

**Interplay Between Deposit Insurance and Subordinate Debt
in Banking System Stability**



सिद्धिमूलं प्रबन्धनम्
भा. प्र. सं. इन्दौर
IIM INDORE

A Thesis Submitted in Partial Fulfillment of the Requirements for
the Fellow Programme in Management

**Indian Institute of Management
Indore**

By
Gaurav Singh Chauhan
(001FPM2008)
Submitted on
August 20, 2011

Thesis Advisory Committee:

Prof. A. Kanagaraj

(Chair)

Prof. Satyam Shivam Sunadaram

(Member)

Prof. Siddhartha K. Rastogi

(Member)

Interplay Between Deposit Insurance and Subordinate Debt in Banking System Stability

Abstract

Banking failures are contagious on account of the information asymmetry inherent in the bank portfolio, which induces uninformed depositors to cause run on seemingly *similar* banks. While deposit insurance can add implicit liquidity to the system by preventing such bank runs, the associated cost of moral hazard makes it difficult to implement. Lack of monitoring by depositors induces banks to shift the risk and choose a level of risk which is socially suboptimal. Risk shifting can be effectively checked by a market oriented *at-risk* stakeholder such as subordinate debt. Being subordinate in claims, the investors in these securities have greater incentives to closely monitor banks.

While subordinate debt can be an effective instrument for market discipline, it can do so if it can monitor *total* risk consisting of systematic and non-systematic risk of a bank. The issuance of subordinate debt to diversified investors may not serve the purpose, as diversified investors lack the necessary incentive to monitor the firm-specific risk of a bank. This is especially important in case of banks where the inherent opacity of banking portfolios entails large firm-specific risk to be kept by banks. The first part in this dissertation explores whether non-diversified investors price firm-specific risk in their investments; and if so, what can be an effective market configuration for subordinate debt using non-diversified investors.

The second part of the dissertation presents a model of a bank with endogenous risk choices, where delegated monitoring by an active market in subordinate debt helps in containing risk shifting by banks in the presence of deposit insurance. In comparison to

static *ex-ante* contracting, the active market enables dynamic incorporation of subordinate debt signals by the banks which penalizes them to shift their risks. Active market signals from subordinate debt also correct for moral hazards associated with deposit insurance. The model helps to derive optimal level of subordinate debt required to achieve equilibrium where banks chooses risk level consistent with the first best as envisaged by a social planner. The optimal quantity of subordinate debt further eliminates any risk shifting associated even with risk insensitive premiums.

The last part of the dissertation presents a model of multiple banks with endogenous risk choices in an economy, where the provision of deposit insurance and active monitoring by subordinate debt influences systemic risk shifting by banks. The model here shows that subordinate debt along with deposit insurance can incentivize banks to keep their asset correlation low. While deposit insurance can eliminate the possibility of costly *ex-post* regulatory forbearance, subordinate debt is shown to force banks to choose strategies with lower asset correlations so as to reduce systemic risk endogenously.

To summarize, the work here can be looked up as a design of banking capital structure which can help in ensuring banking stability by market forces. The dissertation seeks an active monitoring role of subordinate debt as an instrument for market discipline to stabilize the banking system. While information based bank runs are prevented by explicit deposit insurance, subordinate debt helps in checking moral hazard associated with it. The utility of active monitoring by subordinate debt also extends to engender countercyclical incentives for banks with regard to their asset allocation. Moreover, the

joint structure of deposit insurance and subordinate debt helps in macro stabilization of banks by checking the systemic risk shifting incentives.

Key Words: Deposit insurance, risk shifting incentives, subordinate debt, moral hazard, market discipline.

Table of Contents

Acknowledgement.....	1
List of Tables, Figures and Appendices.....	5
Abstract.....	6
1. Introduction	9
1.1 Management Context.....	9
1.2 Research Objectives	15
1.3 Organization of Thesis.....	20
2. Review of Literature.....	22
2.1 Banking Theory and Financial Intermediation.....	22
2.2 Bank Regulation and Systemic Risk.....	24
2.3 Approaches for Banking Stability	27
2.4 Deposit Insurance and Moral Hazard.....	28
2.5 Market Discipline and Subordinate Debt.....	30
2.6 Research Gap.....	33
3. Risk monitoring by Non-Diversified Investors: Implications for Subordinate Debt Issuance by Banks	38
3.1 Analytical Framework.....	41
3.2 Empirical Analysis	47
3.2.1 Significant Pricing of Non-systematic Risk.....	47
3.2.2 Consistent Pricing of Non-systematic Risk.....	54
3.3 Market Configuration for Subordinate Debt Issuance by Banks	58
4. Market Oriented Delegated Monitoring by Subordinate Debt.....	62
4.1 The Model.....	68
4.2 Risk Shifting Incentives for the Bank	71

4.2.1 Risk Shifting with Deposit Insurance	72
4.2.2 Risk Shifting with Deposit Insurance and Subordinate Debt	74
4.3 Deposit Insurance Premiums and Subordinate Debt.....	80
4.4. Moderation in Systematic Risk Shifting by Subordinate Debt	86
5. Moderation in Systemic Risk Shifting by Subordinate Debt.....	89
5.1 The Model	90
5.2 Systemic Risk Shifting Incentives for the Banks.....	95
5.2.1 Banks without Deposit Insurance and Subordinate Debt.....	95
5.2.2 Banks with Deposit Insurance and No Subordinate Debt.....	100
5.2.3 Banks with Deposit Insurance and Subordinate Debt	102
6. Discussion and Implications.....	109
7. Conclusion	119
7.1 Contribution	119
7.2 Limitations and Future Directions.....	122
Appendices.....	123
References	132

List of Tables, Figures and Appendices

List of Tables

<i>Description</i>	<i>Page No.</i>
Table 1: Descriptive statistics for 30 random diversified portfolios	49
Table 2: Total variance explained by extracted market wide systematic factor	50
Table 3: Descriptive statistics for market wide systematic factor	50
Table 4: Descriptive statistics for sector specific random portfolios	51
Table 5: Descriptive statistics for extracted sector specific systematic factors	53
Table 6: Percentage allocation for sector specific mutual funds	54
Table 7: Explained variance of returns of sector specific mutual funds (Full period)	55
Table 8: Total Variance Explained (Market wide systematic factor)	56
Table 9: Descriptive statistics for market wide systematic factor	57
Table 10: Descriptive statistics for extracted sector specific systematic factors	57
Table 11: Explained variance of returns of sector specific mutual funds (Time windows)	59

List of Figures

<i>Description</i>	<i>Page No.</i>
Figure 3.1: Fama decomposition of Portfolio Performance	43
Figure 4.1: Risk and Return in State 1	71
Figure 5.1: Conditional Probability of Default Vs. Market Shock	104
Figure 5.2: Conditional Probability of Default Vs. Correlations	105

List of Appendices

<i>Description</i>	<i>Page No.</i>
Appendix A : NIFTY Constituents	124
Appendix B : Constituents of random sector specific portfolios	125
Appendix C: Fractional Constituent Weights for 30 Random Diversified Portfolios	126
Appendix D: Fractional Constituent Weights for Sector Specific Random Portfolios	128
Appendix E: Derivation for conditional probability of default	130