T.C.
SAKARYA UNIVERSITY
INSTITUTE OF SOCIAL SCIENCE

THE IMPACT OF INTEREST RATE FLUCTUATIONS ON THE PARTICIPATION BANKS PROFITABILITY: TURKEY CASE

M.Sc. THESIS

Mariem MINNY

Department : Islamic Economy and Finance

Thesis Supervisor : Assoc.Prof. Şakir GÖRMÜŞ

JULY-2017

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This thesis has been accepted unanimously/with majority of votes by the examination committee on 19/07/2017

JURY MEMBERS	CONVICTION	SIGNATURE
Doç.Dr.Şakir Görmuş	Successful	
Doç.Dr. Ali Kabasakal	Successful	
Prof.Dr. Seyit Köse	Succesful	

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Mariem Minny

ÖĞRENCİ BİLGİLERİ

Adı – Soyadı	:	Mariem Minny
Öğrenci Numarası	:	Y1460600 24
Ana Bilim Dalı	:	İslam Ekonomisi ve Finansı
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Doç. Dr. Sakir Görmüş
Danışman
(Adı - Soyadı, İmzası, Tarih)

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Mariem MINNY

25/07/2017

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LIST OF SYMBOLS AND ABREVATIONS

TKBB : Participation Banks Association of Turkey

CAGR : Compound Annual Growth Rate

TBB : The Banks Association of Turkey

BA : Branches Abroad

BT : Branches in Turkey

PCSE : Panel Corrected Standard Error

GCC : Gulf Cooperation Council

ROA : Return on Assets

ROE : Return on Equity

PBT : Profit Before Tax

OLS : Ordinary Least Squares

GDP : Gross Domestic Product

PLS : Profit Loss Sharing

IFSB : Islamic Financial Services Board

VAR : Vector Auto-regression

ARDL : Auto-Regressive Distributive Lag

ICB : Industrial and Commercial Bank of China

VEC : Vector Error Correction

TCMB : Central Bank of Turkey

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The Title of the Thesis: The Impact of Interest Rate Fluctuations on The Islamic Banks Profitability: Turkey Case.

Author : Mariem MINNY **Supervisor :** Assoc.Prof. Şakir GÖRMÜŞ

Date : **No. of pages :** First part (ix)+Theses (62)

Department : Islamic Economy and Finance

The core objective of the current study is to analyze the relationship between the interest rate changes on the profitability of the participation banks being operated in Turkey by examining the financial statements of three major participation banks during 2008 Q1 to 2016 Q3. The panel data analysis and panel co-integration estimation technique are adopted to achieve the objectives of the study. The results from Kao co-integration test show that the variables are co-integrated. In addition, the coefficient of interest rate on profitability estimated by FMOLS. The empirical analysis shows that the interest rate changes have a significantly positive relationship with the profitability of the participation banks.

Keywords: Determinants of Banks Profitability, Islamic Economy, Islamic Finance, Impact of interest rate on Banks Profitability

Sakarya üniversitesi,Sosyal Bilimler Enstitüsü **Yüksek Lisans Tez özeti**

Tezin Başlığı: İslami Bankalar Kârlılığa Faiz Oranı Değişiminin Etkisi: Türkiye Örneği.	
Tezin Yazarı: Mariem MİNNY	**Danışman:** Doç.Dr.Şakir GÖRMÜŞ
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Mevcut çalışmanın temel amacı, 2008 yılı I. Çeyrek 2016 Üçüncü çeyreğinde Türkiye'de faaliyet gösteren üç büyük katılım bankasının finansal tablolarını inceleyerek katılım bankalarının karlılık, faiz oranlarındaki değişimlerin arasındaki ilişkiyi analiz etmektir. Çalışmanın amaçlarına ulaşmak için panel veri analizi ve panel eşbütünleşme tahmini tekniği benimsenmiştir. Kao eşbütünleşme testlerinin sonuçları ilişkin göstergeler eşbütünleşiktir olduğunu göstermektedir. Ayrıca, faiz oranının kârlılık katsayısı FMOLS tarafından tahmin edilmiştir. Ampirik analiz faiz oranı değişiklikleri katılım bankalarının karlılık ile anlamlı pozitif ilişki olduğunu göstermektedir.

Anahtar Kelimeler : Bankaların Kârlılıklarının Belirleyicileri, Islam Ekonomisi, Islami Finans, Faiz Oranlarının Bankalar Kârlılığına Etkisi.

INTRODUCTION

The Islamic finance has become a very essential part of the global international financial system in the last decades which is predictable after the high recorded compound. According to the world Islamic banking reports, average growth rate (CAGR) is 20% per year which assured development in assets from 150.0 billion $ in the mid-1990s to around USD 1.88 trillion in 2015. In addition to the Islamic finance noticeable growth and especially after the subprime mortgage crisis in late 2007, the whole world got to know that the conventional economic and banking systems have a lot of gaps which directed their eyes to the new banking system (Islamic finance) that wasn't affected to a remarkable degree by the same crisis. That's what gave some of the countries courage to adopt the Islamic system as the base for their banking system and economic activities like Pakistan (in a specific period), Iran and Sudan. Others preferred the dual banking system such as Malaysia, Qatar, Bahrain, Kuwait and Turkey among others.

In turkey, in 1985 Albaraka Turk and Faisal Finance were established as the first participation banks or "Private Financial Institution" as it used to be named at that time. After that the market opened its doors for all the investors who wanted to invest in this field. The following banks proceeded to action in the specified corresponding years. Kuveyt Turk Finance institution in 1989, Anadolu Finance institution in 1991, Ihlas Finance institution in 1995, Asya Finance institution in 1996, Turkiye Finance in 2005 and more recently Ziraat Participation Bank (2015) and Vakiflar Participation Bank (2016) (TKBB reports).

To encourage the improvement of the Islamic banking system in the market and make it operate with more influence, in 2005 the name "Private Financial Institution" was changed to nowadays known name "Participation Bank" but maintaining all the old work principles and methods. Participation Banks Association of Turkey (TKBB) was established in 2006 with the objective of developing the coordination and corporation between the participation banks.

In the last years, participation banks in Turkey showed a very fast improvement however, they reached this point after a lot of bumps especially during the period of private financial institutions that was defined as the most challenging period.

The following are some of the difficulties that faced the participation banks in its first years Turkey:

- The weakness of the legislation,
- Lack of legal basis,
- The small number of branches,
- Insufficiency of infrastructure,
- Difficulties in personnel procurement,
- High inflation
- The general instability of the economy

Despite the fact that the participation banks don't use interest rate in their operations, the major point of concern is finding out whether the interest rate of the conventional bank's fluctuations affect the participation banks profitability in anyways.

Purpose of the Research

The purpose of the research is to study the impact of interest rate changes on the Islamic Banks despite being interest-free. This research seeks to determine if the interest rate fluctuations impact the Islamic Bank's profitability and how. This research also aims to identify the relationship between the Islamic Bank's profitability and other concepts such as total assets and loan.

Research Questions

The research questions of this study are:

- Do the interest rate fluctuations affect the Islamic Bank's profitability?
- How can the relationship between interest rate and Islamic Banks profitability be defined?

Research Hypotheses

The hypotheses of the research are:

- The fluctuations of the interest rate affect the Islamic Bank's profitability.
- The fluctuation of the interest rate impacts the Islamic Bank's profitability in a negative way, in other words when the interest rate increases the Islamic Bank's profitability decrease and vice versa.

The rest of the paper is organized as follows. Participation banks in Turkey were discussed, in addition to the purpose, questions, hypotheses and methodology of the research in the introduction , first section will be a resume of the Turkish Banking System in general and the Participation Banking Sector in specific where there is clarification of the participation banks status with statistics, then the second section discusses the determinants of banks profitability including the Islamic Banks in which a big group of authors review will be spotted and the diversity in their opinions will be mentioned .In the third section, the impact of the interest rate on the banks in general and on their profitability in specific will be discussed. The last section before the conclusion is the most important part which is the empirical framework in which the data and the econometric methodology used plus the results of the econometric research will be presented, then Conclusion and recommendations in the last.

CHAPTER 1: DEVELOPMENT OF ISLAMIC BANKING IN TURKEY

1.1 An Overview of the Turkish Conventional Banking Sector

According to the Turkish Banking Association (TBB) reports, the banking sector in Turkey contains 47 banks and these banks are giving services through 10677 branches in Turkey and 79 abroad. These 47 banks include deposit banks which can be divided into state-owned deposit banks, privately owned deposit banks, banks under the deposit insurance fund and foreign banks. In addition to development and investment banks which are divided into state-owned development and investment banks, private development and investment banks and foreign development and investment banks (TBB reports, 2016).

From the 47 banks in Turkey, only three of them are deposit banks owned by the state.Their total assets in 2016 Q3 has almost reached 739 Billion TL using 3673 branches in Turkey and 35 abroad in countries like USA, UK, Bahrein, KSA, Germany, and others. Ziraat bank is considered nowadays as the oldest bank in Turkey. Even though it was founded in 1863 with an aim to give loans to farmers, it barely became a bank with regulation in 1888 and became a state- owned institution in 1937. Now Ziraat bank is one of the top 5 Turkish Banks by assets size with assets that reached nearly 330 Billion TL and also its number of branches is more than any other bank with 1791 branches in Turkey and 27 branches abroad (TBB reports, 2016).

Table 1: State-Owned Deposit Banks.

Bank	Foundation	B.A[1]	B.T[2]	Total Assets (2016/9) 1000 TL
Ziraat Bankası A.Ş	**1863**	**27**	**1791**	**329.749.062**
Halk Bankası A.Ş	**1938**	**5**	**961**	**211.319.174**
Vakıflar Bankası T.A.O	**1954**	**3**	**921**	**197.611.819**

Source: TBB 2016Q3 reports.

The privately owned deposit banks are represented only by 9 banks in the market. Those 9 banks as it is shown in Table 2 are serving their clients through 3169 branches in Turkey and only 5 abroad and their total assets are nearly 383 billion TL.

[1] Branches Abroad
[2] Branches in Turkey

Some of these banks were founded at the first place as foreign banks like Fiba bank A. Ş which was transferred from "Foreign Banks" group to "Privately-Owned Banks "group in 11 November 2012 after the Fiba Housing had decided to buy more than 97% of its shares. Also Turkish Bank that was founded under the name of "Turk Bankasi LTD" was created 1981 as a foreign bank however, the name was changed in 1991 to Turkish Bank A.Ş then in 1998 the bank was transferred to "Privately-Owned Commercial Banks" group. Others have a partnership with "Foreign Banks" or "Foreign Banks has branches in Turkey", such as "Akbank T.A.Ş" that had a partnership agreement in 2006 with "Citigroup"and according to this agreement Citigroup acquired 20% equity stake in Akbank. Also in the same year, 33.98% of the Şekerbank T.A.Ş shares were sold to Turan Alem Securities JSC of Kazakhstan. In case of Türk Ekonomi A.Ş, TEB Mali Investments A.Ş which was the main shareholder of the bank's shares sold 50% of its shares to BNP Paribas as a result, BNP Paribas has indirectly required 42.125% of Turk Ekonomi bank shares.

Table 2: Privately Owned Deposit Banks

Bank	Foundation	B.T	B.A	Total Assets (2016/9)1000 TL
Adabank A.Ş.	1985	1	0	54.926
Akbank T.A.Ş.	1948	840	1	256.513.694
Anadolubank A.Ş.	1997	108	0	10.985.425
Fibabanka A.Ş.	1984	73	0	13.467.510
Şekerbank T.A.Ş.	1953	273	0	22.846.053
Turkish Bank A.Ş.	1982	13	0	1.387.604
Türk Ekonomi Bankası A.Ş.	1927	511	4	77.795.354
Türkiye İş Bankası A.Ş.	1924	1350	23	292.881.669
Yapı ve Kredi Bankası A.	1944	932	1	231.166.786

Source: TBB 2016Q3 reports

These 9 banks include also some which were created as public banks then transferred to "Privately Owned Commercial Banks" group such as "Anadolu bank A.Ş" which started its operation in 1997 after the privatize process of Etibank A.Ş (TBB).

According to TBB, there is only one Bank under the Deposit Insurance Fund (TMSF)which was found as local bank in 1958 under the title Çaybank A.Ş. It was

transferred to the TMSF on 10 July 2001 and after several changes of name, in December 2005 nowadays title was chosen.

Table 3: Bank under the Deposit Insurance Fund.

Bank	Foundation	B.T	B.A	Total Assets (2016/9) 1000 TL
Birleşik Fon Bankası A.Ş.	1958	1	0	3.537.298

Source: TBB 2016Q3 reports.

From the 47 banks in Turkey, 15 are Foreign Banks; these 15 foreign banks had opened 2854 branches in the aim to serve their customers in Turkey. The total assets of Foreign Banks in Turkey according to the rapport of TBB of 2016 Q3 are nearly 627 Billion TL.

According to TBB, some of these banks were originally privately owned deposit banks such as Alternative Bank A. Ş which transferred from "Privately Owned Deposit Bank" group to "Foreign Deposit Banks" group in the year of 2013 after the transaction of its shares to the "Commercial Bank of Qatar". Burgan Bank A.Ş had the same situation, it was founded 1992 as a private bank then it was transferred to the Fund in 1998. However in 2001 70% of its shares were sold to Eurobank EFG Holding (Luxembourg) and according to the new shares, the Bank was transferred from "Private Owned Deposit" group to "Foreign Deposit Bank" group in 2007.

One of the most important foreign banks is Garanti Bank which was founded as "Privately Owned Commercial Bank". The BBVA became the dominant partner of the bank in 2015, therefore Garanti Bank was transferred to "Foreign Deposit Banks" group. Garanti Bank is one of the Top 5 Turkish Banks by asset size with assets that nearly reach 270 Billion TL (TBB reports, 2016).

Table 4: Foreign Deposit Banks Founded in Turkey.

Bank	Foundation	B.T	B.A	Total Assets (2016/9) 1000 TL
Alternatif bank A.Ş.	1992	53	0	14.065.266
Arap Türk Bankası A.Ş.	1977	7	0	4.448.676
Bank of Tokyo-Mitsubishi UFJ Turkey A.Ş.	2013	1	0	7.345.403
Burgan Bank A.Ş.	1992	49	0	11.522.071
Citibank A.Ş.	1980	7	0	8.678.992
Denizbank A.Ş.	1997	693	1	92.455.885
Deutsche Bank A.Ş.	1988	1	0	2.769.406
Finans Bank A.Ş.	1987	603	1	93.988.166
HSBC Bank A.Ş.	1990	86	4	29.469.617,55
ICBC Turkey Bank A.Ş.	1986	44	0	6.936.488
ING Bank A.Ş.	1984	267	0	46.525.912
Odea Bank A.Ş.	2012	50	0	33.141.160
Rabobank A.Ş.	2014	1	0	1.034.710
Turkland Bank A.Ş.	1991	33	0	5.492.691
Türkiye Garanti Bankası A.Ş.	1946	959	9	269.637.820

Source: TBB 2016Q3 reports.

According to TBB, there are 5 Foreign Deposit Banks Branches in Turkey. They are serving with 7 branches in Turkey majority of them are opened by Bank Mellat. The total assets of these Banks reached 7,129,427,000 in September 2016. These Banks are originally from different countries such as France, UK, and others (TBB report, 2016).

Table 5: Foreign Deposit Banks Branches in Turkey.

Bank	Foundation	B.T	B.A	Total Assets (2016/9)1000TL
Bank Mellat	1984	3	0	522.032
Habib Bank Limited	1982	1	0	138.046
Intesa Sanpaolo S.p.A.	2013	1	0	5.107.335
JPMorgan Chase Bank N.A.	1984	1	0	415.167
Société Générale (SA)	1989	1	0	277.902
The Royal Bank of Scotland Plc.	1921	1	0	668.945

Source: TBB 2016Q3 reports.

In the following, we can find a detailed clarification of the development and Investment banks in Turkey. The Development and Investment Banks in Turkey are

13 with 42 branches in Turkey and none abroad; they can be divided to state-owned, privately owned and foreign development and investment banks. The total of the development and investment banks asset is almost 128 Billion TL (TBB report, 2016).

Table 6: State-Owned Development and Investment Banks.

Bank	Foundation	B.T	B.A	Total Assets (2016/9) 1000TL
İller Bankası A.Ş.	1933	19	0	20.201.673
Türk Eximbank	1987	3	0	59.086.377
Türkiye Kalkınma Bankası A.Ş.	1950	1	0	5.638.248

Source: TBB 2016Q3 reports.

Table 6 shows the State Owned Development and Investment Banks, such as Iller Bank, Turk Eximbank, and Turkey Development Bank.

Table 7: Privately-Owned Development and Investment Banks.

Bank	Foundation	B.T	B.A	Total Assets (2016/9) 1000 TL
Aktif Yatırım Bankası A.Ş.	1999	8	0	8.344.126
Diler Yatırım Bankası A.Ş.	1998	1	0	137.364
GSD Yatırım Bankası A.Ş.	1998	1	0	266.984
İstanbul Takas ve Saklama Bankası A.Ş.	1995	1	0	7.494.521
Nurol Yatırım Bankası A.Ş.	1989	1	0	1.207.737
Türkiye Sınai Kalkınma Bankası A.Ş.	1950	3	0	22.870.278

Source: TBB 2016Q3 reports.

The table 7 shows privately owned development and investment banks such as Aktif Investment Bank, Diler Bank, Nurol bank among others. All these banks have been founded in the period between 1950 and 1990. The investment banks have no branches abroad and the majority of them have only one branch in Turkey except for the Aktif Investment Bank which has 8 branches and Turkiye Sinai Development Bank with 3 branches.

Table 8: Foreign Development and Investment Banks.

Bank	Foundation	B.T	B.A	Total Assets (2016/9) 1000TL
BankPozitif Kredi ve Kalkınma Bankası A.Ş.	1999	1	0	1.571.966
Merrill Lynch Yatırım Bank A.Ş.	1992	1	0	361.872
Pasha Yatırım Bankası A.Ş.	1987	1	0	436.833
Standard Chartered Yatırım Bankası Türk A.Ş.	1990	1	0	77.769

Source: TBB 2016Q3 reports.

Table 8 shows information about foreign development and investment banks including their numbers, names, date of foundation, the number of branches in and out of Turkey and total assets in 2016 Q3.

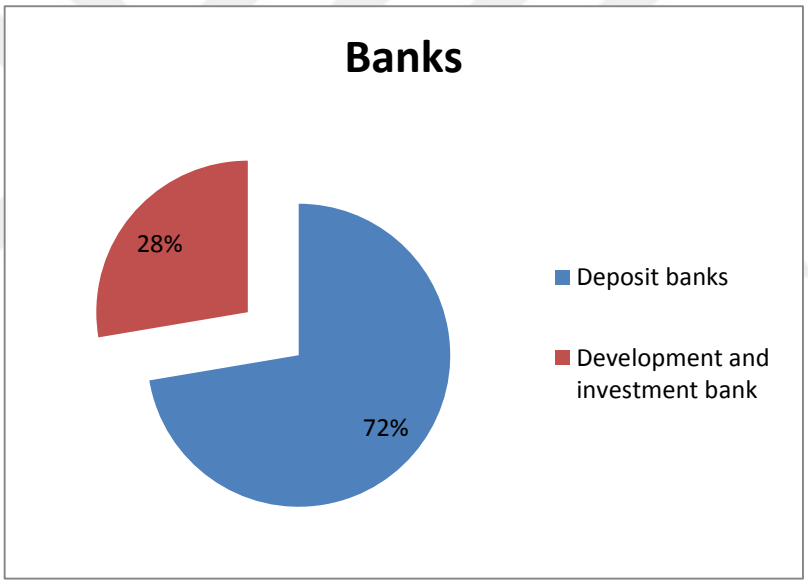

Figure 1: Banks shares 2016Q3 Source: (TBB, 2016)

Figure 1 shows that Deposit Banks are the dominant when it comes to the number of banks in the Turkish Market. In Turkey 47 banks are operating, 13 of them are Development and Investment Banks which represent 28% of banks, the share of Deposit Banks is 72% which is represented by 34 banks in the Turkish market. As indicated above deposit banks, investment & development bank are divided into owned by the state, privately owned and the foreign banks (TBB reports, 2016).

According to TBB reports, deposit banks in Turkey are divided into 4 types as shown in Figure 2. In deposit banks, foreign banks are dominant with 62% representing 21 banks , then the privately owned deposit banks follow with 26% representing 9 banks after that the state owned bank 9% with 3 banks and banks under the deposit insurance fund 3% represented by only 1 bank in the market.

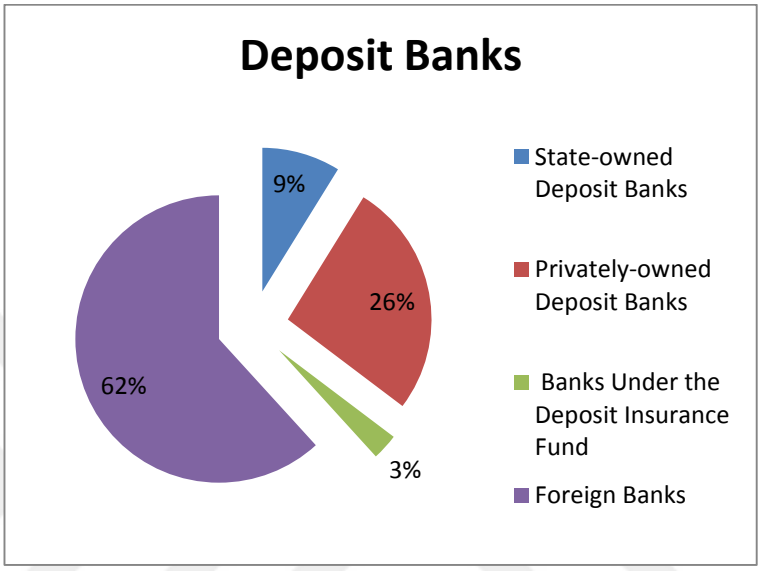

Figure 2: Deposit Banks share 2016 Q3. Source: (TBB, 2016)

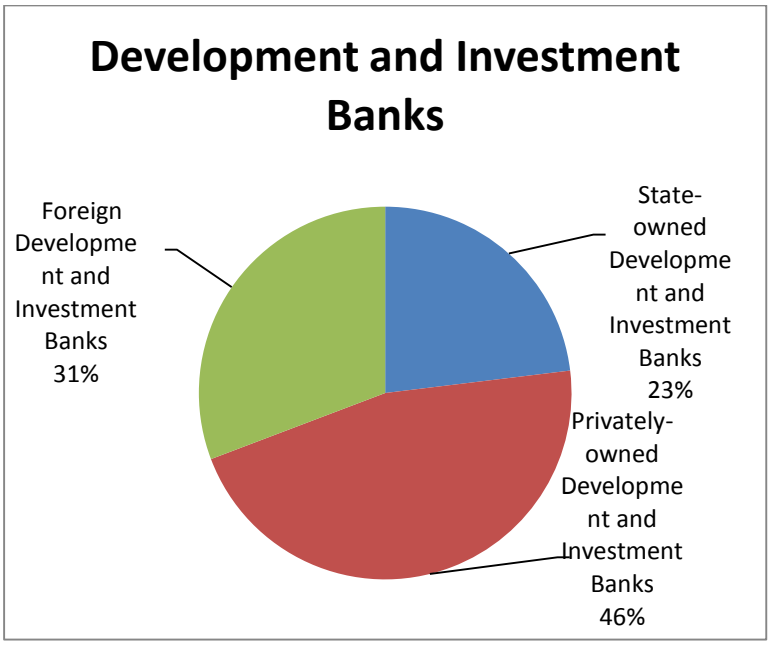

Figure 3: Development &Investment Banks shares 2016Q3. Source: TBB

In the Turkish market, the development and investment banks represent 28% from the total 47 banks and this percentage represent 13 banks. As shown in Figure 3 this percentage is divided between privately owned development and investment banks which are the dominant with 46% followed by foreign development &investment bank with 31% and lastly the state-owned development & investment banks with 23 % (TBB report, 2016).

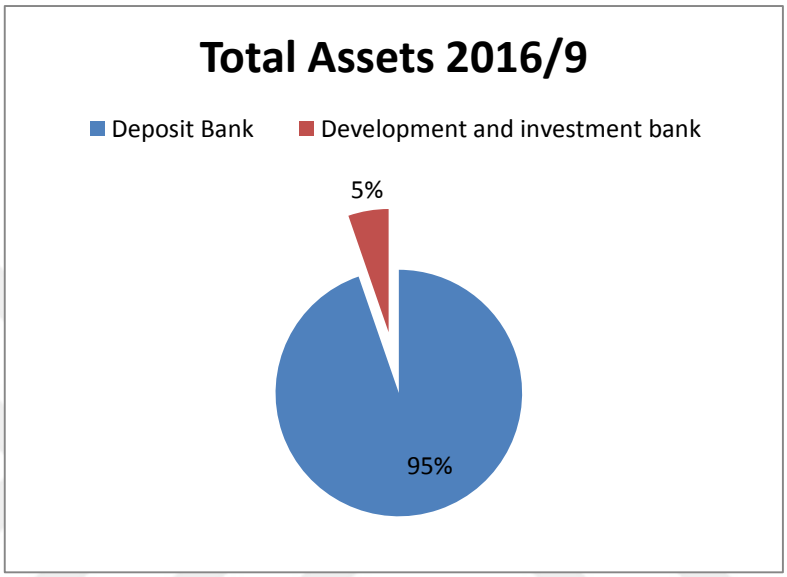

Figure 4: Total Assets shares 2016Q3. Source: (TBB, 2016

In 2016/9 the total assets in the Turkish banking system was 2411.65 Billion TL. As what appears in Figure 4, 5% of the total assets are represented by the 13 development and investment banks, 5 % reach almost 128 Billion TL However, the crushing dominance is for the deposit banks with a percentage that reaches 95% of the total assets. The deposit banks assets for 2016 Q3 has reached 2,284 billion TL. That can be explained by the inequality of the presence as a number of banks and branches operating in the banking sector market (TBB report, 2016).

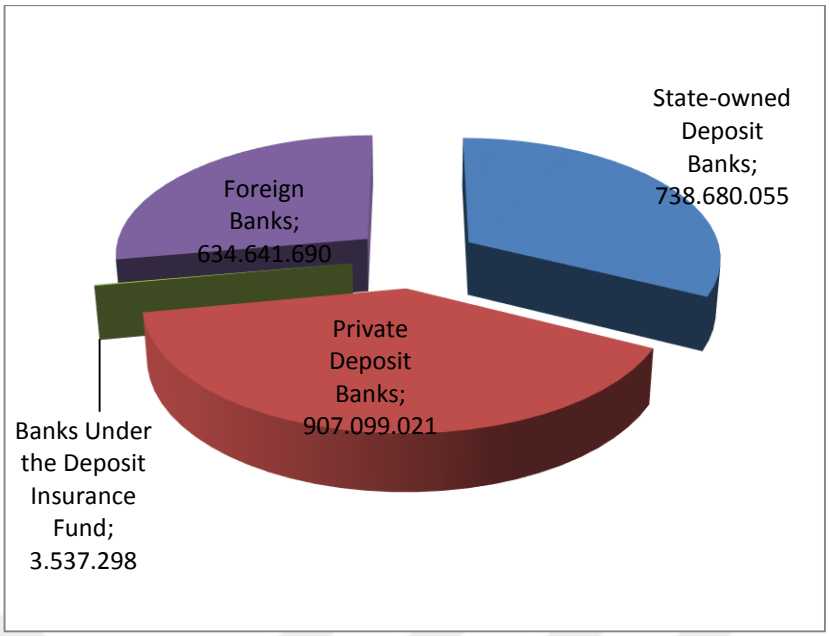

Figure 5: **Deposit Banks Assets Shares 2016Q3. Source: (TBB, 2016)**

Figure 5 shows the deposit banks assets shares, The privately owned deposit banks have more assets than any other type of deposit banks, its assets reach more than 907 Billion TL which represent 40% of deposit banks total assets followed by state-owned deposit banks assets that reach nearly 739 billion TL which represent 32%, then foreign deposit banks with total assets reached in 2016 Q3 more than 634 Billion TL representing 28% of the total assets of the deposit banks. Banks under the deposit insurance fund which are represented by only one bank and don't represent even 1% (TBB report, 2016) come last.

The total branches of the banks operating in Turkey are 10678 and abroad are 79 branches. As shown in Figure 6, 10636 branches represent deposit banks with a percentage that reach almost 100% of the total branches operating in the market. On the other hand, there is the development and investment banks branches which are too much barely reach 42 in Turkey and none abroad and that represent less than 1% of the total branches (TBB report, 2016).

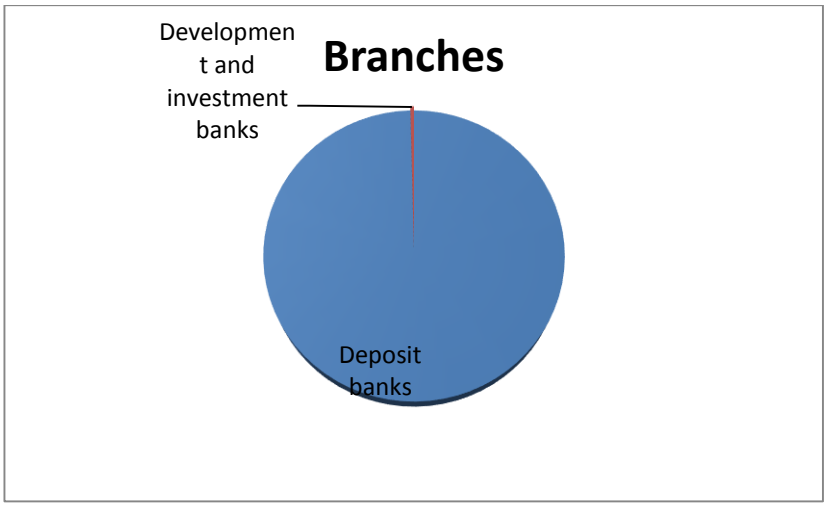

Figure 6: Branches shares 2016Q3. Source: (TBB, 2016)

According to figure 7, from this 10636 branches of different deposit banks 39% of these branches were opened by the privately owned deposit banks which are only 9 banks, then state-owned deposit banks with percentage reaching 34% with the knowledge that they are only 3 banks but have 3673 branches in Turkey market and 35 abroad. In addition, there are the foreign banks which represent 27% of the total branches with 2862 branches in Turkey and 15 abroad. lastly, there is the bank under the deposit insurance fund which represents nearly 0%, with only 1 bank and 1 branch (TBB report, 2016).

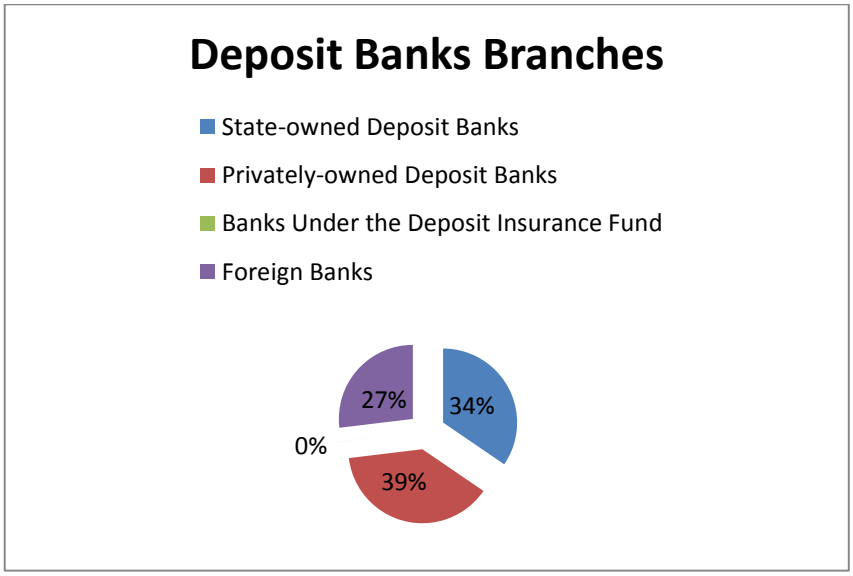

Figure 7: Deposit Banks Branches shares 2016Q3. Source: TBB

On the other hand according to the TBB reports, the development and investment bank in total have only 42 branches in Turkey and 0 abroad. Those branches are

divided as what is clarified in figure 8 with 55% of the development and investment branches opened by state-owned development and investment banks and this percentage represent 23 branches followed by the privately owned with 15 branches representing 36% and the rest is for foreign banks with just 4 branches and 9% as indicated in figure 8.

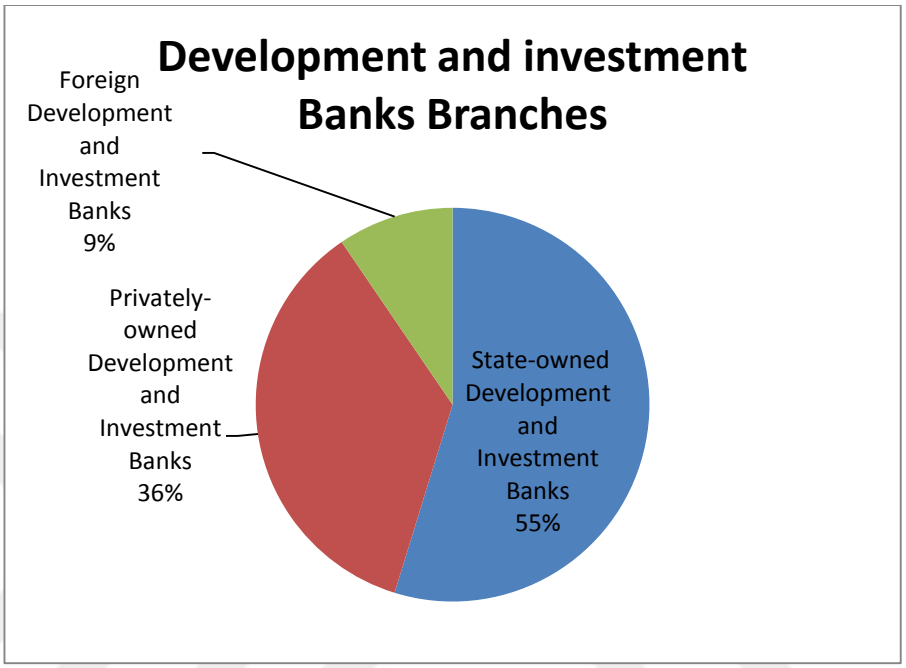

Figure 8 : Development & Investment Branches Shares 2016Q3.Source: (TBB, 2016).

In Figure 9, the data was taken from the TBB reports and the panel time used was from 2005 Q3 to 2016 Q3. The asset of each was calculated and reformed in one graph in an aim to observe the growth of the banking sector in Turkey in the last decade. As shown figure 9, the total assets of the year 2005 Q3 was 364.25 Billion TL however, in 2006 Q3 the total assets of the banking sector reached 460.99 Billion TL which means that banking sector grew with 96, 74 Billion TL. In other words, the growth rate of the year 2006 is nearly 3%. Then the improvement of the banking sector continue to the following year as the total assets of the banking sector in Turkey reached 525,38 Billion TL which indicate a growth with 64,39 Billion TL but at the same time indicate a decrease in the growth rate . In the year of 2008 Q3, the total assets were 655.43 Billion TL and a noticeable growth is observed as the total of assets grew with 130.05 Billon TL which represent a growth rate of 4%. Then in

the year of 2009 the assets grew with 109 Billion TL, the development and increase of the total assets has been improving with almost stable steps. Furthermore, the Turkey banking system shows a very strong assets growth with a stunning CAGR that reached 19% and the banking sector's asset grew to more than TL 2.2 trillion in June 2015 (TBB report, 2016).

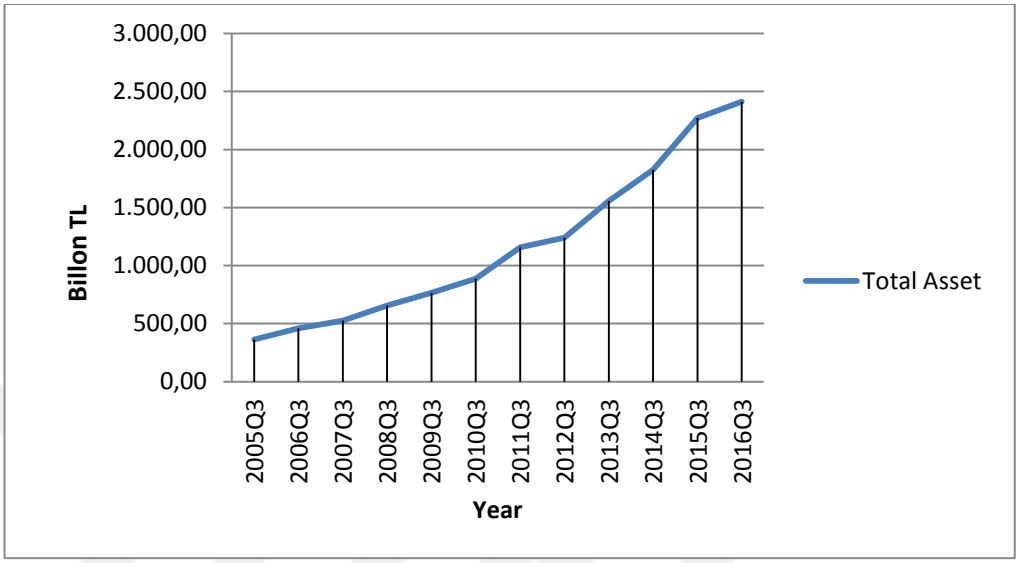

Figure 9: Total Assets growth 2016Q3. Source: (TBB, 2016).

Figure 9 indicated that the Turkish Banking Sector's total assets is always increasing for sure with different yearly growth rate but the most important is the fact that even during the economic crisis the total assets is still on the increase. In last report (2016Q3), the total assets of Turkish banking sector are 2411.65 Billion TL from 364.3 Billion TL in 2005 to 2411.65 TL in 2016 which mean a growth of 2047.35 Billon TL in nearly 10 years which is a very strong growing rate (TBB report, 2016).

In conclusion, The Turkish Banking System is developing with stable steps and that is because of the experience that it gained from the difficulties and crisis that it bypassed. Nowadays in the banking system in Turkey 47 banks are serving through 10678 branches in the Turkish market and 79 abroad often in European and Asian countries (TBB report, 2016).

1.2 Development of Participation Banking in Turkey

1.2.1 Milestones of Participation Banking in Turkey

The Islamic banking began in Turkey somehow early in November 1975, the first interest-free bank was established by the state and named "State Industrial and Workers Investment Bank" (SIWB) and was converted to a conventional bank in November 1978. However, the real step was made in August 1983 when the legal framework passed new regulations for the Islamic banks to be able to operate in the Turkish market under the name of "Special Finance House Act". This step opened the door for the foreign Islamic banks to open in Turkey so in 1985 Faisal Finans and Al Baraka Bank opened their first subsidiary in Turkey and after that in 1989, Kuveyt Turk started operating in the Turkish market. In 1991 recognizing the birth of the first privately owned domestic Islamic bank in Turkey which was Anadolu Bank, followed by Ihlas Bank in 1995 and Bank Asya in 1996 (TKBB reports).

However, in 2001 Turkey recognized a national economic crisis which affected the Islamic banking in Turkey relatively lower than the conventional bank. Ihlas finance bank became bankrupt because of its ties to the real economy unfortunately, Ihlas Finance customers lost all their deposits because there was no framework that protects Islamic banks in Turkey. For that reason, in the same year, the Turkish Banking Regulatory and Supervisory Agency (BRSA) was established and the "Special House" (participation banks in that time) were brought under the same regulations (TKBB reports 2016Q3).

The Islamic banking in the 1990s and beginning of 2000s was improving slowly and with a lot of attention however, the real beginning of Islamic banking in Turkey was in 2005 when a new law 5441 was adopted. That law renamed the "Special Finance House" to be what is still nowadays known as "Participation Banks" and also the same law extends the saving deposit insurance fund for participation banks up to 50.000 TL. In the same year "Family Finans" and "Anadolu Finans" merged to form one of the most important participation banks in our days "Turkiye Finans". In 2010 a framework of Sukuk was set up and in the same year in August, Kuveyt Turk issued Turkey's first Sukuk. Soon after the Islamic banking in Turkey started improving with stable steps in addition to the Turkish government deep interest in this field therefore the parliament passed the legislation to promote Islamic banking

in 2011. In the same year, the Istanbul Stock Exchange launched its first participation index.

Currently the Islamic windows are not accepted based on the denial of the BRSA of this type of Islamic finance investment in 2012. In 2013 the deposit target was set to reach 15% in 2020 and in the same year the Turkish government confirmed its support to this field by planning to establish two new state participation banks "Ziraat Participation Bank" and "Vakif Participation Bank". In 2014 a new regulation was adopted by the National bank that affected the participation banks significantly in a negative way (Belge and Egresi, 2015).

Table 9: Main Events that Impacted the Evolution of Islamic Banking in Turkey.

Date	Event
1983	Legal framework that allowed the operation of Islamic banks established. These were named "Special Finance Houses"
1985	Al Baraka (Bahrain) opened its first subsidiary in Turkey
1985	Faisal Finans (Saudi Arabia) opened its first subsidiary in Turkey
1989	Kuveyt Turk (Kuwait) started operations in Turkey.
1991	Anadolu Finans (domestic capital) started operations.
1995	Ihlas Finans (domestic capital) started operations.
1996	Asya Bank (domestic capital) started operations
1999	Finance houses become subject to the Banking law no 4389 which regulates the banking system in Turkey
2000	Turkish holding Ülker bought Faisal Finans and changed its name into Family Finans House.
2001	Ihlas Finance House went bankrupt
2001	Creation of the Association of Special Finance Houses
2004	The state extended its 50,000 lira guarantee on deposits to Special Finance Houses
2005	Special Finance Houses re-named "participation banks" and the Association of Special Finance Houses re-named Participation Banks' Association
2005	Türkiye Finans Participation Bank was established by merging of Family Finans and Anadolu Finans
2008	National Commercial Bank (NCB) from Saudi Arabia acquired 60% of Türkiye Finans shares for US$ 1billion
2010	Framework for corporate sukuk was set up
2010 (August)	Kuveyt Turk issued Turkey's first sukuk, US$ 100 million
2011	first participation index was launched by the Istanbul Stock exchange
2012 (September)	first dollar denominated sovereign sukuk issuance, US$ 1.5 billion
2012 (October)	lira denominated sovereign sukuk issuance US$ 904 million
2013 (March)	Bank Asya issues the first lira denominated sukuk out of Turkey.
2014 (July)	Newly adopted mutual fund regulation, "participation umbrella fund" (katılım şemsiye fonu) will include funds with no interest bearing securities.

Source: Belge and Egresi "development of Islamic banking" in Turkey, 2015.

1.2.2 Participation Banks Growth

1.2.2.1 Participation Bank's Assets Evolution and Shares.

The participation banks in Turkey have shown a very good success and this success can be noticed from the fast development in their assets situation. In 2002, the participation banks asset value was almost 4 billion TL with a stable rate of development; in 2010 the active value reached 43, 3 billion TL and 104.3 billion TL in 2014, and 132 billion TL in 2016. The noticeable thing is the ability of improvement even during the Turkish economic crisis and the global crisis (TKBB reports, 2016).

Table 10: Participation Banks Total Assets.

Year	Participation Banks	Growth (%)	Banking Sector	Share (%)
2005	9.945.431	36,26%	406.915.000	2,44%
2006	13.729.720	38,05%	498.587.000	2,75%
2007	19.435.082	41,55%	580.607.000	3,35%
2008	25.769.427	32,59%	731.640.000	3,52%
2009	33.628.038	30,50%	833.968.000	4,03%
2010	43.339.000	28,88%	1.006.672.000	4,31%
2011	56.076.929	29,39%	1.217.711.000	4,61%
2012	70.279.000	25,33%	1.370.614.000	5,13%
2013	96.086.000	36,72%	1.732.413.000	5,55%
2014	104.319.000	8,56%	1.994.329.000	5,23%
2015	120.253.000	15,27%	2.357.453.000	5,10%
2016	132.874.000	10,50%	2.730.942.000	4,87%

Source: TKBB 2016Q3 reports.

Table 10 shows that the growth rate of the participation banks assets is too high. The time interval used in this case was from 2005 to 2016 showing that the growth rate increased from 36, 26% in 2005 to 41, 55% in 2007. However, the growth rate showed a decrease because of the international economic crisis in 2008, as the growth rate had decreased from 41.55% to 32.59% and continued decreasing to the year of 2013 that recognized a new important improvement that has reached 36.72%. Unfortunately, the growth rate of participation banks in Turkey had faced a big decrease in 2014 from 36% in 2013 to 8% in 2014 which wasn't something

predictable or at least this volume of diminution couldn't be foreseen. From what is theoretically known, this big damage was caused by a new regulation adopted by the Turkish National Bank. This new regulation from what is in the previous table affected only participation banks because the Turkish banking sector showed an improvement (TKBB reports, 2016).

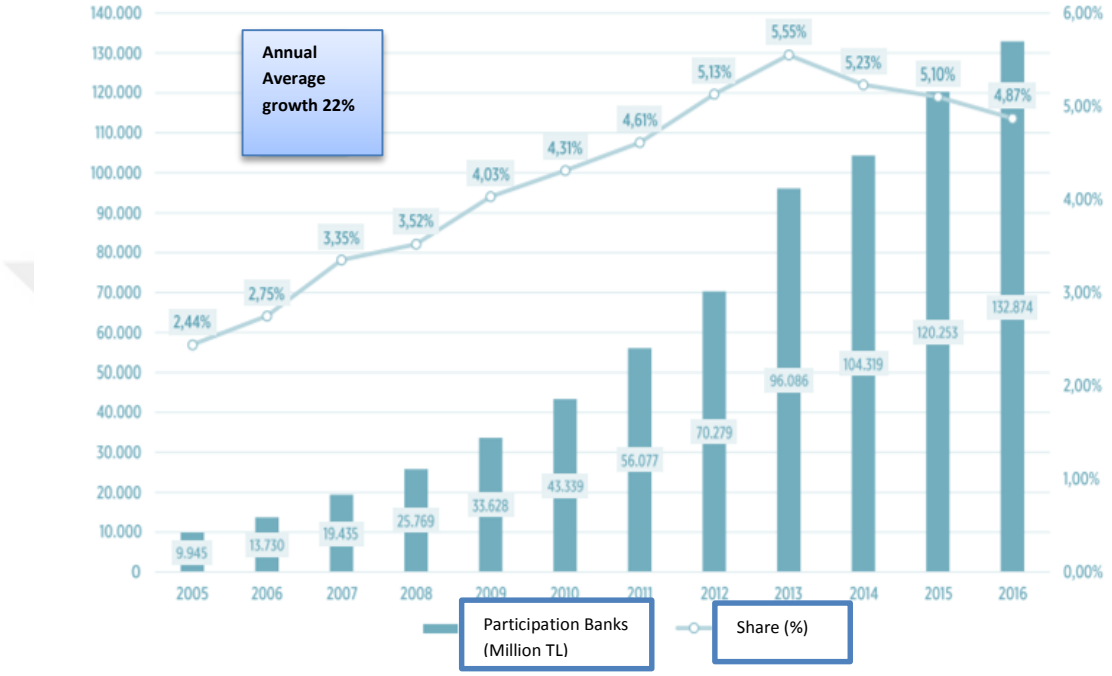

Figure 10: Growth Rate. Source: TKBB

On the other hand from the table 10 and figure 10 there is certainity that the participation banks assets in Turkey is always increasing despite the international and national crisis but the growth rate is somehow fluctuating. Sometimes the growth rate reaches very high percentages like 41% and in some special conditions it goes low like what happened in 2014 which the growth rate of participation banks had reached nearly 8% (TKBB reports).

1.2.2.2 Participation Banks Collected Fund Development

Table 11 shows an interval of time used from 2005 to 2016. The collected fund of participation banks in 2005 were 8.369.000 TL with a growth rate of almost 40% and a market share that reached 3.19%. The market share increase continues however, the growth rate of collected fund started decreasing slowly from the year 2005 to 2009. An increase was noticed in the growth rate which reached 39.73% after that it began

decreasing slowly in the year 2013 in which it increased from 20% to 27%. However, this success didn't last too long because in 2014 the growth rate had a big decrease from 27% to nearly 6% which was seen as a great decrease even the share in the banking sector has decreased in the year. In 2015 the growth rate commits a jump from nearly 6% to 13% more than the double but this result didn't continue in 2016 that recognized a new decrease in the collected fund growth rate (TKBB reports, 2016).

Table 11: Participation Banks Collected Fund.

Year	Participation Bank	Growth (%)	Banking Sector	Share (%)
2005	8.369.000	39,67%	261.948.000	3,19%
2006	11.237.000	34,27%	324.069.000	3,47%
2007	14.943.000	32,98%	371.927.000	4,02%
2008	19.210.000	28,56%	472.695.000	4,06%
2009	26.841.000	39,73%	522.415.000	5,14%
2010	33.828.000	26,03%	631.119.000	5,36%
2011	39.869.282	17,86%	707.510.000	5,64%
2012	48.198.000	20,89%	783.888.000	6,15%
2013	61.495.000	27,59%	949.319.000	6,48%
2014	65.405.000	6,35%	1.056.679.000	6,19%
2015	74.362.000	13,70%	1.250.016.000	6,00%
2016	81.505.000	6,60%	1.459.269.000	5,58%

Source: TKBB 2016 report.

In figure 11, a larger data time is examined from 2000 up to 2016. In this graph the fluctuation of participation banks collected fund growth during different difficulties and crisis either national or international ones is observed. In 2000 the first years of presence of Islamic banking in Turkey, the collected funds were 1.863.000 with a growth rate of 1.28% and the collected funds continued growing with stable steps and an increasing growth rate. 2013 was the peak in term of growth rate that reached 6.48% and nearly 61 million TL however, after 2013 the funds collected kept increasing but with a decreasing growth rate. In 2016 the last reports show that collected funds were 81.505 million TL. In the last 16 years, the annual growth rate of the collected funds of participation banks was almost 23% (TKBB).

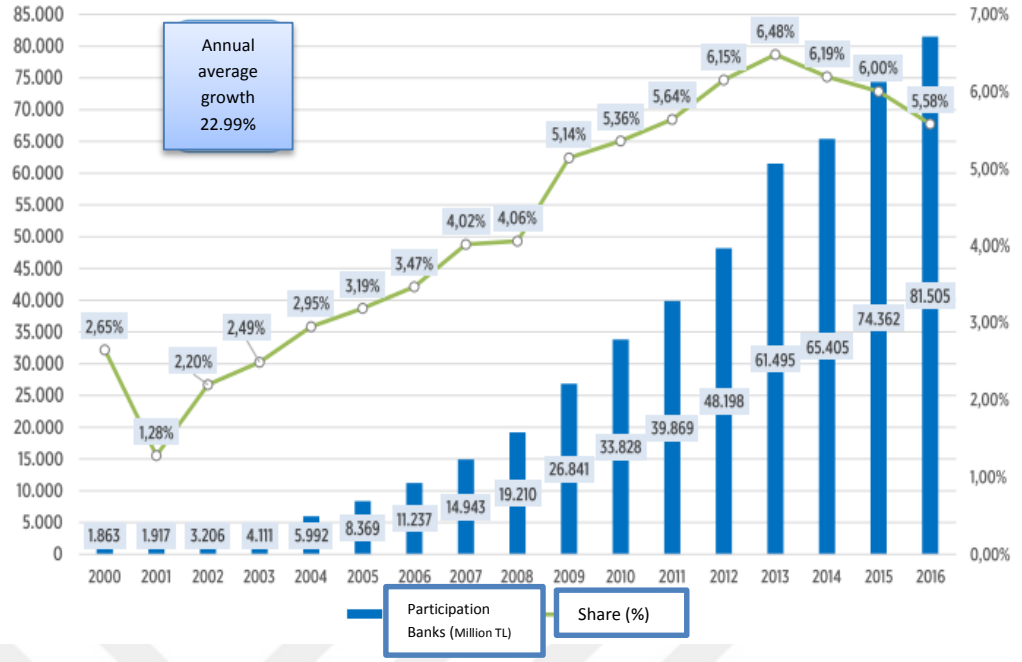

Figure 11: Development of collected Fund of Participation Banks. Source: TKBB

1.2.2.3 Participation Banks Equity Development

Without any doubt the most important element in the participation banks assets is equity because if the participation banks equity is strong, that gives them the ability to use more funds in addition to the stakeholders confidence that is very important. Table 12 shows that the total equity of the participation banks in 2010 was almost 5.5 billion TL and that represent a yearly growth rate of 15.1%. After 2010 there was a decrease in the annual growth rate from 15.1% to 14% and in 2014 the greater decrease happened from 20% to nearly 9%. The year of 2015 recognized a small increase in the equity growth rate but at the same time a decrease in the market share however, this improvement didn't last long as in 2016 the growth decreased again and the market share continued decreasing (TKBB 2016 reports).

Table 12: Participation Bank's Equity Shares.

Year	Participation Banks	Growth (%)	Banking Sector	Share (%)
2005	951.000	6,61%	54.687.000	1,74%
2006	1.560.000	64,04%	59.538.000	2,62%
2007	2.364.000	51,54%	75.850.000	3,12%
2008	3.729.000	57,74%	86.425.000	4,31%
2009	4.419.564	18,52%	110.874.000	3,99%
2010	5.457.000	23,47%	134.545.000	4,06%
2011	6.193.314	13,49%	144.650.000	4,28%
2012	7.377.000	19,11%	181.882.000	4,06%
2013	8.852.000	19,99%	193.745.000	4,57%
2014	9.673.000	9,27%	232.007.000	4,16%
2015	10.645.000	10,00%	262.275.000	4,00%
2016	11.494.000	8,00%	300.172.000	3,82%

Source: TKBB 2016 reports.

The figure 12 shows in details the participation banks equity during the last decade from 2005 to 2016 noticing that the equity is always increasing but with fluctuating growth rate however, the yearly growth rate is 25.43% which is considered a high rate. The higher growth rate in this interval time was 4.75% in 2013.

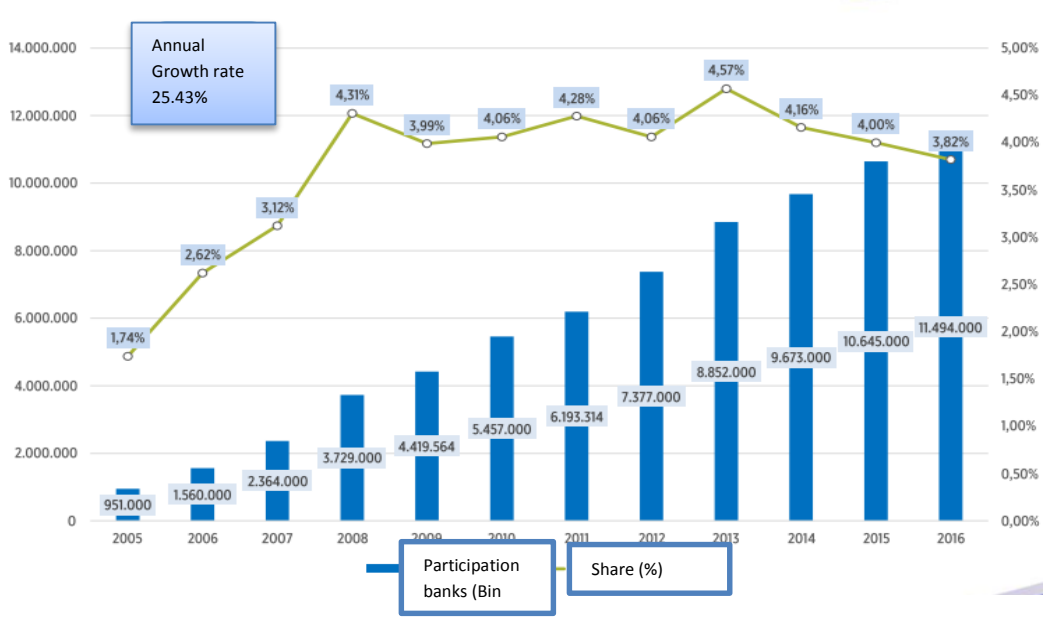

Figure 12: Participation Banks Equity Growth. Source: TKBB.

1.2.2.4 Participation Banks Branches and Personal Evolution

Without any doubt, the development that the participation banking sector is committing will include the branches and personnel which affects the bank's profitability directly in a positive way. The number of personnel generally improves with the number of branches noticed in Table 13 & 14 and Figures 13&14.

Table 13 shows the improvement of the branches in number during the10 last years and also the growth rate of the year 2005 to 2016. The reports show that the number of branches is often increasing except in one case which is the year of 2016 that has recognized a decrease which reached 11.30%. However, in the other years, the number of branches was always increasing. In 2005 the number of branches was average 200 in Turkey; in 2015 the number of participation banks branches has reached 1080 which represent a very important growth rate not in a long time. In the period of crisis the participation banks branches number was improving but with smaller steps, in 2007 a small diminish in the growth rate took place as the growth rate of 2006 was 22% and in 2007 reduced to 19%. In 2009 the diminish was bigger and that is due to the international economic crisis and from what is indicated in Table 13, the growth rate of 2008 was 26% however, in 2009 a very big reduce took place. The growth rate in that year reached 6% in other words in 2009 the growth rate of branch numbers diminished with 20 percentages but, it bypassed it and started increasing again despite all the difficulties.

Figure 13 reflect the data mentioned above about the participation banks branch numbers development so the fluctuation of the growth rate is very clear in figure 13. Nevertheless, it shows also the increase of the branch numbers even during the crisis. In 2014 as mentioned above because of new regulations adopted by the Turkish National Bank, the participation banks were affected from all sides and that is clear in this case in which the growth rate recognized a diminish from 17% to 2% in 2014. In 2016 it is clear that the participation banks lived some challenges shown in Table 13 and Figure 13 depicting a big decrease in the branches growth rate that reached 11.30%.

Table 13: Branches Development.

Year	Branches	Growth (%)
2005	290	14,00%
2006	355	22,00%
2007	422	19,00%
2008	530	26,00%
2009	560	6,00%
2010	607	8,00%
2011	685	13,00%
2012	829	21,00%
2013	966	17,00%
2014	990	2,00%
2015	1.080	9,00%
2016	957	-11,30%

Source: TKBB

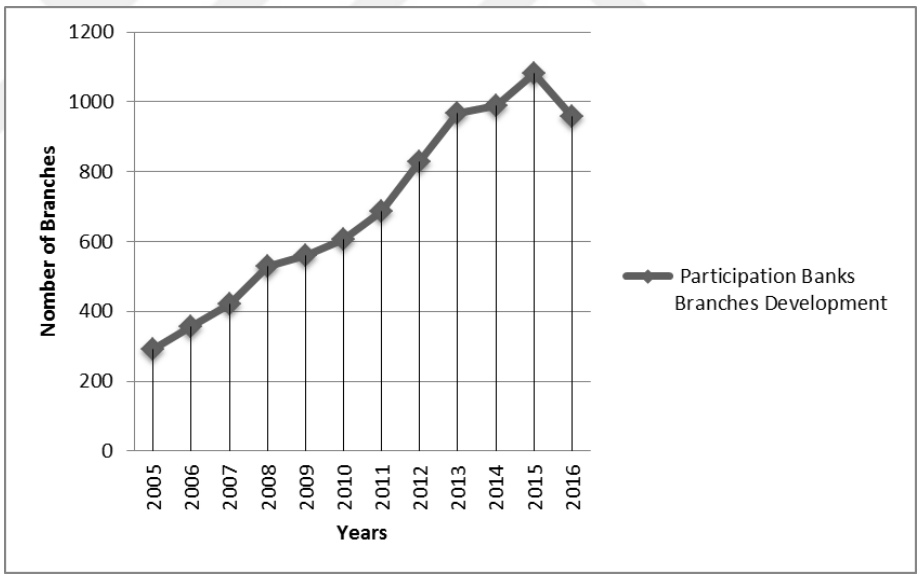

Figure 13: Participation Banks Branches Development. Source: TKBB.

Figure 14 and Table 14 show the different changes of participation banks personnel number and its growth rate. From observing the changes it can be noticed that there was a decrease in the year 2013 and in 2016 also and that can be explained by the decrease in the branches number, fewer branches mean less personnel and vice versa.

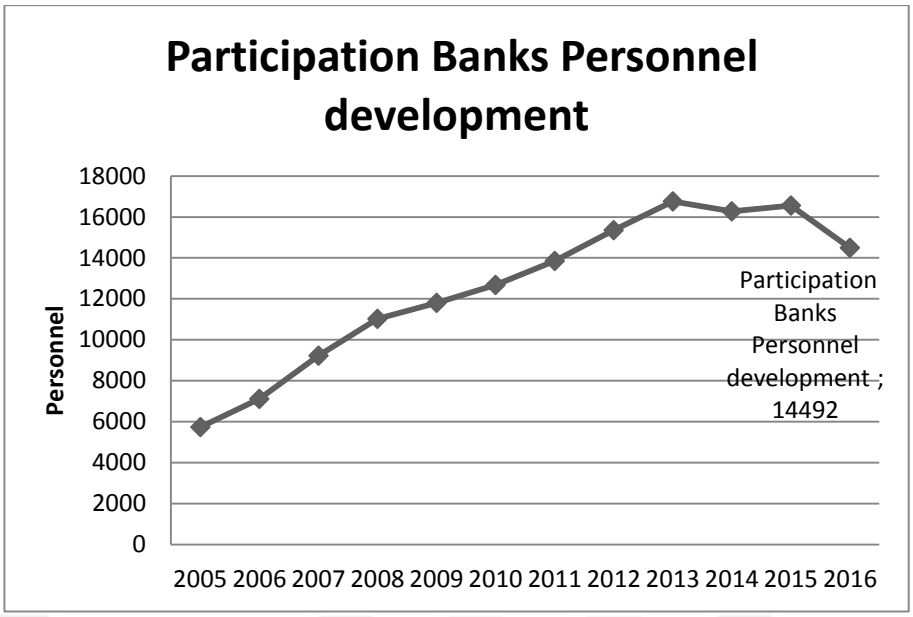

Figure 14: Participation Banks Personnel Development. Source: TKBB

Table 14 shows that in 2005 the number of personnel was 5740 with 20% as growth rate and that percentage continue increasing to 2008. In 2008 because of the international economic crisis, the number of personnel growth rate decreased from 30% to 20%. 2009 wasn't better in terms of personnel growth rate as it kept decreasing to 2011. In 2011 and 2012 the growth rate kept increasing with small steps unfortunately this improvement didn't last too long so in 2014 for the first time, a decrease happened not only in the growth rate but also in the personnel number. In other words, some of the employees were released. The same situation happened again but with a bigger rate as the growth rate reached -12.40% which mean almost 2000 employees lost their job in 2016.

The number of employees is also increasing in parallel with the augmentation of the participation banks and new branches. At the end of 2014, the participation banks offered jobs to 16,249 employees at an average annual growth rate (CAGR) of 6.6%.

Table 14: Personal Growth Rate.

Year	Personnel	Growth (%)
2005	5.740	20,00%
2006	7.114	24,00%
2007	9.215	30,00%
2008	11.022	20,00%
2009	11.802	7,00%
2010	12.677	7,00%
2011	13.857	9,00%
2012	15.356	11,00%
2013	16.763	9,00%
2014	16.280	-3,00%
2015	16.554	1,70%
2016	14.492	-12,40%

Source: TKBB

1.2.3 The Most Important Participation Banks in Turkey.

The participation Banks in Turkey were 6, one was closed recently, 2 of them owned by the state which were opened in the last years, Ziraat Participation Bank and Vakif Participation Bank and 2 privately owned banks plus 2 foreign banks. In Turkey, the 6 serving banks are Ziraat Katilim Bank, Vakif Katilim Bank, Kuveyt Turk Bank, Albaraka Turk Bank, Turkiye Finans Bank and Bank Asya which was closed recently because of legal issues (TKBB reports, 2016).

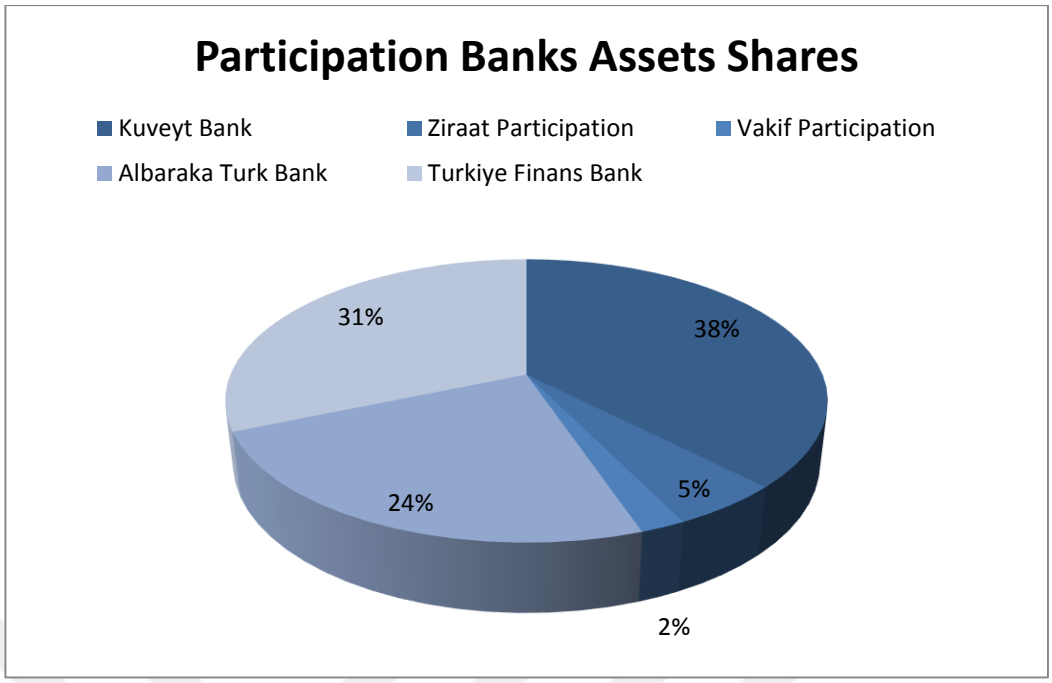

Figure 15: Participation Banks Assets Shares. **Source:** TKBB 2016 report

However, according to reports the most important participation banks in Turkey are Albaraka Turk Bank, Kuveyt Turk Bank, and Turkiye Finans Bank. As figure 15 shows Kuveyt Turk bank has more assets with a percentage of 38% then Turkiye Finans Bank followed by Albaraka Turk Bank and others.

1.2.3.1 Kuveyt Turk Participation Bank

Kuveyt Turk participation Bank is a foreign bank founded in 1989, it helped to improve the participation banking sector in Turkey for example by bringing Sukuk to the market. As what is shown in figure 16, in 2009 a big step was made in terms of assets, the total assets of Kuveyt Turk in 2009 reached almost 10 Billion TL which mean more than 40% as a growth rate.Similar steps were done in 2010 with total assets of 15 billion TL which is a growth of 5 billion TL, the total assets kept increasing even during the hardest crisis but with different growth rate (TKBB report, 2016).

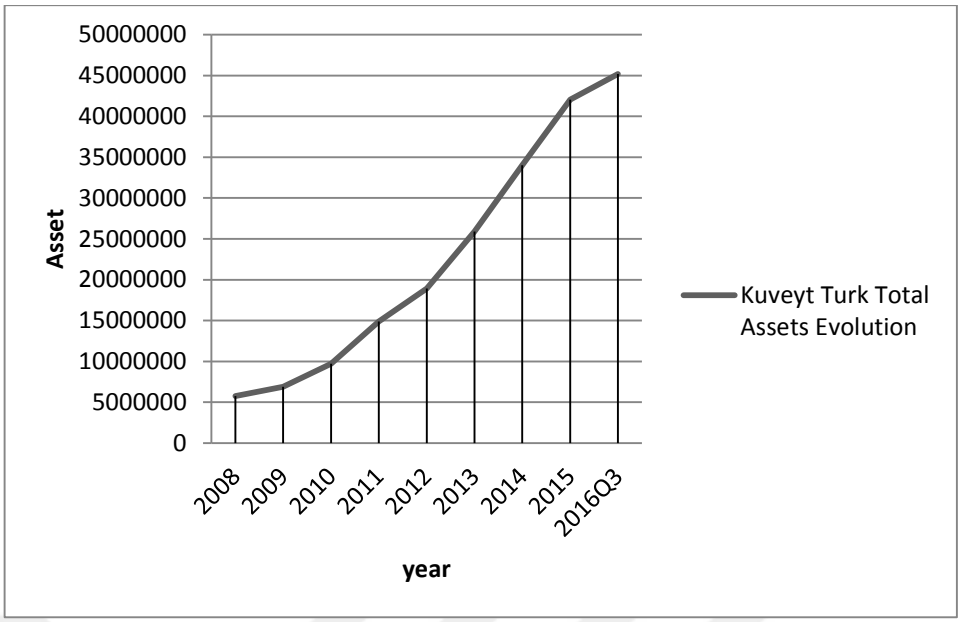

Figure 16: Kuveyt Turk Assets Evolution. **Source:** TKBB

Figure 17 shows the change of the income of the Kuveyt Turk Bank during the last 8 years from 104 million TL in 2008 to 440 million TL in 2016 Q3 which is multiple four in 8 years and that despite the difficulties and crisis that happened in the years. The income of Kuveyt Turk gives an idea about the improvement of this bank and can guarantee that as financial performance, it is the best participation bank in Turkey.

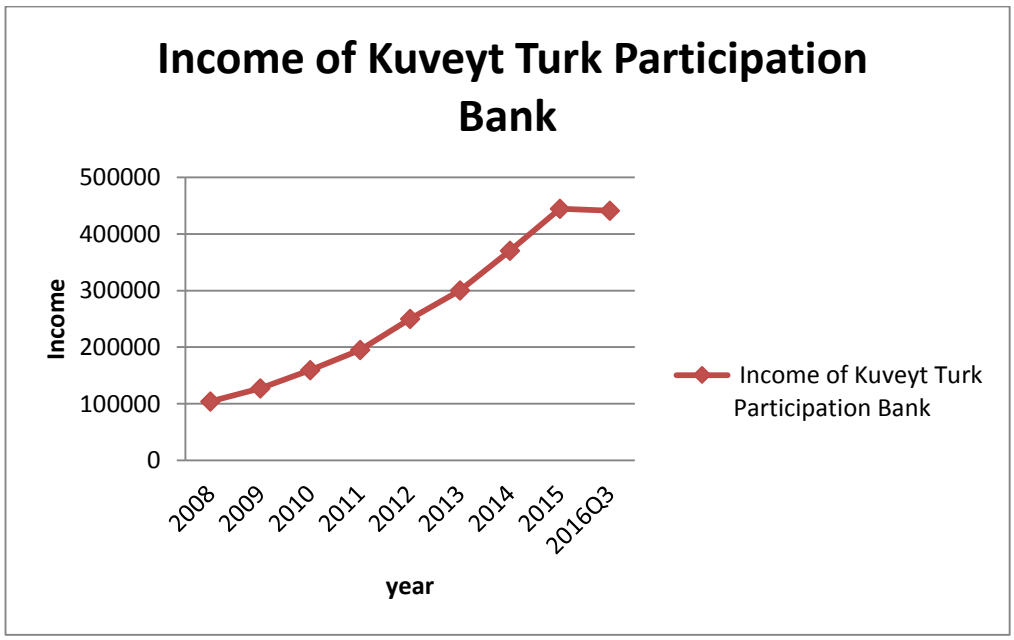

Figure 17: Kuveyt Turk Income. **Source:** TKBB

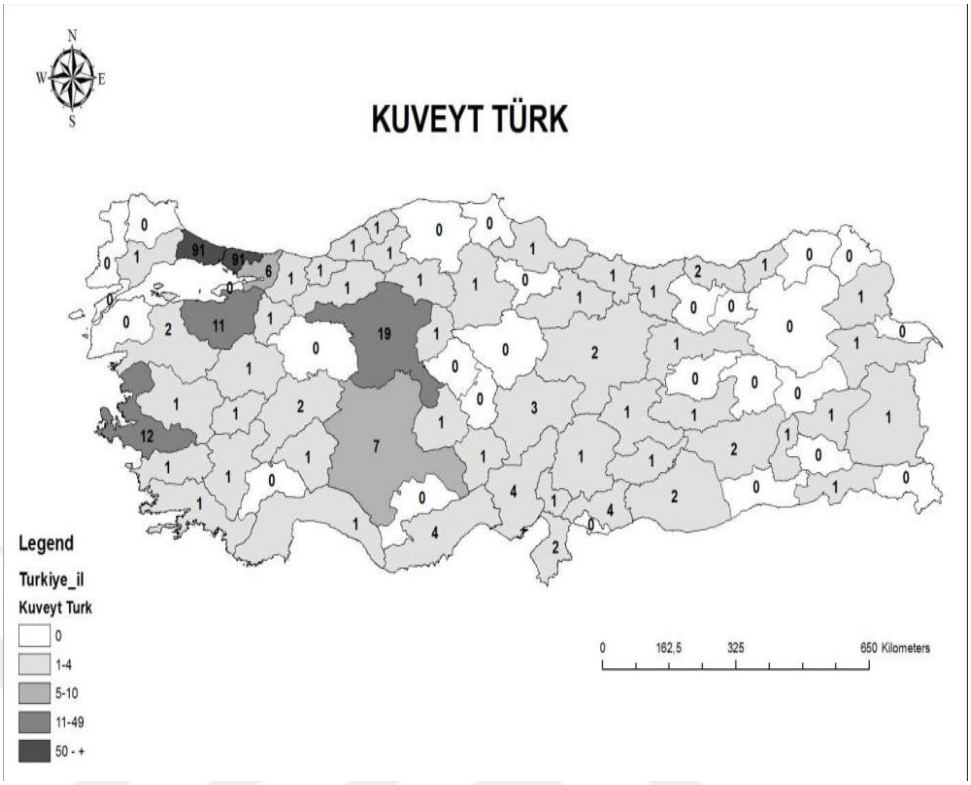

Figure 18: Geological dissemination for Kuveyt turk bank limbs crosswise over turkey. (Data of 2012)

Source: Belge and Egresi Development of Islamic Banking in Turkey, 2015

Figure 18 shows the distribution of Kuveyt Turk branches across Turkey. In some towns there are no branches at all and in others, it fluctuates between 1 and 91. This report was taken from a study done by Rauf and Istvan and it is for the year 2011. Nowadays Kuveyt Turk has a total of 388 branches, 28 branches in Ankara and 162 branches in Istanbul and others (TKBB reports, 2016).

1.2.3.2 Al Baraka Turk Participation Bank

Al Baraka participation Bank was founded by Bahrain Al Baraka Banking in 1984 as Albaraka Türk "Private Financial Institution" and it was the first participation bank in Turkey (Wikipedia).

Figure 19 is studying the growth of Albaraka Turk participation Bank Assets growth during the last 8 years from 2008 to 2016. In 2008 the total assets of Al Baraka Turk participation bank were almost 5 billion TL and in 2016Q3 was nearly 29 billion TL which mean an increase of 24 billion TL in 8 years.

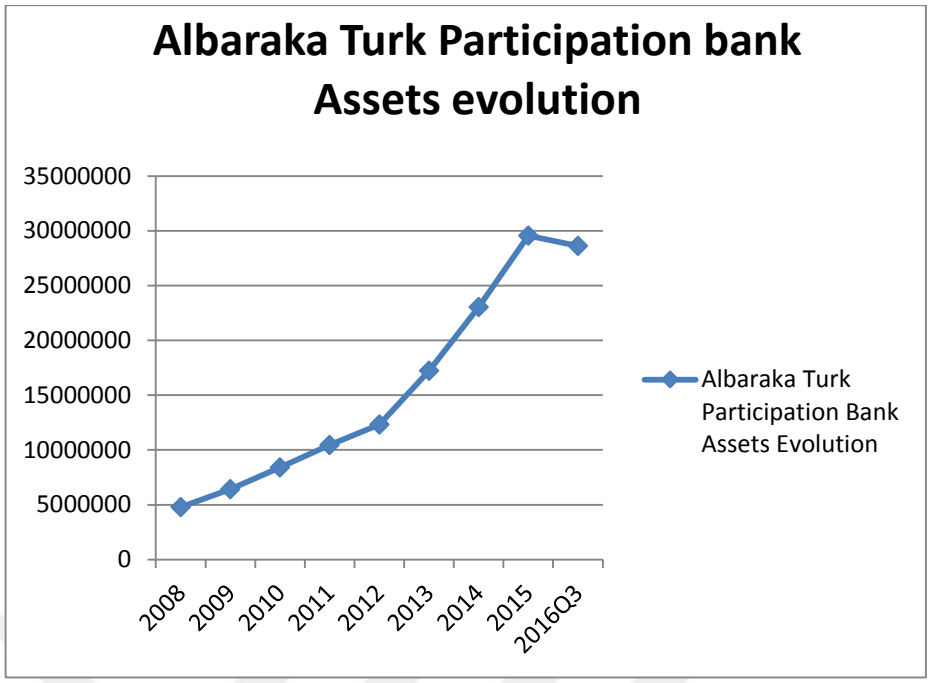

Figure 19: AL Baraka Assets. **Source:** TKBB

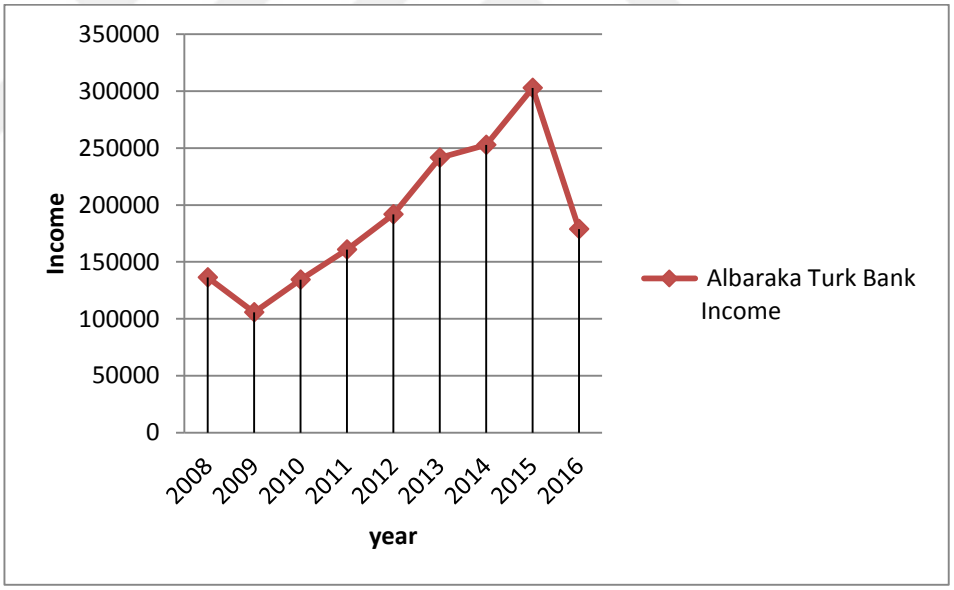

Figure 20: Al Baraka Turk Income. **Source:** TKBB

Figure 20 shows the income of Al Baraka Turk and growth during the last 8 years. In 2008 the income of Al Baraka Turk participation bank was nearly 136 million TL but unfortunately because of the international crisis the income of Al Baraka Turk decreased in 2009 to 105 million TL and that is clear in figure 18. In 2010 Al Baraka Turk started making new steps to come back to the track so its income increased again from 105 million to 134 million TL and it kept increasing respectively reaching

160 million TL,191 million TL, 241 million TL, 252 million TL and 302 million TL in 2015.

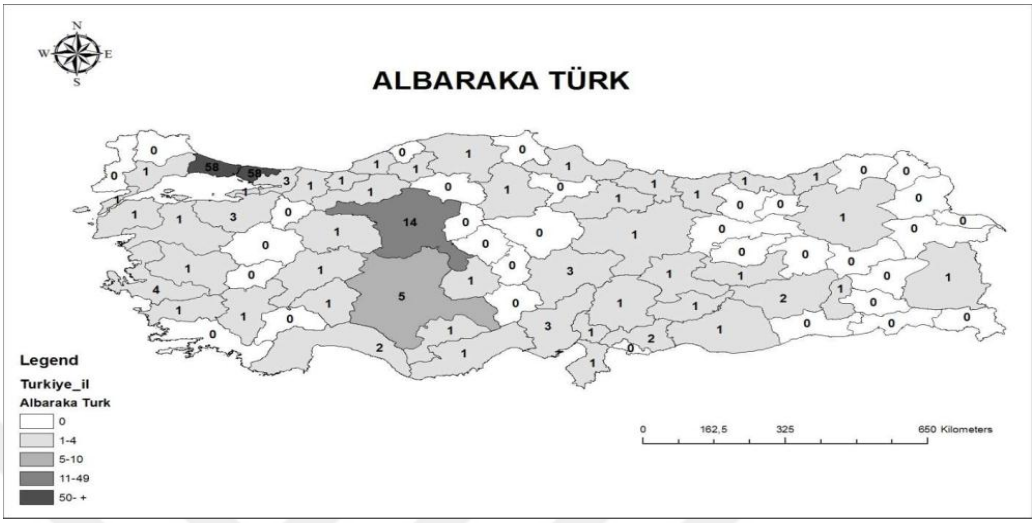

Figure 21: Geological dissemination for AL Baraka Turk bank limbs crosswise over turkey. (Data of 2012).

Source: Belge and Egresi Development of Islamic banking in Turkey, 2015.

Figure 21 shows the Geological dissemination for Al Baraka turk bank limbs crosswise over turkey. in the year 2012. It is seen that the Al Baraka Turk bank branches are all around Turkey but the majority of branches are in Istanbul and Ankara.

1.2.3.3 Turkiye Finans Participation Bank

Turkiye Finans Bank is a privately owned bank with the National commercial bank as its main shareholder founded in 2005 (Wikipedia).

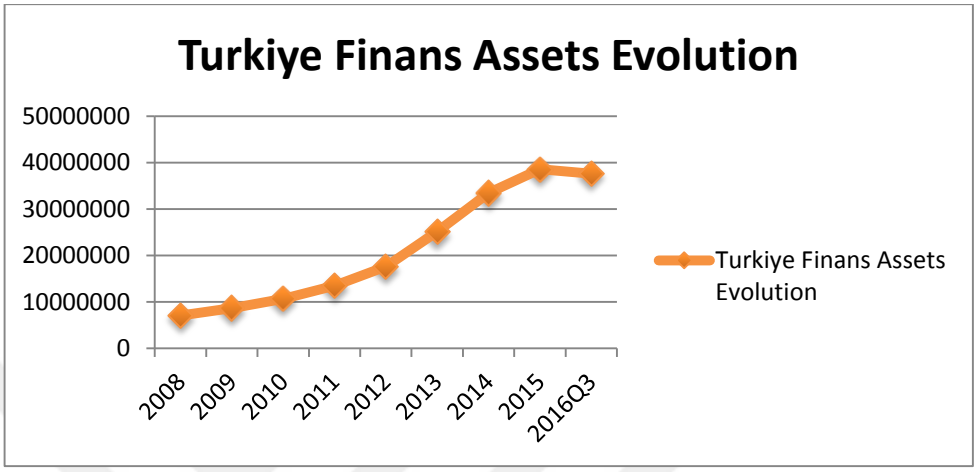

Figure 22: Turkiye Finans Assets. **Source:** TKBB

Figure 22 shows the evolution of Turkiye Finans Participation Bank assets during the last 8 years between 2008 and 2016. In 2008 the total assets of Turkiye Finans was more than 7 Billion TL and in 2009 it reached almost 9 billion TL and it continued increasing with a fluctuating growth rate to 2015 when it reached more than 38 Billion TL which was considered a very important step.

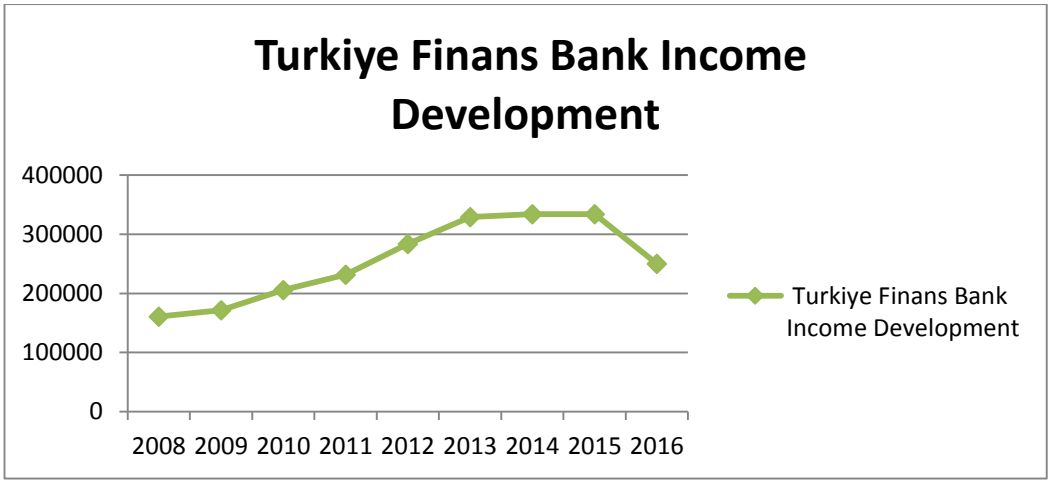

Figure 23: Turkiye Finans Income. **Source:** TKBB

Figure 23 studies the income of Turkiye Finans Participation Bank in the interval time between 2008 and 2016. In 2008 the income of Turkiye Finans was

160million TL and the increase wasn't huge because of the crisis and the difficulties of that period but the participation banks in general bypassed it .Turkiye Finans committed a noticeable increase by reaching 205 million TL in 2010.Then 231 million TL in 2011, 2012 recognized a small increase from 231 million TL to 238 million TL and it kept increasing with stable steps and different growth rate.

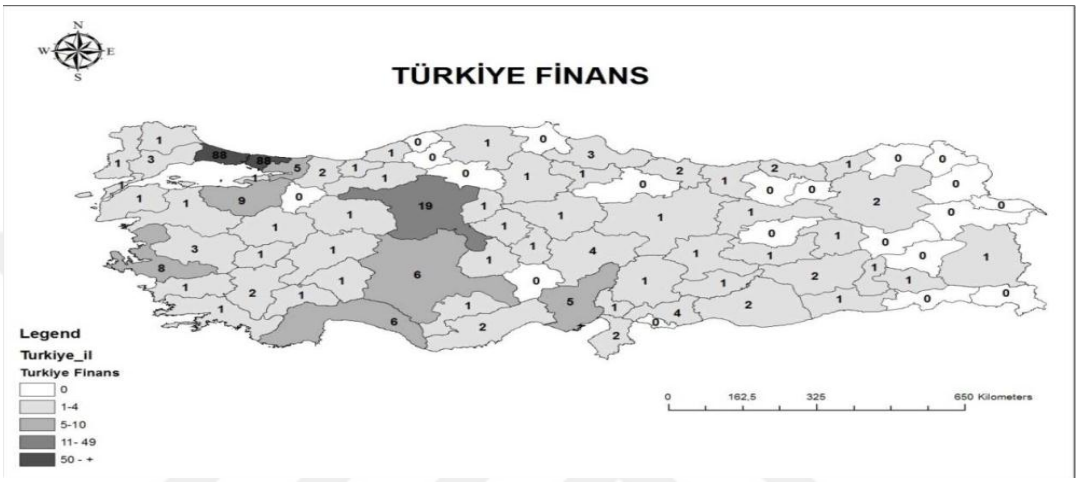

Figure 24: Geological dissemination for Turkiye Finans bank limbs over turkey. (Data of 2012)

Source: Belge and Egresi Development of Islamic Banking in Turkey, 2015.

CHAPTER 2: DETERMINANTS OF BANKING PROFITABILITY IN GENERAL

For the past three decades, a lot of researches have been made with an aim to reveal the factors that affect the conventional bank's profitability. However, only a few studies investigated the determinants of profitability of the Islamic banks.

Haron (2004) did research on the determinants of Islamic banks profitability by using VAR model from 1994 to 2002. The results show that there is a significant long run relationship between the Islamic banks profitability and determining variables such as liquidity, deposit, assets structure, inflation and money supply. He also found out that profitability of Islamic banks does not respond quickly to changes in the explanatory variables in the short term.

Yilmaz (2013) investigated the determinants of profitability using a panel data regression over 2005 to 2010 from 195 banks in Turkey and eight other countries. The end result shows that operating expenses management, credit risk, capitalization, bank size and inflation affect the profitability significantly.

Smaoui et at (2012) in his study on the profitability, the profitability model is estimated using the Prais-Winston estimation technique which produced panel corrected the standard error (PCSE) estimates for linear panel data models on Islamic banks in GCC region basing on data collected from 44 banks between 1995 to 2009. This study concluded that higher capital means better asset quality and the larger size is a reason of higher profitability, at the same time, higher cost to income ratio cause lower profitability.

The capital plays a very important role in determining the Islamic bank profitability meanwhile operating expensive is strongly but negatively linked to it which prove that bank management's cost decision is influential in the bank performance (Wahidudin,2012).

In General, the literature has divided the determinants of Islamic banks into two categories. The bank-specific determinants which can be named internal factors are those factors that are considered to be somehow under the control of the bank administration including the size of the bank, loan, deposit, the risk taken and others. The second type of the determinants is the macroeconomic factors that are also called

external factors which are away from the bank administration's control such as inflation, interest rates changes, industry production growth, market share, gross domestic product etc (Chowdhury, 2015).

2.1 Bank Specific Determinants (Internal Factors)

More recent Z.R Imad (2011) by using profit margin and return on assets (ROA) with linear regression model on unstable panel data investigated the influence of the bank-specific determinants of Jordanian Islamic banks profitability. The factors that were involved are bank size, capital adequacy, credit risk, liquidity risk, management efficiency, management expenses, non-interest earning, and market concentration, banking industry size, inflation and economic growth. The upshot indicates that the equity to total asset ratio, capital adequacy, investment to total deposits ratio, management efficiency have a good effect on the Jordanian Islamic bank's profitability and can guide to a greater profit. On the other hand, it shows the positive effect of the credit risk on Islamic bank's profitability and the non-significant effect of other factors like non-interest earning, bank size, and efficiency of management expenses.

In Jordan, during the period 2000-2006 loans to total asset ratio, the deposit ratio, the capital structure, and the operating expenditures ratio and non-operating expenditures ratio were the most important internal determinants of the profitability of banks (Al-Jarrah; 2010).

Lipunga (2014) using a linear regression model between 2009 and 2012 in developing countries. The end result shows that liquidity, bank size, and management efficiency affect the bank's profitability. Oppositely to capital adequacy that doesn't have a meaningful effect on ROA.

Putranto et al. (2014) using Return on Assets (ROA) and Return on Equity (ROE) as proxies of profitability examined 25 commercial banks in Indonesia over the period of 2007-2012, the outcomes showed that loan to deposit ratio and market share of credit has a negative impact on profitability.

2.1.1 Deposit

According to some Islamic financial institutions, deposits are categorized to Wadia and Emana, on the other hand, current accounts can be counted as Qard hassan (Farooq, 2008).

In the case of Qard hassan, the bank has the permission to use the money of the depositors to invest its own operations but is assuring full repayment in case of request (Ahmad, 1994).

These kinds of accounts are considered as a loan from the depositors and therefore the bank is obligated to repay on demand but in consequences, the account holders can't get any kind of benefit. If the customers of Islamic banks want a benefit from their deposits, they should participate in investment accounts also known as PLS profit and loss sharing account and from the name we can understand the concept of these kinds of accounts. In contrast with the conventional banks the profit of investment accounts in Islamic banks is not fixed in advance. The customer should participate with percentage of his funds to be used in one of the banks investment project which can lead to benefit but also can lead to a loss and in the both cases, the customer is obligated to share loss and profit with the bank according to the contract (Al-Jarhi and Iqbal; 2001)

On the other hand, Fraser and Rose (1971) didn't find any significant relationship between profitability and loan rate, time to deposit rate and loan to deposit rate.

Haron (1966) using dummy variable model on Islamic banks from various countries proved that current savings and investment accounts of Islamic banks are positively related to the profitability term. Between the terms of operating costs, deposit and loan structures and control management, the factor of bank cost has the biggest impact on the bank's performance following by bank's deposit then loan composition.

Which mean that deposits in Islamic banks can be seen as a liability and that's due to the concept of "profit and loss sharing" that the Islamic banks are practicing.

Almost in all the literature, a negative relationship between time deposits and profitability, at the same time significant positive relationship between profitability and current account deposits was discovered.

Haron (2004) applied a dummy variable approach and found that practically there is no significant relation between profitability ratio and all deposit structure variables, except for deposits in current account which its significant relationship with return on total asset (ROTA) and net profit before tax (PBT) was proved. The statistics added also that each 1% increase in the current accounts leads to an increase in the bank's income and profit before tax respectively by 0.034% and 0.036%. This study was in line with others which indicated a significant positive relationship between savings deposits variable and ROTA where for each 1% rise in a savings account, ROTA increase by 0.26%. The fund deposited can be used by the Islamic banks to do investment and make a supplementary profit.

Muhammad, Inamullah, and Mudsir (2016) affirm that the impact of deposits over the profitability of the bank is so important and that can be caused by the fact that deposits are the principal source of funding for banks and its liability also, therefore any increase in deposits level cause an increase in the profitability.

2.1.2 Bank Size

In Rahaman and Akhter (2015) study, the size of the banks is considered as an internal factor as it is considered one of the banks specific on the supposition that the administration of the bank is responsible for increasing their institution by collecting supplementary assets and liabilities.

Still, other researchers count it as an external factor. The relation between the bank size and its profitability is not clear and can't be easily predicted from preexisting studies. Nonetheless, there is a good reason that makes assures that there is a relation between the bank size and the profitability. The more the size of a bank is bigger the more it is profitable and that is by allowing banks to realize economies of scale and that can cause a better banking system by getting rid of incompetence and diminishing risks (Regehr and Sengupta, 2016).

The fact that increases in the size of a bank allows it to divide fixed expenses over a larger asset-based by that lowering their average costs. Also, the size can help by limiting the risk (Mester, 2010)

Reducing the risk can play a principal role in promoting profitability, it can affect the profitability of the bank directly and that by reducing losses, or indirectly by

diminishing the bank's funding expenses by making the liability holders ready to receive lower benefit (Regehr and Sengupta, 2016).

Murthy (2014) in his study assumed that a lot of factors affect the bank's profitability and the size of the total assets was determinate from the most important factor that affects banks profitability in the gulf by using panel regression did an investigation on the banks in the gulf cooperation council countries on data including Islamic and conventional banks over the period 1999 to 2012.

Rahaman & khan (2015) concluded that the Size has a positive and significant impact on ROA by using return on assets (ROA), net interest margin over total assets (NIM) and return on equity (ROE) on data covering 25 commercial banks between 2006 and 2013 in Bangladesh agreed.

The significant effect of the size can be due to the fact that for larger banks the cost of borrowing is lower (Ali, Akhtar, & Sadaqat, 2011; Idrsi et al., 2011; Ahangi, 2013). In addition the larger banks are considered more effective when it comes to the cost management (Alkassim, 2005; Idris et al., 2011; Ahangi, 2013).

On the other hand, the size can have some negative effects because of bureaucratic and other reasons (Abduh and Idrees, 2013).

2.1.3 Liquidity

Achieving a profit is the most important concept in any banking activities and the Islamic banks are not an exception. The liquidation is considered as one of the bank-specific determinants that are very significant in the term of profitability. Without having the appropriate level of liquidation (neither too high nor too low) the Islamic banks won't be able to reach the await profit.

Rasu (2013) did a study by applying multiple linear regression models on 5 banks in Bangladesh between 2001 and 2011 and discovered a significantly positive relationship between liquidity and banks profitability.

Molyneux and Thomton (1992) in their study using a simple linear equation across eighteen European countries between 1986 and 1989 discovered a significant positive relationship between profitability and liquidity. More recent Haron (2004) and Wasiuzzaman & Tarmizi (2016) findings are strengthening the same.

It can be seen from the way of calculation of Liquidity ratio (loans to total deposit and short-term funding), the clear correlation between liquidity and banks performance in general and profitability in specific because loan is one of the most elements that can affect profitability therefore, there should be more profit when more deposits are transferred into loans. In consequences, the liquidity ratio is related positively to profitability (Abduh and Idrees, 2013).

On the other hand, some studies disagree and confirm that the relation between liquidity and profitability is significantly negative. Further, they state that the Islamic banks are more liquid than conventional banks (Izhar and Asutay, 2007 and Srairi, 2009).

Under some condition, the relationship between liquidity and profitability of Islamic bank can be negative. The ratio investment to total asset concludes that if the bank concentrates on investing the funds more in assets, the liquidity will be low and profitability will be high. That indicated the negative relationship between liquidity and profitability that the Islamic banks are experiencing (Maqbool, 2014).

2.1.4 Capital Adequacy

Capital ratio is measured by total equity over total assets. Higher capital ratio lead to less need for external funding and less borrowing costs thus well-capitalized banks are expected to be more profitable.

Athanasoglou et al, (2005) study the determinants of bank profitability using a linear regression model in the south eastern European region during 1998 to 2002 approved that the relation between Islamic banks profitability and capital adequacy is predicted to be significantly positive.

Abreu and Mendez (2002) in their study used the balance sheet and income statement data for the period 1986-99. The result shows that Banks with large capital can face lower expected bankruptcy costs, thus showing that there is a positive relationship between capital and profitability by increasing profits. Higher capital ratio leads to less need for external funding and less borrowing costs thus well-capitalized banks are expected to be more profitable.

Izhar and Asutay (2007) using linear regression model, the data used in this study was monthly data of Bank Muamalat Indonesia from January to December. Their

study aims to examine the relationship between the performance of Islamic banks against a set of internal and external determinants. They found an insignificant negative relationship between capital and profitability hence showing that equity is a small proportion of total assets.

Wasiuzzaman & Tarmizi (2010) using Ordinary Least Squares (OLS) method over 16 banks and windows in Malaysia from 2005 to 2008 came online and found a negative relationship and suggest that Islamic banks in Malaysia should not focus on increasing the equity performance in an aim to increase profitability.

Strong capital is a big guarantee for the bank in the critical situations and insures the depositors that their money is in safe hands. Higher capital indicates lower leverage and risk which mean lesser financial charges, therefore higher profitability (Chowdhury, 2015).

2.1.5 Expenses Management

In the literature, the majority of researchers determinate that the expense control is the prime mover of bank profitability because it offers a constant chance for profitability increase. This fact is identical in the Islamic banks and conventional banks. According to the level of competition in the market, great expenses management means lesser effectiveness of bank which affects the bank profits negatively. The distinctness of payments for work (wages) is so noticeable which put the expenses of management as a key of determinants of profitability , staff and other expenses of its kind decrease the income (bottom line), it comes into sight that staff expenses affect return over asset negatively (Bouke , 1989).

Molyneux (1993) study indicated that in the case of regulated industry, high and good quality can be the main cause of higher profitability. In other words, high expenses generally mean better quality so better service/goods which can cause a bigger share of the market hence more profit.

2.2 Macroeconomic Determinants (External Factors)

The profitability of any bank can be affected either by external or internal factors. Macroeconomic (external factors) are those factors that can't be controlled by the bank's administration. Some of them are significantly related to profitability others

are not but it is certain that the macroeconomic factors affect the banks operating within it. In this study, four of these factors will be studied: inflation rate; gross domestic product GDP growth rate; market share; money supply (Uhomoibhi; 2008).

The majority of the macroeconomic factors such as interest rates, market share, bank size, economic growth, inflation, finances stored under current accounts, the profit rate given by the bank to depositors and cash supply (Haron, 2004).Others such as the level of interest rates, bank concentration are strongly correlated to the Islamic bank's profitability (Molyneux and Thornton; 1992).

Abreu and Mendes (2002) used Interest Margin, Return on Assets (ROA) and Return on Equity (ROE) between 1986 and 1999 from various EU countries (Portugal, Spain, France, and Germany). They confirmed that the unemployment rate has a significant positive impact on the Islamic banks' ROA. In addition, the inflation rate has the same positive impact on the banking sector in general.

In the study of Bashir (2000) using regression model and data from the sample of 43 Islamic banks from eight Middle Eastern countries are pooled for all eight years (1994-2001). The results show that GDP and profitability has significant positive relationship.

2.2.1 Inflation Rate

The inflation rate is one of the most important macroeconomic factors that may impact not only the Islamic banks but also the conventional banks.

Papanikolaou (2009) Wasiuzzaman and Tarmizi (2010), Athanasoglou et al (2005), Izhar and Asutay (2007), Vong and Chang (2006), Kunt and Huizinga (2000) and Haron (2004) in their studies investigated the relation between profitability and inflation and discovered that it is significant and positive.

While the study of Hassan and Bashir (2004) disagree with them and consider the relation between the profitability and inflation is totally negative.

Still, Srairi (2009) went further by denying any significant relation or impact of inflation over the bank's profitability.

On the other hand, some empirical studies indicate that the inflation rate effects the Islamic bank's profitability positively which proved that almost in all situations Islamic banks were capable of predicting the probable change in the inflation rate (Bashir 2003; Smaoui & Salah 2012; Wasiuzzaman & Tarmizi, 2010).

The consequence of any case of unexpected change of inflation rate is a negative impact on the bank's profitability (Kok et al, 2012).

Therefore the impact of inflation rate is highly related to whether it has been predicted or not. In the case of Islamic banks the prediction is very important as long as in the modes of financing (the non-PLS and the PLS mode of financing) showing the markup values and the share of profit are predetermined. Therefore in case of unanticipated inflation, the profit accomplished by the bank loses its original value and like that the inflation affects the profitability negatively (Parviz Ahangi, 2009).

Due to the fact that the interest based loans are prohibited in Islamic banks, the inflation can probably have impact only on the actual financial worth of the profits and losses with the knowledge that in general the inflation rate have a significant impact on the profits achieved by banks and that is by affecting loan quantity, asset quality, and interest rate (Wasiuzzaman & Tarmizi, 2010).

Inflation is determined as one of the most important macroeconomic factors, Staikouras and Wood (2002) confirmed that inflation has a direct and indirect impact on the profitability of banks. The direct impact is an increase in the price of labor and the indirect one is an increase in asset prices.

2.2.2 Real Gross Domestic Product (GDP) Growth Rate

Real gross domestic product (GDP) is a guide that can make us understand the situation of economic activity in specified area. It can affect the market in general by impacting many factors such as demand for loans and deposits.

Bashir (2003) did an empirical study using a data that includes 14 Islamic banks in 8 different countries between 1993 and 1998 using panel data methods that showed that GDP has a positive and significant impact on Islamic banks profitability.

Srairi (2009), Wasiuzzaman and Tarmizi (2010) in their studies on the determinants of islamic banks profitability on GCC countries and Malaysia. The two studies admit

that the relationship between Islamic banks profitability and GDP is significant and positive and that's due to the macroeconomic situations that impact the environment that banks are operating in.

Ramadan et al (2011) studied determinants of Islamic banks profitability on Jordanian banks using two measures of bank's profitability: the rate of return on assets (ROA) and the rate of return on equity (ROE over the period of 2001-2010), found a positive but insignificant relationship between GDP and Islamic banks profitability which was the same result accepted by Kunt and Huizinga (2000) and Vong and Chang (2006) who found similar results.

As known, the Islamic banks work on the concept of profit and loss sharing therefore, the situation of the economy has a direct impact on the investment of Islamic banks. Thus, it will affect the profitability of the bank and its customer by reducing the profit expected from the projects. Therefore, the relationship between the economic growth and bank's profit is expected to be positive (K Karim, Mohamed Sami, and K.Hichem, 2010).

In a developed economy, the demand is high for all kind of financial institutions and the default risk is low hence a high profitability of banks. In this study, the author expected that the GDP growth has a positive impact on banks profitability (Abduh and Idrees, 2013).

2.2.3 Money Supply

Kok et al., (2012) used Ordinary Least Square (OLS) to run the regression model over data from the year 2006 to 2010 from 16 Islamic banks in Malaysia. The results show that the money supply affect the macroeconomic conditions in consequence it affects the bank's profitability by affecting the capability of customers. Therefore, the money supply affects not only the Islamic banks but also conventional banks performance. The empirical study shows a positive and significant relationship between money supply and profitability of Islamic banks.

On the other hand, some authors such as Haron (2004) found a positive but insignificant relationship between money supply and profitability of Islamic banks.

2.2.4 Market Share

Mongo and Heggested (1976) in their study about the determinants of the bank's profitability indicate that market share affects the profitability of banks in other words if the Islamic banks have a bigger market share that can help them to be more effective and profitable in addition to the ability of controlling the prices and customer services.

CHAPTER 3: IMPACT OF INTEREST RATE ON BANKING PROFITABILITY

3.1 The Impact of Interest Rate on Banks

In a theoretical study, Rosly (1999) affirm that because of the overdependence of the Islamic banks on fixed rate asset financing such as murabaha the Islamic banks are exposed to interest rate risk. He added that in the case of interest rate changes the conventional bank's rates of return on deposit will change parallel with the interest rate yet the Islamic banks can't do the same because its profit rate is fixed in advance. Therefore, the Islamic deposits accord lower return and as consequences, depositors go for conventional banks. That was supported by his findings of Bank Islam Malaysia Berhad that showed a decrease in the profit of the mentioned bank in the period of increase of interest rate of the conventional banks.

The Islamic banks are facing also the return risk rate due to the use of interest rate to define the rate of return on investment accounts and financing rate (IFSB, 2005). This is coming from the fact that the Islamic banks can't lead the market for the moment mainly because of its small size compared with the conventional system. Therefore the Islamic banks are obligated to follow the market interest rate changes. This means that the Islamic banks can't protect themselves from the interest rate changes in the nowadays situation in consequences it will affect the return rate and the deposits level and other aspects of the Islamic banking (Ayub, 2007).

Kader and Leong (2009) provide an empirical explanation of the impact of interest rate changes on demand for the Islamic banks in a dual banking system in Malaysia by using Co-integration, VAR and Granger Causality Test and a monthly data from 1999 to 2009. They emphasize that any increase in the base lending rate would induce customers to obtain financing from Islamic banks and vice versa. When the interest rate increases the Islamic banks financing will be more desired and in the case of decrease of interest rate customers will prefer conventional loans than Islamic financing. They resumed by highlighting the fact that the Islamic banks which are operating in a dual system are exposed to interest rate risk despite being interest-free. They recommended that Islamic banks should be more independent and not let the

interest rate movement affect it by concentering more on the profit-sharing concept and rent based finance leasing.

In the study of Mangkuto (2004) on the Bank Muamalat Indonesia, a positive correlation between the bank return rate and the level of deposit in the interval of time 2000-2004 were found, and that is not the case when it comes to conventional banks interest rates which seem to have a negative relation with the deposit level. This means that some of the bank depositors are motivated by the profit rate, what explains the effect of interest rate changes on the Islamic bank's deposit level.

Bacha (2004) discussed the correlation between the interest rate and the Islamic bank's rates of return as well as the deposit level by using time series data between 1994 and 2003 in Indonesia. Results from Pearson Correlation and OLS Regression shows that any changes in interest rate and deposits of conventional banks cause changes in the rate of return and deposits of the Islamic banks. He documents that when the interest rate increase the Islamic banks should increase their return rate and the lack of ability to do so can cause them a lack of liquidity problem.

There are other studies that went furthermore to affirm that Islamic banks despite being interest-free are more affected by the interest rate changes than the conventional banks that are due to the type of financial market that they are performing (Kassim et al, 2009). Kassim et al (2009) study based on Vector Auto-regression methodology between December 2005 and July 2009 states that the conventional interest rate is one of the major factors that determinant the saving in the Islamic banks in Indonesia.

Rohmah (2006) in his study used Autoregressive Distributive Lag (ARDL) and data covers all Islamic banks in Indonesia from 2000 to 2006. Showed that the investment accounts deposit in the Islamic banks is cointegrated with the return of the Islamic deposit, interest rate of the conventional banks' deposit, number of Islamic banks' branches.

Chong and Liu (2008) study based on Granger Causality test and data between April 1995 and April 2004 showed that the rate of return in Islamic bank deposit is positively correlated with the interest rate in conventional banks in Malaysia. It is empirically proven that any increase in interest rate will cause an increase in

conventional banks deposit level yet it will cause a decrease in the Islamic deposits and vice versa.

Rahmatina and Salina (2009) employed the Vector Autoregressive model to analyze the rate of return importance on Islamic deposit. Data from 2000 to 2007 show that the interest rate on conventional deposit, real income, and a number of Islamic bank branches in determining the level of savings in the Islamic banks for all Islamic banks in Indonesia. They found that the interest rate changes affect the level of saving in the Islamic banks. The results of this study have big comments on the risk management applied by the Islamic banks.

Zainol and Kasim (2010) examined the determinants of the rate of return and total deposits in Islamic banks using Vector Autoregression (VAR) over a data from January 1997 to October 2008 in Malaysia. They found that the Islamic banks rate of return and the interest rate of conventional banks are related and have a long-run equilibrium. Even more, the study supports Chong and Liu (2008) by concluding that the deposit rate in Islamic banks and the interest rate of conventional banks have a negatively significant relation.

Zairy and Salina (2010) exanimated how the interest rate changes influence the rate of return of the Islamic banks and the deposit level of both Islamic and conventional banks. Using time series data from January 1997 to October 2008, based on the Vector Autoregression (VAR) framework. The study findings indicated that despite being operation interest-free but a dual banking system can cause them to face the problem of rate return risk. Result showed that interest rate of conventional banks has significant effect on the rate of return and deposit of the Islamic bank. The recommendation of this study is not to count too much on the fixed rate instruments (Murabaha) but to concentrate on the profit sharing ones like Musharaka and Mudaraba contracts.

Etem and Bengül (2011) analyze the impact of interest rate changes on the deposits and loans of both Islamic and conventional banks in Turkey by using VAR method and a monthly data for the period between 2005/12 and 2009/7. The result of the study shows that unlike theoretical expectations not only the conventional banks are

affected by the interest rate changes but also such instruments of Islamic banks are facing a serious interest rate risk.

In an empirical study made by Haron & Norafifah used Adaptive Expectation Model and aim to study the effects of conventional interest rates and rate of profit on funds deposited with Islamic banking system in Malaysia. They proved that there is a noticeable relation between the rate of return and the level of deposit in the Islamic banks. They confirmed that the majority of the Islamic bank's clients that place their savings at investment accounts are from the first place guided by the profit motivation and that is further confirmed from the negative relationship between the interest rate of the conventional banks and the level of deposits in the Islamic banks that was mentioned several times ahead.

3.2 The Impact of Interest Rates Changes on Banks Profitability

In the literature, the majority of studies empirical and theoretical ones indicate that the interest rate fluctuation has a strongly significant positive relationship with banks profits in general. In other words, the authors agreed that in the case of an interest rate rise the banks' profits increase also and in the period of interest rate decrease the banks' profits decrease. However, this rule does not include the Islamic banks. On the contrary, the relationship between Islamic banks and the interest rate is significantly negative. Any increase in the interest rate may cause a decrease in the Islamic banks' profits and vice versa. According to most studies, the Islamic bank's customers are profit motivated so in the case of high-interest rate all the customers in the market will prefer to cooperate with the conventional banks as they will be offering a better profit which will cause a lack of deposits for Islamic banks and as results fewer profits. In addition, any decrease in interest rate can be very usefully for Islamic banks profitability and affects it positively.

Akpomiemie (2012) study investigated impact of market interest rate fluctuations on the profitability of commercial banks for fourteen commercial banks and one investment bank in South Africa between 2001 and 2010. He found that interest rate changes have a positive impact on the profitability of commercial banks in South Africa. In a time of increase of interest rate the profit of small commercial banks also rises.

Khedhiri (2011) study about "Determinants of bank net interest margin in Tunisia: a panel data model" using regression model and profits and interest rates for 10 commercial banks in Tunisia during the period 1996-2003. The result shows that the interest rate impacts the expenses of banks therefore, it affects the bank profitability.

Staikouras, (2002) worked with a balanced sample covering the entire EU banking industries in the period 1994-1998. The findings show that the European banks are affected by external and internal factors and the interest rate is determined as one of the external factors that affect the European bank's profitability significant positivity, in other words, any rise in interest cause increase of bank profitability.

Piergiorgio and Benjamin (2012) examined the link between interest rate and banks' profits using regression model and a unique panel data set on UK banks in the period from 1992Q1 to 2009Q3. Result showed that rise of interest rate in short term reduce profitability, however any increase in interest rate in long run can lead to profitability increases.

Aydogan (1991) investigated the relationship between interest rate risk and bank profitability using data from first January 1991 up to last September 1991 from the same year for Turkey, using monthly reports for 42 banks including 5 state-owned banks, 17 private Turkish banks, and 20 foreign banks. The study discusses the risk of interest rate menacing the commercial banks in Turkey. He concluded that the interest rate that rises in short term may cause a better profitability.

Abdul Satar & Khan (2014) researched the impact of interest rate changes on the profitability for four big banks in Pakistan, using Pearson correlation method on banks statement from 2008 to 2012. He concluded that the relationship between commercial banks profitability and the interest rate is strongly positive, in other words, if interest rate increase the commercial bank's profitability increase also and vice versa.

On the other hand, Genay (2014) in his theoretical Essay "Impact of low-interest rate environment on bank profitability" attest that the interest rate affect banks profitability, high-interest rate lead to increasing profitability of banks and in case of low-interest rate the profitability of banks especially small ones decrease, however even big changes in interest rate has only small effects on banks profitability.

About Islamic banks, Kader & Leong (2009) examined the impact of interest rate changes on Islamic banks in Malaysia a dual banking system using Unit Root Test, Co-integration, Vector Autoregressive (VAR), Granger Causality and Impulse Response Function (IRF) over monthly data from 1999 to 2007. Result showed that the customers are profit motivated if the interest given by conventional banks is too high than Islamic banks profit rate, the customers will guide their deposits to conventional banks and vice versa what will influence directly the Islamic bank's profitability.

Ergeça and Arslan (2011) study based on Vector Error Correction (VEC) methodology over the period between December 2005 and July 2009 examined the impact of interest rate on deposits and loans held by conventional banks and Islamic banks. The findings show that Islamic banks in Turkey are noticeably influenced by interest rate, any increase of interest rate increase the conventional bank's deposits at the same time it decreases the Islamic bank's deposits.

CHAPTER 4: EMPIRICAL FRAMEWORK

4.1 Data Collection

This study empirically analyzes the impact of interest rate on Islamic banking profitability in Turkey by using econometric methods and a quarterly data for three participations banks from 2008:1 to 2016:3. Data used in this study are comprised of 3 currently operating participation banks in Turkey such as Kuveyt Turk, Al Baraka Turk, and Turkiye Finance participation banks. Total assets, Loans and return on total assets (total profit) data for participation banks obtained from TKBB and interest rate data obtained from Central Bank of Turkey (TCMB), Probability is calculated ROA divided by total assets.

4.2 Methodology

4.2.1 Panel Unit Root Test

The variables should be integrated of the same data, as the first step for testing the panel co-integration among variables is to examine the units root properties of the data. It can used two type of specification to do the Panel unit-root test, one with a homogeneous process and the other with a heterogeneous unit-root process. The first type of specification can be fulfilled by Levin, Li and Chu (2002) (LLC), Breintung (2000), and Hadri (1998), the second specification can be done by Im, Pesaran and Shin (2003) among others. In the present study we have used one method of panel unit root tests which is Im, Pesaran and Shin (2003) (IPS) from the second specification.

Researches in economics indicated in their studies the fact that IPS test have a superior test power in analyzing long-run relationships in panel data, therefore this test will be used in our study. IPS is based on the well-known Dickey-Fuller Procedure:

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

Where i= 1. . . N and t = 1. . . T

The hypotheses may be written as:

H_0: $P_i=0$; for all *i*

H_1: $P_i<0$; for at least one *i*

The average of the t-statistics for from the individual ADF regressions, $\boldsymbol{t_{iTi}(p_i)}$:

$$\bar{t}_{NT} = \frac{1}{N}\sum_{i=1}^{N} t_{iT}(p_i \beta_i)$$

The t-bar is then standardized and it is shown that the standardized t-bar statistic converges to the standard normal distribution as N and T→ ∞.

4.2.2 Panel Co-integration

In the traditional sense, there is co-integration if the long run relationship between variables is linear. Several tests have been proposed for panel co-integration like Pedroni (1999; 2004), Kao (1999) and a Fisher-type test using an underlying Johansen methodology (Maddala and Wu, 1999). In order to examine the long-run equilibrium relationship among variables the study uses Kao (1999) Residual Co-integration Test, which is based on Engle Granger-two step. Kao (1999) test is calculated as follows:

$$y_{it} = \alpha_i + \beta x_{it} + e_{it}, \text{ i=1, N…t=1…T}$$

Where:

$$y_{it} = y_{it-1} + u_{it}$$

$$x_{it} = x_{it-1} + \varepsilon_{it}$$

Kao's (1999) Augmented Dickey-Fuller (ADF) test can be calculated as follow:

$$\acute{\varepsilon}_{it} = \rho \acute{\varepsilon}_{it-1} + \sum_{j=1}^{p} \Theta_{it} \Delta \acute{\varepsilon}_{it-j} + v_{it}$$

The null hypothesis of no co-integration against the alternative can be specified as:

H_0: $\rho=1$, H_1: $\rho< 1$

4.2.3 Estimation of Coefficient

In the presence of co-integration relationship between the variables, long-run parameters had to be estimated. Once the co-integration is proved, OLS estimates show spurious coefficients.

For the estimation of Panel Co-integration a several of alternative estimators can be used such as DOLS and FMOLS among others. Because DOLS estimator does not consider the cross-sectional heterogeneity problems, Pedroni (2000) preferred to use FMOLS estimator that take care of the cross-sectional heterogeneity, endogeneity and serial correlation issues. In small samples –like our case- FMOLS is more trusted because it gives more rational estimations.

The heterogeneity was allowed from Pedroni (1996 and 2000) in the short run dynamics and the fixed effects. FMOLS Pedroni's estimator is constructed as follow:

$$\hat{\beta}_{FM} \quad \beta = \sum_{i=1}^{N} \hat{\Omega}_{22i}^{2} \sum_{t=1}^{T} (x_{it} \quad \hat{x}_t)^2 \quad {}^{1} \sum_{i=1}^{N} \hat{\Omega}_{11i}^{1} \hat{\Omega}_{22i}^{1} \quad \sum_{t=1}^{T} (x_{it} \quad \bar{x}_t) e_{it} \quad T\hat{\gamma}_i$$

$$\hat{e}_{it} = e_{it} \quad \hat{\Omega}_{22i}^{1} \hat{\Omega}_{21i}, \qquad \hat{\gamma}_i = \hat{\Gamma}_{21i} + \hat{\Omega}_{21i}^{0} \quad \hat{\Omega}_{22i}^{1} \hat{\Omega}_{21i} \left(\hat{\Gamma}_{22i} + \hat{\Omega}_{22i}^{0} \right)$$

Where the covariance matrix can be decomposed as $\Omega_i = \Omega_i^0 + \Gamma_i + \Gamma_i$

$\boldsymbol{\Omega_i^0}$: Contemporaneous Covariance Matrix

Γ_i : Weighted Sum of Auto-covariance

In this study, we employed Panel Fully Modified Least Square (FMOLS) test which is developed by Pedroni.

4.3 Results

4.3.1 Panel Unit Root Test Results

In order to analyses the panel unit root of profitability, interest rate, loan and total asset Im, Pesaran and Shin (2003) IPS panel unit root test were used.

The results of Table 15 present IPS (2003) tests, it shows that all the studied variables are non-stationary at their level[3]. The null hypotheses of non-stationary cannot be rejected so the series contains a unit root. However, after the first order differentiation, the test statistics show that we can reject the null hypothesis of non-stationary for all the series at 1% level of significance. As a conclusion, all series are stationary on their first order difference; the variables are integrated of the order of one. In order to understand the long run equilibrium relationship between the variables the Kao co-integration test will be applied. Kao analysis of co-integration has been explained in the following session.

Table 15: IPS Panel Unit Root Test results

Series Profitability (P)	
I(0) 1.158 (0.123)	I(1)) 10.395* (0.000)
Series Interest Rate (F)	
I(0) 1.918 (0.027)	I(1) 4.005* (0.000)
Series Total Assets (TA)	
I(0) 3.508(0.999)	I(1) 1.612* (0.000)
Series Loan (L)	
I(0) 4.330 (1.000)	I(1) 1.374* (0.000)

*indicates 1% level significance

[3] Interest rate is non-stationary at 5% level

4.3.2 Panel Co-integration Results

As the panel unit root results reveal that all the variables are stationary at I (1), we proceed to check the co-integration or long-run relationship between the variables by using Kao test.

Table 16: Results of Kao's Residual Co-integration Test

Series Interest Rate and Profitability	
ADF	-2.679* (0.003)
Residual Variance	1.419
HAC Variance	1.926
Series Interest Rate and Loan	
ADF	-2.536*(0.005)
Residual Variance	1.470
HAC variance	2.305
Series Interest Rate and Total Asset	
ADF	-2.483*(0.006)
Residual Variance	1.464
HAC Variance	2.224

*indicates 1% level significance

Table 16 confirms that the Kao co-integration tests suggest long-run relationship among four variables at 1% level of significance. The statistics indicate that null hypothesis of no co-integrating relationship can be rejected at 1% level of significance. Kao test statistics support a panel co-integration between interest rate and profitability, interest rate and loan, interest rate and total asset.

4.3.3 Estimation of Coefficient Results

Since the pre-tests for unit roots and co-integration suggest that the variables are stationary and co-integrated, we continue the estimation of coefficient of the long run relationship using the FMOLS within dimension pooled estimator suggested by Kao and Chiang.

Table 17: Results of FMOLS

Dependent Variable : Profitability (P)	
Variable	Interest rate (F)
Coefficient	0.000258*
Std.Error	6.60E -05
t-Statistics	3.913625
Prob.	0.0002
Dependent Variable : Loan	
Variable	Interest rate (F)
Coefficient	-634875.0
Std.Error	410816.0
t-Statistics	-1.5454
Prob.	0.1255
Dependent Variable : Total Assets (TA)	
Variable	Interest rate (F)
Coefficient	-945552.1
Std.Error	643915.0
t-Statistics	-1.468442
Prob.	0.1452

The table 17 shows the long-run coefficient estimated by adopting FMOLS. The study estimates long run relationship between interest rate and profitability, interest rate and loan, interest rate and total asset with panel group.

FMOLS results show that the relation between the interest rate and participation banks profitability is significantly positive. If the interest rate increases 1 point, profitability of participation banks will increase 0.00025 points. This result does not support the theory and our hypotheses.

However it was not a surprise, because of the people who claim that participation banks are getting close to conventional banks and behave like them. On the other hand, any increase in interest rate will be faced by an increase on the credit rate of the participation banks, while only a slight change on the profit rate will be seen. In

consequences, the spread between credit rate and profit rate will augment, therefore the profitability of participation banks will increase just like the conventional ones.

Even though, interest rate and loan are co-integrated according to the Kao panel co-integration test, the results from FMOLS shows that coefficient of interest rate is unexpectedly negative and insignificant. If it is considered that participation banks are getting close to conventional banks and behave like the sign of coefficient can be negative due to the fact that the participation banks increase their credit rate as interest rate increase.

On the other hand, interest rate and total assets are also co-integrated, however the results of FMOLS shows that the coefficient of interest rate is negative as expected but insignificant.

CONCLUSION

This study aimed to shed light on the impact of interest rate fluctuations on the profitability of participation banks being operating in Turkey. During the study other variables were added such as loan and total assets. The Return on Asset (ROA) will be taken as a measurement of profitability. A data of 3 participation banks operating in Turkey from 2008 to 2016 Q3.

While using the needed empirical methods, the results found didn't support the theory neither the hypotheses of the study. The hypotheses indicates that any increase in interest rate will affect the customers (depositors) which are profit-motivated, so they will prefer to deposit their funds in participation banks which will lead to more fund so more profit.

However the empirical work shows that the interest rate and participation banks profitability are co-integrated, and their relationship is significantly positive. This result can be explained by the fact that participation banks are getting closer to the conventional banks and are moving with them.

So any increase of interest rate will be faced by an increase in the credit rate of participation banks, while the profit rate will see only a slight increase and vice versa. In consequence, the gap between credit rate and profit rate will increase, therefore the profitability of participation banks increase.

In conclusion, the study proved with empirical models applied on three banks operating in Turkey that the participation banks despite being interest free, the interest rate fluctuations can still impact their profitability very lightly in a significantly positive way.

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BIOGRAPHY

Mariem MINNY was born on 25 December 1992 in Mauritania/Kiffa. She went to Burj Al Elem International School for college and Al Karama Private School for high school. In 2011 she graduated from the high school from the scientific branch. On September 2011, she began her Bachelor in Finance and Accounting in the Superior Institute of Commerce and Management of Societies (ISCAE) and graduate in the academic year 2013-2014 with “Very Good” mention. In 2014 she won the Turkish scholarship, she did a one year preparatory course for Turkish Language. In 2015 she began her Master degree in “Islamic Economy and Finance” in Sakarya University.