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WORKING PAPER

Are Islamic Banks Subject to Depositor Discipline?

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Are Islamic banks subject to depositor discipline?

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Abstract

We look at market discipline in the Islamic deposit market of Turkey for the period after the 2000 crisis. We find support for quantity based disciplining of Islamic banks through the capital ratio. The evidence for price disciplining is, however, less convincing. In addition, we also look at the effect of the deposit insurance reform in which the dual deposit insurance was revised and all banks were put under the same deposit insurance company in December 2005. We observe that the reform increased quantity based disciplining in the Turkish Islamic deposit market.

JEL Classification: G23, G28, O52

Keywords: Depositor discipline, Islamic banks

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1. Introduction

From its humble inception five decades ago as a micro-lending institution in the Nile Delta, Islamic banking has grown into an acclaimed mainstream industry with still a massive outreach potential. While in a few countries, such as Iran and Sudan, the entire banking industry operates according to Islamic rules, in many other countries, such as Bangladesh, Egypt, Malaysia and Turkey, Islamic financial institutions are running side-by-side with conventional banks. Islamic banks are also not limited to predominantly Muslim populated countries, and are increasingly gaining international acceptance. In August 2004, for example, the Islamic Bank of Britain (IBB) was formed the first fully fledged Islamic bank in a country without a Muslim majority. Moreover, to accommodate the growing demand for Islamic products, several major international banks (e.g., Citibank, Deutsche Bank, HSBC, and BNP Paribas) established Islamic windows or business units. According to latest figures from Ernst & Young (2012), Islamic finance activity has been growing between 10 and 20% per year, with Islamic finance assets exceeding $1.3 trillion in cumulative value in 2011.

The Islamic banking system shows key differences from the conventional system because interest (*riba*) is prohibited in Islam; i.e., banks are not allowed to offer predetermined interest rates on deposits and are not allowed to charge interest on loans and mortgages. In line with the *Shariah*, Islamic religious law, the Islamic banking model is based on the profit-and-loss sharing mechanism (PLS), which is typically practiced through *Mudarabah* (profit-sharing) and *Musharaka* (joint venture) contracts. Under the PLS paradigm, bank assets and liabilities are balanced in such a way that borrowers share profits and losses with banks, which in turn share profits and losses with depositors. Given this emphasis on equity financing, advocates of Islamic banking argue that the deleveraged nature of Islamic banks contribute to the stability of the financial system (Khan and Mirakhor 1989, Ebrahim and Safadi 1995, Iqbal 1997). Čihák and Hesse (2010), Hasan and Dridi (2011) and Beck et al. (2013), amongst others, provide empirical evidence that Islamic banks are more stable than conventional banks. Instead of debt, Islamic finance introduces asset backed financing instruments, where the investor's return is connected to the profit and loss of a pool of diversified assets. In addition, Chapra (1992) and Mills and Presley (1999) suggest that the Islamic banking system promotes long-term economic growth as the risk-sharing feature of the profit-and-loss paradigm allows Islamic banks to lend on a longer-

term basis to projects with better risk-return profiles. Given the equity-like nature of savings and investment deposits, it has been strongly claimed that Islamic banks are more subject to market discipline (Errico and Farahbaksh 1998, El-Hawary et al. 2004, Beck et al. 2013). In other words, as 'quasi-shareholders', Islamic bank depositors have greater incentives to exercise control over management to prevent excessive risk taking behavior. Surprisingly, however, as far as we know, there is no empirical analysis that reveals market discipline on Islamic banks. The aim of this paper is to test the conjecture that Islamic bank depositors are able to monitor and discipline their banks.

The motivation behind market discipline is to supplement regulatory discipline and to promote a safer and more efficient banking system. The growing complexity of banking practices and the move towards more market-based banking provide an explanation for why subsequent Basel reforms increasingly emphasize the role of market pressure. Market discipline refers to a situation where depositors or other creditors actively reward or punish banks for their relative performance. The theory of market discipline predicts that when excessive risk taking occurs, depositors will ask higher returns on their deposits or withdraw their funds. This mechanism of market discipline generates in principle both price and quantity adjustments in bank liabilities, which, in turn, would force bank management to reduce risk-taking in order to attract funds (Flannery 1998, Park and Peristiani 1995, Martinez Peria and Schmukler 2001).

For conventional banks, the process of market surveillance is well-documented and reflected in the literature. Much of this evidence is from countries with mature, more transparent, conventional banking markets. Both price and quantity discipline have been shown to play an important role as a complement to supervisory efforts, particularly with respect to deposits that are not fully insured. Using a sample of banks in thirty-two OECD countries, Nier and Baumann (2003) find that riskier banks in general hold a bigger capital buffer, which confirms the presence of market discipline in other mature institutional settings. Sironi (2003) considers the sensitivity of subordinated notes and debentures spreads and finds that investors impose market discipline on private European banks. Demirgüç-Kunt and Huizinga (2004) use data from a sample of both OECD and developing countries and find that an increase in the capital ratio leads to an increase in deposit growth and a decrease in deposit rates; i.e., the major effect is a rightward shift of the deposit supply curve.

Although the Islamic finance literature has highlighted the importance of market discipline, still very little is known about the mechanisms through which the disciplining occurs in a profit and loss sharing arrangement. In particular, we focus on the *Mudaraba* contract that involves a partnership between the bank as one of the several investors, with profits and losses being shared in mutually agreed proportions. This mode of financing is manifested on the deposit side of the bank, with investment accounts or deposits that do not yield preset interest rates but rather confer a proportion of profits. An Islamic deposit contract, in fact, contains neither debt nor equity compensation – and, this in turn, introduces additional agency conflicts. Although in such a framework depositors turn from bank creditors to residual claimants on banks' cash flows, they still do not have control rights that shareholders possess and their cash flow rights do not coincide with the rights to control investments. The agency problems do not only stem from the separation of ownership and control for shareholders (Berle and Means, 1932; Jensen and Meckling, 1976; Fama and Jensen 1983), but also from the separation of cash flow and control rights for depositors (Safieddine 2009). According to Shleifer and Vishny (1988, 1997), large blockholders have more incentives than atomistic shareholders to exercise disciplining sanctions and pressure management to operate prudently and hence avoid failure. However, depositors still could exercise power over bank management due to their ability to withdraw their deposits when information indicates poor firm prospects. Such an exit by depositors can be an effective governance mechanism, even when they have no direct intervention power in the operation of the banks. This reasoning may also fit with recent theoretical models in corporate finance that predict disciplining behavior of dispersed blockholders on firm management. This behavior involves an exit strategy leading to a stock price that closely reflects the firm's fundamental value, which hurts management through its equity interest in the firm (Admati and Pfleiderer 2009, Edmans 2009, and Edmans and Manso 2011).

This paper is novel in at least two respects. First, we examine whether Islamic bank depositors discipline their banks by withdrawing their deposits. Secondly, this paper attempts to uncover further empirical evidence regarding the relationship between deposit insurance reforms and market discipline in the context of Islamic banks. Our results suggest that Islamic bank depositors discipline their banks through the capital ratio; i.e., banks with lower capital exhibit slower deposit growth. However, we do not find that the capital ratio is used for price disciplining. We also find that the deposit insurance reform in December 2005, in which the

management of the Islamic deposit insurance fund was transferred to the Savings Deposit Insurance Fund, resulted in an increase in depositor vigilance.

This paper is organized as follows. In Section 2, we give an overview of the Islamic banking sector in Turkey. In Section 3, we present the data and empirical model used for the analysis. Section 4 presents the estimation results of our basic model and our interpretation of them. In Section 5, we test whether the deposit insurance reform have affected depositor discipline. The last section contains concluding remarks.

2. Islamic banks in Turkey

Parallel to the growth in the Islamic finance industry worldwide, Islamic banks in Turkey have also been expanding and attracting new customers. Interest-free banking has long been present in Turkey and was first made legal in 1985, as part of a plan to attract more foreign direct investment from the Gulf states, under the government of Turgut Özal, a former prime minister and president of the Turkish Republic. To distinguish the Islamic financial institutions from the conventional banks operating in Turkey, they were given the status of 'special finance houses'. Despite being Islamic-compliant financial institutions, such a name was given with the objective to soften their Islamic image in order not to offend the ideological sensibilities of the political establishment. These institutions did not have the same status as the conventional banks, the Deposit Insurance Fund did not cover their deposits, and they could not invest in government securities. Islamic finance debuted in 1985 with Bahrain-based AlBaraka Turk and Saudi-based Faisal Finance. The Kuwaiti-based Kuveyt Turk began its operations in 1989. Afterwards, the special finance houses also began lending with domestic capital, including: Anadolu Finance (1991), Ihlas Finance (1995) and Asya Finance (1996). We refer to Aysan et al. (2013a), for an overview of the developments in the Islamic banking sector in Turkey.

In the 1990s, otherwise known as the lost decade, the Turkish economy suffered severe setbacks from large and volatile international capital flows. The first unpleasant experience was due the 1991 Gulf War, which led to capital flow reversals and bank distress due to Turkey's closeness to Iraq, and the first major banking collapse occurred in 1994. Although the banking sector recovered quickly from the 1994 crisis, the economy in Turkey continued to face

significant headwinds. Political instability, fiscal challenges, chronic and high inflation, and the financial turmoil in similar emerging markets (Mexico in 1995, in the Far East in 1997, in Russia in 1998, and in Brazil in 1999) continued to weigh heavily on the Turkish economy, which eventually resulted in an unprecedented banking crisis in 2001. In the aftermath of the 2001 crisis, the number of conventional banks fell sharply from more than 50 to just 33. The financial crisis not only affected conventional banks, but also the special finance houses. Ihlas Finance filed for bankruptcy in 2001, and the Turkish holding company Ülker purchased Faisal Finance in 2000, changing its name to Family Finance. After the merger of Anadolu Finance and Family finance into Türkiye Finance in December 2005, there are currently four *Shariah*-compliant banks operating in Turkey.

The 2001 crisis led to a rehabilitation of Turkey's financial system, and the parliament passed a new law in order to discipline the overall banking system (Banking Act No. 4389). Under this law, Special Finance Houses were brought under the same umbrella of regulations covering conventional banks. After the collapse of Ihlas Finance, and because of the economic turmoil, the government instituted an Islamic deposit insurance scheme to instill depositors' confidence. The Islamic deposit insurance scheme provided insurance up to ¨ 50,000 for each deposit ownership in each bank, while the conventional insurance offered at that time an unlimited coverage. Furthermore, unlike the conventional system, which was managed by the government, the Islamic deposit insurance system (IDIS) was administered by the 'Union of Private Finance Houses'. Membership to the Union was compulsory for all licensed Islamic banks. However, on December 2005, upon enactment of the Banking Act No. 5411, the dual deposit insurance system was revised and the management of the Islamic deposit insurance fund was transferred to the Savings Deposit Insurance Fund (SDIF). Of equal importance, following amendments to the banking law, 'Special Finance Institutions' were renamed as 'Participation Banks', which allowed them to integrate fully into the financial system.

Participation banking in Turkey has not traditionally made up a large portion of Turkey's finance sector due to the secular tradition of the republic. However, by becoming more and more like banks in both image and reality, they progressively gained acceptance among depositors and investors. Also, after the 2001 crisis, the ruling Justice and Development Party (AKP) paved the way to the ascent of Islamic finance. As illustrated in Table 1, slowly but surely, and even more

pronouncedly after the Banking Act of 2005, the sector has managed to increase its market share both on the credits and deposits segments of the financial industry.

3. Empirical methodology

3.1. Data

Our unique database contains monthly balance sheet and income statement information on all participation banks operating in Turkey from January 2001 to January 2013. We have a balanced panel of four banks as we have integrated backwards the financial accounts of the two Islamic banks that merged during our sample period. Since Anadolu Finance absorbed Family Finance in December 2005, the accounts of the two single institutions before December 2005 are added up in the data set and reported as accounts of one bank. The rationale behind this procedure is that the merger date fell exactly in the same month as the reform of the deposit insurance system. We also refer to Hadad et al. (2011) who adopt a balanced panel to ensure that the results would reflect the impact of regulatory reforms in their analysis of market discipline in the Indonesian banking industry. Our methodological approach is (*i*) to infer whether market discipline is present using evidence from both deposit rate and deposit growth regressions, and (*ii*) to address the question whether a change in deposit insurance reform affects market discipline.

3.2. A model for depositor discipline

We examine whether depositor discipline is existent in the Turkish participation banking sector by relating bank fundamentals to the reaction of deposits volumes, and the return of deposits. Depositor discipline would emerge if depositors withdraw their funds whenever the financial condition of their bank becomes relatively riskier. For conventional banks, it has been put forward that the market's disciplining mechanism will work because of an upward shift of the deposit supply curve; i.e., the bank will face deposit outflows and climbing deposit rates. For Islamic banks, the return on deposits should in principle reflect the risk profile of the Islamic bank. This is why analyzing both the reactions of deposit prices and quantities is important, as

only such combined information will enable us to disentangle depositor discipline from demand shifts and regulatory shocks (see, amongst others, Park, 1995, Martinez Peria and Schmukler, 2001, Ioannidou and de Dreu, 2006, Karas et al., 2010, Disli et al., 2013).

Hence, to examine whether there is any market discipline in our sample, we estimate the following reduced-form equations, in which we measure the reaction of deposits (Eq.1) and return on deposits (Eq. 2) to bank risk taking, respectively:

$$\mathrm{DEPG}_{i,t} = \alpha_i + \alpha_t + \alpha_1 \mathrm{Risk}_{i,t-3} + \alpha_2 \mathrm{Controls}_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$\mathrm{RDEP}_{i,t} = \beta_i + \beta_t + \beta_1 \mathrm{Risk}_{i,t-3} + \beta_2 \mathrm{Controls}_{i,t} + \mu_{i,t} \quad (2)$$

The dependent variables are the traditional measures of market discipline. $DEPG$ is the quarterly difference of the log of three-month moving average of deposits, and $RDEP$ is the implicit three-month moving average return on Islamic deposits. The fundamental difference between the return on Islamic deposits and the return on conventional deposits is that the first is anticipated but not agreed beforehand, while the latter is predetermined. Table 2 provides summary statistics of the numerical measures of the dependent variables, bank fundamentals and bank controls for the sample period 2001:01 – 2013:01. We notice that the mean change of the three-month moving average has been positive across banks and over time (8%), and the average three-month moving average return on deposits reveals that the banking sector historically has paid on average 1.8%. The nonnegative minimum value of the return on deposits suggests that in practice there is a considerable smoothing of returns on investment accounts.

In line with the literature, Risk represents a vector of publicly observable bank-specific risk characteristics (Park and Peristiani 1998, Martinez Peria and Schmukler 2001). This vector comprises three-month lags because of the quarterly delay in publication of the balance sheet and income statement information. Furthermore, this lag structure helps to moderate our concerns about endogeneity. For the deposits growth equation, evidence of market discipline would emerge when the estimated coefficients to bank risk variables indicate a negative relationship (i.e., $\alpha_1 < 0$). The $Equity$-variable is the ratio of book value of equity to total assets, and informs outsiders about the solvency of the bank. This variable has an inverse relationship with bank risk,

and hence we expect this ratio will be positively related to the growth in deposits. The summary statistics in Table 2 reveal that the average capital ratio in our sample is 11%. The $Bad\ Loans$-variable is defined as the ratio of loans under follow-up to gross loans, and proxies for a riskier asset management strategy. Because a high non-performing loans ratio is associated with higher credit risk, all else equal, we expect this ratio will have a negative impact on deposit growth. The Return on Assets (ROA) is calculated as the shareholders' profit after taxes divided by total assets, and proxies for management's ability to generate profits from the bank's assets. We expect, ceteris paribus, this ratio will have a positive impact on deposit growth. Due to the nature of Islamic banking, we, a priori, hypothesize that there no association between the Risk-vector and the reaction variable return on deposits $(RDEP)$. We winsorize the dependent and bank risk variables at the 2% level in both tails to moderate the inordinate influence of extreme values. The disturbance terms $\varepsilon_{i,t}$ and $\mu_{i,t}$ are independently distributed with mean zero and variance $\sigma^2_{i,t}$. Following most prior research, we estimate a model using bank fixed effects, α_i, for the quantity reaction, and β_i, for the pricing reaction, to control for the unobserved heterogeneity across banks. To control for potentially heteroscedastic and potentially correlated error terms within an entity, we estimate heteroscedastic- and autocorrelation consistent standard errors. Furthermore, in all specifications, we include monthly time fixed effects to account for macroeconomic fluctuations, the time dimension of our data and to capture possible trends that might influence the return on deposits (i.e., β_t) and growth in deposits (i.e., α_t).

The control variables are selected on the basis of prior studies on depositor discipline (e.g., Park and Peristiani 1995, Disli et al. 2013). The $Relationship\ banking$ variable is calculated as the ratio of total number of bank personnel to total assets and is used as a metric of bank service quality. The natural logarithm of the number of months the bank exists ($Bank\ age$) is included as a proxy for institutional maturity, while the square of the natural logarithm of bank age ($Bank\ age\ squared$) is included to capture any non-linearities in the relationship between age and deposits growth (or return on deposits) relationship. The $Size$variable, calculated as the natural logarithm of total assets, is included to account for the likelihood that depositors consider larger Turkish banks safer.

4. Estimation results

4.1. Do riskier Islamic banks attract fewer deposits?

We run bank and time fixed-effects regressions using cross-sectional time series data to estimate the reaction of depositors to the default risk of Islamic banks in the Republic of Turkey. Previous literature has indicated why discipline in the deposits market will often operate through quantity adjustments (for theory and empirical evidence that riskier banks attract less deposits, see Gorton and Pennacchi 1990, Calomiris and Kahn 1991). In Table 3, we report the results of the deposits growth equation (i.e., Eq. 1). In the first three columns, the bank risk variables are estimated separately, while column 4 presents their joint estimations. Primary interest is in the identification of bank fundamentals that have an influence on the deposits growth. Through the quantity equation, our results reveal that the capital ratio gives the most convincing evidence of the presence of depositor disciplining, while the two remaining risk variables (Bad Loans and Return on Assets) fail to produce shifts of the deposit supply curve.

It turns out that the capital ratio is the most relevant measure for depositors in monitoring their banks. This is not surprising since the capital provides a secure cushion that protects the bank whenever the value of its assets falls; a bank will be able to meet its obligations to depositors as long as bank's losses do not exceed its capital (Marcus 1983). Consequently, more than any other measure, the capital ratio has been identified as a crucial determinant for bank quality in market discipline studies (e.g., Hannan and Hanweck, 1988, Park and Peristiani, 1998, Martinez Peria and Schmukler, 2001, Disli et al. 2013).

Most of the bank-specific control variables included in the model does not enter the deposits growth equation significantly. One possible issue with using both bank- and time-fixed effects, and because we only have four banks in our regression analysis, is the lack of substantial variation in the explanatory variables, giving rise to insignificant coefficient estimates. Indeed, the coefficient of our proxy for relationship banking is positive but not significant for the quantity equation. Our results also suggest that *Bank age* has a negative effect while *Bank age squared* has a positive effect. However, both of the coefficients are not significant at the 10% level. Table 3 also shows that larger Islamic banks have an advantage in the acquisition of deposits.

4.2. Do riskier Islamic banks pay higher returns on deposits?

For conventional banks, a substantial amount of research has yielded evidence that the cost of debt finance contain accurate information about the default risk. This means that investors such as depositors and bondholders behave in a risk averse fashion and require an adequate risk premium for the risk they assume. Previous evidence of market discipline through the price mechanism is predominantly US oriented. See, amongst others, Hannan and Hanweck (1986) and Ellis and Flannery (1992) for disciplining in the certificate of deposit (CD) market, Flannery and Sorescu (1996) for disciplining in the subordinate notes market, Jagtiani and Lemieux (2001) for disciplining in the bond market, and Furfine (2001) for disciplining in the overnight interbank market. However, there is a growing amount of research being done on market discipline in emerging market economies. Most of this research has simultaneously concentrated on both price and quantity signals. For Bolivia, Ioannidou and de Dreu (2006) find, consistent with the market discipline hypothesis, a relationship between bank fundamentals and the supply of deposits and deposit rates. For the Latin American crisis-hit countries, Martinez Peria and Schmukler (2001) find that riskier banks exhibit slower deposit growth, and pay their depositors higher interest rates. Karas et al. (2010) and Disli et al. (2013), for instance, show that capital-based depositor discipline is also present in other emerging markets like Russia and Turkey, respectively.

While the concept of price disciplining is intuitively appealing, we are a priori not sure that depositors are able to resort to price adjustments in the context of Islamic banks. In practice, Islamic deposit contracts are more opaque than their conventional counterparts; and the profit-sharing ratio is subject to management's discretion, which is partly attributed to a lack of competition in the sector. Very often, Islamic banking products, including Islamic deposits are benchmarked to the conventional interest-based sector (for related evidence see Aggarwal and Yousef 2000, Chong and Liu 2009, Khan 2010, and Cevik and Charap 2011). Such a practice does obviously not take into consideration the different risk positions of Islamic depositors and, consequently, the risk profile of the assets of the Islamic bank will not be appropriately reflected in the return of Islamic deposits (Nienhaus 2007). Discretionary margins are particularly elevated through smoothing techniques that allow management to delink the profits allocated to depositors from the returns on the assets portfolio. In other words, in a mixed banking system without competition in the Islamic banking segment, informed but religious minded Islamic depositors

will possibly lack the necessary bargaining power to exert market disciplining through the price mechanism. In Table 4, we report the results of the return on deposits equation (i.e., Eq. 2). In the first three columns, the bank risk variables are estimated separately, while column 4 presents their joint estimations. Our results indeed indicate that the return on deposits is not sensitive to bank risk. We, actually, find evidence that shareholders' profits is influencing positively the return on deposits, lending some support to the PLS principle.

For the bank-specific control variables, we observe that older banks offer higher returns to their depositors likely because of the higher level of experience in monitoring their investments and borrowers. However, we also find that the coefficient of the square of is negative, suggesting that the positive effect of age on deposit returns is increasing at a decreasing rate. Although the *Relationship banking* variable has the expected signs in both the deposits growth equation (Table 3) and the in return on deposits equation (Table 4), suggesting that better services offered by banks to their clients is attracting more deposits when the return on deposits is low, they lack significance at conventional levels. We also observe that the Size variable has a positive sign in both equations, indicating that bigger banks are exploiting their economies of scale by offering higher interest rates (Table 4) in order to attract more deposits (Table 3). This finding is in agreement with the results found by Aysan et al. (2013b), who observed that Turkish Islamic banks gained more monopolistic outlook in the post-2000 period.

5. Impact of deposit insurance reform

After the deposit insurance reform in December 2005, the duality in the deposit insurance system came to an end and all banks were put under the same deposit insurance company (SDIF). We proceed by verifying the changes in intensity of market discipline after the deposit insurance reform. In the following two specifications, bank fundamentals interact with a deposit insurance reform dummy variable, which enables us to examine the impact of a full blanket guarantee on depositor discipline:

$$DEPG_{i,t} = \alpha_i + \alpha_t + \alpha_1 Risk_{i,t-3} + \alpha_2 Risk_{i,t-3} \times Reform + \alpha_3 Controls_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$RDEP_{i,t} = \beta_i + \beta_t + \beta_1 Risk_{i,t-3} + \beta_2 Risk_{i,t-3} \times Reform + \beta_3 Controls_{i,t} + \mu_{i,t} \quad (4)$$

The coefficients on $Risk$ and $Risk \times Reform$ capture the sensitivity of the reaction variables to bank risk before the reform and the change in the sensitivity of the reaction to bank risk after the reform. For the deposits growth equation, if the reform made depositors tougher and intensified market discipline, then the coefficient on $Risk \times Reform$ should be negative in the equation for the growth in deposits and vice versa.

The existence of deposit insurance entails a trade-off between greater protection against bank runs and increasing moral hazard. As originally analyzed by Merton (1977) in the context of deposit insurance, safety nets have moral hazard consequences in that they limit the bank's downside risk and therefore encourage risk taking. Diamond and Dybvig (1983), deposit insurance diminishes the probability of system-wide bank panic as it retains bank runs and is so conducive to a stable pool of deposits. Examining the relationship between deposit insurance and financial crises, Demirgüç-Kunt and Detragiache (2002) find evidence that explicit deposit insurance tends to increase the likelihood of banking crises in a sample of 61 countries over 1980 – 1997. The cross-country study conducted by Demirgüç-Kunt and Huizinga (2004) conveys that the introduction of a blanket guarantee disturbs the market's incentives deeply to discipline banks through interest rates.

The impact of the deposit insurance reform on depositor discipline via the deposits equation and price equation are presented in the last columns of Tables 3 and 4, respectively. Recall that the coefficient on $Risk \times Reform$ in Eq. 3 and Eq. 4 captures the change in the sensitivity of the reaction variables to bank risk after the reform. Column 5 of Table 3, shows that our previous evidence of capital-based of quantity discipline is actually driven in the post-reform period (i.e., there is no market disciplining by depositors in the pre-reform period). In other words, high-risk (less capitalized) banks experienced lower deposit growth rates than low-risk (well-capitalized) banks after the deposit insurance reform. Column 5 of Table 4, on the other hand, shows that the return on deposits stays insensitive to bank risk in the post-reform period. In part, for the deposits growth equation, this finding may be attributed to the credibility of the SDIF scheme if depositors perceive that it might repudiate its deposit insurance obligations towards Islamic banks. In fact, in developing countries, it is frequently observed that deposit insurance schemes are not fully credible. Martinez Peria and Schmukler (2001) proved that depositors are

also concerned about the solvency of the insurance fund by showing that small-insured depositors also react to bank risk. Prean and Stix (2011) and Disli et al. (2013) show that the credibility of generous deposit insurance schemes are especially affected in turbulent economic environments. Secondly, depositors may have started to hesitate about the Shariah compliance of Islamic banks under SDIF protection, since the SDIF was originally established for the coverage of conventional banks. This is a viable argument since the purpose of a separate Islamic deposit insurance scheme was to signal a radical break from the conventional banking system in order to soothe the sensitivities of the religiously inspired depositors. Hence, in Turkey, the Islamic deposit insurance allowed Islamic banks to give more security to their depositors, while keeping their operations ostensibly interest-free (El-Gamal and Inanoglu, 2000). Thirdly, and perhaps most importantly, since the Islamic deposit insurance scheme was administered by the 'Union of Private Finance Houses', the Islamic bank depositors could have delegated their monitoring activities to this Union. The Union consisted of only a handful of Islamic banks, which made robust oversight possible over its members. The Union was empowered to act as the resolution authority for non-viable banks, and was charged to promote sound risk management practices over its members. Furthermore, the Union was mandated to detect early warning signals so that it could intervene timely in the resolution of troubled banks. Thus, in conclusion, the above mentioned elements could explain the finding that market discipline was absent in the period before the reform.

6. Conclusions

In this paper, we measure the extent of market discipline in the Islamic deposit market of Turkey for the period after the 2000 crisis. Although Islamic banks have not traditionally made up a large portion of Turkey's finance sector, they progressively gained esteem from depositors and investors. The Islamic banking sector now has become an inextricable part of the financial system thanks to regulatory reforms that have contributed to a growing formalization of the sector.

We find that depositors impose market discipline on bank risk-taking. In particular, our analysis suggests that depositors adjust the level of their funds in Islamic banks based on the banks' capital adequacy; i.e., better-capitalized banks experienced higher deposit growth rates.

Risk factors are, however, not significant in demanding higher returns on deposits. Due to the small size and immaturity of the market, Islamic bank depositors are probably not in the position to require returns commensurate with the level of associated bank risk.

In December 2005, the Savings Deposit Insurance Fund absorbed Turkey's Islamic deposit insurance system, leading to protection of Islamic deposits under the umbrella of the conventional deposit insurer. We find that the deposit insurance reform enhanced market discipline in the Turkish Islamic banking sector. This reform may have upset the sensitivities of the religiously inspired depositors, and perhaps more importantly it might have terminated the mutual supervision and support of Islamic banks.

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Table 1: Turkish participation banks' main figures

	December 2005 (thousand TL)	Growth between 2001 and 2005 (%)	December 2012 (thousand TL)	Growth between 2005 and 2012 (%)	Compared to banking sector 2001 (%)	Compared to banking sector 2005 (%)	Compared to banking sector 2012 (%)
Loans	6,473,627	504	47,961,193	641	2.95	4.23	6.24
Funds collected	8,369,155	336	47,921,101	473	1.15	3.30	6.22
Total Assets	9,945,428	320	70,279,383	607	1.42	2.51	5.41
Total Shareholders' Equity	951,090	367	7,376,806	676	2.09	1.77	4.23

Source: Banks Association of Turkey, Participation Banks Association of Turkey, own calculations. Note that the banking sector comprises both conventional banks and investment banks.

Table 2: Summary statistics

	Description	Mean	Std. Dev.	Min	Max
Reaction variables					
DEPG	Quarterly difference of the log of three-month moving average of deposits	0.0800	0.0553	-0.0202	0.2497
RDEP	three-month moving average return on deposits	0.0182	0.0047	0.0103	0.0283
Bank risk variables					
Equity	The ratio of book value of equity to total assets	0.1108	0.0258	0.0489	0.1648
ROA	Shareholders' profit after taxes divided by total assets	0.0095	0.0129	-0.0400	0.0337
Bad Loans	The ratio of loans under follow-up to gross loans	0.0403	0.0527	0.0013	0.2424
Bank controls					
Relationship banking	The ratio of total number of bank personnel to total assets (in million of TL)	0.5635	0.3557	0.2027	2.4950
Bank age	The natural logarithm of the number of months the bank exists	5.2743	0.3252	4.2905	5.8201
Size	The natural logarithm of total assets (in million of TL)	8.0570	1.1318	5.3776	10.0013

Table 3: Testing for the presence of market discipline through the deposits growth equation

	DEPG (1)	DEPG (2)	DEPG (3)	DEPG (4)	DEPG (5)
Equity	0.3634***			0.3419***	-0.0818
	(0.031)			(0.055)	(0.202)
ROA		0.4674		0.3528	0.9063
		(1.028)		(0.983)	(1.103)
Bad Loans			0.0519	0.0489	0.0983
			(0.128)	(0.108)	(0.148)
Equity x Reform					1.0762**
					(0.320)
ROA x Reform					-2.6122
					(1.162)
Bad Loans x Reform					-0.0364
					(0.852)
Relationship banking	0.0713	0.1034	0.0802	0.0826	0.1111
	(0.053)	(0.060)	(0.051)	(0.067)	(0.060)
Bank size	0.0803*	0.0762**	0.0813**	0.0817**	0.0930**
	(0.027)	(0.020)	(0.018)	(0.019)	(0.016)
Bank age	-1.2528	-0.8766	-0.9612	-1.4618	-0.9088
	(1.191)	(1.390)	(1.660)	(1.412)	(1.569)
Bank age squared	0.1030	0.0727	0.0755	0.1294	0.0610
	(0.149)	(0.174)	(0.200)	(0.174)	(0.198)
Bank-fixed effects	Yes	Yes	Yes	Yes	Yes
Time-fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	560	560	560	560	560
R-squared	0.762	0.755	0.753	0.764	0.787

Robust standard errors are in parentheses. *,**,*** statistically significant at 10, 5 and 1 percent levels, respectively.

Table 4: Testing for the presence of market discipline through the return on deposits equation

	RDEP (1)	RDEP (2)	RDEP (3)	RDEP (4)	RDEP (5)
Equity	0.0101			0.0038	0.0118
	(0.011)			(0.007)	(0.012)
Return on Assets		0.1003		0.1071*	0.1313*
		(0.044)		(0.034)	(0.046)
Bad Loans			0.0153	0.0177	0.0187
			(0.019)	(0.016)	(0.016)
Equity x Reform					-0.0062
					(0.021)
Return on Assets x Reform					-0.1311
					(0.065)
Bad Loans x Reform					-0.0037
					(0.043)
Relationship banking	-0.0021	0.0016	-0.0032	0.0003	0.0007
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Bank size	0.0030**	0.0026**	0.0038**	0.0037***	0.0044***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)
Bank age	0.5373**	0.5165**	0.5024*	0.4548*	0.4593*
	(0.161)	(0.126)	(0.191)	(0.153)	(0.162)
Bank age squared	-0.0647**	-0.0612**	-0.0611*	-0.0548*	-0.0556*
	(0.020)	(0.016)	(0.023)	(0.018)	(0.019)
Bank-fixed effects	Yes	Yes	Yes	Yes	Yes
Time-fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	568	568	568	568	568
R-squared	0.803	0.815	0.808	0.824	0.828

Robust standard errors are in parentheses. *,**,*** statistically significant at 10, 5 and 1 percent levels, respectively.