

The link between deposit insurance And banks' risk taking

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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. The system is first introduced in 1933 for Turkey and taken its final form with regulations in 2004. Deposit insurance in Turkey is handled by Savings Deposit Fund Insurance and according to the latest regulations compensation limit covers a maximum of 50,000 TL per depositor per member institution. Deposit insurance system which is adopted in most countries has various advantages for both individuals and banks. However academic debates commonly focus on whether this system encourages banks to take excessive risk. In this context the purpose of this study is to analyze the link between deposit insurance and bank 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 2004-2010.

Keywords: Deposit insurance, bank risk taking, panel data regression.

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 which is known as bank runs. 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).

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).

In Turkey, the system is first introduced in 1933 and taken its final form with regulations in 2004. Deposit insurance in Turkey is handled by Savings Deposit Fund Insurance and according to the latest regulations compensation limit covers a maximum of 50,000 TL per depositor per member institution. From this point of view, the purpose of this study is to investigate whether the amount 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 proxy variable used in the analysis.

The rest of this paper is organized as follows: Section 2 looks at the related literature. Section 3 describes data and variables and Section 4 introduces the methodology used in our empirical analysis. Section 5 presents the empirical findings. Finally in Section 6 we 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. In a similar study, 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.

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.

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.

Leaven and Levine (2008) assessed the relationships among risk taking of banks, their ownership structures and national bank regulations including deposit insurance system. Their 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.

3. Data and Variables

To analyze the effects of deposit insurance on banks' risk taking, we used annual bank level data of 27 banks continually operated in Turkey during 2004-2010 (from the beginning of implementation of the latest deposit insurance regulation to the present). Following Ng, Lim, et al. (2010), we aimed to understand the effects of the insured deposits/total deposits ratio (as the proxy of explicit deposit insurance) on banks' risk taking and activities. For investigating banks' risk taking behaviors, following variables are selected:

Table 1: Definition of Variables

Variables	Acronyms	Definition
Deposit insurance	DI	Insured deposits/total deposits
Credit Risk	NPL	Non-performing loans/total loans
Liquidity Risk	LIQ	Liquid assets/short term liabilities
Interest Rate Risk Exposure	INT	Interest rate sensitivity of balance sheet and off-balance sheet position/total capital*
Capital Adequacy Ratio	CAR	Capital as a fraction of risk-weighted assets

4. Methodology

Following the existing 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, we applied regression analysis to our panel data set of 189 observations including 27 banks and 7 years. Effects of insured-deposit-rates on several risk factors are analyzed separately. So our key independent variable is deposit insurance (DI). An Ordinary Least Squares technique is used; because it is suitable to use for the econometrics of panel data because of the double individual dimensions of the data (Batisse, 2001). Random effects technique is selected in estimations according to the data structure.

Definitely, insured-deposits-rate is not the only variable determining the risk levels of banks; but the others wouldn't be considered in the context of this study. In our empirical analysis, we just add three control variables to improve the explanatory power of DI. These variables are;

- ◇ Crises Dummy: The global financial crisis quite likely has affected the level of risk variables. The crisis has begun in 2007 but its effects are experienced in Turkey especially in 2009. We can understand this looking at the negative growth rates of the economic indicators (mainly Gross Domestic Product-GDP growth) in 2009. So the variable takes "1" for 2009 and "0" for other years.
- ◇ Real GDP: Gross Domestic Product is expected to have an impact on the risk levels of banks affecting their borrowers' solvency as well as risk appetite of banks. Data is obtained from www.dpt.gov.tr.
- ◇ Inflation: Proxied by producer price index. Basic impact of inflation is expected to be on interest rates. Inflation also increases the uncertainty of the future for borrowers, depositors and for banks. So the variable is expected to have a positive effect on risk levels. Data is obtained from www.dpt.gov.tr.

* Ratio of the difference between the liabilities subject to repricing within one year and the assets subject to repricing within one year plus off-balance sheet position to total capital

5. Empirical Results

Applying OLS technique to our panel data set, we have found that the effect of deposit insurance is significant only for two variables. These variables are NPL (non performing loan ratio) and LIQ (liquidity ratio). The directions of these effects are consistent with literature and with our expectations.

Results suggest that the amount of insured deposits over total deposits has a positive and significant effect on 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.

Another significant effect of DI is on LIQ and the direction of this effect is negative as expected. This result suggests that when the insured deposit rate is higher, i.e. bank’s responsibility is undertaken by government, bank’s incentive to invest in liquid assets in order to meet its obligation is destroyed.

Interest rate sensitivity (INT) is affected positively by DI. It means that banks become less careful in matching assets and liabilities according to the time remaining to repricing. But this effect is not statistically significant.

Deposit insurance affects Capital Adequacy Ratio (CAR) negatively. Banks consider deposit insurance as compensation towards their potential losses but if their obligations are insured by the government, they don’t consider equity necessary. However, this effect is not statistically significant.

In determination of LOAN variable, DI gets negative coefficient but it is not significant. In the equation of DEP, DI gets positive coefficient but this effect is insignificant either.

Table 2- Empirical Results

Depended Variable	Coefficient of DI	Probability	R ²
NPL	0.090385	0.0940*	0.019856
LIQ	-0.303803	0.0454**	0.094406
INT	0.003329	0.4712	0.021026
CAR	-0.081813	0.2556	0.075056
LOAN	-0.904939	0.5806	0.024697
DEP	0.056876	0.2336	0.021429

* Significant at %10 significance level

* Significant at %5 significance level

6. 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 political attitudes. For example during 1990s, deposit insurance covered 100% of deposits in each bank. Since 2004, coverage limit is discounted to 50,000 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 this new system. To analyze the possible effects of deposit insurance system, we applied Ordinary Least Squares method to our bank level data including a panel of 27 banks operated in Turkey during 2004-2010. 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 and activities. We considered three risk factors which are credit risk (NPL), interest rate risk and liquidity risk. Other dependent variables are Capital Adequacy standard ratio (CAR), loans/deposits ratio (LOAN) and deposits/total assets ratio (DEP). Supporting the moral hazard argument, results suggest that deposit insurance raises credit risk which is proxied by NPL ratio. Insured deposit rate also has a deteriorating effect on banks' liquidity. On the other hand, the variable isn't found related with interest rate risk, capital ratio, loan ratio and deposits ratio.

Basing on these findings, we suggest that regulatory institutions should focus on the moral hazard of banks to eliminate the adverse effects of the system. In order to explore whether the impact of deposit insurance on banks changed after the latest regulation, a further analysis is necessary.

REFERENCES

- Angkinand, Apanard, C., Wihlborg, (2010), "Deposit Insurance Coverage, Ownership and Banks' Risk Taking in Emerging Markets", *Journal of International Money and Finance*, Vol. 29, 252-274.
- Aydin, N., Başar M., Coşkun, M., (2006), *Bankacılık Uygulamaları*, Anadolu Üniversitesi Ya. No. 1711, Eskişehir.
- Bartholdy, Jan, Glenn W. Boyle, R.D. Stover, (2003), "Deposit Insurance and the Risk Premium in Bank Deposit Rates", *Journal of Banking and Finance*, Vol. 27, 699-717.
- Batisse, C., (2001), "Externalities and Local Growth: A Panel Data Analysis Applied to Chinese Provinces", *International Conference of the Chinese Economy, Has China Become a Market Economy?*, May 17-18 2001, France.
- Beck, T., (2008), "Bank Competition and Financial Stability: Friends or Foes?", *World Bank Policy Research Working Paper*, No. 4656, pp. 1-30.
- Bossone, B., (2000), "What Makes Banks Special? A Study of Banking, Finance and Economic Development", *World Bank Working Papers*, No. 2408, pp.1-66.
- Boyd, J.H, de Nicola, G, (2008), "The Theory of Bank Risk Taking and Competition Revisited", *the Journal of Finance*, Vol. 60, No. 3, 1329-1343.
- Carapella, F., G. Di Giorgio, (2004), "Deposit Insurance, Institutions and Bank Interest Rates", *Transition Studies Review*, Vol. 11, no. 3, 77-92.
- Demirgüç-Kunt, A., E. Detragiache, (1999), "Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation", *World Bank Policy Research Working Paper*, No. 2247.

Gropp, Reint, Jukka Vesela, (2004), “Deposit Insurance, Moral Hazard and Market Monitoring”, European Central Bank, Working Paper Series, No. 302.

Ioannidou, Vasso, P., M.F. Penas (2010), “Deposit Insurance and Bank Risk Taking: Evidence from Internal Loan Ratings”, Journal of Financial Intermediation, Vol. 19, 95-115.

Keeley, M.C., (1990), “Deposit Insurance, Risk and Market Power in Banking”, The American Economic Review, Vol. 80, No. 5, 1183-1200.

Leaven, L., R. Levine, (2008), “Bank Governance, Regulation and Risk Taking”, NBER Working Paper Series, No: 14113.

Ng, Tuan Hock, Lim, Y.S., Tan N. L., (2010), “Deposit Insurance and Bank Risks: The Case of Malaysia”, European Journal of Economics, Finance and Administrative Sciences, Issue 18, 19-27.

Ninimäki, J-P., (2000), “The Effects of Competition on Banks’ Risk Taking with and without Deposit Insurance”, Bank of Finland Discussion Papers, No. 21.

Şıklar, İ, (2004), Finansal Ekonomi, Anadolu Üniversitesi Ya., No. 1588, Eskişehir.

Silva, Nancy (2008), “Deposit Insurance, Moral Hazard and The Risk of Runs”, Central Bank of Chile Working Papers No. 478.

Wu, R-J, C-P, Chi, (2006), “Competition, Deposit Insurance and Bank Risk Taking”, <http://centerforpbefr.rutgers.edu/2006/Paper%202006/16AS02-056-Chien-Ping%20Chi.pdf>.

www.dpt.gov.tr

www.tbb.org.tr