Captivity in Islamic and Conventional Banks: Evidence from Different Deposit Groups

Ahmet F. Aysan [*] Mustafa Disli [†] Meryem Duygun [‡]

Huseyin Ozturk [§]

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Abstract

This study investigates the behavioural aspects of Islamic bank depositors in a dual–banking system. By categorizing the depositors into groups by the amount of their deposited funds, we estimate the responses of different deposit groups to interest rate changes. We take the findings of conventional banks as a comparative baseline, and investigate the extent to which the changes in different Islamic depositor groups differentiate from conventional depositor groups. The findings suggest that depositors in both Islamic and conventional banks respond to interest rate changes in aggregate terms. Group–wise analysis indicates that Islamic bank depositors are even more responsive when deposit size gets larger. When Islamic bank depositor's opportunity cost gets higher due to interest rate changes, they do not hesitate to withdraw their deposits. This relationship is more robust in Islamic banks than conventional banks.

[*]Central Bank of the Rebuplic of Turkey, ahmet.aysan@tcmb.gov.tr

[†]Ghent University, mustafa.disli@ugent.be

[‡]Hull University, m.duygun@hull.ac.uk

[§]Corresponding author. Central Bank of the Rebuplic of Turkey, huseyin.ozturk@tcmb.gov.tr

1 Introduction

Since the outbreak of the global financial crisis, Islamic banking has increasingly gained attention as a viable alternative to the conventional model of banking. At this point, we can safely say that Islamic banking has evolved from a little–known financial experiment to a major player in the world finance, both in terms of asset size and activity. The increasing customers' awareness of Islamic banking products/services, and the recent financial crisis which induced search for alternative havens are often mentioned the triggering factors for the growth of Islamic finance (Khan, 2010). In parallel to the accelerating importance of the Islamic banking sector, increasing academic attention has resulted in a wide range of research foci–varying from measuring the efficiency of Islamic banks (e.g. Samad, 1999; Abdul-Majid et al., 2010; Srairi, 2010) to the identification of differences with conventional banking practices (e.g. Iqbal, 2001; Beck et al., 2013; Elnahass et al., 2013). Moreover, there is now a thriving literature studying the resilience of Islamic banks during the global financial crisis (Čihàk and Hesse, 2010; Hasan and Dridi, 2011; Abedifar et al., 2013). Nevertheless, partly because of data constraints, these studies have not specifically addressed the dynamics of depositor behaviour.

The main pillar of Islamic banking is the prohibition of *Riba* (interest); an Islamic bank deposit account cannot pay a formally fixed rate of return. In theory, Islamic banks operate similar to equity–based companies in which the depositors are treated as if they were shareholders of the bank (Khan and Mirakhor, 1989). From this perspective, ideal modes of Islamic financing are based on the paradigm of profit-and-loss sharing (PLS). Under the PLS arrangement, the terms of financial transactions should ideally reflect a symmetrical risk–return distribution between counterparties (El-Hawary et al., 2007). However, a number of studies note that in practice, Islamic finance relies primarily on non–PLS models. While funding activities are mainly carried out through PLS, Islamic banks tend to follow their conventional counterparts in creating their assets through non–PLS (Dar and Presley, 1999; Chong and Liu, 2009; Charap and Cevik, 2011). These non-PLS assets mainly include

mark-up financing and a guaranteed profit margin, based on deferred obligation contracts.

Given the logic of operations embedded in the interest–free banking practice, we would expect that Islamic banks' depositors are not sensitive to interest rate changes. This expectation is supported by the research that has linked *Shariah* arbitrage and bank profitability. El-Gamal (2006) argues that Islamic banks operate in a demand–driven market in which the participants seek *Shariah* board approved products and services. This relationship renders the participants captive despite inherent inefficiencies in their banks at least arising from additional legal fees. The author names this mechanism as *Shariah* arbitrage since Islamic banks can remain profitable by exploiting the arbitrage created by *Shariah* licences. Therefore, the rationale would suggest that Islamic bank depositors can be insensitive to the opportunities created by any interest rate changes due to the belief that they are sterilised from interest rates by using *Shariah* compliant products and services. Nevertheless, recent research has uncovered substantial evidence that monetary policy impulses do not only affect the deposits in conventional banks but also the deposits in Islamic banks (Haron and Ahmad, 2000; Kassim et al., 2009; Zainol and Kassim, 2010; Ergec and Arslan, 2013). In general, displaced commercial risk is among the most cited reasons for why Islamic banks are also sensitive to interest changes. Displaced commercial risk refers to the partial transfer of risk from deposit holders to the bank shareholders. In a dual banking system, Islamic banks are pressured to absorb excess losses that ideally should be shared between banks and deposit holders. In this case, Islamic banks are forced to pay higher returns than actually earned to their depositors in order to compete with their conventional counterparts. Islamic banks who in theory should offer the actual profit/loss to their depositors fear losing their depositors who are able to earn more by depositing at conventional banks. Empirical evidence has indeed documented that Islamic banks are subject to this pressure, and as a consequence, Islamic deposit accounts offer similar rates to those of conventional deposits (Khan, 2010; Ergec and Arslan, 2013; Chong and Liu, 2009).

This paper contributes to the literature in several ways. First, Turkey, in particular, pro-

vides an interesting case study as Islamic banks operate side by side with conventional banks, with each group serving specific clientèle. Having a greater understanding in how interest rate changes are propagated throughout a dual banking system is a critical requirement for the success of monetary policies. Second, as far as we know, this is the first paper to measure directly the reaction of Islamic depositors to monetary policy shocks over different deposit groups. Although the influence of interest rate changes is frequently discussed in aggregate terms, we are aware of the lack of empirical work on different deposit sizes. Therefore we are unaware how the size of deposit alter depositors' behaviour. The work presented here is therefore also an attempt to broaden our understanding about the behaviour of Islamic depositors from the *Shariah* arbitrage perspective. The presence of *Shariah* arbitrage is widely discussed, but never tested. In this study, we aim at testing the presence of *Shariah* arbitrage through depositors response to interest rates. Our final contribution is related to our methodology, since we examine the response of bank depositors to interest rate changes using a panel–VAR framework, which controls for bank level heterogeneity. Prior research investigated the deposits in the whole banking system and neglected differences across the banks.

In this paper, we examine the sensitivity of Islamic bank depositors' behaviour to interest rate changes. Specifically, we compare Islamic deposit accounts vis–à–vis the conventional deposit accounts in their responses to monetary policy shocks. In our analysis, we first categorize Islamic and conventional bank depositors by the amount of money deposited at their bank. Then, we examine whether the size of deposits alters depositors' incentive to withdraw their funds. In doing so, we observe how differently the opportunity cost motivate Islamic bank and conventional bank depositors. The panel–VAR results suggest that in aggregate terms both Islamic and conventional banks react to interest rate changes that is much in line with the majority of the findings in the literature. However, when we take a closer look to the behaviour of different depositor categories, we observe that Islamic depositors in almost all deposit categories are sensitive to interest rate changes, whereas

this is only true for conventional depositors in the upper category. Our results indicate that Islamic bank depositors react even more to interest changes than conventional banks depositors.

The rest of this paper proceeds as follows. Section 2 reviews the previous literature and discusses the motivation behind the study. Section 3 gives a concise history of Islamic banking in the dual–banking system of Turkey. Section 4 introduces the data and methodology. Section 5 discusses the main findings and offers some robustness checks related with empirical analyses. We conclude in Section 6.

2 Brief Literature and Motivation

It is well known that monetary policy changes affect real macroeconomic variables through several channels. In their seminal work, Bernanke and Blinder (1992) argue that innovations to funds rates are at least as effective through the credit channel–bank loans as well as through the money channel–bank deposits. The credit channel emphasizes that when the central bank adopts contractionary policy through increasing interest rates, the reserves in the banking system drains steadily. Banks reduce their loans since it would be costly and timely to fund the gap through other sources. The inherent assumption in the credit channel is that bank reserves are imperfect substitutes for external funding [1]. The monetary transmission mechanism leads to a drainage of deposits when central banks raise the interest rates and the level of deposits declines as a response to an increase in interest rates. This is explained by the rational behaviour of depositors who search for alternative instruments for their savings against rising opportunity cost of holding deposits in their account.

The monetary transmission can be effective for conventional banks, yet its effect on Islamic bank depositors is blurred. The transmission can be ineffective in Islamic banks

[1]Carpenter and Demiralp (2008) posit that in developed financial markets, bank loans are funded by "managed liabilities" which are not subject to reserve requirements. Under these conditions, the credit channel of the monetary transmission mechanism is not functional. However, Demiralp (2008) argues that this channel is still functional in less–developed countries since the drainage of reserves would not be compensated by external sources.

since interest rate is prohibited in Islamic banking. As argued by Khan (1991), the time value of money is recognized only as a part of a real economic transaction in Islamic banks. Islamic banks function as investment companies and depositors behave like shareholders who earn dividends for their investment. In this business model, banks share their earnings with its depositors according to a pre–agreed rate of profits. Islamic bank depositors can deposit their money to their bank to abstain from interest returns, as *Shariah* arbitrage suggests, and are not affected by monetary policy changes. Nonetheless this explanation still needs verification, as this study intends, since depositors could withdraw their deposits to divert them to alternative investments after a positive interest shock. Alternative investment opportunities are not necessarily the ones that are directly interest bearing, e.g. the real estate investment investments (see e.g. Erdem et al., 2013b,a, for the dynamics of housing market in Turkey). Therefore, monetary transmission can be operational on Islamic banks as well.

The monetary transmission is investigated intensely in the literature after the papers of Bernanke and Blinder (1988) and Bernanke and Blinder (1992). However, the impact of monetary policy on Islamic banks is scarcely investigated. Within the scope of this study, the relationship between interest rate changes and Islamic bank deposits is investigated in several countries who accommodate conventional and Islamic banks. For instance, Takayasu (2013) investigates Malaysian banking and finds that Islamic rates of return and conventional interest rates co–move in the Malaysian deposit market. He interprets these results as the evidence of a strong competition between Islamic and conventional deposit markets. Interestingly, the author finds that Islamic rates of return have more impact on the formation of short–term interest rates than conventional interest rates. Ergec and Arslan (2013) examine Turkish banking system and find that rates in conventional banks and Islamic banks respond similarly to monetary policy shocks. Charap and Cevik (2011) compare Turkish and Malaysian dual banking system and find similar results. Another comparison between two countries' banking systems is investigated by Mohd Yusof et al. (2009) who find that de-

posits in Islamic banks' of Bahrain are relatively more sensitive to monetary policy changes compared to deposits in Islamic banks' of Malaysia in the long run. This study also provides evidence that Islamic bank depositors in these countries co–move with monetary aggregates and interest rate.

Although relevant papers in the literature stressed that Islamic bank deposits respond to interest rate changes, their analysis was conducted by solely using aggregate deposits data. This limitation hindered to extract patterns from different depositor groups. Up to now, we still know very little about whether deposit size does indeed matter. We try to fill this gap in the literature by taking into account the different deposit groups in both Islamic and conventional banks. By doing so, we attempt to complement the literature by providing background insights for the finding that Islamic bank deposits respond to interest rate changes. The classification of deposit accounts in terms of their size will help us to understand the behavioural aspects of depositors. The results will uncover to what degree Islamic bank depositors are responsive to monetary policy. The comparison between conventional and Islamic bank depositors will highlight this difference.

3 Conventional versus Islamic Banking in Turkey

Until 1980s, the dual banking system in Turkey was non–existent, the banks operated under conventional banking rules. Particularly after the early 1960s, commercial banks as well as state–owned development banks became the tool–kits of planned industrialization policies. State involvement was substantial in the banking sector, and included, *inter alia*, interest rate controls, directed credit programs, high reserve requirements, as well as entry restrictions. While these financial and regulatory policies were not unique to Turkey and can be argued that they were partially successful in its development process, they had put high burden on the banking system by reducing competition and efficiency in the banking system (Denizer, 1997).

In the beginning of the 1980s, the scheme that governed the banking system needed restructuring. Starting from June 1980, as part of an overarching stabilization and structural adjustment program, liberal and deregulatory measures in the financial system have been implemented. The reforms aiming at enhancing efficiency were arguably successful during the liberalization period. Isik and Hassan (2002) and Zaim (1995) report efficiency gains in the Turkish banking system after the 1980 liberalization program. Moreover, it is claimed that the Turkish banking system became more integrated with the global financial system and improved its financial technology and human capital (Denizer, 1997). At the same time, the liberalization of cross–border fund flows enabled the banking system to borrow in foreign currency that were previously restricted. Related with the scope of this study, relaxation of regulatory barriers has attracted a significant number of banks into the system, including the Islamic banks. The introduction of Islamic banks was also conducive to the deepening of the sector since it allowed attracting funds from citizens who were deemed to be religiously conservative.

Islamic banks in Turkey continued to operate in Turkish banking system, though the status of these banks had been controversial. Aysan et al. (2013) report that, after the enactment of a governmental decree, Al–Baraka Turk Finance House and Faisal Finance House entered into the Turkish banking system in 1984. Kuveyt Turk followed these ones and joined the system. By 1991 three new banks, Anadolu Finance House, Ihlas Finance House, and Asya Finance House, were opened up with 100 percent domestic capital. As the name "Finance House" would suggest, these institutions were not in the same status of conventional banks. Until late 2005, these banks remained subject to different statutory and regulatory arrangements. Different regulatory and statutory arrangements led to different rights which used to cover solely conventional banks but not the others. For instance, Aysan et al. (2013) convey that Islamic banks were not fully covered by a deposit guarantee scheme, although a comprehensive scheme was used to cover conventional deposits. Similar to global trends, Turkey has introduced several favourable regulatory changes to Islamic banks as the

interest toward Islamic banking gained further momentum. The legislative changes in late 2005 have eliminated the deprivations and provided a more constructive environment for Islamic banks. Perhaps the most important, the Islamic banks eventually gained a legal "bank" status and started to operate without any discrimination.

4 Data and Methodology

4.1 Data

We investigate whether Islamic bank depositors react differently than conventional bank depositors to interest rate changes. We collect deposit data of Islamic banks and conventional banks for the period of 2004:9–2012:12. Limited information would emerge when using aggregate deposit figures, since depositors' response to interest rate changes may vary depending on deposit size. Although interest rate hikes increase the opportunity cost of holding the money in the account, small deposit holders may not find enough incentives to withdraw their money (Cúrdia and Woodford, 2010). When the deposit size gets larger, the opportunity cost of holding money may become unbearable. Martinez Peria and Schmukler (2001) study the market discipline across different deposit size stressing the impact of size on depositor discipline. They posit that the disciplining role of depositors change based on the amount of funds at their banks. When the deposit size gets larger, they monitor their banks against bank risk more closely. In this study, we argue that depositors begin not bearing the opportunity cost of monetary policy changes after a threshold. This threshold may vary in Islamic and conventional banks. The differences in the movements across different deposit sizes have valuable information content about the behaviour of Islamic and conventional bank depositors.

We distinguish between insured and uninsured deposits. By investigating the insured and uninsured funds, we disentangle the impact of bank credit risk (failure of payment) on the relationship between monetary policy and deposits. During the sample period, the deposit

insurance authority in Turkey (Savings Deposit Insurance Fund) provided insurance upto 50 thousand Turkish Liras in Turkey. Funds exceeding this amount are deposited at depositors' own risk. Among uninsured deposits, we distinguish deposits by the amount of deposits. We study five different groups of depositors both at Islamic banks and conventional banks. The groups are classified according to the amount of deposits in the banks at the end of each quarter during sample year. The smallest deposit holders whose funds are less than 10 thousand Turkish Liras are in the first group. The depositors in the second, third, fourth and finally fifth groups deposit up to 20 thousand, 30 thousand, 40 thousand and 50 thousand Turkish Liras respectively. Uninsured deposits are examined on aggregate terms, without any categories.

We use overnight money market rate of the Central Bank of Turkey. We compute the average overnight rates per quarter during the sample period and use the differences between consecutive quarters to proxy for interest rate changes.

[INSERT TABLE I ABOUT HERE]

Table 1 presents the summary statistics for insured deposit groups, total insured deposits, total uninsured deposits and total deposits in the system. Consistent with our expectations, banks collect the largest amount of deposits from the fifth group, where depositors have more than 40 thousand and less than 50 thousand Turkish Liras. Nonetheless, the smallest deposit holders who have less than 10.000 Turkish Liras contribute as the second largest group to the deposit base of banks. This may show that conventional banks have widespread outreach capacity, although Islamic banks also show considerable success in reaching smaller deposit holders.

4.2 Methodology

We use a panel vector autoregression (panel–VAR) methodology which we consider best fits the purpose of this paper. This method extends the traditional VAR approach to a panel setting and allows us to control for bank level heterogeneity. As in traditional VAR

approach, the variables in the system are treated as endogenous. We specify our model of order s is as follows:

$$Z_{i,t} = \Gamma_0 + f_i + \Gamma_1 Z_{i,t-1} + \Gamma_2 Z_{i,t-2} + ... + \Gamma_s Z_{i,t-s} + \varepsilon_{i,t}. \quad (1)$$

In this specification the variables *Deposit*, *Interest* that denote for different deposit groups, overnight money market rate, are the components of a two–variable vector Z in the VAR system for bank i and time t. We estimate two–variable VAR to investigate the depositors' response to interest rate changes. In all estimations, we control for bank level heterogeneity by incorporating f_i as proposed by Holtz-Eakin et al. (1988). We used forward mean–differencing, known as "Helmert procedure" which allows us to use lagged dependent variables as instruments for identification (Love and Zicchino, 2006). The f_i are eliminated by subtracting the means of each variable calculated for each bank–quarter.

In traditional VAR, it is assumed that the data generating process is the same for each cross–sectional units which is hardly met in practice. In order to control for individual level heterogeneity we allow for fixed effects, f_i in the models. The f_i can be removed by mean–differencing, but mean-differencing in panel estimation leads to biased estimates. In a VAR setting, because of the dynamic nature of the estimation, lagged dependent variables are correlated with the disturbance term. The fixed effect estimator transformation of variables eliminates f_i, yet, the regressor $y_{it-1} - \bar{y}_i$ where $\bar{y}_i = \frac{\sum_{t=p+1}^{T} y_{it-1}}{T-p}$ is still correlated with the error term $\varepsilon_{it-1} - \bar{\varepsilon}_i$ where $\bar{\varepsilon}_i = \frac{\sum_{t=p+1}^{T} \varepsilon_{it-1}}{T-p}$, since y_{it-1} is correlated with $\bar{\varepsilon}_i$ by construction. Due to these weaknesses of mean–differencing procedure we use forward mean–differencing, known as the "Helmert procedure". This transformation satisfies the orthogonality assumption between transformed variables and lagged regressors. Therefore, we can use lagged dependent variables as instruments and estimate the coefficients by system GMM (Love and Zicchino,

2006) [2].

To analyse the potential effects of interest rate shocks, *Interest*, on depositor groups, *Deposit*, we generate impulse response functions showing the reaction of deposits belonging to a depositor group to interest rate shock, where shocks to other variables held constant. To do so it is necessary to decompose the residuals so that they are orthogonal. This can be accomplished by ordering the variables, namely Choleski ordering, to allocate any correlation between two variables to the variable that comes ahead of it in the ordering. Choleski ordering suggests that variables that enter into the VAR system earlier affect the following variables contemporaneously and with a lag, while later variables affect the variables that entered earlier with a lag (Hamilton, 1994).

5 Results

5.1 Main Findings

We first conduct a unit–root test on all the variables used in the analysis. To this end, we test whether the selected variables are stationary or not. In the panel–VARs we use the Helmert transformed variables. The use of Helmert transformation contributes to the stationarity of the variables used in the models (de Haan and van den End, 2011). We use Fishers test statistics for the presence of panel unit root (see e.g. Maddala and Wu, 1999), since this test does not require a balanced panel unlike the Im–Paseran–Shin test proposed by Im et al. (2003). According to our test results, the null hypothesis of unit roots is rejected either at their level or differences for all variables used in our analyses [3].

[INSERT TABLE II ABOUT HERE]

The opportunity cost of interest rate changes can be interpreted from the significance of parameter estimates. By increasing amount of deposits, depositors are expected so show

[2]We also estimate the model with mean–differenced regressors, in our analysis the main results did not change.

[3]We do not report the results for unit root test, which are available upon request.

more significant response. Uninsured deposits which are larger than the insured deposits are expected to show significant response, as well. Therefore, our main assumption that the significance of responses to interest rate shocks are in close association with the deposit size. Table 2 reports the estimated coefficients of the two–variable VAR system for the banking system once the fixed effects are removed. Estimation results are generated for insured deposit groups, total insured deposits, total uninsured deposits and total deposits in the system. What we observe from Table 2 is that deposits higher than 40 thousand Turkish Liras give a robust and significantly negative response to shocks to interest rates. The panel–VAR results confirm our main assumption that the increasing amount of deposits is in close relation with the significance of responses. This assumption is thus confirmed by the panel–VAR results for the banking system.

[INSERT TABLE III ABOUT HERE]

To compare conventional and Islamic bank depositors' responses to interest rate shocks, we run the same regressions for the restricted samples of conventional and Islamic banks. The estimation results in Table 3 yield similar results as we obtained in the banking system. This is probably due to the dominance of conventional banks in the system, i.e. deposits are mainly hold in conventional banks. According to the panel-VAR results, solely the largest group responds negatively to interest rate shocks. Since the largest group, deposits larger than 40 thousand Turkish Liras, dominates the total insured deposits (around 45% of aggregate deposit), we can say that the significant and negative response of total insured deposits is mainly driven by the largest group's response.

[INSERT TABLE IV ABOUT HERE]

In the same fashion, we obtain regression results for Islamic bank depositors. Table 4 exhibits the results for Islamic bank sample. Interestingly, except for the smallest depositor groups at Islamic banks, whose money is under 10 thousand Turkish Liras, all the depositor groups give negative and significant response to positive shocks to interest rate. We derive two clear conclusion: Islamic bank depositors do not differentiate from conventional bank

depositors in the sense that both bank depositors assess the opportunity cost of monetary policy. The naïve expectation that Islamic bank customers should not respond to interest rate changes. The results in this paper thus confirm the findings of Khan (2010), Ergec and Arslan (2013), and Chong and Liu (2009). The results in this paper further show that Islamic bank depositors' response are even more robust across deposit size suggesting that Islamic bank depositors are more sensitive to interest rate changes.

[INSERT FIGURE I ABOUT HERE]

[INSERT FIGURE II ABOUT HERE]

[INSERT FIGURE III ABOUT HERE]

We check the validity of panel–VAR results by generating impulse response functions (IRFs). If the error bands spans the zero line, we interpret that the responses are insignificant, i.e. failing to reject that responses are different than zero. The graphs are presented with their 5% error bands which are generated by Monte–Carlo simulations. Figure 1 and 2 display the IRFs for the banking system and conventional banks respectively. IRFs in Figure 1 2 corroborate the panel–VAR results presented in Table 2 and 3. The responses are only significant at the largest insured deposits group in conventional bank sample, positing that the size of deposits is closely associated with significant responses. Figure 3 displays the IRFs for Islamic banks. IRFs presented in Figure 3 show that the responses are only insignificant in the smallest insured deposits group in Islamic bank sample. This finding is also clear in Table 4.

Overall results suggest that depositors in Turkish banking system who reserve upto 50 thousand Turkish Liras significantly respond to interest rate changes. When we classify the depositors into five categories by the multiples of 10 thousand Turkish Liras, the findings suggest that the significant response of conventional bank depositors mainly originate from the largest depositor group whose deposit is between 40 thousand and 50 thousand Turkish Liras. The other groups in conventional banks do not significantly react to interest rate changes. On the other hand, all Islamic bank depositors excluding the smallest depositor

group significantly react to interest rate changes. The results demonstrate that conventional bank depositors are more hesitant in withdrawing their money what makes these depositors more captive. Whereas Islamic bank depositors are found to make more rational calculations against the changing opportunity cost of holding their fund [4].

5.2 Robustness Checks

In this section we present some robustness tests. Robustness checks include different panel–VAR set–up and the reduction of self–selection bias across conventional and Islamic banks.

5.2.1 Different Panel–VAR Estimations

Monetary policy is assumed to affect macroeconomic variables through several spillovers (Bernanke and Blinder, 1992). There is a spillover from exchange rate to inflation contemporaneously and that effects the general economy. This assumption is valid since the foreign exchange is influential on an import dependent economy which is effective through the level of inflation. We first follow the following Choleski ordering: Interest rate $\rightarrow$ foreign exchange rate $\rightarrow$ inflation $\rightarrow$ deposit as a robustness check. We use US Dollar/Turkish Lira exchange rate and consumer price index for the new set up. To check the sensitivity of our results with respect to the order of the variables in the Cholesky decomposition, we alter the inside of the Cholesky ordering and re–estimate the panel–VARs (see e.g. Grossmann et al., 2014; Lof and Malinen, 2014; Kim and Lee, 2008, for similar sensitivity analysis). The main results remain unchanged. We solely report the VAR results for the banking system to show the unchanged results (Table 5). We are able to observe that the results are unchanged over the IRFs that consider the spillover effects (Figure 4). It's worth mentioning here that deposits in most of the clusters are responsive to foreign exchange shocks, which we deem reasonable in an

[4]We deem that the smallest depositor group at Islamic banks do not find enough gain to withdraw their money probably due to small amount of money they deposited. Recall that this threshold was found to be 40 thousand in conventional banks.

emerging market country where foreign exchange fluctuations change depositors' investment preferences. In an additional exercise, we decompose deposits in deposits groups as foreign (USD) and domestic (TRY) currency deposits to observe how foreign exchange shocks drive depositors' currency preferences. The panel–VAR results for this exercise show that positive foreign exchange shock (depreciation of domestic currency) leads to withdrawals from domestic currency and penetration to foreign currency deposits. Therefore, the results addressing the spillovers provide consistent results for foreign exchange rate [5].

[INSERT TABLE V ABOUT HERE]

[INSERT FIGURE IV ABOUT HERE]

5.2.2 The Impact of Self–Selection Bias

In this section, we test the robustness our findings on a reduced sample of conventional bank observations whose characteristics are more similar to those of Islamic bank observations. In this way, we aim at reducing self selection bias and heterogeneity across the full sample. There can be several bank characteristics that can differentiate Islamic banks from conventional banks in terms of the behaviour of depositors. For instance, the larger banks in the system are operating for long years in the system. This fact could create "too big to fail" perception among depositors which further validates excluding the largest bank observations. Since the depositors of larger banks can be more loyal to their banks and might have fewer incentives to withdraw their money under changing interest rates the results found earlier can be misleading.

The accurate comparison requires that the banks observations share the same identification so that differences among the bank characteristics of the two different banking systems can be simply attributed to their "Islamic" status. We are aware of the fact that Islamic and conventional banks can differentiate in their fundamentals. For instance, several conventional banks operate for over hundred years in the country and have extensive branch

[5] We do not report the results for domestic and foreign currency deposits to keep coherence of the theme of this research but available upon request.

coverage, enabling them to reach remote rural areas. On the other hand, Islamic banks operate merely around thirty years and their branch coverage is still emerging. The classification of all the banks by simply imposing a simple comparison as conventional and Islamic may not be acceptable that is addressed in the literature as "sample selection bias". Hence, before comparing these two groups of banks, we need to ensure that the Islamic and conventional bank characteristics we analyse share the same characteristics in such a way that variations in their bank fundamentals among the two groups of banks can only be attributed to their brand name, i.e. Islamic or not.

To address these concerns, we use matching models namely Propensity Score Matching (PSM) proposed by Rosenbaum and Rubin (1983) and identify among the conventional banks a sub–set of banks whose main characteristics are similar to those of Islamic banks. This procedure involves the estimation of propensity scores, i.e. a bank's propensity to being "Islamic" over a set of bank characteristics in this study. A conventional bank is then selected as a match to the Islamic bank, using specific approaches to matching, e.g. radius matching, kernel matching, and nearest–neighbour matching.

In the first stage, the propensity to being "Islamic" is estimated by using probit and logit models. In the second stage, each Islamic bank observation is then matched to a conventional bank with a similar propensity score. For this analysis we consider the nearest–neighbour matching where each Islamic bank observation is paired with its conventional bank counterpart that has the closest propensity score. We also estimate this matching within a given threshold distance called caliper (Becker and Ichino, 2002; Dehejia and Wahba, 2002).

[INSERT TABLE VI ABOUT HERE]

The empirical specification of the probit and logit models used to estimate the propensity scores for the sample of Islamic and conventional banks is inspired by the active literature. Empirical evidence suggests that the capital and liquidity management of Islamic banks are different than their peers in the system (Abedifar et al., 2013; Beck et al., 2013). Therefore we define liquidity and capital adequacy measures. In a profit–loss sharing mechanism, the

loan loss provision behaviour can be significantly different between conventional and Islamic banks (Elnahass et al., 2013). Hence we employ operational cost and loan–loss provision figures of the banks. The Islamic banks under consideration are relatively small size players in the system. Since a small number of banks own the bigger stake of assets in the system, we use total assets of the banks. Once we adapt the variables based on this motivation, we argue that a bank's propensity to being "Islamic" is associated with its capital and liquidity management, loan–loss provision and operational cost and its size. We use probit and logit estimates to generate propensity scores to select matched pairs. Table 6 presents the result of probit and logit models. Our results suggest that Islamic banks in Turkey are associated with higher loan loss provisions and lower operational costs. Islamic banks are poorer in terms of equity per total assets but rich in terms of liquidity. As said Islamic banks are relatively young and own only a small portion of the total assets in the banking system, Islamic banks tend to manage smaller assets.

[INSERT TABLE VII ABOUT HERE]

By using the propensity score estimates of conventional banks observations that are closer to those Islamic bank observations, we create a sub–sample of conventional banks that are matched pairs of Islamic bank observations. For our analysis, the matched pairs are assigned with nearest–neighbour matching algorithm (Becker and Ichino, 2002). The results for nearest–neighbour matching with caliper that is equal to 0.030 yields the similar results [6]. The results of the balancing tests are presented in Table 7 and these tests cannot reject the hypothesis that the mean of each covariates is equal across the control and the treatment groups. An important assumption underlying the matching technique is the Conditional Independence Assumption (or CIA) that cannot be tested *per se* (Becker and Ichino, 2002); yet, the empirical specification of both probit and logit models are satisfactory based on the Hosmer–Lemeshow test for the goodness of fit and the test for the empirical specification of the probit and logit models (see Table 6) .

[6]The results are not reported here but available upon request.

The obtained matched sample consists of 248 observations (51.6% of the observations are in the treated group and remaining are in the non–treated group) representing 30 banks in total and 25 conventional banks. We observe that large banks leave the sample. Indeed the mean total assets in the sub–sample equal to 7.28 billon Turkish Liras whereas in full sample the assets was 20.6 billion Turkish Liras. The descriptive statistics on the matched sample are presented in Table 8 as well the results of the t-tests on the difference of the means of each variable between conventional and Islamic banks.

[INSERT TABLE VIII ABOUT HERE]

Table 8 demonstrates that Islamic banks were able to attract more deposits than their conventional counterparts at astatistically significant level. This finding does not change after matching. Islamic banks exhibit weaker fundamentals in terms of asset quality. Specifically, we can argue that Islamic banks show lower asset quality based on the ratio of NPLs to total credits. The difference is insignificant and negative suggesting a higher asset quality for Islamic banks before matching, whereas in the matched sub–sample the difference switches sign and gains significance. Perhaps more importantly, the profitability of Islamic banks is significantly different than their conventional counterparts indicating a higher performance. Yet, before matching the sign was negative that implies a lower profitability for Islamic banks. Overall results reveal that Islamic banks enjoy having relatively ample deposits. Yet, their asset quality is poor since Islamic banks generate larger NPLs with respect to their asset size. We observe that Islamic banks manage to cover their losses from NPLs with other sources of revenues, since the ROA measure indicates higher profitability for Islamic banks even with lower asset quality.

[INSERT TABLE IX ABOUT HERE]

Since only the largest depositor group is found to be sensitive to interest rate changes, we check the results by running a smaller conventional bank sample that are similar to Islamic bank observations. Based on the matched conventional banks obtained by PSM, we estimate the response of different depositors group to interest rate changes. We pursue

the following strategy: We first obtain the matched pairs of each Islamic bank observations and identify their banks. Regardless of the number of matched observations, we include the all observations belonging to that bank. The conventional bank sub–sample is reduced to 609 bank–quarter observations after this strategy. As discussed, the larger banks in the system were excluded from the sub–sample since none of their observations were matched to Islamic bank observations. The regression results with the reduced sample provides us exactly the same findings which suggest that Islamic bank depositors are more responsive than conventional banks to interest rate changes (Table 9).

5.3 Discussion

The traditional conceptualization of the association between monetary policy and deposits asserts that central banks are able to directly manipulate the level of deposits through their control of bank reserves and the money multiplier mechanism (see e.g. Bernanke and Blinder, 1988; Kashyap and Stein, 1995). According to this view, following a tight monetary policy action a contraction in the loan supply takes place since the central bank drains reserved deposits from the system through open market sales. Another interpretation relies on portfolio substitution arguments, where mechanics of household portfolio rebalancing prevail since policy actions alter the yields on deposits relative to other assets (see e.g. Kishan and Opiela, 2000; Ehrmann et al., 2001). Either way, a policy tightening seems to affect the deposits of both conventional and Islamic banks. Our results show that Islamic banks are in fact more sensitive to policy shocks. This finding seems to confirm the existence of displaced commercial risk between Islamic and conventional banks, such that Islamic depositors transfer their funds to conventional banks upon a monetary policy shock. However, given the small share of Islamic banks in the financial system, this fund transfer (whether partially or not) seems not to impact the deposit volumes of conventional banks in a significant way, or the transfer may counteract the reduction of conventional deposits following the interest rate shock.

Besides these classical arguments, operational principles of Islamic banks in Turkey may have an enforcing effect on the interest rate–deposits nexus. Only a handful of Islamic banks are operating in Turkey, which give them a strong market power in the negotiation of pro–rata shares of asset returns. In other words, strong market power enables Islamic banks to heavily exploit the *Shariah* arbitrage opportunities. Unless they are big, Islamic depositors have to accept the rates set by their bank. Given this background, unsatisfied Islamic bank depositors can only demonstrate their discontent by mainly following an exit strategy (Admati and Pfleiderer, 2009; Edmans and Manso, 2011). Furthermore, Islamic banks are slower in adjusting their rates of return, which makes them more vulnerable to policy shocks. During periods of declining interest rates, this strategy yields competitive return rates which lead to an expansion of the deposit base. On the other hand, since it widens the wedge between the rates of return offered by Islamic and conventional banks, increasing interest rates may result in sharp reductions in the deposit base of Islamic banks. As a final note, in practice, Islamic banks in Turkey do not discriminate across different depositor clusters nor do they provide investment accounts with different risk–return profiles. Regardless of the deposited amount, Islamic banks, given the above–mentioned market power they have, gather these deposits in a pool and offer a uniform pro–rata rate irrespective of depositor attributes. This practice may account for the difference in smaller depositors' sensitivity between the two banking groups. Given the more competitive conventional banking market, conventional depositors have more bargaining power and can negotiate with bank officials to earn higher returns. To partly overcome the vulnerability of Islamic banks, we recommend that Islamic banks introduce different depositor accounts with an attainable set of risk–return combinations reflecting the spirit of PLS. This exercise might also be conducive to proper risk management in Islamic banks which is deemed to be one of the drawbacks in current Islamic banking practices (see e.g. Akkizidis and Khandelwal, 2008).

6 Concluding Remarks

There is an active controversy in banking literature to what extent Islamic bank customers are akin to conventional bank customers. The academic debate swings between religious commitments or rational preferences, whether or not religious doctrines prevent Islamic bank customers using interest rate embedded financial products and services. While it is expected that Islamic banks customers are not affected by the changes in interest rates, the existing evidence show conflicting relationship.

This study examined how Islamic bank and conventional bank depositors respond to interest rate changes to observe if religious commitment is key on Islamic bank depositors' economic decisions. Whilst the literature provides convincing evidence that, in aggregate terms, both conventional bank and Islamic bank depositors react to interest rate changes, how this relationship varies depending on the size of deposit is unknown. To disentangle the behaviour of different depositors who have different amount of deposits, the depositors are grouped under five categories by the amount of money they deposited at their accounts. Then, we analysed the responses to interest rate shocks in each group.

The panel–VAR results confirmed the previous findings that both Islamic and conventional bank depositors negatively respond to interest rate shocks. These findings implies that when central banks adopt contractionary policy, the opportunity cost of deposit accounts increase. We obtain more interesting results when the depositors are categorized. We found that conventional bank depositors are relatively less sensitive to interest rate changes compared to Islamic bank depositors since only the largest depositor groups are found to be significantly responsive to interest rate shocks. All Islamic bank depositors except for the ones in the smallest depositor group are significantly sensitive. The results are robust to different panel–VAR specifications and self selection bias.

Our results have important policy implications. First, we show that Islamic bank depositors are more sensitive to interest rate changes. The only non–sensitive Islamic bank depositors are those in the smallest deposit group. Therefore, policies promoting Islamic

bank outreach is of utmost importance for the stability of deposit level in these banks. The wide branch coverage can help Islamic banks mitigate interest rate shocks by reaching small depositors' money. Second, we find that the interest rate sensitivity may not be the outcome of adherence to conventional banking principles, since the interest rate sensitivity among conventional bank depositors is not so robust across different depositor groups. We explain this finding by the operational differences among conventional and Islamic banks. Conventional bank depositors are able to negotiate on deposit returns, whereas Islamic bank depositors are offered the same pro–rate return regardless of the size of deposits. When the size of deposit gets higher in Islamic banks, the opportunity cost of keeping deposit at the banks increases. Nonetheless, the same depositors in conventional banks can compensate potential losses through bargaining beforehand. This paper provided an initial but crucial important contribution on a highly debated topic. Further researches will provide further insights on the impact of religious commitment on Islamic band depositors by studying province–level bank data.

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7 Tables and Figures

Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Banking System					
0–10 thousand TL	1000	789704.4	1421745	39	7115134
10–20 thousand TL	1000	602568.2	1049394	13	5635549
20–30 thousand TL	1000	488558.3	833084.7	20	4633188
30–40 thousand TL	1000	404919.6	672149.5	30	3772473
40– thousand TL	1000	1864488	3042665	133	1.86E+07
Total insured deposits	1000	4150238	6897824	444	3.88E+07
Total uninsured deposits	1000	5077393	7999276	7.7599	4.17E+07
Total deposits	1000	9227632	1.45E+07	615.7599	7.73E+07
Conventional Banks					
0–10 thousand TL	869	861263.2	1511367	39	7115134
10–20 thousand TL	869	646423.5	1117750	13	5635549
20–30 thousand TL	869	523825.3	886925.5	20	4633188
30–40 thousand TL	869	434553.9	715115.8	30	3772473
40– thousand TL	869	2011040	3232563	133	1.86E+07
Total insured deposits	869	4477105	7333643	444	3.88E+07
Total uninsured deposits	869	5539987	8469690	7.7599	4.17E+07
Total deposits	869	1.00E+07	1.54E+07	615.7599	7.73E+07
Islamic Banks					
0–10 thousand TL	131	315012.9	142990.6	74629	672497
10–20 thousand TL	131	311650.6	149811.1	55823	721934
20–30 thousand TL	131	254611.8	132570.8	40244	602244
30–40 thousand TL	131	208337.7	111652	30980	492659
40– thousand TL	131	892322.9	525835.9	169605	2127860
Total insured deposits	131	1981936	1039972	463852	4527402
Total uninsured deposits	131	2008734	1354009	263668.1	5983165
Total deposits	131	3990670	2368096	727520.1	1.05E+07

Note: The deposit amounts are in thousand Turkish Liras. The table reports descriptive statistics for different depositor groups in conventional banks, Islamic banks and in the whole banking system. The quarterly observations for insured deposits are classified by the amount of funds. The smallest group is upto 10 thousand Turkish Liras and the highest is the group that has the amount between 40 thousand to 50 thousand Turkish Liras. Uninsured deposits are the funds that are not insured by the insurance authority in Turkey.

Table 2: Panel VAR Results– Banking System Depositors' Response to Interest Rate Changes

		Responses of					
		Deposit			Interest		
Responses to							
		β	Std. error	T-stat	β	Std. error	T-stat
Aggregate	Deposit(-1)	0.918	0.015	62.802 ***	0.000	0.000	0.874
	Interest(-1)	-26357.792	7402.394	-3.561 ***	0.945	0.011	84.996 ***
Uninsured	Deposit(-1)	0.912	0.018	49.922 ***	0.000	0.000	1.051
	Interest(-1)	-22266.052	6458.764	-3.447 ***	0.946	0.011	84.464 ***
Insured	Deposit(-1)	0.917	0.013	69.861 ***	0.000	0.000	0.647
	Interest(-1)	-6308.021	1971.660	-3.199 ***	0.943	0.011	84.726 ***
Fifty	Deposit(-1)	0.917	0.016	58.827 ***	0.000	0.000	0.788
	Interest(-1)	-4874.948	1516.075	-3.216 ***	0.944	0.011	82.610 ***
Fourty	Deposit(-1)	0.908	0.018	51.542 ***	0.000	0.000	0.619
	Interest(-1)	-420.648	294.280	-1.429	0.943	0.012	80.935 ***
Thirty	Deposit(-1)	0.911	0.022	41.290 ***	0.000	0.000	0.630
	Interest(-1)	-310.069	369.401	-0.839	0.943	0.012	81.176 ***
Twenty	Deposit(-1)	0.924	0.031	29.591 ***	0.000	0.000	0.565
	Interest(-1)	-415.601	431.603	-0.963	0.943	0.012	78.216 ***
Ten	Deposit(-1)	1.043	0.270	3.870 ***	0.000	0.000	0.389
	Interest(-1)	1365.773	3115.634	0.438	0.945	0.021	45.461 ***

Note: ***, **, and * represent significance at 1%, 5%,and 10% levels. Two–variable VAR model is estimated by GMM. Bank–time fixed effects are removed prior to estimation. Reported numbers show the coefficients of regressing the column variables on row column variables. Heteroscedasticity and serial correlation robust standard errors appear in second and fifth column.

Table 3: Panel VAR Results– Conventional Bank Depositors' Response to Interest Rate Changes

		Responses of					
		Deposit			Interest		
Responses to							
		β	Std. error	T-stat	β	Std. error	T-stat
Aggregate	Deposit(-1)	0.918	0.015	62.337 ***	0.000	0.000	0.679
	Interest(-1)	-27110.002	7709.244	-3.517 ***	0.940	0.012	80.304 ***
Uninsured	Deposit(-1)	0.912	0.018	49.373 ***	0.000	0.000	0.846
	Interest(-1)	-23420.806	6835.507	-3.426 ***	0.942	0.012	79.302 ***
Insured	Deposit(-1)	0.918	0.013	69.896 ***	0.000	0.000	0.469
	Interest(-1)	-6063.742	1965.161	-3.086 ***	0.938	0.012	81.126 ***
Fifty	Deposit(-1)	0.918	0.016	58.724 ***	0.000	0.000	0.604
	Interest(-1)	-4831.367	1582.190	-3.054 ***	0.940	0.012	78.341 ***
Fourty	Deposit(-1)	0.910	0.018	51.805 ***	0.000	0.000	0.437
	Interest(-1)	-346.071	304.818	-1.135	0.938	0.012	78.551 ***
Thirty	Deposit(-1)	0.913	0.022	41.559 ***	0.000	0.000	0.455
	Interest(-1)	-214.810	373.694	-0.575	0.938	0.012	79.167 ***
Twenty	Deposit(-1)	0.926	0.031	29.978 ***	0.000	0.000	0.402
	Interest(-1)	-386.591	425.867	-0.908	0.938	0.012	77.471 ***
Ten	Deposit(-1)	1.042	0.263	3.969 ***	0.000	0.000	0.227
	Interest(-1)	1272.915	2825.331	0.451	0.939	0.020	47.076 ***

Note: ***, **, and * represent significance at 1%, 5%,and 10% levels. Two–variable VAR model is estimated by GMM. Bank–time fixed effects are removed prior to estimation. Reported numbers show the coefficients of regressing the column variables on row column variables. Heteroscedasticity and serial correlation robust standard errors appear in second and fifth column.

Table 4: Panel VAR Results– Islamic Bank Depositors' Response to Interest Rate Changes

		Responses of					
		Deposit			Interest		
Responses to							
		β	Std. error	T-stat	β	Std. error	T-stat
Aggregate	Deposit(-1)	0.832	0.054	15.460 ***	0.000	0.000	1.419
	Interest(-1)	-54125.949	21854.914	-2.477 **	1.087	0.083	13.162 ***
Uninsured	Deposit(-1)	0.860	0.067	12.814 ***	0.000	0.000	1.572
	Interest(-1)	-25894.320	15572.316	-1.663 *	1.079	0.070	15.353 ***
Insured	Deposit(-1)	0.781	0.049	16.095 ***	0.000	0.000	1.233
	Interest(-1)	-30296.320	8506.450	-3.562 ***	1.115	0.117	9.524 ***
Fifty	Deposit(-1)	0.800	0.044	18.306 ***	0.000	0.000	1.308
	Interest(-1)	-15156.802	4227.724	-3.585 ***	1.105	0.103	10.717 ***
Fourty	Deposit(-1)	0.769	0.069	11.121 ***	0.000	0.000	1.199
	Interest(-1)	-3399.760	1305.644	-2.604 ***	1.140	0.140	8.139 ***
Thirty	Deposit(-1)	0.776	0.069	11.290 ***	0.000	0.000	1.159
	Interest(-1)	-3755.030	1501.820	-2.500 **	1.125	0.132	8.493 ***
Twenty	Deposit(-1)	0.770	0.086	8.980 ***	0.000	0.000	1.080
	Interest(-1)	-4009.731	2031.610	-1.974 **	1.135	0.152	7.476 ***
Ten	Deposit(-1)	0.839	0.208	4.029 ***	0.000	0.000	1.008
	Interest(-1)	-1756.448	3844.097	-0.457	1.172	0.200	5.853 ***

Note: ***, **, and * represent significance at 1%, 5%,and 10% levels. Two–variable VAR model is estimated by GMM. Bank–time fixed effects are removed prior to estimation. Reported numbers show the coefficients of regressing the column variables on row column variables. Heteroscedasticity and serial correlation robust standard errors appear in second and fifth column.

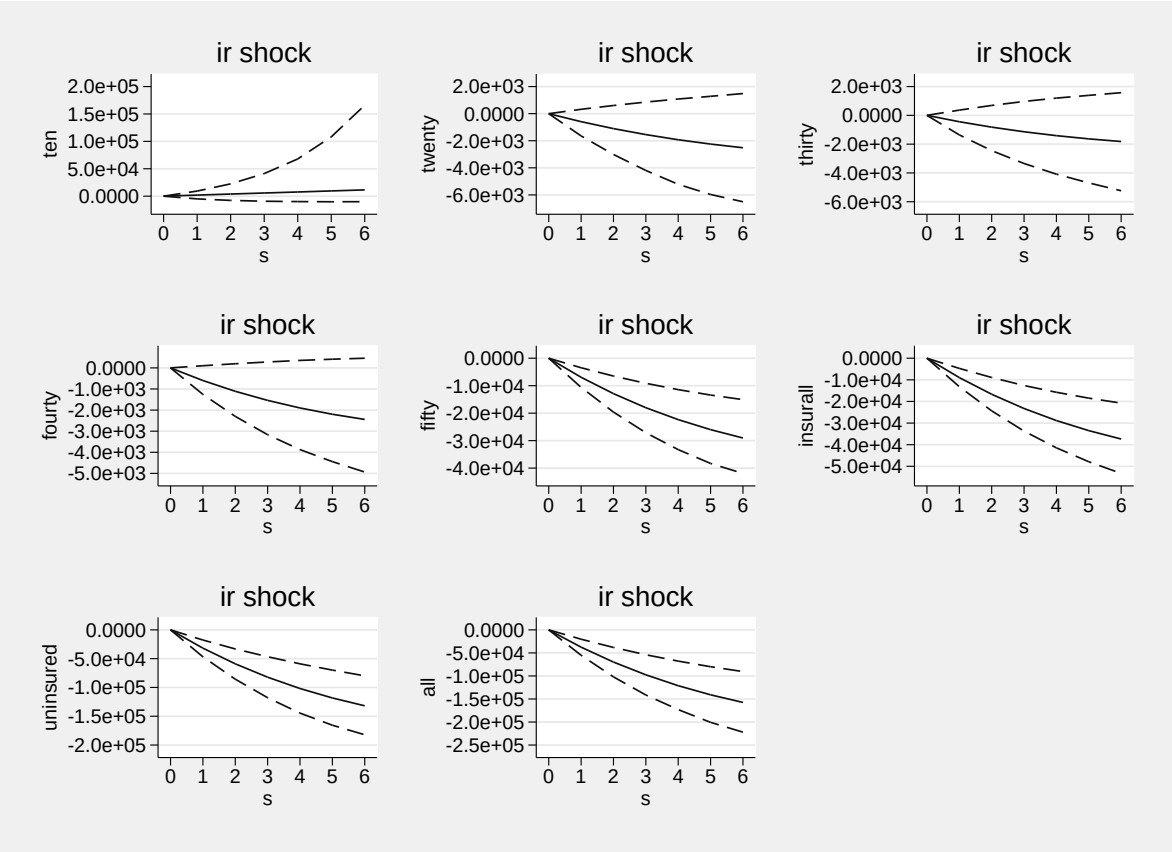

Figure 1: Impulse Responses of Two–Variable VAR for the Banking System

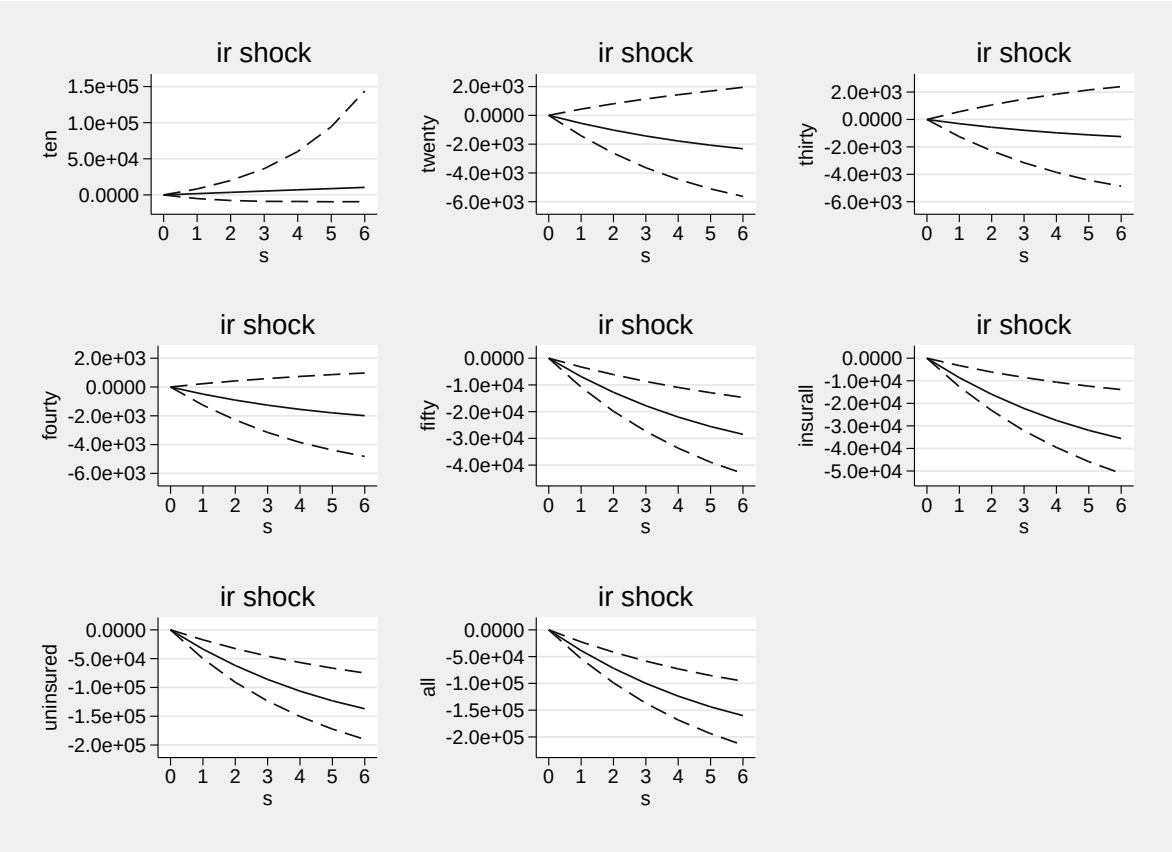

Figure 2: Impulse Responses of Two–Variable VAR for the Conventional Banks

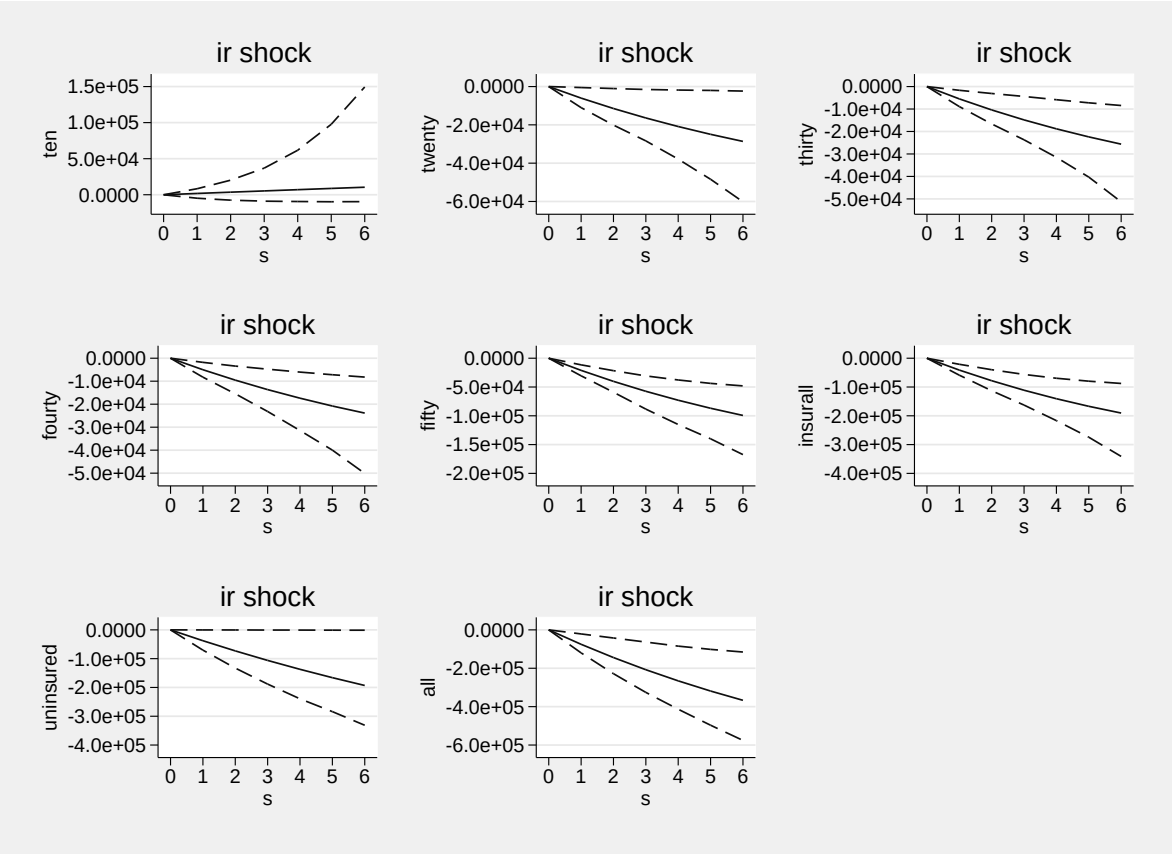

Figure 3: Impulse Responses of Two–Variable VAR for the Islamic Banks

Table 5: Panel VAR Results– Banking System Depositors' Response to Interest Rate Changes through Spillovers

		Responses of Deposit		
Responses to				
		β	Std. error	T-stat
Aggregate	Deposit(-1)	0.927	0.014	67.378 ***
	Interest(-1)	-47458.126	11944.664	-3.973 ***
	Foreign Exchange(-1)	-1023399.800	187041.030	-5.472 ***
	Inflation(-1)	-286.615	1576.358	-0.182
Uninsured	Deposit(-1)	0.923	0.017	53.191 ***
	Interest(-1)	-36171.072	9985.506	-3.622 ***
	Foreign Exchange(-1)	-703692.240	142477.670	-4.939 ***
	Inflation(-1)	-147.798	1182.609	-0.125
Insured	Deposit(-1)	0.924	0.012	75.127 ***
	Interest(-1)	-11216.880	3535.548	-3.173 ***
	Foreign Exchange(-1)	-312847.230	67545.786	-4.632 ***
	Inflation(-1)	253.298	522.690	0.485
Fifty	Deposit(-1)	0.928	0.016	59.397 ***
	Interest(-1)	-7975.087	2638.529	-3.023 ***
	Foreign Exchange(-1)	-257883.130	70594.496	-3.653 ***
	Inflation(-1)	353.321	432.979	0.816
Fourty	Deposit(-1)	0.913	0.017	52.960 ***
	Interest(-1)	-590.261	445.191	-1.326
	Foreign Exchange(-1)	-17045.389	13200.655	-1.291
	Inflation(-1)	31.724	68.540	0.463
Thirty	Deposit(-1)	0.915	0.022	42.213 ***
	Interest(-1)	-426.730	546.842	-0.780
	Foreign Exchange(-1)	-16540.799	16201.831	-1.021
	Inflation(-1)	40.685	95.018	0.428
Twenty	Deposit(-1)	0.932	0.033	28.300 ***
	Interest(-1)	-1059.710	634.011	-1.671 *
	Foreign Exchange(-1)	-25011.737	19993.275	-1.251
	Inflation(-1)	-29.071	99.931	-0.291
Ten	Deposit(-1)	1.077	0.322	3.340 ***
	Interest(-1)	-1501.017	2011.056	-0.746
	Foreign Exchange(-1)	7559.065	44515.949	0.170 *
	Inflation(-1)	-635.886	1013.055	-0.628

Note: ***, **, and * represent significance at 1%, 5%,and 10% levels. Two–variable VAR model is estimated by GMM. Bank–time fixed effects are removed prior to estimation. Reported numbers show the coefficients of regressing the column variables on row column variables. Heteroscedasticity and serial correlation robust standard errors appear in second and fifth column.

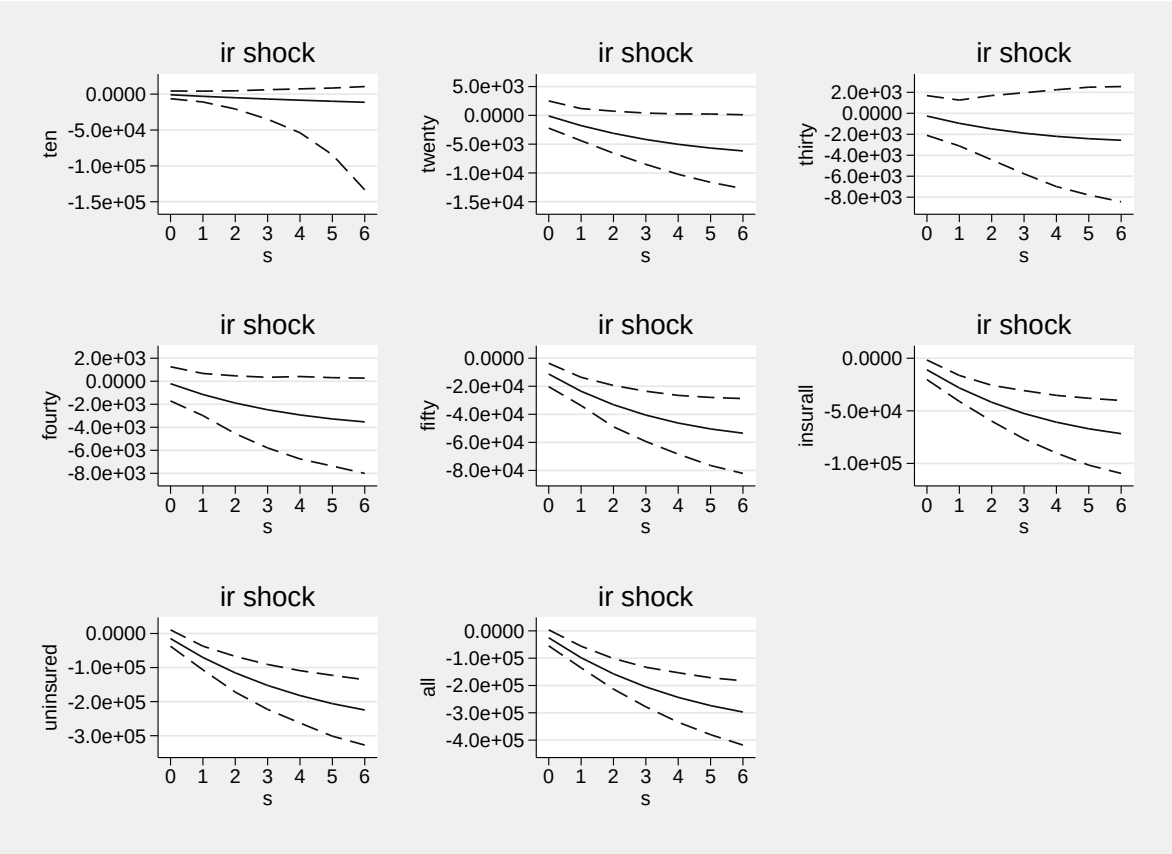

Figure 4: Impulse Responses of Two–Variable VAR for the Banking System with Spillovers

Table 6: Propensity to "Islamic" – Binary Response Model Results

		Logit Model		**Probit model**	
Variable	Definiton	Coef.	T-stat	Coef.	T-stat
prov	*provisions*	1.64E-05	2.18*	9.42E-06	2.2 *
opcost	*operational costs*	-1.68E-06	-2.28*	-9.65E-07	-2.38*
capadq	$\frac{shareholder\ equity}{total\ assets}$	-13.83	-5.19**	-8.05	-5.25**
liqdt	$log(assets - credits - fixed\ assets)$	0.39	2.66**	0.23	2.72**
assts	*totalassets*	-6.20E-08	-3.61**	-3.53E-08	-3.6**
constant		-4.98	-2.37*	-2.99	-2.46**
Observation	1183		1183		
Chi-squared $(p - value)$	0.00		0.00		
Hasmer-Lemeshaw test $(p - value)$	1.00		1.00		

Note: **, and * represent significance at 1%, and 5%, levels. The dependent variable is a dummy variable taking the value of 1 for banks which are Islamic banks. T-statistics are computed by using standard errors clustered around each bank. The Hosmer–Lemeshaw test of goodness of fit statistic is computed as the Pearson chi-square from the contingency table of observed and expected frequencies.

Table 7: Covariates Statistics – Balancing Tests

Variable	Definition		Mean Treated	Mean Control	Bias %	Bias red. %	T-stat
prov	*provisions*	Unmatched	1.09E+04	2.57E+04	-34.90		-2.83*
		Matched	1.09E+04	7.10E+03	9.00	74.2	1.93
opcost	*operational costs*	Unmatched	1.80E+05	4.30E+05	-49.60		-4.03*
		Matched	1.80E+05	1.60E+05	4.90	90	1.11
capadq	$\frac{shareholder\ equity}{total\ assets}$	Unmatched	0.12	0.20	-63.90		-5.14*
		Matched	0.12	0.12	-0.70	98.9	-0.35
liqdt	$log(assets - credits - fixed\ assets)$	Unmatched	14.36	14.57	-13.40		-1.12
		Matched	14.36	14.22	9.40	30.1	1.2
assts	*totalassets*	Unmatched	7.70E+06	2.20E+07	-55.50		-4.47*
		Matched	7.70E+06	6.20E+06	5.70	89.8	1.96

Note: * represent significance at 1% level. The first row of corresponding variable presents the difference between all conventional and Islamic banks. The second row represents the difference when being "Islamic" is taken as a treatment. The difference between the treated and non–treated observations is reported.

Table 8: Summary Statistics with Propensity Score Matching

Variable	Definition	Sample	Treated	Controls	Difference	Std. Error	T-stat
Leverage	$\frac{deposits}{total\ assets}$	Unmatched	0.292	0.107	0.185	0.008	22.45**
		Average Treatment	0.292	0.138	0.154	0.012	12.92**
Asset quality	$\frac{NPLs}{total\ credits}$	Unmatched	0.016	0.152	-0.137	0.098	-1.39
		Average Treatment	0.016	0.011	0.005	0.002	2.97**
Profitability	$\frac{profits}{total\ assets}$	Unmatched	0.007	0.008	-0.001	0.003	-0.21
		Average Treatment	0.007	0.005	0.002	0.001	2.09*

Note: **, and * represent significance at 1%, and 5%, levels. The first row of corresponding variable presents the difference between all conventional and Islamic banks. The second row represents the difference when being "Islamic" is taken as a treatment. The difference between the treated and non–treated observations is reported.

Table 9: Panel VAR Results– Matched Conventional Bank Depositors' Response to Interest Rate Changes

		Responses of					
		Deposit			Interest		
Responses to							
		β	Std. error	T-stat	β	Std. error	T-stat
Aggregate	Deposit(-1)	0.922	0.017	53.662 ***	0.000	0.000	0.603
	Interest(-1)	-13625.288	4466.650	-3.050 ***	0.944	0.013	71.272 ***
Uninsured	Deposit(-1)	0.917	0.023	40.166 ***	0.000	0.000	0.666
	Interest(-1)	-10742.612	4092.320	-2.625 ***	0.945	0.013	70.030 ***
Insured	Deposit(-1)	0.928	0.016	58.026 ***	0.000	0.000	0.510
	Interest(-1)	-3225.316	1301.720	-2.478 **	0.942	0.013	74.008 ***
Fifty	Deposit(-1)	0.924	0.019	49.493 ***	0.000	0.000	0.662
	Interest(-1)	-2834.423	1099.636	-2.578 ***	0.944	0.013	71.378 ***
Fourty	Deposit(-1)	0.927	0.020	45.879 ***	0.000	0.000	0.427
	Interest(-1)	-154.053	178.531	-0.863	0.942	0.013	72.932 ***
Thirty	Deposit(-1)	0.922	0.023	39.402 ***	0.000	0.000	0.475
	Interest(-1)	-89.409	167.890	-0.533	0.942	0.013	71.852 ***
Twenty	Deposit(-1)	0.978	0.039	25.409 ***	0.000	0.000	0.350
	Interest(-1)	-139.787	184.826	-0.756	0.941	0.013	73.756 ***
Ten	Deposit(-1)	0.936	0.056	16.859 ***	0.000	0.000	0.252
	Interest(-1)	38.969	300.389	0.130	0.940	0.012	75.483 ***

Note: ***, **, and * represent significance at 1%, 5%,and 10% levels. Two–variable VAR model is estimated by GMM. Bank–time fixed effects are removed prior to estimation. Reported numbers show the coefficients of regressing the column variables on row column variables. Heteroscedasticity and serial correlation robust standard errors appear in second and fifth column.