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Does Bank Type Affect the Profitability? An Econometric Research on Conventional and Islamic Banks *

Banka Tipi Kârlılığı Etkiler mi? Konvansiyonel ve İslami Bankalar Üzerine Ekonometrik Bir Araştırma

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Abstract: As in all world, in Turkey banks have quite an active position within the national economy. Banking sector providing transfer of capital accumulation to real investments, in 2005, with the arrangement, included deposit banks and development and investment banks as well as participation banks. Thus, two types of banks with different philosophy and principles had the opportunity to operate subject to the same regulations in the same competitive environment. Profitability is a matter that needs to be carefully examined in order to sustain the life of the enterprises. On the other hand, banking is a sector that is worth analyzing with the profitability numbers announced even during the global crisis. The aim of this study is to determine the factors affecting the profitability of banks. In this study, the data of 3 participation banks and 16 conventional banks operating in Turkish Banking Sector and having regular data between 2006-2018, was used. Descriptive and inferential statistical methods were used in the study. Independent internal variables, bank type, asset size, credit risk, liquidity risk, operational efficiency, capital structure; independent external variables, inflation and GDP growth rate; dependent variables were taken as return on equity and return on assets. The number of horizontal section units of the panel data is $N = 19$ and the number of time units obtained for each horizontal section unit is $T = 52$. The data set consists of a total of 988 observations. Stata package program was used for data analysis. The study contributes to the literature by distinguishing it from other studies conducted in terms of analysis period, variables and sample. First, the effect of banking type on profitability was examined. Hypothesis tests were tested by creating a panel data regression where return on assets is a dependent variable.

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Similarly, the regression result was obtained for the return on equity variable. As a result, no significant impact was detected in models that tested the effect of bank type (conventional / Islamic) on return on equity and return on assets. In the second stage, in order to examine whether the variables differ according to bank type, t test was performed. As a result, it was found that operational efficiency, total assets representing the bank size, liquidity risk and financial risk were significantly lower in Islamic banks than in conventional banks.

Structured Abstract: The purpose of the study to determine the effect of banking type on the level of profitability and which variables has an affect on the profitability of banks, which consists of 3 participation banks and 16 conventional banks from the two types of banks operating in Turkey for the period covering 2006-2018 years. Return on asset and return on equity variables is used as dependent variables in the analysis. While the bank type, asset size, credit risk, liquidity risk, financial risk and operational efficiency are used as independent internal variables, macroeconomic indicators representing by inflation and GDP growth rate are used as independent external variables. The number of horizontal section units of the panel data is $n = 19$ and the number of time units obtained for each horizontal section unit is $t = 52$. The data set consists of a total of 988 observations. Stata package program was used for data analysis.

When the academic studies that comparatively examine the financial performances of Islamic banks and conventional banks is considered, different results can be observed. The study carried out to examine the effect of bank type on profitability differs from other studies conducted in terms of selected analysis period, sample and variables and makes a significant contribution to the literature.

In the analysis, data for deposit banks got from the independent auditors' quarterly report issued at the official web page of the Banks Association of Turkey (TBB). Data for participation banks got from the independent auditors' quarterly report issued at the official web page of the Participation Banks Association of Turkey (TKBB). The inflation and growth rates data obtained from the official web page of Turkish Statistical Institute (TÜİK). The monthly available data has been converted into quarterly data for 4 periods.

In this study, descriptive statistics of the variables that are thought to affect the asset profitability of banks are determined, and the profitability variable trend is revealed. First, the effect of banking type on profitability was examined. Hypothesis tests were tested by creating a panel data regression where return on assets is a dependent variable. Similarly, the regression result was obtained for the return on equity variable. In order to see whether classical banking and Islamic banking systems have an impact on profitability, a dummy variable that indicates the banking system is included as a descriptive variable in the regression model. In the second stage, t-test was applied to determine the variables that differ according to the bank type.

As a result of the analysis; it is concluded that to made a classification as Islamic banks and conventional banks does not have an impact on profitability. Even if the working principles and philosophy are different, the similarity of the functioning structure of the two bank types and their operation in the same competitive environment and subject to the same legal regulations can be considered as one of the main reasons of this result.

According to the results of the t-test applied to examine whether the effects of the variables differ according to the bank type; it is determined that operational efficiency, bank size, liquidity risk and financial risk were significantly lower in Islamic banks than conventional banks.

Determining that operational efficiency is significantly lower in Islamic banks than conventional banks shows that the share of Operating Expenses (Dividend Expenses + Commercial Loss) in Net Dividend Revenues is lower in Islamic banks. The fact that the asset size value representing the bank size is lower in Islamic banks compared to conventional banks supports the fact that the share of Islamic banks in the banking sector is below the target. This result coincides with the understanding that Islamic banks bring the funds collected by working with the principle of profit and risk sharing to the economy, but not aim the profit maximization.

Liquidity status is related with banks' fulfilling their deposit, debt and credit obligations. Determining that the liquidity risk is significantly lower in Islamic banks than conventional banks; shows that the total debt divided by the total deposit ratio is lower in islamic banks. This result supports that the performance of Islamic banks yielded better results than conventional banks during the 2008 Global Financial Crisis period. The result

that equity capital has less share in the capital structure of Islamic banks than conventional banks means the financial risk level is significantly lower in Islamic banks.

Developing unique and modern products in accordance with Islamic finance understanding will enable to reveal their differences within the sector. In addition, Islamic banks are expected to increase permanently their shares in the sector by paying attention to Islamic financial literacy in order to ensure the public understanding of the financial products and services that they use. So, they will be able to compete more successfully on the international platforms.

Keywords: Islamic Finance, Islamic Banking, Conventional Banking, Financial Performance, Panel Data Analysis

Jel Codes: G2, G21

Öz: Tüm dünyada olduğu gibi Türkiye’de bankalar ülke ekonomisi içinde oldukça etkin bir konuma sahiptir. Sermaye birikiminin reel yatırımlara aktarılmasını sağlayan bankacılık sektörü 2005 yılında yapılan düzenlemeyle birlikte, mevduat bankaları, kalkınma ve yatırım bankalarının yanı sıra katılım bankalarını da içine almıştır. Böylece felsefesi ve ilkeleri farklı olan iki banka tipi, aynı rekabet ortamında aynı düzenlemelere tâbi olarak faaliyet gösterme imkânı bulmuştur. Kârlılık, işletmelerin hayatını devam ettirebilmesi açısından dikkatle incelenmesi gereken bir meseledir. Bankacılık ise küresel kriz sürecinde bile açıkladığı kârlılık rakamları ile analiz edilmeye değer bir sektördür. Bu çalışmanın amacı, bankaların kârlılığını etkileyen faktörlerin belirlenmesidir. Çalışmada, Türk Bankacılık Sektöründe faaliyet gösteren ve 2006-2018 yılları arasında düzenli veriye sahip 3 katılım bankası ile 16 konvansiyonel banka verileri kullanılmıştır. Çalışmada betimsel ve çıkarımsal istatistik yöntemlerinden faydalanılmıştır. Bağımsız iç değişkenler, banka tipi, aktif büyüklüğü, kredi riski, likidite riski, faaliyet verimliliği, sermaye yapısı; bağımsız dış değişkenler, enflasyon ve GSMH büyüme oranı; bağımlı değişkenler ise öz kaynak kârlılığı ve aktif kârlılığı olarak alınmıştır. Panel verinin yatay kesit birim sayısı $N = 19$, her bir yatay kesit birimi için elde edilen zaman birimi sayısı ise

$T = 52$ ’dir. Veri seti toplam 988 gözlemden oluşmaktadır. Veri çözümlemesinde Stata paket programından faydalanılmıştır. Çalışma analiz dönemi, değişkenler ve örneklem bakımından yapılmış olan diğer çalışmalardan ayrılarak, literatüre katkı sağlamaktadır. İlk olarak, bankacılık tipinin kârlılık üzerindeki etkisi incelenmiştir. Aktif kârlılığın bağımlı değişken olduğu bir panel veri regresyonu oluşturularak hipotez testleri sınanmıştır. Benzer şekilde özsermaye getiri oranı değişkeni için de regresyon sonucu elde edilmiştir. Sonuçta, banka tipinin (konvansiyonel/katılım) öz kaynak kârlılığı ve aktif kârlılığı üzerindeki etkisini test eden modellerde, önemli düzeyde bir etki tespit edilememiştir. İkinci aşamada; banka tipine göre değişkenlerin farklılık gösterip göstermediğini incelemek amacıyla t testi yapılmıştır. Sonuçta faaliyet verimliliğinin, banka büyüklüğünü temsil eden aktif toplamının, likidite riskinin ve finansal riskin, konvansiyonel bankalara göre katılım bankalarında anlamlı düzeyde daha düşük olduğu sonucu elde edilmiştir.

Anahtar Kelimeler: İslami Finans, İslami Bankacılık, Konvansiyonel Bankacılık, Finansal Performans, Panel Veri Analizi

Jel Kodları: G2, G21

Introduction

As in all around the world, banks have quite an active position within the national economy in Turkey. This effective position of banks in the country's economies stems from the task of bringing together those has surplus fund with those need fund. It is very necessary to ensure high performance in the banking sector. The most basic reason behind this is that the effects of a possible trouble that may occur in the banking sector will reflect on the entire economy. Therefore, countries carry out many studies to make the banking sector more effective and academic studies examining the profitability of banks are also important. In this context, the subject of the study consists of examining the effect of bank type (Islamic-conventional) on profitability and determining the variables that affect the profitability of banks.

The banking sector that enables the transfer of capital accumulation to real investments also included participation banks as well as deposit banks and development banks with an arrangement made in 2005 in Turkey. Participation banks which are getting more important in the financial system got start with the name of “private financial institutions” in Turkey in 1983. The purpose of the establishment of this institutions is to bring the savings of people with interest sensitivity to the economy and to ensure that similar foreign funds come to the country. The private finance institutions has been named as “Participation Bank” since 2005 (Parlakkaya & Akten Çürük, 2011: 37). So, two types of banks, whose philosophy and principles are different, had the opportunity to operate under the same regulations in the same competitive environment.

The aim of the study, which consists of 3 participation banks and 16 conventional banks from the two types of banks operating in Turkey, to determine the effect on the level of profitability and to determine the variables that affect the profitability of banks for the period covering the period of 2006-2018. For this purpose, firstly, panel data regression analysis was performed to determine the effect of banking type on profitability. In the second stage, t-test was performed to determine the variables that differ according to the bank type. It is thought that the study will make a significant contribution to the literature by distinguishing it from other studies conducted in terms of selected analysis period, variables and sampling.

The study consists of four chapters. After the introduction, a literature review is given in the first part. After the second section, which includes the methodology of the study, the empirical findings obtained were reported and interpreted in the third section. The study has been completed with the fourth section where a general evaluation is made.

Literature Review

A large number of academic studies was examined, which comparatively analyzed the financial performance of Islamic banks and conventional banks (Table 1). It was observed that different results were detected in these studies. When the following literature is examined, which consists of two parts in the form of studies conducted in Turkey and abroad. (Iqbal, 2001), (Jaffar & Manarvi, 2011), (Usman & Khan, 2012), (Siraj & Pillai, 2012), (Parlakkaya & Akten Çürük, 2011), (Şamiloğlu et al. 2013) are concluded that the performance of Islamic banks is higher than the conventional banks. On the other hand, (Safiullah, 2010), (Fayed, 2013), (Toraman et al. 2015), (Tuncay, 2018) have concluded that conventional banks are more effective than Islamic banks.

(Samad & Hasan, The performance of Malaysian Islamic bank during 1984-1997: An exploratory study, 1999), (Samad, 2004) and (Loghod, 2005), (Sakarya & Kaya, 2013), (Doğan, 2013) et al. found that there is no difference between financial performances of two type banks. All these results caused debates and caused an increase in the academic studies on this subject.

Table 1: Related Studies

Studies Conducted Abroad				
Author(s)	Method	Time Period	Extent	Result
Samad and Hasan (1999)	Ratio Analysis	1984-1997	Malaysia (8 Islamic and 8 Conventional Banks)	It is determined that the bank type does not differ statistically in terms of profitability.
Iqbal (2001)	Ratio Analysis	1990-998	12 Islamic and Conventional Banks operating in 9 Countries	It is determined that Islamic banks outperform conventional banks in terms of liquidity and profitability almost every year.

Samad (2004)	Ratio Analysis	1991-2001	Bahrain (Islamic and Conventional Banks)	It is concluded that the bank type does not differ significantly in terms of profitability and liquidity performance.
Loghod (2005)	Logit	2000-2005	Islamic and Conventional Banks operating in 5 Countries	It has been determined that there is no significant difference between the performances of Islamic and conventional banks.
Safiullah (2010)	T-test	2004-2008	Bangladesh (4 Islamic Banks and 4 Conventional Banks)	It has been determined that the performances of conventional banks are better than Islamic banks.
Jaffar and Manrvi (2011)	CAMEL	2005-2009	Pakistan (5 Islamic Banks and 5 Conventional Banks)	It is determined that Islamic banks outperform conventional banks and provide liquidity.
Ansari and Rehman (2011)	T-test ANOVA	2006-2009	Pakistan (3 Islamic Banks and 3 Conventional Banks)	There was no statistically significant difference between Islamic and conventional banks in terms of profitability performance.
Siraj and Pillai (2012)	ANOVA	2005-2010	Gulf Region (6 Islamic Banks and 6 Conventional Banks)	It is determined that Islamic banks have higher rate of return on equity and rate of return on assets than conventional banks.
Rashwan (2012)	MANOVA	2007-2009	46 Islamic Banks and 49 Conventional Banks from 15 Countries	It was determined that Islamic banks performed better than conventional banks in 2007, and that conventional banks performed better in 2009.
Usman and Khan (2012)	T-test	2007-2009	Pakistan (3 Islamic Banks and 3 Conventional Banks)	It is determined that Islamic banks have high liquidity power, high growth and profitability compared to conventional banks.
Fayed (2013)	Ratio Analysis	2008-2010	Egypt (3 Islamic Banks and 6 Conventional Banks)	It has been determined that conventional banks outperform Islamic banks.
Studies Conducted in Turkey				
Author(s)	Method	Time Period	Extent	Result
Parlakkaya and Çürük (2011)	T-test Logit	2005-2008	Turkey (4 Participation Banks and 24 Conventional Banks)	It has been determined that participation banks have higher profit margins than conventional banks.

Er and Uysal (2012)	DEA	2005-2010	Turkey (4 Participation Banks and 26 Conventional Banks)	It is concluded that according to the total efficiency scores participation banks are more efficient than conventional banks in the period.
Sakarya and Kaya (2013)	Panel Data Analysis	2005-2012	Turkey (Participation Banks and Conventional Banks)	It was found that participation banks didn't differ significantly from conventional banks in terms of efficiency and profitability.
Şamiloğlu et al. (2013)	TOPSIS	2003-2011	Turkey (4 Participation Banks and 4 Conventional Banks)	It has been determined that participation banks are more profitable and have higher performances than conventional banks.
Doğan (2013)	T-test	2005-2011	Turkey (4 Participation Banks and 4 Conventional Banks)	It was determined no statistically significant difference in the profitability of participation banks and conventional banks.
Toraman et al. (2015)	T-test GMM	2006-2014	Turkey (4 Participation Banks and 11 Conventional Banks)	It has been determined that the total assets and liquid assets of conventional banks are higher than those of participation banks.
Ata and Buğan (2016)	DEA	2006-2014	Turkey (4 Participation Banks and 11 Conventional Banks)	Participation banks were found to be more efficient than conventional banks.
Yurttadur and Demirbaş (2017)	T-test	2010-2016	Turkey (3 Participation Banks and 3 Conventional Banks)	Participation banks were found to perform better in terms of profitability than conventional banks.
Tuncay (2018)	T-test Mann Whitney-U test	Year 2016	Turkey (5 Participation Banks and 17 Conventional Banks)	Although not statistically significant, profitability was found to outperform conventional banks than participation banks.

According to the literature examined, of this study; it is observed that it differs from other studies conducted in terms of analysis period, variables and selected sample. Thus, the study will make an significant contribution to the literature.

Methodology of the Research

Purpose, Extent and Importance of the Research

The purpose of this study, to determine the effect on the profitability levels of the two types of banks and to identify variables that affect the profitability of banks, for the period covering the years 2006-2018 in Turkey. The extent of this study; although their philosophy and principles are different, they constitute two types of banks consisting of 3 participation and 16 conventional banks operating under the same regulations in the same competitive environment. For this aim, firstly, panel data regression analysis was performed to determine the effect of banking type on profitability. at the second stage, t-test was performed to determine the variables that differ according to the bank type. The study will make a significant contribution to the literature by distinguishing it from other studies conducted in terms of selected analysis period, variables and sampling.

The banking sector is a very important sector that is worth analyzing with its profitability figures announced even during the global crisis. Countries are carrying out many studies to make the banking sector work more effectively. Therefore, academic studies examining the profitability of banks are very important. In this context, the study carried out to examine the effect of bank type on profitability differs from other studies conducted in terms of selected analysis period, sample and variables and makes a significant contribution to the literature.

Data Set and Sample of the Research

In this study, we used data from quarterly financial tables of 3 participation banks and 16 conventional banks, which operate in the Turkish banking sector and have regular data between 2006-2018. The bank names included in the analysis are given in Table 2.

Table 2: Banks Included in the Analysis

Conventional Banks (Deposit Banks)		
Public Capital Deposit Banks		Banks Funded by Foreign Capital
1	Türkiye Cumhuriyeti Ziraat Bank A.Ş.	11 Alternatifbank A.Ş.
2	Türkiye Halk Bank A.Ş.	12 Citibank A.Ş.
3	Türkiye Vakıflar Bank T.A.O.	13 Denizbank A.Ş.
Private Equity Deposit Banks		14 HSBC Bank A.Ş.
4	Akbank T.A.Ş.	15 QNB Finansbank A.Ş.
5	Anadolubank A.Ş.	16 Türkiye Garanti Bank A.Ş.
6	Şekerbank T.A.Ş.	
7	Turkish Bank A.Ş.	
8	Türk Ekonomi Bank A.Ş.	
9	Türkiye İş Bank A.Ş.	
10	Yapı ve Kredi Bank A.Ş.	
Participation Banks (Islamic Banks)		
1	Albaraka Türk Participation Banks A.Ş.	Horizontal Section Units n=19
2	Kuveyt Türk Participation Banks A.Ş.	Number of Time Units t=52
3	Türkiye Finans Participation Banks A.Ş.	Total Observations = 988

Three of conventional banks are public banks, six of them are foreign banks and seven of them are private banks. Only 3 participation banks from 6 participation banks currently operating in Turkey is included in the analysis. In this case, the number of horizontal section units representing the number of banks in the analysis is $N = 19$, and the number of time units obtained for each horizontal section unit is $T = 52$. Therefore, the data set consists of a total of 988 observations.

The rate of return on assets and the rate of return on equity are used as dependent variables. Bank type, asset size, credit risk, liquidity risk, financial risk and activity efficiency represents independent internal variables. As macroeconomic indicators representing independent external variables in the analysis; inflation and GDP growth rate is used. Abbreviations and calculations of the variables used are given in Table 3.

Table 3: Variables Used in the Analysis

Variable Name Used	Acronym	Calculation of Variables
Return on Assets	ROA	Net Profit / Total Asset
Return on Equity	ROE	Net Profit / Equity Total

Activity Efficiency	AE	Operating Expenses / Net Interest (Dividend) Income
Asset Size	AS	Logarithm of Assets
Credit Risk	CR	Non-Performing Loans / Total Loans
Liquidity Risk	LR	Total Debt / Total Deposits
Financial Risk	FR	Equity Total / Total Assets
Inflation	INF	
GNP Growth Rate	GNP	

Data Collection Technique and Tool of the Research

In the analysis, data for deposit banks got from the independent auditors' quarterly report issued at the official web page of the Banks Association of Turkey (TBB). Data for participation banks got from the independent auditors' quarterly report issued at the official web page of the Participation Banks Association of Turkey (TKBB). The inflation and growth rates data obtained from the official web page of Turkish Statistical Institute (TUIK). The monthly available data has been converted into quarterly data for 4 periods.

Research Method

In this study, descriptive statistics of the variables that are thought to affect the asset profitability of banks are determined, and the profitability variable trend is revealed. First, the effect of banking type on profitability was examined. Hypothesis tests were tested by creating a panel data regression where return on assets is a dependent variable. Similarly, the regression result was obtained for the return on equity variable. In order to see whether classical banking and Islamic banking systems have an impact on profitability, a dummy variable that indicates the banking system is included as an independent variable in the regression model. In order to see the effect of dummy variable in the model, pooled OLS model is used. In the second stage, t-test was applied to determine the variables that differ according to the bank type. Stata package program was used in data analysis.

To determine the independent variables that affect the profitability of banks;

➤ **H1₀**: Explanatory variables have no effect on asset profitability.

H1: Explanatory variables have an impact on asset profitability.

➤ **H2₀**: Explanatory variables have no effect on equity profitability.

H2 : Explanatory variables have an impact on equity profitability.

in this way alternative hypotheses has been formed.

In order to determine whether of two types banks consisting of conventional and Islamic banks affect profitability;

➤ **H3₀**: Banking type does not affect asset profitability.

H3: Banking type affects asset profitability.

➤ **H4₀:** Banking type does not affect equity profitability.

H4: Banking type affects equity profitability.

in this way hypotheses has been formed.

Panel data regression equations created to test **H1** and **H2** hypotheses are given in equations (1) and (2).

$$ROA_{it} = \beta_{0it} + \beta_{1it} \cdot AE_{it} + \beta_{2it} \cdot AS_{it} + \beta_{3it} \cdot CR_{it} + \beta_{4it} \cdot LR_{it} + \beta_{5it} \cdot FR + \beta_{6it} \cdot INF + \beta_{7it} \cdot GNP + \varepsilon_{it} \quad (1)$$

$$ROE = \beta_{0it} + \beta_{1it} \cdot AE_{it} + \beta_{2it} \cdot AS_{it} + \beta_{3it} \cdot CR_{it} + \beta_{4it} \cdot LR_{it} + \beta_{5it} \cdot FR + \beta_{6it} \cdot INF + \beta_{7it} \cdot GNP + \varepsilon_{it} \quad (2)$$

$$i = 1, \dots, N, \quad t = 1, \dots, T$$

In Equation 1, created to test the **H1** hypothesis, while the asset profitability also expressed as the Rate of Return on Assets (ROA), represents the dependent variable; activity efficiency (AE), asset size (AS), credit risk (CR), liquidity risk (LR), financial risk (FR) independent internal variables, inflation (INF) and GNP growth rate represent independent external variables. In the 2nd Equation created to test the **H2** hypothesis; equity profitability also referred to as Rate Return on Equity (ROE), represents the dependent variable.

To test the **H3** and **H4** hypotheses, dummy variables were added to equations (1) and (2).

$$ROA_{it} = \beta_{0it} + \beta_{1it} \cdot AE_{it} + \beta_{2it} \cdot AS_{it} + \beta_{3it} \cdot CR_{it} + \beta_{4it} \cdot LR_{it} + \beta_{5it} \cdot FR + \beta_{6it} \cdot INF + \beta_{7it} \cdot GNP + \beta_{8it} \cdot DConv + \beta_{9it} \cdot DPart + \varepsilon_{it} \quad (3)$$

$$ROE = \beta_{0it} + \beta_{1it} \cdot AE_{it} + \beta_{2it} \cdot AS_{it} + \beta_{3it} \cdot CR_{it} + \beta_{4it} \cdot LR_{it} + \beta_{5it} \cdot FR + \beta_{6it} \cdot INF + \beta_{7it} \cdot GNP + \beta_{8it} \cdot DConv + \beta_{9it} \cdot DPart + \varepsilon_{it} \quad (4)$$

$$i = 1, \dots, N, t = 1, \dots, T$$

DConv in equations (3) and (4); If the bank is a classic bank it takes value 1, in other case it takes value 0. On the other hand *DPart* in equations (3) and (4); If the bank is a Islamic bank it takes the value 1, in other case it takes value 0.

It refers to '*i*' bank number, '*t*' time units, '*ε*' error terms, '*β₀*' constant terms and *β₁, β₂, ..., β₉* regression coefficients in the equations.

Empirical Findings Obtained in the Research

Descriptive statistical information about the variables used in the analysis; mean, standard deviation, number of observations, minimum and maximum values are given in Table 4. Descriptive statistics related to variables were calculated separately for general, horizontal section units and time period.

Table 4: Descriptive Statistics of Variables

Overall	0.0103	0.0071	-0.0146	0.0486	988
Within		0.0029	0.0029	0.0140	N = 19
Between		0.0065	-0.0112	0.0460	T = 52
Overall	0.0919	0.0619	-0.1566	0.3527	988
Within		0.0282	0.0185	0.1438	N = 19
Between		0.0555	-0.1109	0.3382	T = 52
Overall	1.2523	0.4850	0.0787	6.7031	988
Within		0.1985	0.7943	1.6488	N = 19
Between		0.4448	0.2536	6.8779	T = 52
Overall	7.4737	0.6789	5.7404	8.7419	988
Within		0.6242	6.0048	8.2488	N = 19
Between		0.3024	6.6659	8.1739	T = 52
Overall	0.0701	0.9407	0.0000	29.5995	988
Within		0.1317	0.0190	0.6105	N = 19
Between		0.9319	-0.5181	29.0591	T = 52
Overall	1.4040	0.1830	1.0313	2.1444	988
Within		0.1215	1.1926	1.6302	N = 19
Between		0.1396	1.0079	2.3387	T = 52
Overall	0.1127	0.0253	0.0568	0.2142	988
Within		0.0181	0.0888	0.1549	N = 19
Between		0.0182	0.0508	0.1728	T = 52
Overall	9.0928	2.9716	4.3500	22.3867	988

	Within	0.0000	9.0928	9.0928	N = 19
	Between	2.9716	4.3500	22.3867	T = 52
	Overall	5.1154	5.0056	-14.6000	12.6000
	Within	0.0000	5.1154	5.1154	N = 19
	Between	5.0056	-14.6000	12.6000	T = 52

The trend of asset profitability by years for the banks is given in Table 5.

Table 5: Average Values of ROA by Years

Years	Banking Sector	Conventional Banks	Islamic Banks
2006	0.0135	0.0131	0.0153
2007	0.0157	0.0158	0.015
2008	0.013	0.0127	0.015
2009	0.0143	0.0147	0.0143
2010	0.0126	0.0127	0.0118
2011	0.0085	0.0083	0.0097
2012	0.01	0.0099	0.0103
2013	0.0085	0.0086	0.0084
2014	0.0073	0.0074	0.007
2015	0.006	0.0061	0.0056
2016	0.0071	0.0073	0.0058
2017	0.0082	0.0087	0.006
2018	0.0085	0.009	0.0061

The trend of return on assets as of the years in which the sector means and conventional and Islamic banks averages are exhibited, with the graph in Figure 1.

Figure 1: Trend and Comparison of ROA by Years

Looking at the graph, it is seen that Islamic banks displayed a higher return on assets than conventional banks with a noticeable difference in 2006 and 2008. Despite the global financial crisis in 2008, the high asset profitability in Islamic banks has increased the interest and trust in Islamic banks after this year.

It is observed that the average of active profitability, which ran parallel to each other in 2009 and 2010, was higher in Islamic banks than in conventional banks in 2011. It is observed that the average of active profitability, which remained parallel to each other from 2012 to 2015, was higher in conventional banks than in Islamic banks after 2015.

Table 6 shows the summary of annual of the change in asset profitability of the sector with conventional banking and Islamic banking.

Table 6: Summary of Annual ROA

	Banking Sector						
	Conventional Banks	Islamic Banks	Min.	Max.	Average	Std. Deviation	Coefficient of Variation
2006	0.0131	0.0153	-0.0012	0.0417	0.0135	0.0090	0.6674
2007	0.0158	0.015	0.0020	0.0395	0.0157	0.0087	0.5561
2008	0.0127	0.015	0.0010	0.0284	0.013	0.0056	0.4281
2009	0.0147	0.0143	0.0011	0.0314	0.0143	0.0071	0.4975
2010	0.0127	0.0118	0.0017	0.0276	0.0126	0.0068	0.5422
2011	0.0083	0.0097	-0.0006	0.0243	0.0085	0.0060	0.7027
2012	0.0099	0.0103	0.0020	0.0395	0.01	0.0087	0.8731
2013	0.0086	0.0084	-0.0020	0.0215	0.0085	0.0050	0.5865
2014	0.0074	0.007	-0.0017	0.0203	0.0073	0.0049	0.6729
2015	0.0061	0.0056	-0.0105	0.0205	0.006	0.0049	0.8092
2016	0.0073	0.0058	-0.0146	0.0241	0.0071	0.0064	0.9001
2017	0.0087	0.006	0.0003	0.0315	0.0082	0.0055	0.6755

2018	0.009	0.0061	0.0009	0.0486	0.0085	0.0068	0.7998
Average	0.0103	0.0100			0.0102		
Std. Deviation	0.0031	0.0039			0.0032		
Coefficient of Variation	0.3001	0.3862			0.3085		

We can analyze the risk situation by looking at the table containing the average, standard deviation and coefficient of variation accepted as risk indicators. When the table is analyzed, it is seen that the average of return on assets is close to conventional banking and Islamic banking. When these values are compared with the general average of the banking sector, it is seen that the values are close to the general average of the banking sector.

Investigation of Multicollinearity

Independent variables must be unrelated to perform regression analysis. For this reason, the correlation matrix, which gives an idea about the relationship of variables, is examined and the results are presented in Table 7.

Table 7: Correlation Coefficients for Independent Variables

	AE	AS	CR	LR	FR	INF	GNP
AE	1	0.006	-0.014	-0.057	-0.293	0.270	-0.145
AS		1	0.002	0.268	-0.349	0.130	0.042
CR			1	0.003	0.007	0.014	0.008
LR				1	-0.211	0.008	0.075
FR					1	-0.153	-0.040
INF						1	-0.193
GNP							1

When correlations between independent variables are evaluated in Table 6, it is observed that there is no significant correlation.

In Table 8, tolerance and Variance Inflation Factors (VIF) values were obtained to investigate the multicollinearity problem (Alpar, 2013). When the findings obtained were evaluated in general, it was determined that there were no multicollinearity problems between the independent variables.

Table 8: Tolerance and VIF Values for Independent Variables

Variables	Tolerance	VIF
AE	0.830	1.204

AS	0.811	1.233
CR	0.999	1.001
LR	0.908	1.102
FR	0.749	1.335
INF	0.878	1.139
GNP	0.941	1.062

Panel Data Regression Analysis

Panel data regression analysis method is suitable when both cross section and time dimension are available in the data. Since the data used in the research are quarterly, seasonal dummy variables are added to the regression equation and season effects are eliminated.

Firstly, it is examined whether there is a cross-section dependency. If there is a cross-section dependency between the units, the analysis results can be deviated and inconsistent (Topaloğlu, 2017). LMadj test of Pesaran et al. (2008) is used in cases where the T dimension is larger than the N dimension. For the LMadj test, the H0 hypothesis is created as no cross-sectional dependency. When applying the LMadj test, the dependent variable was calculated separately for ROA and ROE. Also, INF and GNP variables are not included in the test since they are the same in all cross sections. $LM_{adj} = 773.9$ ($p = 0.000$) was obtained for the ROA variable. For the ROE variable, $LM_{adj} = 758.3$ ($p = 0.000$). Error terms of the regression model built with variables have cross-section dependency.

Unit root analysis was performed in panel data variables due to the length of time. Since cross-section dependency is detected in the data, cross-section extended CIPS statistics were used developed by Im et al. (2003) (Yerdelen Tatoğlu, 2018). The stationarity of the variables of INF and GNP was investigated with the PP statistics of Phillips and Perron (1988). For both tests, the H0 hypothesis states that the series is not stationary. Results for unit root tests are given in Table 9. Maximum lag is taken as 2. When Table 9 is examined, the H0 hypothesis, which indicates that the CR, Inf and GNP variables contain unit root, could not be rejected for all lags. The series should be made stationary by taking the difference.

Table 9: Unit Root Tests

CIPS		Constant			Constant and Trend		
	Lag	0	1	2	0	1	2
ROA	Statistics	-4.902	-5.379	-6.262	-3.953	-4.977	-5.405
	p value	0*	0*	0*	0*	0*	0*
ROE	Statistics	-5.097	-6.664	-6.977	-4.271	-6.419	-7.066
	p value	0*	0*	0*	0*	0*	0*
AE	Statistics	-2.961	-8.309	-5.217	-2.536	-10.25	-6.057
	p value	0.002*	0*	0*	0.006*	0*	0*
AS	Statistics	-3.29	-2.451	-2.785	-3.519	-3.586	-4.732
	p value	0.001*	0.007*	0.003*	0*	0*	0*
CR	Statistics	0.174	-0.067	-1.812	3.128	2.361	-0.016
	p value	0.569	0.473	0.035**	0.999	0.991	0.494
LR	Statistics	-5.982	-3.268	-2.206	-7.354	-4.927	-1.964
	p value	0*	0.001*	0.014**	0*	0*	0.025**

FR	Statistics	-2.017	-1.83	-1.619	-3.282	-1.826	-1.642
	p value	0.022**	0.045*	0.048**	0.001*	0.034**	0.045**
PP	Constant			Constant and trend			
	Lag	0	1	2	0	1	2
INF	Z(rho)	2.207	2.114	3.22	0.76	2.665	6.142
	Z(t)	0.275	0.262	0.422	0.107	0.44	1.162
	p value	0.9762	0.9755	0.9823	0.9952	0.9967	1
GNP	Z(rho)	-11.521	-11.574	-11.213	-11.768	-11.811	-11.419
	Z(t)	-2.654	-2.659	-2.629	-2.424	-2.428	-2.388
	p value	0.0823	0.0815	0.0872	0.3671	0.3648	0.3858

*: Significant at the 5% level

**: Significant at the 1% level

The unit root tests of the series in which the difference is taken is given in Table 10. While the CR and GNP variables become stationary with the first difference, the INF variable has become stationary by taking the second difference. In regression analysis, delayed values of the variables were used.

Table 10: Variables Made Stable by Taking the Difference

CIPS		Constant			Constant and Trend		
	Lag	0	1	2	0	1	2
CR(1)	Statistics	-15.535	-6.836	-4.97	-14.247	-4.991	-2.863
	p value	0**	0**	0**	0**	0**	0**
PP		Constant			Constant and Trend		
	Lag	0	1	2	0	1	2
INF(2)	Z(rho)	-14.236	-14.193	-13.162	-14.823	-14.735	-13.654
	Z(t)	-4.33	-4.336	-4.573	-5.003	-5.04	-5.757
	p value	0.0004**	0.0004**	0.0001**	0.0002**	0.0002**	0**
GNP(1)	Z(rho)	-15.428	-14.875	-13.684	-15.268	-14.176	-12.643
	Z(t)	-3.967	-3.992	-4.096	-3.792	-3.849	-4.066
	p value	0.0016**	0.0015**	0.001**	0.0169*	0.0142*	0.0071**

*: Significant at the 5% level

**: Significant at the 1% level

Models were estimated by pooled least squares (POLS) method to test H1, H2, H3 and H4 hypotheses. Model's whether errors are not autocorrelated and there is distortion in fixed variance assumptions are examined and the results are given in Table 11.

Table 11: POLS Assumptions in Panel Data

No autocorrelation	Wooldridge	169.577	0.000	H ₀ rejection
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Fixed variance	Breusch-Pagan / Cook-Weisberg Test	19.24	0.000	H ₀ rejection
No autocorrelation	Wooldridge	131.814	0.000	H ₀ rejection
Fixed variance	Breusch-Pagan / Cook-Weisberg Test	14.57	0.000	H ₀ rejection

The error terms of the model obtained by POLS method are assumed to be unautocorrelated and fixed variance. With the (Breusch & Pagan, 1979)/ (Cook & Weisberg, 1983) test, a regression model is established with independent variables by e taking dependent variable the squares of the error terms obtained from the POLS regression. The NR^2 values obtained from the model are compared with the $\chi^2_{(p)}$ values. In this place, N is the number of observations and p is the number of independent variables. Wooldridge test is a robust method that can be applied in the absence of unit effects in the data to examine whether the error terms are autocorrelated (Drukker, 2003).

$$\Delta Y_{it} = \Delta X_{it}\beta + \Delta \varepsilon_{it}$$

in the model, the regression of error terms with lagged values is calculated. The validity of the regression is examined with the F test.

According to Table 11, there is a deterioration in the assumptions. Therefore, the Driscoll-Kraay estimator which produces robust standard errors, was used in the variance estimation of the parameters (Hoechle, 2007). The findings of parameter estimates are given in Table 12 for H1 and H3. It is given in Table 13 for H2 and H4.

Table 12: Driscoll-Kraay Standard Errors POLS Coefficients for the ROA Dependent Variable

	ROA	Coefficient	Std. Error	t	P>t	R ²	F	P>F
H ₁	AE	0.000837	0.001033	0.81	0.428	0.46	51.31	0.000*
	AS	0.002505	0.000652	3.84	0.001*			
	CR	1.62E-05	7.72E-05	0.21	0.836			
	LR	-0.00947	0.001174	-8.07	0.000*			
	FR	0.078759	0.013001	6.06	0.000*			
	Inf	2.75E-05	0.000102	0.27	0.792			
	GNP	-2.6E-05	0.000143	-0.18	0.86			
	Constant	-0.00018	0.004896	-0.04	0.971			
H ₃	AE	0.00096	0.001039	0.92	0.368	0.46	109.27	0.000*
	AS	0.002573	0.000675	3.81	0.001*			
	CR	1.66E-05	7.79E-05	0.21	0.834			
	LR	-0.00918	0.001318	-6.97	0.000*			
	FR	0.081896	0.014306	5.72	0.000*			
	Inf	2.91E-05	0.000101	0.29	0.778			

GNP	-2.6E-05	0.000143	-0.18	0.86
Part.	0.000472	0.000642	0.74	0.471
Constant	-0.00169	0.006102	-0.28	0.785

*: Significant at the 5% level

In Table 12, where the results for the H1 hypothesis, where the rate of return on assets (ROA) is a dependent variable, the asset size has a positive effect (0.00251) on asset profitability. Liquidity risk has a decreasing effect of -0.009 units on active profitability. The impact of financial risk on asset profitability is positive and is 0.0788 units. In the model obtained for the H3 hypothesis created to test the impact of the banking system on asset profitability, no significant impact on profitability has been identified in the variation of the bank type as Islamic bank or conventional bank.

Table 13: Driscoll-Kraay Standard Errors POLS Coefficients for the ROE Dependent Variable

	ROE	Coefficient	Std. Error	t	P>t	R ²	F	P>F
H₂	AE	0.011981	0.009781	1.22	0.236	0.44	70.76	0.000*
	AS	0.019667	0.005899	3.33	0.004*			
	CR	0.000193	0.00067	0.29	0.777			
	LR	-0.09417	0.011738	-8.02	0.000*			
	FR	-0.04305	0.109564	-0.39	0.699			
	Inf	0.000297	0.000903	0.33	0.746			
	GNP	-0.00018	0.001244	-0.15	0.886			
	Constant	0.110293	0.04915	2.24	0.038			
H₄	AE	0.012075	0.009604	1.26	0.225	0.44	116.74	0.000*
	AS	0.01972	0.006249	3.16	0.005*			
	CR	0.000193	0.000671	0.29	0.777			
	LR	-0.09394	0.01306	-7.19	0.000*			
	FR	-0.04063	0.13912	-0.29	0.774			
	Inf	0.000299	0.000892	0.33	0.742			
	GNP	-0.00018	0.001244	-0.15	0.886			
	Part.	0.000364	0.006985	0.05	0.959			
	Constant	0.109131	0.063413	1.72	0.102			

*: Significant at the 5% level

In Table 13, where the results for the H2 hypothesis, where the rate of return on equity (ROE) is dependent variable, it is seen that the size of the bank has a positive effect on the return on equity (0.01967). Liquidity risk has a decreasing effect of -0.094 units on equity profitability.

The H4 hypothesis was tested to see the effect of the banking system on equity profitability. According to the findings, there was no significant effect on the profitability of the bank type varying as Islamic bank or conventional bank.

t-Test

To examine whether the variables differ according to the bank type;

- **H5_a**: It does not differ according to the variable banking type.

H5 : It varies according to the variable banking type.

alternative hypotheses has been formed.

Table 14: Variables that Differ Between Islamic Banks and Conventional Banks

Variable	t	p value	Mean difference
AE	-2.705	0.007*	-0.11442
AS	-8.584	0.000*	-0.34969
CR	-.524	0.601	-0.04322
LR	-9.867	0.000*	-0.15818
FR	-7.648	0.000*	-0.01409
INF	0.002	0.998	0.00055
GNP	0.015	0.988	0.00639
ROA	-0.880	0.380	-0.00049
ROE	1.019	0.309	0.00550

*: Significant at the 5% level

The t-test results applied to the hypotheses formed to determine whether the variables differ by bank type are reported in Table 14. The data Islamic bank was prepared as 1 and the conventional bank as 2.

Findings obtained in Table 14; activity efficiency, asset size (total assets), liquidity risk and financial risk variables are significantly lower in Islamic banks than in conventional banks.

Conclusion

In this study, it is aimed to investigate the effects of bank type on profitability. In this context, panel data regression analysis is carried out by using data from quarterly financial tables of 16 conventional banks and 3 participation banks, which had regular data between 2006-2018. In order to determine the variables that differ according to the bank type, t test was performed. Return on asset and return on equity variables is used as dependent variables in the analysis. While the bank type, asset size, credit risk, liquidity risk, financial risk and operational efficiency are used as independent internal variables, macroeconomic indicators representing by inflation and GNP growth rate are used as independent external variables.

As a result of the analysis; it is concluded that to made a classification as Islamic banks and conventional banks does not have an impact on profitability. This result reached in the study; (Samad & Hasan, 1999), (Samad 2004) and (Ansari & Rehman, 2012) are similar to the results of studies conducted abroad. It also resembles the results of the studies conducted by (Sakarya & Kaya, 2013) and (Doğan, 2013) in Turkey. Even if the working principles and philosophy are different, the similarity of the functioning structure of the two bank types and their operation in the same competitive environment and subject to the same legal regulations can be considered as one of the main reasons of this result.

According to the results of the t-test applied to examine whether the effects of the variables differ according to the bank type; It was determined that the variables of activity efficiency, bank size, liquidity risk and financial risk is significantly lower in participation banks than conventional banks.

The fact that the operating expenses / net profit share revenues ratio, which is used to measure operational efficiency, is significantly lower in participation banks than in conventional banks shows that participation banks are better in the input-output relationship.

The relatively low bank size indicates that the asset size in participation banks has not yet reached the desired level.

The concept of liquidity refers to the power of banks to meet all kinds of cash needs. In the study, it is determined that the liquidity risk is significantly lower in participation banks than conventional banks. It means that borrowing items of participation banks other than deposits, for example, borrowings, commercial debts and debt to money markets, etc. are proportionally lower. In other words, the capacity or willingness to access alternative fund resources other than deposits is lower in participation banks.

Determining that the ratio of equity / total assets calculated for the purpose of determining the level of financial risk is significantly lower in participation banks than conventional banks shows that participation banks are more sensitive to economic fluctuations and need to strengthen their capital structures. Developing unique and modern products in accordance with Islamic finance understanding will enable to reveal their differences within the sector. In addition, Islamic banks are expected to increase permanently their shares in the sector by paying attention to Islamic financial literacy in order to ensure the public understanding of the financial products and services that they use. So, they will be able to compete more successfully on the international platforms.

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