

INTERNATIONAL JOURNAL  
OF ISLAMIC ECONOMICS  
AND FINANCE STUDIES



*Uluslararası İslam Ekonomisi ve  
Finansı Araştırmaları Dergisi*

July 2017,  
Vol:3, Issue:2

Temmuz 2017,  
Cilt:3, Sayı: 2

e-ISSN: 2149-8407

p-ISSN: 2149-8407

journal homepage: <http://ijisef.org/>



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## The Impact Of Interest Rate Fluctuations On The Participation Banks Profitability: Turkey Case

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Doi: 10.25272/j.2149-8407.2017.3.2.03

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### ABSTRACT

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**Keywords:** *Determinants  
of Banks Profitability,  
Impact of interest rate on  
Banks Profitability*  
**JEL Classification Code:**  
*G21, G32*

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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 cointegration estimation technique are adopted to achieve the objectives of the study. The results from Kao co-integration test show that the variables are cointegrated. 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.

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## Introduction

The Islamic finance has become an 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. Kuvveyt Turk finance institution in 1989, Anadolu finance institution in 1991, Ihlas Finance institution in 1995, Asya Finance institution in 1996, Turkiye Finans in 2005 and more recently Ziraat Participation Bank (2015) and Vakiflar Participation Bank (2016) (TKBB reports).

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 affects the participation banks profitability in anyways.

The paper is organized as follows. Participation banks in Turkey were discussed, in the first section, 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 of 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

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econometric research will be presented, then Conclusion and recommendations in the last section.

## 1. 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 al (2012) in his study on the profitability, the profitability model is estimated using the Prais-Winsten 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

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changes, industry production growth, market share, gross domestic product etc (Chowdhury, 2015).

### **1.1 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.

### **1.2 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 (Uhomobhi; 2008).

The majority of the macroeconomic factors such as interest rates, market share, and size of the bank, economic growth, inflation, funds deposited into current accounts, total capital and reserves, the percentage of profit-sharing between bank and depositors and money supply (Haron, 2004). And 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 Impact of Interest Rate on Banking Profitability**

In this chapter, effect of interest rate on banking sector in general concept and effect of interest rate on banking profitability in specific concept will be explained in theoretically and empirically.

### **2.1 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

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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 centering 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 in which (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.

In 2006 a study made by Rohmah using Autoregressive Distributive Lag (ARDL) enlarged the scope of the previous study to cover all Islamic banks in Indonesia from 2000 to 2006. It 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 Auto-regression 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) examined 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.

## **2.2 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 all the 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 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.

More recently, in 2013 Scannella & Bennardo

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 time series econometric techniques of 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.

### 3 Empirical Framework

#### 3.1 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.

#### 3.2 Methodology

##### 3.2.1 Panel Unit Root Test

The variables should be integrated with the same data, as the first step for testing the panel cointegration among variables is to examine the units root properties of the data. It can be 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), Breitung (2000), and Hadri (1998)  $t$ , 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.

Researchers in economics indicated in their studies the fact that IPS test has a superior test power in analyzing long-run relationships in panel data, therefore this test will be used in our study. IPS (Im, Pesaran and Shin 2003) 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  $i = 1 \dots N$  and  $t = 1 \dots T$

The hypotheses may be written as:

$$\begin{aligned} H_0: P_i &= 0; && \text{for all } i \\ H_1: P_i &< 0; && \text{for at least one } i \end{aligned}$$

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

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

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  $T \rightarrow \infty$ .

### 3.2.2 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:

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

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:

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

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

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

### 3.2.3 Estimation of Coefficient

In the presence of a 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.

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

$$\hat{e}_{it} = e_{it} \quad \hat{\Omega}_{22i}^{-1} \hat{\Omega}_{22i}, \quad \hat{\gamma}_i = \hat{\Gamma}_{2li} + \hat{\Omega}_{22i}^0 \quad \hat{\Omega}_{22i}^{-1} \hat{\Omega}_{22i} (\hat{\Gamma}_{22i} + \hat{\Omega}_{22i}^0)$$

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

$\Omega_i^0$ : Contemporaneous Covariance Matrix

$\Gamma_i$  : Weighted Sum of Auto-covariance

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

### 3.3 Results

#### 3.3.1 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. 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 cointegration has been explained in the following session.

**Table 1:** 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

### 3.3.2 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 2:** 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. Kao test employed to investigate the null hypothesis of no cointegration relationship among the alternative hypotheses of the existence of a cointegration relationship. 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

### 3.3.3 Estimation of Coefficient Results

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

**Table 3:** 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

Table 17 shows the long-run coefficient estimated by adopting FMOLS. The study estimates the 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, the 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 with an increase in the credit rate of the participation banks, while only a slight change in 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 insignificantly negative. 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 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.

While using the needed empirical methods, the results found didn't support the theory either the hypotheses of the study. The hypotheses indicate 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 in interest rate will be faced with 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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