Kuwait, Oman, and Qatar. Arguably, the banking asset portfolios of those countries composed mainly of loans and securities funding and Islamic interest-free financing products, constituting more than 50 percent in the kingdom of Saudi Arabia and 71 percent in the United Arab Emirates (Al-Hassan et al., 2010).

The capital structure of the banking sector, within the gulf regional council, is more than the minimum requirement by the international standard in contrasts (Louati et al., 2015). According to Hancock Laing and Wilcox (1995), banks in the Gulf regional council have risen their capital structure as a cushion against universal market shocks. A banking institution is believed to be adequately funded when its equity/assets ratio surpasses 10 percent, and its operational mode is better described with assets quality and better profit generation (Islam, 2003). The contagious effect of the GFC is still fresh in the minds of bankers as it seriously changed the position of their bank balance sheets (Al-Hassan et al., 2010; Louati et al., 2015; Pappas et al., 2017).

In recent times, Islamic banks have grown into a significant pillar of financial intermediation within the Middle East, Africa, and the entire world. The Middle Eastern region accounted for 70.9 percent of the global Islamic banking assists, followed by the Asian countries, with 22.7 percent assets share of sharia financing. The sharia financial assets in the Middle East is approximately divided between GCC countries, 35.6 percent, and non-GCC member with 35.3 percentage point. In 2015, the Gulf regional council-controlled more than 35 percent of an estimated figure of ($178 billion) of Islamic finance assets concentrated within three countries namely: Bahrain, Kuwait, and the United Arab Emirates. Interests in conventional banks portfolio are widely more diversified in the region. This is to handle the demand of capital deficit in the economy.

Though the waves of the global financial crisis have affected both the traditional and the Islamic financial systems on a significant scale, the Gulf countries have comparatively showed sustained a favourable financial and economic recovery regime along with vibrant growth for both banking institutions. Generally speaking, the oil price boom has helped the region to recover quickly. And, in line with such success, still, the place still suffers from limited global financial resource participation (Espinoza & Prasad, 2010).

The Gulf and non-Gulf countries are vulnerable to the drop in hydrocarbon demand and price than to a massive reduction in the economics of the European market which affected global financial development in 2009. The Gulf Cooperate Council countries pursue substantial cash reserves to alleviate any sizeable systemic risk and any persistent fall in the price of hydrocarbon over the short and medium terms. To confront inflationary pressures, majority of members of the regional council have planned to slash government expenditures to save their economies from warmness and to advance sustainable fiscal development (Espinoza & Prasad, 2012). Inflation must be reduced as it influences the exchange rates. The GCC states have tightened their currencies and economic transactions with the US dollars to prevent possible currency variation being the source of risk for sharia banking institutions (Kayed & Mohammed, 2009).

2.4.2 An Overview of the Banking Situation in Non-GCC Countries

The Non-GCC Countries is a set of countries located in the Middle East and some parts of the North African subregion. They comprise of Algeria, Egypt, Jordan, Lebanon and Tunisia. These countries belong to high and middle-income categories of a nation. Their rapid economic growth relies heavily on oil and gas exports (Baffes, Kose, Ohnsorge, & Stocker, 2015). The Non-GCC region's financial system is classified as banking based, where both the conventional and Islamic banks control the majority of financial sector flows and possess most of the financial assets (Graham, Nikkinen, Kiviahu, & Omrah, 2013). The conventional and their Islamic bank counterparts are the main drivers of the financial sector, rendering a wide range of banking services like deposit, advances, leases, and payments. The family-controlled and state-controlled dominated the ownership structure of the banking sector in the region with high concentration level. The highest level of bank concentration exists in states like Lebanon and Egypt. The bank assets of three largest banks accounted for more than 79 percent of commercial banks, where the entry of the new competitor is difficult (Kobeissi, 2004). Nevertheless, the average banking sector assets in these countries accounted for about 60 percent of their GDP growth.

2.5 Banking Stability

The 2007 global financial crisis became one of the most determining factors for the considerable increase in studies relating to banking stability. Banking stability becomes an essential motivator of economic growth. A trusting relationship exists between financial stability and a country's real productivity. The policymaker uses the link between banking stability and economic growth as the tool for monetary policy and financial projections. However, the stability of the banking environment has a significant influence on banks' earnings and sustainability. Hellmann et al. (2000) are of the view that the banking sector's profitability increase attracts a high-risk premium and consequently deteriorate the stability of the sector.

However, an intense argument among researchers, policymakers and in management circles (Berger, Klapper, & Turk-ariss, 2009; Maghyereh & Awartani, 2016) is that banking instability is a sign of banking regulatory weakness and feeble financial sector discipline and competition which will result in the creation of resilient banks.

Based on the works reviewed so far, the majority of the researchers had looked at the traditional commercial banks (Cubillas & Gonzalez, 2014; William, 2014) when compared to Islamic banks with a limited number of empirical studies conducted to evaluate the stability of the banks in correlation with traditional banking (Ghosh, 2014; Beck et al., 2013; Pappers et al., 2016; Ibrahim & Rizvi 2017). However, a significant number of studies adopted Z-score as the determinants of bank stability. The capital ratio is another indicator used by scholars to indicate the stability of the banking industry (DeYoung & Torna, 2013; Schaeck & Cihak, 2014). Similarly, there is a particular category of studies that evaluate the indicators of banking stability by non-performing loans (Bucher, Dietrich, & Hauck, 2013; Cucinelli, 2015; Mileris, 2014; Ouhibi et al., 2017). There is wide-ranging literature that evaluates banking stability through lease square regression (Bourkhis & Nabi, 2013; Fu et al., 2014; Jeon & Lim, 2013; Srairi, 2013).

2.5.1 Determinants of Banking Stability with Z-score

From the institutional perspective, Z-score is utilized to foresee the stability of the banking sector through CAMEL assessment (Fu, Lin, & Molyneux, 2014b; Lee & Chih, 2013; Liu, Molyneux, & Nguyen, 2012). In the international scene, Cubillas and González (2014), using bank data of developed and developing nations from 1991- 2007, have come up with the idea that the random effects reveal that bank competition generated by liberalization reform increased the risk exposure of the banking sector. More so, the expansion of bank capital by regulators naturalizes the negative consequences of competition. Similarly, Chalermchatvichien, Jumreornvong, and Jiraporn (2014); Jeon and Lim, (2013) and Williams, (2014) also determined bank stability through Z-score using a combination of banking and institutional predictors. They found that the predictors pointed to achieving higher stability.

Concentrating on the bank-specific and macroeconomic factors, Rajhi & Hassairi (2013), using data from MENA and South Asian sub-region, found that bank efficiency and prize increase reduced banks stability. On the other hand, institutional size, bank intermediation quality, liquidity, and industrial growth enhanced banks stability. The findings are supported by the work of Cihak & Hesse (2010), who revealed that an increase in bank expenditure over income increases the tendency of the bankruptcy of financial institutions. The outcome of the investigations indicates that management has to attract customers to patronize loan facilities by slashing lending rates and, at the same time, improve in their cost efficiency.

In an attempt to confirm the Islamic bank's resistibility, Faye, Triki, and Kangoye (2013) combine Z-score and capital ratio as the stability indicators with African bank data from 2005 to 2012. The outcome of the study reveals that bank size had a significant influence on bank stability, just as the quality of monitoring and improvement in economic growth aided the capital. Moreover, state regulatory reforms supported the stability of the banking sector through solvency.

Beck et al. (2013) have argued that Islamic banks in the GCC appeared to be more stable and able to continue operation during the financial crunch than their conventional counterparts because of the increasing value of Z-score (Al-Khouri & Arouri, 2016; Cihak & Hesse, 2010; Hasan & Dridi, 2011). The study further revealed that banks with higher value of the fixed asset and non-interest incomes were less likely to face bankruptcy. This this feature is found to be very common among smaller banks. On a similar note, Bourkhis and Nabi (2013) have justified the work of Beck et al. (2013) with his larger international sample of 16 countries. The study found bank efficiency of small banks increased the value of Z-score. This proved to be higher than the Z-score of the larger banks. The quality of the two studies could have improved if multiple indicators of stability, such as NPL and capital ratio were used.

Srairi (2013) contends the argument which proved that Islamic banks are less risky and stable. In his approach to using MENA bank data, he claims that conventional banks are resistant to the instability of 2007 as their management quality ratio increased the Z-score value significantly. The study found that banking businesses owned by families tended to be far away from the probability of bankruptcy. However, according to Ghosh (2014), the 2007/2008 financial crisis did not affect banking stability in the Gulf countries. He added that increase in capital requirement increased the z-score value.

In his attempt to identify the factors that were responsible for making banks resilient to banking crisis, Kohler (2015) found capital adequacy, fee incomes, interest margin, and economic development to improve stability score. The price increase, bank size and asset quality led to growth and increased bank instability measured by Z-score.

The collection of empirical literature on banking stability between the conventional and Islamic banks remain with an inconsistent outcome. In contrast, Islamic banks, based on their foundation theory, appeared to be more capitalized as they venture more into equity financing than their traditional conventional counterparts. So they are less unstable (Khediri, Charfeddine, & Youssef, 2015). On the contrary, the conventional banks appeared to earn more profits as their operations did not consider religious principles (Chong & Liu, 2009).

To find relevant information to aid the understanding and configure the conventional bank stability and its determinants, researchers came up with various means to explore the relationship. Nguyen et al. (2012) worked on the stability factor of commercial banks in the four sub-Asian countries namely, Bangladesh, India, Pakistan and Sri-Lanka from 1998 to 2008. Adopting the Dynamic panel technique of moment condition, the study reveals that bank size, non-interest income, bank capitalization, financial growth, and cyclical economic growth are responsible for the banking solvency by Z-score. The finding tallies with that of Horvath, Seidler, and Weill, (2014) on the Czech Republic. In other words, while bank concentration and ex-post credit loss decreased the stability index pushed banks to the default line.

While supplying the position of Nguyen et al. (2012), Jeon and Lim (2013) explored the impact of competitive banking environment, bank internal factors, and cyclical economic factors on bank Z-score of Korean banking data from 1999 to 2011. The study adopted the OLS estimation technique and found that the competitive environment of the Korean banking sector was significantly positive and responsible for the stability of the banking sector. Furthermore, the study pointed out that saving banks appeared to be more stable and resilient to risk than their commercial pairs.

When extending the literature to American sub-continent, DeYoung and Torna (2013), used the data span of US bank from 2007 to 2010. The statistical technique reveals that banks' stability was significantly affected by bank capital, liquidity, goodwill, and non-performing loans. The most significant contribution of this empirical work is the test of a new variable of goodwill to banking stability which was not tested or received practical consideration before now. In summary, the review of the empirical literature on banking stability reveals that conventional banks attained a high level of banking stability and distance to default following their outstanding profits making.

On the collection of literature that investigates the stability of Islamic with Z-score. Cihak and Hesse (2010) have used cross country data analysis of 77 interest-free Sharia banks from 1993 to 2004 to determine banking stability. According to them, the efficiency ratio reveals negatives but significant relation with z-score. This indicates that Islamic banks are not very efficient in managing their expenditures as they spread above the generated income. This pushes them to the probability of default. Similarly, the loan quality variable affected their stability index inversely. Finally, larger banks appeared to be more stable and resilient to risk. The study omitted crucial bank stability determinants such as capital adequacy and the liquidity position of the banks.

In their attempt to explore the Islamic bank stability determinants in the MENA and some Asian states, using bank data period from 2000 to 2008, Rajhi and Hassairi (2013) found the size, loan quality, liquidity and macroeconomic growth reasons for banking stability, while management efficiency variable and inflationary rate lead to banking instability. The work could have been more robust if multiple stability indicators were put to the test.

Diverting the investigation on Islamic bank stability to Africa, Faye et al. (2013), using Islamic bank data span from 2005 to 2012, found Islamic capital buffer significant and positively affecting banking stability through bank size. Similarly, the study found GDP growth and qualitative banking supervision as essential elements to support the capital ratio. Moreover, top banking policies by the regulators aided to ensure banking stability and fewer default tendencies.

2.5.2 Determinants of Banking Stability with Probability to Default (PD)

Harada, Ito, and Takahashi (2013) used distance to default (DD) as the market base measure of Japanese banking credit risk to assess the bank failure prediction power of the variable. The study found the distance to default to be a better indicator of banking failure and healthier in predicting insolvency than another conventional index. The work of (Kabir

& Worthington, 2017; Kabir et al., 2015) supported the prediction power of distance to default in evaluating the probability of banking solvency risk in Islamic banks.

In the latest financial crisis of 2008, Zhang, Xie, Lu, and Zhang, (2016), using the 2900 bank holding company data of the United States from 2003 to 2012, adopted distance default to predict the probability of financial institution distress/insolvency risk. The result shows a robust positive relationship between DD and the predictors of bank-specific variables (loan loss reserve, Capital ratio). DD remains a reliable indicator when used as the predictor of financial default.

To confirm the predictive capacity of DD to Islamic banks over Z-score, Hassan, Khan, and Paltrinieri (2019) used the selected bank data of the Organization of Islamic Cooperation Countries ranging from 2007 to 2015 of both Islamic and conventional banks. Using crisis and post-crisis simultaneous regression, the study reveals that credit and liquidity risk are negatively related to banking stabilities. Similarly, the result confirms the better managerial efficiency of conventional banks over Islamic banks.

2.6 Banking sector stability predictors

Recently, various factors (bank-specific, institutional, and macroeconomic variables) influence the stability of the banking sector. In this light, the variables below will be reviewed to see how they affect z-score value.

2.6.1 Capital Adequacy Ratio and Banking Stability

Capital adequacy aids the financial institution to cope with financial tremors which perhaps, precipitate banking crises. Bank leverage is found to be akin to "braking distance". The higher the bank capital, the longer the distance between the institution and financial failure. Hence, the greater time at the disposal of management to sight approaching peril and come with decisions that will enhance the lending institutes chances of survival (Berger & Bouwman, 2013).

Ghosh (2014); Köhler (2015); Liu et al. (2012); Tabak, Gomes, & Medeiros (2015); Williams (2014) have argued that bank equity formation is stringing its ability to resist the risk of bankruptcy. Similarly, the argument and findings are favored by Wahid and Dar (2016) in the work done in Malaysia. In contention, the empirical study of Tabak has proved that access bank capital pushed the banking industry to instability by reducing the value of Z-score of banks. Kochubey and Kowalczyk (2014) and Moussa (2015) have supported the discovery in their Tunisian empirical investigation.

Some studies have reported that there is no stringent relationship that exists between quality capital requirement and banking risk. Demirguc-Kunt and Detragiache (2011), using 3000 bank data in 86 economies, have recorded that regulated capital requirement shows no robust relationship with the risk of banking measured by Z-scores. Conversely, Barry, Lepetit, and Tarazi (2011); Delis, Tran, and Tsionas, (2012) and Srairi, (2013) have not established any link between bank capital adequacy and bank stability value of Z-score. Although improving on bank capital structure is a healthy move that influences banking liquidity, money creation, and stability. Thus, a bank with enough equity is in a better chance to deal with credit shocks since the financial crisis comes with economic modification (Gambacorta & Mistrulli, 2004).

Bridges et al. (2014) have claimed that demand to increase equity capital by banks leads to a reduction in bank credit growth and money creation. However, the official capital declaration is a challenge to bank competition. Putting higher capital beyond bank equity level is entirely reliant on a market condition. This reform becomes an external hindrance to the banking processes (Yeboah & Agyei, 2012). The theory has predicted that any foreign constraints that affects the banking business operation, temper with bank short-term profit making and undermine its stability and long-run survival. Therefore, higher regulatory capital can reduce the occurrence and cost of banking default (Dewatripont & Tirole, 1994). Decisively, both theoretical and experimental literature is not as decisive as to whether stringent capital regulations decrease banks risk-taking and transform their lending rates.

The major technique used by studies that assessed the effect of bank capital on banking stability Cihak and Hesse (2010); Beck, et al. (2013); Ghosh (2014) and Kohler (2015) is the traditional panel approach. Soedarmono, Machrouh and Tarazi combined both traditional and dynamic panel approaches for the robustness of their model. Results of their studies indicate that although the Z-score model is capable of suggesting a bank default, it does not offer market information about the Probability of the default model. Similarly, they failed to account for the long-run relationship between capital on stability Z-score of the banking sector. Therefore, further studies on the extent of conventional and Islamic banks resistance to default and long-term stability is required for better performance. Whereas Beck et al. (2013) and Ghosh built their stability model on the basis of the capital buffer theory and financial intermediation theory, Hassan, Khan and Paltrinieri (2019) concentrated on the stability of the relationship established through the reserve and asset management theories.

2.6.2 Asset Quality and Banking Stability

This study views the reserves of bank loan loss from the signalling hypothesis argument. The focus of such banks is to send financial signals to outsiders about the loan portfolio quality of their bank (Kanagaretnam, Lobo, & Yang, 2005; Wahlen, 1994). Concerning asset quality variable, the loss reverse ratio reveals the quality of the bank loans and measures the possible threat that could be linked with bank operations, especially lending and investing. A higher value of the variable reflects a lesser loans quality, thereby indicating a problematic condition for the banking sector which requires the advancement of credit facilities and appropriate risk management techniques. Loan loss is affected by external influences such as economic crisis and regulatory requirements (Berger & Mester, 2000). The relationship between bank loan quality and stability measure of the banking sector in some recent works has shown that there is no consensus on the direction of the Nexus. Zhang et al. (2016) have confirmed that banks with more extensive loan reserves portfolio experience significantly higher stability index. The scenario has motivated banks to accumulate a large volume of the loan loss portfolio to distance themselves from insolvency risk (American bank's data from 2003 to 2012). The outcome is contrary to the position of Soedarmono (2011); Beck et al. (2013); Berger, Klapper, & Turk-ariss (2009); Bourkhis & Nabi (2013); Rumler & Waschiczek (2016); Wahid & Dar (2016) who noted that substantial loan collections drop the banking stability and draw banks to risk-taking behaviours. Ghosh (2014) has maintained that there is no variation of instability and risk of bankruptcy between the traditional conventional and interest-free Islamic banks in terms of loan quality. On their part, Alandejani, Kuta and Samargandi (2017) found contrary results whereby loan reserves increased the conventional banks' solvency and eroded the stability of Islamic banks. Concerning the estimation techniques, Alandejani et al. (2017) did a good job as they applied the clog-log and discrete period estimation approach. This is contrary to other studies which reviewed the nexus between the reserved loan loss and stability using the traditional panel approach of least square. Based on the Z-score measurement and the bank data span of 23 countries from 1999 to 2005, Berger et al. (2009) have warned banks to desist from over lending as it increased bank resistance to bankruptcy and rendered them unstable. Contrary to prior findings, Akhtar and Akhtar & Ahmad (2016) found no significant connection between the asset quality and banking stability of Islamic banks in Pakistan. Using the least square approach of estimation, the study predicts the relationship between the two variables through the theory of agency and financial management theory.

2.6.3 Bank Liquidity and Banking Stability

The relationship between bank liquidity and resistance to bankruptcy in the literature remains inconsistent. Higher liquidity ratio indicates that the bank is proned to the danger of business defaults. This indicates that the bank has credited up abundantly. In other words, that bank's solvency level remains very low. This view is held with a kin interest in the literature by (Agusman, Monroe, Gasbarro, & Zumwalt, 2008). Hassan (2010) claims that a more significant figure of bank liquidity ratio halts banking defaults (Altaee, Talo, & Adam, 2013; Bourkhis & Nabi, 2013; Degryse, Ather Elahi, & Penas, 2013; Rajhi & Hassairi, 2014; Wahid & Dar, 2016). The work of Adusei (2015); Bustaman, Ekaputra, Husodo, & Prijadi (2017) found no significant relations between bank liquidity and the index of stability of banks in Ghana and the sub-region of ASEAN. On the contrary, Alandejani et al., (2017); Kohler, (2015); Rahim & Zakaria, (2013) found that banking liquidity enhanced banking stability in the conventional banking system using the OLS regression technique.

In another empirical survey, Soedarmono, Machrouh, and Tarazi (2011), used Asian countries' bank data from 2001-2007 after the financial crisis in the region. The study documented a positive and significant relationship between bank liquidity ratio and stability determinant. The outcome of the survey replicates the works of Degryse, Elahi, & Penas, (2013), Dima, Dincă, & Spulbăr, (2014) Jeon & Lim, (2013) and Nguyen & Nghiem, (2015). The result indicates that banks can improve stability by reducing credit facilities to meet up with customer liquidity demand. Lee and Chih (2013) have declared that there is a significant negative relationship between stability and bank liquidity in the Chinese banking market (Rajhi 2013). However, Lei and Song (2013) using China bank data from 2003 to 2011, have reported that bank liquidity is immaterial to banking stability. More so, Aldeehani (2016), using bank data of GCC countries has confirmed the positive relationship between the index of risk and two indicators of bank liquidity ratios of deposit to total assets and current assets to current liability. These variables indicate similar trend with stability. This means that deposits accelerate bank liquidity which buffers stability index. On the same note Aldeehni's (2016) findings have included that all proxies for bank liquidity indicate a negative relationship with risk determinant. This signifies that there is a movement in reverse track with bank stability. The theoretical connection between liquidity and nexus of stability follows the expalaination of agency theory and stewardship hypothesis (Adusei, 2015).

2.6.4 Control of Corruption and Banking Stability

In this work, indicators of bribery are put on as one of the determinants of the level of corrupt practices in the sampled countries. The index firstly appeared in 1995 through the seminal work of Transparency International. The model was expanded to contain 177 nations in 2013, more comprehensive than its initial figures of 44 countries at the introduction stage. The index ranked, countries based on their public sector, are the distance to corruption. At inception, the countries were on the scale of 0 (adversely corrupt) and 10 (minimally corrupt). However, right from 2012 to date, Transparency Corruption Perception Index (CPI) measure was changed from 0 signifying the extreme level of corrupt practices in the public offices and 100 indicating maximum control of the menace. Therefore, the lower level of control is sending a signal to the higher level of instability in the banking system (Bougatef, 2016; Park, 2012).

Based on the researcher's investigation of the connection between banking stability and the influence of corruption, very few works of literature seem to be documented in this regard.

Hoque et al. (2015) have investigated the impact of bribery in the European Union countries from 2000-2012. They found the index of corruption insignificant to the probability of bankruptcy of the European banks. However, contrary to the work of Hoque et al. (2015), the empirical work of Chen, Jeon, Wang, and Wu (2015); Korbi and Bougatef (2017); Toader, Onofrei, Popescu, and Andrieş (2018) investigated on the influence of corruption on bank stability in emerging nations. The result indicates the use of Spartan corruption to improve the instability of banks. This result is supported by the practical work of Bermpei et al., (2018) who investigated the level of stability in commercial banks in 69 emerging states from 2004-2013. Berpei builds the relationship from the agency theory approach.

2.6.5 Political Stability and Banking Stability

The stability of the political atmosphere of a nation remains one of the determinants of banking market performance. Over the years legislative risk in economic literature has not received substantial deliberation. This absence of information on the impact of political stability affects macroeconomic progress. Although, internal conflict is accepted as one of the determinant factors. The consequences of political risk consist of civil unrest, terrorism, violence, and political disorder arising from a constitutional or illegal change of government (Alesina & Perotti, 1996). Based on this assessment, we can argue that political conflict in a country creates political risk. This will, in turn, increase the uncertainty level in the financial industry. This increasing pressure of political strife affects most of the financial and economic determinants. It will also have impacts on the micro and macroeconomic growth of the country negatively. Based on this assessment, the banking industry, being the major contributor to the financial industry, becomes more exposed to these effects from both the depositors' and the borrower's sides.

The Gulf region may appear like an area where most countries are facing frequent political instability, right from the period after the 911 attack and the Arabs spring, etc. Based on the previous literature collection, few studies have been observed to evaluate the impacts of political conflict on banking stability, more especially on conventional and Islamic banks in the GCC and non-GCC countries. Bermpei, Kalyvas, and Nguyen (2018) have used data span from 2004 to 2013 in their attempts to find an indirect relationship between political stability and Z-score as a proxy for banking stability in emerging and developing countries. The outcome demonstrates that political stability enhances banking stability. Previous literature have mainly concentrated on banks' mechanical effects such as performance. After analyzing Turkish bank data from 2002-2015, Yalcinkaya et al. (2016) found that internal political instability index affected bank profitability negatively. This finding tallies with the work of Demirguc-Kunt & Huizinga (1999); and Sanhsoy, Aydm, & Yalcinkaya (2017). However, the very few scholars that have studied the direct effects of political stability on banking default are Barkat & Hussainey (2013) and Bermpei, Kalgvas & Nguyen (2018). Using the sample of 20 EU countries bank data from 2008 to 2010, Barakat and Hussainey (2013) investigated the impact of political stability on banking probability to default. The study found out that political stability helped to decrease banking default Z-score using the GLS technique. However, using the sample of 69 data emerging from some countries, and adopting the GMM approach, Bermpei et al. (2018) found political stability helped to enhance banking stability. These studies negated the sample of Islamic banks which now serve as a competitive rival to conventional banks, more especially in the Muslim-dominant countries. Agency, portfolio and capital buffer theories suggest that proper regulation and strict monitoring of the financial sector would help to shape banking instability.

2.7 Macroeconomic variables

There is an essential interrelationship that exists between banking stability and macroeconomic factors. Nowadays, empirical evidence has proved that financial discomforts can be prophesied through macroeconomic information. Macroeconomic predictors that scholars usually adopt while assessing the distance of financial system to instability consist of domestic price fluctuations (inflation), cyclical economic growth (Beck, Levine, & Loayza, 2000).

2.7.1 Growth Domestic Product and Banking Stability

Various empirical works have used the economic development indicator on banking sector stability, even though the outcomes remain inconclusive. However, a significant number of researchers have revealed that macroeconomic growth has a positive correlation with the Z-score value of banks (Anginer et al., 2014; Bertay et al., 2013; Dima et al., 2014; Houston et al., 2010; Köhler, 2015; Lee & Hsieh, 2014; Mirzaei et al., 2013; Srairi, 2013; Tan & Floros, 2013; Williams, 2014). Similarly, other works have revealed that economic growth increases the banking probability to instability (Agoraki, Delis, & Pasiouras, 2011; Barakat & Hussainey, 2013; Bertay et al., 2013; Cubillas & González, 2014; Dong, Meng, Firth, & Hou, 2014; Soedarmono et al., 2011). More so, the works of Chalermchatvichien, Jumreornvong, and Jiraporn (2014) and Adusei (2015) have noted that there is no connection between economic development and bank stability indicator. Concerning the effects of GDP on the stability of conventional and Islamic banks, Bitar et al. (2017) have, relying on the combined estimation techniques of quantile regression and GMM, found GDP to improve the banking stability of conventional banks. It shows no significant effect on Islamic banks stability in a cross-sectional countries analysis. Contrary to the findings of Bitar et al. (2017), Alandejani et al. (2017) found the variable of economic progress to erode the stability of conventional banks. In the context of Islamic banks, the variables revealed improvements in banking stability.

2.7.2 Inflation and Banking Stability

Literature on the price increase and banking stability by z-score appears to be a different one. In the Ghanian financial system, Adusei (2015) reviewed bank data from the first quarter of 2009 to last quarter of 2013 and found how banking stability reacted to price increase. The study reveals that inflation reduced the banks' probability of bankruptcy by increasing the value of z-score. The finding received backing from the works of Alandejani et al.,(2017); Bertay et al. (2013). On the same note, Bourkhis and Nabi (2013), while expanding on the sample of Adusei (2015), using cross-country analysis of both Islamic and conventional institutions, found out that inflation reduces bank insolvency risk (Amatus & Alireza, 2015; Bermpei et al., 2018). Unlike Adusei (2015), Boukhis and Nabi (2013), Ibrahim and Rizvi used the dynamic non-linear model and found out that inflation could help to improve banking stability. From the contrary side, some literature found out that inflation could have a detrimental effect on banks stability. Such scholars warned that banks should avoid such countries with higher value of inflation (Cubillas & González, 2014; Delis et al., 2012; Houston et al., 2010; Kabir & Worthington, 2017; Köhler, 2015; Mirzaei et al., 2013). The results were further testified to by public sector banking data through the efforts of Nguyen and Nghiem (2015). Although some studies have, using the difference-in-difference technique found out that the inflationary rate does not influence the financial stability of domestic banks in Eastern Europe. (Fang, Hasan, & Marton, 2014). This study received the empirical support of Criste and Lupu, (2014); and Delis et al., 2012; Ozili, 2018; Srairi, (2013).

Similarly, Bitar (2017) incorporated quantile regression and two dynamic panel regression techniques on 19 developing countries bank data. The study revealed that the inflationary rate eroded the stability of conventional banks. It also showed an insignificant relation with Islamic bank stability (Akhtar & Ahmad, 2016). Moreover, building the nexus of inflation banking stability on the portfolio management hypothesis, Rahman (2010) adopted the multiple estimation techniques and found a fixed effect negative relationship between inflation and stability in some Islamic banks in Malaysia. On the whole, the generalised least square result indicates that inflation reduces the tendency of Islamic bank to default.

2.7.3 Change in Oil price and Banking Stability

Recently there was a rapid increase in hydrocarbon prices which spurred a sequence of empirical studies that discussed the influence of change on banking stability. Based on the literature, very few studies were conducted to assess how shock in the price of hydrocarbon transmitted into the macroeconomy and how the shocks were transmitted into the bank books of the oil-exporting countries. Using 76 banks data sampled from the Gulf region from the period 2000 to 2013, Alqahtani and Mayes (2013) found out that oil prices significantly and negatively affected the stability of both the conventional and Islamic banks. Similarly, investigating the oil price and banking stability nexus on a cross country analysis of both conventional and Islamic banks, Bitar et al. (2017) found out that oil price significantly caused a drop in the stability of the baking sector. However, the vast majority of previous literature that investigated the nexus of oil price and banking stability had concentrated on NPLs as the only determinant of banking stability. In contrast, the stability measure of Z-score and PD were neglected in this respect. In the work of Alodayni (2016) using bank data from the span of 2000 to 2014, of 38 banks from GCC countries, it is clear that oil price decrease is one of the leading determinants of non-performing loans across banks in the Gulf States and their banking stability.

2.8 Control Variables

The last category of variables is the range of control elements at the bank level. This comprises the bank size, managerial efficiency, and income diversification. These variables are selected to ensure the control of Omitted Variable Bias (OVB) in the model (Bond, 2011). The variables were selected based on previous literature and theory.

2.8.1 Bank Size and Banking Stability

The total asset of a bank determines the actual size of the cooperative. In recent literature, bank size plays a serious part in deciding banking stability. There is a different version of the novel regarding the bank package of total assets. Some scholars are of the view that bank size preserves banks against and from the default of insolvency risk. Others hold the contrary view. Tabak et al. (2015) found a positive relationship between total assets and stability index in Brazil from 2001 to 2011. The work of Tabak received tremendous support from the literary efforts of Beck et al., (2013); Berger, Klapper, & Turk-ariss, (2009); Cubillas & González, 2014; Houston et al., (2010); Soedarmono et al., (2011) and Srairi (2013). However, the work of Anginer et al., (2014); Barakat & Hussainey, (2013); Ghosh, (2014) and Williams, (2014) reported an insignificant connection between banks total asset and their resistance to default.

2.8.2 Management Efficiency and Banking Stability

Prior empirical studies have identified the relationship between overhead cost and stability of the banking industry, more especially with conventional and Islamic banks which has remained mixed. The ratio portrays to the banking investors how resourcefully the management handles the affairs of their wealth: the lesser the figure of the signified, the more stable the run. Therefore, several empirical works claim that banks that are highly managed do shy away from indulging in risky ventures to improve their stability performance (Kwan & Eisenbeis, 1997).

In their attempt to measure stability and the practical differences between the conventional and Islamic banks, Rahim and Zakaria (2013) found a significant positive relationship between cost to income ratio and banking stability indicator using Z index. They adopted the Malaysian bank data that spanned from 2005 to 2010. In their similar findings, Abedifar et al., (2013); Altunbas, Carbo, Gardener, & Molyneux, (2007), Bustaman, Ekaputra, Husodo, & Prijadi, 2017; Bustaman et al., 2016, Kwan & Eisenbeis (1997) have claimed that there is a positive relationship between distance to default and managerial efficiency. Their position tallies with the empirical effort of Berger & DeYoung, (1997) who reaffirmed that the cost of ineffective management in banking procedure had led some administration to shy away from precarious portfolios. Wahid & Dar, (2016) claims that the cost of income ratio and bank stability are negatively related. This indicates that banks with poor managerial capabilities are more susceptible to bankruptcy (Altaee et al., 2013; Ghenimi et al., 2017; Shehzad, de Haan, & Scholtens, 2010). These findings are in conformity with the efforts of Bourkhis & Nabi, (2013b); Imbierowicz & Rauch, (2014) and Srairi (2013).

2.8.3 Income Diversification and Banking Stability

Banking deregulations have barred banks from monopolising the lending market in the disposing of funds. The scenario has corroded the absolute advantage enjoyed by banks as the chief lending intermediary, giving other lending institutions which are non-banking to challenge banks in the market. However, for banks to respond to such competitive pressure, they must derail from utterly traditional banking business and engage in the marketing of non-credit services like insurance, agency and estate management which can generate reasonable income compared to interest income (Deyoung & Roland, 2001; Stiroh & Rumble, 2006). It is advised that banks should enlarge their revenue far away from the traditional intermediation as fee and commissions' revenues are secured from interest fluctuations and market uncertainties, unlike the income made from credit sales (DeYong

& Roland, 2001). It is apparent that income diversification reduces the level of banking business risk (Martinez-Miera & Repullo, 2010; Mercieca, Schaeck, & Wolfe, 2007).

Köhler (2014) has noted that banks become significantly more resilient to financial risk when they expand their operations beyond interest revenue. Kohler (2014) shows that intermediating financial firms (banks) appeared to be more stable if they are managed to secure an equilibrium revenue structure, with neither interest reliant nor non-interest earnings in Germany. The result revealed that bank diversification improves the Z-score value. However, the view of the banking business model diversification received the support of Saunders et al. (2016) and Stiroh (2004), considering the fact that the study draws on more samples of quoted and non-quoted banks. Thus, the bank can move away from the instability culture by merely focusing on diversified banking efforts (Ghenimi et al., 2017; and Srairi, 2013). However, following the literature of Altunbas, Manganelli, and Marques-Ibanez (2011) and Demirgüç-Kunt and Huizinga (2010) have recognized that banks that secure higher fee income earnings are more exposed to risk. Therefore, they needed to hire an expert to man noncore banking operations (Cihak & Hesse, 2010; Rajhi & Hassairi, 2014), In their study Bustaman et al. (2017) found income diversification to be negatively related to the index of stability. The result was supported by Altaee et al., (2013) and Kabir & Worthington, (2017). While the work of (Rajhi & Hassairi, 2014) found conventional banks to be more stable when they are diversified to non-traditional banking contrary to Islamic banks that face default as their income is shifted from the lending market.

2.9 Analysis of the Literature Gap

The review of literature has divulged the following gaps. First, the reviewed literature unveils ambiguous judgments or mixed outcomes on the nature of the effect of explanatory variables on the dependent variables. The overall studies on the traditional conventional and Islamic banks stability nexus indicated that stability among the dual banks differs from state to state. The presence of contradictions in the outcomes and conclusion of the earlier literature has shown that the study in a particular country or a set of nations cannot be generalized to another group of nations. Henceforth, further investigation is required into the influence of identified explanatory factors on banking stability in GCC and Non-GCC selected countries.

Similarly, the vast majority of previous studies are of the view that banking stability between the conventional and Islamic bank used accounting data only to assess the stability positions (Abedifar et al., 2013; Beck et al., 2013; Cihak & Hesse, 2010; Pappas et al., 2016; Srairi, 2013). In other words, less concern is given to market-based banking stability assessment which appeared to be more related to Sharia-complying banking system (Harada et al., 2013; Kabir & Worthington, 2017). This is so because the instrument of Islamic banks are used to deal with real buying and selling which attached them more to market. However, using historical information single-handedly to measure institutional solvency risk could pose a serious challenge, especially at the present moment when investors are more sensitive to market information. Thus, adopting the multiple default risk measurements rather than bending on a single measure offers them greater prediction capacity in explaining banks behaviour on systemic occasions (Billio, Getmansky, Lo, & Pelizzon, 2012; Giglio, Kelly, & Pruitt, 2016; Pappas et al., 2017).

To the best of our knowledge, only a works have considered Probability to default, a market information assessment on conventional and Islamic banking stability nexus (Kabir et al., 2015). Likewise, numerous prior studies have failed to utilize Merton's Distance to Default to predict the probability of default in the contest of Islamic and conventional banks in GCC and Non-GCC countries. Engaging both accounting and market-centred methods of stability will harvest a more robust finding on the relationship between the traditional and Islamic banks' stability.

In addition, very few studies have considered the effects of corruption on banking stability with respect to the conventional and Islamic banking systems (Bougatef, 2015; Hoque et al., 2015). More so, the impact of oil price change on banking stability is another angle that received little consideration from the literature on banking stability. The very few studies that have measured the relationship used the Nonperforming loan (NPL) instead of Z-score as the measure of banking stability and the change in the price of hydrocarbon. Simply put, previous studies did not examine the influence of oil price change on banking stability with the Z-score and Probability of default for analysing their data.

Contrary to some scholars theoretical prediction, majority of the GCC and Non-GCC countries derived the source of their legal system from Islamic sources. This is part of the customs of the Arab Worlds and is expected to have reliable institutional quality and be more financially developed. However, the corruption control index of transparency international proves otherwise as the countries do not put forward quality institutions with weak legal systems to protect investors (La Porta, Lopez-De-Silanes, & Shleifer, 1998). Identifying this vacuum in the literature is among the crucial of various research works. In essence, spotting a missing knowledge and setting out how to solve them, generally, is what makes our study unique. This will also enable this researcher to produce a work that will help policy improvement. Therefore, our study tries to bridge the literature vacuum mentioned previously in the conventional Islamic bank's stability in the nexus literature.

Again, the significant number of studies that have investigated into the working of the conventional and Islamic banks stability variation did that by adopting historical data (Alandejani et al., 2017 Abedifar et al., 2013; Beck et al., 2013; Bourhkis & Nabi 2013; Ibrahim & Rizvi, 2017). Some of the researchers took Z-score to derive its measurement entirely from historical figures. Z-score encompasses a bank 's buffers (return on asset and capital) with the return on assets standard deviation (Beck et al., 2013; World Bank, 2017). By relying entirely on accounting records in this dynamic environment for evaluating how banking stability could display some weakness, Altman and Saunders (1997) believed that there is the presence of variation regarding the real value of properties and accounting values based on the traditional pattern of record-keeping in accounting. Another point is that accounting data may be altered to suit managerial interest (Agarwal & Taffler, 2008; Bharath & Shumway, 2008; Burgstahler & Dichev, 1997). Therefore, previous studies did not focus their attention on market-based measures of solvency assessment of banking stability (Boumediene, 2011; Harada, Ito, & Takahashi, 2010; Kabir, Worthington, & Gupta, 2015).

Although a significant number of empirical literature has examined the stability difference between conventional and Islamic bank, majority of them were silent on the persistence nature of banking stability, more especially between the conventional and Islamic banks. The industry adjusted the stability for each financial year are evaluated within the years 2008, 2009, 2010 to 2016 years before deciding the longevity of the persistency effect. If the stability relative to the banking sector were random, there could be no signal for correlation of the adjusted stability from the year to another year. However, previous literature only relates the issue of persistence to the profitability of the banking sector (Berger, Bonime, Covitz, & Hancock, 2000; Goddard, Liu, Molyneux, & Wilson, 2011; Pervana, Pelivan, & Arnerić, 2015).

Another significant gap that is left by previous literature is the methodology: most of the existing literature used ordinary lease square, generalised lease square and survival analysis (Beck et al., 2013a; Čihák & Hesse, 2010; Hasan & Dridi, 2011; Kabir et al., 2015; Pappas et al., 2017; Zhang et al., 2016). In general, only a few stability studies used GMM to consider the presence of endogeneity in the model (Alqahtani & Mayes, 2018). In addition, previous bank stability studies failed to reflect the long run prediction power of the GMM despite its immense significance to banking stability. Therefore, this current study will attempt to bridge the literature openings revealed above in the conventional and Islamic bank stability literature.

2.10 Summary

This chapter treats the related literature on the determinants of banking stability, which is very crucial to the survival of conventional and Islamic banks. Also, the chapter captures bank-specific which contains the capital adequacy, assets quality and liquidity. On the institutional quality, it comprises the control of corruption and political stability. The last segment is the combination of macroeconomic factors like GDP, inflation and change in oil price being the primary indicators identified in the literature to determine banking stability. The insolvency standpoint of the empirical literature on conventional and Islamic banks is not abundant. A high number of descriptive literature concentrated on profitability and related regulatory challenges in conventional and Islamic banking (Beck et al. 2013; Ghosh, 2015; Olson & Zoubi, 2011), with a sufficient number of experimental studies centring on the cost efficiency in conventional and Islamic interest-free banking (Abdul-Majid et al. 2010; Assaf et al. 2011; Mostafa, 2007; Olso & Zoubi, 2011; Tabak et al. 2013). Other scholars such as Cihak and Hesse (2008) utilized the data they got from the Middle East to measure the stability of the banking sector. The study provides practical evidence of only the stability of Islamic banks, giving a potential question of banking coverage, stability measurement issues and static method of analysis. However, this study combined the conventional and Islamic bank stability to ensure the balance of both the accounting and market approach. Hence, the best mix between the dual approaches is desirable for the successful realization of banking stability.

Moreover, the significance of oil price volatility has not received a thorough descriptive investigation in the line of literature, just as its impacts on dual banking stability are relatively unfamiliar. As the period of the investigation captured the must volatile high and lowest in oil price fluctuation (2009 to 2016), this study will be a major contribution to the literature by analyzing this phenomenon within the regions' banking stability.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The chapter emphasises the nature of the data, methods and the procedures employed in the conduct of the study. 3.1 The theoretical framework is presented in the study. 3.2 is the Research framework. 3.3 denotes the Methodology of the study. 3.4 presents the analytical model. And 3.5 justifies the variables. 3.6 emphasises the method of data analysis. 3.7 handles the conclusion of the chapter.

3.2 Research Framework

This section explores and discusses the distinct framework of each variable by addressing the existing connections between dependent variables and other anticipated predictor variables. Accordingly, the estimation technique will be carved from the conceptual framework. Therefore, in examining the effect of factors that influence banking stability, we will look at the impact from the microeconomic and macroeconomic standpoints. Looking at it from the microeconomic perspective means that issues that relate to how internal bank factors control the stability of both the dual banking system will be discussed. Then, one of the most critical questions regarding banking stability is: What combination of factors should be considered to maintain given stability and which type of bank will be more stable? Looking at the issue from the perspective of macroeconomic factors, the matter arising is which combination and how the macroeconomic and institutional variables affect banking stability over a specific economic situation (Beck, Demirgüç-

Kunt, & Levine, 2006). While elaborating on the existing relationship between variables, our theoretical framework will create a linkage between theory and the specified model.

3.3 Conceptual Framework

This work employs the asset management theory and intermediation theory to radically examine the connection between bank stability differences between the two banking institutions (Islamic and traditional or conventional banks). The theories will help in highlighting various hypotheses relating to banking and its stability nexus. Nonetheless, asset management theory explains how banks manipulate the best combinations of resources in the attempt to reduce possible shocks that will hinder financial intermediation functions. The application of the theory of asset management will permit us to swing into a smaller unit of market risks. In other words, using asset management theories will permit us to lower the financial institution portfolio's and its corresponding market risks. On Basel III provision 2010, it gives room to bank management to alter the size of bank capital, assets value, liquidity, and operation to attain stability (Parlinska & Panchenko, 2014). Portfolio hypotheses are an essential part of the present day financial market and have supplied banks with a significant instrument in combating default and earning losses.

However, the asset management hypothesis believes that banks jump off into a liquidity crisis when management fails to dynamically optimise with the demand of changing the asset and liquidity size to ensure stable operation and to curtail risks behaviour (Elsas, Hackethal, & Holzhauser, 2010). In a nutshell, the banking instability problem was generated and has become more severe because of portfolio conflict. They believed that banks could resolve financial instability by increasing their capital structure. The theory argues that enhancing capital structure can help fix asset quality, liquidity, and other operational problems.

These theories are relevant to our study because they could be applied to banks to reduce risks from their loan collections and to augment unsystematic lending risks. However, the possibility of a sudden deterioration in credit assortment of some financial institutions can not be put behind us. This is so because market shocks could come up at any given situation without permitting the banks enough time to cushion the menace (Caprio & Kligebiel, 2002).

In an attempt to achieve the objective of the influence of institutional variables on banking stability nexus of dual banking. The theory of resource curse hypotheses becomes very relevant. The theory expresses the phenomenon of how the economic performance of the natural/abundant resources of nations worsen compared to nonmineral resource economy (Auty, 1994). The overall idea behind the resource curse model is that the natural endowment transformed to be more of an economic curse to the countries than the blessing to medium-income states. The oil exporting countries are said to transmit a unit characteristic of political instability, corruption, among other social ills, in their economies (Ebeke, Désiré, & Laajaj, 2015; Ross, 2015).

To attain the second segment of our objective of the influence of macroeconomic factors on banking stability, the resource curse hypothesis, appears very relevant. The theory expresses the simultaneous relationship between the natural resource boosting sector and the lagging-traded-producing sector of the economy. In the majority of the sampled GCC and Non-GCC countries, their economic growth solely depends on natural oil exploration and the booming industry dominate all the other traded production industry. The trend of GDP in the majority of countries follows the pattern of oil price fluctuations, thus demonstrating the existence of the dutch disease. The boosting industry pressures the other areas of the economy by pulling resources and leading to a price increase of traded outputs (Corden & Neary, 1982). Therefore, Resource Curse theory becomes relevant as it has integrated the relationship between macroeconomic variables (changes in oil price, GDP, and inflation) and banking stability in oil regions of both the GCC and Non-GCC states.

Consequently, following the integration of the asset management theory, the intermediation theory and resource curse theory in the study, the study attempt to achieve the design objectives and provide an answer to the research questions. The research framework established is as shown in Figure 3.1

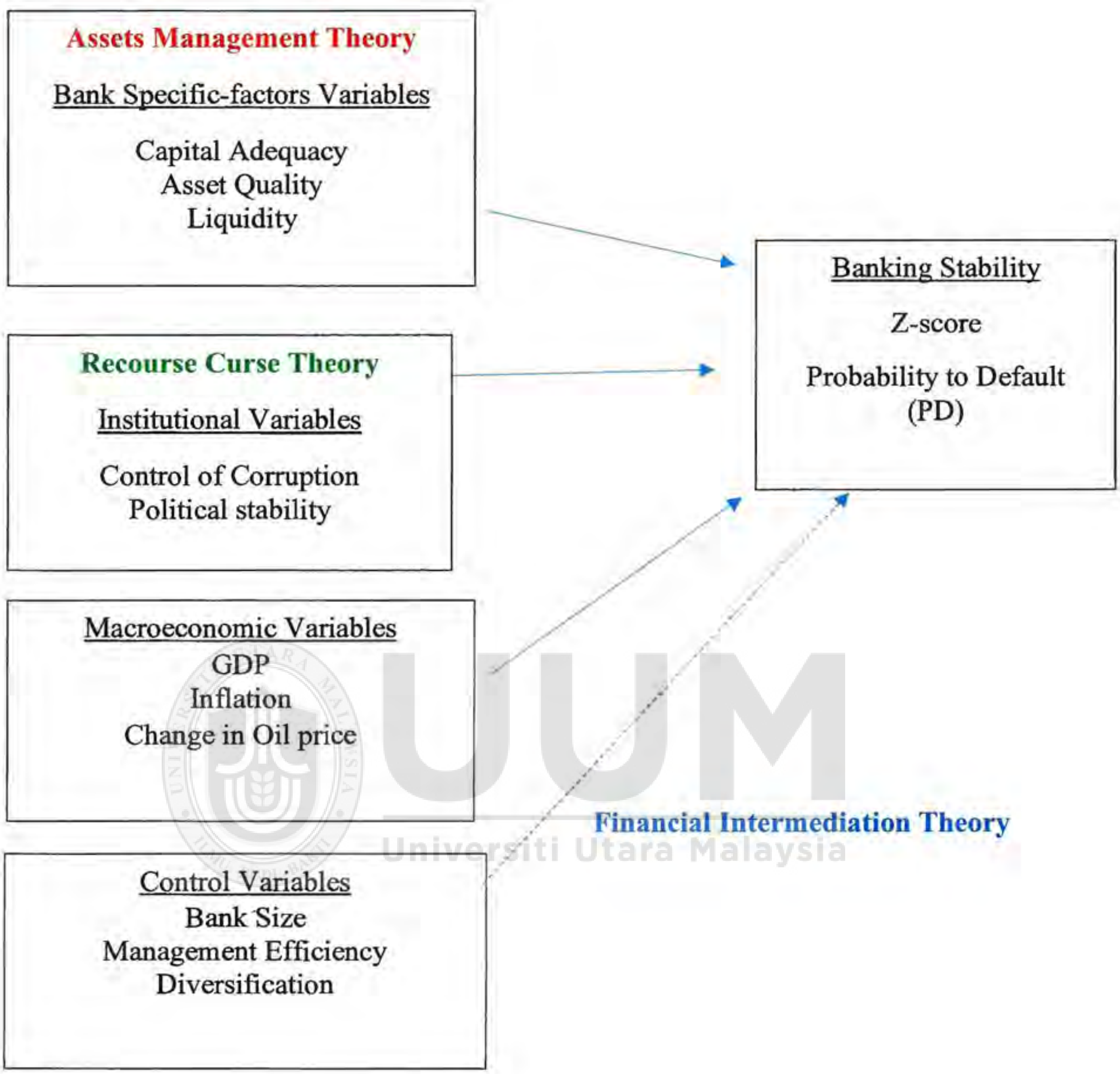

Figure 3. 1
Conceptual Framework of the research

3.4 Theoretical Formation of Banking Stability Models (Z-score)

The background of banking solvency is traced to the earlier efforts of Roy (1952). Even though the work concentrated on safety from the on-set. Subsequently, its application was found to be appropriate to financial and banking literature (Abedifar, Molyneux, & Tarazi, 2013; Beck, Demirguc-Kunt, & Merrouche, 2013; Martin Cihak & Hesse, 2010; Asli Demirgüç-Kunt & Huizinga, 2010; Fu, Lin, & Molyneux, 2014; Pappas, Ongena, Izzeldin, & Fuertes, 2016, 2017). The statistical buildup of the theory was established on the joint probability of future event happenings. The theoretical emphasis of this framework was postulated with an element of predicted uncertainties because of the systematic and nonsystematic kind of risks that are attached to the financial system in GCC and Non-GCC countries. Thus, the tendency of a financial institution to become bankrupt is not only connected with only internal cost. Instead, it involves externalities that are not readily be traced inside the banking business domain. The declaration of the embedded roots to failure is comparable to that of banking distress cost due to organizational, moral hazard and legal cost which originate from the tradeoff theory the formational capital structure (Myers, 1984).

However, Niu (2008) maintains that organizations are confronted with some elements of negative and positive marks that encompass liquidation cost, assets, and profitability. The banking profit has a direct connection with solvency, and profit gathered in the cause of operation exceeds the expenditures incurred within a financial year. Given that Roy (1952), outlined a market situation under uncertainty with an expectation that the gross profit *(m)* shall be more than the value of final returns *(π)*. However, the estimated value of gross profit can be devoted to a standard error *(s)* since the condition is uncertain. Although, previous data regarding returns and its volatility indicated the probable outcome with a detailed assumption on the sign of *(m,* and *(s)*. Hence, the coherent function between probable returns and the value of standard error can be represented by *f(s,m)* = 0. In the meantime, it is difficult to determine the exact possibility of the final returns *(π)* with values *(m)* and *(s)*. Therefore, computing the higher bound of this possibility is the only alternative that can be attained vis-a-vis Bienayme-Chebycheff's inequality[1]. Supposing the return is in a randomize variable *(Ζ)* as a substitute:

$$p(\backslash Ζ - m \backslash \geq m - \pi) \leq \frac{s^2}{(m-\pi)^2} \tag{3.1}$$

Therefore,

$$p(m - Ζ \geq m - \pi) = p(Ζ \leq \pi) \leq \frac{s^2}{(m-\pi)^2} \tag{3.2}$$

Perhaps, on the condition that bank is minimalizing default $p(Ζ \leq \pi)$, then the financial institution functions on the $\frac{s^2}{(m-\pi)^2}$ which is equals to (m-π) /s. Excitingly, in the condition that randomized variable of final return Ζ is normally distributed with m mean and the deviation from mean s, the bank surely will minimalize the default tendency. Consequently, any bank that exhibits constant variance s for all anticipated returns m, certainly the bank is ready to maximize (m-π) / *s* the expected returns.

The financial institutions are operating within the higher spectrum of risky assets which entail interest on credits in the case of traditional banks, which return on capital investment accrued sharia banks, cash, and derivatives and so forth. Therefore, integrating assets to

[1] Bienayme-Chebysheff inequality is the theorem that guarantees for a margin of probability distribution that a random variable differs from its mean by more than *K* standard deviation is less than or equal to $1/K^2$.

the earlier proposition will predict default when the impact of the recent losses deplete the bank capital (Hannan & Hanweck, 1988). Thus, in interest-free banking literature, insolvency risk predictions receive little consideration. Building on the work of (Hannan & Hanweck, 1988), (Boyd et al., 1993) entirely depends on profit, assets, and equity to evaluate banking failure. Where π stand for gain, $\tilde{\hat{A}}$ is assets, $\tilde{E}$ represent equity, and the probability of default is generated as:

$$\frac{\pi}{\tilde{\hat{A}}} < -\frac{\tilde{E}}{\tilde{\hat{A}}} \tag{3.3}$$

Where the randomize variable $\pi\ /\tilde{\hat{A}}$ and $-\tilde{E}/\tilde{\hat{A}}$ present profit to assets and equity (presenting capital) to assets. Accordingly, this can be summarized as $r = \pi/\tilde{\hat{A}}$ and $k = -\tilde{E}/\tilde{\hat{A}}$. Similarly, to minimize default, we substitute (m-π)/s, in equation (3.2), given the following:

$$\frac{r+k}{s} \tag{3.4}$$

Thus, Boyd and Runkle (1993) have expressed the default realization of r when losses exceed k the probability is rewritten as:

$$p(\pi < -E) = p(r < k) = \int_{\infty}^{k} \varphi(r)dr \tag{3.5}$$

As with Demirguc-kunt, Fayen, and Levine (2012) have declared that in the condition where r is normally distributed, then $p(\mathrm{r} < \mathrm{k}) = \int_{\infty}^{k} N(0,1)dr$ and z is Z-score. Boyd and Runkle (1993) further noted that in a situation where the normal distribution for r does not grip, and then the z-score will oblige the lesser bound on the default possibility is cherished within the Tchebycheff inequality. On the other hand, the situation can be represented as the probability to insolvency as:

$$p \leq \left(\frac{1}{2}\right) s^2/(r+k)^2 \tag{3.6}$$

Where ½ in the equivalence (3.6) is explaining that insolvency can only take place in one tail of the distribution (Hannan & Hanweck, 1988). Using Chebyshev inequality permit us to estimate using the higher bound of the default possibility (Laepetit & Strobel, 2013; 2015), as follows:

$$p(r \leq -k) \leq Z^{-2} \tag{3.7}$$

Banking insolvency is here explained as $(r + k) < 0$, and the Z-score can be express as:

$$Z \equiv \frac{ur+k}{s^2} > 0 \tag{3.8}$$

Arguably, it warrants to modify the insolvency indicator but without altering the preceding assumption perpetual normality of variance to profit as:

$$p(r \leq -k) \leq \frac{1}{1+Z^2} < 1 \tag{3.9}$$

Where the Z is defined as is mentioned in equation (3.8), and modification between Z-score in equation (3.8) and (3.9) is the maximum value of the enhanced version of 0.5 at Z=1 in $lim_{z-m}D(Z) = lim_{z-0}D(Z) = 0$. The use of the enhanced version is less in empirical literature compared to conventional one in the financial literature. Apart from the historical banking risk of default due to bank insolvency condition, bank probability to default from a market-based measure is another important component to appropriate banking stability. This has received significant theoretical backing to banking and financial literature.

3.5 Hypotheses Development

In most financial research, the hypotheses are formulated in an attempt to test or confirm whether the variable or a combination of predictor variables would have some effects on the dependent variable in the regression equation. Based on the four research questions in 1.4 and our reliance on the theoretical proposition of financial intermediation which guided the entire study, the internal bank factors are supported by assets management theory. Institutional factors and macroeconomic factors are guided and supported by the resource curse theory in 2.4. On the whole, 16 hypotheses were generated.

3.5.1 Bank Internal Factors and Banking Stability

The first hypotheses we designed to test whether the stability of conventional and Islamic banks in GCC and Non-GCC countries is significantly related to the difference in the combination of their internal bank factors. The theoretical and empirical review evidence makes us to believe that there is inconsistency in terms of stability between conventional and Islamic banks.

The asset management theory asserts that conventional and Islamic banks are exposed to banking instability. Similarly, Dridi and Hassan (2010) have claimed that Islamic banks are more stable than the conventional banks. In contrast, Beck et al. (2013) are of the view that conventional banks are more stable than Islamic banks. The conclusion is based on small scale bank sample. Kabir et al. (2015) and Akkizidis and Khandelwal (2008) have suggested that Islamic banks' operational framework is exposed to a higher level of financial instability. The internal bank factors influence the formation of bank stability. This research employs three internal bank factors namely: capital adequacy, asset quality and liquidity. This set of variables has been identified on the basis of previous literature as no study has investigated into the effects of these internal variables simultaneously in determining the stability between conventional and Islamic banks. Therefore, the research hypothesis that banking stability is significantly linked to the variation in internal bank factors.

3.5.1.1 Capital Adequacy and Banking Stability

The amount of regulatory capital is broadly believed to lessen the intensity of banks to involve in risky assets (Jokipii & Milne, 2011). To perform better intermediation roles, banks are required to have sufficient capital. The asset management theory has proposed that banks should alter the size of their capital to confront uncertainties in the market. The empirical work of Kohler (2015) and Williams (2014) has argued that bank capital formation will significantly affect banks' stability. Therefore, the research hypothesises that banking stability is significantly linked to the variation in capital adequacy is variable. The hypothesis of the first test in banking stability is written as:

H01: There is no significant relationship between capital adequacy and the stability of conventional and Islamic banks.

Ha1: There is a significant relationship between capital adequacy and the stability of conventional and Islamic banks.

3.5.1.2 Assets Quality and Banking Stability

Banks use sufficient loan reserves in expect action of loan loss. As a result, they engage in excessive behaviours that further erode banking stability (Elsiefy, 2013; Laeven & Majnoni, 2003; Ozili & Outa, 2017). Berger et al. (2009) have cautioned banks to shy away from excessive lending to improve financial stability. Therefore, the research hypothesis says that banking stability is significantly associated with the variation in asset quality is variable. The hypothesis of the second test of internal bank factors on banking stability is rewritten as:

H02: There is no significant relationship between assets quality and the stability of conventional and Islamic banks.

Ha2: There is a significant relationship between assets quality and the stability of conventional and Islamic banks.

3.5.1.3 Liquidity Ratio and Banking Stability

The greater banking stability, the more will it positively contribute to higher liquidity position (Jeon & Lim, 2013; Nguyen & Nghiem, 2015; Soedarmono et al., 2011). Banks with higher liquidity are prone to engage in risky activities while exposing them to instability (Rajhi, 2013). Therefore, the research hypothesis that bank stability is significantly linked to the variation in bank liquidity is variable. The hypothesis of the third test of internal bank factors on banking stability is rewritten as:

H03: There is no significant relationship between liquidity and the stability of conventional and Islamic banks.

Ha3: There is a significant relationship between liquidity and the stability of conventional and Islamic banks.

3.5.2 Bank Institutional Factors and Banking Stability

The financial intermediation theory asserts that a qualitative institution performs some critical roles to improve the level of efficiency of intermediation roles by cutting the information, supervision and transaction cost (Demetriades & Law, 2006; Dougless North, 1990). The resource curse theory has characterized the institution's quality of the naturally endowed economy to be very weak and dominated by corruption and political instability. All of these add to the cost of monitoring and transaction cost in the financial intermediation process. Hou and Wang (2016) have suggested that weak institutional quality is negatively significant to banking stability. An attempt to improve institutional quality decreases the level of asymmetric information (Bermpei et al., 2018). The formation of banking stability is affected by the variation in the institutional factors. This research employs control of corruption and political stability as institutional factors.

3.5.2.1 Control of Corruption and Banking Stability

The resource curse theory asserts that conventional and Islamic banks are exposed to banking instability because natural resource dependent economies are characterized by weaker institutional quality like the control of corruption. Chen et al. (2015) have asserted that poor control of corruption affects banking stability significantly. Park (2012) found poor control of corruption to distort bank resource allocation from less risky projects to more risky ventures. This decreases the quality of the intermediation process and banking stability also.

Formation of banking stability is affected by the variation in corruption control. Therefore, the research hypothesizes that bank stability is significantly affected by the variation in control of corruption is variable. The hypothesis of the fourth test of institutional factors on banking stability is rewritten as:

H04: There is no significant relationship between the control of corruption and the stability of conventional and Islamic banks.

Ha4: There is a significant relationship between the control of corruption and the stability of conventional and Islamic banks.

3.5.2.2 Political Stability and Banking Stability

The resource curse theory asserts that banks are exposed to financial instability because countries whose economies heavily rely on natural resources like oil are associated with political instability. Demirguc-Kunt and Detragiate (1998) have stressed that financial stability is significantly associated with quality institutional quality. Bermpei et al. (2018) are of the view that political stability enhances the position of commercial banks. Therefore, based on the theoretical proposition, the research hypothesizes that banking stability is significantly affected by the difference in political stability variables. The hypothesis of the fifth test of institutional factors on banking stability is rewritten as:

H05: There is no significant relationship between political stability and the stability of conventional and Islamic banks.

Ha5: There is a significant relationship between political stability and the stability of conventional and Islamic banks.

3.5.3 Macroeconomic Factors and Banking Stability

The resource curse theory asserts that any significant shocks in oil price, as the dominant source of revenue to the countries, will significantly affect all other sectors of the economy. Banking stability is influenced by variations in macroeconomic factors. Such as the GDP, inflation and change in oil price.

3.5.3.1 GDP and Banking Stability

The financial shock of 2008 has made many institutional investors to incorporate macroeconomic scenarios in their asset management strategies. The resource curse theory asserts that oil price shock, as the dominant source of revenue, affects economic growth. This, in turn, affects the stability of the financial sector (Polterovich, Popov, & Tonis, 2010). Based on the literature, the relationship between conventional and Islamic banks stability and GDP is inconclusive (Köhler, 2014; Shayegani & Arani, 2012). The higher the GDP of a country tends to improve conventional and Islamic banks stability (Karim, Al-Habshi, & Abduh, 2016). Cubillas and Gonzalez (2014) found that GDP is negatively significant to banking stability. This indicates that an increase in GDP reduces conventional bank stability. Therefore, the research hypothesizes that the variation significantly influences banking stability in the GDP variable. The hypothesis of the sixth test of macroeconomic factors on banking stability is rewritten as:

H06: There is no significant relationship between GDP and the stability of conventional and Islamic banks.

Ha6: There is a significant relationship between GDP and the stability of conventional and Islamic banks.

3.5.3.2 Inflation and Banking Stability

The resource curse theory asserts that banks are exposed to financial instability because countries that are resource-dependent economies suffer from higher inflation (Kakanov, Blochliger, & Demmou, 2018; Polterovich, Popov, & Tonis, 2008). On the part of empirical analysis, the direction of inflation on banking stability remains inconclusive. Rumler and Waschiczeck (2016) have suggested that banking stability responds significantly to inflation. The result implies that inflation increases commercial banking stability index. A similar result obtained by Barakat and Hussainey (2013) indicates that conventional and Islamic banks stability improves with inflation. This contradicts the findings that inflation is injurious to conventional and Islamic banks stability (Gonzalez, 2015; Kabir & Worthington, 2017). Thus, the research hypothesizes that bank stability is significantly affected by the variation in the level of inflation is variable. The hypothesis of the seventh test of macroeconomic factors on banking stability is rewritten as:

H07: There is no significant relationship between inflation and the stability of conventional and Islamic banks.

Ha7: There is a significant relationship between inflation and the stability of conventional and Islamic banks.

3.5.3.3 Change in Oil Prices and Banking Stability

The theoretical analysis of the resource curse asserts that banks in resource-based economies are exposed to financial instability due to oil price fluctuations. The direction between change in oil prices and conventional and Islamic banks stability Z-score is lacking. Alqahtani and Mayes (2017) found changes in oil prices to affect banking stability significantly. Therefore, the work hypothesizes that bank stability is significantly influenced by the change in oil prices is variable. The hypothesis of the eighth test of macroeconomics on banking stability is rewritten as:

H08: There is no significant relationship between conventional and Islamic bank stability in terms of change in oil prices.

Ha8: There is a significant relationship between conventional and Islamic banks stability in terms of change in oil prices.

3.5.4 Stability Difference in terms of Accounting and Market Measurement

The Financial intermediation theory stresses on how both conventional and Islamic banks channel their financial resources from surplus to the deficit point of need. The banks operate on the same market but they do so under different frameworks. The operational framework of Islamic bank is genuine giving and taking of physical delivery of assets and equities. This practice is believed to attach Islamic banks operations more to real sectors or market, thus helping in slashing the level leverage and averting the exposure of operating speculative and derivatives which lead to banking default (Chapra, 2008). Zhang et al. (2016) assert that banking stability responds significantly to alternative accounting and market-based stability measurements.

Previous literature that compared the significant stability difference between conventional and Islamic banks are based on accounting measurement (Beck et al. 2013; Cihak & Hesse, 2010; Hassan & Dridi, 2011; Pappas et al. 2016; Gonzalez, 2014). Kabir et al. (2015) and Alqahtani and Mayes (2017) have suggested that there are stability differences between conventional and Islamic banks in terms of accounting and market stability measurement. Therefore, the study hypothesizes that the change significantly influences bank stability in the measurement of accounting and market-based. The hypothesis of the ninth to the eleventh test of bank-specific, twelfth and thirteenth tests of institutional variables, and fourteenth to sixteenth tests for macroeconomics on banking stability is written as:

5.4.1 Bank Specific and Probability of Default

The asset management theory asserts that conventional and Islamic banks are exposed to market instability. The information on market-based bank stability is influence by bank-specific variables. The study employs three bank-specific factors, namely: capital adequacy, assets quality and liquidity. These group of variables have been known from the previous literature as there were no efforts to examine the simultaneous influence of these variables on determining bank stability PD between conventional and Islamic banks. The ratio of capital buffer remains one of the management controlling factors that are believed to prevent macroeconomic and market shocks (Fu et al., 2014b).

H09: There is no significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of capital adequacy.

Ha9: There is a significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of capital adequacy.

Asset quality variable is extensively utilized in financial literature as a proxy of loan quality. According to stability, Zhang et al. (2016) found American banks to be more fragile to default as the connection between reserve loan loss and probability default is positively significant at one percent.

H010: There is no significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of asset quality.

Ha10: There is a significant relationship between stability measurement of conventional and Islamic banks in terms of asset quality.

The greater exposure of bank liquidity is negatively contributing to higher banking stability PD, with weak loan quality banks are prone to market instability (Kabir et al. 2015). Alqahtani and Mayes (2018) have a similar result for 76 conventional and Islamic banks in the Gulf states for a span of 2000 to 2013.

H011: There is no significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of bank liquidity.

Ha11: There is a significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of bank liquidity.

5.4.2 Institutional variables and Probability of Default

The resource curse theory assets that conventional and Islamic banks are exposed to banking instability PD. The formation of the banking instability is influenced by Institutional variables. The research employs two institutional factors namely: Corruption control index and political stability. From previous literature, there was no empirical attempt to simultaneously investigate the influence these set of variables exert on bank stability PD of conventional and Islamic banks.

Corruption control is the variable that will indicate the quality of the banking institution in managing elements of corruption. This relationship indicates how the book of financial institutions responds to appropriate measures for curtailing the menace of corruption in the affected countries in Middle East state.

H012: There is no significant relationship between stability measurement PD and Z- score of conventional and Islamic banks in terms of corruption control.
Ha12: There is a significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of corruption control.

The political stability factor illustrates how the episode of political instabilities such as the Syrian conflict and the Arab Spring that started in the year 2010 from Tunisia engulfed the entire region (Cordesman, 2018; Marshall & Elzinga-Marshall, 2017). The scenario affected the banking sector of the GCC and Non-GCC countries. Ozili (2018), in his empirical study, focused on how political instability affects the banking stability of 48 Africa countries. He presented shreds of evidence to prove that banking sector stability was severely affected by the political instability between 1996 to 2015.

H013: There is no significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of political stability.
Ha13: There is a significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of political stability.

5.4.3 Macroeconomic variables and Probability of Default

As suggested by Saksonova (2013), the asset management theory is of the view that the mixture of systematic and unsystematic factors affect banking stability. This study is going to investigate the simultaneous effects of macroeconomic cycles on banking stability PD of conventional and Islamic banks. The eleventh, twelfth and thirteenth hypotheses have proposed that macroeconomic variables play some crucial roles in determining banking stability PD of both conventional and Islamic banks. Kabir et al. (2015) have found that the banking stability PD of both conventional and Islamic banks is significant and negatively affected by inflation and GDP.

H014: There is no significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of inflation.

Ha14: There is a significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of inflation.

Concerning the nexus between GDP and probability default, most of the current literature claims that the rate of economic growth helps banks to become highly stable and be further from financial insolvency (Srairi, 2013). Alqahtani and Mayes (2018) and Kabir et al. (2015) are up with some conclusions on these findings.

H015: There is no significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of GDP.

Ha15: There is a significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of GDP.

The influence of change in oil prices on banking stability PD of conventional and Islamic banks had been well documented before now. Alqahtani & Mayes (2018) have suggested that change in oil price is positive and insignificant to banking stability DD of both the conventional and Islamic banks.

H016: There is no significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of change in oil price.

Ha16: There is a significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of change in oil price.

3.5 Methodology

This section provides an explanation of the methods to be used in analyzing the data of the study. It consists of research design, Sample and Data Source, among others.

3.5.1 Research Design

In an attempt to achieve the prime objectives of the study, the preferred Explanatory form of design is adopted. This is a design where the researcher offers explanations and definitions in handling a given problem which requires more studies before further clarification or improvement on the final results (Veal, 2017). Usually, This kind of design relies on quantitative techniques to find any newly available literature, identify the likely alternatives to a specified solution, as well as find appropriate variables that are required to be taken into account. While conducting the study, the major task of the researcher should be to acquaint himself with new ideas, data, and hypotheses for proper handling of the subject matter.

In a nutshell, our study will adopt the Explanatory study design to evaluate the connotation of bank-specific elements (capital adequacy, asset quality, and liquidity), institutional qualities (political stability, control of corruption), and macroeconomic factors (change in the price of oil, GDP, and inflation) as the explanatory variables, and bank stability (Z-Score, and PD) as dependent variables. Finally, the combination of these (dependent, explanatory, and control) will form part of the variables that the study will use.

3.5.2 Population of the Study

The total population for this study are all the traditional conventional and Islamic banks in GCC and selected Non-GCC countries. Over 179 banks are operating in the GCC countries and about 169 banks in the Non -GCC nations (Al-Hassan et al., 2010; GBFR, 2013; Qattan, 2015).

3.5.3 Sampling Selection Criteria

The bank sample encompasses the annual historical data of conventional and Islamic banks in the GCC (Bahrain, Kuwait, Qatar, Saudi Kinkdom, and U.A.E) and the Non-GCC countries (Algeria, Egpyt, Jordan, Lebanon, and Tunisia). The GCC set of countries hold more than 25 percent of the global Islamic bank assets (IMF, 2017), while the non -Gulf states of the Middle East hold more than 21 percent of the global Islamic bank finance

(IFSB, 2017). The Islamic banking system has been a reliable source of financial intermediary in the Middle East, regulating, on the average, 24 percent of the regional banking sector assets. The GCC and Non-GCC countries are a homogeneous set of countries in terms of culture, language and geographical location (Alqahtani & Mayes, 2018). The first sample of international Islamic bank was created in the Middle East region, better known as the Islamic Development Bank situated in Saudi Arabia (Alharthi, 2017). Some of the sampled countries (namely, Algeria, Kuwait, Saudi Arabia and UAE) form part of the membership of the Organisation of Petroleum Exporting Countries (OPEC, 2018). Though the Islamic banking model started operation very late and initially designed for Muslims in their dominated territories, this banking model has spread everywhere in the globe, especially in the aftermath of the subprime economic crisis. The last couple of 3 decades of Islamic bank operation has witnessed improvement in the number of Islamic banks operating in diverse parts of the world. Islamic banks have roles that are similar to those of their conventional partners even when their operational nature and the structure of their financial instruments are entirely different. Another base for comparison between them is the market annual asset growth. From the period 2009 after the crisis down to 2013, Islamic banks witnessed 11 percent asset annual growth whereas the conventional partner operating in the same market experienced 6.8 percent (Alqahtani et al., 2017; International Monetary Fund-IMF, 2018). Another reason for selecting these countries, is that the region provides an enabling environment for research to compare the stability of the dual banking system operating hand in hand in the area. The banking sector is the major component of the regional financial system contributing to over 65 percent to the area's economic growth (IMF, 2017). Moreover, to ensure comparability of the data set, other forms of banks or financial institutions which are nonconventional and nonIslamic banks were excluded. Similarly, to avoid the probable bias of financial information reporting banks with unconsolidated financial statements were also excluded (Francis, Pinnuck, & Watanabe, 2014). Banking institutions without a minimum of three years of financial data were also excluded from the panel set (Beck, Demirguc-Kunt & Merrouche, 2013).

Table 3. 1
The Sample of GCC and Non-GCC Banks

Countries GCC	**Conventional Banks**	**Islamic Banks**	**Total**
Bahrain	9	14	23
Kuwait	5	7	12
Qatar	6	4	10
Saudi	8	6	14
UAE	15	8	23
Total	43	39	82
Non-GCC	**Conventional Banks**	**Islamic Banks**	**Total**
Algeria	6	1	7
Egypt	21	3	24
Jordan	11	3	14
Lebanon	25	2	27
Tunisia	11	2	13
Total	74	11	85

Source: Bank Scope and Risk Management Institute (2018)

After the preliminary sample choice, further cleaning criteria were followed to erase non-representative information. A bank without enough data to compute the stability measures and other explanatory variables were also eliminated. In conformity with various empirical literature, a bank with so many missing values on their income and balance sheet statements, regarding the underlying variables were detached (Berger et al. (2009). The sample size of 167 banks - 117 conventional and 50 Islamic banks - was got from the historical and market data for this investigation. Details of the sampled size are presented in table 3.1. On the market data, Algeria was dropped from the sample because the country has no operational stock market.

3.6 Data Sources and Period of the Study

The span f for the study is from the 2008-2016 bank financial year. It was a period with a noticeable decrease in global oil price from \$109.45 for a barrel in 2012 to \$40.68 for a given barrel in 2016 (International Monetary Fund-IMF, 2018). Similarly, the financial crisis and recession took place between 2008 to 2009 (Beck et al., 2013). The annual bank internal data were collected from the Bankscope database (Fitch Rating & Bureau van Dijk, 2015) and Bloomberg database. The two databases have remained some of the reliable most databases as provided by earlier literature (Alandejani et al., 2017; Cihak & Hesse, 2010; Pappas et al., 2016). However, the market-based stability (PD) is the difference between bank market value of assets and the book value of bank debt. The data for market value were retrieved from the Bloomberg database and Credit Research Initiative, while the annual book value data of the bank's debt is a source from DataStream. The Credit Research Initiative provide a comprehensive probability default data of the listed banks to free registred memmbers. Similarly, institutional and macroeconomic data are assembled from Transparency International, World Bank, and the World Economic Outlook (IMF, 2018) database. Our justification for choosing the period was based on the availability of data. Secondly, instances of Islamic banking failures occurred within the same time frame in the GCC region (Aliyu & Yusof, 2017). Similarly, oil price change is said to have reached the highest figure ever and, at the same time, reaching its lowest value for over a decade (Alodayni, 2016).

3.7 Analytical Model

This section specifies the general model to be followed to realise the research objectives. We will start with the first objective of the fourth part of the objective.

3.7.1 General Model

The impact of bank-specific, institutional factors and macroeconomic factors on the stability of conventional and Islamic banks in GCC and Non-GCC countries. is presented in general in equation (3.10) below:

$$Zscore/PD = Bankspecificf(Eqta, Liq, LLr) + \text{Institution}f(CPi, Psi) + Macroeconomicf(\Delta oilp, GDP, Inf) + Controlf(eff, Idiv, \text{inTa}) + D) \quad (3.10)$$

$$Zscore_{j,i,t} = \alpha_0 + \alpha_1 Eqta_{j,i,t} + \alpha_2 LLr_{j,i,t} + \alpha_3 Liq_{i,t} + \alpha_4 CP_{j,i,t} + \alpha_5 Ps_{i,t} + \alpha_6 GDP_{i,t} + \alpha_7 Inf_{i,t} + \alpha_8 \Delta oilp_t + \alpha_9 Idiv_{j,i,t} + \alpha_{10} eff_{j,i,t} + \alpha_{11} inTa_{j,i,t} + \alpha_{12} D_{j,i,t} + \mathcal{E}_{j,i,t} \quad (3.11)$$

$$PD_{j,i,t} = \alpha_0 + \alpha_1 Eqta_{j,i,t} + \alpha_2 LLr_{j,i,t} + \alpha_3 Liq_{i,t} + \alpha_4 CPi_{j,i,t} + \alpha_5 Psi_{i,t} + \alpha_6 GDP_{i,t} + \alpha_7 Inf_{i,t} + \alpha_8 \Delta oilp_t + \alpha_9 Idiv_{j,i,t} + \alpha_{10} eff_{j,i,t} + \alpha_{11} inTa_{j,i,t} + \alpha_{12} D_{j,i,t} + \mathcal{E}_{j,i,t} \quad (3.12)$$

3.7.2 Model of Bank-Specific Variables

This model is designed based on the bank-specific objective, under the guidance of financial intermediation theory and supported by asset management theory. To achieve this objective and check for the robustness of the study result, the study separates and estimate the specific models. The model contains only the bank factors and control variables, following the step analysis of (Alqahtani & Mayes, 2018; Hassan et al., 2018; Rashid, Yousaf, & Khaleequzzaman, 2017). The financial instability index is determined by three variables associated with banks, the institution, and macroeconomic factors correspondingly.

To analyze the effects of internal bank factors (Capital, Liquidity, and asset quality) on conventional and Islamic banks stability. Specifically:

$$Zscore = f(\ Eqta, Liq, LLr, eff, Idiv, \mathrm{InTa}, D) \tag{3.13}$$

Where: *Z*-score stands for risk default, *Eqta* is capital adequacy, *Liq* is liquidity, and *LLr* is the loan loss reserve proxy for assets quality. While *eff* is management efficiency, *Idiv* is income diversification, and *InTa* is the bank size, which stands as the control variables in the model. *D* is a dummy variable; it stands for Islamic bank with value 1 otherwise 0.

Econometrics specification of Equation (3.10) is presented as

$$\begin{aligned} Zscore_{j,i,t} = \alpha_0 + \alpha_1 Eqta_{j,i,t} + \alpha_2 LLr_{j,i,t} + \alpha_3 Liq_{i,t} + \alpha_4 Idiv_{j,i,t} + \alpha_5 eff_{j,i,t} \\ + \alpha_6 inTa_{j,i,t} + \alpha_7 D_{j,i,t} + \varepsilon_{j,i,t} \end{aligned} \tag{3.14}$$

Where ε is the error term, with its usual properties $\varepsilon_{j,i,t}$= $(\upsilon_j, \gamma_t, \mu_{i,t})$, υ_j~$iid(0,\delta_j^2)$ which is a bank-based error term, γ_t~$iid(0,\delta_t^2)$ which is a time-base error term and $\mu_{i,t}$~$iid(0,\delta_{i,t}^2)$ which is country/cross-sectional-base error term. Therefore, var $\varepsilon_{j,i,t}$= $(\delta_j^2 + \delta_t^2 + \delta_{i,t}^2)$, α_i (i=1, 2….N) are coefficients, j=1…, N a particular banks, i = 1 …10 in a country and t=

2008-2016 at a given time. The rest of the variables are as defined in the previous Equations. The apriority expectation is $(\alpha_1\alpha_2\alpha_3\alpha_4\alpha_5\alpha_6\alpha_7 > 0)$. Therefore, *Liq, LLr, Eqta*, *eff, Idiv*, and *InTa* are positively related to banking stability.

3.7.3 The Institutional Factor Model

To examine the impact of institutional factors (Corruption Control, Political instability index) on the stability of traditional and Islamic banks in GCC and Non-GCC countries, Specifically:

$$Zscore = f(\,CPi, Psi, D, inTa, Idiv, eff) \tag{3.15}$$

Where: *CPi* is Corruption control index, *Psi* is political instability index, *InTa* is the size of bank assets, While *eff* is management efficiency, *Idiv* is income diversification as a control variable. The rest are as defined in the previous Equations.

The econometric specification of Equation (3.13) is

$$Zscore_{j,i,t} = \beta_0 + \beta_1 Cpi_{i,t} + \beta_2 Psi_{i,t} + \beta_3 D_{j,i,t} + \beta_4 inTa_{j,i,t} + \beta_5 Idev_{j,i,t} + \beta_6 eff_{j,i,t} + \varepsilon_{i,t} \tag{3.16}$$

The apriority expectation $(\beta_1\beta_2\beta_3 > 0, \beta_4\beta_5 < 0)$, therefore InTa, Idev and eff, are to be positive, while Cpi and Psi are negative to banking stability.

Where all variables as defined in previous Equations

3.7.4 The Model of Macroeconomic Variables

To assess the influence of macroeconomic variables (oil price fluctuation, gross domestic product, and inflation) on the stability of the dual banks. Specifically:

$$Zscore = f(\Delta oilp, GDP, Inf, D, inTa, Idiv, eff) \quad (3.17)$$

Where $\Delta oilp$ of oil price change, *GDP* is the growth domestic product, *Inf* is the inflation. The rest is as fined in the previous Equation.

The econometric specification of Equation (3.15) is

$$Zscore_{j,i,t} = \phi_0 + \phi_1 \Delta oilp_t + \phi_2\, GDP_{i,t} + \phi_3 Inf_{i,t} + \phi_4 D_{j,i,t} + \phi_5 \text{inTa} + \phi_6 Idiv_{j,i,t} + \phi_7 eff_{j,i,t} + \mathcal{E}_{j,i,t} \quad (3.18)$$

The apriority expectation $(\emptyset_1 \emptyset_2 \emptyset_3 \emptyset_4 \emptyset_5 \emptyset_6 > 0)$. *T*herefore InTa, Idev, eff, Δoil, and GDP positive, while *Inf* is negative to banking stability.

This is where all variables are as defined in the previous Equations.

3.7.5 Model of Change of Stability Measurement

The objective is to examine if the difference in stability measurement will result in variation of stability between the conventional and Islamic banks in GCC and Non-GCC countries. Market-based stability measurement will be more appropriate, with conventional bank relying on debt-based instruments which are riskier than the Islamic sale type of instruments which are more attached to the market. Islamic banks deal with direct buying and selling and taking transfer of ownership. This makes their operational frameworks to come closer to the market.

This model is separated into general and specific models, and the approach enables us to restrict the model to each species as the bank-specific, institutional and macroeconomic to see the step analysis and behaviour of each model as a robust to the general model. The study follows the same pattern as in the Z-score model. Similarly, appropriate banking stability measurement provides the basis for establishing precise, prudential and control mechanisms to cope with banking instability. Specifically, this can be represented as:

$$PDf = f(Liq, LLr, \text{Eqta}, eff, Idiv, InTa, D) \tag{3.19}$$

$$PDf = f(\,Cpi, Psi, D, inTa, eff, Idiv) \tag{3.20}$$

$$PDf = f(\,\Delta oilp, GDP, Inf, inTa, Idev, eff, D) \tag{3.21}$$

Where *PDf* is distance –to default, measuring banking stability using market information. The rest of the variable is as defined in previous equations.

The econometric specification of the Equations are:

$$\begin{aligned} PDf_{j,i,t} = \alpha_0 + \alpha_1 Liq_{j,i,t} + \alpha_2 LLr_{j,i,t} + \alpha_3 eqta_{j,i,t} + \alpha_4 eff_{j,i,t} + \alpha_5 Idiv_{j,i,t} \\ + \alpha_6 inTa_{ji,t} + \alpha_7 D_{j,i,t} + \mathcal{E}_{i,t} \end{aligned} \tag{3.22}$$

$$\begin{aligned} PDf_{j,i,t} = \beta_0 + \beta_1 Cpi_{i,t} + \beta_2 Psi_{i,t} + \beta_3 D_{j,i,t} + \beta_4 inTa_{j,i,t} + \beta_5 Idev_{j,i,t} + \beta_6 eff_{j,i,t} \\ + \mathcal{E}_{i,t} \end{aligned} \tag{3.23}$$

$$\begin{aligned} PDf_{j,i,t} = \phi_0 + \phi_1 \Delta oilp_t + \phi_2\, GDP_{i,t} + \phi_3 Inf_{i,t} + \phi_4 D_{j,i,t} + \phi_5 inTa_{j,i,t} + \phi_6 Idev_{j,i,t} \\ + \phi_7 eff_{j,i,t} + \mathcal{E}_{j,i,t} \end{aligned} \tag{3.24}$$

Where all the variables are as defined in previous equations.

3.8 Measurements of the Variables

This segment provides a brief description of the variables, their measurements and the expected nature of the relationship. Effect of the independent variables on the dependent variable were also mentioned in some of the studies that used the variables.

3.8.1 Z-Score

The dependent variable is the measure of banking default known as Z-Score. Williams (2014) views Z-Score as the summation of the average return on assets and average leverage sufficiency over the volatility range of return on assets. Recently, various studies have utilized Z-score as a tool for assessing banking risk. The Z-score remains one of the tools that the World Bank, the International Monetary Fund (IMF) and Standard and Poor's have used to appraise the level of banking distance to financial instability. The computation of Z-score is interpreted on the historical financial information retrieved from bank annual accounting data. The measurement tool remains one of the widely used instrument because of its simplicity. The tool has a good prediction power and can only be calculated with accounting data, compared to the other market-originated stability measurements. This quality makes it more desirable to both quoted and unquoted financial institutions (Kabir & Worthington, 2017; Lepetit & Strobel, 2015).

The relationship with the financial institution probability of insolvency and Z-score is relatively an inverse. A bank can become insolvent when the value of its assets descends far away from its debt and the Z index displays the number of standard deviations that bank earnings decrease below the expected figure to deplete equity thereby forcing the bank to become insolvent. The measure (Z-score) has the following attributes: Firstly, it is an improvement over the previous literature that adopted accounting-based ratios like Capital adequacy, non-performing loan, Margin of interest as the distance to insolvency determinants (Demirguc-Kunt & Detragiache, 2009). Secondly, in the absence of more sophisticated market information, Z-Score remains the most desirable measure of banking stability, more especially if it involves banking stability comparisons. Also, Z-score permits comparing of various organizations which vary in ownership, principles, and objectives, but that are confronted with the stress of insolvency.

However, the Z-score is solely a piece of accounting information, and the quality of such data may differ between countries depending on accounting standards (Beck et al. 2009). More so, accounting data are backward and historical. It may not apprehend the ongoing phenomena copiously in the banking system, leading to a distorted measure of distance to instability. Several empirical stability literature have adopted Z-score as measure of banking distance to default (Beck, Demirguc-Kunt, & Merrouche, 2013; Bourkhis & Nabi, 2013; Delis, Hasan, & Tsionas, 2014; DeYoung & Torna, 2013; Fang, Hasan, & Marton, 2014; Fu, Lin, & Molyneux, 2014; Ghenimi, Chaibi, & Omri, 2017; Hasan & Dridi, 2011; Kabir & Worthington, 2017; Kabir, Worthington, & Gupta, 2015; Laeven & Levine, 2009; Lepetit & Strobel, 2015; Özşuca & Akbostancı, 2016; Rajhi & Hassairi, 2014). This gives us the justification for choosing the indicator as to the response variable in our study as it remains the most popular and effective measure of banking stability as evinced in earlier literature.

Formular for Z-Score:

$$Z_{it} = (ROA_{it} + \frac{E_{it}}{TA_{it}}) / \sigma(ROA_{it}) \tag{3.25}$$

Where ROA_{it} stands as a return on assets, $\frac{E_{it}}{TA_{it}}$ is equity to total assets or capital to assets ratio, $\sigma(ROA_{it})$ is the standard of return on assets. We adopt the three- years time as the rolling window (Beck et al., 2013). The approach evades the disparity in Z-scores within the banks over a period of time which is exclusively driven by the disparity in capital and profitability (Schaeck & Cihak, 2010). We used ln(Z-score) to smoothen the higher scores of Z-score as it remains highly skewed. Similarly, to avoid truncating the value of Z-score at zero, we use transformation ln(1+Zscore) following (Beck, De Jonghe, & Schepens, 2013).

3.8.2 Probability to Default (PD)

The Probability of risk default is a market information measurement for estimating the credit default of quoted banks. The model (PD) has been broadly adopted by empirical researchers as it possesses the sophisticated quality to overcome or address the shortcomings of accounting-based stability measurements such as Z-score and NPL (Anginer et al., 2014; Kabir & Worthington, 2017; Koutsomanoli-filippaki, Mamatzakis, & No, 2009; Monnin & Jokipii, 2013). The distance to default is evaluated as a market-centred measure of risk default following the theoretical contributions of Merton (1974) and Black and Scholes (1973). There are various market-based techniques for predicting bank risk default, such as bond values and credit defaults swap (Martin Cihak, 2007). According to Harada et al. (2010), Allen and Powell (2012) are of the view that the

Probability of defaults is the most popular and accurate market built measurement for banking failures. This model states that banks face insolvency at the point when the market value of their assets drop lower than the liability book values (Harada et al., 2013). Meanwhile, PD has an inverse relation with the Z-score. A higher value of PD signifies instability, while low values indicate stability.

On the other hand, this indicator (PD) is only applicable to the listed companies that were functional. The robust stock market operates every business day (Harada et al., 2013). However, very few empirical studies have used this measurement of market quality to project the probability of corporate liquidation (Agarwal & Taffler, 2008; Fu, Lin, & Molyneux, 2014; Harada et al., 2013; Kabir & Worthington, 2017). However, based on this, the indicator will be used in the study as the dependent variable.

The Merton distance to bankruptcy model conveys two assumptions. The first is that the market value of the bank asset is moving geometrically in Brownian motion.
Distance to default formula equation (3.25);

$$p = N\left(-\frac{In\left(\frac{v_{At}}{Dt}\right)+\left(u-\frac{1}{2}\sigma_A^2\right)T}{\sigma_A\sqrt{T}}\right) \qquad (3.26)$$

Where the value of P represents the probability of insolvency, N is the sum of standard density, V is the value of the assets, D_t is debt face price substitutes by total liability, $\mathcal{U}$ represent anticipated return, σ_A is standard deviation of asset t, T is period of expiration (considered to be one year). The estimation for the probabilistic tendency of default is specified by McDonald (2002). The study adopts the improved version of PD using special forward treatments of intensity modified by (Duan, Sun, & Wang, 2012), which overcome some weaknesses identified with traditional DD. The literature of financial econometric believed that the parameter of anticipated return ($\mathcal{U}$) can not be assessed with reasonable accuracy unless a long span of data is utilised. Therefore it is more realistic to dodge using the parameter ($\mathcal{U}$) while estimating the value of PD in an attempt to escape sampling error.

$$PD_t = \frac{\log\left(\frac{V_t}{D}\right)}{\sigma\sqrt{T-t}} \tag{3.27}$$

Where the symbols are express in the previous equation

3.8.3 Capital Adequacy Ratio

The variable Capital Adequacy (EQTA) indicates the size of capital equated to bank total assets. Bank management struggles to acquire more capital higher than the lowest requirement to shine away from the probability of default (Apergis, 2014). More so, Williams (2014) believed that attaining a high level of bank capital ratio distance the bank far away from insolvency. Matten (1996) identified three functions of bank leverage. On the edge of banking stability, the focus is centred on the bank loss absorption function; this remains one of the principal roles of capital. Capital saves as a buffer to shield against any losses. Higher capital permits banks to absorb financial injuries generated from borrowers inability to meet their obligations and from a scenario where assets are completely or partially irrevocable. By acquiring more capital financial institution is likely to be more flexible to financial turmoil.

The bank leverage ratio is seen as the relationship between financial firm core capitals and total assets. The higher the figure of bank leverage, the better the likelihood that financial institutions will withstand undesirable shocks on its financial statement. The importance of this variable makes it an instrumental figure in the International accords of Basel I to Basel III. Therefore, institutional with quality capital receive investors confidence, with that positive relationship is expected between bank leverage and stability index. The intermediation theory of (Bryant, 1980; Diamond & Dybvig 1983), together with the "representation hypothesis" (Dewatripont & Tirole, 1994) acknowledges that regulation of capital can be used to protect banks from macroeconomic shocks. Curak, Poposki, and Pepur (2012) believed that the leverage ratio reduces bank earnings, and profit is very instrumental in bank stability. However, capital adequacy has been adopted in the literature as a predicting variable for bank Z-score (Ghosh, 2014; Kohler, 2015; Mirzaei et al., 2013; Nguyen & Nghiem, 2015; Özşuca & Akbostancı, 2016; Tabak et al., 2015; Williams, 2014; Zhang et al., 2016). These justified the adoption of capital adequacy as the explanatory variable in this study. However, it expected that adequate bank capital would prevent the bank from financial insolvency.

The formula for capital adequacy;

$$Eqta_t = {}^{Eq_t}/_{Ast_t} \tag{3.28}$$

Where Eq_t is the equity ownership of the bank, while Ast_t is the bank assets for the period.

3.8.4 Asset Quality

The variable asset quality (LLR) look at loan intensity as the scale that measures banks loan quality and how the management controls the credit portfolio against default from the customer. The loan quality is calculated by a loan loss reserve over the total loan package of the banks. The measure is used in assessing banking stability as in (Kohler, 2015; Rumler & Waschiczek, 2016; Wahid & Dar, 2016), justifying the use of the indicator in the study. It is expected that higher asset quality will improve bank stability.

In essence, the measure of asset quality signified the level of a financial portfolio made available but not written off. A higher value of the provision of the variable could be a pointer for poor loan quality and consequently, a greater portfolio risk. Conversely, with quality loans, a higher provision could involve a positive connection amid risk and stability, as portrayed by asset management theory. Hence, there is ambiguity on how the signage of the hypothesis association could be because some studies recorded positive while others negative. Similarly, the apprior expectation of asset quality on Z-score is negative, while the expectation on the PD will be positive. However, a negative of the effect of the provision on bank stability would advocate the quality of a weak loan that reduces the financial strength of bank revenue and upsurge provisional costs of the financial institution. The formula for Assets quality;

$$LLr_t = {}^{LLr_t}/_{TL_t} \tag{3.29}$$

Where LLr_t is the reserves of loan written off of bank the, while TL_t is the bank total loan for the period.

3.8.5 Liquidity Ratio

Banking liquidity (LIQ) is the scale that measures the bank readiness and ability to meet its immediate cash obligation upon the request of their clients. Bank liquidity arrases from straight notes holdings or on account holding with apex financial regulating bank. Holding near cash securities or government bonds with a shorter validity period. Therefore, the bank can stimulate their solvency through the provision of lesser loan facilities to meet with customer's withdrawals requirement (Berger et al., 2009).

On the other hand, the higher the bank collection of credit, the closer to default risk, which overwhelms cooperate stability (Altunbas et al., 2007; Stiroh & Rumble, 2006). Banks with a lower ratio of liquidity have a higher level of risk exposure (Liu et al., 2012). The size of bank liquidity is calculated by the ratio of bank loans over entire bank assets. However, Wagner (2007) claims that bank upper liquidity level still is confronted with lower cooperate stability as liquidity assets do not make part of a capital requirement by regulation. Several empirical stability studies utilized liquidity ratios to promote banking stability (Bustaman et al., 2017; Jeon & Lim, 2013; Nguyen & Nghiem, 2015; Özşuca & Akbostancı, 2016; Soedarmono, Machrouh, & Tarazi, 2011). This justified the utilization of bank liquidity ratio as our explanatory variable in this essay. Thus, it is expected that bank liquidity will improve banking stability.

The formula for Liquidity quality:

$$Liq_t = {}^{TL_t}/_{Ast_t} \tag{3.30}$$

Where TL_t is the total loans of bank, while Ast_t is the bank total assets for the period.

3.8.6 Corruption Control Index

Corruption Control (CPI) is a measurement of assessing the level of corrupt practices within the administrative class of a given country. In this study, CPI will measure the extent to which corruption influence banking stability. The scale of CPI ranged from 0 (adversely corrupt) and 100 (minimally corrupt). The variable has been widely used (Chen et al., 2015; Hoque et al., 2015; Korbi & Bougatef, 2017; Toader et al., 2017). This permits the use of the variable as the independent variable. Corruption is the abuse of entrusted common control for personal pleasure, is a common, political, and financial phenomenon ubiquitous universally but more persistent in developing countries (TI, 2016). Corruption is capable of reducing the efficiency of the business industry. It is expected that a high level of corruption will deteriorate banking stability in GCC and Non-GCC states.

3.8.7 Political Stability

Political Stability (PSI) refers to a tool designed for assessing the level of political impetuosity in the state and the gravity of its implication on governance and economic stability. The higher figure in the ranking indicates a minimal level of civil unrest in the state. It means that the leadership does not indulge in dictatorial activities, directly or indirectly, against the country's citizens. The lower ranking assigned to a state implies that distraction such as public disorder is going on in the country. This indicator encompasses some components such as terrorism, civil chaos, and the threat of changing the political class. It is evident that states with healthier country-based governance attract better earnings as stockholders' rights receive maximum protection (John, Litov, & Yeung, 2008). However, it is anticipated that a high level of internal conflict will lead to bank insolvency.

3.8.8 Growth Domestic Product

GDP is the income that accrues to all citizens of the state when real GDP is divided by the entire population (World Development Indicator, 2017). In an attempt to measure economic progress, researchers primarily utilize the growth of actual GDP from year to year (Gordon, 2012). The variable was used as by many scholars as a measure of economic progress (Bustaman et al., 2017; Ghenimi, Chaibi, & Omri, 2017; Hesse, 2010; Hoque et al., 2015; Korbi & Bougatef, 2017; Nguyen & Nghiem, 2015; Özşuca & Akbostancı, 2016; Wahid & Dar, 2016). The growth rate indicator of the economy is expected to have a positive influence on banking system stability.

Measurement of GDP:

$$GDP = C + I + G - M \tag{3.31}$$

Where C is the consumption, I for investment, G is for government expenditures, and M is for imports.

3.8.9 Inflation

Inflation (INF) is the measurement of economic condition that signifies increase in prices of products and services over a predetermined period in a state. In essence, it denotes the percentage of the indicators of inflation shown every year (Consumer Price Index CPI). The indicator is widely used by many studies to indicate a change in general price

(Bustaman et al., 2017; Martin Cihak & Hesse, 2010; Cubillas & González, 2014; A Demirgüç-Kunt & Detragiache, 1998; Kabir & Worthington, 2017; Nguyen & Nghiem, 2015; Wahid & Dar, 2016). Similarly, it is expected that inflation drops banking stability and advances their insolvency.

Measurement of *CPI* Laspeyres index

$$INF_t = \frac{\sum(P_t.q_o)}{\sum(P_o.q_o)} \tag{3.32}$$

Where P_t stand for later year price of goods, P_o is the base year goods price, q_o is the base year quantities of goods. While q_t is the later year quantities.

3.8.10 Oil Price Changes

Oil Price change ($\Delta oilp$), in the recent time, refers to changes in the price of hydrocarbon as spurred multiple demands for empirical studies that elaborate on the appropriate measurement of oil price changes (Hamilton, 2008). Hydrocarbon price is the global oil price in U.S Dollars (Brent crude price). In this study, 12 months, forward average from World Bank and Bloomberg is adopted. The indicator is widely used to present the annual average increase in oil price (Alodayni, 2016; Hesse & Poghosyan, 2016). However, the drop in oil price is expected to spur banking insolvency risk.

The crude oil average growth rate is measured with an arithmetic mean of 365 days growth rate of a spot in U.S. dollar: (fr_t)

$$CHt = \frac{\sum_{i=1}^{365}[\log(fr_{t,i}) - \log(fr_{t-1,i})] \times 100}{365} \tag{3.33}$$

The study comprises of 5 GCC countries and 5 Non-GCC countries. In the GCC countries, all quoted banks available on the Bank scope data system from 2008-2016 are considered part of the sample. The countries in the GCC are (Bahrain, Kuwait, Kingdom of Saudi Arabia, Qatar and the United Arab Emirates). The countries that form part of the Non-GCC are (Algeria, Egypt, Jordan, Lebanon, and Tunisia). Moreover, these countries are selected based on their similar economic features such as financial system is bank based, operating dual banking and export of petroleum products (Alandejani et al., 2017; Alqahtani & Mayes, 2018). The data are sourced from Bank scope, World Bank database, Transparency International, and the International Country Risk Guide.

3.8.11 Bank Size

Bank Size (InTA) is the sum of the total bank assets that stand for the bank size. The size of total bank assets is one reason for higher bank risk-taking, caused by the notion of "too big to fail" syndrome in large financial institutions (Bustaman et al., 2017; Ghenimi et al., 2017; Soedarmono et al., 2011). However, it is expected that banks with higher total assets would enhance the bank solvency rate because large banks do benefit from the economy of scale and can reduce their cost and risk simultaneously. However, the cost of bureaucracy increases with the size of the financial institution, especially those accruing for extra-large banks. Therefore, the effect of size on banking stability could reverse its direction (sign) when the bank size has attained a given threshold.

3.8.12 Management Efficiency

Management Efficiency (EFF) refers to banks operational efficiency measured using operating revenue divided by their operating cost. The measurement of operation quality is a crucial indicator in measuring management efficiency in confirming that the bank assets are well managed to realize a light spread with the price of withholding liabilities. However, when the cost of funding increases in the market, management will prefer to liquidate certain quota of bank assets rather than to incur more responsibilities to fund the operation of the bank (Awojobi, Amel & Norouzi, 2011). Higher the ratio of costs signifies a higher level of inefficiency from the management. This also has a positive influence on bank credit risk just as it indicates that the administration is not broad enough to curtail its deficiency. Lack of management quality is identified when the fall in cost efficiency provisionally leads to an escalation in the volume of risk (Williams, 2004).

Banks with inefficient management will fail to control operational expenditure and observe borrowers. Hence, they will experience increase in cost inefficiency (Berger & DeYoung, 1997). Thus, such banks will have poor credit and investment portfolios, triggering shortfall in revenue efficiency (Williams, 2004). Proper operation in cost management promotes banking stability (Uhde & Heimeshoff, 2009). Also, there is no economic theory that has, so far, predicted that Islamic banks should be more cost-effective than their conventional peers. But some ambiguities do exist pertaining to the efficiency of the sharia financial institutions. Monitoring the expenses of Islamic banks could be small because it attracts inferior agency difficulty. Thus, a higher complication of sharia funding might lead to more extensive expenditure, which makes the Islamic banks less management efficient (Beck et al., 2013).

Furthermore, different bank stability literature have used bank expenditure income ratios as the measure of bank management efficiency (Awojobi, Amel, & Norouzi, 2011; Beck et al., 2013; Bustaman et al., 2017; Ghenimi et al., 2017; Kabir & Worthington, 2017; Nguyen & Nghiem, 2015). This guarantees the use of the same indicator as a predictor variable in this work. Similarly, it is expected that efficient management will improve banking stability.

The formula for managerial efficiency is presented below:

$$M_{eff} = {}^{op_{exp}}\!/_{op_{in}} \tag{3.34}$$

Where op_{exp} are the operating expenses, op_{in} Is the operating income.

3.8.13 Income Diversity

Income Diversity (IDIV) refers to revenue diversification. It entails the shift of banking business paradigm from the sale of traditional loan instruments to non-traditional loan products like pension schemes, estate management, stockbroking and consultancy services which are bundled together with loan instruments to produce commission-based revenues (Deyoung & Roland, 2001; Stiroh, 2004; Stiroh & Rumble, 2006). It is claimed that certain incentives are driven by banks for increasing income from non-credit avenues because commission and fee-centred revenues are sheltered from interest rate oscillations and macroeconomic conditions, unlike incomes, that are generated from credit sales (DeYoung & Roland, 2001, Smith et al., 2003; Williuoms, 2016; Ozili, 2017).

However, bank income divergence reduces banks' exposure to default. Stiroh (2010), through modern portfolio theory, has proved the relationship between bank revenue diversification and stability. Similarly, the intermediation theory encourages banks to diversify income portfolios to tackle financial shocks. It is contended that banks diversify more when they require an increase in the bank capital formation to accommodate the training and hiring of experts to man the non-traditional banking products (Cihak & Hesse, 2010). Higher figure of the variable tallies with diversity at a higher grade that implies better stability of the banking institution. Thus, a significant number of literature on the relationship between banks and stability nexus use the noninterest income to revenue ratio (Bustaman et al., 2017; Martin Cihak & Hesse, 2010; Kabir & Worthington, 2017; Kabir et al., 2015; Nguyen & Nghiem, 2015; Ozili, 2018; Rajhi & Hassairi, 2014; Santoso, Rum, & Patria, 2016; Senyo, Olivia, & Musah, 2015; Smith, Staikouras, & Wood, 2002). However, it is expected that high banking revenue diversification will positively enhance banking stability.

$$Inc_{Div} = {}^{Nonit_{inc}}/_{Texp_{inc}} \qquad (3.35)$$

Where $Nonit_{inc}$ is the non-interest income, while $Texp_{inc}$ is the total expenditure income.

Below is a summary of the variables and their measurements

Table 3. 2
Summary of the Variables and Measurement

Variables	Measurement/Description	Source	Authors
Dependent Variable:			
Z-Score	EA+ROA/σ(ROA). EA represents ratio of equity to the bank assets, σ(ROA) is the velocity of bank assets return. Higher figure signified for lower probability of banking default, or higher degree of banking stability.	Bank Scope	Beck et al., 2013
Probability of Default (PD)	Volatility of assets	Data Stream	Kabir et al., 2015
	Total liabilities (short term liabilities)	Bank Scope	
	Risk free rate (3/6 month treasury rate)	IMF/World Bank	
	The Market Value of Assets	Data Stream	
	The expected return on assets	Data Stream	
	High value signified bank insolvency or higher degree of banking instability		
Bank Specific Variables:			
Capital Adequacy	Equity/Assets. Due to the huge equity cushion, a bank stand resilient to insolvency default	Bank Scope	Kohler, 2015; Ghosh, 2014
Assets Quality	Loan loss reserve/loan. The ratio of reserved loan portfolios written off.	Bank Scope	Wahid & Dar, 2016
Institutional Variables:			

Variables	Measurement/Description	Source	Authors
Corruption Control (CPI)	The index of Transparency International, demonstrating the perceived level of corruption on a scale of 10-100, with higher index signified proper control on corruption, while lower value demonstrates rampant or poor control of corruption.	Transparency International/World Bank	Chen et al., 2015
Political Stability	The index of World Bank demonstrating the business World player's perception of the level of political stability in the country. Scaled on 10-100, higher figure denotes political integrity, while lower index demonstrates political turmoil in the country.	World Bank	Bermpei, Kalyvas, Nguyen, 2018
Macroeconomic Factors:			
GDP	The Growth rate of nominal GDP (Business Cycle)	World Bank	Hoque et al.,2015
Inflation	Change in CPI	World Bank	Cihak & Hesse, 2010
Δ Oil price	Annual average growth in oil price	IMF, Bloomberg	Hesse & Poghsyan 2016
Control Variables:			
Size	Natural Logarithm of total assets	Bank Scope	Bustaman et al., 2017
Managerial efficiency	Total operation exp. to operating incomes	Bank Scope	Beck et al., 2013
Diversification	Noninterest income-to-total operation income	Bank Scope	Kabir & Worthington, 2017
Islamic Bank Dummy	1=Islamic, 0=Conventional Bank, is a categorical variable to represent the		Beck et al., 2013

Variables	Measurement/Description	Source	Authors
	present or absent of some effect that could shift the expected outcome.		

3.9 Method of Analysis

In attempt to pursue the research objectives, the statistical regression technique is adopted to determine how strong the relationship is between one financial variable (dependent variable) and the other series of financial data (independent variables). Regression helps econometricians to explain how strong the regressors affect the dependent variable in a model. Since this study is using both the cross-sections (197 banks) and the time series data of ten years from (2008-2016), the study used a panel data analysis that appears to be consistent with previous literature (Alandejani et al., 2017; Hasan & Dridi, 2010). In this regard, panel data appeared more accurate and can accommodate sample variability than time-series and the cross-sectional kind of data. Similarly, panel data has the quality to control for heterogeneity and can estimate a model that can not be measured with time-analysis and cross-sectional analysis (Hsiao, 2003; Baltagi, 2013).

In our attempt to answer the research question, the econometrical technique of dynamic panel data is adopted in this empirical analysis. The followings justify the selection. Firstly, a common practical symmetry in data suggests that banking profits in GCC and Non-GCC are highly persistent following the imperfect nature of the competition and regional autocorrelation (Berger, 2000). The technique of dynamic system GMM is designed to correct the wrong causation by introducing lagged-on dependent variable (Z-score) to curtail for the endogeneity bias in the series (Arellano and Bond, 1991). Secondly, some of the regressors especially bank internal factors of stability like capital adequacy variables, are expected to be endogenous to other error terms (Athanasoglou, 2008). This situation renders the traditional panel (like, pool regression, fixed and random effects) unfitting and biased. However, to provide a reliable estimation system, the GMM approach permits instrumenting of the endogenous regressors. Lastly, due to the vulnerable nature of the traditional panel to variable omission bias, where significant variables are excluded from the banking stability series, the GMM technique is designed robustly to variable omission problem (Roodman, 2009; Hesse & Poghosyan, 2009).

In estimating the model within the system GMM framework, we will begin with testing the stationarity properties of the sequences. Statistical inferences require that variables in the model should be stationary to ensure the appropriateness of the selected method in the dynamic panel (Baumohl & Lyosa, 2009; S. Hassan, Abu Bakar, & Abdullah, 2014; Lyocsa, Vyrost, & Baumohl, 2011). The GMM estimators are of two kinds. The first is difference of Arellano and Bond (1991) and the system GMM designed by Arellano and Bover (1995) and Blundell and Bond (1998).

Testing for the asymptotic properties of the variable and the series in the micro panel is necessary in order to certify the suitability of the method of the dynamic panel (Bond, Nauges, & Windmeijer, 2005; Chang, Huang, & Wei, 2011). The problem of non-stationarity is also prevalent in the panel analysis as it was discovered in the time series analysis, more especially if the number of cross sections is much higher than the observation period (Arellano, 2003; Holtz-Eakin, Newey, & Rosen, 1988). If the asymptotic distribution of the variables is integrated at I(1), the difference in GMM is more appropriate as the method collapses when the variables are integrated at I(2). This is so because the difference in GMM approach can only estimate a model in the first difference. Also, the procedure for system GMM is applicable when the series are integrated at the level (Roodman, 2009).

Unit root testing was established to scrutinize the stationary properties of the panel data observation. In this study, I'm, Pesaran, and Shin (IPS) test is adopted to examine the properties of the variable as the assorted test allows appropriate datasets with the huge panel and fewer period (I'm, Pesaran, & Shin, 2003). Similarly, the test allows for balance and unbalance panel datasets. Akaike Information Criteria (AIC) with automatic lag selection is used.

The specification for the (IPS) is as follows:

$$\Delta z_{it} = \alpha_i + \delta_{it-1}\gamma_{it-1} + \sum_{j=1}^{p} \emptyset_{ij}\,\Delta y_{it-j} + \varepsilon_{it} \tag{3.36}$$

$$\Delta z_{it} = \alpha_i + \alpha_i t + \delta_{it-1}\gamma_{it-1} + \sum_{j=1}^{p} \emptyset_{ij}\,\Delta y_{it-j} + \varepsilon_{it} \tag{3.37}$$

Where Δ = the difference operator, γ is the variable to be tested (*Z-score, PD, Eqta, LLr, Liq, Cpi, Psi, Δoilp, GDP, INF, inTa, Eff, Idiv*) $i = 1,\ldots..N$ which stands for the entities and t = 1, .. .9 which denotes period, α is the coefficient and Ɛ represent error term. The equation (3.36) represents (IPS) without trend, while equation (3.37) is with a time trend.

In following the procedure for the estimation of these research models, the Generalized Method of Moment (GMM) estimator is adopted after the confirmation of the stationarity of the variables. Specifically, the most proficient and a lesser amount of bias (Blundell and Bond 1998) "system GMM" estimator is utilized. However, the estimation is a technique found to be consistent in the empirical literature, and it can vanquish the Nickell (1981) bias and resolve the concern of measurement error and endogeneity across banks (Ding & Knight, 2011). Arellano and Bond (1991) derived the "difference" GMM model was further settled through the efforts of Blundell & Bond (1998). The Dynamic system GMM models are one of the most reliable techniques utilized in dynamic panel information (Baltagi, Demetriades, & Law, 2009). The estimator (GMM) expresses its assumptions on data generating procedures. The procedure is dynamic, with the present value of predicting variables being influenced by the preceding ones.

The arbitrarily distributed fixed specific effect may occur in the dynamic thereby indicating that the dependent variable steadily changes quicker for some observable units than others. This claim is contrary to cross-sectional regressions which assume fixed effect absent and favouring panel outfit, where deviation over time is used to pinpoint parameters. The endogeneity may be found in the regressors.

Idiosyncratic disturbances (excluding fixed effect) which have given forms of heteroskedasticity and serial correlation. The idiosyncratic disturbance is unlinked transversely on individuals.

Some predictors may be prearranged but not strictly exogenous: even if the regressor of present disturbances is still affected by the former ones. For instance, we have the lagged-dependent variable. The number of the time span of existing data, *T*, might stay small. (Typically, the panel carry small *T*, the more substantial value of *N*.). It appears only in internal instruments based on the lags of the instrumental variables that are available. Conversely, the estimators do permit the enclosure of external instruments.

The system GMM model of estimation also looks after the time in-variant, country-specific. This means that there are undetected particular effects which can be correlated with the predictor variables. It naturalizes the endogeneity of the explanatory and escapes dynamic panel bias. Additionally, the model also absorbs unbalanced panels. This applies also to several endogenous variables. Alongside the benefits related to system GMM estimation, the occurrence of a lagged dependent variable between the predictor's meltdown standard estimators pooled OLS, fixed and random effects unreliable and bias. This is seen in equation (3.38) below:

$$zsc_{i,t} = \emptyset_0 + \sum_{k=1}^{n} \emptyset_1 zsc_{i,t-1} + X_{i,t}\emptyset_2 + v_i + \varepsilon_{i,t} \tag{3.38}$$

$zsc_{i,t}$ is representing the function of v_i. Then it is followed by lagged $zsc_{i,t-1}$ another function of v_i hence, $zsc_{i,t-1}$ the regressor in the right hand direction in equation is correlated with the error term. This turns the OLS biased and unreliable even in the condition $\varepsilon_{i,t}$ are uncordially correlated. Due to the regressor similarity error term, the correlation, random and fixed effects models become inappropriate.

The difference GMM estimator of (Arellano & Bond 1991), at first difference the regression is intended to eradicate country-specific effect[2]. Differencing of equation (3.39) below:

$$zs_{i,t} - zs_{i,t-1} = \emptyset_0 + \emptyset_1(zs_{i,t-1} - zs_{i,t-2}) + \emptyset_2(X_{i,t} - X_{i,t-1}) + (\varepsilon_{i,t} - \varepsilon_{i,t-1}) \quad (3.39)$$

Therefore, the country explicit effect v_i is eradicated because (v_i- v_i)= 0. Then, the equation is substituted as:

$$\Delta zsc_{i,t} = \emptyset_0 + \emptyset_1 \Delta zs_{t,i-1} + \emptyset_2 \Delta X_{i,t} + \Delta\varepsilon_{i,t} \quad (3.40)$$

Where Δ represents change, while others explain previously.

Thus, this takes us to problems (i) error term correlation. Remembered that $\mathcal{E}$ is presumed to be i.i.d. while the first difference error never i.i.d, because $\Delta\varepsilon_{i,t} = \mathcal{E}_{i,t} - \mathcal{E}_{i,t-1}$ and $\Delta\varepsilon_{i,t-1}= \mathcal{E}_{i,t-1} - \mathcal{E}_{i,t-2}$ are correlated (by taking similar component Viz.$\mathcal{E}_{i,t-1}$), (ii) regressor error term correlation (endogeneity). This is so because $\Delta zs_{i,t-1} = zs_{i,t-1} - zs_{i,t-2}$ relies on $\mathcal{E}_{i,t-1}$. This forms the transformed error term. In attempting to resolve the

[2] The country-specific effects are the parculier factors that are unit to a given country which can influence banking stability in that country.

issue, the lag of the explanatory variable values is utilized as the instrument (Arellano & Bond, 1991). The instrument most are pertinent and show a strong relation with predictors; it should carry zero correlation with the error term.

However, going with the postulations error term now is out of serial correlation. Regressors are frailly exogenous, presuming to be uncorrelated with the forthcoming realization of the error term. The estimation model of dynamic GMM follows these moment conditions:

$$E\left[zs_{i,t-j}\left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right)\right] = 0 \ \ for\ j \geq 2; t = 3, \dots \dots \dots T \qquad (3.41)$$

$$E\left[PD_{i,t-j}\left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right)\right] = 0 \ \ for\ j \geq 2; t = 3, \dots \dots \dots T \qquad (3.42)$$

Building on the above conditions moment, two-step GMM was proposed (Arellano & Bond, 1991). The assumption surrounding the first step error term must be independent and homoscedastic within the cross sections, countries over the span period. While the second assumes that, the residual generated in the former step is utilized to build a reliable estimate of variance to the covariance matrix and, in so doing, relaxing the assumption of independence and homoscedasticity.

Therefore, Arelliano and Bover (1995) have maintained that when a higher persistent autoregressive process takes place or variance ratio in the panel effect v_i to variance of the idiosyncratic error $\varepsilon_{i,t}$ turn very large, the lagged levels are weak instruments for regression indifference. The GMM difference estimator also left valued observations. In the situation, the difference in GMM estimation is likely to accomplish poorly and have poor sample properties. Thus, banking on the efforts of Arellano & Bover (1995), Blundell and Bond (1998) have suggested a more proficient estimator – "system" GMM that fishes out weak instrumental problems through adding moment conditions. System estimator conglomerates both moment and differenced model together with levels model. That implies combining in a system difference and levels regression. So, the instruments for regression in differences remain alike, while the instruments for the regression in level are lagged differences of conforming and corresponding variables. Another moment conditions in the second set of the system is the regression in level as:

$$E\left[(zs_{i,t-j} - y_{i,t-j-1})(v_i + \varepsilon_{i,t})\right] = 0 \ for\ j = 1 \tag{3.43}$$

$$E\left[(PD_{i,t-j} - X_{i,t-j-1})(v_i + \varepsilon_{i,t})\right] = 0 \ for\ j = 1 \tag{3.44}$$

However, the system estimator employs the moment conditions through the equation (3.41) and (3.42), (3.43) and (3.44) respectively to produce consistent and proficient parameter estimates.

The predetermined conditions are main for series $Zs_{i,t}$ *and* $PD_{i,t}$ having become time-invariant. These permit the instruments for level equation, the adoption of the first lagged difference of dependent and predicting variables (Hou & Chen, 2013). According to Law (2014), system GMM executes significantly better more accurately if the series are insistent or neighbouring to random march.

Another rule of thump justifying for the selection of the System GMM over Difference GMM following Bond (2001), where he proposed three-step guidelines as follows:

1. The model should be estimated using both Pooled OLS and fixed effect methods.
2. The Pooled OLS result should be considered the upper limit of the estimate. Result of the estimated fixed effect is considered as the lower limit of the estimations.
3. The autoregressive model is also estimated with Difference GMM one-step and two-step, respectively. If the two results from the Difference GMM is closer to the estimated fixed effect, this suggests that the Difference GMM estimate is downward biased following weak instrumentation. Therefore, System GMM should be preferable instead of Difference GMM. Refer to appendix B for the selection test.

The Dynamic panel specification is as given below:

$$\begin{aligned} Zscore_{j,i,t} = a_0 &+ \sum_{k=1}^{n} a_1\, Zscore_{j,i,t-1} + \sum_{k=0}^{n} a_2\, eqta_{j,i,t} + \sum_{k=0}^{n} a_3\, Liq_{j,i,t} + \sum_{k=0}^{n} a_4\, LLr_{j,i,t} \\ &+ \sum_{k=0}^{n} a_5\, CCi_{i,t} + \sum_{k=0}^{n} a_6\, Psi_{i,t} + \sum_{k=0}^{n} a_7\, Inf_{i,t} + \sum_{k=0}^{n} a_8\, GDP_{i,t} \\ &+ \sum_{k=0}^{n} a_9\, \Delta oilp_t + \sum_{k=0}^{n} a_{10}\, eff_{j,i,t} + \sum_{k=0}^{n} a_{11}\, Idiv_{j,i,t} + \sum_{k=0}^{n} a_{12}\, inTa_{j,i,t} \\ &+ a_{13}D_t + \varepsilon_{j,i,t} \end{aligned} \tag{3.45}$$

$$\begin{aligned} Zscore_{j,i,t} = \alpha_0 &+ \sum_{k=1}^{n} \alpha_1 Zscore_{j,i,t-1} + \sum_{k=0}^{n} \alpha_2 Liq_{j,i,t} + \sum_{k=0}^{n} \alpha_3 eqta_{j,i,t} + \sum_{k=0}^{n} \alpha_4 LLr_{j,i,t} \\ &+ \sum_{k=0}^{n} \alpha_5 eff_{j,i,t} + \sum_{k=0}^{n} \alpha_6 Idiv_{j,i,t} + \sum_{k=0}^{n} \alpha_7 inTa_{j,i,t} + \alpha_9 D_{j,i,t} \\ &+ \varepsilon_{j,i,t} \end{aligned} \tag{3.46}$$

$$Zscore_{j,i,t} = \beta_0 + \sum_{k=1}^{n} \beta_1 Zscore_{j,i,t-k} + \sum_{k=0}^{n} \beta_2 Cpi_{,i,t} + \sum_{k=0}^{n} \beta_3 Psi_{,i,t} + \sum_{k=0}^{n} \beta_4 eff_{j,i,t} + \sum_{k=0}^{n} \beta_5 inTa_{ji,t} + \sum_{k=0}^{n} \beta_6 Idiv_{j,i,t} + \beta_8 D_{j,i,t} + \mathcal{E}_{i,t} \quad (3.47)$$

$$Zscore_{j,i,t} = \phi_0 + \sum_{k=1}^{n} \phi_1 Zscore_{j,i,t-k} + \sum_{k=0}^{n} \phi_2 \Delta oilp\ \ _t + \sum_{k=0}^{n} \phi_3 GDP_{,i,t} + \sum_{k=0}^{n} \phi_4 Inf_{i,t} + \sum_{k=0}^{n} \phi_5 inTa_{j,i,t} + \sum_{k=0}^{n} \phi_6 Idiv_{j,i,t} + \sum_{k=0}^{n} \phi_7 eff_{j,i,t} + \phi_8 D_{j,i,t} + \mathcal{E}_{j,i,t} \quad (3.48)$$

$$PDf_{j,i,t} = \alpha_0 + \sum_{k=1}^{n} \alpha_1 PD_{j,i,t-1} + \sum_{k=0}^{n} \alpha_2 Liq_{j,i,t} + \sum_{k=0}^{n} \alpha_3 eqta_{j,i,t} + \sum_{k=0}^{n} \alpha_4 LLr_{j,i,t} + \sum_{k=0}^{n} \alpha_5 eff_{j,i,t} + \sum_{k=0}^{n} \alpha_6 Idiv_{i,t} + \sum_{k=0}^{n} \alpha_7 inTa_{j,i,t} + \alpha_9 D_{j,i,t} + \mathcal{E}_{j,i,t} \quad (3.49)$$

$$PDf_{j,i,t} = \beta_0 + \sum_{k=1}^{n} \beta_1 PD_{j,i,t-1} + \sum_{k=0}^{n} \beta_2 Cpi_{i,t} + \sum_{k=0}^{n} \beta_3 Psi_{i,t} + \sum_{k=0}^{n} \beta_4 eff_{j,i,t} + \sum_{k=0}^{n} \beta_5 Idiv_{j,i,t} + \sum_{k=0}^{n} \beta_6 inTa_{j,i,t} + \beta_8 D_{j,i,t} + \mathcal{E}_{j,i,t} \quad (3.50)$$

$$PDf_{j,i,t} = \phi_0 + \sum_{k=1}^{n} \phi_1 PD_{j,i,t-1} + \sum_{k=0}^{n} \phi_2 \Delta oilp_t + \sum_{k=0}^{n} \phi_3 GDP_{i,t} + \sum_{k=0}^{n} \phi_4 Inf_{i,t} + \sum_{k=0}^{n} \phi_5 inTa_{j,i,t} + \sum_{k=0}^{n} \phi_6 Idiv_{j,i,t} + \sum_{k=0}^{n} \phi_7 eff_{j,i,t} + \phi_8 D_{j,i,t} + \mathcal{E}_{j,i,t} \quad (3.51)$$

Where all variables remain as previously defined in the Equation.

3.9.1 Long-Run Effect

The study has determined the short-run dynamics of the banking stability of the cluster banks, using the system estimator of GMM. Basically, the model is not only built on a partial adjustment but it also has the properties of estimating the overall dynamics that are similar to the approach of Bond, Elston, Mairesse, & Mulkay (2003); Eslamloueyan & Jokar, 2014; Mulkay, Hall, & Mairesse, 2001; Nordin & Nordin, 2016; Yasar, Nelson, & Rejesus, (2006). Similarly, Piper (2014) split the property of dynamic panel estimator into contemporaneous (short-run) effects and the corresponding overall (long-term) effects. This approach will give the researcher an avenue for predicting future possibilities of the banking stability of conventional and Islamic banks. This will give policymakers opportunities for overall adjustment following better implication. The approach of Nordin and Nordin (2016) explains the estimated coefficient as well as the standard error of the long-run consequence for the dynamic panel L^{th} path parameter which can be calculated as:

$$\phi_L \div [1-\beta] \tag{3.52}$$

Where ϕ represents a significant variable in the short run, β is the Lag of the dependent variable. This can be executed using the "nlcom" command on a STATA.

3.10 Estimation Procedure

In estimating the stability difference between conventional and Islamic banks, this study employs dynamic panel data estimation technique GMM. Most studies on the stability difference between conventional and Islamic banks used OLS (Ordinary Least Square) and GLS (Generalized Least Squares) estimation technique. However, the few empirical studies that used GMM method of estimation did not study the banking stability difference between conventional and Islamic banks in GCC and non-GCC countries as noted in Beck et al. (2013); Dradi and Hesse (2010); Kabir et al. (2015) and Zhang et al. (2015). But our focus on the traditional panel of estimation.

In the attempt to avoid spurious estimation of the research models, which usually emanate from the series that are not integrated in the same order, the researcher conducted a unit root test to know the stationary properties of our variables before testing for the relationships among variables (Dickey & Fuller, 1979), using the statistical package of Eviews 10. The study conducted the I'm, Pesaran and Shin (IPS) unit root test. The test rejects the null hypothesis and accepts the Alt hypothesis as the probability is less than five percent. This means that the variables have become stationary at level, that is I(0). This indicates that the variables have expressed constant long-run mean characteristics (Libanio, 2005). The detection of unit root guides the study in selecting either the difference or the system GMM, the result favours the system GMM as the variable remains stationary at a level.

However, to control for the time dimension bias in the model, the study generates and include year dummies to control for the time variation of the dependent variables across the panels. However, monitoring for the unobserved elements varying across the time remains necessary in the series (Alqahtani & Mayes, 2018). To generate the year dummy in a Stata package command, **tabulate year** and **tabulate year, gen(y)** is used.

In estimating for the short-run relationship on how the dependent variable is affected by the set of independent variables, the study uses the integrated statistical software Stata 14. The software package has a unique capacity to allow and provide the researcher with data science needed for statistical analysis. However, to achieve the objectives of the study, we run the system GMM on the general model. Using the xtabond2 Stata command developed by Roodman (2014). For the estimated result to be valid, the number of groups (number of cross-sections) must be higher than or equals to the number of instruments (moment conditions). The Wild chi2 test must come with high value and significance. The test is meant to determine the fitness of all the variables in the model (Roodman, 2009).

However, system GMM is an orthogonal model which uses the lag of the dependent variable to remove the effect of endogeneity in the model. The p-values of the lag of the dependent variable must be significant to determine the persistence of the model. The next step is the sign, size of the coefficients to determine the direction and level of significance of the variables. To validate the estimation technique, two post-estimation-diagnostic tests become very necessary for the GMM model, which are:

1. Hansen J test (1982) it is a test design that measures the over-identifying restrictions of the instrument. The Null hypotheses signify the validity of the overall

instruments used. Failure of the test to reject Null hypotheses give support for the selection of the instrument.

2. Arellano and Bond (1991) it is a test for autocorrelation and serial correlation of the error term. The failure of the test to reject the Null hypotheses that there is no serial order, the serial correlation indicates that the original error term remains serially uncorrelated implying that the moment conditions are specified correctly in the model when the value of AR2 fall greater than 0.05.

Then after having the properties to determine the short-run relationship, the GMM technique also has the qualities to predict long-run horizons. However, to estimate for the long-run coefficient of a given variable, the variable is most significant in the short run before it is extended for a long run estimation. However, to estimate for the long-run relationship between the banking stability and its predictors (bank-specific, institutional and macroeconomic factors), the Stata 14 software package recognized the command "nlcom" to execute long-run regression. The probability value, direction and size of the coefficients determine the level of significance of the long-run relationship. The levels that are significant to this study are 1%, 5% and 10% respectively.

3.11 Conclusion

The techniques adopted in conducting the research are presented in this chapter. The section started by introducing the chapter and the theoretical and research framework are presented. Similarly, sections four and five of the chapter prescribed methodology and sources of data for the study. The analytical model and justification of the variables are in sections six and seven, respectively. The method of analysis is described in section eight. Section nine concludes the entire chapter.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter looks at the result of the analysis and discussion of the findings. Section 4.2 deals with descriptive statistics; Section 4.3 offers the correlational analysis. Section 4.4 presents the results from the panel data analysis, the unit root testing results and estimate the effects of the two-stage system GMM. Finally, Section 4.5 offers the concluding remarks on the chapter.

4.2 Descriptive Statistics Results

This segment explains the steadfastness as well as the degree of confidence of the data employed in the study. Before benching on any complex inferential estimations of the banking stability models, it is essential first to label the statistical summary of all the variables employed for the study, to show their overall distribution. Descriptive statistics is an essential analytical tool that defines the basic structures of the available data for a meaningful explanation. Therefore, this procedure enables the researcher to give a simple interpretation of the data in use. Typically, two kinds of statistics: measures of central tendency, made up of mean and median, and eventually the means of spread symbolised by standard deviation are commonly used to describe any given data.

4.2.1 Descriptive Analysis

In the analysis of the panel data, the descriptive statistics for the conventional and Islamic banks and all groups variables in the GCC and Non-GCC sampled countries are typically distributed. Tables 4.1 and 4.2 demonstrate the comparative descriptive statistics for conventional and Islamic banks analysis.

Table 4.1
Descriptive Analysis

VARIABLE	Obs	Mean	Std. Dev.	Min	Max
		Conventional Banks			
ZSCORE	1,062	45.6	40.5	-8.27	282.0
EQTA	1,062	13.2	7.1	-5.06	62.4
LLR	1,062	6.58	8.3	18.0	113.5
LIQ	1,062	47.7	18.8	-5.55	105.4
CPI	1,062	42.4	14.3	25	77
PSI	1,062	29.5	25.5	4.81	92.4
GDP	1,062	25.3	1.05	23.8	27.3
INF	1,062	4.67	4.45	-4.86	18.3
ΔOIL	1,062	82.3	24.8	40.6	109.4
InTA	1,062	15.4	1.52	10.0	19.1
IDIV	1,062	10.7	2.66	0.00	15.03
EFF	1,062	46.3	23.0	15.7	439.3
		Islamic Banks			
ZSCORE	441	25.12	31.61	-1.64	246.7
EQTA	441	29.3	27.67	3.30	106.0
LLR	441	7.89	12.85	0.01	100
LIQ	441	44.3	25.12	0.00	102.6
CPI	441	50.0	11.85	25	77.0
PSI	441	40.6	25.18	4.8	92.4
LGDP	441	25.4	1.15	23.8	27.5
INF	441	3.78	3.53	-4.8	18.3
ΔOIL	441	82.3	24.8	40.7	109.5
InTA	441	14.7	1.5	11.1	18.3
IDIV	441	8.56	4.5	0.00	15.9
EFF	441	72.6	88.6	7.68	973.3

Zscore- stability indicator, EQTA- equity to total asset, LLR-loan loss reserves to loan, NLA-net loans to an asset, CPI-corruption perception index, PSI-political stability index, LGDP-growth domestic product, INF-inflation, ΔOIL-change in oil price, LNTA-bank size, EFF-managerial efficiency, IDIV-net income diversification.

Table 4.2
Descriptive Analysis

VARIABLE	Obs	Mean	Std. Dev.	Min	Max
		Conventional Banks			
PD	522	23.5	28.6	0.28	246.5
EQTA	522	12.7	4.3	-5.5	38.03
LLR	522	5.5	4.2	0.21	28.4
LIQ	522	55.9	15.1	13.9	105.4
CPI	522	46.5	13.9	25	77
PSI	522	37.2	24.7	4.81	92.4
GDP	522	25.3	1.11	23.8	27.3
INF	522	4.4	4.0	-4.86	18.3
ΔOIL	522	82.3	24.8	40.6	109.4
InTA	522	16.0	1.30	12.8	19.1
IDIV	510	11.7	1.6	0.00	19.1
EFF	522	41.6	12.9	15.7	83.0
		Islamic Banks			
PD	243	34.3	49.7	0.001	298.6
EQTA	243	22.8	22.6	3.32	98.9
LLR	243	9.3	15.9	0.00	100
LIQ	243	49.9	23.6	0.00	92.7
CPI	243	50.8	12.5	28	77.0
PSI	243	47.1	24.9	6.7	92.4
GDP	243	25.8	0.99	23.8	27.3
INF	243	4.4	4.01	-4.85	18.3
ΔOIL	243	82.3	24.8	40.6	109.4
InTA	243	15.4	1.37	11.2	18.3
IDIV	209	11.2	1.84	0.00	14.5
EFF	243	61.8	74.1	8.40	771.8

PD- Probability of default as stability indicator, EQTA- equity to total asset, LLR-loan loss reserves to loan, NLA-net loans to an asset, CPI-corruption perception index, PSI-political stability index, LGDP-growth domestic product, INF-inflation, ΔOIL-change in oil price, LNTA-bank size, EFF-managerial efficiency, IDIV-net income diversification.

Consequently, Tables 4.1 and 4.2 illustrate the comparative descriptive statistics for bank stability analysis. This comprises the variables of bank-specific, institutional variables, and macroeconomic variables. Variables of bank-specific are retrieved from the annual income statement, operation ration, and statement of affairs. The total asset, net interest income is in millions of dollars, while the rest of the financial variables are virtually expressed in thousands and ratios. The values of the total assets are not in ratio like the other variables. That is why the study used the log of the total asset. The second set is the institutional indicators illustrated in tables 4.1 and 4.2; the index is in percentage. Similarly, in the last column are the three macroeconomics indicators. The first two are expressed in percentage, while the previous is the oil price expressed in the form of an annual average of global oil price. The entire sample in the Z-score model consisting of 1503 bank-year observations (1062 conventional banks and 441 Islamic banks). The sample of Probability of default comprises of 765 bank observations (522 conventional banks and 243 Islamic banks).

The upper part of Table 4.1 and 4.2 displays the descriptive analysis for the two alternative sub-sampled banks (conventional banks and Islamic banks in GCC and Non-GCC regions). The mean values and standard deviation figures differ in all corresponding sub-samples. Similarly, the observation figure is classified according to bank type separation of the study, conventional and Islamic banks which accounted for 1062 and 441 in Z-score model, and 522 and 243 in the Probability to default model.

Meanwhile, the dispersion from the mean and standard deviation is represented in the second and third columns correspondingly. To start with, the capital cushion ratio (equity to assets), which accounted for an average of 13 percent for conventional banks is comparatively less than the 29 percent for Islamic banks despite their higher value of observations. The result supports the previous conclusion that Islamic banks are more capitalized than their conventional counterparts (Beck et al., 2013; Khediri et al., 2015). Conversely, the average loan loss reserve to the gross loan of Islamic banks is slightly higher than that of their conventional bank counterparts. A wider gap has been expressed by dispersion from the mean exhibiting significance variation among Islamic banks and conventional banks in the size of loan provisions. In the same illustration, the banks appeared to be of the same size dispersion of 1.52 for conventional banks and 1.53 for Islamic banks, respectively.

However, it is statistically evident that Islamic banks recorded slightly higher liquidity dispersion (net loan/asset ratio) compared to conventional banks with a confirmation of volatility. Hence, the solvency in Tables 4.1 and 4.2 of these financial institutions cannot be precisely determined at the level of descriptive analysis without comprehensive analysis using distance to default ratios.

In summary, the descriptive analysis results displayed in Tables 4.1 and 4.2 have shown that data for bank-specific (Capital Adequacy, Asset Quality, and Liquidity Quality), institutional indicators and macroeconomic data for GCC and Non-GCC countries are largely normal and evenly distributed.

4.3 Correlation Analysis

The correlation matrix displayed a linear strength and directions of the association between the variables of the study. The correlation analysis is separated between conventional and Islamic banks to compare the analysis between the banks as in (Alandejani et al., 2017). Correlations between the dependent variable and explanatory variables, more especially the crucial variables, show valuable pre-estimation hints regarding the promising relationship suggested theoretically. Furthermore, the correlation coefficient between the independent variables forms the possible problematic data like multicollinearity. In a regression model, the issue of multicollinearity occurs whenever some independent variables are either marginally or highly correlated. Though marginal multicollinearity might not necessarily become a problem in panel data (Goldberger, 1991), a collinear problem can cause the signage of the coefficient to change. This can decrease the statistical power of the analysis by supporting the influence of t-statistic and related p-value to evaluate the consequence of independent variables (Bowerman, O'connell, & Orris, 2004).

Correlation (r) only designates a kind of relationship that exists between one set of the variable to another, where the figure $r = 1$ and $r = -1$ indicates a perfect positive or negative correlation. Equally, a correlation figure $r = 0$ designates absence of any association between the variables of interest. In stuck between the extreme cases ($r = 1$ and $r = -1$), commonly, a correlation coefficient of $r = 0.1$ is seen as feeble relationship, where values $r = 0.5$ and beyond is a strong connection with reasonable relationship lying in-between (Gujarati & Porter, 2009).

4.3.1 Correlation Analysis of Z-score Model

Correlation Table 4.3 presents the comparative correlation analysis between conventional and Islamic banks in GCC and Non-GCC set of countries.

Table 4.3
Pairwise Correlation Analysis for Z-score Model

Conventional Banks

VAR	ZSC	EQTA	LLR	LIQ	CPI	PSI	GDP	INF	ΔOIL	InTA	IDIV	EFF
ZSC	1.00											
EQTA	0.11	1.00										
LLR	-0.26	0.03	1.00									
LIQ	-0.11	0.12	-0.30	1.00								
CPI	-0.03	0.26	-0.20	0.57	1.00							
PSI	-0.04	0.18	-0.15	0.56	0.88	1.00						
GDP	-0.12	-0.01	-0.11	0.28	0.34	0.36	100					
INF	-0.20	-0.17	0.08	-0.07	-0.24	-0.17	0.30	1.00				
ΔOIL	0.00	0.01	0.03	-0.02	0.03	0.01	0.01	0.17	100			
InTA	0.10	-0.34	-0.25	0.28	0.37	0.37	0.42	-0.03	-0.03	1.00		
IDIV	0.42	-0.05	-0.29	0.18	0.29	0.26	0.36	-0.01	-0.02	0.66	1.00	
EFF	-0.15	-0.08	0.18	-0.28	-0.41	-0.40	-0.37	-0.01	0.03	-0.45	-0.56	1.00

Islamic Banks

VAR	ZSC	EQTA	LLR	NLA	CPI	PSI	GDP	INF	ΔOIL	InTA	IDIV	EFF
ZSC	1.00											
EQTA	0.17	1.00										
LLR	-0.36	0.17	1.00									
LIQ	0.16	-0.53	-0.44	1.00								
CPI	0.12	-0.12	-0.18	0.39	1.00							
PSI	0.16	-0.13	-0.14	0.35	0.78	1.00						
GDP	0.15	-0.08	-0.05	0.32	0.26	0.43	1.00					
INF	-0.01	-0.06	0.04	-0.04	-0.35	-0.13	0.20	1.00				
ΔOIL	0.01	-0.01	0.03	-0.04	0.10	0.03	0.04	0.10	1.00			
LNTA	0.09	-0.59	-0.23	0.60	0.42	0.42	0.47	-0.02	-0.04	1.00		
IDIV	0.38	-0.26	-0.23	0.39	0.25	0.24	0.30	0.03	-0.03	0.61	1.00	
EFF	-0.32	0.12	0.17	-0.35	-0.31	-0.33	-0.21	0.02	0.04	-0.39	-0.52	1.00

ZSC- stability indicator, EQTA-capital adequacy, LLR-asset quality, LIQ-liquidity quality, CPI-corruption perception index, PSI-political stability index, GDP-growth, INF-inflation, ΔOIL-change in oil price, LNTA-bank size, IDIV-net income, EFF-cost to income. *, **, signified the level of significance 1% and 5%, respectively.

The correlation coefficient of the study variables, the magnitude, and direction of the association between the dependent variables and their corresponding independent variables have remained modest. Following Alandejani et al. (2017) and El-Ansary et al. (2019) the study has separated the correlation analysis because the study is comparative in nature. By separating the correlation analysis it will provide room for comparative between the correlation of conventional and Islamic banks. In the same table, the dependent variable Z-score indicates a weak but positive and significant correlation for EQTA, but a negative correlation for LLR with conventional banks. While capital buffer and Net loan to asset ratio of Islamic show a positive relationship to stability Z-score. Loan provisions remain negative in both conventional and Islamic banks with a significant value of (-0.26), respectively. Therefore, with the magnitude of the coefficient < 0.7, it is indicating that there could be no element of multicollinearity in the model among the independent variables (Goldberger, 1991; Gujarati & Porter, 2009). Furthermore, both conventional and Islamic banks show a similar direction and magnitude of the relationship with the Z-score. This implies that capital and liquidity will increase the solvency position of the banks. Where conventional and Islamic banks need to reduce their loan loss reserves in an attempt to achieve stability.

Within a panel analysis of data of institutional factors, correlation matric is observed for the conventional banks and Islamic banks for the GCC and Non-GCC countries. Table 4.3 reveals the correlation analysis for conventional banks. The coefficient of the correlation shows an average weak association between the independent variables and the dependent variable as (-0.03 and -0.04). This is indicating a negative relationship between Z-score and its institutional indicators of CPI and PSI, respectively. On the part of Islamic bank correlation analysis in Table 4.3, the correlation coefficient reveals the weak positive relationship between the dependent variable and the independent variables as (0.12 and 0.16), respectively. Thus, the correlation result reveals that there could be an element of the linear relationship between the independent variable PSI and CPI as the coefficient rally > 0.7, so that after the estimation, the variance inflation factor (VIF) test should be conducted or a robust endogeneity technique should be used during the estimation. Furthermore, CPI and PSI in the conventional banks have shown a lower relation Z-score, while the Islamic banks' panel moderates the relationship with those variables.

Concerning the correlation between the Z-score and macroeconomic variables, the outcome indicates an average association between the dependent variable and the cyclical factors. The correlation value -0.12, -0.20 and 0.0003 points out a weak association for GDP, INF, and ΔOIL, respectively. The ΔOIL reveals a very weak positive but not significant association with Z-score. However, the Islamic bank counterparts also displayed a weak correlation coefficient value of 0.15, -0.01 and 0.01, respectively. This shows that GDP has a significant and positive relationship with the Islamic bank Z-score. Meanwhile, the average oil price reveals a positive coefficient indicating more relationship with Islamic bank stability indicator than their conventional counterparts. On the variable INF, Islamic banks exhibit weak negative coefficient with a dependent variable Z-score. Thus, the correlation matrix result displays that there is no linear relationship between the variable, indicating that no element of multicollinearity as the coefficient remains < 0.8 in the model.

4.3.2 Correlation Analysis of PD Model

The correlation between the probability of default and independent variables of EQTA, LLR, and LIQ exhibit relatively weak correlation with a probability of default in all banks. This is reflected in Table 4.4. The conventional banks show a significant negative EQTA and significant positive LLR variables with bank probability of default. The Islamic banks exhibit significant EQTA, LLR, and LIQ as -0.24, 0.29 and -0.26, respectively. Therefore, with the magnitude of the coefficient < 0.8, the model indicates that there could be no element of multicollinearity.

Table 4.4
Pairwise Correlation Analysis for PD Model

Conventional Banks

VAR	PD	EQTA	LLR	LIQ	CCI	PSI	GDP	INF	ΔOIL	LNTA	IDIV	EFF
PD	1.00											
EQTA	- 0.108	1.00										
LLR	0.293	-0.076	1.00									
LIQ	-0.029	0.136	0.101	1.00								
CCI	-0.112	0.447	-0.205	0.418	1.00							
PSI	-0.047	0.384	-0.120	0.470	0.85	1.00						
GDP	0.120	0.185	-0.168	0.230	0.35	0.36	100					
INF	0.385	-0.099	0.204	-0.063	-0.29	-0.20	0.15	1.00				
ΔOIL	-0.142	0.056	0.041	-0.017	0.02	0.05	0.02	0.20	100			
LNTA	-0.157	0.032	-0.438	0.089	0.30	0.28	0.47	-0.20	-0.03	1.00		
IDIV	-0.19	0.094	-0.418	0.063	0.30	0.25	0.49	-0.08	-0.01	0.841	1.00	
EFF	-0.004	-0.23	0.26	-0.26	-0.43	-0.47	-0.51	-0.00	-0.01	-0.46	-0.50	1.00

Islamic Banks

VAR	PD	EQTA	LLR	NLA	CCI	PSI	GDP	INF	ΔOIL	LNTA	IDIV	EFF
PD	1.00											
EQTA	-0.19	1.00										
LLR	0.20	0.25	1.00									
LIQ	-0.26	-0.49	-0.62	1.00								
CCI	-0.39	-0.04	-0.24	0.44	1.00							
PSI	-0.33	-0.11	-0.19	0.32	0.80	1.00						
GDP	0.02	-0.02	-0.13	0.17	0.13	0.17	1.00					
INF	0.54	-0.07	0.04	-0.19	-0.46	-0.30	0.15	1.00				
ΔOIL	-0.13	0.01	0.02	-0.06	0.10	0.10	0.08	0.08	1.00			
LNTA	-0.15	-0.61	-0.41	0.55	0.25	0.16	0.32	-0.14	-0.03	1.00		
IDIV	-0.21	-0.34	-0.35	0.33	0.29	0.20	0.27	-0.09	0.00	0.78	1.00	
EFF	0.07	0.03	0.284	-0.22	-0.36	-0.41	-0.04	0.05	-0.00	-0.23	-0.37	1.00

PD-probability to default, the rest remain as described above. *, **, signified the level of significance 1% and 5% respectively

Similarly, Table 4.4 describes the correlational relationship between the probability of default dependent variable and the independent institutional variables of the conventional and Islamic banks in the sampled area. All the independent institutional variables of Islamic bank shows a significant negative correlation between banking stability and the independent variables except for GDP and INF. The coefficient figures, -0.37, -0.30 and -0.16 imply an average association between PD and EQTA, LLR, and NLA, respectively. While conventional banks indicate a weak relationship between PD and EQTA, LLR, and NLA, the correlation matrix result displays that there is no linear relationship between the variable, thus indicating that no element of multicollinearity as the coefficient remains < 0.8 in the model.

While GDP per capita growth in Table 4.4 reveals a weak positive correlation with the probability of default indicator of conventional bank stability, Islamic banks have revealed that there is a significant average relationship between inflation, oil price, and bank probability of default. Similarly, conventional banks displayed a similar considerable association between INF, ΔOIL, and bank PD. Thus, the correlation result exhibits that there is no linear relationship between the dependent variables and the regressors. This is indicating that no element of multicollinearity as the coefficient remains < 0.7 in the model.

4.4 The Estimated Results

This segment reports the estimated outcomes of the study models and their assessment on the association between bank-specific, Institutional, and macroeconomic factors on the one hand, and bank stability Z-score, on the other hand. We also have an association between bank-specific, Institutional, and macroeconomic factors on the one hand, and bank stability PD using the System GMM method. Furthermore the study separate and restricted the model to in bank-specific, institutional and macroeconomic to see the effect of each variable and robustness in each model as in (Hassan et al., 2018). For the study to find a further relationship between the variables, a pre-estimation test (Unit Root test) was conducted.

4.4.1 The Estimated Result of the effect of Bank Specific Variables on Bank Stability

This section discusses the effect of bank-specific variables on banking stability Z-score, starting with unit root test to check for the asymptotic properties of the variables. This is followed by a display of the estimated result and the post-estimation diagnostic check.

4.4.1.1 Unit Root Testing

Testing the stationarity of the variables in the model has been described as essential in order to select the appropriate methodology. The estimation of dynamic panel model requires the stationarity properties chicking (Chang et al., 2011; Olaniyi, 2019). This is important as the variables problem of non-stationarity is more prevalent in a panel data analysis when the cross-sections are greater than time (Buck, Liu, & Skovoroda, 2008). Table 4.5 below, present the result of the unit root test:

Table 4.5
Unit Root Test Result for Bank Specific

Method	**Full Sample (IPS)**	**Conventional Banks (IPS)**	**Islamic Banks (IPS)**
Variables	Level	Level	Level
Z-SCORE	-2.957*	-16.104*	-13.025*
	(0.000)	(0.000)	(0.000)
EQTA	-4.884*	-4.1798*	-4.640*
	(0.000)	(0.000)	(0.000)
LLR	-5.207*	-6.089*	-3.699*
	(0.000)	(0.000)	(0.000)
LIQ	-6.405*	-6.523*	-14.966*
	(0.000)	(0.000)	(0.000)
lnTA	-8.23*	-4.994*	-1.722*
	(0.000)	(0.000)	(0.000)
EFF	-4.902*	-5.810*	-4.582*
	(0.000)	(0.000)	(0.000)
IDIV	-15.813*	-7.776*	-7.856*
	(0.000)	(0.000)	(0.000)

*,**, *** indicate significance level at 1%, 5% and 10% respectively.

Table 4.5 shows that the variables of banking stability Z-score, EQTA, LLR, LIQ, InTA, EFF, and IDIV are all stationary at a level in all the sampled banks. Similarly, bank control variable also remains stationary at a level in conventional banks in the full sample and Islamic for the banks. Following the integration of the variables in the order I(0), the selection of the system GMM technique is appropriate.

4.4.1.2 The Estimated Results of Bank Specific factors

In the comparison of the stability difference between conventional and Islamic banks, the study presented the results on the bases of general and specific restricted samples. The columns Full sample contained an estimation of the combined sample of both conventional and Islamic banks. Column CB contains the estimation of only the sample of conventional banks, while the column IB entails the estimation of the Islamic samples. The result of the effect of bank-specific variables on banking stability is presented in Table 4.6 below.

Table 4.6
System GMM Estimation for Bank Specific Factors in all Countries

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
ZScore	0.716*	0.407*	0.602*	0.637*	0.415*	0.665*
L.1	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
EQTA	0.163***	0.444*	0.894*	0.102*	5.935*	1.006*
	(0.061)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LLR	-0.460*	-1.176*	0.684*	-0.405*	-1.173*	0.320*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LIQ	-0.528*	-0.981*	1.861*	-0.160	-1.556*	1.036*
	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)
CPI	-0.625*	-2.278*	1.613**			
	(0.000)	(0.000)	(0.007)			
PSI	0.195*	0.961*	0.712***			
	(0.000)	(0.001)	(0.033)			
INF	-1.641*	-0.935*	-3.029*			
	(0.000)	(0.000)	(0.000)			
GDP	-0.024***	-0.264*	-0.267*			
	(0.067)	(0.000)	(0.000)			
ΔOILP	0.001*	0.005*	0.007*			
	(0.000)	(0.000)	(0.000)			
lnTA	-0.010	-0.016	-0.014	-0.181*	0.069*	-0.154*
	(0.551)	(0.109)	(0.783)	(0.000)	(0.000)	(0.000)
EFF	0.242*	0.321*	0.408*	0.007	0.637*	0.002*
	(0.000)	(0.000)	(0.000)	(0.500)	(0.000)	(0.94)
IDIV	0.105*	0.294*	0.090*	0.141*	0.302*	0.065*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BANK DUMMY	-0.338*			-0.174**		
	(0.000)			(0.010)		
Cons-	0.135*	0.980*	4.982*	2.558*	4.765*	1.827*
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Statistic	Coefficient and (Probability)					
Wald Chi	27504.6	30377.28	39833.8	121174.9	20937.5	34723.51
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ar2	0.425	0.341	0.103	0.422	0.346	0.065
Hansen J	0.219	0.462	0.682	0.090	0.168	0.181
YearDummy	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1336	944	392	1336	944	392
Groups	167	118	49	167	118	49
Instrument	106	111	45	141	89	43

. *, **, *** signified the level of significance 1%, 5% and 10% respectively

The table shows that the lag of the dependent variable Z-score is positively affecting the stability of banks, it is significant in all the sampled groups. Specifically, in the full sample, the conventional and Islamic banks recorded one percent increase in the stability of the banks last year leading to the rise in banking stability by 0.72 percent, 0.41 percent and 0.60 percent this year for the respective sample group of banks. For the robustness, the result of the general model using GMM indicates a similar finding which has proven the dynamic nature of the model. This result indicates that the persistent nature of banking stability in the GCC and the Non-GCC region as the magnitude of the coefficient is above 0.4. This indicates the existence of market power (Fuhrer, 2011).

Moreover, the table also presents the coefficient of EQTA as significant and positively affecting the stability of banks in all the sampled groups. One percent increase in capital adequacy will lead to a 0.16 percent significant increase in the stability of the banks in the full sample group. Another one percent increase in capital will also lead to 0.44 percent significance in conventional banks and 0.89 percent in Islamic banks' stability. For robustness, Table 4.6 is split into the general model and specific model column. The result of conventional and Islamic banks in the specific model confirms the main findings. The significant result is consistent with regulatory requirements and theoretical projection that conventional and Islamic banks should increase their capital formations above the risk-weighted assets to accommodate unexpected financial shocks (IFSB, 2011). The results support the prior findings that adequately capitalized banks tend to be more stable and can absorb default shock (Alharthi, 2017; Ghosh, 2014; Kohler, 2015; Tabak et al., 2015; Wahid & Dar, 2016; Williams, 2014). However, this finding contradicts the study that capital buffer has a statistically adverse effect on the stability of the banking sector (Imbierowicz & Rauch, 2014; Tabak, Fazio, & Cajueiro, 2013). Therefore, with higher EQTA condition, the stability of both conventional and Islamic banks increased. As such hypothesis Ha1, which hypothesized a significant effect of capital adequacy on banking stability of conventional and Islamic bank is supported in the short run.

On a similar note, the Asset Quality Variable displays a significant but negative coefficient affecting the stability of banks in all sub-sample groups except in the Islamic banks. A one percent increase in bank loan loss to loan provision will lead to a 0.45 percent decrease in banking stability of the full sample. Similarly, a one percent increase in asset quality will lead to a significant decline in bank stability of conventional banks with 1.176 percent, indicating that the increasing loan loss prevision is subjected to decreasing bank bank profit and stability (Ozili & Outa, 2017). However, the positive coefficient and a corresponding increase in Islamic banks stability, with 0.68 percent, has predicted that the quality of assets would consistently function with an increase in reserves for the loan loss. This is so because getting access to collateral in Islamic banking is highly difficult as the profit loss sharing package cannot systematically be executed on the collateral or other forms of guarantees to lessen credit default risks. Similarly, floating charges on the collateral do not satisfy the real condition as specified by majority jurists like Hanafi, Hambali and Shafia (Ali & Haron, 2018). Therefore, the banks are exposed to various risks with the default of borrowers (Bourkhis & Nabi, 2013; Kabir et al., 2015; Sundararajan & Errico, 2002). Thus, the only option left for the Islamic bank is to increase loan loss provision to reduce credit risk. Concerning the coefficient result of the asset quality of the conventional banks which is negative and highly significant at one percent. The findings are in accord with the discoveries of Korbi and Bougatef (2017) and Zhang et al. (2016) in post-crisis period which slows how significant upsurge of loan loss reserve estimate erodes bank profit making and depleted their capital strength (Ozili & Outa, 2017). For robustness, the specific model column in Table 4.6 confirms the main findings. Furthermore, the result is consistent with the theoretical argument of the assets management theory. This result tally with hypothesis Ha2, which predict the significant effect of asset quality on conventional banking stability is supported.

Hence, the Islamic banks coefficient of Asset quality indicates a positive and significant sign at one percent. It suggests that an increase in loan loss reserves of Islamic banks tend to increase their stability. The positive effect of asset quality on the stability of the Islamic banking system may be as a result of its philosophies of profit and loss sharing, which enables the bank to lower their loans loss. This is so because, in a situation of losses, the bank may shift some part of the burden to its depositors (Olson & Zoubi, 2008). The results validate the prior expectation, and it is in link with previous literature in Trad, Trabelsi, and Goux (2017). On the other hand, the results are found to be contrary to the findings of Korbi and Bougatef (2017). The result tally with hypothesis Ha2, which predict the significant effect of asset quality on Islamic bank stability is now supported.

However, the coefficient of Liquidity variable shows a negative and significant to bank stability in the full sample as a one percent increase in liquidity will lead to a corresponding decrease in banking stability with 0.528 percent. On the part of conventional banks, a percentage increase in liquidity ratio will lead to a significant decrease in bank stability of 0.98 percent. The results indicate that high loan intensity raises the threat of bank to default. This tallies with the work of Aldeehani (2016), Rumler and Waschiczek (2014) and Beck, et al. (2013). Similarly, the colossal liquidity position could help the bank to meet customer sudden cash demand and raise bank client confidence to remain with the bank. This findings tally with hypothesis Ha3, which predict the significant effect of liquidity on banking stability is now supported.

Concerning the condition of Islamic banks, the study finds the model that a percentage increase in liquidity variable will generate a significant and positive rise in Islamic bank stability by 1.86 percent. The finding reveals that providing more loan facilities to their tendency to increase the stability of Islamic banks. This motivates such banks to raise loan intensity as it pushes them away from further instability risk. The finding is in agreement with that of Kohler, (2015) and Özşuca & Akbostancı (2016). On the other side, the variable of loan growth tends to increase the threat of banking instability in conventional banks. The argument is in line with the discoveries of Beck et al. (2013b); Bourkhis & Nabi, (2013). In an attempt to check for the robustness of our result, the study estimates the specific model using system GMM and the findings can be regarded as robust to a general model level. This results tally with hypothesis Ha3, which predict the significant effect of liquidity on banking stability is now supported.

The long run effect of bank specific variables on the stability of conventional and Islamic banks is presented in table 4.7 below.

Table 4.7
Long Run System GMM Estimation for Bank Specific Factors Z-score

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
EQTA	0.437*	5.801*	1.495*	0.723**	0.282*	3.004*
	(0.000)	(0.000)	(0.000)	(0.047)	(0.000)	(0.000)
LLR	-0.701*	-1.983	1.144*	-0.551**	-1.118*	0.955*
	(0.000)	(0.000)	(0.000)	(0.026)	(0.000)	(0.000)
LIQ	-0.518*	-1.656*	3.114*	-0.442*	-0.445*	3.094*
	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)
CPI	-1.860*	-3.844*	2.699*			
	(0.000)	(0.000)	(0.007)			
PSI	0.275*	1.62*	1.191**			
	(0.000)	(0.001)	(0.028)			
INF	-6.539*	-1.577*	-5.12*			
	(0.000)	(0.000)	(0.000)			
GDP	-0.099*	-0.446*	-0.446*			
	(0.000)	(0.000)	(0.000)			
ΔOILP	0.006*	0.008*	0.012*			
	(0.000)	(0.000)	(0.000)			
InTA	-0.200*	-	-	-0.297*	-0.498*	-0.459*
	(0.000)	-	-	(0.000)	(0.000)	(0.000)
EFF	0.591*	0.541*	0.683*	-	-	-
	(0.000)	(0.000)	(0.000)	-	-	-
IDIV	0.415*	0.496*	0.151**	0.275*	0.542*	0.193*
	(0.001)	(0.000)	(0.006)	(0.000)	(0.000)	(0.000)
Bank Dummy	-0.435*			-0.951*		
	(0.000)			(0.000)		
-cons	0.135	0.983*	4.98**	5.212*	-3.602*	5.457*
	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)

*, **,*** signified the level of significance 1%, 5% and 10% respectively. – indicating the variable is not significant in the short run

Long-term results are determined from the short-term results of the significant bank-specific variables in table 4.7. A percentage increase in Capital adequacy is linked with a 0.437 percent increase in banking stability in the long run of the full and at five percent level of significance. Similarly, another percentage change in a capital buffer is accompanied by 5.8 and a 1.49 percent increase in banking stability in the long run for conventional and Islamic banks by one percent significant levels. Hence, capital adequacy and bank stability display an inelastic relationship. As such hypothesis Ha1, which hypothesized a significant effect of capital adequacy on banking stability of conventional and Islamic bank is supported in the long run.

On the part of the long-run relationship between Asset quality and bank stability, the outcome of the estimation revealed that a percentage change in Asset quality is associated with 0.70, and 1.92 percent decrease in banking stability at a one percent level of significance of full sample, and conventional banks respectively. However, the long-run effect of asset quality of Islamic banks exhibits a percentage increase in banking stability by 1.14 percent at a one percent level of significance. This results tally with hypothesis Ha2, which predict the significant effect of asset quality on banking stability is now supported. On the other, the parametric analysis of bank Liquidity exhibited a percentage decrease in banking stability during the long run period by 0.51 percent and 1.65 percent for a full sample and conventional banks sample at five and one percent level of significance. While Islamic banks displayed a percentage change in liquidity resulted in a 3.12 percent increase in banking resilience to default at one percent significant position. The result supported hypothesis Ha3, which predict the significant effect of liquidity on banking stability. In a nutshell, capital adequacy, asset quality, and Liquidity ratios exhibited a more substantial positive and negative effect on banking stability in the long run than in the short run periods. Subsequently, the bank dummy indicates stability difference between conventional and Islamic banks using the stability measure of Z-score, the result of bank dummy with a coefficience of 0.95 percent signified that conventional banks were more stable in the long-run period. For the robustness of the long run results, the column of the general model confirms the main results.

Furthermore, the study conducted a robustness check for the impact of bank specific variables on banking stability between the GCC and Non-GCC. In this segment, the researcher split the samples of conventional and Islamic banks in GCC and Non-GCC countries. The short run estimation of the results is presented in table 4.8 below.

Table 4.8
System GMM for Bank Specific factors of GCC and Non-GCC

VARIABLES	Conven GCC Banks	Islamic GCC Banks	Conven Non-GCC Banks	Islamic Non-GCC Banks
	Coefficient and (Probability)			
ZSCORE				
L1.	0.592*	0.736*	0.677*	0.677*
	(0.000)	(0.000)	(0.000)	(0.000)
EQTA	0.773*	0.489*	2.320*	0.654*
	(0.003)	(0.000)	(0.000)	(0.000)
LLR	-0.962**	0.883*	-0.617**	-0.394**
	(0.048)	(0.000)	(0.009)	(0.021)
LIQ	-0.747*	0.519*	-0.275*	-0.075
	(0.000)	(0.000)	(0.004)	(0.500)
lnTA	-0.002	0.149**	0.064**	0.145*
	(0.941)	(0.008)	(0.008)	(0.000)
EFF	-0.244*	-0.116*	0.633*	0.021
	(0.000)	(0.000)	(0.000)	(0.463)
IDIV	0.077*	0.009*	0.068*	0.003**
	(0.001)	(0.003)	(0.000)	(0.019)
_Cons	-1.731*	-0.111	-3.136*	-1.6138*
	(0.001)	(0.849)	(0.000)	(0.000)
Statistics	**Coefficient and (Probability)**			
Wald Chi2 (14)	86363.06	130167.55	8600.29	52899.41
	(0.000)	(0.000)	(0.000)	(0.000)
Ar2	0.310	0.109	0.317	0.139
Hansan J	0.319	0.628	0.222	0.421
Year Dummy	Yes	Yes	Yes	Yes
Obs.	344	312	600	312
Groups	43	39	75	39
Instruments	43	37	67	41

*, **,*** signified the level of significance 1%, 5% and 10% respectively

The result indicates how banking stability responded to the influence of Capital adequacy, Asset quality, and bank Liquidity quality. It also shows how the stability differs between conventional and Islamic banks in GCC and Non-GCC states. A percentage increase in Capital adequacy of conventional banks in the GCC region is associated with a 0.773 percent increase in banking stability, at one percent level of significance. Correspondingly, another percentage change in capital adequacy is accompanied by 0.489 percent increase in banking stability in the GCC region in the case of Islamic banks by one percent significant level. Hence, the preceding literature holds that adequately capitalized banks display more excellent stability (Kohler, 2015; Wahid & Dar, 2016). Similarly, on the part of conventional and Islamic banks in the Non-GCC region, a one percent rise in bank capital is accompanied by a 2.332 and 0.65 percent increase in banking stability. As such the result tally with the general model and hypothesis Ha1, which hypothesized a significant effect of capital adequacy on banking stability of conventional and Islamic bank is supported.

However, the coefficient of Asset quality variable is significant in the conventional and Islamic banks sub-groups. W|ith one percent increase in asset quality, the stability of conventional banks reduces with 0.96 percent in and stability of Islamic bank increases with 0.88 percent in the GCC set of countries at five and one percent levels of significance, respectively. The result in table 4.8 shows that Loan loss reserves increase Islamic banks stability in GCC. This is because Islamic banks use their loan reserves to smoothen both capital and income management (Othman & Mersni, 2014; Taktak et al., 2010). However, a one percent increase in Asset quality leads to a reduction in bank stability with 0.64 percent and 0.39 percent in conventional and Islamic banks in the Non-GCC region. The result has indicated that more provision of loan loss has reduced the banking stability of conventional banks in both region and Islamic banks of Non-GCC countries. It is contended that banks with higher Loan loss reserve are opened to the likelihood of instability because an increase in loan reserve erodes both capital and profitability (Berger et al., 2009; Borio, Furfine & Lowe, 2001; Wong, Fong & Choi, 2011, Ozili & Outa, 2017). The robust results are consistent with the general model and supported the hypothesis Ha2, which predict the significant effect of asset quality on banking stability.

Furthermore, the result of bank liquidity to banking stability has revealed that a percentage increase in loan to asset would lead to a reduction in banking stability of conventional banks of both GCC and Non-GCC set of countries of 0.75 and 0.25 percent, respectively. While a one percent increase in bank Liquidity resulted to 0.52 percent increase in Islamic banks stability in GCC at a significant level of five percent, this reveals that Islamic bank created more loan services to improve their stability positions (Ozsuca & Akbostanci, 2016). This results tally with hypothesis Ha3, which predict the significant effect of liquidity on banking stability is now supported. However, the robust result of the liquidity variable is found not significant to Islamic banks in Non-GCC states. The econometric reason for the disparity is that the split model becomes less informative and heterogeneous, while the general model is homogeneous (Baltagi, 2013). The practical reason could be a fact that the banks are not large and are newly introduced in the market. Another reason could be that Islamic banks used a portion of their assets in off-balance sheet operations which serve as an alternative avenue for liquidity. The result replicates the empirical work of Muda, Aziz, Hassan, & Bakar (2017). Similarly, Ghosh (2014) reveals that bank leading did not show any link to stability in GCC banks from 1996 to 2011. This result does not tally with hypothesis Ha3, which predict the significant effect of liquidity on banking stability is now rejected.

In an attempt to scrutinize the significance of long-run regional differences between GCC and Non-GCC states, the long-run relation of bank-specific to banking stability is generated from the short run estimations of significant vectors represented in table 4.9 below.

Table 4.9
Long Run System GMM for Bank Specific Factors GCC and Non-GCC

	Coefficient and (Probability)			
VARIABLES	**Conv Banks GCC**	**Islamic Banks GCC**	**Conv Banks Non-GCC**	**Islamic Banks Non-GCC**
EQTA	1.908**	2.260*	7.226*	2.029*
	(0.047)	(0.000)	(0.000)	(0.000)
LLR	-0.831***	2.560**	-1.890**	-1.22**
	(0.073)	(0.000)	(0.011)	(0.009)
LIQ	-1.635*	1.040*	-0.835 *	-0.075
	(0.000)	(0.000)	(0.004)	(0.500)
lnTA	-0.002	0.260**	0.210**	0.451*
	(0.941)	(0.015)	(0.010)	(0.000)
EFF	-0.624*	-0.290**	1.963*	0.825*
	(0.000)	(0.015)	(0.000)	(0.002)
IDIV	0.222*	0.050*	0.210*	0.011*
	(0.000)	(0.000)	(0.000)	(0.036)
_cons	4.464*	0.111	-9.711*	-1.613
	(0.000)	(0.849)	(0.000)	(0.000)

*, **,*** signified the level of significance 1%, 5% and 10% respectively

A one percent rise in Capital adequacy is accompanied with a 1.91 and 2.26 percent increase in banking stability in the long run of GCC conventional and Islamic banks sample, at the five and one percent significance, respectively. Similarly, another one percent change in the capital buffer is supplemented with a 7.23 percent increase in banking stability in the long run in the conventional banks in Non-GCC states. At the same time, Islamic banks displayed a significant relationship between capital variable and banking stability at 2.029 percent in the long run. Hence, the Capital adequacy and bank stability displayed an elastic relationship, thereby indicating the sensitivity of capital to banking stability. As such hypothesis Ha1, which hypothesized a significant effect of capital adequacy on banking stability of conventional and Islamic bank is supported in the long run.

On Asset quality, a one percent increase in the variable eventually leads to a decrease in banking stability with 0.83, 1.89 in conventional banking in both the GCC and Non-GCC regions. Similarly, another one percent increase in asset quality leads to a 2.56 percent increase and a 1.22 percent decrease in Islamic banks of both the GCC and Non-GCC set of countries. These findings tally with the empirical work of Muda et al. (2017). Furthermore, the coefficience of quality asset variable for a conventional bank in GCC and Non-GCC is notably comparable in both the short and long term duration of the divided samples. As such hypothesis Ha2, which hypothesized a significant effect of asset quality on banking stability of conventional and Islamic bank is supported and extended to the long run.

On the part of bank Liquidity management, a one percent increase in the liquidity quality resulted in a 1.64 and 0.84 percent decrease in banking stability of the conventional banks in the GCC and Non-GCC regions. This reveals that a bank that heavily depends on bank loans operates with smaller profit which increases the tendency of the bank to face financial instability (Staikouras & Wood, 2003). More so, a bank with a higher ratio of loan to asset moves closer to the index of financial instability (Abideen & Salisu, 2016). Similarly, a rapid increase in credit is strongly associated with banking instability that will lead to a financial crisis (Odeduntan, Adewale, & Hamisu, 2016). The study replicates the work of Beck et al. (2013), Berger et al. (2009) who had demonstrated that loans decrease banking stability and push banks to take risky behaviours. In comparison, a corresponding increase in liquidity quality reflected 1.03 percent increase in banking stability of Islamic banks in the GCC region. The result is consistent with the work of Kohler, (2015); Rajhi & Hassairi, (2014). However, a percentage change in liquidity of Islamic banks indicates no significant effect on the stability of banks in the Non-GCC region. This could be due to the fact that the variable in the short run is not significant. Therefore, the model did not provide a long term estimation for a variable that is not significant in the short term (Bond et al. 2003). As such hypothesis Ha3, which hypothesized a significant effect of bank liquidity on banking stability of conventional and Islamic bank is rejected.

4.4.1.3 Post Estimation diagnostic checks

To ensure that the estimated model is correctly identified, the Hansen J test for overidentifying restriction has failed to reject the null hypothesis thereby indicating that the instruments remain valid and are not correlated with the error term. Specifically, the instruments are reliable and unbiased. Hence, the model and instruments are correctly specified. Correspondingly, the regression is free from serial correlation, The Arellano and Bond test autocorrelation specifies the nonexistence of a second-order serial correlation. The test fails to reject the null hypothesis that no second order-autocorrelation existed. Based on the literature expectation, the null hypothesis of free from first-order serial correlation is rejected. Thus, this test backs the validity and reliability of the system GMM approach in the estimation.

4.4.1.4 Summary of the effect of bank-specific variables on bank stability

The summary of the dynamic regression results of the impact of bank specific variables on banking stability are presented in Table 4.10.

Table 4.10
Summary System GMM Results of Bank Specific and Banking Stability

Variables	**Hypo**	**Z-Score (General model)**		**Z-score (Specific model)**	
		Con Banks	**Islamic**	**Con Banks**	**Islamic**
EQTA	Ha1	Significant(+)	Significant(+)	Significant (+)	Significant (+)
LLR	Ha2	Significant(-)	Significant(+)	Significant (-)	Significant (+)
LIQ	Ha3	Significant(-)	Significant(+)	Significant (-)	Significant (+)
		(Long Run)		**(Long Run)**	
EQTA	Ha1	Significant(+)	Significant(+)	Significant (+)	**Significant**(+)
LLR	Ha2	Significant(-)	Significant(+)	Significant (-)	Significant (+)
LIQ	Ha3	Significant(-)	Significant(+)	Significant (-)	Significant (+)
		Split Robust Sample (GCC)		**(Non-GCC)**	
EQTA	Ha1	Significant(+)	Significant(+)	Significant (+)	Significant (+)
LLR	Ha2	Significant(-)	Significant(+)	Significant(-)	Significant (-)
LIQ	Ha3	Significant(-)	Significant(+)	Significant (-)	**Insignificant**
		(Long Run)		**(Long Run)**	
EQTA	Ha1	Significant(+)	Significant(+)	Significant (+)	**significant(+)**
LLR	Ha2	Significant(-)	Significant(+)	Significant (-)	Significant (-)
LIQ	Ha3	Significant(-)	Significant(-)	Significant (+)	**Insignificant**

The result indicates that the three bank-specific variables are significantly allied with conventional and Islamic banks stability in the GCC and Non-GCC countries. These internal bank factors are EQTA, LLR and LIQ. Capital adequacy indicates positive and significant coefficients in both conventional and Islamic banks as found by the previous literature. Theoretical evidence has revealed that for the prediction of Capital Adequacy-stability, there is a hypothesis which submits that growing bank equity entails improving the banking stability Alharthi (2017); Bourkhis and Nabi (2013a); and Ghenimi et al. (2017) as well as the prediction of Asset management theory that predicts that, an increased capital buffer signals for the good management and ultimately better stability in both the short and long-run conditions. Therefore, with higher EQTA condition, the stability of both conventional and Islamic banks increased. As such hypothesis Ha1, which hypothesized a significant effect of capital adequacy on banking stability of conventional and Islamic bank is supported.

Asset quality shows that conventional banks have a negative effect on banking stability in both general and specific models. The Asset quality of Islamic banks affects banking sector stability positively in the general sample and GCC short-run specific model. The Non-GCC Islamic banks portrayed a negative association with banking stability in the short and long run positions of the split samples. This tally with hypothesis Ha2, which predict the significant effect of asset quality on banking stability is now supported. Bouvatier and Lepetit (2006) have proposed that the expected loan loss should be covered by making loss reserves while the bank capital takes care of the unexpected loss. On bank Liquidity, the coefficient of conventional banks revealed a significant and adverse effect on banking stability short and long-run dimension. This tally with hypothesis Ha3, which predict the significant effect of liquidity on banking stability is now supported. On the part of Islamic banks, liquidity express positive effect on bank stability in the GCC region and line with hypothesis. On the contrary, Islamic banks robust result in Non-GCC have shown a non-compliance with the general model and do not tally with hypothesis H03, indicating the hypothesis is not supported as liquidity is insignificant to banking stability.

4.4.2 Presentation of Result of the Impact of Institutional Factors on Bank Stability

This section discusses the influence of institutional variables on banking stability Z-score, plus looking at the unit root test to determine the properties of the variables. This is followed by the introduction of the estimated result and post-estimation diagnostic checks.

4.4.2.1 Unit Root Test

Table 4.11 demonstrates the trend and the order of integration of the variables Z-score, corruption perception index and political stability index, together with control variables.

Table 4.11
Unit Root Test Result of Institutional factors

Method	**Full Sample (IPS)**	**Conventional Banks (IPS)**	**Islamic Banks (IPS)**
Variables	Level	Level	Level
Z-SCORE	-2.957*	-16.104*	-13.025*
	(0.000)	(0.000)	(0.000)
CPI	-2.562**	-5.903*	-1.618***
	(0.005)	(0.000)	(0.053)
PSI	-11.443	-26.862*	-8.796*
	(0.948)	(0.000)	(0.000)
lnTA	-8.23*	-4.994*	-1.722*
	(0.000)	(0.000)	(0.000)
EFF	-4.902*	-5.810*	-4.582*
	(0.000)	(0.000)	(0.000)
IDIV	-15.813*	-7.776*	-7.856*
	(0.000)	(0.000)	(0.000)

. *, **, *** signified the level of significance 1%, 5% and 10% respectively

The table shows that the variables Z-score, PSI, InTA, EFF, and IDIV are all stationary at a level of one percent in all the sub-sampled. The variable of corruption control of Islamic banks is stationary at the level of five percent in the sub-sample. Similarly, bank control variable also remains stationary at a level in conventional banks in the full sample and Islamic for the banks. Following the integration of the variables in the order I(0), and do not surpass I(1), then the selection of the system GMM technique is appropriate.

4.4.2.2 Presentation of Estimated Result

Result of the impact of institutional variables on banking stability is presented in Table 4.12 below. The table presents how institutional factors affect banking stability of conventional and Islamic banks in two different models for the robustness of the result.

Table 4.12
System GMM for Institutional Factors of Conventional and Islamic

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
ZScore	0.716*	0.407*	0.602*	0.717*	0.556*	0.761*
L.1	(0.000)	(0.00)	(0.00)	(0.000)	(0.000)	(0.000)
EQTA	0.163***	0.444*	0.894*			
	(0.061)	(0.000)	(0.000)			
LLR	-0.460*	-1.176*	0.684*			
	(0.000)	(0.000)	(0.000)			
LIQ	-0.528*	-0.981*	1.861*			
	(0.000)	(0.004)	(0.000)			
CPI	-0.625*	-2.278*	1.613**	-0.443*	-0.741*	0.317**
	(0.000)	(0.000)	(0.007)	(0.000)	(0.000)	(0.025)
PSI	0.195*	0.961*	0.712***	0.051**	0.106*	0.105***
	(0.000)	(0.001)	(0.033)	(0.032)	(0.000)	(0.088)
INF	-1.641*	-0.935*	3.029*			
	(0.000)	(0.000)	(0.000)			
GDP	-0.02***	-0.264*	-0.267*			
	(0.067)	(0.000)	(0.000)			
ΔOILP	0.001*	0.005*	0.007*			
	(0.000)	(0.000)	(0.000)			
InTA	-0.010	-0.016	-0.014	-0.023*	0.106*	-0.112*
	(0.551)	(0.109)	(0.783)	(0.000)	(0.000)	(0.000)
EFF	0.242*	0.321*	0.408*	0.053*	0.286*	0.022*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.049)
IDIV	0.105*	0.294*	0.090*	0.060*	0.076*	0.040*
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
BANK DUMMY	-0.338*			-0.189**		
	(0.000)			(0.000)		
Cons-	0.135*	0.980*	4.982*	0.564*	0.623*	1.765*
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Statistic	Coefficient and (Probability)					
Wald Chi	27504.6	30377.28	39833.8	119073.4	383164.9	21281.29
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ar2	0.425	0.341	0.103	0.425	0.345	0.062
Hansen J	0.219	0.462	0.682	0.141	0.211	0.207
YearDummy	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1336	944	392	1336	944	392
Groups	167	118	49	167	118	49
Instrument	106	111	45	141	111	45

*, **,*** signified the level of significance 1%, 5% and 10% respectively

The table exhibits the lag of the dependent variable Z-score is positively affected by the stability of banks, and it is significant in the entire sub-sampled sets. This signifies that the persistence of the model justifies the adoption of a dynamic panel of analysis in the study. The estimation result of the full sample, conventional and Islamic banks, reveals that a one percent increase in the stability of the banks last year transformed to a rise in banking stability by 0.717 percent, 0.556 percent, and 0.761 percent this year, for the respective sampled groups of banks. More so, the table also presents the coefficients of the Corruption perception index as significant, and negatively affecting the stability of banks in all the sub-sampled groups. One percent increase in the corruption control index will generate to 0.625 percent decrease in the stability of the banks in the full sample group, and 2.27 percent decrease in conventional banks. This supports the curse theory and is consistent with the findings of some previous scholars that reported the negative effects of corruption on banking stability (Korbi & Bougatef, 2017). This results tally with hypothesis Ha4, which predict the significant effect of corruption control on banking stability is now supported.

Furthermore, a one percent increase in corruption perception will also lead to a 1.62 percent increase in the Islamic bank's stability. Outcomes of this research are linked with previous studies where corruption control is positively influencing the stability of Islamic banks (Korbi & Bougatef, 2017; Ozili, 2018; Toader et al., 2018). It is practically proved that Islamic banking institutions are prevented from corruption. This is in line with the structural framework that prohibits corruption. This result is consistent with the sand wheel argument of corruption. For the robustness of the result, the specific model column in table

4.12 displays similar findings. The results tally with hypothesis Ha4, which predict the significant effect of corruption control on banking stability is now supported. Based on the result from the conventional banks, it becomes clear that the banks could be benefiting from corrupt practices to aid their stability. Many Middle East countries are linked with a high index of corruption that plagues the region (Bougatef, 2015). Indeed, the bank manager could use their positions to create ties with regulators and bureaucrats (Meschi 2009). In return, they receive privileges such as tax reduction and contracts (Hanoteau & Vial, 2014; Park & Luo, 2001; Zhou & Peng, 2012). For checking the robustness of the findings, the column of the general model in table 4.12 reveals similar results

Similarly, table 4.12 displays the coefficience of the Political stability variable is positive and significant in all the sub-sampled groups. The one percent increase in Political stability will lead to 0.195 percent increase in bank stability in the full sample. From the conventional and Islamic banks samples, a one percent increase in political stability variable will lead to a corresponding 0.96 and 0.71 percent increase in banking stability. This supports the curse theory and the findings resemble the results of Ashraf, (2017), Bermpei, Kalyvas & Nguyen, (2018). For Ozili (2018), the political index stability is averse to conventional banks. The result indicates that a conducive political atmosphere helps in improving banking stability. Therefore, any changes in the institutional quality can alter the stability of the conventional than that of Islamic banks. This tally with hypothesis Ha5, which predict the significant effect of political stability on banking stability is now supported. Conversely, the bank's dummy signifies the difference between the cluster banks using Z-score measurement. The result is implying that conventional banks show more signs of stability than Islamic banks with a coefficience of 0.189 percent. For the robustness of the result, the specific model column in table 4.12 displays similar findings.

Table 4.13 below, presents the long run effect of institutional factors on the stability of conventional and Islamic banks in GCC and Non-GCC countries.

Table 4.13
Long Run System GMM for Institutional Factors Z-score

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
EQTA	0.437*	5.801*	1.495*			
	(0.000)	(0.000)	(0.000)			
LLR	-0.701*	-1.983	1.144*			
	(0.000)	(0.000)	(0.000)			
LIQ	-0.518*	-1.656*	3.114*			
	(0.000)	(0.004)	(0.000)			
CPI	-1.860*	-3.844*	2.699*	-1.563*	-1.670*	1.325**
	(0.000)	(0.000)	(0.007)	(0.000)	(0.000)	(0.000)
PSI	0.275*	1.62*	1.191**	0.181**	0.239*	0.159***
	(0.000)	(0.001)	(0.028)	(0.031)	(0.000)	(0.076)
INF	-6.539*	-1.577*	-5.12*			
	(0.000)	(0.000)	(0.000)			
GDP	-0.099*	-0.446*	-0.446*			
	(0.000)	(0.000)	(0.000)			
ΔOILP	0.006*	0.008*	0.012*			
	(0.000)	(0.000)	(0.000)			
InTA	-0.200*	-0.016	-0.014	-0.081*	0.076*	-0.467*
	(0.000)	(0.109)	(0.783)	(0.000)	(0.000)	(0.000)
EFF	0.591*	0.541*	0.683*	0.186	0.645	0.090**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.057)
IDIV	0.415*	0.496*	0.151**	0.211*	0.172*	0.169*
	(0.001)	(0.000)	(0.006)	(0.000)	(0.000)	(0.000)
Bank Dummy	-0.435*			-0.617*		
	(0.000)			(0.000)		
-cons	0.135	0.983*	4.98**	0.564*	-1.404*	7.378*
	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)	(0.001)

*, **,*** signified the level of significance 1%, 5% and 10% respectively. – indicates the variable is not significant in the short run

Considering the interpretation in table 4.13, a proportional change in corruption control index is linked with a 1.56 and 1.67 percent drop in banking stability in the long run period, at a significance level of one percent on the full sample and conventional banks. While the long-run effect of the percentage change in the corruption control index generated a 1.33 percent increase in Islamic banks stability at a significant level of one percent, *certeris paribus*. On average, the corruption control index has a higher negative effect on the full sample and conventional bank samples during the long run than in the short term. Conversely, the Corruption control has a greater positive consequence on the stability of Islamic banks in the long run 1.33 than in the short-run period 0.32. This results tally with hypothesis Ha4, which predict the significant effect of corruption control on banking stability is now supported in the long run.

A percentage increase in the Political stability index is accompanied by a 0.18 percent increase in banking stability of the full sample in the long run, at a five percent level of significance. While one percent change in the Political stability index will reflect a 0.24 and 0.15 percent increase in banking stability of conventional and Islamic banks in the long run at one at and five percent level of significance. The findings tally with hypothesis Ha5, which predict the significant effect of political stability on banking stability is now supported and extended to long run. Conversely, the bank dummy indicates a difference in stability between the cluster banks with Z-score, conventional banks appeared to be more stable than the Islamic banks with a coefficient of 0.62 percent in the long run. For the robustness of the result, the column of the general model reflects similar findings.

Furthermore, to estimate the robustness check of the impact of institutional variables on banking stability between the GCC and Non-GCC. In this segment, the study split the samples of conventional and Islamic banks in GCC and Non-GCC countries. Table 4.14 below, discloses the estimation result between institutional factors and banking stability of GCC and non-GCC countries.

Table 4.14
System GMM for Institutional Factor of GCC and Non-GCC

	Coefficient and (Probability)			
VARIABLES	**Conven GCC Banks**	**Islamic GCC Banks**	**Conven Non-GCC Banks**	**Islamic Non-GCC Banks**
ZSCORE				
L1.	0.672*	0.544*	0.787*	0.581*
	(0.000)	(0.000)	(0.000)	(0.000)
CPI	-0.297*	0.676*	-0.758**	0.517**
	(0.000)	(0.030)	(0.017)	(0.014)
PSI	0.105*	0.339**	0.584*	0.182**
	(0.000)	(0.015)	(0.001)	(0.087)
lnTA	-0.003	-0.017	-0.226*	-0.336
	(0.694)	(0.683)	(0.000)	(0.285)
EFF	-0.157*	-0.029	0.978*	0.009
	(0.000)	(0.368)	(0.000)	(0.683)
IDIV	0.043*	0.031*	0.319*	0.035*
	(0.000)	(0.002)	(0.000)	(0.000)
_Cons	1.448*	1.551**	-2.794**	1.601
	(0.000)	(0.008)	(0.037)	(0.000)
Statistics	**Coefficient and (Probability)**			
Wald Chi2 (13)	319122.9	27069.28	1861.89	1300.23
	(0.000)	(0.000)	(0.000)	(0.000)
Ar2	0.237	0.128	0.339	0.102
Hansan J	0.570	0.433	0.263	0.661
Year Dummy	Yes	Yes	Yes	Yes
Obs.	344	312	600	312
Groups	43	39	75	39
Instruments	43	37	40	29

*, **,*** signified the level of significance 1%, 5% and 10% respectively

A one percent increase in Control of corruption index has resulted in a decrease in conventional banks stability with a coefficient value of 0.29 and 0.75 percent in GCC and Non-GCC countries respectively. This implies that the banks needed to re-strategise on how to curtail corrupt practices in the industry. The more the control, the better the proposal of banking stability. These findings receive the backings of the resource curse theory. The result is in consonance with the work of Korbi & Bougatef, (2017). The empirical outcomes confirm the negative tie between the control of corruption and banking stability. It further reveals that banking instability increases as the severity of corruption persist. However, on the part of Islamic banks in the GCC, the result indicates that a percentage change in corruption control leads to a significant increase in banking stability with 0.90 percent. This is indicating that the better the control of corruption, the higher banking stability. On the part of the Non-GCC, Islamic banks indicate a similarly significant relationship of 0.52 percent. This results tally with the general model and hypothesis Ha4, which predict the significant effect of corruption control on banking stability is now supported.

On analysing the impact of political stability as the determinant of banking stability, the empirical estimation confirms the positive connection between lower level of political stability and banking solvency stability. A one percent upsurge in the Political stability index is associated with an increase in banking stability in all the banks across the regions. The result agrees with earlier studies done by Ashraf, (2017). It reveals that banking instability increases with a break in the political system. The direction of estimation of the banks in all the two regions are similar; the only difference is on the size of the coefficient indicating that the severity of political shocks is higher in the Non-GCC set of countries.

This result tally with the general model and hypothesis Ha5, which predict the significant effect of political stability on banking stability is now supported. The estimation suggests that the political environment of a country is a significant determinant of financial stability (Abdelsalam et al., 2017; Khafagy, 2017).

Table 4.15 below represents the long-run effect of institutional factors on banking stability in the GCC and Non-GCC set of countries, particularly on how their stability varies for the conventional and Islamic banks.

Table 4.15
Long Run System GMM for Institutional Factors GCC and Non-GCC

	Coefficient and (Probability)			
VARIABLES	**Conv Banks GCC**	**Islamic Banks GCC**	**Conv Banks Non-GCC**	**Islamic Banks Non-GCC**
CPI	-0.905*	9.629	-4.143**	1.234**
	(0.000)	(0.049)	(0.028)	(0.018)
PSI	0.320**	2.664	2.640**	0.435***
	(0.028)	(0.103)	(0.005)	(0.079)
lnTA	-0.003	0.256**	-1.145**	-0.336
	(0.694)	(0.015)	(0.003)	(0.285)
EFF	-0.481*	-2.363**	4.985*	0.009
	(0.000)	(0.041)	(0.000)	(0.683)
IDIV	0.131*	0.351*	1.656*	0.083*
	(0.000)	(0.030)	(0.000)	(0.000)
_cons	1.448*	27.119**	-14.854*	1.601*
	(0.000)	(0.051)	(0.020)	(0.000)

A one percent increase in control of corruption resulted in a decrease in conventional banks stability with a coefficient value of 0.91 percent in GCC countries. This indicates that the conventional banks in the GCC region need to attain a higher level of stability without compromising their efforts to control corruption. However, a one percent increase in corruption control in Non-GCC states resulted in a 4.1 percent reduction in conventional banking stability. Similarly, Islamic banks reflect a significant relationship between corruption and banking stability in the long term in the GCC and Non-GCC region at a 9.6 and 1.23 percent. This indicates that the effect of corruption in the short run is now extended to a longer time. The robust results tally with the general model and hypothesis Ha4, which predict the significant effect of corruption control on banking stability is now supported.

In response to political hazards, table 4.15 displays how banking stability responded to the long-run change in the political atmosphere as a one percent increase in political stability index led to a corresponding increase in conventional banking stabilities with 0.75 and 2.6 percent in GCC and Non-GCC countries. This indicates that reducing political instability is instrumental in obtaining banking stability and rapid financial progress. Similarly, the long-run estimation of Islamic bank and stability relation remains significant in Non-GCC sampled states. The results supported the hypothesis Ha5 in the long term. However, the result of political stability reveals insignificant relation with Islamic bank stability in GCC region. The possible reason for the disparity of two models (general and robust) is the heterogeneity of the robust model. Alternatively, the result indicated that the effect of political stability on banking stability in the GCC region is only in the short run. While on the part of Non-GCC Islamic banks, the effect of political stability is extended to the long run. The robust result rejects the hypothesis Ha5, which predicted a significant effect of political stability on banking stability.

4.4.2.3 Post Estimation diagnostic checks

To certify that the estimated model is correctly identified, the Hansen J test for overidentifying restriction has failed to reject the null hypothesis. This is signifying the that instruments have remained valid and are, of course, exogenous. Precisely, the model and subsets of instruments are correctly specified. Similarly, the regression is free from serial correlation, as the Arellano and Bond test autocorrelation specifies the nonexistence of second-order serial correlation. The test fails to reject the null hypothesis that there is no second order-autocorrelation. Thus, this test backs the validity of the system GMM estimator.

4.4.2.4 Summary of the impact of institutional variables on bank stability

The summary of the dynamic regression results of institutional variables and banking stability are presented in Table 4.16.

Table 4.16
Summary System GMM Results of Institutional Variables on Banking Stability

Variables	Hypo	Z-Score (General model)		Z-score (Specific model)	
		Con Banks	Islamic	Con Banks	Islamic
CPI	Ha4	Significant(-)	Significant(+)	Significant (-)	Significant (+)
PSI	Ha5	Significant(+)	Significant(+)	Significant (+)	Significant (+)
		(Long Run)		(Long Run)	
CPI	Ha4	Significant(-)	Significant(+)	Significant (-)	Significant(+)
PSI	Ha5	Significant(+)	Significant(+)	Significant (+)	Significant (+)
		Split Robust Sample (GCC)		(Non-GCC)	
CPI	Ha4	Significant(-)	Significant(+)	Significant (-)	Significant (+)
PSI	Ha5	Significant(+)	Significant(+)	Significant(+)	Significant (+)
		(Long Run)		(Long Run)	
CPI	Ha4	Significant(-)	Significant(+)	Significant (-)	**Significant(+)**
PSI	Ha5	Significant(+)	**Insignificant**	Significant (+)	Significant (+)

The investigation reveals that the corruption perception index has a significant and negative impact on banking stability on the conventional banks sub-sample and tally with theoretical expectation of the resource curse and hypothetical expectations of Ha4 which state a significant effect of corruption on banking stability is now supported. Islamic banks display a significant and positive impact of corruption on banking stability in both short-run positions in the general and specific samples of GCC and Non-GCC. Which tally with the hypothetical expectation of Ha4 and now supported. Counting on the political stability rate is found to have a significant and positive effect on bank stability in the full sample, conventional and Islamic banks sub-sample. The result is found agreeable to the findings of the general model, and the result is consistent with a prior expectation of Ha5, which hypothesised the significant effect of political stability on banking stability is supported. While on the part of GCC Islamic banks, the effect of political stability is not extended to the long run and is not supported.

4.4.3 Presentation of Results of the Influence of macroeconomic factors on Bank Stability

This section discusses the influence of macroeconomic variables on banking stability Z-score. This will starts with the unit root test to determine the properties of the variables. It is followed by the presentation of the estimated result and the post-estimation diagnostic check.

4.4.3.1 Unit Root Test

Table 4.17 shows that the variables of banking stability Z-score, GDP, inflation, and average oil price are all stationary at a particular level. Similarly, the bank size, management efficiency, and income diversification control variables are stationary at a level in conventional banks, the full sample and in the Islamic bank sub-groups.

Table 4.17
Unit Root Test Result for Macroeconomic Factors

Method	**Full Sample (IPS)**	**Conventional Banks (IPS)**	**Islamic Banks (IPS)**
Variables	Level	Level	Level
Z-SCORE	-2.957*	-16.104*	-13.025*
	(0.000)	(0.000)	(0.000)
GDP	-19.830*	-14.128*	-6.904*
	(0.000)	(0.000)	(0.000)
INF	-21.500*	-16.389*	-10.792*
	(0.000)	(0.000)	(0.000)
ΔOIL	-3.867*	-4.603*	-2.966*
	(0.000)	(0.000)	(0.002)
lnTA	-8.23*	-4.994*	-1.722
	(0.000)	(0.000)	(0.000)
EFF	-4.902*	-5.810*	-4.582*
	(0.000)	(0.000)	(0.000)
IDIV	-15.813*	-7.776*	-7.856*
	(0.000)	(0.000)	(0.000)

. *, **,*** signified the level of significance 1%, 5% and 10% respectively

Following the order of integration of variables in Table 4.17. The variables Z-score, GDP, inflation, change in oil price, and the control variables bank size, management efficiency, and income diversification do not exceed the order of I(1). Then the selection of the system GMM technique is appropriate.

4.4.3.2 Presentation of Estimated Result

Results of the influence of macroeconomic variables on banking stability of conventional and Islamic banks are presented in Table 4.18 below. The table estimation is divided into a general and specific model to confirmed the robustness of the model.

Table 4.18
System GMM for Macroeconomic Factors of Conventional and Islamic

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
ZScore L.1	0.716*	0.407*	0.602*	0.699*	0.458*	0.734*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
EQTA	0.163***	0.444*	0.894*			
	(0.061)	(0.000)	(0.000)			
LLR	-0.460*	-1.176*	0.684*			
	(0.000)	(0.000)	(0.000)			
LIQ	-0.528*	-0.981*	1.861*			
	(0.000)	(0.004)	(0.000)			
CPI	-0.625*	-2.278*	1.613**			
	(0.000)	(0.000)	(0.007)			
PSI	0.195*	0.961*	0.712***			
	(0.000)	(0.001)	(0.033)			
INF	-1.641*	-0.935*	-3.029*	-0.743*	-1.526*	-1.357*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP	-0.024***	-0.264*	-0.267*	-0.057*	-0.121*	-0.061*
	(0.067)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)
ΔOILP	0.001*	0.005*	0.007*	0.009*	0.011*	0.002*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
InTA	-0.010	-0.016	-0.014	-0.036*	0.011**	-0.037*
	(0.551)	(0.109)	(0.783)	(0.000)	(0.009)	(0.006)
EFF	0.242*	0.321*	0.408*	0.026*	0.291*	0.026*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)
IDIV	0.105*	0.294*	0.090*	0.065*	0.093*	0.036*
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
BANK DUMMY	-0.338*			-0.456**		
	(0.000)			(0.000)		
Cons-	0.135*	0.980*	4.982*	0.564*	2.171*	2.142*
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Statistic	Coefficient and (Probability)					
Wald Chi	27504.6	30377.28	39833.8	86363.3	198121.3	75535.45
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ar2	0.425	0.341	0.103	0.423	0.344	0.061
Hansen J	0.219	0.462	0.682	0.177	0.261	0.299
YearDummy	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1336	944	392	1336	944	392
Groups	167	118	49	167	118	49
Instrument	106	111	45	148	118	46

*, **,*** signified level of significance 1%, 5% and 10% respectively

The table discloses that the lag of dependent variable Z-score is positively influencing the stability of banks and is significant in the entire sample sets. The result of the full sample, conventional and Islamic banks reveals that a one percent increase in the stability of the banks last year transformed to an increase in banking stability by 0.69 percent, 0.46 percent, and 0.77 percent this year, for the respective sample groups of banks in specific model. More so, the table also presents the negative coefficient of inflation as the significant and predicting the likelihood that a persistent increase in commodity price will lead to instability of banks in all the sub-sampled groups. A one percent increase in inflation will lead to a 1.64 percent decrease in the stability of the banks in the full sample group. Similarly, another one percent increase in inflation will also lead to a 0.94 percent decrease in the solvency of the conventional banks in GCC and Non-GCC countries.

However, for the Islamic banks, a percentage increase in inflation will lead to a corresponding decrease in banking stability with a 3.03 percent in both regions of the GCC and Non-GCC states. It is known that inflation is harmful to major economic activities. This implies that the persistent increase in price, the borrowers may find it easier to secure funds and pay their loan obligations. Drop in the real value of bank loans could inspire borrowers to service their debt, and cause a reduction in the overall stability and makes banking operation go near to default. Moreover, inflation could adversely affect the stability of the entire banking system (Huybens & Smith, 1999). This result supports the resource curse theory and the hypothetical expectations of Ha6, which state a significant effect of inflation on banking stability is now supported. The outcome of the study is consistent with the findings of Ibrahim & Rizvi, (2017); Kabir et al. (2015) and Mirzaei et al. (2013). However, the result is found contrary to the findings of Bourkhis & Nabi (2013) and Srairi (2013).

Focusing on the growth of domestic product variable, the result displays that there is a significant but negative coefficient affecting the stability of banks in the full sample for the conventional bank's groups and Islamic banks. A one percent increase in GDP will lead to a 0.024 percent decrease in banking stability of the full sample, and 0.026 percent in conventional banks. Typically banks moderate intermediation roles when the condition of the economy is terrible. The result agrees with our prior expectations and tallies with the empirical claims of Agoraki et al., (2011); Cubillas & González, (2014); Ghenimi et al., (2017); Imbierowicz & Rauch (2014). Similarly, a one percent increase in GDP will lead to a decrease in bank stability of Islamic banks by 0.261 percent. This result replicates the position of Ibrahim and Rizvi (2017). The result also supports the financial intermediation theory and reflects the hypothetical expectations of Ha7 which state a significant effect of GDP on banking stability is now supported in the short run.

Concentrating on the influence of oil prices on banking stability, the coefficient of the oil price variable is also significant and positive in all the sub-sample groups. Thus, a one-dollar increase in oil price will lead to 0.001 percent increase in the stability of the banks in the full sample group, Another one-dollar increase in average oil price will also lead to 0.005 percent increase in bank stability of the conventional banks and 0.007 percent in Islamic banks, respectively. This proves how vulnerable the oil price is to most commercial activities in the region. This result supports the resource curse theory and also tally with hypothetical expectations of Ha8 which state a significant effect of oil price on banking stability is now supported. The findings also confirm the conclusion of Alqahtani and Mayes (2018) on their smaller conventional and Islamic banks samples. The empirical findings contradict the news of (Bitar, Ben Naceur, Ayadi, & Walker (2017). Consequently, the bank dummy variable signifies that conventional banks appeared more stable than the Islamic banks with a coefficient value of 0.46 percent. To confirm the robustness of the results, in reference to previous analytical techniques, the study re-estimate the model in the specific equation column, and the result confirms similarities in findings.

Table 4.19 below indicates the long-run position of macroeconomic factors estimation. The long-run estimation is presented in two models, general and specific model to confirm the robustness of the results in the models.

Table 4.19
Long Run System GMM for Macroeconomic Factors Z-score

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
EQTA	0.437*	5.801*	1.495*			
	(0.000)	(0.000)	(0.000)			
LLR	-0.701*	-1.983	1.144*			
	(0.000)	(0.000)	(0.000)			
LIQ	-0.518*	-1.656*	3.114*			
	(0.000)	(0.004)	(0.000)			
CPI	-1.860*	-3.844*	2.699*			
	(0.000)	(0.000)	(0.007)			
PSI	0.275*	1.62*	1.191**			
	(0.000)	(0.001)	(0.028)			
INF	-6.539*	-1.577*	-5.12*	-2.466	-2.815	-8.967
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP	-0.099*	-0.446*	-0.446*	-0.191	-0.223	-0.201
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)
ΔOILP	0.006*	0.008*	0.012*	0.030	0.021	0.010
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
InTA	-0.200*	-0.016	-0.014	-0.119*	0.021*	-0.358*
	(0.000)	(0.109)	(0.783)	(0.000)	(0.009)	(0.000)
EFF	0.591*	0.541*	0.683*	0.087	0.537*	0.120**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)
IDIV	0.415*	0.496*	0.151**	0.215*	0.172*	0.171*
	(0.001)	(0.000)	(0.006)	(0.000)	(0.000)	(0.000)
Bank Dummy	-0.435*			-0.502*		
	(0.000)			(0.009)		
-cons	0.135	0.983*	4.98**	6.020*	4.005*	0.610*
	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)	(0.001)

*, **,*** signified the level of significance 1%, 5% and 10% respectively. – indicating variable is not significant in the short run.

The table 4.19 indicates the long-run position of macroeconomic factors estimation where a percentage change in the rate of inflation is associated with a decrease in banking stability of 2.47, 2.82, and 8.97 percent of all the sub-samples at one percent significant position in the long run. The result tally with hypothetical expectations of Ha6 which state a significant effect of inflation on banking stability is now supported. Equally, a percentage upsurge of GDP is also connected with a 0.19, and 0.22 percent reduction in banking stability of the full sample, and conventional banks all at one percent significance. Similarly, Islamic banks portray a 0.2 percent decrease in bank stability of a five percent significant position in the long run. The long run result tally with hypothetical expectations of Ha7 which state a significant effect of GDP on banking stability is now supported. The dummy variable signifies that there is a difference regarding stability between conventional and Islamic banks, in the long run, using the Z-score stability measurement. The coefficient of the dummy variable implies that conventional banks are more stable than Islamic banks with 0.5 percent.

A one-dollar increase in Oil price is related to 0.03, 0.02, and 0.01 percent increase in banking stability in the long run in all the sub-samples at one percent significance position. Therefore, oil price and banking stability unveil an inelastic association. Change in oil price has a more significant positive consequence for banking stability in the long run than in the short run. The resulting tally with hypothetical expectations of Ha8 which state a significant effect of change in oil price on banking stability is now supported. For the robustness of the results, the specific model column in table 4.17 provides similar findings.

Table 4.20 below analyzes the effects of macroeconomic factors as the main determinants of banking stability in the GCC and Non-GCC set of countries. The research investigates whether banking stability differs across the dual banks between the GCC and Non-GCC countries. For further robustness check of the results.

Table 4.20
System GMM for Macroeconomic Factors of Conventional and Islamic

VARIABLES	Conven GCC Banks	Islamic GCC Banks	Conven Non-GCC Banks	Islamic Non-GCC Banks
	Coefficient and (Probability)			
ZSCORE				
L1.	0.647*	0.837*	0.275*	0.712*
	(0.000)	(0.000)	(0.000)	(0.000)
INF	-1.143**	-1.984***	-3.647*	-4.142
	(0.013)	(0.025)	(0.000)	(0.006)
GDP	-0.071*	-0.045*	-0.081**	-0.177
	(0.000)	(0.005)	(0.006)	(0.000)
ΔOILP	0.005*	0.001***	0.006*	-0.004**
	(0.000)	(0.055)	(0.000)	(0.001)
lnTA	0.006	-0.081**	-0.482*	-0.049*
	(0.357)	(0.010)	(0.000)	(0.001)
EFF	-0.146*	0.061	0.701*	0.011
	(0.000)	(0.304)	(0.000)	(0.282)
IDIV	0.058*	0.024*	0.476*	0.036*
	(0.001)	(0.000)	(0.000)	(0.000)
_Cons	3.106*	0.675	4.032*	-3.057
	(0.000)	(0.308)	(0.000)	(0.000)
Statistics	**Coefficient and (Probability)**			
Wald Chi2 (14)	20279.07	15398.25	26155.06	23257.62
	(0.000)	(0.000)	(0.000)	(0.000)
Ar2	0.327	0.131	0.367	0.109
Hansan J	0.167	0.175	0.202	0.639
Year Dummy	Yes	Yes	Yes	Yes
Obs.	344	312	600	312
Groups	43	39	75	39
Instruments	43	37	74	36

*, **,*** signified the level of significance 1%, 5% and 10% respectively

Concerning the influence of macroeconomic factors, a one percent increase in the inflationary rate results to a reduction of banking stability in all sub-sampled banks in both the GCC and Non-GCC states with a significant coefficient of 1.14 percent, 1.98 percent, 3.64 percent and 4.14 percent respectively. More so, the shock of inflation on banking stability is more pronounced in the Non-GCC states as the banks in the region are unable to adjust to the instability triggered by inflation. This confirms the proposition that banks lose a significant part of their assets with an increase in inflation. The result is consistent with the empirical findings of Kabir et al., (2015), Ibrahim & Razvi, (2017), Rajhi & Hassair (2013). The robust result supported the general model and hypothetical expectations of Ha6 which state a significant effect of inflation on banking stability.

Furthermore, table 4.20 also indicates that a one percent increase in GDP resulted in a decrease in the stability of conventional banks by 0.07 percent in the GCC region and 0.081 percent in the Non-GCC states. Similarly, the result also reveals a significant, definite link between GDP and banking stability of Islamic banks in GCC and Non-GCC states. In other words, when GDP increased by one percent the banking sector responded with 0.10 and 0.18 percent stability decrease. In essence, the reduction of economic growth has a more considerable impact on bank solvency of Islamic banks. The finding received the supporter of earlier postulations that economic progress lessens banking stability (Cubillas & González, 2014). On a contrary note, Rahim and Zakaria (2013) have confirmed that economic boost leads to improvement in the banking sector. The result tally with the general mode and hypothetical expectations of Ha7 which state a significant effect of GDP on banking stability is now supported.

To differentiate the effects of ΔOILP on banking stability between global oil giants of the Middle East GCC and Non-GCC set of countries, table 4.20 has indicated that oil price change has a significant impact on the banking sector in both sets of countries. The result indicates that a one-dollar increase in oil price is linked with an increase in banking stability with 0.005 and 0.001 percent in conventional and Islamic banks of GCC. Another one-dollar increase in oil price was associated with stability increase in conventional banks with 0.006 percent in Non-GCC sub-region, while Islamic banks stability decreased with an oil price dollar change. Islamic banks in the Non-GCC states are not benefiting more from the boost in oil price because their market share is minimal when compared to the conventional banks. This is indicating a greater attachment of oil marketers' funds with conventional banks than Islamic banks in the Non-GCC countries (Effendi, 2019). The robust results supported the hypothetical expectations of Ha8 which state a significant effect of change in oil price on banking stability is now supported.

Table 4.21 shows the long-run influence of macroeconomic factors on the stability of the banking system in GCC and Non-GCC countries. The estimation is split into a group of conventional and Islamic banks in GCC and Non-GCC set of countries.

Table 4.21
Long Run System GMM for Macroeconomic GCC and Non-GCC

	Coefficient and (Probability)			
VARIABLES	Conv Banks GCC	Islamic Banks GCC	Conv Banks Non-GCC	Islamic Banks Non-GCC
INF	-3.465**	-2.185*	-5.034*	-4.389*
	(0.016)	(0.058)	(0.000)	(0.003)
GDP	-0.218*	-0.274	-0.112**	-0.615*
	(0.000)	(0.001)	(0.000)	(0.000)
ΔOILP	0.015*	0.006***	0.009 **	-0.013*
	(0.000)	(0.059)	(0.000)	(0.000)
lnTA	0.006	-0.499	-0.666*	-0.172*
	(0.357)	(0.017)	(0.000)	(0.004)
EFF	-0.442*	0.061	0.967*	0.011
	(0.000)	(0.304)	(0.000)	(0.282)
IDIV	0.175*	0.146*	0.656*	0.125
	(0.000)	(0.000)	(0.000)	(0.000)
_cons	9.414*	0.675	4.032*	-3.057
	(0.000)	(0.308)	(0.000)	(0.000)

*, **,*** signified the level of significance 1%, 5% and 10% respectively. – indicating the variable is not significant in the short run

The inflationary rate variable demonstrates that a one percent increase results in a significant decrease in conventional banking stability with 3.5 and 5.03 percent in the GCC and Non-GCC sets of states. Islamic banks indicate decreasing stability of 2.19 percent and 4.38 percent concerning the change in inflationary rate in the GCC and Non-GCC states. This indicates that higher rate of inflation generally goes with a higher proportion of interest. This position could generate credit bubble leading to the probability of banking instability. This position receives agrees with that of Demirguc-Kunt & Detrgiache (1998). The long run result supported the hypothetical expectation of Ha6 which state a significant effect of inflation on banking stability.

A percentage change in GDP will result in a significant decrease in conventional banking stability of the GCC and Non-GCC states with 0.22 and 0.11 percent. This is indicating that on the long run, a drop in economic activities stimulates banking insolvency position. It is, therefore, evident that the outcome of this estimation on banking stability on GDP supports the earlier works of Bertay et al., (2013); Dong et al., (2014), Soedarmono, Machrouh, & Tarazi (2011). Similarly, the long-run result of GDP in the GCC and Non-GCC states indicates that Islamic banks show a significant relation with stability. The result supported the hypothetical expectations of Ha7 which state a significant effect of GDP on banking stability.

On the estimation of the long-run impact of oil price on banking stability, table 4.21 illustrates that a one-dollar increase in oil price leads to an increase in conventional bank stability with 0.015 and 0.006 percent in GCC and Non-GCC states, respectively. Similarly, an increase in one dollar in oil price is in favour of Islamic banks because it will lead to a significant increase in banking stability in the GCC states with 0.006 percent. The reason for this is that if oil prices rise, revenue through export will increase and virtually accelerate the level of financial activities in the benefitting countries. Similarly, the long run estimation also reveals that an increase in oil prices reflects a corresponding improvement in Islamic banks' stability in GCC states with 0.006 percent. On the other hand, a significant value decrease of 0.013 percent is recorded on the part of the Non-GCC Islamic banks. The robust results are consistent with overall results and supported hypothetical expectations of Ha8 which state a significant effect of change in oil price on banking stability.

4.4.3.3 Post Estimation diagnostic checks

To confirm that the estimated model is correctly identified, the Hansen J test for overidentifying restriction has failed to reject the null hypothesis. This signifies that the instruments have remained valid and are, of course, exogenous. Explicitly, the model and subsets of instruments are correctly specified. Similarly, the regression is free from serial correlation, as the Arellano and Bond test autocorrelation specifies the nonexistence of second-order serial correlation. The test fails to reject the null hypothesis that no second order-autocorrelation. Thus, the Wald Chi2 test is significant at one percent backing the fact that the variables collected for the model are fit.

4.4.3.4 Summary of the influence of macroeconomic variables on bank stability

The summary of the dynamic regression results of the impact of macroeconomic variables and banking stability are presented in Table 4.22.

Table 4.22
Summary System GMM Results of Macroeconomic Variables on Banking Stability

Variables	**Hypo**	**Z-Score (General model)**		**Z-score (Specific model)**	
		Con Banks	**Islamic**	**Con Banks**	**Islamic**
INF	Ha6	Significant(-)	Significant(-)	Significant (-)	Significant (-)
GDP	Ha7	Significant(-)	Significant(-)	Significant (-)	Significant (-)
ΔOILP	Ha8	Significant(+)	Significant(+)	Significant (+)	Significant (+)
		(Long Run)		**(Long Run)**	
INF	Ha6	Significant(-)	Significant(-)	Significant (-)	Significant(-)
GDP	Ha7	Significant(-)	Significant(-)	Significant (-)	Significant (-)
ΔOILP	Ha8	Significant(+)	Significant(+)	Significant (+)	Significant (+)
		Split Robust Sample (GCC)		**(Non-GCC)**	
INF	Ha6	Significant(-)	Significant(-)	Significant (-)	Significant (-)
GDP	Ha7	Significant(-)	Significant(-)	Significant(-)	Significant (-)
ΔOILP	Ha8	Significant(+)	Significant(+)	Significant (+)	Significant(+)
		(Long Run)		**(Long Run)**	
INF	Ha6	Significant(-)	Significant(-)	Significant (-)	significant(-)
GDP	Ha7	Significant(-)	Significant(-)	Significant (-)	Significant (-)
ΔOILP	Ha8	Significant(+)	Significant(+)	Significant (+)	Significant(-)

The model explores the influence of Inflationary rate on bank stability as significant and negative on the whole sub-samples groups in both the short and long runs. Therefore, hypothesis Ha6 which hypothesized the significant effect of inflation on banking stability is supported. The GDP reveals the significant but negative influence of the variable on bank stability in the full sample, conventional banks and Islamic banks. As such, the variable reveals significant relation with banking stability which is consistent with the supported hypothesis Ha7. Average Oil price shows a positive and significant influence on bank stability of full sample, conventional and Islamic bank in the GCC countries. In contrast, Islamic banks in Non- GCC states indicate a significant but negative relation with banking stability in short and longer periods. The result complies with the prior expectation of the hypothesis Ha8 and therefore, supportive.

4.4.4 Presentation of Results of the Banks' PD Stability Measurement

This section presents the estimated outcomes of the study models and their assessment on the association between bank-specific, Institutional, and macroeconomic factors on the one hand, and bank stability PD, on the other hand.

4.4.4.1 Presentation of Results of the effect of Bank Specific on Bank Stability

This segment contains the presentation of the effects of bank-specific variables on the banking stability PD. We will begin with the unit root test to determine the properties of the variables. This is followed by the presentation of the estimated result and the post-estimation diagnostic check.

4.4.4.1.2 Unit Root Test

Table 4.23 represents the test for the stationarity order of the variables in the model. The model entails the combination of the three bank specific factors (EQTA, LLR and LIQ) on the probability default.

Table 4.23
Unit Root Test Result for Market Bank Specific

Method	**Full Sample (IPS)**	**Conventional Banks (IPS)**	**Islamic Banks (IPS)**
Variables	Level	Level	Level
PD	-11.506*	-9.697*	-12.062*
	(0.000)	(0.000)	(0.000)
EQTA	-3.411*	-3.101*	-3.771*
	(0.000)	(0.001)	(0.000)
LLR	-4.255*	-3.818*	-4.875*
	(0.000)	(0.000)	(0.000)
LIQ	-4.444*	-3.836*	-17.658*
	(0.000)	(0.000)	(0.000)
lnTA	-5.981*	-12.31*	-4.275*
	(0.000)	(0.000)	(0.000)
EFF	-2.463*	-3.051*	-3.032*
	(0.007)	(0.001)	(0.001)
IDIV	-4.480*	-1.903**	-3.4332*
	(0.000)	(0.029)	(0.000)

. *, **,*** signified the level of significance 1%, 5% and 10% respectively

The table shows that the variables of banking stability PD, capital adequacy, asset quality, liquidity, management efficiency, bank size and income diversification indicators are stationary at a level in all the sub-sampled banks.

4.4.4.1.3 Presentation of Estimated Result

Results of the effects of bank-specific variables on banking stability are presented in Table 4.24. The table analyses the short run effect of bank specific variables on the probability default of both conventional and Islamic banks.

Table 4.24
System GMM for Bank Specific Factors of Conventional and Islamic

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
DP	0.414*	0.526*	0.267*	0.514*	0.753*	0.119**
L.1	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.041)
EQTA	-0.459*	-0.985*	-1.267**	-0.729*	-1.745*	-2.236*
	(0.001)	(0.000)	(0.024)	(0.000)	(0.000)	(0.000)
LLR	-0.179*	0.369	-1.475**	-0.136*	1.367*	-1.027*
	(0.000)	(0.186)	(0.021)	(0.000)	(0.000)	(0.003)
LIQ	-0.295*	0.129**	-1.638**	-0.480*	0.217*	-3.135*
	(0.000)	(0.011)	(0.009)	(0.003)	(0.004)	(0.000)
CPI	0.436*	0.327**	-1.241**			
	(0.000)	(0.024)	(0.010)			
PSI	-0.221*	-0.250*	-0.305			
	(0.002)	(0.001)	(0.105)			
INF	2.364*	0.718**	3.396*			
	(0.000)	(0.009)	(0.000)			
GDP	0.074*	0.057*	0.185**			
	(0.000)	(0.000)	(0.013)			
ΔOILP	-0.003*	-0.003*	-0.005***			
	(0.000)	(0.000)	(0.068)			
lnTA	-0.102*	-0.106*	-0.098***	-0.054*	-0.081*	-0.002
	(0.000)	(0.000)	(0.008)	(0.000)	(0.002)	(0.985)
EFF	0.232*	0.133*	-0.260***	-0.141*	-0.194*	-0.542*
	(0.000)	(0.000)	(0.080)	(0.000)	(0.000)	(0.000)
IDIV	0.025*	0.030**	-0.077	0.018*	0.070*	-0.083**
	(0.001)	(0.023)	(0.246)	(0.001)	(0.000)	(0.027)
BANK DUMMY	0.159*			0.096*		
	(0.000)			(0.000)		
Cons-	0.821*	0.178*	1.382***	2.048*	1.519*	5.473*
	(0.000)	(0.056)	(0.051)	(0.000)	(0.000)	(0.001)
Statistic	Coefficient and (Probability)					
Wald Chi	13869.59	388248.48	18018.54	8901.69	10494.75	13590.29
(18)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ar2	0.107	0.350	0.097	0.166	0.529	0.139
Hansen J	0.101	0.230	0.244	0.265	0.487	0.400
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	638	454	27	638	454	184
Groups	85	58	29	85	58	27
Instrument	71	57	45	57	51	25

. *, **,*** signified the level of significance 1%, 5% and 10% respectively

The table discloses that the lag of the dependent variable PD is positively affecting the stability of banks. It is significant in the full sample, conventional and Islamic banks sub-sampled groups. In the general model column in table 4. 24, a one percent increase in the stability of the full sample, conventional and Islamic banks last year transforms to an increase in banking stability by 0.42, 0.52 and 0.27 percent this year. The significance and positive coefficience of the lag of the dependent variable prediction show how highly persistent the stability of conventional banks is with a figure of more than 40 percent level of significance. However, the lag of the dependent variable in the case of Islamic banks is low persistence and significant. This low volatility implies that the length of time of Islamic banks are quoted in market operation is a current phenomenon, mostly as from 2005 onwards. This is not enough time to explain the persistence level of a bank. PD is built on market information, which is very volatile; and it will take time for the persistence to explain itself the more.

More so, table 4.24 also presents the coefficient of capital adequacy as significant and negatively affecting the probability of banks default in all the sub-sampled groups. A one percent increase in capital is accompanied with 0.46 percent, 0.97 percent and 1.27 percent increase in banking stability of all the subgroups. The result is indirectly consistent with the expectation of Merton (1977), Cole and White (2012) are of the view that low capitalization reduces banking stability. The result supports the prediction of the financial intermediation theory. It tallies with our prior expectations of the hypothesis Ha9 and therefore supportive.

Similarly, the Asset quality variable proxy for loan loss reserves over total loans displayed a significant but negative coefficient affecting the probability of default variable of banks in all sub-sample groups, except in the conventional banks which present an insignificant and positive coefficient. An increase in bank asset quality will lead to a 0.17 percent decrease in banking probability to the default of the full sample and 1.47 percent decrease in bank probability of default of Islamic banks, respectively. A one percent increase in assets quality is accompanied by the insignificant relationship of conventional bank stability. The result is consistent with the findings of Zhang et al. (2015) who found an insignificant effect of asset quality on the market based stability measurement. This implies that consistent provision for loan loss has the tendency of not improving the stability of conventional banks, compared to Islamic banks whose stability improves with consistent loan loss provision. The result reported with respect to Islamic banks signifies that the banks increase their financing loss reserves when they anticipate higher credit default. That is to say that Islamic banks genuinely decide on their loss reserves based on the level of risk of their loan portfolio as suggest in Basel Accord. For the robustness of the result, the general model column and the Z-score stability measurement results provide similar findings.

The coefficient of liquidity variable shows a significant relationship to banking stability of the sub-sample groups. A one percent increase in bank Liquidity ratio will lead to a decrease in bank probability of default with 0.29 percent in the full sample and 1.64 percent in Islamic banks sub-sample. This indicates that liquidity contributes to the improvement of banking stability, thus implying that retaining a large amount of liquidity helps Islamic banks to reduce banking instability. The result is consistent with the expectation of the financial intermediation theory and that studies of Kabir et al., (2015). Concerning the effects of liquidity on the stability of the conventional banks, the coefficience of the liquidity shows a positive and significant relationship with banking stability, as a one percent increase in bank liquidity will lead to a 0.13 increase in banking probability of default in the conventional sub-sample. This is signifying that an increase in the liquidity quality leads to a decrease in conventional bank stability. The findings are contrary to our prior expectations and the views of Kabir et al., (2015). By contrast, the positive coefficience indicates that conventional banks would have to generate finances other than short-term assets to meet with all of their short-term liability withdrawals. To verify the robustness of the result, the specific model column and the Z-score results have provided similar findings.

In comparing the two stability indicators, that is the Z-score and PD with bank-specific variables, some differences are uncovered. On the part of the Capital adequacy ratio, the variable is found to stimulate banking stability in all the sub-samples banks, respectively. There are indications of any significant differences between the two indicators. Regarding shocks of capital adequacy in Z-score, the conventional banks absorbed more shocks than the Islamic banks with a coefficient value of 5.93 and 1.01. On the part of PD, Islamic banks observed more shocks in capital adequacy than the conventional banks. This is with a coefficient value of 0.98 and 1.27. This indicates that conventional banks are better explained by stability indicator Z-score, while Islamic banks could better be explained with the market measurement PD.

Asset quality is another bank's specific variable that shows how a significant difference between the two banking stabilities. The loan reverse indicates a significant and negative coefficient in conventional banks and positively significant in Islamic banks using Z-score stability measure. Similarly, the impact of loan loss reserves variable on the stability of conventional and Islamic banks, using PD measurement, exhibit dissimilar result with the Z-score.

Concerning the liquidity quality variable, the coefficience of the variable exhibits a better explanation of the conventional banks' stability with a 1.56 percent level of significance under the Z-score measurement. In comparison, Islamic banks' stability is better explained with PD with a higher coefficient value of 1.64 percent. The result tallies with the findings of Kabir et al., (2015). The findings are robust with a specific model column in both the Z-score and PD estimations.

Table 4.25 displays the long-run relationship between the banks specific and the probability of default. The table presents the long run results in the general and specific model to check the robustness of the results.

Table 4.25
Long Run System GMM for Bank Specific Factors PD

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
EQTA	-0.784*	-2.077*	-1.543*	-1.499*	-3.340*	-2.539*
	(0.000)	(0.000)	(0.019)	(0.000)	(0.000)	(0.000)
LLR	-0.307*	0.369	-2.014*	-0.280**	5.534*	-1.160*
	(0.000)	(0.186)	(0.027)	(0.026)	(0.000)	(0.000)
LIQ	-0.508*	0.273*	-2.236*	-0.987*	0.458*	-3.560*
	(0.000)	(0.008)	(0.011)	(0.000)	(0.004)	(0.000)
CPI	0.744*	0.687*	-1.694*			
	(0.000)	(0.017)	(0.014)			
PSI	-0.378*	-0.528*	-0.412			
	(0.000)	(0.000)	(0.113)			
INF	4.042*	1.514*	4.637*			
	(0.000)	(0.017)	(0.000)			
GDP	0.120*	0.121*	0.252*			
	(0.000)	(0.000)	(0.004)			
ΔOILP	-0.004*	-0.007*	-0.008			
	(0.000)	(0.000)	(0.68)			
lnTA	-0.174*	-0.223	-0.098*	-0.168*	-0.371*	0.002
	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.985)
EFF	-0.379*	0.281*	-0.355***	-0.351	-0.346	-0.615
	(0.000)	(0.000)	(0.086)	(0.000)	(0.000)	(0.000)
IDIV	-0.043*	0.064*	-0.077	-0.029*	0.261*	-0.095**
	(0.000)	(0.036)	(0.246)	(0.001)	(0.000)	(0.016)
Bank Dummy	0.435*			0.201*		
	(0.000)			(0.000)		
-cons	0.821	0.177*	4.98**	4.212*	3.533*	5.457*
	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)

*, **,*** signified the level of significance 1%, 5% and 10% respectively. – dash indicate short-run insignificance of the variable

The percentage rise in capital adequacy is allied with a 0.78, 2.07, and 1.54 percent increase in banking stability in all the sub-samples in the long run at a one percent level of significance. According to the asset quality of the full sample and Islamic banks, one percent change in the loan reserve variable is connected with 0.31, and 2.01 percent increase in banking stability PD at ten percent and one percent level of significance in the long run. A One percent increase in assets quality of the conventional banks is linked with insignificant relation with banking stability of Probability default. This is because investors are not very much kin about loan provisions, which can use for income smoothing (Ghosh, 2016; Shubita, 2015). However, one percent rise in Liquidity quality is associated with 0.51 and 2.24 percent increase in banking stability of both full sample and Islamic banks sub-samples in the long run at a significance of one percent. The findings indicate that Islamic banks with higher liquidity exhibit a positive association with banking stability. This tallies with the views of Basel III higher liquidity requirement and also consistent with Rahim and Zakaria (2013) who had suggested that liquidity shortage is sufficient to cause banking default. A percentage rise in liquidity is related to a 0.27 decrease in banking stability of conventional banks. On the long run, it will be at the one percent significance. Result of the bank dummy indicates that the difference in stability between conventional and Islamic banks could be measured with PD. Based on this result, Islamic banks appeared to be more stable with a coefficience of bank dummy of 0.2 percent. Therefore, most of the bank-specific variables have a greater positive effect on banking stability during the long-run than during the short run.

4.4.4.1.4 Post Estimation diagnostic checks

The alternative sub-samples and the estimated models are correctly specified. The Hansen J test for overidentifying restriction fails to reject the null hypothesis. This is signifying that the instruments have remained valid and are, of course, exogenous. Accurately, the model and subsets of the instruments are correctly specified. Similarly, the regression is free from serial correlation, as the test of Arellano and Bond of autocorrelation. The test specifies the nonexistence of second-order serial correlation. Since the test has failed to reject the null hypothesis, it means that there is no second order-autocorrelation in the models. Wald cha2 confirms the fitness of the model. The variables are significant: meaning that each variable contributes significantly to the model. Thus, this test is backing the validity of the system GMM estimator.

4.4.4.1.5 Summary of the effect of a bank-specific variable on bank stability (PD)

The model reveals that the Capital Adequacy ratio enhances banking stability in the entire sub-samples in the short and long-run conditions. The Asset quality variable also improves bank stability in the full samples and Islamic banks. The conventional banks reveals an insignificant effect of asset quality on bank stability. The negative direction of the probability to default variable indicates a better the stability. This means that stability is improving (Kabir et al., 2015). Regarding the liquidity quality, the variable indicates a significant and positive effect on bank stability on conventional banks, the Islamic banks remain negative and significant in bank stability. This result concludes that the hypothesis on bank internal factors have considerably impacted the stability of conventional and Islamic banks.

4.4.4.2 Presentation of Results of the Impact of Institutional Variables on Bank Stability

This segment looks at the impact of institutional variables on the banking stability PD. We begin with unit root test to determine the properties of the variables. This is followed by the presentation of the estimated result and the post-estimation diagnostic check.

4.4.4.2.1 Unit Root Test

Table 4.26 shows that the variables of banking stability PD, political stability index, management efficiency, and income diversification variables are stationary at a particular level in all of the sub-sampled groups.

Table 4.26
Unit Root Test Result Market Institutional Factors

Method	Full Sample (IPS)		Conventional Banks (IPS)		Islamic Banks (IPS)	
Variables	Level	1st Diff	Level	1st Diff	Level	1st Diff
PD	-11.506*		-9.697*		-12.062*	
	(0.000)		(0.000)		(0.000)	
CPI	-4.335*		-5.903*	-16.437*	-1.618	-11.028*
	(0.000)		(0.000)	(0.000)	(0.053)	(0.000)
PSI	-4.001*		-10.571*		-5.574*	
	(0.000)		(0.000)		(0.000)	
LNTA	-5.981*		-12.308*		-4.233	
	(0.000)		(0.000)		(0.000)	
CIR	-2.463*		-3.051*		-3.032*	
	(0.007)		(0.001)		(0.001)	
NI	-4.480*		-1.903**		-3.433*	
	(0.000)		(0.029)		(0.000)	

*, **, *** signified the level of significance 1%, 5% and 10% respectively

However, the corruption perception index variable is significant at difference level, of conventional and Islamic sub-sample groups. Similarly, bank size and other control variables are stationary at a level in all the sub-sampled groups. Following the order of integration of variables in Table 4.26. The variables PD, PSI, and the control variables bank size, management efficiency, and income diversification do not exceed the order of I(0). While the integration order of CPI is stationary at I(1), but do not exceed the integration of I(1). Then the selection of the system GMM technique is appropriate for the estimation of the model.

4.4.4.2.2 Presentation of Estimated Result

The result of the impact of institutional variables on banking stability is presented in table 4.27. the general and specific models are estimated below to show the impact of corruption control and political stability on the market based probability to default.

Table 4.27
System GMM for Institutional Factors Conventional and Islamic

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
DP	0.414*	0.526*	0.267*	0.591*	0.574*	0.838*
L.1	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
EQTA	-0.459*	-0.985*	-1.267**			
	(0.001)	(0.000)	(0.024)			
LLR	-0.179*	0.369	-1.475**			
	(0.000)	(0.186)	(0.021)			
LIQ	-0.295*	-0.129**	-1.638**			
	(0.000)	(0.011)	(0.009)			
CPI	0.436*	0.327**	-1.241**	0.200*	0.261*	-0.762*
	(0.000)	(0.024)	(0.010)	(0.001)	(0.000)	(0.001)
PSI	-0.221*	-0.250*	-0.305	-0.200*	-0.712*	-0.055
	(0.002)	(0.001)	(0.105)	(0.000)	(0.000)	(0.743)
INF	2.364*	0.718**	3.396*			
	(0.000)	(0.009)	(0.000)			
GDP	0.074*	0.057*	0.185**			
	(0.000)	(0.000)	(0.013)			
ΔOILP	-0.003*	-0.003*	-0.005***			
	(0.000)	(0.000)	(0.068)			
lnTA	-0.102*	-0.106*	-0.098***	-0.083*	-0.155*	0.219**
	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.007)
EFF	0.232*	0.133*	-0.260***	-0.255*	-0.223*	-0.298**
	(0.000)	(0.000)	(0.080)	(0.000)	(0.000)	(0.008)
IDIV	0.025*	0.030**	-0.077	0.004*	0.035*	-0.139**
	(0.001)	(0.023)	(0.246)	(0.303)	(0.000)	(0.037)
BANK DUMMY	0.159*			-0.035*		
	(0.000)			(0.017)		
Cons-	0.821*	0.178	1.382***	2.308*	2.302*	0.245*
	(0.000)	(0.056)	(0.051)	(0.000)	(0.000)	(0.001)
Statistic	Coefficient and (Probability)					
Wald Chi	13869.59	388248.48	18018.54	21774.27	18533.25	894.4
(18)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ar2	0.107	0.350	0.097	0.165	0.494	0.185
Hansen J	0.101	0.230	0.244	0.234	0.311	0.521
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	638	454	27	638	454	184
Groups	85	58	29	85	58	27
Instrument	71	57	45	71	57	25

*, **,*** signified the level of significance 1%, 5% and 10% respectively

The table shows that the lag of the dependent variable PD is positively affecting the stability of banks; it is significant in all the sub-sampled groups, respectively. To be more precise in all the sub-sample groups, the one percent increase in the stability of the banks last year transformed to an increase in banking stability by 0.41 percent, 0.526 percent, and 0.268 percent this year for the fully sampled conventional and Islamic banks. More so, the table also presents the coefficient of corruption variable as significant and positively affecting the stability of banks in the full sample and conventional banks sub-sampled groups. One percent increase in the corruption index will lead to a 0.44 and 0.32 percent increase in the probability of default of the banks in the fully sampled and conventional bank groups. The outcomes indicate that an increase in the control of corruption in the set countries will consequently decrease the stability of conventional bank. Alternatively, conventional banks were found to be involved in risky businesses that consequently expose them to greater vulnerability in fraudulent economies.

Also, a one percent increase in Corruption control perception will lead to 1.24 percent decreases in bank probability of default of Islamic banks. As a result, Islamic banks portray their capacity to block corrupt practices from their operations and remain stable. The result can be justified with an operational framework that corruption is forbidden in Islam. However, the result contradicts the findings of Akhtar and Hayati (2016) and Bougatef (2015) that corruption had forced some Islamic banks into instability. Although the outcome of our work does not support the position of the natural resource curse assumption, states with efficient institutional policies that will fight corruption do not succumb to the natural resource curse theory.

Concerning the relationship between political stability country index and banking stability PD, the variable of political stability displayed a significant negative coefficient thereby affecting the stability of the banking sector in the full sample and conventional bank groups. A one percent increase in political stability index will lead to a 0.22 percent decrease in banking probability to the default of the full sample, and 0.25 percent in conventional banks sub-sample. This result implies that an increase in the political stability index of conventional banks tends to improve the market stability PD level. The outcome of the study is in line with the findings of Bitar, Hassan, and Walker (2017) that the soundness of conventional banks improves under a good political environment. The market stability measurement of Islamic banks in the GCC and Non-GCC regions was not affected by the political stability factor. This implies that Islamic banks are not very much exposed to political risk in the Middle East. For the robustness checks, we examined the sensitivity of the result. The specific model column in table 4.28 presents a similar result.

In the attempt to compare the impact of institutional factors on bank stability measurements Z-score and PD, the conventional banks are doing better regarding stability with Z-score than Islamic banks, as the coefficient of the variable of corruption is 2.27 percent and 1.61 percent for an Islamic bank. Using PD as the tool for measurement, the variable explains the stability of Islamic banks regarding the influence of corruption with a coefficient of 1.24 percent and 0.33 percent for conventional banks.

Table 4.28 indicates the long run position of system GMM estimation on the impact of institutional variables on bank stability PD.

Table 4.28
Long Run System GMM for Institutional Factors PD

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
EQTA	-0.784*	-2.077*	-1.543*			
	(0.000)	(0.000)	(0.019)			
LLR	-0.307*	0.369	-2.0144*			
	(0.000)	(0.186)	(0.027)			
LIQ	-0.508*	-0.273*	-2.236*			
	(0.000)	(0.008)	(0.011)			
CPI	0.744*	0.687*	-1.694*	0.489*	0.612**	-4.710***
	(0.000)	(0.017)	(0.014)	(0.001)	(0.007)	(0.090)
PSI	-0.378*	-0.528*	-0.412	-0.489*	-0.405*	-0.305
	(0.000)	(0.000)	(0.113)	(0.000)	(0.000)	(0.105)
INF	4.042*	1.514*	4.637*			
	(0.000)	(0.017)	(0.000)			
GDP	0.120*	0.121*	0.252*			
	(0.000)	(0.000)	(0.004)			
ΔOILP	0.004*	-0.007*	-0.008			
	(0.000)	(0.000)	(0.68)			
InTA	-0.174*	-0.223	-0.098*	-0.202*	-0.271*	1.353
	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.229)
EFF	-0.379*	0.281*	-0.355***	-0.624	-0.522*	-1.843
	(0.000)	(0.000)	(0.086)	(0.000)	(0.000)	(0.243)
IDIV	-0.043*	0.064*	-0.077	0.004	0.082*	-0.858
	(0.000)	(0.036)	(0.246)	(0.303)	(0.000)	(0.99)
Bank	0.435*			-0.048*		
Dummy	(0.000)			(0.031)		
-cons	0.821	0.177*	4.98**	5.612*	5.402*	-1.513*
	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)

*, **,*** signified the level of significance 1%, 5%, and 10% respectively, - indicate insignificant variable in the short run

A percentage change in corruption perception index is allied with a 0.74 and 0.69 percent decrease in banking stability PD in the long run for the full sample and conventional bank samples at one percent significance. This is in line with the natural resource curse theory and supports Chen, Jeon, Wang & Wu (2015). On the part of Islamic banks, a percentage change in the corruption index raised the PD by 1.7 percent in the long run. The result is consistent with the work that accounts for "grease the wheel" impact of corruption in developing countries like the GCC and Non-GCC states (Xu, 2016). From the estimation result, the corruption perception index coefficients indicate that the effect of the variable on banking stability is lesser in the short run than in the long run, as the size of the coefficients is 0.26 percent and 0.7 in the short run but smaller than 0.69 percent, and 1.2 percent is larger. Similarly, the estimation result shows in Table 4.28 the long-run relationship between Political stability and banking stability. In other words, a change in political stability is accompanied with a 0.37, and 0.53 percent rise in banking stability of the fully sampled and conventional banks in the long run. Therefore, Political stability and the banking stability index PD exhibit a stable connection with conventional banks.

4.4.4.2.3 Post Estimation diagnostic checks

To certify that the estimated model is correctly identified, the Hansen J test for overidentifying restriction has failed to reject the null hypothesis thus signifying that the instruments have remained valid and are, of course, exogenous. Precisely, the model and subsets of instruments are correctly specified. Similarly, the regression is free from serial correlation as the Arellano and Bond test autocorrelation specifies the nonexistence of second-order serial correlation. The test fails to reject the null hypothesis of no second order-autocorrelation. Thus, the Wald Chi2 test is significant at one percent backing the combination of the variables that are fit and valid in the model.

4.4.4.2.4 Summary of the impact of institutional variables on banks stability

In summary, the investigation has hoked at the effects of the Corruption index on bank stability of full samples and conventional samples sub-groups as positive and significant.

Islamic banks sub-samples remains significant and negative. The Political stability index reveals a negative and significant impact of the variable on bank stability throughout the conventional bank's samples, while political stability of Islamic banks is found to be insignificant both in the short and long period estimations. The findings show that corruption control variable can explain banking stability, whilst political stability only explains conventional bank stability. The result of corruption control and political stability of conventional banks is found to be in conformity with the resource curse theory and hypothetical predictions that they significantly affected banking stability.

4.4.4.3 Presentation of Result of the Influence of macroeconomic factors on Bank Stability

This s section discusses the influence of macroeconomic variables on the banking stability PD. We are starting with the unit root test to determine the properties of the variables. It is followed by the presentation of the estimated result and the post-estimation diagnostic check.

4.4.4.3.1 Unit Root Test

Table 4.29 shows the stationarity order of the variables in the macroeconomic model. The unit root test is conducted in order to find the appropriate methodology, and to complies with a requirement which demands for unit root, when the number of cross-sections in the series is higher than the time series (Buck et al., 2008).

Table 4. 29
Unit Root Test Result for Macroeconomic Factors

Method	**Full Sample (IPS)**		**Conventional Banks (IPS)**		**Islamic Banks (IPS)**	
Variables	Level	1st Diff	Level	1st Diff	Level	1st Diff
PD	-11.506*		-9.6969*		-12.062*	
	(0.000)		(0.000)		(0.000)	
GDP	-14.311*		-10.885*		-6.926*	
	(0.000)		(0.000)		(0.000)	
INF	-17.984*		-11.376*		-9.370*	
	(0.000)		(0.000)		(0.000)	
ΔOILP	-2.759*		-3.227*		-2.201**	
	(0.003)		(0.001)		(0.014)	
lnTA	-5.575*		-12.12*		-4.275*	
	(0.000)		(0.000)		(0.000)	
EFF	-2.463*		-3.051*		-3.032*	
	(0.007)		(0.001)		(0.001)	
IDIV	-4.480*		-1.903**		-3.4332*	
	(0.000)		(0.029)		(0.000)	

. *, **,*** signified the level of significance 1%, 5% and 10% respectively

The table indicated that the variables of banking stability PD, GDP, INF, and ΔOILP are all stationary at a level in all the sub-sampled banks. Similarly, the bank size variable is stationary at a level in conventional banks. However, stationary and full sample and Islamic bank sub-groups and other control variables also remain stationary at a particular level.

4.4.4.3.2 Presentation of Estimated Result

Results of the influence of macroeconomic variables on banking stability are presented in Table 4.30. The study estimated different models, general and specific, to confirm the robustness of the results.

Table 4. 30

System GMM for Macroeconomic Factors conventional and Islamic

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
DP	0.414*	0.526*	0.267*	0.573	0.370	0.370
L.1	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
EQTA	-0.459*	-0.985*	-1.267**			
	(0.001)	(0.000)	(0.024)			
LLR	-0.179*	0.369	-1.475**			
	(0.000)	(0.186)	(0.021)			
LIQ	-0.295*	-0.129**	-1.638**			
	(0.000)	(0.011)	(0.009)			
CPI	0.436*	0.327**	1.241**			
	(0.000)	(0.024)	(0.010)			
PSI	-0.221*	-0.250*	-0.305			
	(0.002)	(0.001)	(0.105)			
INF	2.364*	0.718**	3.396*	3.029*	2.000*	4.230*
	(0.000)	(0.009)	(0.000)	(0.000)	(0.000)	(0.000)
GDP	0.074*	0.057*	0.185**	0.011*	0.030*	0.100*
	(0.000)	(0.000)	(0.013)	(0.000)	(0.001)	(0.000)
ΔOILP	-0.003*	-0.003*	-0.005***	-0.002*	-0.001*	-0.003
	(0.000)	(0.000)	(0.068)	(0.000)	(0.000)	(0.042)
lnTA	-0.102*	-0.106*	-0.098***	-0.060*	-0.090*	-0.240*
	(0.000)	(0.000)	(0.08)	(0.000)	(0.000)	(0.001)
EFF	0.232*	0.133*	-0.260***	-0.210*	-0.270*	-0.610*
	(0.000)	(0.000)	(0.080)	(0.000)	(0.000)	(0.000)
IDIV	0.025*	0.030**	-0.077	-0.005***	0.010	-0.090**
	(0.001)	(0.023)	(0.246)	(0.076)	(0.258)	(0.066)
BANK DUMMY	0.159*			-0.059*		
	(0.000)			(0.000)		
Cons-	0.821*	0.178	1.382***	1.622*	1.920*	2.880*
	(0.000)	(0.056)	(0.051)	(0.000)	(0.000)	(0.000)
Statistic	Coefficient and (Probability)					
Wald Chi	13869.59	388248.48	18018.54	309713.0	23966.3	13857.94
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Ar2	0.107	0.350	0.097	0.119	0.268	0.102
Hansen J	0.101	0.230	0.244	0.173	0.243	0.416
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	638	454	27	638	454	184
Groups	85	58	29	85	58	27
Instrument	71	57	45	84	55	27

. *, **,*** signified the level of significance 1%, 5% and 10% respectively

The table 4.30 reveals that the lag of the dependent variable PD is positively influencing the stability of banks and is significant in the entire sub-sampled groups. Furthermore, in the full sample, conventional and Islamic banks, there is one percent increase in the stability of the banks. Last year transformed to an increase in banking stability by 0.57 percent, 0.370 percent, and 0.370 percent this year for the respective sample groups of banks. Additionally, the table also presents the coefficient of inflation as significant and positively affecting the stability of banks in all the sub-sampled groups. A one percent increase in inflation variable will lead to 2.36 percent increase in banks probability of default in the full sample, 0.72 percent for the conventional banks, and 3.39 percent for Islamic banks. An increase in inflation helped to aggravate the degree of bank instability. Therefore, a positive coefficient of the variable suggests that an increase in the inflationary rate which would lead to a decrease in banking stability for both the conventional and Islamic banks. The result is consistent with that of Kabir, Worthington, and Gupta's (2015) predictions. It tallies with resource curse theory and *a priori* expectations Ha14.

Focusing on the effect of country-specific GDP variable, the results disclose a positive and significant coefficient of GDP with PD. The coefficient is indicating an increase in the default risk of banks in all the sub-sample groups as one percent increase in GDP will lead to 0.074 percent increase in banking probability to the default of the full sample, 0.57 percent in conventional banks and 0.18 percent for Islamic banks. This indicates that both banks could not use the benefit of their economy growing to stabilise. The literature of Alharthi (2017) and Kabir et al. (2015) found a significant negative impact of GDP on banking stability. The findings contribute positively to the probability of default in the banking sector. The tallies with *a priori* expectations Ha15 of a significant relationship between GDP and probability default.

As evidenced in Table 4.30, the coefficient of the ΔOILP variable reveals a consistent and significant negative correlation with PD of banks in the entire sub-samples. This implies that a one percent increase in oil price variable will lead to a 0.003 percent decrease in the probability of the banks going to default in the full sample group and another one percent increase in average oil price will also lead to 0.003 percent and 0.068 percent decrease in bank probability of default of the conventional and Islamic banks. The result reveals that with any rise in oil price, the conventional and Islamic banks tended to improve in their level of stability. As bank solvency risk decreased, both banks will increase lending to boost customer confidence in them. These findings are line with the views of Alodayni (2016) and Monnin & Jokipii (2013). They are also consistent with the natural resource curse theory and *a priori* expectations Ha16. For the robustness of the model, the specific model column in table 4.30 confirms all the general model's results on the impact of macroeconomic factors on bank probability to default.

Additionally, our objective is to find if there is any difference in determining the stability of the banking sector between conventional and Islamic banks with the change of stability measurement (Z-score and PD). However, using the market measurement PD in relation to macroeconomic variables (inflation, GDP and change of oil price) shows a significant effect and displays consistent findings with accounting based stability measurement Z-score. This clears the doubts on our confidence in the effectiveness of how the stock data reflect all the information confirmed in the accounting statement (Agarwal & Taffler, 2008).

The long-run relationship between macroeconomics and market-based probability default (PD) is presented in table 4.31. The table indicates how both conventional and Islamic banks responded to the change in macroeconomics determinants.

Table 4. 31
Long Run System GMM Estimation for Macroeconomic factor with PD

	Coefficient and (Probability)					
	General Model			Specific Model		
Variable	**Full Sample**	**CB**	**IB**	**Full Sample**	**CB**	**IB**
EQTA	-0.784*	-2.077*	-1.543*			
	(0.000)	(0.000)	(0.019)			
LLR	-0.307*	0.369	-2.0144*			
	(0.000)	(0.186)	(0.027)			
LIQ	-0.508*	-0.273*	-2.236*			
	(0.000)	(0.008)	(0.011)			
CPI	0.744*	0.687*	-1.694*			
	(0.000)	(0.017)	(0.014)			
PSI	-0.378*	0.528*	-0.412			
	(0.000)	(0.000)	(0.113)			
INF	4.042*	1.514*	4.637*	6.751*	3.111*	8.903**
	(0.000)	(0.017)	(0.000)	(0.000)	(0.000)	(0.005)
GDP	0.120*	0.121*	0.252*	0.034*	0.039*	0.196*
	(0.000)	(0.000)	(0.004)	(0.000)	(0.003)	(0.000)
ΔOILP	-0.004*	-0.007*	-0.008	-0.004*	-0.002	-0.011
	(0.000)	(0.000)	(0.68)	(0.000)	(0.000)	(0.021)
InTA	-0.174*	-0.223	-0.098*	-0.151*	-0.132*	-0.354
	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.001)
EFF	-0.379*	0.281*	-0.355***	-0.489	-0.468*	-1.080
	(0.000)	(0.000)	(0.086)	(0.000)	(0.000)	(0.000)
IDIV	-0.043*	0.064*	-0.077	-0.009	0.018**	-0.183**
	(0.000)	(0.036)	(0.246)	(0.080)	(0.050)	(0.015)
Bank Dummy	0.435*			0.021*		
	(0.000)			(0.000)		
-cons	0.821	0.177*	4.98**	4.215*	4.533*	6.213*
	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)

The long-run relationship between macroeconomics and bank stability (PD) is presented in table 4.31. The GMM result shows that the inflationary rate is positively affecting banking stability PD at 4.04 percent, 1.52 percent, and 4.63 percent in all the sub-sample groups (full sample, conventional and Islamic banks) in the long run. This is in line with the expectation that inflation is injurious to banking stability. The result is in conformity with short run estimation and supported Ha14. Similarly, the variable GDP is also positively significant at one percent affecting banking stability PD with coefficient values of 0.13 percent in the full sample, 0.12 percent for conventional banks, and a 0.25 percent for the Islamic banks in the long run. The result is in conformity with short run estimation and supported Ha15.

However, a percentage upsurge in oil price is correlated with a 0.004 and 0.007 percent rise in banking stability of full sample and conventional banks sub-samples in the long run position. While the long run effect of oil price on Islamic bank stability PD, shows an insignificant relationship. This indicates that change in macroeconomic policies from oil dependence other sectors economy. The result is not in conformity with short run estimation and rejected Ha16. In a nutshell, the macroeconomic variables have a more significant effect on banking stability during the long run than in the short run. The variable results of Inflation, GDP and oil price consistently exhibit a similar direction for the variables measured with Z-score. For the robustness result, the specific model column in table 4.31 expresses similar findings. The result also indicates similarities with accounting stability measurements in the short run.

4.4.4.3.3 Post Estimation diagnostic checks

To certify that the estimated model is correctly specified, the Hansen J test for overidentifying restriction has failed to reject the null hypothesis. This is indicating the instruments have remained valid and are, of course, exogenous. Precisely, the model and subsets of instruments are correctly specified. Similarly, the regression is free from serial correlation as the Arellano and Bond test autocorrelation specifies the nonexistence of second-order serial correlation. The test fails to reject the null hypothesis that indicates that there is no second order-autocorrelation. Hence, the Wald Chi2 test is significant at one percent backing the combination of the variables that are fit and valid in the model.

4.4.4.3.4 Summary on the impact of macroeconomic variables on bank stability

The model discloses that the inflation variable is significant and has a positive effect on bank probability of default in all the sub-sample groups in both the short and long run positions. The GDP variable also reveals the positive and significant effect on bank probability default in the entire sub-sampled groups. While the average oil price indicates a significant and adverse effect on probability default of conventional samples, the Islamic banks exhibit a significant effect in the short run and insignificance links in the long run. Findings from the GMM estimation exhibit the dissimilar impact of macroeconomics in influencing banking stability formation based on the applied models to determine the direction and degree of their effects. The estimation result shows that Inflation and GDP explain banking stability negatively. In other words, a dollar change in the price of oil explains banking stability positively in the GCC and the conventional banks in Non-GCC states. The result is found to be consistent with the hypothesis and theoretical predictions that the variables have significantly affected banking stability.

4.5 Summary of the Comparative Results between Z-score and PD

To summarise the effects of bank-specific, institutional and macroeconomic variables on the probability to default (PD) and compare the results with that of Z-score is presented in table 4.32 below:

Table 4.32
Summary Results of Comparison between Probability Default and Z-score

Independent Variables	**Z-Score (Short Run)**		**Probability Default (Short Run)**	
	Con Banks	**Islamic Banks**	**Con Banks**	**Islamic Banks**
EQTA	Significant (+)	Significant (+)	Significant (-)	Significant (-)
LLR	Significant (-)	Significant (+)	**Insignificant**	Significant (-)
LIQ	Significant (-)	Significant (+)	Significant (+)	Significant (-)
CPI	Significant (-)	Significant (+)	Significant (+)	Significant (-)
PSI	Significant (+)	Significant (+)	Significant (-)	**Insignificant**
INF	Significant (-)	Significant (-)	Significant (+)	Significant (+)
GDP	Significant (-)	Significant (-)	Significant (+)	Significant (+)
ΔOILP	Significant (+)	Significant (+)	Significant (-)	Significant (-)
	(Long Run)		**(Long Run)**	
EQTA	Significant (+)	Significant (+)	Significant (-)	Significant (-)
LLR	Significant (-)	Significant (+)	**Insignificant**	Significant (-)
LIQ	Significant (-)	Significant (+)	Significant (+)	Significant (-)
CPI	Significant (-)	Significant (+)	Significant (+)	Significant (-)
PSI	Significant (+)	Significant (+)	Significant (-)	**Insignificant**
INF	Significant (-)	Significant (-)	Significant (+)	Significant (+)
GDP	Significant (-)	Significant (-)	Significant (+)	Significant (+)
ΔOILP	Significant (+)	Significant (+)	Significant (-)	**Insignificant**

The two banking stability measurements Z-score and Probability default are having an inverse relationship with each other in terms of improvement of banking stability. The positive direction of Z-score indicated an improvement in banking stability, while a negative direction of Probability default indicates better banking stability (Kabir et al., 2015).

Therefore to the results obtained from probability default, the impact of capital adequacy on banking stability Z-score of conventional and Islamic banks are found to be similar. Capital adequacy is found to improve the stability of both conventional and Islamic banks. Therefore, the study concludes the support of Ha9, which predict the significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of capital adequacy. However, the results from probability default, found the impact of Asset quality on conventional banks stability not significant, which is different from the result of Z-score. As such, the Ha10 is not supported. The results of the probability default are found very similar to the result of Z-score in which Bank liquidity is found to reduce the stability of conventional banks and improve the solvency of the Islamic banks. Therefore, the study concludes the support of Ha11, which predict the significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of bank liquidity.

On the Comparison, of the results between baking stability PD and Z-score in table 4.32. The impact of corruption control on banking stability is found to be similar. The change in corruption control reduces the stability of conventional banks and stimulate the stability of Islamic banks in GCC and Non-GCC countries. The results support the prior expectation of Ha12, which indicate no significant difference between stability measurement PD and Z-score in terms of corruption control. The results tally with resource curse theory which predicts the significant effect of corruption in oil controlled economy. However, the result which compared the impact of political stability on stability measurements PD and Z-score in table 4.32 are found different. The result indicates an insignificant relationship between political stability and probability default of Islamic banks, while political stability indicates a significant relation with Islamic banks Z-score. Therefore, the study concludes the rejection of Ha13, which predict the significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of political stability.

The results of the impact of macroeconomic factors of inflation, GDP and change in oil price on bank stability PD have shown a similar pattern with the results of Z-score. A percentage change in inflation and GDP resulted in a decrease in the stability of both conventional and Islamic banks in the short run and long run. Therefore, the study concludes the support of Ha14 and Ha15, which predict the significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of inflation and GDP. On the effect of change in oil price on the stability measurement PD, the result indicated a similarity between the probability of default and the Z-score result model in the short run. However, the results on the impact of oil price on probability default reveal an insignificant relationship on the stability of Islamic banks. The result is contrary to what Z-score stability measurement reveals in the long run. Therefore, the study concludes the support of Ha16, which predict the significant relationship between stability measurement PD and Z-score of conventional and Islamic banks in terms of change in oil price in the short run. The result rejected Ha16 in the long run, as there is a significant difference in stability measurement PD and Z-score in terms of oil price change.

4.6 Conclusion

This chapter offers a comprehensive discussion of the results of the estimations using dissimilar models. The study assesses and analyzes four different models in the attempt to examine the factors that affect the stability of conventional and Islamic banks in the GCC and Non-GCC regions. The system GMM estimator exhibits the analytical results comparing the differences in how the bank-specific, institutional factors and macroeconomic factors influence the stability of conventional and Islamic banks. furthermore, the study split the samples between the GCC and Non-GCC states. The findings also compare the banking stability difference between the conventional and Islamic banks in terms of Z-score stability measurements. The findings also indicate that out of the eight research variables, three showed a significant difference between conventional and Islamic banks stability namely: LLR, LIQ and CPI. This is suggesting that there is a stability difference in terms of loan loss reserves, liquidity and corruption control index between the conventional and Islamic banking. At the same time, EQTA, PSI, INF, GDP and ΔOILP are combinations of variables that display no substantial difference between conventional and Islamic banks stability in terms of Z-score in both the short and long-run dynamics.

Furthermore, the model of bank specifics indicates that some variables display an indifferent sign and significance of the coefficient on their effects to banking stability namely: LLR (-) on the conventional banks (+) for Islamic banks, LIQ (-) for conventional (+) for Islamic banks, CPI (-) for conventional and (+) for Islamic banks. The GMM estimation results of cyclical macroeconomics model indicate that both the conventional and Islamic banks exhibit a negative sign in the coefficience for inflation and GDP to banking stability in the GCC and Non-GCC.

As for the regression result of stability difference between the conventional and Islamic banks in terms of PD measurement, six out of the eight combined variables were found to be significant to banking stability of probability default in the short run. They are EQTA, LIQ, CPI, INF, GDP and ΔOILP whereas the LLR and PSI indicate an insignificant connection with conventional and Islamic banks in the short run and long run. The market-based stability measurement was estimated and analysed in order to compare the results with that of accounting-based stability measurement. Results from the two distinctive stability measures are significantly similar except in LLR, PSI and long run ΔOILP variables which appeared to be insignificant with probability to default. Lastly, the results of the diagnostic checks conducted in all the models have validated the entire estimations and findings of this study. Therefore, the overall result found that bank-specific variables, institutional factors and macroeconomic variables affect the stability of conventional and Islamic banks. However, there is no strong indication that political stability and change in oil prices reduced the probability of default of Islamic banks in the Non-GCC countries.

CHAPTER FIVE

CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Introduction

The chapter consists of the last segment of this of research. The target is to present the conclusions of the entire study, the theoretical, methodological, and practical contributions of the study, and give recommendations based on the empirical findings of the study. There are also limitations and suggestions for further investigations.

5.2 Recapitulations

This work examines the financial stability difference between conventional and Islamic banks in the GCC and Non-GCC regions. The study comprises of annual financial and market data from conventional and Islamic banks in Bahrain, Kuwait, Qatar, Saudi Arabia, U.A.E, popularly known as the countries GCC and Non-GCC countries like Algeria, Eygpt, Jordan, Lebanon, and Tunisia. The data sampled for the study spans from 2008- 2016. Annual bank data were retrieved from Bankscope, Datastream, and Credit research initiative. Country-based and macroeconomic data were extracted from the world development indicators and the International Monetary Fund (IMF).

The primary objectives of the study are to compare the financial stability of conventional and Islamic banks in the GCC and Non-GCC countries. The study employed system GMM of Arellano and Bover, which is robust to heteroscedasticity to estimate and compare the banking stability between conventional and Islamic banks based on stability measurement Z-score and PD.

This segment deliberates on the significant discoveries with precise attention to hypothetical statements drawn from the objectives. This is part of the attempts to link the theoretical, the conceptual framework, and the methodology to answer the research questions. Summary of the findings is based on the four objectives designed to answer the research questions drafted by the study.

5.2.1 Objective One: Effect of Bank-Specific Factors on Banking Stability

The estimation result demonstrates that the three bank-specific variables, namely capital adequacy, asset quality and liquidity, are significantly associated with banking stability. The analysis in this segment begins with pooling together the accounting data from the sampled GCC and their Non-GCC banks. We found that both the conventional and Islamic banks stability was enhanced with an increase in equity-based financing. This confirms other conclusions found in the works of Alharthi (2017), Lewis, (2015); Wheelock & Wilson (2000). This discovery maintained the theoretical position that management adjustment in equity-based capital enabled the banks to absorb financial shocks that would have resulted in bank insolvency (Khan, 1986). These findings received the support of regulatory Base II and III requirements. The capital adequacy is positively significant with banking stability. This implies that for conventional and Islamic banks to attain higher banking stability, they needed to increase the adequacy of their capital. Therefore, results of the Capital Adequacy ratio indicate that Islamic banks appeared to be less stable than their conventional peers based on the size of the coefficient in both the short and long-run analyses of the combined countries. The result shows that equity capital had a bigger effect on banking stability as the variable increased the stability of the conventional and Islamic banks in the GCC and Non-GCC states. Therefore, the study concludes the support of Ha1 which predict the significant effect of capital adequacy on banking stability.

The asset quality variable is found to have had a negative and significant effect on banking stability with a coefficient estimate of 1.17 percent and significant P-value at the level of 0.000. This implies that conventional banks increased their loan reserves in response to any decrease in banking stability. This finding is similar to that of Korbi and Bougatef (2017) and Zhang et al. (2016). Another explanation in favour of the negative and significant result of asset quality was given by Bouvatier and Lepetit (2013) and Ozili and Outa (2017). They found an increase in bank loss reserves during recessionary times. This will further lessen the interest margin and shrink the level of overall bank returns and worsen the stability of the banks during the slump. If the recessionary period was prolonged, bank capital adequacy could be completely wiped out (Borio, Furfine, & Lowe, 2001). Finally, the variable was found to have negatively affected the stability of the conventional bank. Therefore, the study concludes the support of Ha2 which predict the significant effect of asset quality on banking stability.

The loan loss reserve of Islamic bank is found to have a positive effect on banking stability with a coefficient value = 0.32 percent, with significant p-value at 0.000 level. This implies that reserves in Islamic banks rose in response to any upsurge in bank stability. These findings are similar to that of Trad, Trabelsi and Gous (2017). Another likely account for the positive and significant effect of loan loss reserves is stated by Othman and Mersni (2014) who found that Islamic banks in the Middle East relied on loan loss reserves for capital management. The findings found loan loss reserver to be positively relevant in affecting the stability of Islamic banks. Therefore, the study concludes the support of Ha2 which predict the significant effect of asset quality on banking stability.

Liquidity ratio shows a negative association between liquidity and banking stability. This indicates that the conventional banks retained lower cash reserves. Instead, they put most of their assets on loan in order to generate additional profit. This eventually affected banking stability. The result is in line with the study of Kohler (2015), Ericsson and Renault (2006) who noted that lower liquidity position meant that higher percentage of bank assets and deposits were tied to loans. Under this type of condition, speedy loan progression tended to result in greater returns and higher instability, particularly if the credit risk is not appropriately managed. Finally, liquidity is found to have negatively affected the stability of conventional banks.

The liquidity of Islamic banks in the GCC states is found to indicate a positive and significant effect on banking stability. This outcome of the study supports the findings of Beck et al., (2013) and Bourkhis and Nabi (2013). This shows that there is a positive and significant connection between liquidity and banking stability with a coefficience of 1.04 percent, and the significant p-value is put at 0.000 level. Therefore, the study concludes the support of Ha3 which predict the significant effect of bank liquidity on banking stability.

Based on the finding, the lag of the dependent variable has indicated that the stability of both the conventional and Islamic banks are persistent in the model. Stability of Islamic banks is more persistent in all the sample groups except in the Non-GCC region. This could be due to the acceptability of Islamic banks in the GCC region. As for the Non-GCC set of countries, Islamic banks are relatively new and small in terms of market power and profitability. This gives the Islamic banks in the GCC states an enormous potential to correct the problem of instability faster than their conventional banks based on their market power.

In the short term result of the effects of bank-specific factors on the stability of conventional banks found that capital adequacy, asset quality and liquidity are statistically significant in ensuring banking stability. Similarly, Islamic banks also displayed a significant effect of capital adequacy, assets quality and liquidity in the short-run period. For the long run estimation, the result on the relationship between the bank-specific variable of capital adequacy, asset quality, and liquidity of conventional banks appeared to be statistically significant. Similar to the results on conventional banks, the Islamic banks also present a significant association between bank specifics, namely capital adequacy, asset quality and liquidity on banking stability. The liquidity variable was irrelevant in affecting Islamic banks stability in the Non-GCC set of countries.

5.2.2 Objective Two: Impact of Institutional Factors on the Stability of Conventional and Islamic Banks

The second objective is to compare the stability difference between conventional and Islamic banks in terms of institutional factors in the GCC and Non-GCC regions. The institutional factors consist of control of corruption and political stability. Findings indicate that the two institutional variables are significantly linked to banking stability.

Corruption Control Index (CPI) indicates a negative association with conventional banks stability, with an estimated coefficient = 0.74 percent, with a significant level of p-value at 0.000. This suggests that conventional banks are less stable at a point where the countries delivered lower control of corruption. Another possible suggestion is that the stability of the conventional banks dropped on account of corruption. Alternatively, conventional banks engaged in risky operations that consequently led to higher vulnerability in severely corrupt economies. This result is similar to that of Asteriou, Pilbeam, & Tomuleasa (2016); Chen et al.,(2015); Korbi & Bougatef (2017). The new finding of this research work is that the position of the natural resource curse hypothesis is relevant in explaining how corruption affects conventional banks stability through the sand wheel scenario. The result found that the CPI indicator is significant and negatively affecting the stability of conventional banks in GCC and Non-GCC countries. Therefore, the study concludes the support of Ha4 which predict the significant effect of corruption control on banking stability.

Concerning the association between corruption control and the stability of Islamic banks, our findings indicate that corruption control impacts stability significantly and positively. This explains that an increase in corruption control would lead to an improvement in banking stability. Another possible explanation for the significant and positive result of corruption is stated by Cooray & Schneider (2018) and Xu (2016) who found that some institutions in developing countries benefited from corruption through the "grease" effect of corruption by circumventing some bureaucratic regulations. The result established a positively and statistically significant association between corruption control and banking stability (Toader et al., 2018). Finally, the control of corruption was found to be relevant in influencing the stability of Islamic banks stability in the GCC and Non-GCC states. Therefore, the study concludes the support of Ha4, which predict the significant effect of corruption control on banking stability.

Therefore, GCC and Non-GCC financial institutions needed to enhance their corruption control mechanisms. The findings have maintained the theoretical position of the Resource Course Model that persistent corruption is a lingering issue in natural resources-endowed economies (Ali, Mohammed, Cockx, & Francken, 2016; Haykal, 2017).

The political stability turns to present a positive and statistically significant impact on banking stability of both the conventional and Islamic banks. Interestingly, political shocks are more severe on the part of conventional banks than on the Islamic banks. This is because Islamic principles that regulate operations in Islamic banks are resilient to political changes. Changes in the political structures of a country do not affect the policies of Islamic financial institutions seriously. The political stability index indicates an improvement in the stability of the conventional banks, as they appeared to be more solvent under a democratic set-up (Bitar et al., 2017). Therefore, the study concludes the support of Ha5 which predict the significant effect of political stability on banking stability.

Moreover, the result has portrayed that institutional factors such as corruption control and political stability affected banking stability in the GCC and Non-GCC states.

5.2.3 Objective Three: Impact of Macroeconomic Factors on the Stability of Banks

The study identifies three macroeconomic factors and their effects on the stability of the conventional and Islamic banks, namely Inflation, GDP, and change in oil price. They displayed a significant association with banking stability. The inflationary rate shows a statistically negative and significant relation with bank stability index in the banks under review. This findings further confirm the positions of Ibrahim and Rizvi (2017), who suggested that a persistent increase in inflation had a negative link with banking stability. Trabelsi and Trad (2017) have noted that the contraction of the financial system due to price increase made banks to experience lower profitability and reduced bank stability. The outcome of this model supports the natural resource curse theory that says that high inflation turns the economic condition unfavourable. This could further lead to lower banking stability. Based on the negative covariates, results in the variable INF was found relevant in influencing the stability of both the conventional and Islamic banks. They are in agreement with the study's expectation of Ha6 and is supported.

Furthermore, the short-run and long-run estimations have revealed that the variable GDP growth decreases the stability of the conventional and Islamic banks across the samples. The findings are consistent with the empirical literature of Cihak and Hesse (2008) on the conventional banks and Cubillas and Gonzales (2014) on Islamic banks. They all found that economic growth shrunk banking stability. Our conclusion is that the stability of the conventional and Islamic banks was negatively influenced by the decrease in the GDP in GCC and Non-GCC states. Therefore, the study concludes the support of Ha7 which predict the significant effect of GDP on banking stability.

Change in oil price (ΔOILP) shows a positive association with banking stability. Thus, the positive effect of such change is found both in the short and long-run dimensions across the banks. These findings are consistent with the theoretical position of the Resource curse hypothesis. They are also similar to the empirical findings of Alaqhtani & Mayes (2017). Additionally, Chaarani (2019) has suggested that the growth of the banking sector in the Middle East is always attached to the global oil price boom. The result of the split sample between the GCC and non-GCC states, conventional banks indicates a positive effect of oil prices on banking stability in the Non-GCC states. However, the effect of oil prices change on banking stability of the Islamic banks indicate a negative and significant relationship in the short run and long run. Based on the significant results obtained, the study concludes that oil prices affect the stability of conventional and Islamic banks in GCC and Non-GCC set of countries, and therefore the hypothesis Ha8 of study is supported.

5.2.3 Objective Four: Comparing Stability Difference between Conventional and Islamic Banks in Terms of Z-score and PD Measurements.

The third objective was modelled to compare the dynamic difference of stability component between conventional and Islamic banks with the change of stability measurement from Z-score to Probability default. The study introduced a forward intensity model of PD, a market-based measure of banking stability, modified by (Duan et al., 2012). The dynamic analysis of system GMM was piloted on the bank-specific variables to examine their effect on the probability of default. First, the lag of the dependent variable PD revealed that conventional banks stability is highly persistent, while their Islamic bank's pairs are low persistent. Based on the persistency nature of the bank's stability using accounting measurement, the study concluded that Islamic banks are less persistent than conventional banks in the GCC and Non-GCC regions.

Consequently, the results reveal that capital adequacy increases the stability of the banking sector of conventional and Islamic banks. Congruently, the direction of the results demonstrates a similarity with the accounting-based stability measure Z-score. Based on the percentage change in EQTA leads to a significant change of banking stability of both conventional and Islamic banks with 1.74 percent and 2.23 percent. The result is indicating how capital adequacy enhances banking stability. The finding is consistent with the view of Kabir et al. (2015). Based on the significant results obtained, the hypothesis Ha9 of study is supported. The result concludes that there is no significant difference between the probability of default and Z-score in terms of conventional and Islamic banks stability determinant with the change in capital adequacy.

The asset quality variable has a positive relationship with the probability of default of conventional banks, but this relationship is not statistically significant. The result is consistent with Zhang et al., (2015) who found an insignificant relationship between LLR and market-based bank distance to default. However, a percentage change in assets quality generated a decrease in probability default of Islamic banks, demonstrating the tendency of Islamic banks to default reduced with increase in bank asset quality variables. The result resembled (Kabir et al., 2015). Based on the insignificant results obtained, the hypothesis Ha10 of study is rejected. Indicating no significant relationship between stability measurement PD and Z-score in terms of asset quality.

The market-based stability indicator reveals that the bank liquidity of conventional and Islamic banks portray similar outcomes with the accounting-based index. A percentage change in bank liquidity generated 0.22 percent increase in the probability of default of conventional banks. This is indicating that the market value of the banks' assets decent was below the book figures of the debts. The result contradicted the findings of Kabir et al. (2015). However, a percentage change in bank liquidity generated a decrease in probability default of the Islamic banks. This indicates the tendency of Islamic bank to default was reduced with an increase in bank liquidity variable. The result resembled that of Kabir et al. (2015). The study concluded that bank liquidity positively affected the stability of Islamic banks while it negatively affected the stability of conventional banks. Based on the significant results obtained, the study concludes that bank liquidity affects the probability default of conventional in GCC and Non-GCC set of countries. Therefore the hypothesis Ha11 of study is supported. Indicating a significant relationship between stability measurement PD and Z-score in terms of bank liquidity.

Furthermore, to estimate and compare the impact of country institutional factors on the stability of the banking system, the market-based stability indicator PD was applied in the study to achieve the objectives. The outcomes have shown that an increase in the corruption control index enhanced the stability of Islamic banks. This is an indication that the more the control on corruption, the lesser the probability to default of Islamic banks. These findings are in line with the empirical literature of Korbi and Bougatef (2017) that the severity of corruption leads to banking default. A percentage of corruption control increased the probability of default of the conventional banks. This means that the management of conventional bank needs to improve upon their corruption control measures. The finding is consistent with Resource curse hypotheses that there is poor control of corruption in resource-based economies. Based on this empirical finding, the study concludes that the control of corruption will significantly improve the stability of Islamic banks. However, on the part of conventional banks, change in their corruption control index did affect their level of stability negatively. Therefore the hypothesis Ha12 of study is supported. The result is found to be consistent with result of the Z-score stability measurement.

Political stability index helped to improve the stability of conventional banks. This is indicating a significant positive relationship between political stability and banking stability using the market-based measurement. In other words, an increase in the political stability index helped the banking sector to attain a significant level of stability. The findings are relatively similar to that of the Z-score model. The study concludes that political stability is very relevant in improving stability in conventional banks. However, on the part of Islamic banks, a change in political stability portrayed an insignificant relationship with the probability of default. For the Islamic banks, investors' expectations do not react to any change in political stability. This could be due to religious attachment to Islamic banks in the region. The result does not tally with the Z-score model. Finally, the study can now conclude that political stability does not affect the probability of default vis-à-vis the stability of Islamic banks in both the GCC and Non-GCC regions. Therefore the hypothesis Ha13 of study is rejected. Indicating an insignificant relationship between stability measurement PD and Z-score in terms of political stability.

In the attempt to estimate the influence of macroeconomic factors on market-based banking stability measure of the conventional and Islamic banks, the inflationary variable has portrayed a positive and significant relation with Probability of default. The result is similar to the findings with of Kabir et al., (2015). The same result was obtained when the Z-score model was applied. In a precise manner, an increase in price level resulted in an insolvency problem in the banking sector. Based on the significant results obtained, the hypothesis Ha14 of study is supported. That there is a significant relationship between stability measurement PD and Z-score in terms of inflation. Considering the estimation of the variable of GDP growth to the probability of default, the result reveals a general reduction in the stability of both the conventional and the Islamic banks under the Probability of default. The result is contrary to the model of Kabir et al. (2015). Yet, it was consistent with the conventional and Islamic banks under the Z-score stability model. The study concludes that GDP was found to be significant in reducing banking stability. Therefore the hypothesis Ha15 of study is supported, Indicating a significant relationship between bank stability measurement PD and Z-score in terms of GDP.

Lastly, the influence of oil price on the stability of the conventional banking sector reveals a significant and negative effect on the probability of default. The result indicates that the banking stability of the conventional bank's samples increased with a change in oil prices in the GCC and Non-GCC countries. The result is consistent with the theoretical hypotheses of the Resource curse that the price of the dominant nature factor dominated the entire economic activities of the natural resource-based economies. It displays no significant difference between market-based and accounting-based measurements regarding the stability of conventional banks. Considering the impact of change in oil price on Islamic banks, a percentage change in oil price led to a reduction in the probability of default of 0.005 percent. However, the long run estimation indicates that the change in oil price was not affecting the probability of default or banking stability. The possible reason could be that the Islamic banks we newly quoted into the stock exchange market of the region. Therefore, they required some time for them to start reacting to oil price fluctuations. Therefore, the study concludes the support of Ha16 in the short run which predict the significant relationship between bank stability measurement PD and Z-score in terms of ΔOILP. While in the long run, the result does not supply a shred of clear evidence that any change in oil prices could decrease the probability of default or increases the stability of GCC and Non-GCC Islamic banks. Therefore, the study concludes the rejection of Ha16 in the long run.

Based on the results obtained from the market stability measures, it can be seen that all the stability predictor variables are significant or have a corresponding effect on stability. This is consistent with the Z-score measurement, except for the variables of political stability and change in oil prices on the stability of Islamic banks in the GCC and Non-GCC states in the long run. The possible reason for the ambiguity of the impact of political stability on the change of oil prices is the period in banking operation between the conventional and Islamic banks. Finally, the study concludes that both the Z-score and Probability of default explain the stability of conventional and Islamic banks except in the area of political stability and long run oil prices change on Islamic banks.

5.3 Contributions of the Study

The combination of the variables that affect banking stability remains one of the significant aspects of addressing financial instability. This work has attempted to undertake a rigorous analysis of the determinants of banking stability in GCC and Non-GCC regions of the Middle East. The study has empirically identified and assessed the significance of bank-specific, institutional and macroeconomic factors that influence the stability of the banking sector. Findings of this study could be looked at from the methodological and theoretical contributions discussed hereunder.

5.3.1 The Empirical Contributions of the Research

Remember that in the literature review, the banking stability difference model of this research has been analysed in the context of the assets management theory, resource curse theory and the Financial intermediation theory. The assets management hypotheses are meant to explain how financial institutions readjust their portfolios to solve banking instability. Previous studies on the stability difference between the conventional and Islamic banks in the Middle East have not looked at the banking stability issue from both the accounting and market-based perspectives. Majority of the literature focused on the accounting-based stability measurement while accessing the difference between conventional and Islamic banks (Abedifar et al., 2013; Beck, Demirguc-Kunt, et al., 2013b; Bourkhis & Nabi, 2013b; Čihák & Hesse, 2010; Ghosh, 2014b; Hasan & Dridi, 2011; Masood, Niazi, & Ahmad, 2011; Monnin & Jokipii, 2013; Pappas et al., 2017; Rajhi & Hassairi, 2014; Schaeck & Cihak, 2014). Therefore, the empirical results of this research support, contradict or contribute new knowledge to the existing body of literature.

The study have contributed to the existing body of literature by introducing multiple measures of assessing banking stability Z-score (accounting-based) and PD (market-based perspectives). One of the significant contributions is that the study has demonstrated that the approach adopted for measuring stability plays an essential role in measuring banking solvency. Pappas et al. (2016) have claimed that the accounting-based stability measure Z-score is only relevant to conventional banks and have a slighter strength to predict the stable position of the Islamic banks. Findings of this research, from the methodological angle, will help to solve the ambiguity in the Islamic finance literature that the banks are not insolvent, or that they are resilient to some degrees. This when Islamic bank is measured with PD, while conventional is more resilient when measured with Z-score.

Secondly, scholars such as Beck et al. (2013); Cihack & Hesses, (2010), Alqahatani et al. (2016); Abedifar et al. (2013); Bourkhin & Nabi, 2013; Rajhi & Hassairi (2013) have all used econometric techniques to assess and compare the stability level between conventional and Islamic banks. None of them applied the GMM estimation technique to view banking stability from accounting and market-based perspectives. Of recent, Alqahtani & Mayes (2018); Boumediene (2011); Kabir et al. (2015) have applied the Z-score and distances to default model to assess the stability of conventional and Islamic banks. Surprisingly, they failed to consider the model as dynamic and to estimate it in the long run. For the GMM estimator, it can be seen from the results obtained that the variables indicate a consistent relationship with banking stability in terms of PD and Z-score. Our findings have shown that the stability of the conventional banks could be better explained with accounting measurement. The stability of the Islamic banks could be better explained with market-based measurement. The study has delivered an empirical backing to the theoretical studies of the association between the accounting-based financial measurement and market-oriented financial measurements.

Comparing the banking stability difference between the conventional and Islamic banks, the predictor is more responsive and in line with the theoretical argument when conventional banks are measured with Z-score than their Islamic counterparts. Conversely, the predictors on Islamic banks are more responsive when banking stability is measured with the market-based model (PD). Similarly, the accuracy of the market-based measurement made it more appropriate for policymakers in the regions to combine the two approaches in order to limit the errors in bank stability forecast. Considering the expansion of Islamic banks in the GCC and Non-GCC regions being the most prominent hub of Islamic banking institutions, Islamic banking activities are more attached to the real sector than the conventional banks. Similarly, the method will reduce conflicting theoretical explanations on the solvency difference between conventional interest and noninterest

Islamic banks. This will give investors a clear direction on their investments and guide regulators in devising policies on where to draw different risk assessment approaches for Islamic banks in the GCC states and beyond.

Thirdly, the study has contributed to the collections of the existing literature by the introduction of the issue of persistent banking stability. The historical results of the Z-score model reveal that both conventional and Islamic banks stability is highly persistent as the value of the coefficient falls above the 0.4 percent benchmark (Fuhrer, 2011). However, the market-based stability model reveals that conventional banks in GCC and Non-GCC states are more persistent than their Islamic bank peers. The result indicates the existence of market power in conventional banks. On the part of Islamic banks, the result reveals low persistency as the value of the coefficients falls below the threshold of 0.4 percent. In applying the dynamic panel regression to the models, this research has revealed, quantitively, the persistence of banking stability.

5.3.2 Contributions of the Newly Tested Variables

Corruption control is a new institutional variable tested with banking stability in terms of conventional and Islamic banks. Control of corruption, according to Transparency International (2017), indicates the stage of a country's institutional quality of her financial system. When corruption control is below the average, that will translate to poor control of corruption and the state's financial sector will experience poor institutional quality. The GMM estimation finding on corruption control demonstrates a negative and significant coefficient to banking stability to conventional banks and positive to Islamic banks. This confirms the curse theory in the GCC and Non-GCC regions.

Political stability index was also tested as an indicator of the tendency to political risk. The lower the index, the higher the tendency of political turmoil and the higher the instability of the banking sector. This variable has been tested in both the conventional and Islamic banks and indicates a positive coefficient to banking stability. On the contest of Islamic banks, the political index shows a positive but not a significant association with banking stability.

Change in oil prices has shown a new empirical backing on how such could affect the stability of the banking sector in the GCC and Non-GCC states. The result reveals that the stability of conventional banks is influenced by the shock of oil prices in both the short and long-run periods. Also, the study has revealed, quantitatively, that oil price has not been beneficial to describe the solvency position of the Islamic banks directly in the Non-GCC region.

5.3.3 Theoretical Contributions

The outcomes of this research for the determinants of banking stability in the conventional and Islamic banks support the assets management theory. This is supported by the fact that bank-specific variables and external factors influence banking stability. However, a greater percentage of banking stability is affected by the variables under the managerial control within the bank (bank-specific). The variables that carry higher value coefficients are capital adequacy, assets quality and liquidity. These variables are statistically significant to banking stability. The findings imply that if banks comply with capital regulation, banking instability would decline. The implementation of the Basel Accord I to III indicates the effectiveness of the policy in mitigating the banking instability, more especially in the context of conventional banks.

Similarly, this research has successfully been able to associate the arguments of the resource curse hypotheses to banking stability. Using institutional quality, macroeconomic variables and different methods, our study has found the argument of resource curse hypotheses very relevant in explaining banking stability in the Middle East sub-region. Though various empirical tests of this theory were carried out by the previous literature in different aspects of the banking system (Badeeb & Lean, 2017; Beck, 2011; Bhattacharyya & Hodler, 2014), yet none has provided an indication of the resource curse in the banking sector of the natural resources rich countries. On the other hand, they relied on the macro-factors relationship between financial indicators and resource factors in their studies.

To the best of our knowledge, no attempt has been made by any previous literature to conduct a test on banking stability from the accounting and market perspectives. However, establishing a practical relationship between the resource curse hypothesis and banking stability hold some policy importance, especially in developing economies where the institutional qualities are relatively weak. The relevance here is that when governments embark on policies that will improve on banking stability, the policymakers may decide to increase the quality of institutional factors.

5.4. Policy Recommendations

After the theoretical contributions that have been driven by this study, our model encompasses implications for the investors, conventional and Islamic bank managers, public policymakers and other researchers. The policy inferences place emphasis on regulatory capital, loan loss provisions, control of corruption, change in oil price and the persistency of stability.

5.4.1 Recommendation to Conventional and Islamic Banks

The study also has some findings that can influence the policy decisions of Islamic banks. Our results have predicted that the conventional and Islamic banks in the GCC and non-GCC regions are stably coupled with capital base attainment as advised by the Basel accord. Thus, we suggest that the proposed capital amendment by the regulators as contained in the Basel requirement should not follow a holistic approach to fit all banks. This approach may not be convenient for all Islamic banks as they do not go to the money market to raise more capital. Thus, the solvency requirement of Islamic banks may not be satisfied through the traditional ratio of capital formation. Therefore, a significant review should be made on the capital sufficiency model to suet the demands of Islamic banks.

5.4.2 Recommendation to Policy Makers

The findings in assets quality reveal that the managerial increase of loan loss provisions of Islamic banks in Non-GCC and conventional banks in GCC indicates the deterioration in the quality of loan facilities. Using LLR to smoothen the financial result during the period under review will inevitably increase the instability exposure of the banks. This issue requires a policy review. In more precise arguments, the Islamic banks should explore avenues for addressing credit quality problems. Again, their loan quality management practices ought to be reinforced and upgraded. Concerning the argument between sufficient and transparent loan loss reserves, this study suggests a compromise between accounting standard and bank regulators, particularly for Islamic banks. That will permit for sufficient loan provisioning while at the same time reducing the opportunities for bank managers to manipulate their estimation of loan loss reserves. Regardless of the uniqueness of any provisioning technique imposed on financial institutions by policy regulators, it is necessary to actively limit the discretion of bank managers in determining their loan loss estimates.

The conventional banking system in the GCC and Non-GCC states have to improve in the area of corruption control. The findings reveal that Islamic banks are significantly benefiting from corrupt practices through the grease approach to attain a certain level of bank stability. In this regard, the countries banking regulators have to strengthen and improve their anti-corruption policies in a sustainable manner. Also, the anti-corruption approach should reproduce the country-specific framework and regional strategies.

Concerning the change in oil prices, the significant impact of oil price on banking stability has revealed the systemic importance of the variable in both the short and long run in oil-exporting states. There is the existence of anecdotal evidence of the association between oil prices and financial stability. But this has not received any critical testing in any practical setting. Specifically, this study suggests that change in oil prices could be applied in macroprudential regulatory formations in the Middle East. Since monitoring of oil price changes is more accessible than the commonness measures of the business cycle (for example, the deviations of GDP from its potential point), the study suggests the tying of the capitalisation of the bankings sector to change oil price. This can help in mitigating procyclical bank lending and will permit banks to make use of their capital cushions generated during the time of boom for lending purposes during the period of recessions. As for the long-run implication of oil price shocks, policymakers need to diversify the economy from oil-dependent to the industrial economy. The issue is more applicable and urgent in the Non-GCC set of countries. The findings with regards to macroeconomic variables of GDP and inflation implies that the policymakers need to take protective measures to correct the negative effect of the indicators on banking stability.

Based on the dynamic stability differences in the model, the findings reveal that conventional banks' stability is better explained with Z-score while Islamic banks stability is better explained with PD. Therefore, it will be very challenging to conclude whether conventional banks are more stable than their Islamic counterparts. In general, policy architects and regulators should suggest employing the two stability measurements in terms of bank prudential stability management. On the part of the persistence of stability between the conventional and Islamic banks, based on the Z-score measurement, the work suggests that Islamic banks stability is more persistence in nature than for their conventional rivals. Therefore, Islamic banks have more potentials to grow faster than conventional banks. In this wise, investors, policymakers, and regulators should draw more resources to explore the potentials.

Similarly, the persistency argument calls for the policymaker's intervention when the persistency of the bank stability falls below the threshold of 40 percent. At this point, bank regulators in the GCC and Non-GCC regions should push for improvement in terms of stability of the concerned banks. Islamic banks need to improve their stock market performance to enhance their market power in the region.

5.4.3 Recommendation to Investors

As a step beyond the model analysis, the study found that the GCC and Non-GCC countries suffer from the negative consequence of a resource curse since they are among the oil major exporters. Across all the different econometric models, the magnitude of the coefficients for the corruption control and political stability is largely indicating that any changes in these institutional factors are highly germane for investment decisions to both the domestic and multinational investors. However, as the findings indicate, different kinds of stability between the conventional and Islamic banks concerning corruption control and political risk. Of course, shareholders as outstanding claimants suffer from a high level of corruption and political instability. There is, therefore, the need to reduce their exposures by slashing the rate of equity holdings.

5.4.4 Recommendation to Researchers

Based on identified limitations by this study, the following future studies are recommended.

Future areas of research should be extended to the entire Middle East and North African (MENA). In doing this, their heterogeneity and differences should be noted and accounted for as the issue of weak banking stability may not be peculiar only to the GCC and Non-GCC selected countries; it may exist in the entire MENA region.

This study has looked at the effects of corruption and political instability on conventional and Islamic banks stability in GCC and Non-GCC states. Another group of banks such as social responsibility banks and other governance variables, may be considered worthy by future studies. The main concerns of the socially responsible banks are related to societal issues and environmental problems such as the provision of affordable shelter, financing educational programs, providing green energy to cut pollution, and supporting petty traders with loans at the negligible interest rate or zero rates.

Finally, future researchers can also apply the holistic method to have more inputs from the entire stakeholders. Other categorical and bank qualitative information may be considered as the variable of interest in further studies. The banking stability research is dominated by using the quantitative estimation techniques, while qualitative studies on bank-specific factors have remained unattended to. A critical look at our reviewed articles confirms that the studies that adopt qualitative or non-regression technique are unpopular among scholars. Only Balasubramanyan, Thomson and Zaman (2014) are among the few that have used qualitative design in their work. A straightforward explanation here is that the relationship between bank-specific and banking stability appears to be of less concern to the qualitative and non-empirical scholars. Therefore, the need for non-empirical researches is required as there is a new research question that regression models have failed to offer the required answer. Similarly, further research may consider expanding the methodology from GMM to other panel methods of estimations like panel ARDL, GLS, panel survival analysis and non-linear GMM. Moreover, even the traditional panel may offer a significant contribution. Similarly, new macroeconomic variables such as Debt reserve ratio and Money supply will play a significant role in assessing the stability of the banking sector in the GCC region, considering these countries access cash reserves.

5.5 Limitations of the Study

Despite the outcome of the study being able to deliver fresh evidence to conventional and Islamic banks stability, it remains an exception to other limitations that can open a new opportunity for directing future studies. Firstly, this research adopted the utilisation of secondary data sources. This has limited the chance of other investigations from various stakeholders of the banks, for example (customers, management staff, shareholders, and community).

Secondly, the data collected and analysed in this research were from banks located with the GCC and Non-GCC countries. Therefore, all the discoveries and conclusions out of this research remain for the study area only and cannot be applied to another region due to cultural, religious, geographical and general perception, among other differences that will usually invalidate any form of the generalisation.

Future studies should incorporate off-balance-sheet variables such as securitisation in association to banking stability, especially from the conventional perspective vis-a-vis

Islamic interbank activities to bank stability. These variables will offer better explanations for determining banking stability.

Finally, the findings of this study are based on the methodology employed (Generalized Method of Moment). Other regression methods of data analysis, such as Ordinary Lease Squire (OLS), Pooled Mean Group (PMG), and non-linear GMM, were not put to use. Therefore, using the non-linear relationship more especially of the macroeconomics factors on banking stability will be of great help for policy decisions.

5.6 Conclusion

This study has examined the determinants of banking stability in the GCC and Non-GCC regions of the Middle East. The sample contains the annual bank data from conventional and Islamic banks in Bahrain, Kuwait, Qatar, Saudi Arabia, and U.AE., known as the Gulf Corporation Countries. In contrast, Algeria, Egypt, Jordan, Lebanon and Tunisia fall within the category of non-Gulf Corporation Countries. Other forms of financial institutions such as investment houses, social responsibility banks, central banks and non-banking financial institutions were not considered from the panel set. The period covered from 2008-2016, with a record fall in oil price for more than a decade. Expansion of the banking sector in the region is attached to oil price increase (Alqahtani & Mayes, 2018; El-Chaarani, 2019). The annual bank data was retrieved from Bankscope and Bloomberg, while institutional quality variables were collected from Transparency International and International Country Risk Guide. Our macroeconomic cycle variables were gathered from the World Development Indicators (IMF, 2012). The empirical technique employed by this study is system GMM because of the endogenetic nature of the model. To test for the properties of the variables, the unit root test was performed.

Findings from the study, have shown that all the three objectives of the study have been achieved. Capital adequacy remains the essential bank internal factor, where corruption and change in oil prices have shown a significant'impact on the banking stability of both banks with the Z-score. At the same time, the probability of default reveals that political stability and oil prices were found not to be significant to Islamic bank stability. The market approach (PD) explains that both the conventional and Islamic banks stability were almost similar to the accounting-based (Z-Score), except with the percentage change in political stability and oil prices concerning the stability of Islamic banks. This research has come up with fresh evidence on the level of banking stability from the GCC and Non-GCC states alike. Hence, the realisation of these objectives would serve as a more open to policy architects, specialists, academics, investors, and community to understand the current positions on conventional and Islamic banks stability nexus. Lastly, it is expected that the declared recommendations of this research work will serve as a contribution to banking controllers, practitioners, and other researchers in the area of banking stability.

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APPENDIX A

Bank Sample Composition

Countries	Banks	Bank type
United Arab Emirates	Dubai Islamic Bank Plc	Islamic
	Abu Dhabi Islamic Bank	Islamic
	Emirates Islamic Bank PJSC	Islamic
	Noor Islamic Bank	Islamic
	Dubai Bank	Islamic
	Sharjah Islamic Bank	Islamic
	Tamweel PJSC	Islamic
	Amlak Finance	Islamic
	Al Hilal Bank	Islamic
	HSBC Middle	Conventional
	Emirates NBD	Conventional
	National Bank	Conventional
	Arab Bank Inv Al Masraf	
	Bank of Sharjah	
	Commercial of Dubai	
	Marshreq Bank PSC	
	First Gulf Bank	
	National Umm Al-Qaiwain	
	Invest Bank	
	National Ras Al-Khaimah	
	National Fujairah	
	CB International	Conventional
	Union National	Conventional
Bahrain	Albaraka Banking Group BSC	Islamic
	Kuwait Finance House	Islamic
	Shamil Bank of Bahrain BSC	Islamic
	Albaraka Islamic Bank BSC	Islamic
	Khaleeji Commercial Bank	Islamic
	Gulf Finance House BSC	Islamic
	Addax	Conventional
	Gulf International	
	BBK BSC	
	National Bank	
	ABC Bank	
	Alubaf Arab Inter	
	Ahli United	
	Future Bank	
	GFH Financial	

Countries	Banks	Bank type
	Bank Alkhair	
	Venrure Capital Bank	
	Seera Bank	
	Ibdar Bank	
	First Energy Bank	
	Al-Salam Bank	
	Bahrain Islamic Bank	
	BMI Bank	Conventional
Egypt	Faisal Islamic Bank	Islamic
	Al Baraka Bank Egypt SAE	Islamic
	United Bank	Conventional
	Arab Banking Corp	Conventional
	Banque du Caire	
	Bank Alexandria	
	Union National Bank	
	Arab International Bank	
	National Bank	
	Commercial International	
	National Bank of Kuwait	
	Arab African Inter	
	SAIB	
	Banque Misr SAE	
	BLOM Bank	
	Egyptian Gulf	
	HSBC Egypt	
	Ahli United	
	Bank Audi SAE	
	QNB Al Ahli	
	Credit Agricole	
	Emirates National	
	Barclays	Conventional
	Abu Dhabi Islamic Bank	Islamic
Jordan	Jordan Islamic Bank	Islamic
	Jordan Dubai Islamic Bank	Islamic
	Arab Bank Group	Conventional
	Arab Bank	
	Jordan Ahli Bank	
	HBTF	
	Bank of Jordan	
	Jordan Kuwait Bank	
	Arab Corporate	
	Societe Generale	
	Capital Bank	
	Jordan Commercial	

Countries	Banks	Bank type
	Cairo Amman	Conventional
	Islamic International Arab	Islamic
Kuwait	Kuwait Finance House	Islamic
	Boubyan Bank KSC	Islamic
	Kuwait International Bank	Islamic
	A' Ayan L&I	Islamic
	Rasameel Structure Fin Com	Islamic
	KSC	Conventional
	Commercial Bank	
	Al Ahli Bank	
	Gulf Bank	
	National Bank	
	Burgan	Conventional
	Kuwait Finance	Conventional
	Warba Bank	Islamic
	FIB Bank	Islamic
Qatar	Qatar Islamic Bank SAQ	Islamic
	Masraf Al Rayan (QSC)	Conventional
	Qatar Inter Islamic Bank	Conventional
	First Finance Com	Islamic
	International Bank	Conventional
	Al Khaliji	
	The Commercial Bank	
	Qatar National	
	Ahli Bank	
	Doha Bank	Conventional
	Barwa Bank	Islamic
Saudi Arabia	Al Rajhi Banking & Invest Corp	Islamic
	Islamic Dev Bank	Islamic
	Bank AlBilad	Islamic
	Samba Fin	Conventional
	National Commercial	
	Saudi Invest	
	Riyad Bank	
	Banque Fransi	
	Alawwal Bank	
	Saudi British	
	ANBPJSS	Conventional
	Alinma Bank	Islamic
	Islamic Corporate	Islamic
	International Islamic ITFC	Islamic
	Bank Aljazira	Islamic
Tunisia	Albaraka Bank Tunisia	Islamic

Countries	Banks	Bank type
	Banque Zitouna	Islamic
	Arab Crop	Conventional
	Union International	
	Banque de	
	Amen Bank	
	Banque Internationale	
	UBCI	
	Banque National Agricole	
	Societe Tunisi	
	Attijari Bank	
	Arab Tunisian	
	Banque de I Habitat	Conventional
Algeria	Arab Corp	
	Gulf Bank	
	Natixis Algerie	
	BNP Paribas EI Djazair	
	Societe Generale	
	Banque de I Agric	Conventional
	Al-Salam Bank	Islamic
Lebanon	CSCB Bank	Conventional
	BBAC Sal	
	Societe Generale	
	Bankmed Sal	
	Bank Audi	
	North African Commercial	
	Credit Bank	
	Banque de IIndustrie	
	Banque Libano-Franc	
	Byblos Bank	
	Bank Audi	
	Fransabank Sal	
	Bank of Beirut	
	Banque Misr Liban	
	Lebanon & Gulf	
	Fenicia Bank	
	Lebanese	
	Saradar Bank Sal	
	Credit National	
	Emirates Lebanon	
	Banque BEMO Sal	
	IBL Bank Sal	
	MEAB SAL	
	BLOM Bank	
	Credi Libanis	Conventional
	B.L.C Bank	Conventional

Countries	Banks	Bank type
	Al Baraka Bank	Islamic

APPENDIX B
Selection between Difference or System GMM

Estimations	Coefficient
Pooled OLS	0.82945
Fixed Effect	0.11441
One Step GMM	0.2148
Two Step GMM	0.21336

APPENDIX C

Altman Ranges and Cut off marks

	Default Area	Grey Area	Non-Default Area
Z-score	Lessthan 1.21	1.31-2.90	Above 2.90

Source: Altman (2013)