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# 16 Macroeconomic shocks and Islamic bank behavior in Turkey

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## 1 INTRODUCTION

Events such as the ‘credit crunch’, ‘bank run’, ‘financial contagion’, ‘flight to quality’ and ‘systemic risks’ have widely transpired in recent times. One important dimension permeating these events is the dynamic link between macroeconomic shocks and banks’ behavior. Economic crises experienced by five East Asian countries in the late 1990s were accompanied by financial sector problems. The Great Recession of the late 2000s also corresponded to heightened solvency risks affecting over-leveraged banks and financial institutions in many developed countries.<sup>1</sup> In a world of imperfect information, adverse macroeconomic shocks could weaken firms’ balance sheets, diminish bank capital and trigger financial disintermediation. Positive shocks, on the contrary, could increase firms’ net worth and prompt additional bank lending. Understanding the nature of this interaction offers regulators, supervisors, firms and households valuable insights into the process of policymaking, financial intermediation and responding to boom and bust cycles in the economy.

The credit and deposit behaviors of banks can be affected by several types of macroeconomic shocks. These include shocks to the business cycle, domestic monetary policy and external risk perception. Prolonged prosperity, according to the financial instability hypothesis of Minsky (1986), may induce speculative euphoria and excessive borrowing that pushes the economy to the brink of a meltdown. Perceived risk of loans may be underestimated by the banks during lending boom periods. Loan quality characteristically weakens as a result of optimistic risk assessments based on the higher expected value of collateral and the current strong economy (Başçı, 2006). This view has been a fertile ground for both theoretical and empirical inquiries. For example, Bucher et al. (2013) present a model that focuses on the role of business cycle volatility as a potential cause for internal and external funding problems of banks. In a downturn, the internal and external funding sources are depleted by virtue of low cash flows from existing loans and low funding liquidity of new loans. This prompts banks to fuel excessive credit growth in good times to strengthen internal funding later during bad times. Banks could also fail if loans become too toxic in an economic downturn. Implications from the model suggest that the performance of banks can be improved only if there is a stabilization of the real economy. Empirically, Asea and Blomberg (1998) showed that the market for bank loans experiences systematic cycles of over and under-lending based on a dataset of 580 US banks between 1977 and 1993. In contractionary phases of the cycle, risk premiums on loans and the probability of collateralization increase, although loan size remains unaffected. During the expansionary phases of the cycle, the premium and the probability of collateralization decrease; while loan size increases.

The pro-cyclical nature of bank lending can be demand driven according to the balance sheet channel (broad credit channel) theory (Bernanke and Gertler, 1989, 1995). The central tenet is that negative macroeconomic shock erodes firms' balance sheets and households' net capital positions, reducing their demand for new credit and banks' willingness to extend loans. The decline in credit forces firms to cut spending and output. Hence, negative macroeconomic shocks may be exacerbated if credit flows are hindered (Bernanke et al., 1996). Shock to domestic monetary policy can also influence the credit and deposit cycles since banks are used by central banks as the primary channel for monetary policy transmission (Bernanke and Blinder, 1992; Bernanke and Gertler, 1995). The bank lending channel (narrow credit channel) posits that a monetary contraction results in the reduction of credit supply that will eventually affect inflation and the business cycle. Theory suggests that the bank lending channel is operational if two key conditions are met. The first condition refers to the inability of banks to fully shield their loan portfolios from monetary policy changes. The second condition refers to the existence of a substantial group of borrowers that cannot insulate their spending from the reduction in bank credit. Large banks, however, may dominate the banking market and reduce the pass-through to the policy rate to bank deposit and lending rates (Rummel, 2014).

In a study of 26 Organisation for Economic Co-operation and Development (OECD) countries from 1979 to 1999, Bikker and Hu (2002) found that lending is dominated by the demand as measured by cyclical variables such as real gross domestic product (GDP) growth, inflation, unemployment and real money supply.<sup>2</sup> Credit rationing during a cyclical downturn is only to a minor extent driven by a shortage of capital, which qualifies the bank lending channel hypothesis. While monetary transmission may operate primarily through the lending channel in certain countries, there are challenges to the effectiveness of this channel in emerging and developing economies owing to the relative small size of the formal financial sector, limited competition in the banking sector, high marginal lending costs, smaller degree of *de facto* financial integration with international capital markets and poor institutional environment (see Mohanty and Turner, 2008; Mishra and Montiel, 2013).

In the wake of globalization and integration of economies, countries now respond to common shocks even more rapidly and collectively. The business cycle of a country is increasingly subject to international shocks beyond domestic shocks (Erden and Ozkan, 2014). Investors' expectation and fear of future market volatility could increase variations in macroeconomic uncertainty. Such uncertainty could further distort banks' allocation of loanable funds over and above the dynamics of macroeconomic aggregates or the limits posed by monetary policymakers' actions as argued by Baum et al. (2009). The authors found that a doubling of macroeconomic uncertainty corresponds to a change of 6 percent to 10 percent in the dispersion of banks' loan-to-asset ratios. More recently, Adams-Kane et al. (2015) found that bank liquidity problem and heightened uncertainty in international asset prices were the key channels by which the 2007–09 financial crisis affected international lending from high-income to developing countries. European banks became more sensitive to market conditions during the most severe times of the crisis, although this is partly offset by the behavior of US banks.

Research on macroeconomic shocks and bank behavior in emerging economies has also gained traction in recent years owing to the rapid growth and internationalization of these markets. The fact that the Basel Committee on Banking Supervision presently com-

prises members and observers of central banks from emerging and developing countries (for example, Brazil, China, Indonesia, Malaysia, Saudi Arabia, South Africa, Turkey and the United Arab Emirates) demonstrates the increasing significance of emerging countries' financial institutions and regulatory trajectory in maintaining global banking system stability. A study based on a sample of 740 commercial banks in 50 emerging countries from 1997 to 2008 observed that bank capital buffers and loan default risk are negatively correlated with the business cycle. In particular, banks with low market power are more inclined to behave in a counter-cyclical way, underscoring the relevance of bank competitive behavior in influencing charter values (Saadaoui, 2014). In the case of South Africa (1980–2005), Akinboade and Makina (2010) discovered that bank lending is strongly dependent on demand factors, namely, coincident indicators (the present state of the economy) and changes in money supply. Supply factors such as capital and reserve also exert influence on bank lending, but only after a long lag period. Their findings lend support to the pro-cyclicality of bank lending in South Africa. Empirical analysis on financial market uncertainty in Malaysia suggests that heightened market uncertainty is negatively related to output in the long term and may dampen real output, real credit and real stock prices (Ibrahim and Shah, 2012).

While the bulk of the literature has been on conventional banks, empirical studies on Islamic banks are becoming popular in tandem with the development of the global Islamic finance industry. The Islamic finance industry has spanned across more than 70 jurisdictions with over 600 financial institutions offering a diverse range of services. With new growth opportunities and areas currently being explored by industry stakeholders, the industry is expected to triple in asset size by 2020, based on recent estimates.<sup>3</sup> Islamic banks have also demonstrated resilience during the recent global financial crisis. Beck et al. (2013) found that Islamic banks are better capitalized, have higher asset quality and are less likely to disintermediate and deleverage during crises. Using a sample of 88 Islamic and 422 conventional banks across 22 countries over the time period of 1995–2009,<sup>4</sup> they found a higher loan–deposit ratio for Islamic banks than for conventional banks and the difference increases significantly during local crises, suggesting that Islamic banks cut back less on lending than conventional banks (see also Hasan and Dridi, 2011; Farooq and Zaheer, 2015). Small Islamic banks have also been found to have relatively lower credit and insolvency risks according to Abedifar et al. (2013) based on a sample of 553 banks from 24 countries between 1999 and 2009. They show that the loan quality of Islamic banks is less responsive to domestic interest rates than conventional banks.

Yet, the growth of the Islamic finance industry is not without challenges and criticisms. Khan and Ahmed (2001) and Sundararajan and Errico (2002) raised concerns that Islamic banks typically face additional deposit withdrawal risk because they share profit and loss with investment depositors.<sup>5</sup> There are also concerns that Islamic banks face interest rate risk (Chong and Liu, 2009; Sukmana and Kassim, 2010; Ergeç and Arslan, 2013; Saraç and Zeren, 2015). Kassim et al. (2009) revealed that Islamic banks are more sensitive to monetary policy changes than its conventional counterparts in a dual banking system as in Malaysia. Another related study showed that Bahraini Islamic banks are less capable in offsetting the destabilizing effect of monetary policy compared to Islamic banks in Malaysia (Yusof et al., 2009). In Pakistan, Islamic banks, which are similar in size as small conventional banks, respond to monetary policy shocks as large conventional banks (Zaheer et al., 2013).<sup>6</sup> The recent Islamic Financial Services

Stability Report 2015 reveals that funding of Islamic banks is dominated by deposits. Profit-sharing and risk-bearing investment accounts (PSIA) were gradually replaced by sale-based fixed profit deposits. By 2013, the share of PSIA went below the 50 percent mark. Islamic banks are also confronted with the same risks from maturity mismatches as conventional banks.<sup>7</sup>

Despite the voluminous body of literature on macroeconomic shocks and bank behavior, there are limited studies on emerging countries and Islamic banks, both of which could offer potential 'alternative markets' insights into the subject. Bank behaviors differ from one country to another. In countries whose banking systems are safe havens for foreign capital, bank credit and deposit behavior could be less reliant on domestic economic conditions. Banks' perception of risk and attitudes towards risk could also be influenced by monetary policy and external factors in different ways. To the best of our knowledge, this chapter is the first attempt to examine multiple shocks to the credit and deposit behaviors of both conventional and Islamic banks. Turkey is a preferred choice of study as the Islamic finance industry is set to gain systemic importance based on medium-term growth rates and the current domestic Islamic banking presence in the country. The Government of Turkey has been firmly supporting the growth of the participation finance sector with an aim to expand its market share to 15 percent by 2023 from 5.1 percent in 2012 (Thomson Reuters, IRTI, CIBAFI, 2014; Islamic Financial Services Board, 2015). Turkey also offers an interesting case for analysis since the Turkish economy has become more integrated with the global economy over the past three decades. In fact, trade integration indicates that Turkish business cycles are closely linked with the cycles of European Custom Union members (Erden and Ozkan, 2014).

In addition to domestic business cycle and monetary policy, we also assess the global transmission channel for bank credit and deposit using the Chicago Board Options Exchange Volatility Index (VIX), a measurement of the expected volatility of the S&P 500 that is gaining popularity in banking studies (Adams-Kane et al., 2015). In the analysis, panel vector autoregressions (VAR) methodology is adopted as it is designed to explicitly address endogeneity problems in a panel-data setting considering the challenge in examining links between banks and macroeconomic conditions. Panel-VAR methodology distinguishes short-term impacts of each factors based on the impulse-response functions from the long-term cumulative impacts of shocks based on variance decompositions. The impulse-response functions (IRFs) can capture any delayed impacts on (and of) the variables under consideration and control for country- and year-fixed effects.

Our panel-VAR IRFs for both conventional and Islamic banks are generally in line with the bank lending channel hypothesis. This finding is in accordance with Başçı et al. (2007) who showed that the stable environment resulting from the implementation of structural reforms after the 2001 crisis has increased the significance of interest rate and credit channels in Turkey. More specifically, we find for both banking types that a monetary contraction leads to significant decline in bank lending and deposits collection. Furthermore, we find that VIX shocks have a significantly positive impact on deposits for both bank types, but no significant association is found with bank lending. This finding is plausibly related to the global financial crisis, in which accommodative policies and uncertainty in advanced economies have been associated with the resurgence of capital flows to developing countries with sound fundamentals (Pradhan et al., 2011). We observe a notable difference in bank behavior between Islamic and conventional banks

following a business cycle shock. While positive GDP shocks negatively affect conventional bank deposits, Islamic banks tend to attract more deposits. A possible explanation for this finding is that Islamic banks and conventional banks, in principle, operate under different business models. Since profit-sharing would imply positive returns during boom episodes, deposit accounts in Islamic banks become more attractive, whereas conventional bank depositors seek higher rates of return on their savings possibly through other non-banking avenues. Therefore, compared to conventional banks, credits from Islamic banks are more pro-cyclical.

In the next section, an overview of the Islamic banking sector in Turkey is provided. Then, section 3 details the data and empirical approach used in the analysis. Section 4 presents and discusses the estimation results. Finally, section 5 concludes with a summary of the main findings and some final remarks.

## 2 ISLAMIC BANKS IN TURKEY

The core of government policy reforms to orient the centrally planned economy towards a market economy started in the early 1980s. As part of these liberalization reforms under Prime Minister Turgut Özal, the enactment of the ‘Special Finance Houses’ decree of 1983, with the intention of attracting capital from Arab Gulf countries, paved the way of interest-free banking in Turkey. In 1985, two major Islamic finance groups entered the banking market: Bahrain-based AlBaraka Turk and Saudi-Based Faisal Finance. The Kuwaiti-based Kuvveyt Turk started its operations in 1989. Initially, Islamic banks were labelled ‘special finance houses’ to soothe the sensitivities of Turkey’s secular tradition. Afterwards, the Islamic banking segment also attracted the interest of domestic investors: Anadolu Finance in 1991, Ihlas Finance in 1995 and Asya Finance in 1996. Initially, special finance houses were treated shabbily since these institutions were not shielded by deposit insurance and, because of their Islamic nature, were not allowed to invest in the lucrative government securities market. The collapse of Ihlas Finance House in 2001 owing to alleged fraudulent conduct was detrimental to the reputation of Islamic banks that were in the process of gaining footprints in the financial system. At the same time, the banking sector was hit by Turkey’s worst economic crisis, after an unsuccessful attempt to implement an exchange rate-based stabilization schedule at the beginning of the 2000s.

Soon after 2002, possibly due to the decisive implementation of banking reforms and political stability, investor confidence was restored and inflation and real interest rates abated. For most of the past decade, Turkey’s economy enjoyed a respectable success, by maintaining a responsible fiscal and monetary policy, lowering the staggering annual inflation rate from 100 percent to single digits and registering GDP growth of more than 45 percent in real terms. The macroeconomic and political stability brought the long neglected country to the attention of investors and the country’s strategic geographical position allowed easy access to customers in Europe, Eurasia, the Middle East and North Africa (Thomson Reuters, IRTI, CIBAFI, 2014). After Turkey’s 2000–2001 crisis and following the 2007–08 global financial crisis, Turkey adopted structural reforms in the financial and banking sectors that included the restructuring, recapitalization and closure of banks and the introduction of stronger supervisory controls and international

standards (by means of instituting an independent banking and regulatory agency). In 2005, following amendments to the banking law, the government created an even level playing field for Islamic banks vis-à-vis conventional market players. Islamic banks' status of 'special finance institutions' was transformed to 'participation banks' and Islamic depositors benefited from the same deposit insurance coverage compared to their conventional counterparts.

Further structural changes have taken place in the Islamic banking landscape since the bankruptcy of Ihlas Finance: the purchase of Faisal Finance by Turkish holding company Ülker in 2000 (named as Family Finance) and the subsequent merger between Anadolu Finance and Family Finance into a bigger institution under the name of Türkiye Finance. As of 2012, Turkey is home to four shariah-compliant banks, representing approximately 5 percent of total banking assets in the country. Today, the Turkish participation banking industry is shared almost evenly among the four market players: Asya Finance, AlBaraka Türk, Kuveyt Türk and Türkiye Finance.<sup>8</sup> The list of conventional and Islamic banks, together with statistics of key variables, in Turkey at 31 December 2012 is provided in Table 16A.1 in the Appendix to this chapter.

### 3 DATA AND EMPIRICAL APPROACH

This study examines how deposits and credits in Islamic and conventional banks in Turkey respond to monetary policy shocks, business cycle fluctuations and external risk perception. The gross domestic product level, overnight money market rate and the VIX index are used as a proxy for business cycle, monetary policy and external risk perceptions, respectively. Deposits and credits are aggregate data from individual banks. Domestic data are collected from the Central Bank of the Republic of Turkey and the VIX index is compiled from Bloomberg data stream. VIX is a trademarked ticker symbol for the Chicago Board Options Exchange Market Volatility Index and is widely tracked by academicians and practitioners as a measure for risk appetite in global financial markets.

In the analysis, we use VIX index (*VIX*), gross domestic product level (*GDP*), overnight money market rate (*IR*), aggregate deposit level (*DEPOSIT*) and total loan amount (*CREDIT*) for the period of the third quarter in 2004 to the fourth quarter in 2012. The year 2004 witnessed some important developments. There was a decrease of annual change in the consumer price index to single digits after more than 30 years. Investment and consumption spending that were deferred following the crisis in 2001 started to rise and fueled credit demand in the banking system. Prospects and convergence expectations with the European Union also increased credit demand. In addition, political stability and the new three-year economic program announced at the end of 2004 facilitated the reduction of risk premiums on securities issued in Turkey (Başçı, 2006).

We log-transform gross domestic product (*GDP*) and normalize credits, *CREDIT* and deposits (*DEPOSIT*) of each bank with their average assets during the sample period. By doing so, we control for bank scale in the responses of deposits and credits. The overnight money market rate of the Central Bank of the Republic of Turkey as the policy rate (*IR*) is proxied by the quarterly averages of overnight lending rates during the sample period. Table 16.1 presents descriptive statistics for Islamic banks, conventional banks and the

Table 16.1 Summary statistics

Variable	Obs.	Mean	Std dev.	Min.	Max.
<i>Conventional banks</i>					
<i>CREDIT</i>	1055	0.419	0.346	0	1.929
<i>DEPOSIT</i>	1055	0.452	0.338	0	1.883
<i>GDP</i>	1055	19.258	0.275	18.765	19.749
<i>IR</i>	1055	11.686	5.801	1.5	21.48
<i>VIX</i>	1055	20.611	9.402	11.03	58.49
<i>Islamic banks</i>					
<i>CREDIT</i>	128	0.699	0.419	0.124	1.586
<i>DEPOSIT</i>	128	0.744	0.41	0.164	1.723
<i>GDP</i>	128	19.299	0.263	18.765	19.749
<i>IR</i>	128	10.837	5.536	1.5	17.5
<i>VIX</i>	128	21.444	9.936	11.03	58.49
<i>All banks</i>					
<i>CREDIT</i>	1183	0.449	0.365	0	1.929
<i>DEPOSIT</i>	1183	0.483	0.358	0	1.883
<i>GDP</i>	1183	19.262	0.274	18.765	19.749
<i>IR</i>	1183	11.594	5.777	1.5	21.48
<i>VIX</i>	1183	20.701	9.461	11.03	58.49

Note: *DEPOSIT* and *CREDIT* are normalized by average assets of each bank. Gross domestic product is the log-transformed value of quarterly *GDP* in thousand Turkish lira (TLs).

total banking sector. Descriptive statistics show that Islamic banks are more capitalized and leveraged than conventional banks during the sample period. This is plausibly reflective of the remarkable growth of Islamic banking in Turkey from 1 percent to around 6 percent of market share during the period of study.

We use the panel-VAR methodology to estimate deposit and credit responses to external (*VIX*) and domestic shocks (*IR* and *GDP*). This methodology extends the traditional VAR approach to a panel data setting and allows the control for bank level heterogeneity. We specify our model as follows:

$$X_{it} = \Gamma_0 + \Gamma(L)X_{it} + F(L)Z_{it} + f_i + \varepsilon_{it} \quad 16.1$$

where  $X_{it}$  is a vector of stationary endogenous bank specific variables that includes *CREDIT* and *DEPOSIT*, whereas  $Z_{it}$  is a vector of macroeconomic variables that includes *GDP*, *IR* and *VIX*.  $\Gamma_0$  is a vector of constants, whereas  $\Gamma(L)$  and  $F(L)$  are matrix polynomials in the lag operator.  $f_i$  is the fixed effects that represent bank specific shocks and  $\varepsilon_{it}$  corresponds to a vector of error terms. The coefficients of the panel-VAR system are estimated by the system generalized method of moments (GMM). Instead of mean differencing that is commonly used in panels to remove fixed effects, we use 'Helmert transformation' that applies forward mean-differencing to the variables in the VAR system. In doing so, lagged dependent variables and regressors can be used as

instruments without violating the orthogonality assumptions (see Arellano and Bover, 1995, and Love and Zicchino, 2006, for further details).

Regarding the ordering of the variables in the system, we assume that monetary policy rate (*IR*) adjusts simultaneously to the external risk perception (*VIX*). Since the collapse of Lehman Brothers, emerging market countries have directly assessed the impact of the crisis on their national economies and changed policy rates in function of external risk aversion. The crisis, which is captured by the deterioration in *VIX*, had a negative impact on the real economic activities and thus the GDP. Monetary policy shocks affect deposits (*DEPOSIT*) and credits (*CREDIT*) with a lag. Monetary shocks create opportunity costs for depositors and affect their investment decision. When the monetary authority changes its policy rate, the incentives for depositors change, prompting a change in bank lending behavior. Hence, the swing in deposits influences the subsequent level of credits. Since deposits are still the main source of lending in emerging market economies, the change in deposit levels can affect the level of credits (Demiralp and Demiralp, 2014). Therefore, we represent the ordering of the variables in the panel-VAR system as  $X_{it} = [VIX_t, GDP_t, IR_t, DEPOSIT_{it}, CREDIT_{it}]'$ .

The main results will be discussed on the impulse response functions of deposit and credits. Impulse response functions are obtained by the estimated panel-VAR coefficients. The standard errors are calculated by Monte Carlo simulations which are employed for generating confidence intervals. Confidence intervals are generated by taking random draws of the models' coefficients, using the estimated coefficients and their variance-covariance matrix. We take 500 draws, and the fifth and ninety-fifth percentiles are used to construct confidence intervals of the impulse responses. We interpret the impulse responses as significant if the confidence intervals do not contain the zero line, that is, rejecting the null hypothesis that impulse responses are zero.

## 4 RESULTS AND DISCUSSION

Before estimating the panel-VAR model, we test for panel unit roots. Table 16.2 represents the panel unit root test results for the variables used in the regressions. We employ Fisher's panel unit root tests since the test does not need the panel to be balanced. As the null hypothesis of the test is non-stationary, the null has to be rejected in order to conduct the panel-VAR estimations. The panel unit root test results indicate that all the variables are stationary in the panel, thus enabling the panel-VAR estimations.

Figure 16.1 plots the impulse responses of *DEPOSIT* to positive shocks to *VIX*, *GDP*, *IR*, *DEPOSIT* and *CREDIT*. The IRFs show the first six periods after the shock with 90 percent confidence intervals. The results show that the positive shock to *VIX* (increasing risk and uncertainties) has a significantly positive but diminishing impact on the level of *DEPOSIT* in conventional banks in Turkey. This result implies the possible influence of 'search for yield' and 'safe haven' behaviors, whereby risk aversion and historical low interest rates in developed markets generally spurred capital flows into emerging market economies with better yield prospects, especially after the 2008 global financial crisis (Choi, 2015). The relative economic and financial stability within Turkey have also prevented capital outflows during volatile global markets.

The impulse responses to a positive *GDP* shock show that depositors shy away from

Table 16.2 Fisher's panel unit root test results

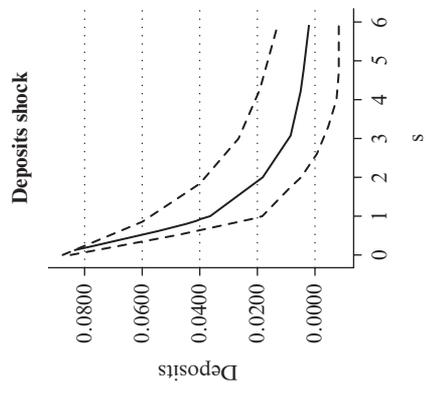
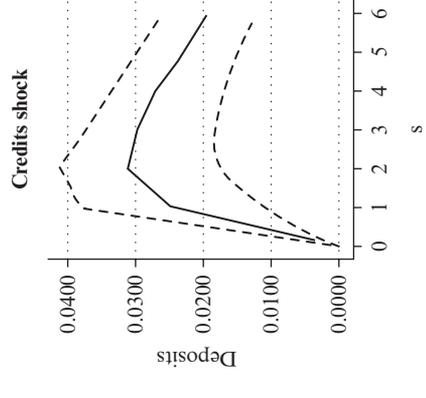
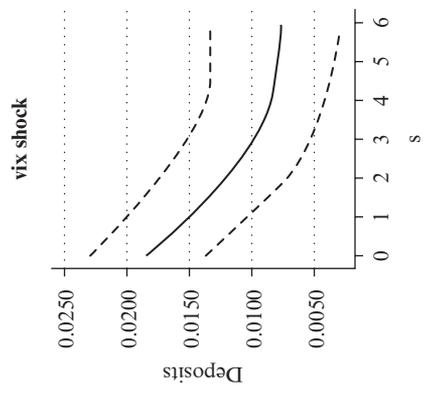
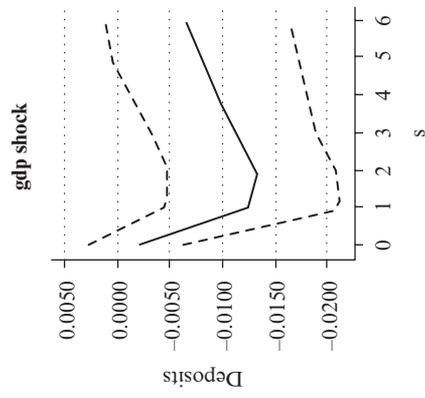
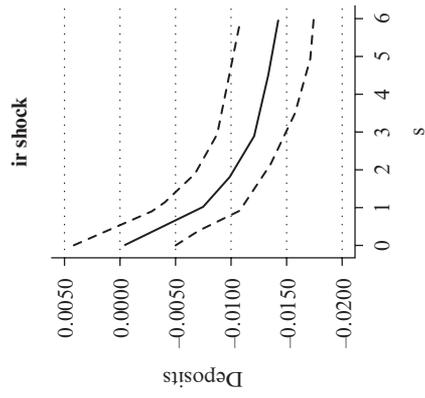
Variable	Chi-square	p-value
<i>CREDIT</i>	103.4226	0.009
<i>DEPOSIT</i>	170.3005	0.000
<i>GDP</i>	240.6838	0.000
<i>IR</i>	224.0227	0.000
<i>VIX</i>	339.6244	0.000

Note: H0: Panels contain unit roots. Ha: Panels are stationary. The estimations assume the process of all the variables is a random walk with non-zero drift.

depositing in a conventional bank. The positive momentum in the economy might have created incentives for real sector investment or other lucrative financial investments, making deposit accounts less attractive for depositors. In terms of monetary contraction, we find that deposits have a significantly negative response, which is consistent with the bank lending channel hypothesis (Gambacorta, 2005). The response of *DEPOSIT* to itself is significant and positive, suggesting some persistence in deposit behavior. Interestingly, positive credit shocks stimulate significantly to deposit money to banks, which suggest that deposits are demand-driven.

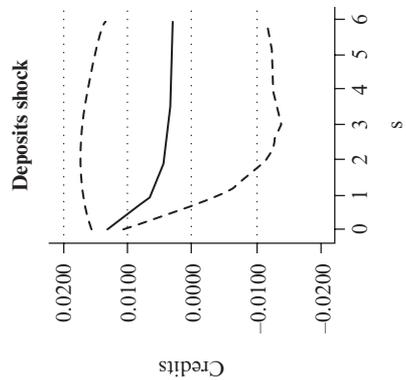
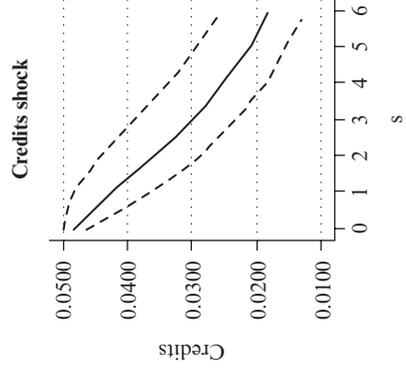
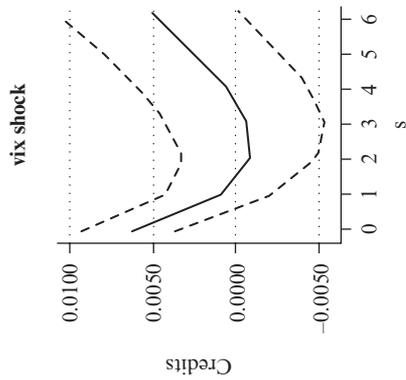
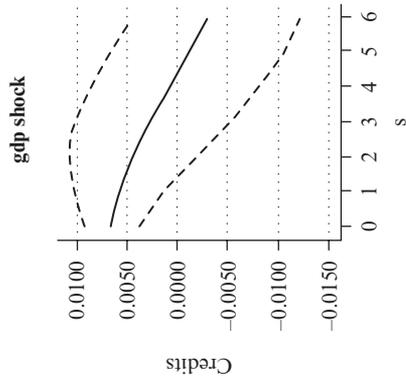
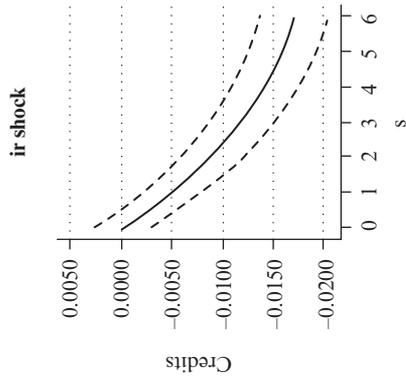
Figure 16.2 shows the response of *CREDIT* in conventional banks to shocks. Credit has a positive response to a positive *VIX* shock although the relationship is insignificant contrary to the corresponding result on deposit in Figure 16.1. In terms of a business cycle shock, conventional bank lending responded positively and significantly to *GDP* shocks until the fourth quarter. This finding is in line with previous literature which shows that banks alter their lending standards depending on the nature of the business cycle (Farmer, 1988; Greenwald and Stiglitz, 1993; Asea and Blomberg, 1998). The variation in banking credit is short-lived in response to *GDP* growth. One suggestive explanation for this finding is that bank-ownership can have a different impact on bank behavior depending on the state of the economy. For instance, Bertay (2014) find evidence that state-owned banks have lent counter-cyclically, especially after the 2008 crisis, to smooth the adverse effects of the crisis on banking activities.<sup>9</sup> The credit cycle appears to be significantly and negatively associated with monetary policy. This finding is in support for the bank lending channel, that is, a negative response of *DEPOSIT* to the shocks to *IR* reduces the capacity of bank lending. Although insignificant, *CREDIT* responds positively to *DEPOSIT* shocks plausibly due to the steady increase of non-deposit liabilities of Turkish conventional banks after 2008.

Figure 16.3 plots the impulse responses of deposits in Islamic banks. One of the notable differences vis-à-vis Figure 16.1 is the positive and significant increase in deposits' response to *VIX*. This is in line with the evidence that Islamic banking sectors are a reliable haven during times of global distress as demonstrated in several recent studies (Hasan and Dridi, 2011; Beck et al., 2013). The other difference in the impulse responses is the pro-cyclical behavior of depositors in Islamic banks. A possible explanation for this pro-cyclical behavior can be related to the different business model adopted by Islamic banks. Islamic banks operate on profit-loss sharing where the returns or losses are



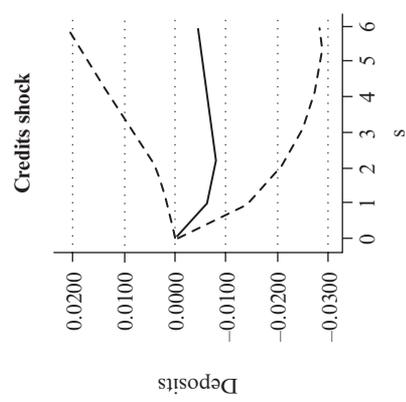
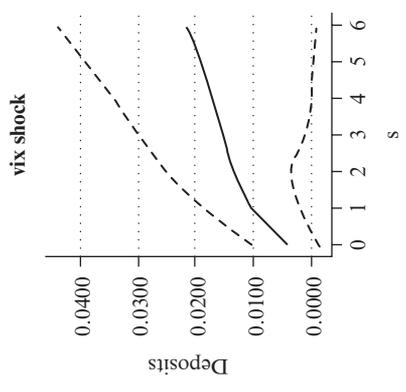
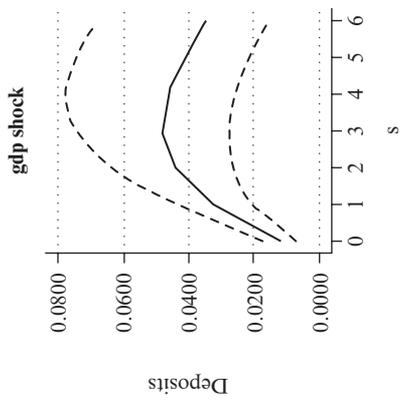
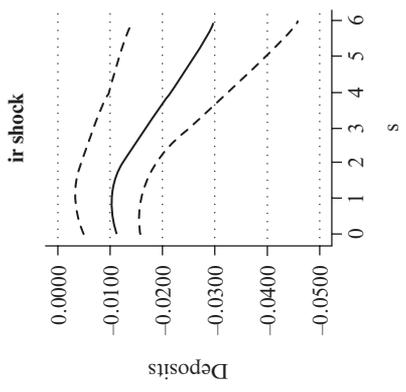
Note: Errors are 5 percent on each side generated by Monte-Carlo with 500 repetitions.

Figure 16.1 Impulse responses of deposits in conventional banks



Note: Errors are 5 percent on each side generated by Monte-Carlo with 500 repetitions.

Figure 16.2 Impulse responses of credits in conventional banks



Note: Errors are 5 percent on each side generated by Monte-Carlo with 500 repetitions.

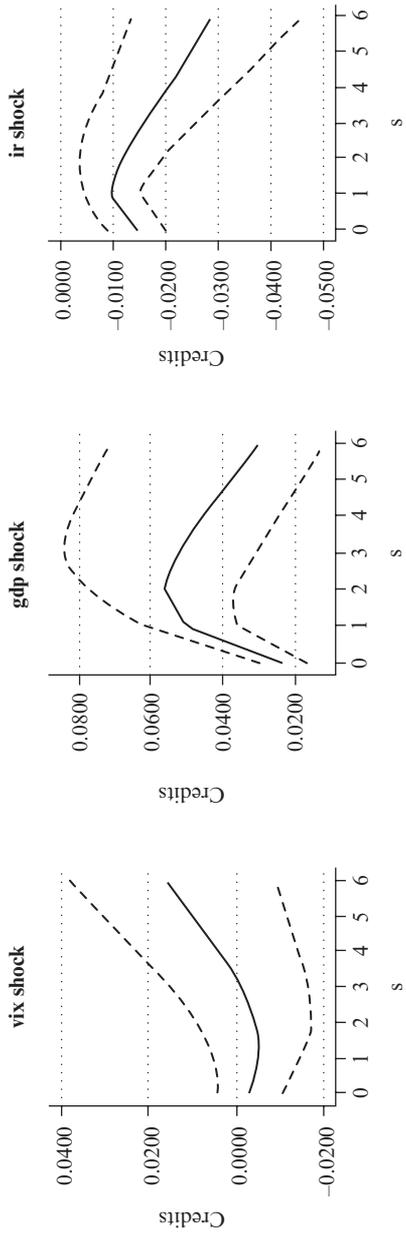
Figure 16.3 Impulse responses of deposits in Islamic banks

shared by the bank and depositors at a pre-agreed ratio. Episodes of a positive growth in the economy are expected to generate net positive profits that will positively reflect on the depositors' share of return. The expected higher return could therefore create more incentives to deposit in Islamic banks. The result also implies that Islamic banking can attract wealth (in the form of deposit) better than its conventional counterparts in times of economic boom during which firms are more profitable and households have higher income. The other responses plotted in Figure 16.3 are basically similar to the findings in Figure 16.1. Because of the presence of displaced commercial risk, Islamic depositors' responses to monetary policy shocks are more sensitive in a dual banking system. This finding is in line with Kassim et al. (2009) who revealed that Islamic banks are more sensitive to monetary policy changes in a dual banking system like Malaysia.

Figure 16.4 shows that responses of *CREDIT* in Islamic banks resemble conventional banks in most cases. A notable difference is the positive and significant response of *CREDIT* to *GDP* shocks. This finding suggests that Islamic banks in Turkey extend credit in a pro-cyclical fashion and is related to the response of deposits mentioned earlier. Following Islamic principles in the encouragement of savings during surplus periods, Islamic banks are expected to lend counter-cyclically to support businesses and households at the time when financing is most needed (Ghafar and Ahmad, 2005).<sup>10</sup> However, it is possible that the pro-cyclicality may imply that Islamic banks are more linked to real production in the economy. This conjecture warrants further investigation in future studies. We also observe that the response of *CREDIT* to *IR* shocks is larger in magnitude. One possible explanation for this finding lies in the higher sensitivity of Islamic depositors to monetary changes as discussed above.

We supplement findings of IRFs with five variable panel-VAR and variance decomposition results. Table 16.3 summarizes the parameter estimates of a five variable panel-VAR model. The parameter estimates of the lagged dependent variable shows the degree of persistence. Credits in conventional banks and deposits in Islamic banks show higher inertia. The dynamics of credits and deposits show significant correlation with monetary policy, business cycle and risk perception in most cases. Policy hikes lead to deposit withdrawals from both types of banks. Business cycle conditions influence Islamic banks' credit more than conventional credit supply. Interestingly, the business cycle seems to exert a diametrically opposite influence to Islamic depositors (0.3668) compared to their conventional counterparts (-0.1474). The deposits and credits at both bank types have a differing relationship with global risk perception. We may consider that deposit levels respond positively to risk aversion and show a tendency toward surges, however Turkish banks still wait for markets to calm down to extend credit. This is interesting in a sense that the uncertainty arising from the 2008 financial crisis has spurred capital flows into certain emerging market countries that are 'decoupled' from the instability in developed markets.

In Table 16.4, we present variance decompositions which show the percentage of the variation in one variable that is explained by the shock to another variable. Deposits of conventional banks, for instance, are almost evenly explained by the variations of all the variables used in the panel-VAR model ten periods ahead. The variance decomposition results also corroborate previous findings: variance decompositions of *CREDIT* and *DEPOSIT* are significantly explained by variations in risk perception. Nonetheless,



Note: Errors are 5 percent on each side generated by Monte-Carlo with 500 repetitions.

Figure 16.4 Impulse responses of credits in Islamic banks

Table 16.3 Main results of a five-variable panel-VAR model deposit and credits responses

Response of	Response to				
	$VIX_{t-1}$	$GDP_{t-1}$	$IR_{t-1}$	$DEPOSIT_{t-1}$	$CREDIT_{t-1}$
<i>Conventional banks (obs: 970)</i>					
$DEPOSIT_t$	0.0014 [0.0006]**	-0.1474 [0.0675]***	-0.0067 [0.0014]***	0.3625 [0.1444]**	0.5203 [0.1559]***
$CREDIT_t$	-0.0003 [0.0003]	0.0342 [0.0328]	-0.0046 [0.0009]***	-0.0619 [0.0847]	0.8787 [0.0799]***
<i>Islamic banks (obs: 120)</i>					
$DEPOSIT_t$	0.0005 [0.0005]	0.3668 [0.1092]***	-0.0027 [0.0017]*	0.9289 [0.1537]***	-0.2140 [0.1691]
$CREDIT_t$	-0.0014 [0.0006]**	0.5019 [0.1142]***	-0.0011 [0.0021]	0.3734 [0.1764]**	0.3020 [0.1809]*

Note: A five-variable panel-VAR model is estimated by GMM. Reported numbers show the coefficients of regressing the row variables on lags of the column variables for each bank type. Heteroscedasticity and serial correlation robust standard errors appear in brackets. \*Statistically significant at 10 percent level; \*\* at 5 percent level; \*\*\* at 1 percent level.

Table 16.4 Variance decompositions

Conventional banks					
	$VIX$	$GDP$	$IR$	$DEPOSIT$	$CREDIT$
$VIX$	0.8014	0.0780	0.0110	0.0549	0.0546
$GDP$	0.0926	0.6107	0.2894	0.0050	0.0023
$IR$	0.2189	0.2474	0.5160	0.0089	0.0088
$DEPOSIT$	0.0713	0.0438	0.0891	0.5235	0.2722
$CREDIT$	0.0242	0.0188	0.1814	0.0253	0.7504
Islamic banks					
	$VIX$	$GDP$	$IR$	$DEPOSIT$	$CREDIT$
$VIX$	0.5448	0.3131	0.0339	0.0923	0.0159
$GDP$	0.1002	0.6975	0.1990	0.0019	0.0014
$IR$	0.4351	0.1157	0.4257	0.0196	0.0038
$DEPOSIT$	0.1599	0.4708	0.2529	0.1063	0.0101
$CREDIT$	0.1008	0.5650	0.2305	0.0595	0.0442

Note: Percentage of variation in the row variable (ten quarters ahead) is explained by the column variable.

$VIX$  and  $GDP$  are explained mostly by the variations in themselves indicating that the shocks to risk perception and economic activity are mostly exogenous, that is, affecting the variables but being hardly affected by the variables. The evolution of the variance decomposition of  $GDP$  suggests that  $GDP$  plays a relatively dominant role in the determination of depositors' and creditors' behavior in Islamic banks compared to

conventional banks. Monetary policy also influences Islamic banks' behavior more than conventional banks.

## 5 CONCLUSION AND POLICY IMPLICATIONS

This study examines bank and depositor behavior to changing macroeconomic conditions, global risk perception and monetary stance in Turkey. We constructed our bank sample as Islamic and conventional to disentangle Shariah and conventional based banking. We find that the impact of heightened global risk perception have been constructive for deposits and credits in Turkey in the last decade. Pervasive risk aversion in advanced countries coupled with the search for yield considerations has paved the way for huge capital flows to emerging market countries. Turkey, with its solid fundamentals and relative resilience after the outbreak of the 2008 financial crisis, have attracted an ample amount of capital internally and externally. We observe a difference in bank behavior between Islamic and conventional banks following a business cycle shock. While positive GDP shocks negatively affect conventional bank deposits, Islamic banks tend to attract more deposits. The results provide evidence that Islamic bank lending in Turkey is more pro-cyclical. Given their community-based priorities, Islamic banks are expected to support their customers during 'bad' times and reduce excessive financing during 'good' times. Our findings also support previous research which showed that Islamic banks are behaving similarly to their conventional counterparts in their monetary stance.

Some policy implications can be drawn for the development of Islamic banking in Turkey. While we have not examined whether the pro-cyclicality of Islamic bank financing is detrimental to businesses and households, future studies could investigate the impact of counter-cyclical regulatory policy on Islamic bank behavior, and assess whether such a policy would have adverse effects on the economy (such as small and medium enterprises, project and infrastructure financing). The shift from interest rate based policy and debt financing have been echoed by several scholars for years, a subject that gained traction particularly since the recent subprime mortgage and Eurozone financial crises. One such example is GDP-linked instruments and alternative monetary policy that are in line with Islamic risk-sharing principles, the viability of which have been extensively discussed by policymakers, regulators, investors and academia. These are important fields of further inquiry that should be seriously explored in future studies.

## NOTES

1. Macroeconomic variables, characteristics of the banking sector and structural characteristics of the country are robustly correlated with banking sector crises as demonstrated by research such as Demirgüç-Kunt and Detragiache (2000).
2. Lending, at over 6 percent GDP growth, is 2.5 times higher than approximately zero GDP growth.
3. KFH Research Limited in Bank Negara Malaysia MIFC Insights Report on 'Innovations drive expansion of global Islamic finance industry', 12 June 2014.
4. Two hundred and nine listed banks across 21 countries from 2005 to 2009 were used to examine impact of global financial crisis on stock market performance of banks.
5. We also refer to Aysan et al. (2015) who verify the presence of depositor discipline in the Turkish Islamic banking market.

6. There is a small body of literature on Islamic financial instruments for monetary policy and fiscal management, discussion of which is beyond the scope of this article (Sundararajan et al., 1998; Haque and Mirakhor, 1999).
7. The financing-to-deposit ratios of most banks are under 90 percent and short-term asset-liability ratio approximately 80 percent of the liabilities payable within 90 days (Islamic Financial Services Board, 2015).
8. The government's support to the sector by allowing the largest state-owned bank, Ziraat Bank, to launch its first Islamic banking branch in May 2015 is expected to further increase the share of Islamic banking.
9. There are three state-owned conventional banks in Turkey with sizeable market share.
10. See Chapter Yusuf verses 46–49 of the Quran.

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APPENDIX 16A.1

Table 16A.1 List of conventional and Islamic banks in Turkey at 31 December 2012

	Total assets	Total loans	Total deposits	Total share-holders' equity	No.of branch offices	No.of emp'ees
Conventional banks						
Türkiye İş Bankası A.Ş.	175444	107142	105383	22719	1250	24411
T.C. Ziraat Bankası A.Ş.	162868	71426	118966	17167	1514	23153
Türkiye Garanti Bankası A.Ş.	160192	91824	87482	21309	933	17285
Akbank T.A.Ş.	155854	87656	86105	21913	962	16315
Yapı ve Kredi Bankası A.Ş.	122180	75769	68044	16862	928	14733
Türkiye Halk Bankası A.Ş.	108282	65894	79974	12323	821	14971
Türkiye Vakıflar Bankası T.AO.	104580	68133	67242	11918	744	13463
Finans Bank A.Ş.	54402	36440	32922	7325	582	12060
Denizbank AŞ.	44198	28191	26696	5030	610	10280
Türk Ekonomi Bankası AŞ.	43532	29686	28727	4806	509	9288
HSBC Bank A.Ş.	25299	15422	14206	3050	338	6170
ING Bank A.Ş.	25115	18842	14430	3072	319	5319
Şekerbank T.AŞ.	14518	9974	10138	1825	272	3565
Alternatifbank A.Ş.	7969	5201	4176	569	63	1230
Citibank AŞ.	7420	2987	5172	1028	37	2123
Anadolubank AŞ.	6291	4176	3921	1160	91	2024
Burgan Bank AŞ.	4442	2905	3265	642	60	976
Fibabanka AŞ.	3900	3221	2689	383	28	612
Tekstil Bankası AŞ.	3677	2660	2715	573	44	841
Odea Bank A.Ş.	3634	1732	2517	514	6	396
Turkland Bank A.Ş.	2966	2017	2149	367	27	524
Arap Türk Bankası A.Ş.	2748	736	1030	413	7	272
Deutsche Bank AŞ.	1297	382	431	515	1	105
The Royal Bank of Scotland Plc.	1019	222	469	456	3	95
Turkish Bank AŞ.	956	396	617	166	19	276
Société Générale (SA)	594	395	127	113	16	282
JPMorgan Chase Bank N.A.	429	0	136	279	1	56
Bank Mellat	408	30	210	184	3	57
Portigon AG	271	25	48	172	1	40
Habib Bank Limited	74	31	10	45	1	17
Adabank A.Ş.	50	0	6	43	1	32
Subtotal	1244610	733517	770005	156937	10191	180971

Table 16A.1 (continued)

	Total assets	Total loans	Total deposits	Total shareholders' equity	No. of branch offices	No. of employees
Islamic banks						
Albaraka Türk	12 328	9 075	9 225	1 218	137	2 758
Bank Asya	21 390	16 085	15 742	2 349	250	5 064
Kuveyt Türk	18 911	11 848	12 755	1 684	221	3 939
Türkiye Finans	17 617	12 971	11 430	2 125	220	3 595
Subtotal	70 245	49 980	49 151	7 377	828	15 356
Banking sector total	1 314 855	783 497	819 157	164 314	11 019	196 327

Note: Total assets, total loans, total deposits and total shareholders' equity are expressed in Million of TL.