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# EFFECTS OF DEPOSIT INSURANCE SYSTEM ON BANKS' RISK TAKING INCENTIVES IN TURKEY*

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**ABSTRACT**

Deposit insurance is an insurance system that guarantees bank deposits of people in case of bank failure or a run on the bank. Deposit insurance in Turkey is handled by Savings Deposit Fund Insurance and according to the latest regulations compensation limit covers a maximum of 100,000 TL per depositor per member institution. The system is adopted in most countries and has various advantages for both individuals and banks. However academic debates commonly focus on whether this system encourages banks to take excessive risks. In this context the purpose of this study is to analyze the link between deposit insurance and banks' risk taking. For this purpose, a panel regression analysis is applied to the ratio of deposits under insurance to total deposits and basic risk measures of banks operating in Turkey during 2002Q4-2013Q1. Results suggest that, higher insured deposit ratios are related to higher credit risk and interest rate risk but lower liquidity risk and overall default risk.

## 1. INTRODUCTION

Banking sector is special with its nature of financing long term investments with relatively short term deposits. This feature makes banks vulnerable to various types of risks both from market and from themselves. One of the threats towards banking system is the sudden withdrawals of large amount of deposits and this is known as bank runs. According to Diamond and Dybvig (1983), during a bank run, depositors scour about withdrawing their deposits since they expect the bank to fail. Following this sudden withdrawals, banks can be forced to liquidate their assets at a loss and fail. With many bank failures, monetary system may be disrupted and production can be reduced (Diamond, Dybvig, 1983:401).

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This brings the need of applying some regulatory techniques to maintain "safety and soundness" of banks. Deposit insurance system is used as a regulatory tool in most countries for many years. The aim of such a system is to provide banking sector's stability preventing banks from being subject to runs. Carapella and DiGiorgio (2004:77) define this system as:

> "*…an instrument through which the banking system guarantees that funds deposited by the public in a bank are independent of solvency and liquidity conditions of the bank itself, so that depositors may be sure of being reimbursed at any time*".

Deposit guarantees are designed to protect small and usually uninformed depositors (Silva, 2008:28) from losses depending on bank defaults, while protecting banking system's stability (Aydın, Başar, et al., 2006:246). Thus, it reduces the likelihood of bank panics and protects banks from facing the problem of excessive and unexpected deposit withdrawal (Şıklar: 2004:243). With strong institutions and proper safeguards, explicit deposit insurance can reduce or even stop bank runs (McCoy, 2006:1).

Deposit insurance system has various advantages for both depositors and banks. However academic debates commonly focus on whether this system is a source of moral hazard which reduces incentives of depositors to monitor their banks while encourages banks to take excessive risks (Silva, 2008; Beck, 2008:8; Boyd, De Nicola, 2005:1330; Bartholdy, Boyle et al., 2003:701; Bossone, 2000; Wheelock, Wilson, 1994:57) knowing that they are underwritten by the insurance scheme (The Economist: 2013). When explicit deposit insurance is not done carefully, it can fuel bank crises by giving banks perverse incentives to take unnecessary risks (McCoy, 2006:1).

Deposit insurance schemes were introduced in 1930s as a reaction to the effects of Great Depression on banking systems. In Turkey, the system is first implemented in 1933 and taken its final form with regulations in February 2013. Deposit insurance in Turkey is handled by Savings Deposit Fund Insurance and after the latest regulations compensation limit covers a maximum of 100,000 TL (50,000 TL during July 2004-February 2013, full coverage during July 2003-July 2004) per depositor per member institution. From this point of view, the purpose of this study is to investigate whether the proportion of insured deposits affects the risk taking incentives of individual banks. According to our knowledge, this is the first study which analysis the bank level effects of deposit insurance system in Turkey. Originality of the study also depends on the deposit insurance variable used in the analysis. Unlike other studies, deposit insurance variable is measured as insured deposits to total deposits.

The rest of this paper is organized as follows: Section 2 looks at the related literature. In Section 3, I introduce data and methodology used in the empirical analysis. This section also presents the empirical findings. Finally in Section 4, I conclude.

## 2. LITERATURE REVIEW

Demirgüç-Kunt and Detragiache (1999) tested the effect of deposit insurance on bank stability. Using the data of 61 countries during 1980-1997, the study found that explicit deposit insurance tends to be detrimental to bank stability.

Ninimaki (2000) analyzed the joint effect of competition and deposit insurance on banks' risk taking when the riskiness of banks can not be observed by depositors. According to the results, if the bank is monopoly or banks compete only in the loan market, deposit insurance has no effect on risk taking. But introduction of deposit insurance triggers risk taking if there is competition in deposit market.

Leaven (2002) calculated the annual implicit cost of deposit insurance and related it with ownership, size and credit growth of banks. Credit growth demonstrates banks' risk taking behavior because according to the author, banks often take risks in the form of excessive credit growth. The study indicates that high costs of deposit insurance is related to the concentrated private ownership, affiliation with a business group, small size, high credit growth, low GDP per capita, high inflation, poor quality and enforcement of laws and low penetration of foreign banks. Results support the view that there is positive relationship between deposit insurance and banks' moral hazard. The author also suggests that as a proxy of bank risk, cost of deposit insurance can be used in prediction of bank failures.

Bartholdy, Boyle et al. (2003) used data from 13 countries to investigate the relationship between deposit insurance and deposit risk premiums. Results suggest that insured deposits have a lower risk premium compared to the uninsured deposits. Another result of the study is that relationship between the risk premium and the maximum dollar value of insurance coverage is non-linear that means moral hazard incentives are recognized and priced by investors.

Gueyie and Lai (2003) compared the risk taking behaviors of banks in Canada before and after the implementation of deposit insurance system in 1967. They found that total risk, market risk, asset risk and residual risk were higher after the introduction of deposit insurance while interest-rate risk decreased after 1967.

Gropp and Vesala (2004) investigated the impact of deposit insurance on EU banks' risk taking during 1990s. The results suggest that the introduction of explicit deposit insurance system may significantly reduce risk taking. The authors also found some evidence that explicit deposit insurance might be a useful way to limit the safety net, increase market monitoring of banks and reduce moral hazard.

Gonzalez (2005) used data of 251 banks in 36 countries over the 1995-1999 period and investigated the effects of bank charter value (measured as Tobin's Q) and the presence of deposit insurance in a country on two kinds of bank risks (credit risk and overall risk). It is found that deposit insurance encourages banks to engage in risk-shifting, and that the quality of contracting environment in a country reduces risk-shifting incentives created by deposit insurance.

Wu and Chi (2006) aimed to find out the relationship between competition and risk taking. They found that this relationship depends on the interactions of market structure between loan and deposit markets, deposit insurance and depositors' risk aversion.

Focusing on the effects of deposit insurance, the results suggest that with full deposit insurance coverage an increase in competition for deposit will trigger moral hazard problem while an inverse impact occurs under competition for loan. If the deposit insurance system is not introduced, then the risk taking behaviors of banks depend on depositor's risk internalization.

Pennacchi (2006), developing a model considering deposit insurance and its effect on banks' choice of risk, suggests that actuarially fair premiums are correct assessments for insuring independent risks, but create moral hazard when assessed to insure systematic risks. According to the author, actuarially fair premiums for deposit insurance and risk-based capital standards may induce banks to increase their insurance subsidy by concentrating their lending and off-balance sheet activities in highly systematic risks.

Leaven and Levine (2008) assessed the relationships among risk taking of banks, ownership structures and national bank regulations including deposit insurance system. The results suggest that the impact of deposit insurance on banks' risk taking varies depending on the ownership structure of banks. If the bank is widely-held, deposit insurance has not have a significant impact on risk taking. On the other hand if bank has a majority owner, bank risk increases significantly with an increase in deposit insurance.

Silva (2008) has introduced deposit insurance in a model of information based bank runs. Results show that the net effect of deposit insurance on the equilibrium demand deposit contract is to raise its value and also the risk of runs. So deposit insurance induces moral hazard.

Ioannidou and Penas (2010) analyzed the effect of deposit insurance on the risk taking behavior of banks. Using the case of Bolivia, the authors compared the risk taking behavior of banks before and after the introduction of deposit insurance system in December 2001. Their main findings indicate that the introduction of deposit insurance system led to an increase in the probability of a bank originating a subprime loan. The results also suggest that banks do not increase collateral requirements or decrease loan maturity to compensate for the extra risk. Cross sectional analysis confirm the consequence that banks take more risk after the deposit insurance system is introduced.

Angkinand and Wihlborg (2010) analyzed whether deposit insurance systems and ownership structures of banks affect the degree of market discipline on banks' risk taking. They found that total effect of explicit deposit insurance coverage on risk taking is shown as a U-shaped curve. This indicates that risk taking is minimized at a positive and partial insurance coverage level where market discipline is at its strongest.

Ng, Lim et al. (2010) searched the relation between explicit deposit insurance and risk taking of banks in Malaysia during 2004-2007. The authors found that explicit deposit insurance had different effects on various risk factors. After the introduction of deposit insurance scheme, only two risks, interest rate risk and risk-weighted capital ratio deteriorated. Deposit rate, credit risk, liquidity risk and core capital ratio were not significantly changed for the post-introduction period.

DeLong and Saunders (2011) analyzed the effects of fixed-price deposit insurance introduced in 1993 on risk-taking of banks and on depositor discipline in the United States.

Results suggested that in the 3 years after the implementation of the system, banks generally became riskier. But banks better performed banks before the system reduced their risk level after deposit insurance. On the other hand, depositors were not concerned that banks became riskier.

Forsbaeck (2011) studied the effects of market discipline by creditors and ownership structure on banks' risk taking in the presence of deposit insurance.

Risk Proxies used in the study were Non-performing loans/equity and z-score. Author found a negative but relatively small effect of market discipline on risk. Results suggested that market discipline had a negative effect when risk is measured as non-performing loan ratio, whereas the effect on the Z-score is not statistically significant.

Abdullah and Ahmad (2012) aimed to search weather the risk taking behaviors of Islamic Banks in Malaysia differ before and after the deposit insurance implementation. Study covers 18 Islamic banks' yearly data of 2002-2010 periods. Results suggest that the Islamic banks have significantly higher operational risk (equity to asset ratio and overhead to asset ratio) after the introduction of deposit insurance. On the other hand, an effective design feature of deposit insurance system has deterred the Islamic banks from increasing their financial risk (non-performing financing to gross loans and non-performing financing to asset ratios) taking.

Yoon and Jun (2012) assessed the effects of the increase in deposit insurance coverage on banks' risk taking in the U.S. Three different types of risk were measured: systematic risk, unsystematic risk and total risk. It is found that the increase in deposit insurance coverage encourages banks to take more risk.

Le (2013) aimed to analyze the effects of deposit insurance on banks' risk taking particularly focusing on leverage. Using z-score as the proxy of risk, results obtained from the study suggested that after introduction of deposit insurance, a significant increase in bank risk of insolvency was observed.

Enkhbold and Otgonshar (2013) examined the effects of deposit insurance on banks' risk taking incentives. Using a panel data of 401 banks from 31 Asian countries over the period from 2000 to 2010, effects of three groups of independent variables (bank specific, country specific and deposit insurance variables) on three different types of risk (overall default risk, credit risk and liquidity risk) is examined. Their results suggest that implementation of deposit insurance helps to stabilize the banking system whereas encourages banks to undertake excessive risks.

Anginer et al. (2014) used a sample of 4109 publicly traded banks in 96 countries and examined the impact of deposit insurance on bank risk and systematic stability separately for the crisis period from 2007 to 2009 and former three-year-period leading up to the crisis. Using an ordinary least squares technique, they found that deposit insurance dummy is associated with lower systemic risk in crisis years but higher bank systemic risk in non-crisis years, and overall effect of deposit insurance over the entire sample period is negative. Risk is proxied by z-score and stock return volatility.

## 3. METHODOLOGY AND DATA

### 3.1. Data and Variables

Following the empirical literature, the main hypothesis of this study is that banks tend to take more excessive risks if their ratio of insured deposits to total deposits is higher. In order to investigate this assumption, I applied regression analysis to the balanced panel data set of 1092 observations including 26 banks and 42 quarters over 2002Q4-2013Q1 period.

In this study, I aimed to understand the effects of the insured deposits/total deposits ratio (as the proxy of explicit deposit insurance) on banks' risk appetite. For investigating banks' risk taking behaviors, following variables are selected:

**Table 1: Definition of Variables**

| Variables | Acronyms | Definition |
|---|---|---|
| **Dependent Variables (Risk Indicators)** | | |
| Credit Risk | NPL | Non-performing loans/total loans |
| Liquidity | LIQ | Liquid assets/short term liabilities |
| Interest Rate Risk Exposure | INT | Interest rate sensitivity of balance sheet and off-balance sheet position/total capital[1] |
| Overall Default Risk | Z-score | Equity to total assets plus net profit over average total assets (ROAA) divided by standard deviation of ROAA |
| **Independent Variables** | | |
| Deposit insurance | DI | Insured deposits/total deposits |
| Capital Adequacy Ratio | CAR | Capital as a fraction of risk-weighted assets |
| Loan Growth | LOAN | Loans/Deposits |
| Scale | TA | Logarithm of total assets |
| Return over Assets | ROA | Net profit/Total assets |

Whole data set is obtained from the web page of the Banks Association of Turkey (www.tbb.org.tr).

### 3.2. Methodology

To analyze the effects of deposit insurance on banks' risk taking, I used bank level data of 26 banks continually operated in Turkey during 2002Q4-2013Q1. Effects of insured-deposit-rates on several risk factors are analyzed separately. So the key independent variable is deposit insurance (DI). And I have established four regression models for testing the hypothesis.

[1]Ratio of the difference between the liabilities subject to reprising within one year and the assets subject to reprising within one year plus off-balance sheet position to total capital

*Model 1:* Effect of Deposit Insurance on Credit Risk

$$NPL_{it} = \alpha_{it} + a_1 DI_{it} + a_2 CAR_{it} + a_3 LOAN_{it} + a_4 TA_{it} + a_5 ROA_{it} + e_{it} \quad (1)$$

I used non-performing loans to total loans ratio as the proxy of Credit Risk. In earlier studies which investigated the effects of deposit insurance on banks' credit risk, different results obtained. Ng et al (2010) used loan-loss provisions to total assets as the proxy of Credit Risk but they did not find a significant result basing on their analysis.

On the other hand, Forssbaeck (2011) interpreted non-performing loans to equity as the proxy of asset risk and found that the risk effect of market discipline (deposit insurance) is negative when risk is measured as the ratio of non-performing loans. Enkhbold and Otgonshar (2013) used non-performing loan to gross loans ratio to measure the credit risk and their results suggested that deposit insurance had a negative effect on credit risk. Gonzalez (2005) used non-performing loans to total loans ratio and found a positive relation with deposit insurance. Gropp and Vesala (2004) measured asset risk by using the share of problem loans in total assets. Their results suggest that introduction of explicit deposit insurance is associated with lower asset risk.

*Model 2:* Effect of Deposit Insurance on Liquidity Risk

$$LIQ_{it} = \alpha_{it} + b_1 DI_{it} + b_2 CAR_{it} + b_3 LOAN_{it} + b_4 TA_{it} + b_5 ROA_{it} + e_{it} \quad (2)$$

Liquidity is defined as the ratio of liquid assets to short-term liabilities. So when the value of the variable is higher, liquidity risk should be interpreted lower. Same variable is used in the studies of Ng et. al (2010) and Enkhbold and Otgonshar (2013). Ng et. al. (2010) suggested that liquidity risk did not increase after the introduction of deposit insurance. On the other hand, Enkhbold and Otgonshar (2013) found a positive relationship between deposit insurance and Liquidity variable which indicates a decrease in liquidity risk.

*Model 3:* Effect of Deposit Insurance on Interest Rate Risk

$$INT_{it} = \alpha_{it} + c_1 DI_{it} + c_2 CAR_{it} + c_3 LOAN_{it} + c_4 TA_{it} + c_5 ROA_{it} + e_{it} \quad (3)$$

Interest rate risk exposure of each bank is measured by the ratio of difference between the liabilities subject to reprising within one year and the assets subject to reprising within one year plus off-balance sheet position to total capital. Gueyie and Lai (2003) found that introduction of Deposit Insurance in Canada in 1967 decreased interest rate risk. Using the same variable, Ng et. al. (2010) found that the interest rate risk increased after the introduction of deposit insurance scheme in Malaysia.

*Model 4:* Effect of Deposit Insurance on Overall Default Risk

$$Zscore_{it} = \alpha_{it} + d_1 DI_{it} + d_2 CAR_{it} + d_3 LOAN_{it} + d_4 TA_{it} + d_5 ROA_{it} + e_{it} \quad (4)$$

Forssbaeck (2011), Le (2013), Enkhbold and Otgonshar (2013) and Anginer et. al. (2014) used Z-score as the proxy of overall default risk in their analysis. Anginer et. al. (2014) found that in crisis years, effect of deposit insurance on z-score is positive and in pre-crisis years it is negative. Le (2013) found that introduction of deposit insurance increases overall bank risk. Forssbaeck (2011) did not find a statistically significant effect of deposit insurance on z-score. Similar result is obtained by Enkhbold and Otgonshar (2013). Authors found a positive but an insignificant coefficient.

In all models;

i= refers to individual bank

t= refers to time (each quarter)

a, b, c, d= refers to the coefficients of variables

α= refers to the constant term

e= refers to the error term

Definitely, insured-deposits-rate is not the only variable which determines the risk levels of banks; but the others wouldn't be considered in the context of this study. In line with the empirical literature, four independent variables which are expected to be interacted with risk factors are selected. These variables are Capital Adequacy Ratio (Huang, 2005), Loan Growth (Gueyie and Lai, 2003; Ng et. al., 2010), Scale (Gueyie and Lai, 2003; Ioannidou and Penas, 2010; Forssbaek, 2011; Yoon and Jun, 2012; Enkhbold and Otgonshar, 2013; Anginer et. al., 2014), and Return over Assets (Ioannidou and Penas, 2010; Anginer et. al., 2014).

The data set includes both time series and cross section. Because of the double individual dimensions of the data, an Ordinary Least Squares (OLS) technique which is suitable to use for the econometrics of panel data is applied (Batisse, 2001).

One of the basic assumptions of Panel Data Regression models is the stationarity of variables. To analyze the variables for their stationarity I applied basic unit root tests (Levin, Lin & Chu; Im, Pesaran and Shin; ADF and PP). Table 2 demonstrates the test results and stationarity levels of each variable. Probabilities lower then %5 allows us to reject the null-hypothesis which states that the variable includes unit root. Data which doesn't include unit root can be accepted stationary.

**Table 2: Unit Root Test Results**

| Variables | Levin, Lin & Chu | | Im, Pesaran and Shin | | ADF | | PP | | Stationarity |
|---|---|---|---|---|---|---|---|---|---|
| | Statis. | Prob. | Statis. | Prob. | Statis. | Prob. | Statis. | Prob. | |
| DI | -1.98155 | 0.0238 | -3.89136 | 0.0000 | 90.3879 | 0.0008 | 127.987 | 0.0000 | Level |
| INT | -3.11806 | 0.0009 | -4.40047 | 0.0000 | 107.932 | 0.0000 | 146.446 | 0.0000 | Level |
| LIQ | -66.6354 | 0.0000 | -23.8855 | 0.0000 | 174.645 | 0.0000 | 272.264 | 0.0000 | Level |
| NPL | -18.5117 | 0.0000 | -11.6510 | 0.0000 | 143.119 | 0.0000 | 185.052 | 0.0000 | Level |
| Z-score | -6.20775 | 0.0000 | -6.27563 | 0.0000 | 135.119 | 0.0000 | 148.435 | 0.0000 | Level |
| CAR | -5.44380 | 0.0000 | -5.60425 | 0.0000 | 136.197 | 0.0000 | 165.627 | 0.0000 | Level |
| LOAN | -4.17037 | 0.0000 | -2.42461 | 0.0077 | 77.8872 | 0.0116 | 134.326 | 0.0000 | Level |
| ROA | -9.01671 | 0.0000 | -16.2121 | 0.0000 | 352.664 | 0.0000 | 603.592 | 0.0000 | Level |
| TA | -11.4948 | 0.0000 | -18.1253 | 0.0000 | 406.287 | 0.0000 | 699.734 | 0.0000 | 1st differ. |

In prediction of panel regression models, two basic models are used according to the intercept, slope coefficients and error term: Fixed Effects Model and Random Effects Model. Hausman Test is applied to select between Fixed and Random Effect Models. The test quantifies the acceptability of Random Effects Model.

Probability values higher than %5 states that the null-hypothesis can not be rejected (Random Effects should be selected). Table 3 shows the results of Hausman Tests and regression model chosen for each model.

**Table 3: Hausman Test Results**

| Correlated Random Effects - Hausman Test | | | | |
|---|---|---|---|---|
| **Models** | **Chi-Sq Statistic** | **Chi-Sq d.f.** | **Prob.** | **Regression Model** |
| Model I | 58.261171 | 5 | 0.0000 | Fixed Effects |
| Model II | 119.919081 | 5 | 0.0000 | Fixed Effects |
| Model III | 61.102597 | 5 | 0.0000 | Fixed Effects |
| Model IV | 6.713608 | 5 | 0.2428 | Random Effects |

### 3.3. Empirical Results

After deciding the model according to the Hausman Tests, four regression models are run to determine the effects of deposit insurance system and other independent variables on risk indicators. In Table 4, coefficients and significances of independent variables for each model can be seen. Findings of the regression analysis show that all risk factors are determined by different factors.

**Table 4: Regression Results**

| Dependent Variable | DI | | CAR | | LOAN | | ROA | | TA | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Coeff. | Prob. | Coeff. | Prob. | Coeff. | Prob. | Coeff. | Prob. | Coeff. | Prob. |
| NPL | 0.124362 | 0.0000* | -0.001 | 0.4604 | -0.004 | 0.0162* | 0.229757 | 0.2074 | -0.038 | 0.2400 |
| LIQ | 1.118272 | 0.0001* | -0.001 | 0.9250 | -0.031 | 0.2096 | 1.313006 | 0.5941 | -0.003 | 0.9944 |
| INT | 0.070594 | 0.0158* | -0.001 | 0.0269* | -0.004 | 0.1339 | 0.224895 | 0.3738 | -0.197 | 0.0000* |
| Z-score | 1.569527 | 0.1134** | 0.001274 | 0.0397* | -0.098 | 0.2498 | 3.680432 | 0.6694 | -6.417 | 0.0000* |

*Significant at %5 significance level
**Significant at %15 significance level

### 3.3.1. Effects of Control Variables on Banks' Risks

Credit risk (NPL) is determined by Loan to Deposits ratio (LOAN) and the direction is negative. It means when banks are more effective at turning deposits to credits, non-performing loans get lower. This finding indicates that banks which are more efficient as intermediaries are also more successful in credit management.

Capital Adequacy Ratio (CAR) and Size (TA) are significant variables for both Interest Rate Risk (INT) and overall default risk (Z-score). Z-score refers to distance to insolvency so when its value is higher, risk level is lower. The result suggests that larger banks tend to take more risks in terms of insolvency.

The positive relation between size and risk appetite (negative relation between TA and Z-score) might be interpreted as larger banks in Turkey fall into trap of "too-big-to-fail[2]" status.

On the other hand, interest rate risk decreases by size which means larger banks enjoys the advantage of scale economies to compensate the maturity mismatches among their assets and liabilities.

High capital adequacy ratios are negatively related with both interest rate risk and overall default risk. However we can't say that these relations are strong because of its low coefficients. Still negative coefficients express that strong capital structure makes banks to avoid extra risk in order to satisfy their shareholders.

### 3.3.2. Effects of Deposit Insurance on Banks' Risks

Applying OLS technique to the panel data set, it is found that the effect of deposit insurance is highly significant for three dependent variables. These are credit risk, liquidity risk and interest rate risk. The directions of these effects are varied among risk factors.

[2] "Too-big-to-fail": Failure of large companies (or banks) may have deteriorating effects on the sector they operate in and even on whole economy. So governments would prefer to subsidize these companies and save them from failure. This conservative attitude of governments encourages large companies pursuing high profits to take excessive risks.

Results suggest that the amount of insured deposits over total deposits has a positive and significant effect on Non-performing Loans (NPL) supporting the "*moral hazard"* argument. According to this argument, deposit insurance makes banks less sensitive in screening and monitoring of loans and this attitude increases the level of NPL. Interest rate sensitivity (INT) is also affected positively by DI. It means that banks become less careful in matching assets and liabilities according to the time remaining to reprising.

Contrary to our expectations, liquidity risk and overall default risk are related negatively with insured deposit rates. Anyone of our independent variables doesn't have a significant effect on Liquidity Risk except DI. Effect of DI on liquidity (LIQ) is significant and the direction of this effect is positive. We expected that when the insured deposit rate was higher, i.e. bank's responsibility was undertaken by government, bank's incentive to invest in liquid assets in order to meet its obligation would be destroyed. But positive coefficient indicates that this assumption is not prevalent for banks in Turkey which means banks with higher insured deposit ratio operate with higher liquidity ratio. Overall default risk (z-score) also has a positive coefficient but the result can be accepted significant only at %15 significance level. Z-score measures the distance of a bank from insolvency. Higher Z-score indicates that bank has a lower possibility of being insolvent. According to our results, when banks have higher insured deposits, they tend to reduce their overall default risk. These results probably suggest that banks tend to operate with high liquidity ratio and lower overall default risk in order to reduce their risk exposure and pay fewer premiums for insurance. These results may also show the stabilizing effect of deposit insurance on financial markets like Enkhbold and Otgonshar (2013) expressed.

## 4. CONCLUSION

Deposit insurance is a system which guarantees repayments of deposits to depositors and in this way protects financial system's stability preventing bank runs. However, there is a common suspicion in academic literature on whether this system leads banks to behave less prudently and encourages them to take excessive risks. This question is widely investigated in academic researches and common view is that the system is a source of moral hazard.

In Turkey, deposit insurance system is being held for many years under various politic attitudes. For example during 1990s, deposit insurance covered 100% of deposits in each bank. In 2004 coverage limit was discounted to 50,000 TL and since February 2013 coverage limit is 100,000 TL for each depositor in each bank. In this context, the aim of this study is to determine what kind of results occurs at bank level by implementing the system. To analyze the possible effects of deposit insurance system on bank risks, I applied Ordinary Least Squares method to the bank level data including a panel of 26 banks operated in Turkey during 2002Q4-2013Q1. The key independent variable of this study is the amount of insured deposits over total deposits (DI). The aim of the study is to determine the effects of DI on various kinds of risk factors. I considered four risk factors which are credit risk (NPL), interest rate risk (INT), liquidity risk (LIQ) and overall default risk (Z-score).

Supporting the moral hazard argument, results suggest that deposit insurance raises credit risk which is proxied by non-performing loan ratio and interest rate risk. On the other hand, deposit insurance seems to have a stabilizing effect on banking markets in terms of liquidity and insolvency.

Basing on these findings, a trade-off between benefits and costs of deposit insurance system which is implemented in Turkey can be seen. In order to solve this trade-off, it can be suggested that regulatory institutions should focus on the moral hazard of banks to eliminate the adverse effects of the system.

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