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# The Relationship between Conventional Deposit and Islamic Profit Share Rates: An Analysis of the Turkish Banking Sector

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***Abstract.*** Islamic finance came to prominence in the last two decades and Islamic instruments have been regarded as an alternative to conventional instruments after the 2008 crisis. In this study, we tried to analyze the relationship between conventional deposit rates and profit share rates of participation banks (Islamic banks) in Turkey by employing both static modeling tools including ARDL, FMOLS and DOLS models and dynamic modeling tools including DCC-GARCH models using monthly data from Turkey covering the 1998-2016 period. According to our knowledge, this is the first study that employs a dynamic model to investigate the relationship between conventional deposit rates and profit share rates of participation banks. Accordingly, it is found that conventional deposit rates significantly affect profit share rates and the dynamic correlation between conventional deposit rates and profit share rates is generally stable around 0.9 when the markets are not disturbed by shocks or crises. Nevertheless, the correlation dramatically fluctuates during periods of stress. Our model managed to capture the effects of the two financial crises (2001 and 2008) on deposit and profit share rates indicating that the correlation between the two rates plummets during crisis periods. However, despite some similarities during the 2001 and 2008 crises, the behavior of the correlation completely differs during the two recovery periods. The correlation recovered pretty fast during the 2001 crisis and remained stable for almost 9 years. As for the 2008 crisis, the correlation recovered rather slowly (in 14 months) and has failed to stabilize since then. In our opinion, this distinction arises due to the ongoing unfavorable political and economic conditions in neighboring countries and the EU members who are the main trade partners of Turkey.

***Keywords:*** *Islamic Finance, Banking, DCC-GARCH, ARDL, Profit Share Rates.*

**KAUJIE Classification:** J3, K0, L0.

**JEL Classification:** G10, G19, G20.

(1) All opinions are those of the authors and do not represent those of their organizations.

## 1. Introduction

Islamic finance is a modern phenomenon in today's world that attracts great attention both in Muslim and non-Muslim countries. Having started with the foundation of Mit-Ghamr Islamic Saving Association (MGISA) in Egypt in the 1960s by Ahmed Al-Najjar, Islamic finance has obtained a rapid growth momentum, especially in the last two decades. Islamic finance instruments grew by nearly 15% per annum in the last two decades and gained further attention since the global financial crisis in 2008 (Maruo et al, 2013, p.9). As of 2015, the size of the sector is worth $2 trillion and it is estimated to reach $3.4 trillion by the end of 2018 (Kateb, 2011). Furthermore, Islamic finance is not limited to Muslim countries. For instance, there is an Islamic index to attract the Gulf States' investors in the U.S stock market (Cizakca, 2011).

Islamic banking constitutes 80 percent of the Islamic finance system in the world. There are currently more than 300 Islamic institutions across 51 countries and the most prominent of them are Iran, Saudi Arabia, the United Arab Emirates, Kuwait, Qatar, and Malaysia (Kateb, 2011). The most important characteristic of the Islamic financial system is that investors are generally prohibited from trading in risk isolated from real economic activity, for example, trade in financial risk products, such as derivatives is not allowed. In addition, profits or losses are shared at a predetermined ratio between sides in contrast to the conventional financial system.

In this study, we evaluate the distinction between Islamic banks and their conventional peers by analyzing the correlation of conventional deposit rates and profit share rates of the Islamic banks by employing both static and dynamic methods. In the second section, we briefly touch upon the Islamic finance by introducing Islamic instruments and specifying their main differences from conventional ones. In the third section, we embark on an empirical analysis of the Turkish banking sector by providing a literature review, then setting up the model and estimating the correlation between conventional deposit rates and profit share rates. This is done by employing the ARDL and DCC-GARCH models using monthly data from Turkey covering the 1998-2016 periods. The last section concludes the paper. As far as we know, this is the first study that employs a dynamic model to investigate the relationship between conventional deposit rates and profit share rates of participation banks.

## 2. Islamic Finance

### 2.1 Main Principles

Islamic finance can roughly be defined as the provision of all kind of financial services in accordance with Islamic jurisprudence (or law) which is called Sharīʿah. According to Islamic norms, there are certain rules regarding the usage of financial instruments and all kinds of financial instruments have to be Sharīʿah-compliant in their structure and usage, including the operations/ products of banks and other financial institutions (Kammer et al., 2015). Hence, the main principles of Islamic finance are generally derived from the Holy Qur'ān and Sunnah(2) as follows (Kateb, 2011):

1. The rule of uncertainty (risk sharing) principle: Profits or losses must be shared by both sides and agreed by a contract.
2. Prohibition against paying or receiving interest (*ribā*).
3. Excluding speculative and gambling transactions. (*gharar*)
4. Employing asset-backed financial transactions: Financial transactions must relate to a tangible and/or identifiable underlying asset, ensuring that Islamic banks remain connected to the real economy.
5. Prohibition from investing in undesirable businesses banned in Islam such as production of pork or alcoholic beverages.
6. Requiring parties to honor principles of fair treatment and the sanctity of contracts.

It can be argued that Islamic finance has a potential in at least three dimensions for further contribution to the finance sector. First of all, it provides greater financial inclusion, especially for the largely underserved Muslim populations. Second, since it emphasizes the importance of asset-backed financing and risk-sharing features, it may be possible to support

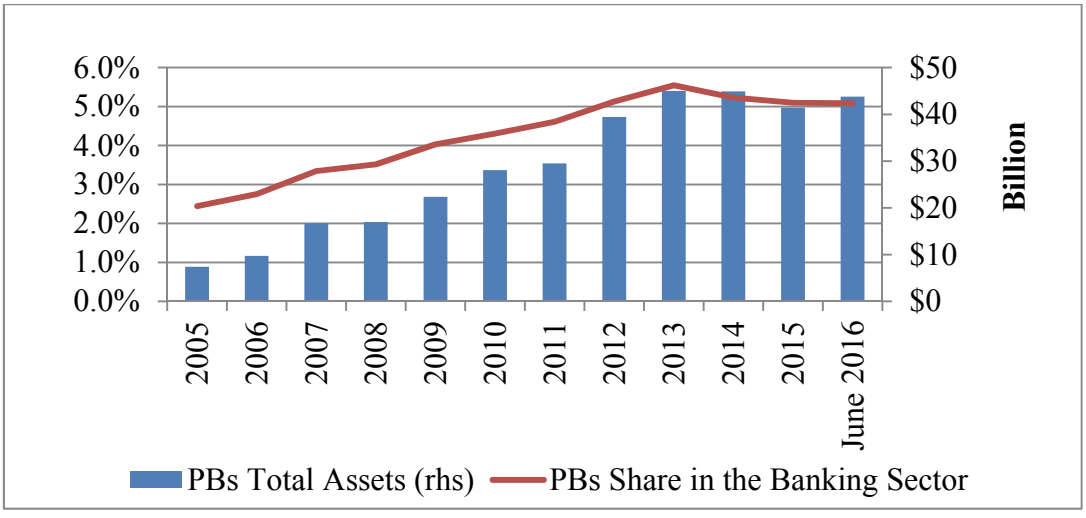
(2) The way of life prescribed as normative for Muslims on the basis of the teachings and practices of Muhammad (pbuh) based on interpretations of the Holy Qur'ān.

small and medium-sized enterprises (SMEs) as well as investments in public infrastructure by the way of Islamic finance. Third, thanks to its asset-backed nature, Islamic instruments pose less systemic risk than conventional instruments (Kammer et al., 2015). Indeed, during the recent global financial crisis in 2008, Islamic financial institutions were mildly affected compared to their conventional peers. Even though some Islamic financial institutions faced defaults, Islamic banks generally avoided the shattering effects of the crisis since they were not exposed to subprime and toxic assets, and had maintained their close link with the real economy (Mohieldin, 2012).

### 2.2 Islamic Banking in Turkey

Turkey first met Islamic banking in 1984 with the enactment of "Regulation on Special Financing Institutions". Shortly after the introduction of this regulation, Faisal Finance and Albaraka Turk were established in 1985. The name of the interest-free financial institutions in Turkey was set as "Participation Banks" in 2005 (Donduren, 2008).

**Figure (1) Islamic Banking Sector in Turkey**




**Source:** *Banking Regulation and Supervision Agency (BRSA), 2016.*

As of 2016, there are 6 participation banks in Turkey, namely Albaraka Turk, Asya Katilim, Kuveyt Turk, Turkiye Finans, Ziraat Katilim, and Vakif Katilim. Among these six, Ziraat Katilim and Vakif Katilim are newly-established participation banks owned by the state. As a whole, participation banks have 1,131 branches all around Turkey (Participation Banks Association of Turkey (TKBB), 2016) and the share of Islamic banks in the banking sector is around 5 percent (Banking Regulation and Supervision Agency (BDDK), 2016).

Apart from the conventional banking services, the Turkish participation banks provide interest-free alternatives to people, both in need of financing and those who have savings. The working principles of participation banks can be briefly summarized as follows (Ozulucan and Deran, 2009): Participation banks generally collect funds via participation and checking accounts. They can also create funds using their equity capital (Eskici, 2007). However, in practice, Islamic banks collect funds from the depositors who want to utilize their funds in interest-free financing methods as *muḍāribs*(3). These funds are in the form of certain Islamic financial tools such as *murābaḥah*, *muḍārabah*, *mushārakah*, diminishing *mushārakah* and *ijārah* in accordance with Islamic principles(4). The profit or loss share of the two sides, depositor and banks, must be determined in advance as a ratio. Since risk exists in Islamic finance,

(3) *Muḍārib* is an investment manager; client in a trust financing transaction who provide know-how, labor or management expertise.

(4) See Ayub (2007) for detailed information about Islamic financial tools.

collected funds must be used in trade facilities or other productive sectors related to production. However, in practice, a great majority of collected funds are used in the form of *murābaḥah* to finance expenditures of households such as buying houses and cars.

## 3. Empirical Analysis on the Turkish Banking Sector

### 3.1 Literature Review

There is a huge and expanding literature focusing on the relationship between conventional deposit rates and returns of Islamic instruments. Most of these papers investigate the relationship between conventional deposit rates and profit share rates of participation banks by employing conventional models such as causality tests, co-integration tests, VECM, ARDL model and FMOLS models for different countries and different samples. Some of these studies in the literature are as follows:

Sarac and Zeren (2015, p.669) investigated the long-term co-integration relationship between term-deposit rates of conventional banks and participation banks in Turkey by employing Maki multi-break structural break co-integration tests as well as frequency domain causality tests. They found that term-deposit rates of participation banks are significantly co-integrated with term-deposit rates of conventional banks except for one participation bank. In addition, according to their findings, the direction of the causality is from conventional banks to participation banks.

Erturk and Yuksel (2013, p.17) analyzed the causality relationship between Islamic banks and conventional banks' deposit rates by employing Granger causality test. The authors found that there is no significant relationship between Islamic banks and conventional banks' instruments. They conclude that there is no adjustment process between conventional banks and participation banks' profit-loss sharing ratios (PLS).

Chong and Liu (2009, p.125) examined Islamic banking and conventional banking relationship for Malaysia by employing Granger causality test, Johansen co-integration approach and Vector Error Correction Model (VECM). They found that only an insignificant part of Islamic bank financing is based on profit-loss sharing ratios (PLS). Although Islamic bonds are interest-free, they are strictly linked to conventional rates. They conclude that this is because of the competitiveness in the markets.

Cevik and Charap (2011) analyzed conventional bank deposit rates and retail Islamic profit-loss sharing investment accounts for Malaysia and Turkey, covering January 1997 to August 2010 period. By employing Johansen co-integration, Granger Causality, VECM and variance decomposition analysis, the authors found that long-run co-integration relationship between conventional and Islamic banks exists. Causality test results indicate unidirectional causality running from conventional bank deposit rates to PLS accounts.

Adebola et al. (2011) investigated the relationship between conventional bank rates and Islamic banks rates for Malaysia covering December 2006-March 2011 period by employing autoregressive distributed lag (ARDL) co-integration approach. They found long-term co-integration relationship between conventional and Islamic banks. Also, they found that conventional bank rates have a significant effect on Islamic bank returns for Malaysia. Accordingly, they conclude that Islamic bank financing is complementary to conventional banks instead of a substitute.

Ergec and Arslan (2013) investigated the effect of interest rate shocks on deposits and loans for both conventional and Islamic banks covering the November 2005-July 2009 period by employing Vector Error Correction (VECM) methodology. Islamic banks are known as interest-free banks and are not expected to be affected by conventional banks' interest rates, whereas the study found that Islamic banks were influenced by conventional banks.

Dube and Zhou (2013) analyzed pass through and the adjustment speed of repo and treasury bill rates shocks to conventional and Islamic banks' rates for South Africa covering the April 1998-January 2011 period by using ARDL and Fully-Modified Least Squares (FMLS) estimators to test for co-integration. Long-term repo rates pass through to bank rates is found 0.83-1.21 and long-term treasury bill rate pass through to participation mortgage rates is found between 1.00-1.29 according to ARDL model results.

As known, static models such as the ARDL and FMLS focus on the averages during the sample period and do not take into consideration the effects of global (or local) crises and structural shocks to economies. For this purpose, apart from the conventional models in the literature, we employ the Dynamic Conditional Correlation Generalized Autoregressive Conditional Heteroscedasticity (DCC-GARCH) model in addition to static ARDL model to analyze time-varying correlation between conventional deposit rates and profit share rates of participation banks. By employing this methodology, we aim to capture the effects of crises or structural shocks on conventional and participation banking systems.

### 3.2 Data and Methodology

In this paper, we use conventional deposit rates and profit share rates of participation banks in Turkey covering the January 1998-May 2016 period. Conventional deposit rates and profit share rates are obtained from the Central Bank of Turkey (TCMB, 2016) and Participation Banks Association of Turkey (TKBB, 2016), respectively. For both series, we use weighted averages of the individual bank rates.

First, we check the stationary of the series by employing the Ng-Perron test (Ng-Perron, 2001). Following that, we use the Toda-Yamamoto causality test (Toda and Yamamoto, 1995) to check the direction of the causality between conventional deposit rates and profit share rates. After checking the stationary and direction of the causality, we investigate co-integration relationship between the variables by employing the Bounds Test proposed by Pesaran et al. (2001).

As for the empirical analysis, we use both static and dynamic methods to analyze the relationship between conventional deposit rates and profit share rates. First, we employ the Autoregressive Distributed Lag (ARDL) model to investigate the long-run relationship between two variables. We also use Full Modified Ordinary Least Squares (FMOLS[(5)]) and Dynamic Ordinary Least Squares (DOLS[(6)]) models as a robustness check. Second, we use the Dynamic Conditional Correlation-GARCH (DCC-GARCH) methodology to detect the time-varying correlation between conventional deposit rates and profit share rates.

### 3.3 Unit Root, Causality and Co-integration Tests

In the empirical analysis, we first check the stationary properties of the variables by employing the Ng-Perron (2001) test. Ng-Perron test is widely used in the empirical analysis and has more power over the other traditional tests for small samples (Ertugrul and Soytas, 2013). The results of the Ng-Perron test are presented in Table 1 where I_CONV denotes conventional deposit rates and I_ISL denotes profit share rates, respectively.

In the Ng-Perron test, the null hypothesis of the MZa and MZt tests assume that the variables have unit root and according to the MSB and MPT tests the null hypothesis is stationary. According to Table 1, I_CONV is stationary in levels [I(0)] and I_ISL is stationary after differencing [I(1)].

After stationary check, we employ the Toda-Yamamoto (1995) causality test in order to reveal the direction of causality between the two variables. By doing so, we determine the dependent and independent variables in our models. The Toda-Yamamoto test has superior properties over the conventional Granger causality test and it eliminates the need for pre-testing for co-integration. It can also be applied irrespective of the co-integration between variables and is unit root robust (Atasoy and Gur, 2016). The test requires the knowledge of maximum order of integration of the investigated variables which is found 1 according to the Ng-Perron test. The Toda-Yamamoto test estimates a VAR (s+dmax) model where s is the optimal lag length and dmax is the maximum level of integration. The test has an asymptotic chi-square distribution and the optimal lag length is found by employing the Akaike and Schwarz information criteria. The results of the Toda-Yamamoto test are denoted in Table 2. According to Table 2, there is a unidirectional causality running from conventional deposit rates to profit share rates.

(5) FMOLS model is robust for serial correlation, endogeneity and multicollinearity problems and superior for an OLS model (Stock and Watson, 1993).

(6) In the DOLS model, right hand side differenced leads and lags of variables are employed to control endogeneity and serial correlation problems (Stock and Watson, 1993).

**Table (1) Ng-Perron Test Results**

| | $MZ_a$ | $MZ_t$ | MSB | MPT |
|---|---|---|---|---|
| I_CONV | -49.988 | -4.983 | 0.099 | 1.905 |
| I_ISL | -4.840 | -1.421 | 0.293 | 18.098 |
| ΔI_ISL | -73.962 | -6.081 | 0.082 | 0.331 |

- Ng-Perron critical values for $MZ_a$, $MZ_t$, MSB, MPT; respectively:
  - %1 significance level -23.80, -3.42, 0.14, 4.03 (In levels)
  - %5 significance level -17.30, -2.91, 0.17, 5.48 (In levels)
  - %1 significance level -13.80, -2.58, 0.17, 1.78 (In differenced form)
  - %5 significance level -8.10, -1.98, 0.23, 3.17 (In differenced form)

* denotes %1 significance level ** denotes %5 significance level

- I_CONV denotes conventional deposit rates and I_ISL denotes profit share rates

**Table (2) Toda-Yamamoto Test Results**

| From | To | Test Statistics | Prob Value | Results |
|---|---|---|---|---|
| I_CONV | I_ISL | 19.751 | 0.000 | Causality |
| I_ISL | I_CONV | 1.377 | 0.262 | No Causality |

* I_CONV denotes conventional deposit rates and I_ISL denotes profit share rates

Co-integration tests investigate whether the linear combinations of two or more series are stationary in the long-run. Therefore, if this relationship exists then it can be inferred that they share the same long-run trend and these variables should be modeled in their level forms.

Following the causality test, we investigate the co-integration relationship between conventional deposit rates and profit share rates by employing the Bounds Test approach. The Bounds Test approach developed by Pesaran et al. (2001) has some advantages over the conventional co-integration tests. It can be employed without investigating the stationary properties of the variables (Pesaran et al., 2001). Moreover, it is superior in small samples over other co-integration approaches (Narayan and Narayan, 2004). For the Bounds test, the Unrestricted Error Correction Model (UECM) is formed as shown in equation (1).

$$\Delta I\_ISL_t = \alpha_1 + \sum_{i=1}^{m} \alpha_{2,i} \Delta I\_ISL_{t-i} + \sum_{i=0}^{m} \alpha_{3,i} \Delta I\_CONV_{t-i} + \alpha_4 I\_ISL_{t-1} + \alpha_5 I\_CONV_{t-1} + \mu_t \quad (1)$$

After estimating equation 1, we test the null hypothesis of $H_0 = \alpha_4 = \alpha_5 = 0$ and compare the calculated F statistic with table bottom and upper critical levels in Pesaran et al. (2001). If the estimated F statistic is lower (greater) than the bottom (upper) bound of critical values, there is no co-integration relationship between the series. If the calculated F statistic is between the bottom and upper bounds, we cannot make an inference (Narayan and Narayan, 2004).

Table 3 exhibits the Bounds test results. Accordingly, the calculated F statistic is greater than the upper bound of the critical values and we reject the null hypothesis of no co-integration. Therefore, we conclude that there is a significant long run co-integration relationship between conventional deposit rates and profit share rates. Thus, we use variables in their level forms in the regressions.

**Table (3) The Bounds Test Results**

| K | F statistic | Critical Value at %5 Significance Level | |
|---|---|---|---|
| | | Bottom Bound | Upper Bound |
| 1 | 21.71 | 3.62 | 4.16 |

k is the number of independent variables in equation 1.

Critical values are taken from Table C1.iii at Pesaran et al. (2001, p. 300).

### 3.4 The ARDL Model

Having detected the co-integration relationship between conventional deposit rates and profit share rates, we investigate the long-run relationship between two variables by employing the ARDL model. The ARDL model representation in our study is presented in equation 2.

$$I\_ISL_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i} I\_ISL_{t-i} + \sum_{i=0}^{n} \alpha_{2i} I\_CONV_{t-i} + \mu_t \qquad (2)$$

We set the maximum number of lags as 8 and employ Akaike and Schwarz criteria to find the optimal lag number. Both criteria point out to ARDL (2,4) model. The estimated long-term coefficients using ARDL (2,4) model are shown in Table 4. Accordingly, conventional deposit rates have a positive effect on profit share rates and a 1 percentage point increase in conventional deposit rates causes profit share rates to increase by 0.56 percentage points(7). This result is in parallel with our expectations, as conventional banking constitutes the largest portion of the financial sector in Turkey whereas participation baking's share is around 5 percent. Since conventional banking takes the lion's share in the financial system, it is natural that there will be spillover effects of conventional banking to participation banking.

Finally, we employ the FMOLS and DOLS models to make a robustness check. Table 5 compares the results of the FMOLS and DOLS models with the ARDL model. As can be seen from earlier Table 4, the results of the FMOLS and DOLS models are consistent with the results of the ARDL model.

**Table (4) ARDL (2,4) Model Long Term Parameter Estimations**

| **Estimated Long Term Coefficients Using ARDL(2,4) Model** | | |
|---|---|---|
| Variables | Coefficient | T statistics |
| I_CONV | 0.560 | 9.863* |
| C | 2.619 | 1.121 |
| **Error Correction Term for the ARDL(2,4) Model** | | |
| Variables | Coefficient | T statistics |
| ECT(1) | -0.050 | -6.590* |
| **Diagnostic Checks** | | |
| $X^2_{BG}$ (A) | 1.847 [0.160] | |
| $X^2_{ARCH-LM}$ (B) | 0.012[0.912] | |
| $X^2_{RAMSEY}$ (C) | 1.207[0.229] | |

* denotes %1 significance level, I_CONV denotes conventional deposit rates, C denotes constant term and ECT denotes error correction term. (A) Lagrange Multiplier test of residual serial correlation, (B) ARCH-LM Heteroscedasticity test based on the regression of squared residuals on squared fitted values, (C) Ramsey's RESET test using the square of the fitted values.

**Table (5) Robustness Check**

| Variable/Model | ARDL (2,4) | FMOLS | DOLS |
|---|---|---|---|
| I_CONV | 0.560* | 0.564* | 0.547* |
| C | 2.619 | 6.839* | 7.275* |

* I_CONV denotes conventional deposit rates and C denotes constant term.

(7) According to diagnostic checks, there are no serial correlation, heteroscedasticity and misspecification problems in the model.

### 3.5 DCC-GARCH Model

Following the ARDL, FMOLS and DOLS models we employ the Dynamic Conditional Correlation-GARCH (DCC-GARCH) methodology to detect the time-varying correlation between conventional deposit rates and profit share rates. By using the DCC-GARCH methodology, we aim to capture the dynamic relationship between the two variables and try to analyze the behavior of correlations during certain time periods.

DCC-GARCH which was introduced by Engle (2002), aims to calculate the dynamic conditional correlation between two variables. DCC-GARCH is a generalization of Bollerslev's (1990) constant conditional correlation estimator. The biggest advantage of using the DCC-GARCH model is the detection of possible changes in conditional correlations over time. Therefore, the time-varying nature of DCC-GARCH gives the opportunity to detect the dynamic relationship between two variables. As an additional benefit, DCC-GARCH estimates correlation coefficients of the standardized residuals and directly takes heteroscedasticity into account (Chiang et al., 2007). Furthermore, the DCC-GARCH estimators are often more accurate than the GARCH estimators (Engle, 2002).

There are two steps in the estimation of the DCC-GARCH model. In the first part, a univariate GARCH model is estimated. Following this, time-varying conditional correlations are derived. The DCC-GARCH model is formed as follows: Let $y_t = [y_{1t}, y_{2t}]'$ be a 2x1 vector containing the data series under the assumption of $y_t|\Omega_{t-1} \sim N(0, H_t)$. The reduced-form VAR denoted below depicts the conditional mean equations:

$$A(L)y_t = \varepsilon_t \quad (3)$$

where $\varepsilon_t = [\varepsilon_{1t}, \varepsilon_{2t}]'$ is the vector showing the innovations, A(L) is a matrix in the lag operator L and $\varepsilon_t \sim N(0, H_t)$, t=1,2,….,T. The conditional variance-covariance matrix of the $\varepsilon_t$ vector is $H_t = D_t R_t D_t$ , where $D_t = \mathrm{diag}\{\sqrt{h_{it}}\}$ is a 2x2 matrix of time-varying standard deviations obtained from univariate GARCH model and $R_t = [\rho_{ij}]_t$ for i,j=1,2 is a correlation matrix that includes conditional correlation coefficients. The standard deviations in $D_t$ are calculated by the GARCH process depicted below:

$$h_{it} = \gamma_i + \sum_{p=1}^{P_i} \alpha_{ip} \varepsilon^2{}_{it-p} + \sum_{q=1}^{Q_i} \beta_{iq} h_{iq-q} \quad , \quad \forall_i = 1,2 \quad (4)$$

The structure of the DCC-GARCH process is defined with a positive matrix stated in equation (5).

$$R_t = diag\{Q_t\}^{-1} Q_t diag\{Q_t\}^{-1} \quad (5)$$

Where $Q_t = (1 - \sum_{m=1}^{M} a_m - \sum_{n=1}^{N} b_n)\,\overline{Q} + \sum_{m=1}^{M} a_m(\varepsilon_{t-m}\varepsilon'_{t-m}) + \sum_{n=1}^{N} b_n Q_{t-n}$ and $\overline{Q}$ is the variance-covariance not varying in time which was obtained by estimating the GARCH process shown in equation (4). $\overline{Q_t}$ is a 2x2 matrix that includes the square root of the diagonal elements of $Q_t$.

The conditional correlation, $\rho_{12,t}$ is equal to $\frac{q_{12,t}}{\sqrt{q_{11,t} q_{22,t}}}$ and the parameters of the DCC-GARCH model could be calculated by maximizing the log-likelihood function given below:

$$L = -\frac{1}{2}\sum_{t=1}^{T} n[log(2\pi)] + 2log|D_t| + y_t{}' D_t{}^{-1} D_t{}^{-1} y_t - \varepsilon_t{}' \varepsilon_t + log|R_t| + \varepsilon_t{}' R_t{}^{-1} \varepsilon_t \quad (6)$$

**Figure (2) Dynamic Conditional Correlation between Deposit and Profit Share Rates**

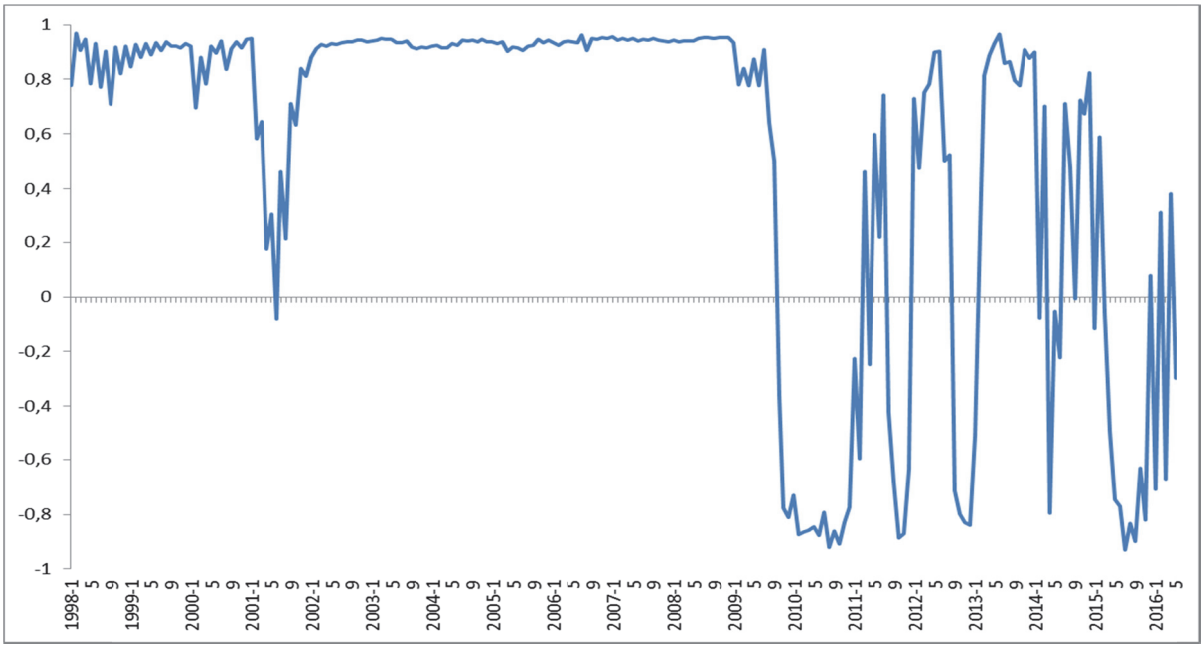



Figure 2 denotes the dynamic conditional correlation between deposit and profit share rates calculated by the DCC-GARCH model. Accordingly, the correlation between deposit rates and profit share rates remained stable around 0.9 during the January 1998-February 2001 period(8). However, there is a huge reduction in the correlation starting from February 2001. As known, February 2001 is an important milestone for the Turkish economy as Turkey faced one of its most severe economic downturns in its history where growth plummeted sharply and unemployment rates surged. The crisis had important implications for the financial sector as well. Accordingly, the Istanbul Stock Exchange crashed, overnight borrowing rates skyrocketed and Turkish lira collapsed. After the initiation of the new economic program on May 2001, financial markets started to recover gradually. In parallel with the recovery in the financial sector, the correlation between deposit and profit share rates recovered as well. The correlation reached its pre-crisis levels in October 2001 after hovering around zero for a couple of months. Following the recovery, the correlation between deposit rates and profit share rates remained stable around 0.9 until they plummeted sharply in October 2009. This period is also a crisis period as the world economy was shattered by the 2008 financial crisis, which first emerged in the US mortgage market during the last quarter of 2007. As an integrated economy to the global economy, the Turkish economy was also badly affected by the crisis. Following the downfall, the correlation returned to their usual value after remaining negative for 14 months. However, different from the previous crisis, the correlation was not stabilized after the recovery. On the contrary, the volatility of the dynamic correlation increased dramatically and fluctuated between $\pm 0.9$ since then.

The DCC-GARCH model managed to capture the effects of the two big crises on deposit and profit share rates indicating that the correlation between the two rates plummets during crisis periods. Nevertheless, despite the similar behavior during the 2001 and 2008 crises, the behavior of the correlation completely differs during the two recovery periods. Accordingly, the correlation recovered pretty fast

(8) The static correlation coefficient between profit share rates and conventional interest rates is 0.71. The arithmetic average of dynamic correlation coefficients is 0.88 during expansion periods and 0.53 for the whole sample including the crises periods. This indicates that both rates generally move together but diversifies significantly during turbulent times.

during the 2001 crisis and remained stable for almost 9 years. As for the 2008 crisis, the correlation recovered rather slowly (in 14 months) and failed to stabilize since then. In our view, the condition of the world economy as well as politics played a huge role in this distinction. The world was politically and economically stable during Turkey's economic downturn in 2001. Despite that a minor crisis occurred in 2001, there was no sign of a global crisis and geopolitical tensions were mild. Turkey's domestic political environment was also favorable as a single-party cabinet was founded after 10 years of coalitions. This led to a quick recovery in the financial sector as well as in the correlation between deposit and profit share rates. However, despite that the same single-party cabinet held the office during the 2008 crisis, there was a severe economic crisis in the world and the MENA region was more unsettled than ever. Moreover, major central banks loosened their monetary policies by employing unconventional methods and pumped liquidity worth trillions of dollars into the markets. These unfavorable political and economic conditions abroad incurred imbalances and caused financial markets to remain gloomy. As a result, the correlation between deposit and profit share rates took much longer to recover and did not stabilize at its pre-crisis levels.

To sum up, Figure 2 implies that even though the dynamic correlation between deposit rates and profit share rates is stable during good times, it differs during crisis periods. Accordingly, it could be argued that economic crises have distinct effects on conventional and Islamic banking sectors. Considering the structure of these two banking sectors, this result seems quite meaningful.

On the other hand, most of the empirical studies show that the Islamic banking sector is more resilient to financial crises due to its asset structure. However, in case of a crisis with a real sector origin, it could be affected worse than the conventional banking system due to its close connection with the real economy. Nevertheless, considering that most of the economic crises in the last two decades originated from the financial system, we could infer that the increasing share of Islamic banking sector may increase the resiliency of the economy to financial crises.

As for the Turkish banking sector, even if the banking sector in Turkish economy has gained a healthier structure together with the measures taken after the financial crisis in 2001, increasing the share of Islamic banking could be helpful to establish a more resilient banking sector during times of financial stress. Moreover, Islamic financial tools could also stimulate saving rates and contribute to infrastructure investments by attaching economically inactive funds to the economic system.

## 4. Conclusion

Islamic finance has drawn great attention both in Muslim and non-Muslim countries, especially during the last two decades as its significance has increased multifold. Since it forms a unique connection between financial and real sectors, it presents interest-free and more secure alternative financial instruments to both depositors and fund-seekers.

Since the crisis in 2008, the critics about the current financial system come into prominence. Scholars, economists, and policy makers plunged into a quest to ease the drawbacks of the conventional financial system and the efforts to search for alternative financial instruments increased. At this point, the question of whether Islamic finance could be an alternative financial method to conventional finance system has come up for discussion. Many economists have suggested Islamic financial instruments as an alternative financial method as it limits the ability to make a profit from a financial asset by creating a closer relationship between real and financial activities.

In fact, considering the drawbacks of financial crises especially on poverty rates and unemployment, Islamic financial instruments may be considered as stabilizers for an economy to decrease income inequality, poverty and unemployment rate because these are less vulnerable to speculation and manipulation, which all are prohibited actions according to the Islamic law. Moreover, they lead to higher asset quality providing great stability in the financial sector particularly during the bad times in the economy.

Indeed, regarding the recent global financial crisis in 2008, there exist numerous empirical studies showing that Islamic financial institutions were less or indirectly affected by the global financial crisis. Islamic banks generally escaped the worst effects of the 2008 crisis since they were not exposed to subprime and toxic assets, and had maintained their close link with the real economy (Mohieldin, 2012).

In this study, we analyzed the relationship between conventional deposit rates and profit share rates of participation banks by employing ARDL and DCC-GARCH models for the Turkish banking sector. We first investigated the causality relationship between conventional and participation banking and found that there is a unidirectional causality running from conventional banking to Islamic banking. Then, we employed different models including, ARDL, FMOLS, DOLS. According to the result of ARDL model, there is a positive relationship between conventional deposit rates and the profit share rates of participation banks. The ARDL model suggests that conventional deposit rates significantly affect profit share rates. One possible explanation for this result is the fact that conventional banks dominate the financial system in Turkey. Hence, it is expected that any change in deposits rates of conventional banks will affect the profit rates of participation banks.

Finally, we analyzed dynamic time-varying relationship between conventional banking and participation banking by using the DCC-GARCH model. Accordingly, it is found that the dynamic correlation between conventional deposit rates and profit share rates are generally stable around 0.9 when the markets are not disturbed by shocks or crises. Nevertheless, the correlations dramatically fluctuate during periods of stress. Our model managed to capture the effects of the two financial crises (2001 and 2008) on deposit and profit share rates indicating that the correlation between two rates plummets during crisis periods. However, despite some similarities during the 2001 and 2008 crises, the behavior of the correlation completely differs in terms of recovery periods. While the correlation recovered pretty fast during the 2001 crisis, after the 2008 crisis the correlation between deposit and profit share rates took much longer to recover and has still not stabilized at its pre-crisis levels due to the ongoing unfavorable political and economic conditions in neighboring countries and European Countries who are the main trade partners of Turkey respectively.

There are important implications of our findings. It is shown that Islamic banks offer more stable yields compared to conventional interest rates. Even though the profit share rates and conventional interest rates move together during normal times, their correlation completely differs during turbulent times. This is a direct result of the "bear the risk" principle of Islamic instruments which indicate co-liability of the bank together with the debtor. Considering that the global crisis was a direct result of the surged risk appetite and lack of regulation, Islamic financial instruments could contribute to financial stability by linking the financial sector to real sector and promoting portfolio diversification. Therefore, substituting conventional financial instruments with Islamic instruments might be an option for investors to get stable yields and policy makers to promote financial stability. Considering the increased share of Islamic banking in recent years, one can argue that this transformation has already begun in Turkey.

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# العلاقة بين الإيداعات التقليدية ومعدلات الأرباح الإسلامية: تحليل للقطاع المصرفي التركي

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**المستخلص.** برز التمويل الإسلامي في العقدين الماضيين، واعتبرت الأدوات الإسلامية بديلا للأدوات التقليدية بعد أزمة عام ٢٠٠٨م. في هذه الدراسة، حاولنا تحليل العلاقة بين معدلات الودائع التقليدية ومعدلات الأرباح في بنوك المشاركة (البنوك الإسلامية) في تركيا من خلال استخدام أدوات النمذجة الثابتة كنماذج أردل (ARDL) و فمولس (FMOLS) و دولس (DOLS) وأدوات النمذجة الديناميكية كنموذج دسس-غارتش (DCC-GARCH) باستخدام البيانات الشهرية في تركيا التي تغطي الفترة ١٩٩٨م إلى ٢٠١٦م. حسب علمنا، هذه الدراسة هي الأولى التي توظف نموذجا ديناميكيًا لبحث العلاقة بين معدلات الودائع التقليدية ومعدلات الأرباح في بنوك المشاركة. وتبعا لذلك، فقد وجدنا أن معدلات الودائع التقليدية تؤثر بشكل كبير على معدلات الربح، كما أن العلاقة الديناميكية بين معدلات الودائع التقليدية ومعدلات الربح مستقرة عموما حول (٠,٩) عند استقرار الأسواق وعدم تأثرها بالصدمات أو الأزمات. ومع ذلك، فإن الارتباط يتذبذب بشكل كبير خلال فترات التوتر. وقد تمكن هذا النموذج من التعرف على آثار الأزمتين الماليتين (٢٠٠١م و ٢٠٠٨م) على معدلات الودائع والربح، مما يشير إلى أن العلاقة بين المعدلين تنخفض خلال فترات الأزمات. وعلى الرغم من بعض أوجه الشبه بين الأزمتين ٢٠٠١م و ٢٠٠٨م، فإن مستوى الارتباط يختلف تماما خلال فترتي الانتعاش. ففي أزمة عام ٢٠٠١م استعادت الارتباطات بسرعة كبيرة وظلت مستقرة ما يقرب من ٩ سنوات. أما بالنسبة لأزمة ٢٠٠٨م، فقد استعادت الارتباطات ببطء شديد (في ١٤ شهرا) وفشلت في الاستقرار منذ ذلك الحين. وفي رأينا أن هذا التمييز ينشأ بسبب الظروف السياسية والاقتصادية الحالية غير المواتية في البلدان المجاورة وأعضاء الاتحاد الأوروبي الشركاء التجاريون الرئيسيون لتركيا.

**الكلمات الرئيسية:** التمويل الإسلامي، الخدمات المصرفية، معدلات الأرباح.