

**T.C.
SAKARYA UNIVERSITY
INSTITUTE OF SOCIAL SCIENCES**

**CREDIT RISK MANAGEMENT: A COMPARATIVE STUDY BETWEEN
ISLAMIC AND CONVENTIONAL BANKS IN TURKEY**

MASTER THESIS

Mohammed M.I. ALKHAWAJA

Department : Islamic Economics and Finance

Thesis Supervisor: Prof. Dr. Şakir GÖRMÜŞ

August – 2019

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“This thesis was accepted unanimously/with the majority vote by the committee on 06.08.2019.”

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ABBREVIATIONS

CB : Conventional Banks

CR : Credit Risk

IB : Islamic Bank

LLP : Loan Loss Provision

NIM : Net Interest Margin

NPL : Non-performing Loan

PLD : Proportion of Loans to Deposits

PLA : Proportion of Loans to Assets



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Department: Islamic Economics and Finance				
In this research we aimed to identify variables determining credit risk in Islamic and conventional ones. A comparison between Islamic and Conventional Banks is highlighted. The researcher employed panel data fixed effect model to analyze quarterly data which belongs to three Islamic Banks in Turkey for the period 2008 Q1 to 2017 Q4. While for conventional banks, previous studies conducted in Turkey are used to compare Islamic banks to conventional banks (ones). Non-performing Loans (NPL) ratio was used as a proxy for credit risk. According to Empirical result NPL in Islamic Banks is positively affected by Loan Loss Provision and Proportion of Loans to Deposits, and it is negatively affected by Assets Size. While in conventional banks it is positively affected by Net Interest Margin, Loan Loss Provision, and Capital Adequacy Ratio and it is negatively affected by Proportion of Loan to Deposits, Proportion of Loans to Assets and SIZE. There were clear differences between both Islamic and Conventional banks related to all variables of study except Loan Loss Provision and Proportion of Loan to Assets ratios.				
Keywords: Credit Risk, Non-performing Loans, Islamic Banks, Conventional Banks, Turkey				

Sakarya University
Institute of Social Sciences Abstract of Thesis

Yüksek Lisans	☒	Doktora	☐
Tezin Başlığı: Kredi Risk Yönetimi: Türkiye’de Katılım Bankaları Konvansiyonel Bankalar Arasında Karşılaştırmalı Çalışma			
Tezin Yazarı: Mohammed M.I. Alkhawaja		Danışman: Prof. Dr. Şakir Görmüş	
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Anabilim Dalı: İslam Ekonomisi ve Finansı			
Bu araştırmada, katılım bankaları ve konvansiyonel bankalarda kredi riskini belirleyen değişkenlerin belirlenmesi amaçlanmaktadır. İslami ve Konvansiyonel Bankalar arasında bir karşılaştırma vurgulanmıştır (uygulanmıştır). Panel verinin sabit etkiler modeli kullanılarak, Türkiye’de bulunan üç Katılım Bankası’nın 2008 Ç1-2017 Ç4 dönemine ait üç aylık verileri analiz edilmiştir. Katılım Bankaları ile konvansiyonel bankaları karşılaştırılmak amacıyla, Konvansiyonel bankalarla ilgili Türkiye’de yapılan çalışmalar incelenmiştir. Takipteki krediler oranı kredi riski mümessili olarak kullanılmıştır. Ampirik çalışmanın sonuçlarına göre, Katılım bankalarındaki takipteki krediler, özel karşılıklar ve kredi / mevduat oranlarından olumlu yönde etkilenmekte ve ölçekten olumsuz yönde etkilenmektedir. Geleneksel bankalarda ise net faiz marjı, özel karşılıklar, sermaye yeterlilik oranlarından olumlu yönde etkilenmekte ve kredi / mevduat oranı, kredi / aktif oranı ve hacminden olumsuz yönde etkilenmektedir. İslami bankalar ile geleneksel bankalar arasında, kredi zararları ve Alacaklar / Aktifler oranları haricinde, tüm çalışma değişkenleri bakımından belirgin farklılıklar gözlenmiştir.			
Anahtar Kelimeler: kredi riski, Takipteki krediler, Katılım bankaları, konvansiyonel bankalar, Türkiye.			

Introduction

Islamic Banking comes as a part of Islamic Finance industry which shown rapid growth during the previous four decades. It is worth mentioning that, IBs are not limited to Muslim countries as it is continuing to grow in Europe, Southeast Asia also. Islamic finance is mainly based on Islamic Sharia principles. Simply, IBs aim to provide CBs' services in an appropriate model for Islamic principles. The main principles of IBs are the prohibition of interest (Riba) and profit-loss sharing. As Islamic Banking a kind of transforming process aiming to modify conventional bank to fit Islamic Law and Muslims who have sensitivity toward interest, there are still shared principles between Islamic and conventional banking models. Turkey as a country is on its way to being a leading country in Islamic Finance field. According to Turkish Participating Banks Union (TPBU) Total Assets of Turkish Islamic Banks reached 160 Billion Turkish Lira by the end of 2017. Currently there are six IBs operating in Turkey, the last one of them is Turkiye Emlak Bank which previously operated as a conventional bank but in 2018 it was transformed into an Islamic Bank.

Subject of Study

Banks as financial intermediaries in general are sensitive toward financial risks. Financial risks such as liquidity risk and credit risk might lead to catastrophic crises and even bankruptcy. Credit risk, however, is crucial to Banks as the profit generator for banks in lending. Due to many mutual principles between IBs and CBs, IBs pay the same attention to credit risk and credit risk management. It is worth mentioning that, credit risk management in IBs is more difficult than CBs due to the restriction imposed by Islamic Law.

Objectives of study

- 1- Testing whether Capital Adequacy Ratio affects non-performing loans of Islamic banks in Turkey.
- 2- Testing whether Loan Loss Provisions Ratio affects non-performing loans of Islamic banks in Turkey.
- 3- Testing whether Net Interest Margin affects non-performing loans of Islamic banks in Turkey.

- 4- Testing whether Proportion of Loans to Deposits affects non-performing loans of Islamic banks in Turkey.
- 5- Testing whether Proportion of Loans to Assets Ratio affects non-performing loans of Islamic banks in Turkey.
- 6- Testing whether Assets size affects non-performing loans of Islamic banks in Turkey.
- 7- Testing whether the impact of predicted variables on credit risk in Islamic banks differs from the impact of the same variables on credit risk in conventional banks working in Turkey.

Methodology

In this research, we aim to predict factors determining credit risk in IBs in Turkey with highlighting a comparison between CBs and IBs. Research is applied through analyzing quarterly financial reports of three Islamic banks operating in Turkey for the period 2008 Q1 to 2017 Q4. Since data type is cross-sectional time series, the research employs panel data regression analysis. Based on Hausman test results Fixed effect model is best fitted in this study. The model is used to test the impact of selected bank-specific variables on the dependent variable non-performing loans ratio which is the proxy of credit risk in this research. For the purpose of applying a comparison between Islamic and conventional banks, previous studies on conventional banks in Turkey are used as a secondary source of data.

Importance of Study

The importance of this study is that it helps Islamic banks managers in Turkey to create new policies minimizing credit risk level.

Originality of study

This is the first study to measure the impact of bank internal variables as determinants for credit risk Islamic banks with highlighting a comparison between IBs and CBs in Turkey.

Implications of study

Study will provide credit risk managers with information about factors affecting credit risk. This information will help credit risk managers to set policies and strategies to minimize credit risk levels in their banks.

Limitations of Study: the study is limited to three Islamic banks and three conventional banks working in Turkish Republic during the period 2008 Q1 to 2017 Q4.



CHAPTER 1: ISLAMIC BANKING IN THE WORLD AND TURKEY

1.1. Global Evolution of Islamic Banking

Islamic finance has been found as a solution for people who have sensitivity toward interest bearing financial services. Globally, the total assets of IBs are continuing to increase. According to Mohammed et al (2013), the first IB experience in the modern history was in Pakistan by establishing Local Islamic banks in the late 1950s. Local IB was established by religious landowners in the purpose of financing the poorer landowner to improve agriculture without charging any interest. Unfortunately, this bank could not succeed due to management weaknesses exemplified by unplanned granting and disability to give benefits to depositors (Chachi, 2005: 15). The second experience was Mit-Gamr Islamic Savings Bank which was established in 1963 in Egypt by Dr. Ahmed Ennajar who was inspired by German banks' role in developing Germany, especially after the Second World War. Ennajar decided to merge the German banking system with Islamic cultural and economic values to meet the needs of Egyptian Muslim society. Mit-Gamr Bank could gain financial and scientific support from Germany for a specific period of time. According to Ennajar statement, Mit-Gamr Islamic Savings bank continued working for only four years due to political pressure. Mit-Gamr stopped working in 1967 (Bayındır, 2007: 21). In 1971 Nasser Social Bank was established in Egypt as a free of interest bank without any reference to Islamic law

According to Kamruzzaman and Islam (2015), the first IBs debuts were in Egypt in the 1960s, they were little scaled and did not conceive a religious image in order avoid conflicts with communist authorities at that time. They worked as savings banks without charging interest from borrowers or giving interest to depositors. While in 1971, Nasser Social Bank was established in Egypt to provide free of interest services to poor people, students, and small scaled entrepreneurs without any reference to Islamic law (Sairally, 2007: 21) (Ariff, 1988: 148).

In 1970s, due to some changes in Arab countries, barriers toward establishing Islamic banks disappeared and there was no need any more to work under any cover. As a result, literally Islamic banks started be established in Arab countries. Among these banks; Dubai IB (1975), the Faisal IB of Sudan (1977), the Faisal IB of Egypt (1977), and the Bahrain IB (1979) (Ariff, 1988: 148).

Islamic Development Bank (IDB) which was based in Jedda was established in 1974 by member countries of Organization of Islamic Corporation. The purpose of this bank was serving as an intergovernmental bank to provide interest-free fund and profit-sharing based services for governments to implement development project (Ariff, 1988: 148).

Although there is no separate law for IBs in Saudi Arabia, it is still moving good. The senior two players in this field in Saudi Arabia are Bank Al Jazira and Al Rajhi Banking and Investment Corporation. On the other hand, CBs are serving IBs customers through Islamic banking windows (Khan, Bhatti, 2008: 714). It is worthy to mention, Al Rajhi bank is the considered the biggest in the Arab Gulf with total assets \$71.3 billion (Lone, Alshehri, 2015: 42).

In Lebanon, Islamic banking industry is still in the first stages. Lebanon Parliamentary Council passed Islamic Banks law in 2004, by 2006, however four Islamic banks were established in Lebanon (Khan, Bhatti, 2008: 713). Bizri (2014) has mentioned that, despite the fact that Lebanon is enjoying a well-managed dual banking system, Islamic banking is not showing progress signs compared to the rapid growth of IBs assets around the world.

As a result of Islamic political groups pressure, the government of Malaysia decided to consider the Islamic values in social and economic life. In 1983, as a result of Malaysian Central banks initiative and a 1-year study conducted by governmentally established National Steering Committee, the Malaysian government issued Islamic Banking act and Bank Islam Malaysia was established (Nakagawa, 2009: 117). According to Nakagawa (2009), Malaysia is a leading country in the Islamic Finance development among Southeast Asian Countries. Furqani and Mulyany (2009) have conducted a study to identify the relation between Islamic banking and economic growth in Malaysia. The study employed Vector Error Correction Model to analyze data belong to the period 1997 Q1-2005 Q4. According to results, Islamic banks as financial intermediaries is in the same with financial sector development which led to economic development.

Bank Muamalat Indonesia was established in 1992 by Indonesia Ulama Council to be the first bank in the country after issuing the Act no. 1/1992. Through the period 1992-1998 there was only one IB in Indonesia till the political reform in 1998 which was accompanied by regulating dual banking system in the country. This change allowed

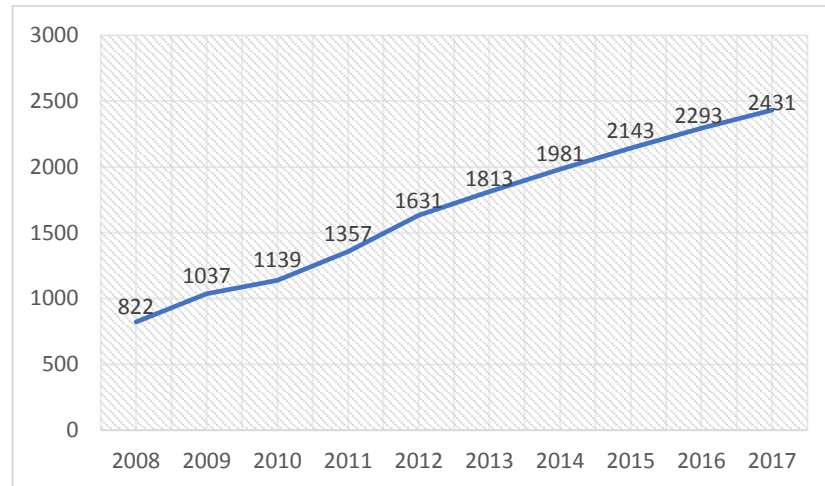
Islamic banks to work side by side with CBs. After that, Bank Syariah Mandiri was established in 1999 to be the second IB in the country. In the same year, conventional banks started free interest banking customers through windows (Ika, Abdullah, 2011: 200). Yazdan et al (2012) have analyzed quarterly data belonging to the period 2000:Q1-2010:Q4 through cointegration and error correction models method in order to measure the effect of Islamic finance development on economic growth. According to the study there is a long-term correlation between Islamic finance development and economic growth.

While in Thailand, the debut of Islamic banking was in 1998 when Government Savings Bank (GSB) introduced Islamic Banking Windows. The same experience was implemented in 1999 by Bank for Agriculture and Agricultural Cooperatives (BAAC). By the end of 2001, four Islamic Saving cooperatives had been established in Thailand; Ibnu Affan, As-Siddiq, Saqaffah Islam, and AllIslamiah Saving Cooperative. While in 2002, a key milestone came to reality when the government legalized Islamic Bank of Thailand Act which opened the door for establishing the first fully Islamic Bank of Thailand in 2003 (Haron, Yamirudeng, 2003: 7).

1.1.1. Global Growth of Islamic Banking Assets

Globally, Islamic Financial Institutions achieved large growth in the previous century as the number of institutions working in field passed 280 institution working in more than 38 country (Grais, Pellegrini, 2006:3). It is worth mentioning that Islamic Finance industry is running exclusively in the Muslim countries but also operates in Southeast Asia and Europe (Samra, 2017:4). Islamic Banking industry is considered fast growing even during Global Financial Crisis in 2008-2010. Graph 1 illustrates Islamic Banking industry growth during the period 2008-2017.

Total assets of Islamic banks were 822 Billion \$ in 2008 and it increased by 26.16% to reach 1.037 Trillion in 2009. While in 2010 the growth ratio was only 9% which might be due to the global Financial Crisis in that. In 2011 global total assets of IBs started to with higher ratios again as it they decreased by 19.14% to reach 1.357 Trillion \$ in that year. In 2012 the growth ratio was 20.19% and Islamic banks total assets reached 1.631 Trillion \$. Growth ratios, however decreased again to be 11% in 2013, 9.27% in 2014, 8.18% in 2015, and 7% in 2016.



Graph 1: Globally Islamic Banks assets growth (Billion \$).
Source: International Islamic Finance Magazine

Islamic banks total assets reached 2.431 Trillion \$ in 2017 recording 6% growth rate compared to 2016 when they reached 2.293 Trillion \$. According to Global Islamic Finance Reports, the slowdown in growth ratios might be due to political conflicts in Middle East, low oil prices, and last is that Islamic finance products might have reached maturity which necessitates creativity and development for generating new markets.

1.2. Islamic Banking in Turkey

1.2.1. Evolution of Islamic Banking in Turkey

The beginning of Islamic banking in Turkey was under the name of Special Finance House (SFH) in 1983 which was established based on the approval of Cabinet decree No. 83/7506 while principles and activities of the institutions were published in the official Gazette in 25th of February 1984 (Ozdemir, Aslan, 2018:23-25). Based on the mentioned decree the first the first Special Finance House was established under the name Albaraka Turk in 1985 while the second was Kuveyt Turk Special Finance House which was established in 1989 followed by Anadolu Special Finance House 1991, Ihlas Special Finance House 1995, and Asya Special Finance House in 1996. In 1999 based on banks law numbered 4389 Special Finance Houses were included to banks law. While in 2001 Ihlas Special Finance House was liquidated due to Banking Regulation and Supervision Agency decision as Ihlas appropriated most of bank deposits to shareholders through connected lending (Starr, Yilmaz, 2007:1116). Also, in 2001, Faisal Special Finance House turned to Family Finance Special House. While in the same year Special Finance

Houses Union was established. In 2005 based on banking law numbered 5411 the name of Special Finance Houses was turned to Participating bank. in the same year Anadolu finans united with Family Finance under the Turkiye Finans. In 2015 Ziraat Participation Bank was established to be the first Public Participation bank in Turkey while in 2016 Vakif Participation bank was established to be the second one. Table 1 views Islamic Banking evolution in Turkey.

Table 1:
Islamic Banks Evolution in Turkey

Year	Process
1983	Issuing Decree No. 83/7506 which allowed established Special Finance Houses as Interest Free Financial Institutions
1985	Albaraka Turk Special Finance House was established
1989	Kuveyt Turk Special Finance House was established
1991	Anadolu Special Finance House was established
1995	Ihlas Special Finance House was established
1996	Asya Special Finance House was established
1999	Based on banks law numbered 4389 Special Finance Houses were included to banks law
2001	Ihlas Special Finance House was liquidated
2005	Based on banking law numbered 5411 the name of Special Finance Houses was turned to Participating bank
2015	Ziraat Participation Bank was established to be the first Public Participation bank in Turkey
2016	Vakif Participation bank was established
2018	Turk Emlak Bank changes the nature of activity to be Turk Participating Bank.

Source: Turk Islamic Banks Union

1.2.2. Currently Active Islamic Banks in Turkey

Currently, there are six active IBs in Turkey, data in Table 2 are were published on Turk Participation Banks Union official website and the official website of each bank.

Table 2:
Current Position of Islamic Banks in Turkey (2018)

Bank Name	Total Assets (1 Billion TL)	Total Deposits (1 Billion TL)	Total Receivables (1 Billion TL)	Number of Branches	Number of Workers
Albaraka Turk Participating Bank (1985)	42	28.6	25.55	230	3988
Kuveyt Turk Participating Bank (1989)	74.2	53.9	46.6	415	5871
Turkiye Finance (2005)	47	26.8	29.6	306	3661
Ziraat Participating Bank (2015)	22.1	15.15	11.37	80	1024
Vakif Participating Bank (2015)	20.9	15.18	13.3	91	1092
Turkiye Emlak Participating Bank (2018)	1.13	0		0	85

Source: Turk Islamic Banks Union

1.2.2.1. Albaraka Turk Participating Bank (1985)

It was established in 1984 as the first interest free bank in Turkey and started performing in 1985. It is a part Albaraka Banking Group which is considered as one of the biggest capital powers in the Middle East. By 31 of December 2018, 65.99% of the bank shares are owned by foreigners, 8.77% is owned by domestic partners and 25.33% is opened to the public (Source: Albaraka Turk Participating Bank Website).

By 31 of December 2018, total assets of Albaraka Turk Participating Bank reached to 42 Billion Turkish Lira, total deposits 28.6 Billion TL, and total receivables of 25.55 Billion

TL. Albaraka Turk Participating Bank in continuing working with 230 branches and 3,988 personnel.

1.2.2.2. Kuveyt Turk Participating Bank (1989).

Kuveyt Turk Special Finance House was in 1989 under the commercial name “Kuveyt Türk Finance Institution of Foundations Joint Stock Company” and began to offer services in 1999. Currently Kuwait Finance House holds 62.24 % of Bank’s shares, and General Directorate of Foundations hold 18.72%, and 9% of bank’s shares are held by Social Security Institution of Kuwait State, while 9% by Islamic Development Bank, the remaining 1.04 % by other real and legal persons (Source: Kuveyt Turk Participating Bank website).

By 31 of December 2018, total assets of Kuveyt Turk Participating Bank totaled 74.2 Billion Turkish Lira, total deposits 53.9 Billion TL, and total receivables of 46.6 Billion TL. Kuveyt Turk Participating Bank is continuing its activities with 415 branches and 5871 personnel.

1.2.2.3. Turkiye Finance

It was established in 2005 as a result of the union between Family Special Finance House and Faisal Special Finance House. In 2008 National Commercial Banks obtained 67.03% of Turkiye Finance shares (Source: Turkiye Finance Participation Bank’s website).

By 31 of December 2018, total assets of Turkiye Finance Participating Bank reached to 47 Billion Turkish Lira, total deposits 26.8 Billion TL, and total receivables of 29.6 Billion TL. Turkiye Finance Participating Bank in continuing working with 306 branches and 3,661 personnel.

1.2.2.4. Ziraat Participating Bank

Ziraat Participation Bank was established in 2015. At the beginning capital amounted to 675 M Turkish Lira paid Turkish republic treasury. By 31 of December 2018 banks’ paid capital amount 1.75 Billion TL and all the shares are owned by Turkish Republic Ziraat Bank. By the same date total assets of Ziraat participating bank amount to 22.1 Billion TL, total deposits 15.15 Billion TL, and total loans of 11.37 Billion TL. Currently the bank operates with its 80 branches and 1042 workers.

1.2.2.5. Vakif Participating Bank

It was established in 2015 with paid in capital of 1.02 Billion TL and started operation in 2016. Total capital of the bank belongs to Waqfs General Management (Source: Vakif Participating Bank website). By 31 of December 2018 banks' total assets amounted to 20.9 Billion TL, total deposits 15.18 Billion TL, while total loans 13.3 Billion. Currently bank continues operating with 1092 workers and 91 branches.

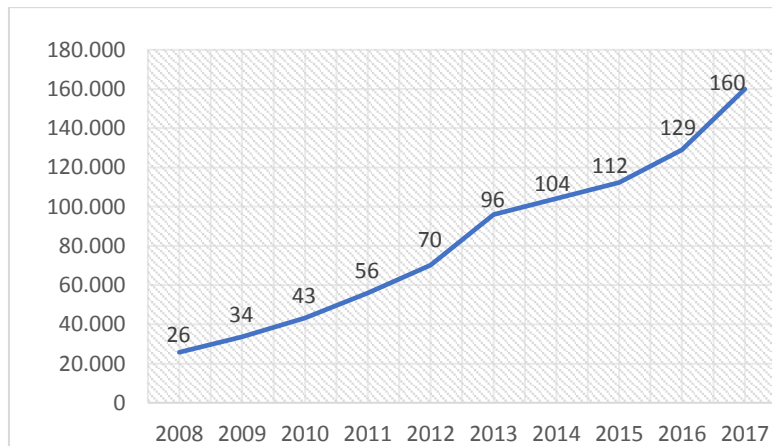
1.2.2.6. Turkiye Emlak Participating Bank

It was first established in 1926 under the name Emlak and Eytam Bank to work as a supporter to construction works. During years the name of the bank changed many times according to the changing needs of the country. Before transforming to participation, the last name Turkey Emlak bank. Turkey Emlak Bank took the license to work as a participating bank from Turk Participating Banks Union in 2018 and the the new name is Turk Emlak Participating Bank. Turk Emlak Participating Bank is owned by Turk Republic Treasury (Source: Turkiye Participating Bank website).

1.2.3. Growth of Islamic Banking Sector in Turkey

1.2.3.1. Assets Growth

Graph 2 views the growth of IBs' assets through the period 2008-2017, while Graph 3 the proportion of Islamic Banks' Total Assets to sectors during the same period.

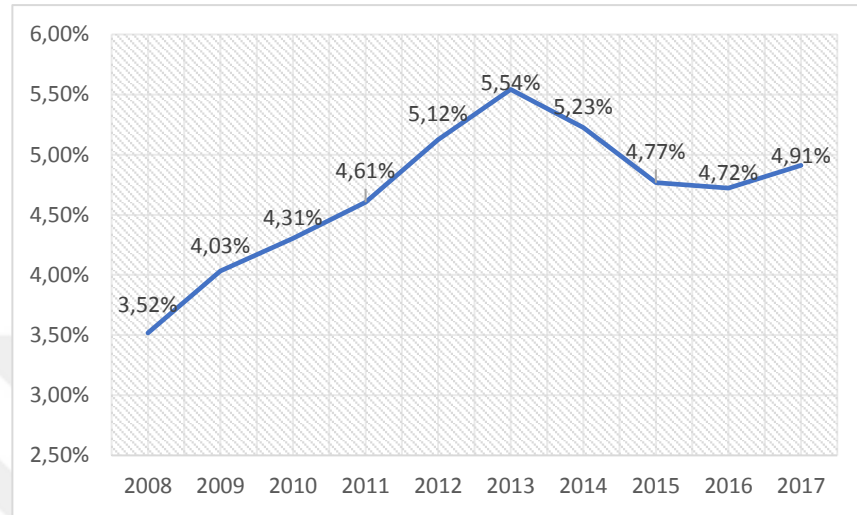


Graph 2: Islamic Banks assets growth in Turkey in 1 Billion TL

Source: Turk Participating Banks Union

Islamic Banks total assets amounted to 25,7 Billion TL in 2008 which equaled 3.5% of sectors total assets the same year while in 2009 this ratio reached 4% as the Islamic banks assets got increased by 30.5%. In 2010 total assets witnessed a growth of 28.9% as they

represented 4.3% of total banks' assets at that year. The same scenario continued to be witnessed until 2013 Islamic banks' total assets reached 96 Billion TL and proportion of Islamic Banks' assets to sector increased to be 5.5% which is considered the peak during our study period.

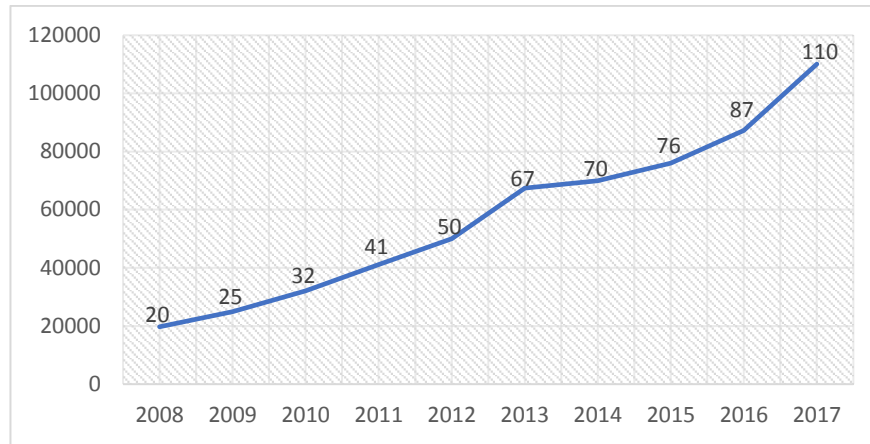


Graph 3: Islamic Banks assets proportion to the overall Turkish banking sector
Source: Turk Islamic Banks Union

After 2013 Islamic banks total assets continued to increase but with lower growth ratios and proportion of Islamic banks' assets to sector started to get lower until 2016. This situation can be explained by the rapid growth of sectors total through the study period. The proportion of IBs' total assets to sectors assets decreased to 5.2% in 2014, 4.8% in 2015, and 4.7% in 2016. In 2017 the total assets increased by 24.1% 159 Billion TL and the proportion to sector increased from 4.7% to 4.9%. During the years 2008-2017 annual growth ratio of Islamic banks total assets in Turkey was 22.9%.

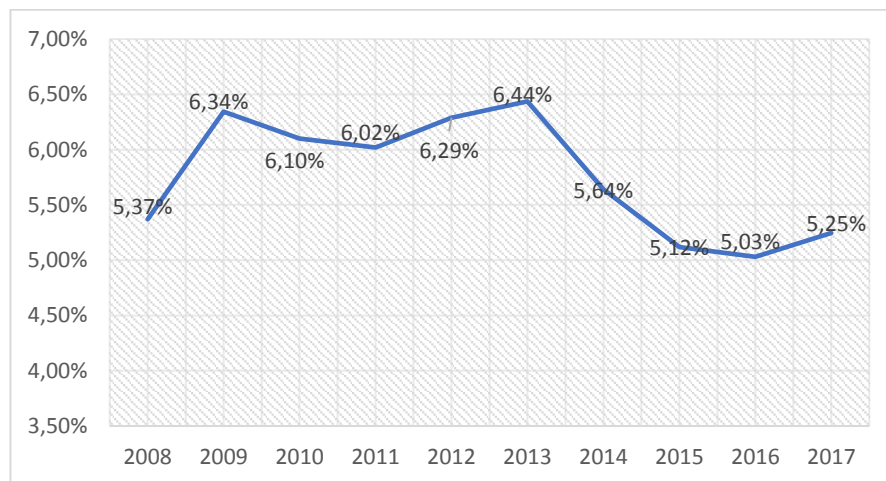
1.2.3.2. Loans Growth

Graph 4 views the growth of Islamic Banks' total loans during the period 2008-2017, while Graph 5 the proportion of Islamic Banks' total loans to secors during the same period.



Graph 4: Growth of Islamic Banks' total loans in Turkey \$ 1 Billion
Source: Turk Participating Banks Unions

While ratio of Islamic Banks total assets to sector witnessed continuous increasing during the period 2008-2013, and slight decreasing during the period 2014-2016. The proportion of Islamic Banks' total loan to sector's total loans was fluctuating. This situation can be explained by the fluctuation of sector's loan growth rate through the period of study. The average growth rate of Islamic banks' total loans during the period study is 21,4%, it is approximately equal to conventional banks average growth rate during the same period as it was 21,6%.



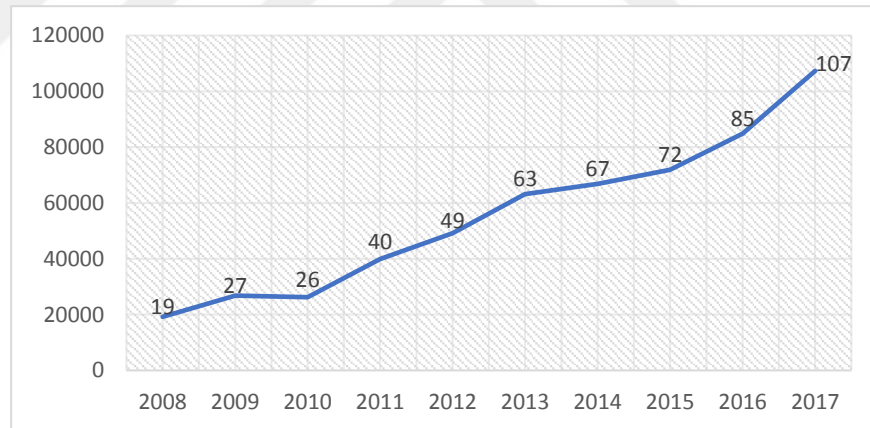
Graph 5: Proportion of Islamic Banks total Loans to Turkish banking sector's total Loans
Source: Turk Participating Banks Union

The total loans of Islamic banks in 2008 was 19.7 billion TL and it represented 5.4% of sector's total loans. In 2009 Islamic banks' total loan increased by 26.2% to reach 24.9 Billion TL and represent 6.3% of the sector's total loans. In 2010 total loans of Islamic banks increased by 28.8% but the proportion to sector's total loans decreased to 6.1% due

to the rapid growth of lending in conventional banks. The same situation continued in 2011 as the proportion of Islamic banks' total loans to sector's decreased to 6% due to the circumstances realized in 2010. In 2012 and 2013 total loans of Islamic banks witnessed a rapid growth compared to sector's statistics thus proportion of Islamic banks total loans to sector's total loan increased to 6.3% in 2012 and 6.4% in 2013. Through the period 2014-2016, Islamic Banks' total loans' growth ratios started decrease again compared to CBs' and as a result proportion of IBs' total loan to the sector's total loans decreased to 5.6% in 2014, 5.1% in 2015, and 5% in 2016. For 2017, growth ratio of Islamic banks' total loans was 26.2% while for conventional banks it was 21% as a result the proportion of Islamic banks total loans to sectors' total loan slightly increased to reach 5.2%.

1.2.3.3. Deposits Growth

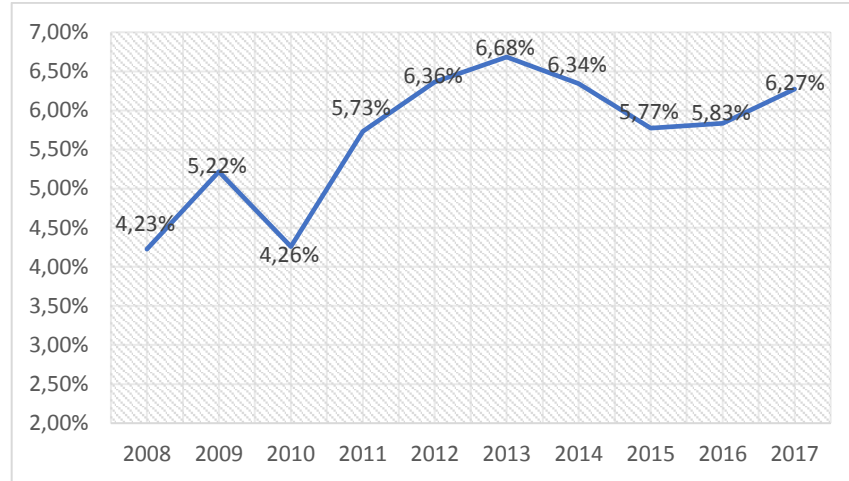
Graph 6 views the growth of Islamic Banks' deposits during the period 2008-2017, while Graph 7 the proportion of Islamic Banks' Total deposits to sectors during the same period.



Graph 6: Growth of Islamic Banks total Deposits in Turkey in 1 Billion TL

Source: Turk Participating Banks Unions

Total deposits in Islamic banks have witnessed a slightly faster growth in compared to total loans of IBs' and much faster growth compared to total deposits of conventional banks during years of study. The average growth rate of total deposits of IBs' during the period of study was 22.1% while in sector as a general it was 15.9%.



Graph 7: Proportion of Islamic Banks total deposits to Turkish banking sector's total deposits
Source: Islamic Participating Banks Union

The proportion of Islamic banks total deposits to sectors' total deposits ratio was 4.2% in 2008, while in 2009 the mentioned ratio increased to 5.2%. The reason for this is that total deposits of IBs' increased by 39.7% in 2009 while sectors total deposits increased only by 13.2%. Total deposits of Islamic banks witnessed the only decrease during the period of study in 2010 as it decreased by 2.1%. Thus, the proportion of Islamic banks' total deposits to sector's total deposits decreased to 4.3% in the mentioned year. Declines did not continue, deposits of Islamic banks increased by 51.8% to 5.7% of sectors total deposits in 2011, while in 2012 they increased by 23.3% to represent 6.4% of sector's deposits. The peak has been reached in 2013 as Islamic banks deposits increased by 28.6% to represent 6.7% of sector's total deposits. Islamic banks deposits growth rates started to decline again in 2014 as it increased only by 5.7% to represent 6.3% of sectors deposits. proportion of Islamic banks' deposits to sector's deposits decreased to 5.8% in 2015 as a result to higher growth sector's deposits in the same year. Both IBs' deposits and CBs' deposits witnessed similar growth rate in 2016. Thus, proportion of Islamic banks deposits to sector's deposits did not change in this year. While in 2017, the proportion of IBs' total deposits to CBs' deposits increased to reach 6.3% due to the higher growth rate of Islamic banks total deposits in the same year as in it increased by 26.6%.

1.2.4. Non-Performing Loans Ratios

In this section we view and discuss Non-Performing Loan (NPL) ratios during the period of study with highlighting a comparison between NPL in Islamic Banks as a whole and sector. Table 3 views NPL in the three Islamic Banks analyzed in this study separately.

Table 3:
Ratios of NPL to Total Loans in IBs in Turkey during the period of study

Year	Kuveyt Turk*	Albaraka	Turkiye Finans
2008	0.0511	0.0289	0.0346
2009	0.0596	0.0367	0.0362
2010	0.0336	0.0304	0.0306
2011	0.0204	0.0237	0.0237
2012	0.0244	0.0246	0.0281
2013	0.0235	0.0233	0.0253
2014	0.0234	0.0211	0.0259
2015	0.0171	0.0252	0.0463
2016	0.0263	0.0506	0.0545
2017	0.0198	0.0496	0.0558

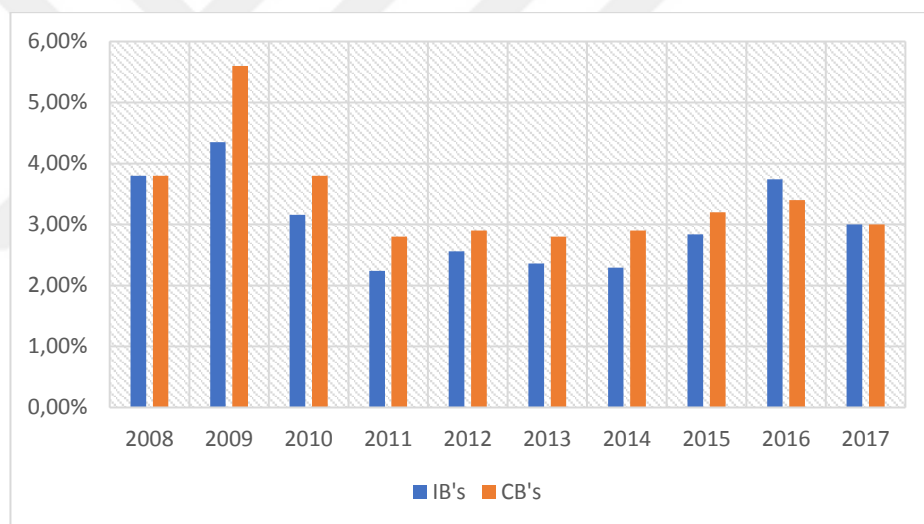
Source: Turk Islamic Banks Union

*: Ratios in this table have been computed through dividing NPL by Total Loans

In 2008, NPL ratio in Kuveyt Turk Islamic banks was 5.11% of total loans which is consider high compared to the other IBs and industry as a whole. While in 2009 NPL ratio increased to 5.96% as it increased in both Islamic banks and banking industry as a whole in Turkey which might bu due the Global Financial Crisis at that year. After that NPL ratio decreased significantly to reach 3.36% in 2010, and 2.04% in 2011. In 2012 NPL ratio increased again in Kuveyt Turk Islamic banks to reach 2.44% as the ratio has increased in the industry as a whole. During 2013-2015 a higher progress was noticed in Kuveyt Turk Islamic bank as NPL ratio witnessed a continuous decrease to reach 2.35% in 2013, 2.34% in 2014, and 1.71% in 2015. As Turkey has lived an economic drop in 2016, NPL ratio in the industry as a whole and in Kuveyt Turk it increased to reach 2.63%. while it has decreased again to reach 1.98% in 2017. During the years of study, the average NPL ratio in Kuveyt Turk Islamic banks is 2.99%.

NPL ratio in Albaraka Islamic bank was better than Kuveyt Turk Islamic bank but it did not continue. While NPL ratio in Kuveyt Turk bank decreased by 61.2% during the period of study, it has decreased by 71.3% in Albaraka bank and Average NPL ratio there was 3.14% during the same period. The observations NPL ratios in Albaraka bank were similar to Kuveyt Turk bank except the last three years as Albaraka Islamic bank has shown a higher sensitivity toward political and economic crises realized in Turkey in 2016.

The situation in Turkiye Finans Islamic bank was similar to Albaraka Islamic bank. NPL ratio increased by 61.3% during the period of study and average NPL ratio was 3.61%. It deserves to be mentioned that both banks have shown low performance compared to banking industry in Turkey as NPL ratio in conventional banks decreased by 20% during the period 2008-2017.



Graph 8: Ratios of NPL to Total Loans in both IBs and CBs in Turkey
Source : Turk Islamic Banks Union

Graph 8 illustrates NPL ratios in both IBs and CBs in Turkey through the period of study. During the years of study, in average IBs have provided a higher performance compared to CBs as the average NPL ratio in IBs was 3.04% while in conventional banks it was 3.4%. During the Global Financial crisis, however, CBs were more sensitive toward the crisis as NPL ratio in CBs increased from 3.8% to 5.6% in conventional banks while in has increased from 3.8% to 4.35% in Islamic Banks. In the years that followed, NPL ratio of both banks started to decrease but IBs witnessed a sharper decrease compared to CBs. For Islamic banks, NPL ratio continued to decrease to reach 2.29% in 2014 while it

reached 2.9% in conventional banks. In 2015 NPL ratio increased in both CBs and IBs. Turkey in 2015 and 2016 suffered from political and economic misunderstandings with other countries beside terrorist attacks in Istanbul. NPL ratio of Islamic Banks reached 2.84% in 2015 and 3.745 in 2016. While in Conventional banks it reached 3.2% in 2015 and 3.4% in 2016. In 2017 NPL in both banks decreased to reach 3%.



CHAPTER 2: LITERATURE REVIEW

This chapter explains credit risk in IBs with highlighting the differences with CBs. In Addition, it provides a brief review about variables of study and interprets previous research opinions about how these variables might affect credit risk in banks.

2.1. Credit Risk Management

The term risk has been used in all ages and different sectors of life and businesses. For financial institutions, however risk is considered more sensitive issue as it might have catastrophic consequences and damages for the institution and the other counterparts such liquidity crisis and even bankruptcy. Due to the numerous types of risks facing banks in all levels of management and working efficient risk management practices should be applied. “The purpose of credit risk management is to maximize a bank’s risk-adjusted rate of return through preserving credit risk exposure within reasonable parameters” Basel II. In the modern era efficient risk management is needed as it is not only a tool for increasing return but also for creating a competitive place for the organization on the other hand inefficient risk would make the organization in a worth position (Nazir, Daniel, Nawaz. 2012:115).

We can consider a risk when there is a potentiality of variable results. Generally speaking, financial risks mainly consist of market, liquidity, and credit risk (Akkizidis, Kumar, 2008:32). Credit risk, however can be defined that the possibility the counterparty might not be able or would not desire to pay its obligations. As depts present more 70% of assets in banks’ balance sheets there no wonder that credit risk is main reason for banks bankruptcy (Van Greuning, Bratanovic, 2009:161).

2.1.1. Credit Risk Management in IBs (Theoretical Overview)

In Islamic banking however, we can define credit risk according to financial product it is associated with e.g., in Murabaha or Ijarah contract the risk occurs when there is a possibility that customer wouldn’t make its due payments on time while in Salam or Istisna it comes to existence when the producers fail to convey the commodity or the product on the agreed time and standards. In case of Musharaka or Mudaraba However, the relation between bank and counterpart is a partnership-based relation rather than

creditor-debtor relation so credit risk occurs when the finance project has the possibility to not bear the expected revenue (Akkizidis, Kumar, 2008:119).

The main distinctions in credit risk management between CBs and IBs come to existence from differences in the financial principles as conventional banks work according to capitalism rules Islamic bank work according to Islamic sharia. Simply Islamic Financial System is a set of instructions and laws originated from Sharia (Islamic law), Main Islamic Banking principles are prohibition of interest (Riba), prohibition of Gharar, prohibition of speculation, necessity of risk sharing and social justice, and necessity of limiting financing to Sharia-approved activities (Van Greuning, Iqbal, 2007:7).

During the last centuries as there were many credit risk management techniques that have been developed by conventional banks, there are still no credit risk management techniques special to under-development Islamic Banking which forces Islamic Banks to use Sharia-compliant conventional credit risk management techniques (Lekpek, 2018:33). Credit risk management in Islamic banks is much wearisome as Islamic Sharia prevents banks from charge extra money for payment delays as it is considered interest so customers can delay payments or even avoid payment as they know no penalty shall be charged (Latif and others, 2014:18). Islamic financial products face different levels of risk exposures, e.g. Debt-based products such as Murabaha and Salam are exposed to a lower level of risk compared equity-based financing products such Musharaka and Mudaraba as the former involves guaranteed schedule payment while equity-based investments are based on profit-loss relation, as a result Islamic banks tend to concentrate more on debt-based investments (Khan, Mirakhor, 2015:169).

In contrast with conventional banks, Islamic Banks come face to face with credit risk. Profit-loss Sharing modes, however, bear credit risk when Mudareb in Mudaraba mode or Sharik (partner) in Musharaka mode does not pay profits to the bank, this situation can result when borrower hides information which bank does not have access to, while in case of debt-based contracts such as Murabaha there is a fixed rate of return and scheduled payments so hazard potentiality would not rise (Siddiqui, 2008:685).

A questionnaire study has been conducted to compare credit risk management in IBs with it in CBs. The study analyzed 180 questionnaires filled by credit risk management offices in 3 IBs and 13 CBs working in Jordan. The study concluded that IBs are more sensitive toward credit risk management than CBs as they give more importance to evaluating and analyzing risks (Alfawwaz et al, 2016:301),

Masood et al (2012), studied credit risk management factors distinguishing IBs from conventional banks in Arab United Emirates. The study analyzed 148 surveys filled by credit risk managers in three IBs and three CBs. Logical regression model has been used. According to result, Islamic banks use more developed and advanced risk management techniques compared to CBs. While CBs care more about cash flow and tend to have more developed risk adjusted return, Islamic banks have more frequent risk assessment processes.

In Lebanon, Hachem and Sujud (2018) compared the aspect of credit risk management of IBs and CBs through analyzing 200 questionnaires filled by 21 conventional banks and 4 Islamic banks. Simple statistical test like mean and standard deviation have been used in the study while researchers tested hypotheses by T-test. According to the study, beside credit risk presence in dept-like transaction Islamic are exposed to moral hazard as they cannot profit from penalties imposed on delayed payment so that IBs are more sensitive toward credit risk management. Researchers suggest that IBs have to assess credit before and after granting.

Akram, and Rahman (2018) conducted a study aiming to analyze credit risk management techniques in both CBs and IBs in Pakistan. Research analyzed annual financial reports for the period 2004-2016 through regression model. According to general results IBs perform credit risk management better than traditional ones specially during the financial crisis. Both banks try to utilize interbank liabilities and collected deposits to push on loans and enhance investments. Researchers suggest that conventional banks have to focus on creating assets-backed products just like Islamic banks and give more attention credit risk.

2.1.2. How credit risk rises from Islamic Banks contract.

Originally Murabaha is a transaction by which the trader buys a property on the purpose to sell it to buyer on agreed profit ratio plus cost, nowadays Islamic banks take the role of trader (Van Greuning, Iqbal, 2007:23). As Murabaha contract mainly carries the risk of default which is considered credit risk. (Tiby, Mohamed, 2011:127) have mentioned that, in case of default banks cannot increase the amount of payment but they are allowed to charges late payment fees and penalties to customers who delay payments with no reason and then donate the extra money to charities as this tool cannot be used for increasing bank profit.

Salam contract is defined as the sale of a well-defined product to be conveyed in the future for a price paid presently, as the seller stays indebted to the buyer until he delivers the product (Al-Fijawi, 2016:65). In Salam contract IBs however, are exposed to credit risk as it is subject to default in case customer could not pay its obligations to bank exactly as in Murabaha, or the seller did not deliver product according to the agreed time and quality and in this case the bank is able to claim against the advanced payment (Tiby, Mohamed, 2011:49,50).

Istisna is a contract made with a producer or a labor to create a good based on specific standards, payment can be advanced or on delivery time or in type of installments (Borhan, 2002:100). In Istisna contract credit risk arises as a result of the buyer disability to buy the agreed product or providing the installed payments after receiving the product (Akkizidis, Kumar, 2008:67).

In Ijarah contract lessor (the owner) gives the right to lease to use a specific property or a good for a fixed period of time against an agreed amount of money (Fatima, 2006:2). As in Murabaha contract credit risk matters in case the customer could not pay the agreed money to the banks (Vejzagic, 2014:3).

In Mudaraba contract however, the relation between bank and Mudareb (funded counterpart) is a profit-sharing based relation, banks cannot participate in managing the funded project or monitor Mudared, so that the bank carries a higher credit risk as the whole profit and loss issue is related Mudareb's ability to efficiently manage the project, as he can damage the banks equity intentionally or unintentionally (Kabir, Worthington, Gupta. 2015:329).

Musharaka is defined profit-loss based joint project or an enterprise in which partners share profit or loss according to predetermined ratio, so the difference between Musharaka and Mudarba is that in Musharaka the partnership includes sharing loss as it includes sharing profit while in Mudaraba it includes sharing profit only (Bhatti, 2011:3). Credit risk in Musharaka agreements comes to existence as a result when the partner does not pay the profit shares to the bank or when the business outcomes vary from the banks expectations (Akkizidis, Kumar, 2008:45).

2.2. Non-Performing Loan (NPL)

Non-Performing Loans to Total Loans ratio is a widely used standard statistic for evaluating the financial performance of banks (Serwa, 2013: 164). NPL ratio is used as a proxy for credit risk by many researchers such as Yuksel (2017), Ahmad and Ariff (2007), Salim et al (2016), Fiordelisi et al (2010), and Misman et al (2015). According to Waqas et al, 2019 a loan can be considered non-performing if its payments gets postponed for more than one year while (Dimitros et al, 2016:116) have reported that it is considered non-performing if payments get deferred for more than 90 days. NPL can also be named troubled debts, or bad debts, these terms refer to loans in default or closed to default (Garla, Boruah, 2018:1).

While loan is considered an asset for banks, interest payment represents banks' profit, so the repayment of the principal and the payment of the loan gets bank will suffer from liquidity and profitability problem which might not only result in profit reduction but also loosing capital (Kirui, 2014:2). As lending is the main activity of commercial banks, NPL ratio is a crucial tool for measuring bank profitability (Akter, Roy, 2017:126). NPL's are given more important as they are a reason for many financial crises as the most important to be mentioned is the previous global financial crisis in United States (Khemraj, pasha, 2009:2).

There is a big emphasis on measuring and studying non-performing loans level due to is in a negative relation with banks' total profitability (Kingu et al, 2018:71) and as a result, affects banks' lending behavior. In the same context, a study based on observations from Italian banks in the period 2007-2013 has concluded that NPL negatively impacts banks' lending decisions in Italy (Cuncinelli, 2015). According to (Fell et al, 2018), in the Euro area higher NPL ratio may impact individual banks' perception toward risk taking to

decreases lending ratio through the periods of high credit risk. Low NPL ratios convinces the bank give more credit, and enhances depositors trust toward the bank (Christaria, Kurnia, 2016:45)

Several studies that tended to investigate the factors affecting banks' credit risk taking NPL as a proxy. Shkodra and Ismajli (2018) have analyzed data belonging to seven commercial banks working in Kosovo for the period 2006-2015 through multivariate regression model. The researched reported that NPL ratio is in a significant negative relation with inefficiency and credit growth while the relation with deposit ratio is positive. On the other hand, the relation with insolvency, loan to deposit ratio, and lending rate is insignificant.

Radivojevic and Jovovic (2017) have conducted a study taking data belonging to 25 merging countries for the period 2000-2011 through linear model of panel data. According to the study some macroeconomic variables have a significant effect on NPL; GDP and domestic currency value negatively affects non-performing loan while unemployment had a positive effect on NPL. Regarding bank specific variables; return on assets has a significant negative relation with NPL while lag NPLs have a positive effect on NPL. From the other side, there was no significant relation between Net Interest Margin and NPL.

Abid et al (2013) investigated factors affecting households' NPL in sixteen banks working in Tunisia. The study employed panel data method to analyse bank data for the period 2003-2012. According to researchers study supports both theories of bad management and bad luck as NPL can explained by macroeconomic variables and Bank specific variables.

2.2.1. Non-Performing Loans Studies in Turkey

Three studies have been conducted in Turkey to predict factors affecting NPL ratio in Islamic Banks; Yüksel (2017) has analyzed the data of 24 deposit banks working in Turkey for 2004-2014 to through porbit model. as the dependent variable in probit model must be categorical, the NPL ratio above the average took the value 1 while NPL ratio under the average took the value 0. According to results, among the variables researcher used on industry production index industry production index has a significant impact

NPL and it is positive impact while other variables such as growth rate and unemployment had no significant impact.

Yağcılar and Demir (2015) have conducted a study to test the impact of macroeconomic and bank specific variables on NPL in 26 commercial banks operating in Turkey. Researchers have analyzed panel regression model to analyze reports belonging to the period 2002:Q4-2013:Q1. According to Results, PLD is negatively related to NPL

Macit (2012), analyzed financial reports belonging to the biggest fifteen commercial banks in Turkey for the period 2005:Q1-2010:Q4 by using Feasible Generalized Least Squares (FGLS) Estimation model. The study included Macroeconomic and Bank Specific Variables. According to regression results, PLA is negatively correlated with NPL ratio while CAR and NIM have a positive relation with NPL, while CAR is positively related to NPL, NIM has no significant relation with NPL.

2.2.2. Non-Performing Loans in Islamic Banks

Ahmad and Ahmad (2004) have conducted a research on the Malaysian IBs and CBs to identify and compare factors affecting credit risk in both of them. The study analyzed data belonging to the six IBs and six CBs for the years 1996-2002 through panel data regression analysis. According to study credit risk in IBs is significantly influenced by and size. While in CBs, CAR, LLP, and loan exposure to risky sectors. Both of them similarly affected by leverage, funding cost, and risk weighted assets.

Firmansyah (2014) has analyzed monthly average data for of all Syariah Rural Credit Banks (SRCB) Islamic banks in Indonesia through multiple regression analysis with least squares equation. The study tested the impact of macroeconomic and bank specific variables. According to the results, GDP and inflation negatively affects NPL, while the effect of liquidity is positive. On the other hand, size and inefficiency have no effect NPL.

Wiryono and Effendi (2018) tested the impact of macroeconomic variables and banks specific on NPL of IBs in Malaysia. Data was analyzed through panel data regression analysis. According to results, financing quality, financing expansion, GDP and inflation negatively and significantly affect NPL.

Özkan and Işıl (2016) have analyzed data related to four active IBs working in Turkey for the period 2006-2014 through panel data regression analysis in order to predict banks

specific factors affecting NPL. According to the study, LLP to total assets ratio positively affect NPL while size and proportion of loan to assets negatively affects NPL.

Zolkifli et al (2018) have conducted a comparative study to investigate factors affecting credit risk in both IBs and CBs in Malaysia by analyzing data for the period 2008-2016 through panel data analysis. In CBs credit risk has a positive relation with bank size, funding cost, and PLD, and negatively affected by leverage, management efficiency, risky loan sector. While in Islamic banks, only loan to risk weighted assets ratio and PLD have a significant positive impact credit risk while management efficiency, size and risky loan sector have a positive relation.

Havidz, and Setiawan (2015) conducted a research for investigating the predictors of bank efficiency and NPL by employing Data Envelopment Analysis. the study analyzed data for the period 2008-2014 with taking four Islamic Indonesian banks as a research sample. According to results, NPL ratio has a significant relation with operational efficiency ratio, size, and GDP growth rate. While the impact of PLD, CAR, inflation, and return on assets is insignificant.

2.3. Selected variables literature

In this study we are testing the effect of six bank specific variables on NPL, these variables are Capital Adequacy Ratio (CAR), Proportion of Loan to Deposit (PLD), Proportion of Loan to Assets (PLA), Net Interest Margin (NIM), Loan Loss Provision (LLP), and Assets Size (Size).

Table 4:
Selected Variables Literature

	Variable Name	Equation	Sources
1	Non-Performing Loan (NPL)	$\text{NPL} = \frac{\text{Non-performing loans}}{\text{Total Loan}}$	Yuksel (2017), Ahmad, Ariff (2007), Salim et al (2016), Fiordelisi et al (2001), Misman et al (2013), Waqas et al (2019), Dimitros et al (2016), Garla, Boruah (2018), khmraj, pasha (2009), Kingu et al (2018), (uncinelli (2015)

2	Capital Adequacy Ratio (CAR)	=Owners' Equity / Total Asset	Fatima (2014), Wood, Skinner (2018), Sinkey, Greenawalt (1991), Panta (2018), trenca, Bozga (2018), Waqas et al (2013), Koju et al (2018)
3	Proportion of Loan to Deposits (PLD)	=Total Loans/ Total deposits	Koju et al (2018), Jameel (2014), Yağcılar, Demir (2015), Anjom, Karim (2014), Abdioglu, Aytekin (2016), Wood, Skinner (2018)
4	Proportion of Loan to Assets (PLA)	=Total Loans/ Total Assts	Kumbirai, Webb (2010), Sinkey, Greenwalt (1991), Koju et al (2018), Shinjergji (2013), Ekanayake (2015), Rajah (2016), Klein (2013), Macit (2012),
5	Net Interest Margin (NIM)	= (Interest income – Interest expense) / Total assets	Saksonova (2014), Das, Gosh (2007), Shinjergji (2013), Macit (2012), Adje et al (2018), Angbazo (1994), Radivojevic, Jovovic (2017), Das, Ghosh (2005), Abdioglu, Aytekin (2016).
6	Loan Loss Provision (PLL)	= Loan Loss Provision / Total Loan	Laeven, Majnoni (2003), Soedarmono et al (2016), Ozili (2018), Ahmad, Ahmad (2005), Karimiyani et al (2013), Boudriga et al (2009), Ekanayake, Azeez (2015), Al-Samdi, Ahmad (2009)
7	Natural Logarithm of Total Assets (SIZE)	= Bank <i>i</i> Total Assets / Total Assets of all Banks in the Country	Ranjan, Dhal (2003), Hu et al (2004), Das, Josh (2005), Islam, Nishiyama (2016), Alhassan et al (2014), Das, Gosh (2007), Macit (2012)

2.3.1. Capital Adequacy Ratio

In 1988, Basel committee issued a statement dealing with CAR which suggested an international standard approach for calculating Capital Adequacy Ratio with specifying a

minimum standard one (internet newzealand). After the last global financial crisis, however, Bank of International Settlement (BIS) proposed Basel III which suggests that banks have to keep a CAR of at least 10.5%, while Basel II required banks to keep a ratio of 8% (Li et al, 2016: 1). CAR is defined as the ratio of a bank's core capital to banks total assets weighted to risk (Bialas, Solek, 2010: 49).

Capital adequacy ratio is important for evaluating the stability of banks financial structure as it measures the banks' ability to face any financial defaults such as credit default and avoid insolvency, it is computed by dividing banks' capital by risk weighted credit exposure (Fatima, 2014: 772). Higher CAR indicates banks' ability to survive even in case of loss, thus, it increases depositors trust toward the bank to deposit more money which increases banks' liquidity and ability to generate profit (Christaria, Kurnia, 2016:44).

Theoretically, there is no specific impact of CAR on NPLs; from a side, banks with high capital more aggressive lending procedures which may result in higher NPL level, from another side lower capital ratio might force banks to adopt low lending standards in order generate higher profit and increase owners' equity which might also result in higher NPL levels (Wood, Skinner, 2018:46).

According to a study made by Sinkey and Greenawalt (1991), banks with higher adequate capital have a higher loan quality and as a result lower NPL ratio. On the other hand, it can be mentioned that Capital Adequacy Ratio negatively affects NPL though statistically it is insignificant (Panta, 2018), and from the European Banking sector the same result has been reached (Trenca, Bozga, 2018). While Waqas et al (2013) made a study taking Pakistani and Bangladeshi banks as a sample reported that NPL ratio is significantly affected by capital ratio, and same result in a similar study has been reported by Jameel, 2014. Higher capital adequacy ratio reflects the banks' ability for long-term financing and resilience against insolvency (Koju et al, 2018: 2).

2.3.2. Proportion of Loan to Deposits

Which also can be referred to as credit-deposit ratio is used for measuring liquidity, as the mentioned ratio gets higher it means higher profitability as it represents the result of efficiently employing banks deposits which is attractive for investors who deposit money (Koju et al, 2018:3). According to Sharifi and Akhter (2016), Credit-deposit ratio is a

crucial tool for measuring banks' performance as it shows banks' ability to utilize funds in order to generate profit. On the other hand, it measures the banks aggressiveness in lending decision, thus measures the banks tendency to take risk.

Higher credit-deposit ratio indicates risk preferences of the bank, so that a positive relation is expected between PLD and NPL ratio, while in case of low credit-deposit ratio it reveals the high liquidity of the bank which reduces insolvency risk (Tole et al, 2019:202). In a study made in Pakistan it was concluded that PLD negatively affects NPL ratio but statistically insignificant effect (Jameel, 2014:707). But Yağcılar and Demir (2015) in their study have found a significant negative correlation between credit to deposit ratio and NPL which can be explained by mentioning that higher credit to deposit ratio is the result of a higher level of management efficiency supposes efficiency in mitigating credit risk. While Anjom and Karim (2014) could find a significant positive relation between credit deposit ratio and NPL ratio. The same view is supported by Abdioglu and Aytekin (2016). From the same point of view banks should not focus on employing all the funds in crediting as this behavior may result in increasing the riskiness of profit portfolio, instead they have research for safer investment (Wood, Skinner, 2018:47).

2.3.3. Proportion of Loans to Assets

Through this ratio a bank can evaluate its liquidity position as higher ratio represents higher liquidity as it measures the proportion of loans in banks assets (Kumbirai, Webb, 2010: 40). According to Sinkey, and Greenwalt 1991, higher loans to asset ratio represents the banks tendency to realize more profitability despite risk cost.

Theoretically, a higher PLA increases the chance for credit problems (Koju et al, 2017:3), as the same result statistically has been reported from a study taking the Albanian banks as a sample (Shinjergji, 2013: 151) and a similar study in Srilanka (Ekanayake, Azeez, 2015: 878). on the line, Rajha (2016) has reported that loans to assets ratio is one of the most significant factors that positively affect non-performing loans. (Klein, 2013: 29) reported that higher credit to asset ratio indicates higher tendency for taking risk which means higher rate of NPL. While in Turkey, a negative relation has been reached this negativity can be explained by understanding that banks with higher loans asset share

have a chance diversify their credit portfolio thus, they have ability to minimize credit problems (Macit, 2012: 37).

2.3.4. Net Interest Margin

Net interest margin which is also referred to as net interest profitability is the ratio of net interest income to banks' assets (Saksonova, 2014: 134). (Das, Gosh, 2007: 18) have reported that a decrease in NIM might incentive policy maker to change lending standard which might lead to more risk. Shinjergji (2013) in his study on the Albanian banks has reported a positive relation between NIM and NPL. According to (Macit, 2012: 37), as banks with higher Net Interest Margins charge higher interest rates from borrowers, the generally lend people who could not borrow from other banks (Risky Borrowers) which results more credit risk, and this behavior justifies the positive relation between Net Interest Margin and NPL. This opinion is supported in a study made by (Adje et al, 2018) on the developed countries as they concluded that an if Net Interest Margin increases by 10% NPL may increase by 7%. On the line, in money center banks net interest margin in significantly in a positive relation with NPL (Angbazo, 1994). According to the other point of view, other researches could not find any significant relation between NIM and NPL (Radiojevic, Jovovic, 2017). The same was in Indian banks during the period 1994-2005 (Das, Ghosh, 2005). While a negative relation got noticed in the Turkish banks (Abdioglu, Aytekin, 2016).

2.3.5. Loan Loss Provision

This term refers to the amount of money that a bank assigns to restitute the expected loan defaults generated from credit default (Laeven, Majnoni, 2003). Soedarmono et al (2015) reported that banks give more emphasis on Loan Loss Provision as it is a crucial tool for mitigating credit risk, mentioning that it is sensitive in case of cyclicity. It is expected that in bad economic situations banks tend to keep higher rates of Loan Loss Provision to be ready for the expected high rates of loan defaults which signals a positive correlation between LLP and NPL (Ozili, 2019). According to Ahmad and Ahmad (2005), Loan Loss Provisions ratio is significantly in a positive correlation with NPL, as it represents the level of loan quality. In Malaysia after analyzing data belonging to twelve commercial banks for the period of 2004-2011 through Fixed Effect Model the same result has been reached (Karimiyan et al, 2013). Other studies supported the same findings (Boudriga et

al, 2009) (Ekanayake, Azeez, 2015: 880). While Al-Samdi and Ahmad, 2009 have reported that the two variables are positively correlated but statistically insignificant. While it can be mentioned that non-discretionary loan loss provisions cannot be easily regulated as they depend on NPL (Soedarmono et al, 2015).

2.3.6. Total Assets

Which is also called size, or natural logarithm of total assets, it is measured as the ratio of a specific bank's total assets to total assets of the all banks in the sector (Ranjan, Dhal, 2003). Theoretically, banks with larger size have better resources and abilities to evaluate credit requests which leads to higher loan quality and lower ratio of NPL (Hu et al, 2004) (Das, Josh, 2005). This theory was supported in many studies. Ranjan and Dhal 2003 found a significant negative effect. In South-Asian countries, Islam and Nishiyama 2016 could reach the same findings. On the other hand, it is also mentioned that as banks get larger efficiently evaluating credit requests gets more difficult which opens the door for loan problems (Alhassan et al, 2014). This theory was supported by the findings of Us 2016 in Turkey. In India Das and Gosh 2007 have reported a positive impact of size of asset on NPL ratio. While Macit (2012) has reached that the relation between SIZE and NLP is insignificant, as it is supported by his empirical study in Turkey.

CHAPTER 3: METHODOLOGY

This study investigates variables affecting NPL in both IBs and CBs working in Turkey through employing panel data fixed effect model. Credit risk proxy in this study is Non-performing Loans ratio. While the research measures the effects of banks specific variables including Capital Adequacy Ratio (CAR), Natural Logarithm of Total Asset (Size), Proportion of Loan to Deposit Ratio (PLD), Net Interest Margin (NIM), Proportion of Loan to Asset Ratio (PLA), and Loan Loss Provision (LLP).

Data are collected from reports published on quarterly basis considering the period 2008 Q1 to 2017 Q4. Islamic banks reports were collected from internet website of Turk Participation Banks Union. Totally we have 120 observation. The participating banks analyzed in the study are Kuveyt Turk Banks, Albaraka Turk Bank, and Turkiye Finans Bank. for conventional banks, we have used previous studies conducted in Turkey as a secondary source of data to compare our empirical results to conventional banks results.

3.1. Panel Data Regression Analysis

The concept panel data was used for the first time in 1938 by Lazarsfeld and Fiske in marketing econometrics to measure the impact radio advertisements on sales level (Frees, 2003). Panel data expands a large number of data points which helps incrementing degrees of freedom and reducing collinearity among explanatory variables so the efficiency of econometric estimations gets higher (Hsiao, 2003). Panel data (longitudinal data) is a set of data related to the same cross section ex, firms, families individuals or country over time (Wooldridge, 2002). Well-organized panel data are more attractive as they provide the ability to identify the impact of predicted variables (Park, 2011). According to Baltagi (2001), panel data provides the researcher with higher degrees of freedom, less collinearity among variables, more informative data and higher efficiency. Panel data can be used for measuring effects of time, individuals, or both of them using fixed effect or random effect models (Park, 2011).

3.1.1. Variables of Study

In this research, NPL ratio is the dependent variable as it is used as a representative value of credit risk as by many other researchers such as Yuksel (2017), Ahmad and Ariff (2007), Salim et al (2016), Fiordelisi et al (2001), Misman et al (2013) while selected six bank internal variables will be used as explanatory variables; Proportion of Loans To Assets (PLA), Capital Adequacy Ratio (CAR), Loan Loss Provision (LLP), Proportion of Loans to Deposits (PLD), Natural Logarithm of Total Assets (SIZE), and Net Interest Margin (NIM).

$$NPL = \frac{\text{Non-Performing Loans}}{\text{Total loans}}$$

$$CAR = \frac{\text{Owners equity}}{\text{Risk Weighted Assets}}$$

$$LLP = \frac{\text{Loan Loss Provision}}{\text{Total Loans}}$$

$$NIM = \frac{\text{interest income}-\text{interest expense}}{\text{Total Assets}}$$

$$SIZE = \frac{\text{Bank i Total Asset}}{\text{Total Assets of all Bank}}$$

$$PLD = \frac{\text{Total Loan}}{\text{Total Deposits}}$$

$$PLA = \frac{\text{Total Loan}}{\text{Total Assets}}$$

3.1.2. Model

In this research, panel data analysis is chosen as our data set is both time series and cross-sectional. Set of data belongs to the period 2008-2017 (time series) and three Islamic banks (cross-sectional).

$$NPL_{i,t} = \alpha + \beta_1 CAR_{i,t} + \beta_2 LLP_{i,t} + \beta_3 NIM_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 PLD_{i,t} + \beta_6 PLA_{i,t} + \varepsilon_{i,t}$$

Where;

$NPL_{i,t}$ = Non-Performing Loan ratio of bank i in quarter t

$CAR_{i,t}$ = Capital adequacy ratio of bank i in quarter t

$LLP_{i,t}$ = Loan Loss Provision ratio of bank i in quarter t

NIM $_{i,t}$ = Net Interest Margin ratio of bank i in quarter t

SIZE $_{i,t}$ = Natural Logarithm of Total Assets ratio of bank i in quarter t

PLD $_{i,t}$ = Proportion of Loans to Deposits ratio of bank i in quarter t

PLA $_{i,t}$ = Proportion of Loan to Assets of bank i in quarter t

3.2. Analysis Procedures

3.2.1. Testing Panel Data Unit Root

In order to conduct panel data regression analysis, we have to be sure that all variables are stationary. For this purpose, we conduct three tests.

3.2.1.1. Levin-Lin-Chu Test

Instead of applying unit root test for each cross-section LLC provide a more powerful unit root test. LLC is suggested to be used for a moderate sized panel with N between 10 and 250 (Baltagi, 2010:241). The proposed null hypothesis states that every time series includes a unit root while the alternative hypothesis states that every individual time series is stationary. LLC test is usually used for balanced panel data. In case one of the variables contains a unit conduct the test again with considering the first difference instead of the first level value.

Test Hypothesis

$$H_0 : P_i = P = 0$$

$$H_a : P_i = P < 0 \text{ for all } i.$$

The structure of the test may be written as follows:

$$\begin{aligned} \Delta Y_{it} &= \rho Y_{it-1} + \alpha_0 + \alpha_1 t + u_{it}, \\ i &= 1, 2, \dots, N, \quad t = 1, 2, \dots, T \end{aligned}$$

3.2.2.2. Im, Pesaran, and Shin Test

IPS test is applied to test the existence of unit root in panel data and usually used for unbalanced panel data. As it has a superior test power by economics analysts it is applied in our study. Conducting IPS test starts with assigning a distinct ADF regressor for every cross-section with individual trend and time trend. Here we mention that the null hypothesis of IPS test is that each series in the panel data contains unit root (not stationary).

Test Hypothesis

$$H_0 : \beta_i = 0, \text{ for all time series}$$

$$H_0 : \beta_i < 0, \text{ for one or more } i.$$

Test Structure

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t-1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t-j} + \varepsilon_{it}$$

$$\text{where } i = 1, \dots, N \text{ and } t = 1, \dots, T$$

3.2.2.3. Fisher-Type Tests

Fisher-type test proposed by Madala and Wu (1999) and Choi (2001). This test combines p-value from unit root tests for each cross-section i to test unit root in panel data. According to Maddala et al. (2000) Fisher test is superior to both IPS and LLC, in addition Fisher test does not require a balanced panel data which is an advantage compared to IPS.

Test Hypothesis

$$H_0 : Y_i = 0 \text{ (} \pi_i = 1 \text{),}$$

$$H_1 : Y_i < 0 \text{ (} \pi_i < 1 \text{).}$$

Test Structure

$$\rho = -\frac{1}{\sqrt{N}} \sum_{i=1}^N [\ln(\pi_i) + 1]$$

3.2.2. Testing Autocorrelation

As autocorrelation is a reason for biasing standard errors and results inefficiency we use Wooldridge test to control data autocorrelation. Wooldridge test is attractive for

researchers as it is applicable under general conditions and easy to implement. The null hypothesis of this test proposes that no first-order autocorrelation.

Test Hypothesis

$$H_0 : \sigma_{\gamma}^2 = 0$$

$$H_0 : \sigma_{\gamma}^2 \neq 0$$

Test Structure

$$y_{it} = \alpha + X_{it}\beta_1 + Z_i\beta_2 + \mu_i + \epsilon_{it} \quad i \in \{1, 2, \dots, N\}, t \in \{1, 2, \dots, T_i\}$$

In case of autocorrelation, we solve the problem panel-specific AR (1) autocorrelation structure is used.

3.2.3. Selecting Panel Regression Model.

Hausman test is used to know which model is supposed to be applied in panel regression analysis. So, it is used to select between Fixed Effect Model and Random Effect Model. Hausman test, simply, test the correlation between unique errors (U_i) and regressors as the null hypothesis, the null hypothesis is that there is no correlation. In case of accepting the null hypothesis of the test random effect model is chosen while if it is rejected the fixed effect model is preferred as an estimator. So, after performing the test if P value is higher than 5% we select random effect model as the null hypothesis is accepted while if P value is lower than or equal to 5% the null hypothesis is rejected and fixed effect model is selected as it is the only consistent model. In other words, there is no correlation between unique error and regressors.

$$H_0: \text{Random Effect Model } [Cov(\alpha, x_{it}) = 0]$$

$$H_1: \text{Fixed Effect Model } [Cov(\alpha, x_{it}) \neq 0]$$

$$H = (\beta_c - \beta_e)' (V_c - V_e)^{-1} (\beta_c - \beta_e)$$

In Hausman test the null hypothesis refers to that covariance of α_i is equal to the covariance of x_{it} and in this $\beta_{FE}^{\wedge}$ is consistent with $\beta_{RE}^{\wedge}$, which means random effect model is more efficient as it has a standard error less than the standard error of fixed effect model.

CHAPTER 4: RESULTS AND DISCUSSION

4.1. Descriptive statistics

Table 5:
Descriptive Statistics of Islamic Banks Data

VARIABLE	Mean*	Median	Standard Deviation	Minimum	Maximum
NPL	0.033	0.028	0.013	0.017	0.0644
CAR	0.149	0.149	0.018	0.122	0.1846
LLP	0.022	0.021	0.006	0.0103	0.04
NIM	0.011	0.01	0.003	0.008	0.023
SIZE	0.012	0.011	0.003	0.006	0.018
PLD	1.002	0.966	0.105	0.818	1.251
PLA	0.7	0.694	0.061	0.586	0.835

*Results have been obtained by Microsoft Excel Software

Table 5 views descriptive statistics of IBs data. Namely, mean, median, standard deviation, and minimum and maximum value. It can be noticed that, there are little differences between IBs and CBs data statistics except in SIZE which is expected as IBs are still a new field and represent only about 5% of banking industry in Turkey. Related to other variable, the mean of NPL ratio in IBs is a little bit smaller than it in CBs which reflects IBs ability to sustain a less risky credit portfolio compared to CBs. On the other hand, PLA and PLD in IBs have bigger means which might indicate that IBs are more efficient in employing deposits or they have more tendency toward taking risk compared to CBs. CAR in both Islamic and conventional banks are similar to each other. As LLP ratio mean in IBs is less than it in CBs, it can be stated that CBs are more sensitive toward credit defaults that may happen.

4.1. Unit Root Test Results

Table 6 shows stationarity testing results of Islamic Banks

Table 6:
Unit Root Test Results for Islamic Banks Model

Variable	Test	First Level	P-value considering First Difference
NPL	Levin, Lin & Chu t	0.3343	0.0000
CAR		0.6192	0.0000
LLP		0.6964	0.0000
NIM		0.0738	0.0000
SIZE		0.9916	0.0000
PLD		0.4809	0.0000
PLA		0.0235	0.0000
NPL	ADF - Fisher Chi-square	0.6414	0.0000
CAR		0.8973	0.0000
LLP		0.886	0.0000
NIM		0.3565	0.0000
SIZE		0.9948	0.0001
PLD		0.7522	0.0000
PLA		0.1616	0.0000
NPL	PP - Fisher Chi-Square	0.7257	0.0000
CAR		0.9452	0.0000
LLP		0.9082	0.0000
NIM		0.1131	0.0000
SIZE		0.9955	0.0000
PLD		0.3532	0.0000
PLA		0.0084	0.0000

After applying Levin, Lin & Chu t test, ADF – Fisher Chi-square test and PP – Fisher Chi-square test for IBs data, as shown in Table 6, we found that all variables were containing unit root at the first level which forces as to accept the null hypothesis. As an econometric solution we reapplied the test by using the first difference and we could find a p-value of 0.0000 for all variables, so we reject the null hypothesis and state each time series in the data set is stationary.

4.2. Autocorrelation Testing Results

Table 7:
Autocorrelation Wooldridge Test Results

	P-value	Decision
Islamic Banks	0.0034	Null Hypothesis Rejected

As Wooldridge autocorrelation test is based on the null hypothesis that “No first order autocorrelation”, we reject the null hypothesis in Islamic banks model which means that there is an autocorrelation problem in Islamic banks model as P-value is less than 0.05. So, a statistical solution will be implemented.

4.3. Hausman Test Results

Table 8:
Hausman Test Results

	P-value	Decision
Islamic Banks Model	0.0370	Null Hypothesis Rejected

Based on results shown in table 8 null hypothesis is rejected in IBs Model which means that the difference in coefficients is systematic so fixed effect model is selected.

4.4. Regression Results

Table 9:
Fixed Effect Regression Results

	Coef.	Std. Err.	z	P-value
CAR	0.0083777	0.0217861	0.38	0.701
LLP	0.9578313	0.0805823	11.89	0.000
NIM	-0.0136321	0.1166002	-0.12	0.907
PLD	0.0143598	0.0063266	2.27	0.023
PLA	-0.0221218	0.0109181	-2.03	0.043
SIZE	-0.4572714	0.4075677	-1.12	0.262
-cons	0.0191265	0.0107741	1.78	0.076
R-sq	62.26%			

Based on our econometric regression results in table 9, CAR variable has a positive relation with NPL in IBs, but statistically the relation is not significant. While in conventional banks Yağcılar and Demir (2015) have reported a positive relation between

CAR and NPL. this result is justified that banks with strong financial structure are ready to take more risk while as IBs are still junior institutions they are more sensitive toward risk.

As expected, LLP is positively and significantly related to NPL in IBs. It could be seen that both of them have a P-value of 0.000 while coefficient is slightly different as it is 0.9578313 in Islamic banks and 1.0478270. This result supports the findings of many other studies (Ozili, 2019) and (Ahmad, Ahmad, 2005) as banks prefer to keep higher rates of LLP in case of higher expected NPL. in Turkish conventional banks same results has been reached by Isik and Bolat (2016).

In our regression model NIM in Islamic banks has a negative relation with NPL but this relation is statistically insignificant as P-value 0.907. In conventional banks, Macit (2012) could find a significant positive relation between NIM and NLP, he justified this result that banks with higher NIM tend to charge higher interest rates which attracts only risky borrowers. While in Islamic Banks, even though they charge high interest rates they still not to lend risky borrowers as they have less alternatives in case of credit default.

Proportion of Loans to Deposits positively affect NPL in Islamic banks, these findings support Anjom, and Karim (2014) findings and exemplifies the theory of Wood, and Skinner (2018) which states that as banks tend to have a bigger credit portfolio, they accept more risk. In conventional banks, however, Yağcılar and Demir (2015) have reported a negative relation between PLD and NLP. Justification was that as banks increase lending ratios they increase the quality of credit requists evaluation process and perform a more proffissional loan portfolio diversification. The same situation is not existing in Islamic Banks, this problem might be due to the restricted loan portfolio diversification as Islamic Banking is limited to specific types of transactions.

PLA variable has a significant negative relation with NPL in IBs meaning that an increase by 1% in PLA in Islamic banks will result in a decrease by 0.0221218% in NPL. As Macit (2012) reported the same conclusion related to conventional banks in Turkey. Macit (2012) has mentioned banks with higher PLA have a better ability to diversify credit. Credit diversification helps banks to distribute risk among different sectors, thus, the

collapse or crisis of sector will have a significant impact on credit portfolio as most credit is given to other sectors which minimized credit problems.

SIZE in Islamic banks negatively related but statistically this relation is insignificant as P-value 0.262. While in conventional banks, Yağcılar and Demir (2015), have concluded that SIZE is negatively impacting NPL. The justification her is that, loan defaults in bigger banks cost more and it will be a bigger damage for shareholders. So, these banks struggles hard to avoid loan defaults. In Islamic Banks, however, as they still small sized, bank size has no impact on NPL ratio.



CONCLUSION

In this study, the researcher aimed to identify factors impacting credit risk faced by Islamic banks in Turkey with viewing differences between Islamic and conventional banks in this point. We employed panel data regression analysis for analyzing quarterly data belonging to three Islamic banks in Turkey for the period 2008 Q1-2017 Q4. Based on Hausman test results fixed effect model is selected. While the results of previous studies conducted in Turkey have been used to compare our empirical findings to conventional banks. Non-performing Loans to Total Loans ratio has been used as a proxy for credit risk in this research. According to empirical results NPL ratio in Islamic banks has a positive significant relation with Loan Loss Provision and Proportion of Loan to deposits ratio while it has a significant negative relation with proportion of Loans to assets. While Non-performing Loans in Islamic banks does not have any significant relation with Capital Adequacy Ratio, Net Interest Margin or size. In conventional banks, however, NPL ratio was significantly positively affected by Loan Loss Provision, Net Interest Margin and Capital Adequacy Ratio while it was significantly negatively affected by Proportion of Loan to Deposits, Proportion of Loans to Assts and SIZE. The similarities were related to Loan Loss Provision and proportion of Loan to Assets.

It can be proposed that, Islamic Banks have to concentrate more on managing loan portfolio in order to create a negative correlation between credit expansion and NPL ratio.

In the future the same research can be applied with using macroeconomic variables instead of bank specific variables as the economic situation of the country affect individual borrowers' financial situation, thus, it affects their ability to pay back loans which might result in a change in NPL ratio.

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