PRICING RESTRICTIONS AND PAIRING EFFECT IN BANK LOAN MARKET: EVIDENCE FROM A NATURAL EXPERIMENT IN NEPAL

A Research dissertation submitted to

Kathmandu University School of Management

in partial fulfillment of the requirements for the

Degree of Master of Philosophy (MPhil) in Management

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DECLARATION

I hereby declare that this dissertation entitled *Pricing restrictions and pairing effect in bank loan market: Evidence from a natural experiment in Nepal* embodies the result of an original research work I carried out in partial fulfillment of the requirements for the degree of Master of Philosophy (MPhil) in Management of the Kathmandu University and that this dissertation has not been submitted for candidature for any other degree.

Santosh Koirala

September, 2015

RECOMMENDATION

This is to certify that Santosh Koirala has completed his research work on *Pricing restrictions and pairing effect in bank loan market: Evidence from a natural experiment in Nepal* under my supervision and that his dissertation embodies the result of her investigation conducted during the period she worked as an MPhil candidate of the School of Management. The dissertation is of the standard expected of a candidate for the degree of MPhil in Management and has been prepared in the prescribed format of the School of Management. The dissertation is forwarded for evaluation.

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APPROVAL

We have conducted the viva-voce examination of the dissertation *Pricing Restrictions and Pairing Effect in Loan Market: Evidence from Natural Experiment in Nepal* by Santosh Koirala and found the dissertation to be original work of the candidate and written according to the prescribed format of the School of Management. We approve the dissertation as the partial fulfillment of the requirements for the degree of Master of Philosophy (MPhil) in Management.

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ABSTRACT

The occurrence of "Pairing Effect" as a consequence of supply side adaptation in bank's credit in the presence of restrictive pricing has been proposed. Policy driven price restrictions leads to inadequate pricing of riskier loan structures and would result in pairing of strong banks with less risky loan structures and weak banks with more risky loan structures. The researcher tests this argument in the presence of exogenous shock based natural experimental setup of interest spread intervention 2013/14 in Nepal. The study applies Difference-In-Differences design to estimate effect of the price restrictions on different loan structures. The study documents significant increase in loan size of structures with low information asymmetry and significant decrease in loan size of structures with high information asymmetry supporting the Pairing Effect argument. The estimates are significant after allowing for firm's specific heterogeneity. The data survive placebo test identified through pseudo-shock and other robustness test that have demonstrated the inferences as non-trivial.

Key words: Pricing restriction, Pairing effect, Bank loan market

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ABBREVIATIONS

DID	Difference in Differences
DSL	Deprived Sector Loan
ISI	Interest Spread Intervention
KUSOM	Kathmandu University School of Management
MPhil	Mater in Philosophy
NRB	Nepal Rastra Bank
OLS	Ordinary Least Square
PISI	Pseudo Interest Spread Intervention
SME	Small and Medium Enterprise
TL	Term Loan
WCL	Working Capital Loan

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CHAPTER I

INTRODUCTION

The theoretical arguments of regulation can be traced back to the historical debate of state versus market (Berle & Means, 1991) in being optimal for an economy. Eventhough the neoclassical economists are inclined more towards market, the argument has mixed empirical evidence. Theories of regulation examine why regulation occurs. This includes the theories of market power and interest group that describe stakeholders' interests in regulation (Stigler, 1971), and theories of government opportunism that describe why restrictions on government discretion may be necessary for the sector to provide efficient services for customers.

Advocates of policy regulation agree that public welfare is too critical issue to be solely left under the discretion of profit oriented business firms and, therefore, interventions are inevitable. Their contention derives its theoretical base from the economic theory of regulation and imperfect markets. Economic theory of regulation by Stigler (1978) argues that regulation occurs because: the government is interested in overcoming information asymmetries with the operator and in aligning the operator's interest with the government's interest, customers desire protection from market power when competition is non-existent or ineffective, operators desire protection from rivals, or operators desire protection from government opportunism. Intervention, as per this school, shatters market distortions that may result in either demand or supply side. This distortion-correction reduces borrowing costs thereby relaxing financial constraints. The economic justification for this view is that reducing distortion through intervention expands the contractual space, which constitutes a

Pareto improvement (Vig, 2013). The school believes that market does not get self-corrected by invisible hands as suggested by Adam Smith (1976).

At the other extreme are group of financial economists who believe that piecemeal intervention is more of a cost than benefit to an economic system. The theoretical foundation of these advocates is the theory of second best proposed by Lipsey and Lancaster (1956). Contention of this theory is that in a world with a large number of constraints or frictions, a piecemeal policy response that fixes or relaxes one of the constraints can actually reduce welfare rather than increase it. In other words, in an economy with several sources of market imperfections, an attempt by regulators to fix a market failure may have an unintended effect of reducing welfare rather than increasing it. This theory provides counter-thesis to piecemeal intervention.

Nepal, as a nascent economy with less matured legal and institutional mechanism, provides a unique setup to test these seemingly opposing arguments for and against intervention. In Nepal market are not efficient and operator's efficiency is not reflected by their prices and performances in the secondary market because of market frictions (Koirala & Sapkota, 2014). This indicates that Nepali context provides unique setup to study impact of policy intervention in the existence of market frictions. The researcher has analysed the impact of policy intervention of interest spread on lending decisions of banks in Nepal.

Statement of the Problem

The literature on state interventions and Finance nexus show seeming opposing view among financial economists regarding the effect of interventions on banks' lending. A group of theorists posits that state intervention is intended to remove any market imperfections and thus lead to welfare improvement. The proposition is that

these reforms foster financial development by lowering the cost of credit. Reduction in cost of capital may be reflected in the form of increased lending following reforms. This view has found some support in the data (La Porta et al.,1999; Visaria, 2009). On the other hand there are other economists who believe that these reforms will increase lending bias. Lending bias is close to "pairing effect" which is the central thesis of this study that takes into account the supply side adaptation in lending decisions. Subsequently, this lending bias increases the cost of borrowing making borrowers unable or less able to participate in credit market (Lilienfeld et al., 2012; Vig, 2013). This vulnerability is believed to be more pronounced for small borrowers owing distribution effect of reform. The resultant effect is that reform that has implicit object of promoting ease in bank loan market end up diseasing the market.

In the wake of these counter-theses, the study aims to answer the question of how banks react to exogenous reform through lending decisions. The researcher examines this through the examination of unique bank level data following interest spread regulation 2013/14 and borrowers' classification of the NRB various loan structures.

On July 21, 2013, NRB announced monetary policy of Nepal for the fiscal year 2013/14. The new annual policy required that the interest spread of financial Institutions (the difference between weighted average interest rate on loan and weighted average cost of deposits) be within the ceiling of 5%. Interest spread intervention is not a new phenomenon in Nepalese banking sector. This intervention was introduced with a broader goal of stabilizing financial system and facilitating growth in investments that may be hinder by high borrowing cost. The banking system of Nepal has young history dating back to 1937 marked by the establishment of Nepal Bank Limited as the first bank in Nepal. As a central bank of Nepal, NRB

was established in 1956. Prior to that central banking function was performed by NBL (for details of banking system in Nepal refer to literature review section in chapter II). In its short history of nearly six decade, NRB has intervened in interest spread regulation significantly. However, the ISI 2013/14 was different from initial interventions. In early periods, banking system of Nepal was dominated by state owned banks with their monopoly in the banking market. However, as of 2013 Nepal banking system has been perceived as a competitive well managed sector of the economy. It has been therefore a matter of policy interest to examine the impact of ISI 2013/14.

Objectives of the Study

As a frontline stakeholder of an economy, the central bank has a key role to play for the economic stability and growth of the economy. In the aftermath of the global financial crisis, central banks around the world have been found struggling to achieve financial stability. In the context of this instable financial environment, the regulatory intervention of NRB was aimed to boost the economy through reducing the lending and deposit spreads which would reflect in the improved credit market for borrowers. NRB's interest spread intervention 2013/14, as an exogenous shock, provides natural experiment setup to test the causality of how bank adapt to policy intervention that restrict their power to price risks.

The objective of the study is to evaluate the effect of the central bank's interest spread intervention policy 2013/14 on lending structures and bank's adaptation to this intervention. The researcher has analysed the effect of interest spread intervention on various loan structures based the level of riskiness associated with different structures. The study exploits four different loan structures for this purpose. Therefore the specific objectives of the research can be stated as under:

- To estimate the effect of the interest spread regulation on term loans and working capital loans
- To examine the impact of interest spread regulation on small and medium enterprises structure and policy directed deprived sector structure.

The study has focused on term loans, working capital loans, deprived sector loans and small and medium enterprises loan. There is a rational justification in this choice. First, out of 15 different loan products defined by NRB, these are the products which can be differentiated based on level of information asymmetry. For example, hire-purchase loan structure (one of the loan structures as per NRB classification) in itself does not allow comparative analysis with other structures based on level of information asymmetry associated. Second and the most important, these four variables stand out as variables of interest to the policy makers as their performance reflect economic health of a nation.

Term loan are business vehicle loans for productive investments and constitute as a basis for productivity improvement. Term loans come in various types and here term loans are business term loans availed by industrial and business consumers for capital expenditure financing and is different from term loans used by retail consumers. (Refer to the definition of each type of loan structures in the appendix for further clarification). Working capital loans are short term more flexible loans extended for short term financing like inventory financing, financing against business receivables, financing current asset cycle deficit and financing contingency need of short term cash flow. Deprived sector loans and small and medium enterprise loan are policy driven structures and rationale behind introduction of these structures is targeting the uncovered and including the excluded borrowers' stratum in the

economy. Targeted loan structures are a measure of development partnership of NRB with the government of Nepal in the quest of inclusive economic development. The four structures vary with each other in that they carry different level of information asymmetry and therefore different level of risk. The study aims at measuring the economic impact of interest spread intervention on these four specific loan structures.

Loan Structures

This section defines Loan structures as a decisional tool of banks. Banks use these tools as an adaptation strategy as a reaction to intervention led price restrictions. Here, we present definitions of four loan structures which have been employed to test our arguments of pairing effect. Complete definitions of all of structures as defined by NRB (please refer consolidated directives 2071/72 for extra details) have been presented in Annexure A1.

1. Term Loan:

It includes loan granted for financing capital expenditure and tenure of which is more than one year.

2. Working Capital Loan

It comprises of a summation of Overdraft Loan and Demand loan and other working capital loan as defined by NRB:

a. Overdraft:

This includes loan disbursed by Financial Institutions in the form of overdraft and is revolving in nature. In reporting, the financial institutions are required to report outstanding loan amount utilized under this facility and not the overdraft limit.

b. Demand Loans and Other working Capital Loans:

This includes Inventory Hypothecation and Assignment of Account Receivables, Working Capital, Short Term Loan, Demand Loan, Time Loan, Cash Credit and other forms of short term loans.

3. Deprived Sector Loan:

This includes loan disbursed in deprived sector as defined by Nepal Rastra Bank through a) capital investment in micro finance development financial institutions (MFDFIs), b) whole sale loan provided to MFDFIs and c) retail loan to the deprived sector borrowers

4. Small and Medium Enterprises Lending (SME):

This loan fulfilling all below mentioned criteria

a. Maximum amount of NPR 5 million.

b. Borrowing firm should have maximum of NPR 50 Mio of paid-up capital

c. Firms should involve in production or service business.

Organization of the Dissertation

The report of this study is organized in five chapters. Starting with chapter one which includes the background, the problem statement and the research objectives.

Chapter two covers the literature review on regulation and intervention. The review presented includes related theories, different perspectives proposed by various scholars, along with the findings of previous research investigations on all the three major topics.

Chapter three deals with the research methodology. This chapter describes natural experiment as a research design for causal inference and application of difference-in-differences as a natural experiment to infer lending adaptations made by banks as a reaction to interest spread intervention.

Chapter four presents the results of difference in difference estimates of average treatment effects of net interest spread intervention on various loan structures. We also show Placebo experiment to ensure robustness of inference.

The study concludes with chapter five in which the summary of the findings and discussions on the findings are included. Implications of the research and limitations of the study are also discussed in this chapter. A reference list and appendices follow chapter five.

CHAPTER II

REVIEW OF LITERATURE

This chapter focuses on the theoretical understanding of various concepts and mechanism of regulation, loan structures and pricing. The chapter begins with the description of theoretical aspects of regulation. It then develops on the factors affecting lending both demand side and supply side. We also explore our understanding on loan structures from the theory of information asymmetry. We also examine so of contemporaneous and classic empirical literatures on impact of policy interventions on lending structures.

The advocates of state intervention do not fully concur to the argument that competition and efficiency fully dictate price and therefore state intervention is required for shattering this market sub-optimality. In other words, in the absence of perfect market conditions, banks price their loan structures at rates that are above the socially optimal level desirable for financial stability and growth of the economy. This requires intervention from state or its agent to define directly or indirectly, the ceilings of prices.

Theory on State Intervention

The theoretical arguments of regulation can be traced back to the historical debate of state versus market. The development and techniques of regulations has long been the subject of academic research. Two basic schools of thought have emerged on regulatory policy, namely, positive theories of regulation and normative theories of regulation.

Positive Theory on Intervention

Positive theories of regulation examine why regulation occurs. These theories of regulation include theories of market power, interest group theories that describe stakeholders' interests in regulation (Stigler, 1971),and theories of government opportunism that describe why restrictions on government discretion may be necessary for the sector to provide efficient services for customers.

In industrial organization, market power is the ability to coerce market. It is the power of a firm to profitably raise the market price of a good or service over marginal cost (Tirole, 2014). In perfectly competitive markets, market participants have no market power. A firm with total market power can raise prices without losing any customers to competitors. Significant market power occurs when prices exceed marginal cost and long run average cost, so the firm makes economic profits. A firm with market power has the ability to individually affect either the total quantity or the prevailing price in the market. Price makers face a downward-sloping demand curve, such that price increases lead to a lower quantity demanded. The decrease in supply as a result of the exercise of market power creates an economic deadweight loss which is often viewed as socially undesirable. A firm usually has market power by virtue of controlling a large portion of the market. Highly concentrated markets may be contestable if there are no barriers to entry or exit, limiting the incumbent firm's ability to raise its price above competitive levels. Market power gives firms the ability to engage in unilateral anti-competitive behaviour and is therefore considered an incentive for government to intervene for public benefit (Tirole, 2014).

The economic interest theory suggests that regulations are set of policies driven by forces of supply and demand. The government is placed on the supply side while the interest groups on the demand side. The theory suggests that regulation is

developed by the industry and that the objective of regulations is to create advantages to the industry concerned (Stigler, 1971).

The conclusions of these theories are that regulation occurs because: the government is interested in overcoming information asymmetries with the operator and in aligning the operator's interest with the government's interest, customers' desire protection from market power when competition is non-existent or ineffective, operators' desire protection from rivals, or operators' desire protection from government opportunism.

Normative Theory of Intervention

Normative theories of regulation assert that regulators should encourage competition where feasible, minimize the costs of information asymmetries by obtaining information and providing operators with incentives to improve their performance, provide for price structures that improve economic efficiency, and establish regulatory processes that provide for regulation under the law and Independence, transparency, predictability, legitimacy, and credibility for the regulatory system.

Both schools of thoughts, in trying to explain the necessity and occurrence of intervention, agree a common proposition that interventions are inevitable and that public welfare is to critical issue to be solely left under the discretion of profit oriented business firms.

Factors Affecting Bank's Lending

The evolution of bank lending theoretically results from the interaction between demand and supply factors. However, the variables that help to explain the dynamics of the loans sometimes affect both demand for and supply of credit, and it is not always, accordingly, possible to empirically identify the two channels. There are

usually variables of scale, variables related to financing conditions, variables related to the position of households and corporations and factors related to structural changes in the banking sector and other variables. In the case of scale, an expense aggregate, an income aggregate or a variable that proxies economic activity is usually considered.

Table 1

Theoretical Foundation of the Study

S. No.	Theory	Contributors
1	State versus market debate	Berle and Means (1990)
2	Economic Theory of Regulation	Stigler (1971)
3	Market Power and Regulation	Tirole (2014)
4	Law and Finance	La Porta et al (1995)
5	Finance and Growth	Schumpter (1911) Levine (2003)
6	Information Asymmetry and Risk	Stigliz (2002)
7	Theory of Second Best	Lipsey and Lancaster (1956)

Demand Side Factors Affecting Lending

Bank loans are usually taken out to finance spending or investment, which agents are unable or unwilling to fund with current income and/or savings. Lifecycle hypothesis (Modigliani & Brumberg, 1954) establishes that households rely on loans in order to smooth their consumption expenditure over the life cycle, according to the present value of its future expected return. Variables of scale, such as economic activity or disposable income, accordingly reflect the ability of households to contract debt, since the expectation of higher levels of income, permitting a higher debt burden to be serviced, leads to higher indebtedness. Corporations, usually take out loans out

to finance investment. Moreover, robust economic growth, translated into higher current results, make it possible to support higher debt levels, therefore financing investment through bank loans. Additionally, expectations of increased activity and productivity may lead to an increase in capacity and/or to a higher volume of projects that become profitable, therefore creating more demand for loans.

A second set of relevant factors relates to financing conditions, which include not only the cost of credit but also other contractual features, such as loan maturities. Higher costs reduce the availability and capacity of economic agents to incur and support debt and have a negative effect on demand for bank loans.

Table 2

Factors Affecting Loan Demand

S. No	Factors	Seminal Work
1	Economic Growth	Schumpter (1911) and Levine (2003)
2	Business Cycle	Modigliani and Brumberg (1954)
3	Interest Rate	Bernanke and Blinder (1988)
4	Transaction Cost	Hess (1995)
5	Demographic Factor	Deans and Stewart (2012)
6	Borrower's Specific Factors	Deans and Stewart (2012, Diamond and Dybvig, 1983)

A third factor relates to the financial position of the borrower, which influences the assessment of its solvency and respective ability to raise new loans. For example, an increase in wealth (particularly in housing wealth) can increase its borrowing capacity, facilitating the acquisition of loans, since it reduces the problems of asymmetric information. This mechanism is similar to the one usually reported for corporations, as documented in Bernanke and Blinder (1988) and Bernanke and Gertler (1989). In this context, the level of existing debt will be a factor that is also

likely to influence the demand for loans. More specifically, the higher the level of debt, the higher the sensitiveness to shocks that may affect debt servicing capacity. Empirical literature on the identification of determinants of bank loans usually focuses on variables more closely associated with demand.

Supply Side Factors

The fact that the non-consideration of factors typically associated with supply may be acceptable in most situations, adds to their general measuring difficulties. However, in episodes such as the recent financial crisis, this may limit the explanatory power of adopted specifications, since there is evidence that credit institutions' supply has been affected in a number of dimensions, including inter alia, fees, amounts, maturities and collateral requirements, which factors are also relevant in determining the equilibrium quantities (Robert and Sufi, 2009). Another set of factors that play a predominant role, especially in the supply of loans, is related to factors, mainly structural in nature, that affect the banking sector. Increased competition led to a wave of innovation and a significant increase in the supply of new products in the financial sector (by increasing loan maturities, securitization, inter alia), which has had serious consequences not only in terms of amounts and conditions of credit supply but also in terms of raising funds and risk management by financial institutions.

Other factors that may also be important in the determination of the loans are related, for example, to demographic issues. The increase in debt may be related to the effects of demographic composition, owing to an increase in the number of agents with greater propensity to take on debt.

Theory on Interest Spread

The effect of interest margins on health of banking system in inconclusive. On the one hand, narrow margins may be indicative of a relatively competitive banking

system with a low level of intermediation costs and regulatory "taxes" (e.g. reserve requirements and capital requirements). On the other hand, relatively large margins may bring a degree of stability for a banking system, in that they can add to the profitability and capital of banks to insulate then from macro and other shocks. As is well known, bank failures can carry significant externalities and social costs (Diamond & Dybvig, 1983). Furthermore, in the absence of well-functioning equity markets, margins and internal-profit generation may be the only means banks have to add to their capital bases.

One of the important factors likely to impact bank margins is the bank's opportunity cost of holding reserves at the central bank. The existence of non-interest-bearing reserve requirements increases the economic cost of funds over and above the published interest expense. This additional cost factor will depend on the size of reserve requirements as well as on the opportunity cost of holding reserves.

A second factor is bank capital that banks hold to insulate themselves against both expected and unexpected credit risk. Specifically, while regulatory imposed bank capital requirements are minimum, banks often endogenously choose to hold more capital because of additional (perceived) credit-risk exposures. However, holding equity capital is relatively costly when compared to debt (because of tax and dilution of control reasons). Thus, banks that have relatively high capital ratios for regulatory or credit reasons can be expected to seek to cover some of this cost by imposing an extra spread (premium) in the banks' net interest margins over the pure spread for interest-rate risk. Deans and Stewart (2012) found that changes in the composition of banks' assets, changes in banks' use of equity funding, changes in the interest income lost because of impaired loans and the use of derivatives to hedge the interest rate risk

on their assets and liabilities are important factors affecting lending and interest margins in Australia.

Theory of Information Asymmetry

In contract theory and economics, information asymmetry deals with the study of decisions in transactions where one party has more or better information than the other (Stigliz, 2002). This unequal information creates an imbalance of power in transactions, which can sometimes cause the transactions to go awry or can create market failure in the worst case. Economic consequence of information asymmetry have been studied broadly under adverse selection, moral hazard, and information monopoly. Agency theory studies information asymmetries in the context of principal–agent problems. Information asymmetry causes misinforming and is essential in every communication process. Information asymmetry is in contrast to perfect information, which is a key assumption in neo-classical economics.

Economic consequences of information asymmetry have been studied broadly under adverse selection, moral hazard, and information monopoly.

Information Asymmetry and Moral Hazard

Moral Hazard is the idea that, under certain circumstances, individuals will alter their behavior and take more risks. Moral hazard can occur if

1. There is information asymmetry.

Where one party holds more information than another. For example, a firm selling sub-prime loans may know that the people taking out the loan are liable to default. But, the bank purchasing the mortgage bundle has less information and assumes that the mortgage will be good.

2. A contract affects the behavior of two different agents.

In some cases, two parties face different incentives. If one is insured then s/he may have less incentive to take care against risks. For example, if a country knows it will receive a bailout from the IMF, then it may feel less incentive to reduce debt. Moral hazard is particularly a problem in the insurance market because when insured, people may be more liable to lose things.

Krugman (2009) defines moral hazard as …"any situation in which one person makes the decision about how much risk to take, while someone else bears the cost if things go badly."

Information Asymmetry and Adverse Selection

The concept of adverse selection was first introduced in economics by Akerlof (1970) in his seminal article "The Market of Lemons". When buyers and sellers have access to different information (asymmetric information),party with better private information about the quality of a product will selectively participate in trades which benefits them the most (at the expense of the other trader). Buyers sometimes have better information about how much benefit they can extract from a service in which case the "bad" customers are more likely to apply for the service. The concept of adverse selection in highly employed in insurance industry, capital market and bank loans.

Information Asymmetry and Loan Structures

Different loan structure are priced differently depending upon the level of information asymmetries associated with these structures. Term loan is a scheduled loan with definite investment purpose, horizon and cash flows. This structure has relatively low information asymmetry between borrower and lender and cost of monitoring is low. On the other hand, working capital loan is a flexible structure. It

has higher cost of monitoring and it conveys relatively higher information asymmetry as borrower cannot fully ensure its purpose and monitor its use.

Deprived sector loan are regulatory- guided loan structures availed to those stratum of borrowers, which does not meet the criteria of borrowers under established principles of bank lending. Same story holds for Small and Medium Enterprises Loan structure because of their size and unestablished credit history. As such, high degree of information asymmetry lie in these loan structure and cost of monitoring is, therefore, high.

Overview of Banking System in Nepal

Modern banking in Nepal is in its nascent state with nearly eight decade long history. The establishment Nepal bank marks the beginning of a new era in the history of the modern banking in Nepal. This was established in 1937 A.D. Nepal bank was established as a semi government bank with the authorized capital of Rs.10 million and the paid -up capital of Rs. 892 thousand. Nepal Bank Ltd. remained the only financial institution of the country until the foundation of Nepal Rastra Bank is 1956 A.D. Due to the absence of the central bank, Nepal Bank has to play the role of central bank and operate the function of central bank. Hence, the Nepal Rastra Bank Act 1955 was formulated, which was approved by Nepal Government accordingly, the Nepal Rastra Bank was established in 1956 A.D. as the central bank of Nepal. Nepal Rastra Bank makes various guidelines for the banking sector of the country. A sound banking system is important for smooth development of banking system. It can play a key role in the economy. It gathers savings from all over the country and provides liquidity for industry and trade. In 1957 A.D. Industrial Development Bank was established to promote the industrialization in Nepal, which was later converted into Nepal Industrial Development Corporation (NIDC) in 1959 A.D.

Rastriya Banijya Bank was established in 1965 A.D. as the second commercial bank of Nepal. The financial shapes for these two commercial banks have a tremendous impact on the economy. That is the reason why these banks still exist in spite of their bad position. As the agriculture is the basic occupation of major Nepalese, the development of this sector plays in the prime role in the economy. So, separate Agricultural Development Bank was established in 1968 A.D. This is the first institution in agricultural financing.

For more than two decades, no more banks have been established in the country. After declaring free economy and privatization policy, the government of Nepal encouraged the foreign banks for joint venture in Nepal.Adjusting to the global changing scenario, NRB refreshed and changed in financial sector policies, regulations and institutional developments in 1980 A.D. The Government of Nepal emphasized the role of the private sector for the investment in the financial sector. These policies opened the doors for foreigners to enter into banking sector in Nepal under joint venture. Some foreign ventures are also established in Nepal such as Nepal Bangladesh Bank, Standard Chartered Bank Limited , Nepal Arab Bank (now NABIL Bank Limited), Nepal State Bank of India Limited, Everest Bank, Himalayan Bank Limited , Bank of Kathmandu and Nepal Investment Bank.

As of July 2015, there are 30 commercial banks 79 development banks 50 finance companies and 36 micro finance institutions. The banking sector is relatively more modernized and systematic managed. There are various types of bank working in modern banking system in Nepal. It includes central, development, commercial, financial, co-operative and Micro finance institutions.

The Context of Interest Spread Intervention in Nepal

Interest rates, in general, reflect the cost of funds - the interest rate can be viewed as the rental price for money, or alternatively can be viewed as the opportunity cost for money where the cost of not using money is its next best alternative. The interest rate regime in Nepal can be broadly categorized into following phases as mentioned in Maskey and Pandit (2010):

Pre Interest Rate Phase (pre-1955)

Prior to 1955, the domestic financial system was underdeveloped - it was dominated by unorganized/informal financial system generally driven by private individuals, Shahus (merchants) and landlords (Pant, 1964). To provide financial services, Nepal Bank Limited (NBL) which is the first commercial bank in the country, was established in 1937, and reflects the start of the formal financial system. During that time, the country's monetary system was characterized as being a dual currency system - financial transactions were dominated by the use of Indian currency (IC) and characterized by high volatility of exchange rate with respect to the stronger Indian rupees. Therefore, in the initial period, the primary responsibility for Nepal Rastra Bank, the central bank of Nepal, was to bring the monetary system under its control - this was reflected in the preamble of the Nepal Rastra Bank Act of 1955.

Controlled Interest Rate Phase (1956 - 1983)

The establishment of Nepal Rastra Bank (NRB) in 1956 coincided with the period of planning (such as the first development plan from 1956 – 1960; GoN (1956)). At the initial stage, the financial system was still rudimentary and described as "predominantly a cash economy" (NRB, 1965). Efforts by GoN to formalize financial system was reflected in the establishment of Nepal Industrial Development Corporation (NIDC) in 1959 , Rastriya Banijya Bank (RBB) in 1966, and Agriculture

Development Bank in 1968 . These institutions facilitated the elimination of the dual currency system in 1967, which predominated in Nepal (NRB, 1996). In that year, NRB also adopted a controlled interest rate determination regime, where the Bank used to fix deposit and lending rates of the commercial banks. Different rates were fixed for different instruments and purpose of the loan. As the market based monetary policy instruments were not developed, determination of interest rate was one of the few options left for the NRB at that time. Before 1983, there were only two commercial banks (NBL and RBB) operating in the country.

Transitional Interest Rate Phase (1984 - 1989)

In early 1980s, Nepal experienced a series of BOP problem. To control the depletion of international reserve Nepal adopted the International Monetary Fund's (IMF) supported economic stabilization program in 1985, and subsequently entered into IMF's Structural Adjustment Facility; this presaged gradual reform measures in the financial sector (Thornton, 1987). On November 16, 1984 NRB initiated a limited flexibility to commercial banks to fix the interest rates. Commercial banks were allowed to offer interest rate on savings and time deposits to the extent of 1.5 and 1.0 percentage point above the minimum level. This form of limited deregulation on interest rate helped increase the competitiveness among banks and financial institutions. In this liberalizing environment, three joint venture commercial banks were established during 1984- 1987. Effective May 29, 1986, interest rates for deposit and lending were further liberalized except for the priority sector lending, in which banks were not allowed to charge interest rate more than 15%. The objective of gradual deregulation of interest rates was to create competitiveness in the banking sector thereby increasing efficiency, effective mobilization and allocation of resources.

Liberalized Interest Rate Phase (1990 – till intervention on July 2013)

Controlled interest rate regime was removed on August 31, 1989. Banks and financial institutions were given autonomy to determine their interest rates on deposits and lending. This coincided with the period of economic liberalization, which saw a huge spurt in the number of banks and financial institutions. The number of institutions expanded tremendously from 7 banks and financial institutions in the last phase to 244 in the current phase - an increase by over 33 times (Maskay and Pandit, 2010). Although the NRB has given the autonomy to determine the interest rate, the Bank has been forced to intermittently issue directives in regard to anomalies in the interest rate determination as there had existed a high interest rate spread between deposit and lending rates.

The promulgation of Nepal Rastra Bank Act 2002 attempted to address development in the financial market. But, the continuing high level of interest rate spread suggested that greater financial sector development (FD) had not brought efficiency in the financial system. To address this, NRB attempted to maintain the interest rate spread of commercial banks at a desired level through using moral suasion only. Additionally, in the spirit of interest rate deregulation, the provision of interest rate spread of 5.5% was withdrawn by the NRB in 2003. Since then no such direct or indirect restriction is implied as far as determination of interest rate is concerned, although NRB has shown intermittent concern regarding interest rates.

The interest spread Intervention 2013

On July 21, 2013, the governor of NRB delivered Monetary policy speech 2013/14 through which he announced that the interest spread of financial Institutions (the difference between weighted average interest rate on loan and weighted average cost of deposits) should be within the ceiling of 5%. This regulation was introduced with a

broader goal of stabilizing financial system and facilitating growth in investments that may be hinder by high borrowing cost.

International Empirical Evidence

This sections present few seminal studies in the international arena that are close to ours in that these studies have attempted to evaluate the outcomes of policy reforms. Some of studies have documented positive linkage between policy reforms and expected policy outcomes. On the other hand, others have documented failure of piecemeal policy reforms and interventions.

Table 3

List of Major Literatures in the Evaluation of Reforms

S.N.	Literature	Coverage of the study	Major Contributions
1	La Porta et al. (1999)	49 countries on the legal system and mechanism and impact on finance and development	Origin of legal system is important in know the level of investors protection variation across the countries and legal reforms presents better financial development.
2	Levine (1999)		More finance leads to more growth
3	Black et al (2006)	Effects of governance reforms on Korean firms	Instrumenting for the uniquely developed governance index that captures the threshold for the application of the reforms, the study documented positive impact of governance reforms on firm's value
4	Davydenko and Franks (2008)	Bankruptcy laws on financially distressed firms in the United Kingdom, Germany, and France	The study documented significant bank level adaptation to minimize the effect of lower creditor's protection in countries with weak debt recovery. They found that banks significantly adjust their lending and reorganization practices in response to the country's bankruptcy code
5	Visaria (2009)	Micro-panel of loans to study the impact of a	The study found that stricter enforcement of lender's rights in the event of default

		judicial reform that improved credit contract enforcement across different states of India	significantly improved repayment behavior.
6	Dharmapala and Khanna (2012)	Analysis of corporate governance reforms in India on firms; value based on natural experiment.	Using the set of reforms, the study documented a large and statistically significant positive effect of the governance reforms in combination with the sanctions.
7	Lilenfeld et al. (2012)	Impact of creditors collection reform on firm's borrowing	The study documented a contraction of credit, fixed assets and profits for small firms, following a reform.
8	Vig (2013)	Impact on creditor's protection on firms' debt.	Creditor's protection reform has reduced use of secured debt. Therefore piecemeal reforms are sub-optimal.

La Porta et al. (1999) documented that weak investor protection is correlated with thinner debt markets across the sample countries. To the end that improved law (or interventions) leads to greater economic growth (Levine, 2003), policy interventions are viewed as positive actions that shatters sub optimality resulting from market imperfections and results in positive economic outcomes.

Black et al. (2006) constructed a Korean corporate governance index (KCGI), which they used to study the effects of governance on Korean firms. They examined the effect of the KCGI on firm's value, instrumenting for the KCGI using an asset size variable that captures the threshold for the application of the reforms, and documented positive impact of governance reforms on firm's value.

Davydenko and Franks (2008) examine the effect of bankruptcy laws on financially distressed firms in the United Kingdom, Germany, and France. They documented two major findings. First, there is bank level adaptation to minimize the effect of lower creditor's protection in countries with weak debt recovery, for example

in France. They found that banks significantly adjust their lending and reorganization practices in response to the country's bankruptcy code. In particular, collateral requirements at loan origination directly reflect the bank's ability to realize assets upon default. Thus, because the proceeds from collateral sales are lower in France, at loan origination French banks demand higher levels of collateral per dollar of debt. Second, their findings underscore the importance of understanding broader institutional considerations in discerning the effects of bankruptcy legislation. For example, they found that loan spreads charged by U.K. banks are similar to those in France, notwithstanding higher U.K. loan recovery rates combined with similar default probabilities in the two countries. The ability of U.K. banks to charge high interest rates despite relatively low expected losses is consistent with higher industry concentration and lower levels of competition in the banking industry in the United Kingdom, with its market-oriented financial system, compared with the bank-oriented systems in Germany and France.

In a developing country context, Visaria (2009) used a micro-panel of loans to study the impact of a judicial reform that improved credit contract enforcement across different states of India. Using the state-time variation in the establishment of the new debt recovery tribunals, she found that stricter enforcement of lender's rights in the event of default significantly improved repayment behaviour, and subsequently lowered average interest rates on new loans.

Similarly, study by Dharmapala and Khanna (2012) is based on natural experiment of corporate governance reforms in India. Although there has been extensive discussion across the fields of economics, law, and finance of the effects of corporate governance, the central challenge has been to find credible evidence of a causal impact of governance practices on firm value, financial development, and the

wider process of economic development. They used a sequence of corporate governance reforms in India as a source of exogenous variation.

These reforms had several unusual features that facilitate identification of this causal effect. In particular, a large group of firms was exempted from the reforms, and the complex rules for the application of the reforms created considerable overlap in the characteristics of affected and unaffected firms. Moreover, the introduction of more severe financial penalties for the violation of the new corporate governance rules took place after the rules were already in force, thus decoupling the effects of substantive legal rules and of increased sanctions. Using the set of reforms, the study documented a large and statistically significant positive effect of the governance reforms in combination with the sanctions. The study, thus, primarily contributed to the very limited body of causal evidence for the proposition that corporate governance affects firm's value. Moreover, the study has highlighted the role of sanctions and enforcement—the substantive legal rules are shown to have a fairly weak effect until the enactment of more severe sanctions.

Lilenfeld et al. (2012) documented a contraction of credit, fixed assets and profits for small firms, following an Indian reform which strengthened banks' ability to enforce credit contracts. They explained this by general equilibrium effects in the credit markets arising due to inelastic supply of loans. The finding provided a basis concerning the adverse effect of strong protection of lender rights on smaller, poorer borrowers. The empirical and theoretical results cast doubt on the general presumption that strengthening lender collection rights or expanded scope for collateral will relax credit market imperfections for most borrowers, or thataggregate efficiency and output will necessarily rise. If small firms have higher marginal returns

to capital, this redistribution of credit may result in an adverse macroeconomic impact.

Lilenfeld et al. (2012) focused on the distributive impacts and found that while lenders were found generally better off due to an increase in credit enforcement, a large fraction of borrowers were adversely impacted. This study is an evidence that expected positive outcomes of reforms could not be realized when policymakers fail to anticipate and therefore respond to the probable demand side manipulation in the credit market before devising policy reforms. Evidently, the study is a classic example of failure of piecemeal policy intervention.

Much of our present understanding of creditor rights is based on the notion that better enforcement of contracts reduces borrowing costs, thereby relaxing financial constraints. The economic justification for this view is that strengthening creditor rights expands the contract space, which constitutes a Pareto improvement. Vig (2013) investigated the effect of strengthening creditor rights in India on firms' financial policies. He finds that an increase in the rights of secured creditors led to a reduction in the use of secured debt. These results suggest that welfare implications of strengthening creditor rights are not clear cut. Although there are obvious benefits from strengthening creditor rights, such as better resource allocation, he finds that stronger creditor rights may cause some firms to be worse off.

Vig (2013) posits that creditor rights affect both supply of, as well as demand for, credit. Suppliers of secured credit are clearly better protected by policy reforms. However, stronger creditor protection also makes borrowers more cautious because it makes secured creditors less willing to compromise.

Table 4

Interest Rate Regulation of in Nepal

Period	Regulation
1971-72	BFIs can determine the interest rate themselves with the approval of NRB such that the rate is not below the floor rate determined by NRB
1984-85	Interest rate can be fixed at an additional rate of 1.5 percent or 1 percent to rate provided on saving deposit and fixed deposit respectively.
1986-87	Interest rate can be self-determined within the range of minimum deposit rate and maximum lending rate fixed by NRB.
1992-93	Interest rate can be self-determined both for deposit and lending
1993-94	Interest spread rate should be maximum of 6.0 percent
1998-99	Weighted average interest spread rate should be maximum 5.0 percent.
2002-03	Interest spread rate limit discontinued.
2013-14	Interest spread rate should not be more than 5.0 percent

Note: Table presents chronology of interest rate intervention introduced by Nepal Rastra Bank.
Source: Financial Stability Report 2014, NRB

Conceptual Framework: The Pairing Effect

Central thesis of the study is that interest spread intervention results "pairing effect" among loan structures and banks. Pairing Effect framework is presented in Figure 1. To illuminate on the concept of pairing effects, consider a two banks-two loan structures model. There are two banks one strong and one weak. There are two structures one with lower information asymmetry and the other with higher. The study sets price of loan as a function of riskiness of loan. Let 'S' be the strong bank and 'W' the weak bank. There are two client categories, one good and the other bad. For simplicity, one client category uses only one type of loan structure. The study assumes two time period framework, t=0 i.e. before intervention and t=1 i.e. after intervention.

Initially at t=0, both banks 'S' and 'W' lend to good and bad categories of borrowers and they are able to adequately price their structures as a function of

riskiness of structures and the level of information asymmetry associated with the structure. Competitive pricing would result in the higher margin of strong banks and lower interest spread of weaker banks.

Now policy directed price restrictions have discriminating effect on stronger and weaker banks. Therefore, at t=1, policy directed price restrictions has lending adaptations among banks. For 'W' with lower interest spread ISI have no direct initial effect on loan structures. However, as 'S' could not adequately price its riskier structure, it extends its loan to less risky loan structure. This has two fold impacts on 'W'. 'W' loses its good clients in not being able to offer them competitive prices owing high cost of fund. In addition, it has to compensate increased demand of riskier loan structures as 'S' stops lending in this loan structure. The resultant effect is: 'S' lends to less risky loan structure with lower information asymmetry (and therefore good borrower) and 'W' lends to loan structure with high risk and with higher information asymmetry (and therefore bad borrowers). The equilibrium outcome therefore is the pairing of strong banks with good borrowers and weak banks with bad borrowers. In other words, there exists Pairing Effect resulting from the banks' adaptation to the restrictive pricing policy. If pairing effects hold the policy outcome would be sub optimal in welfare.

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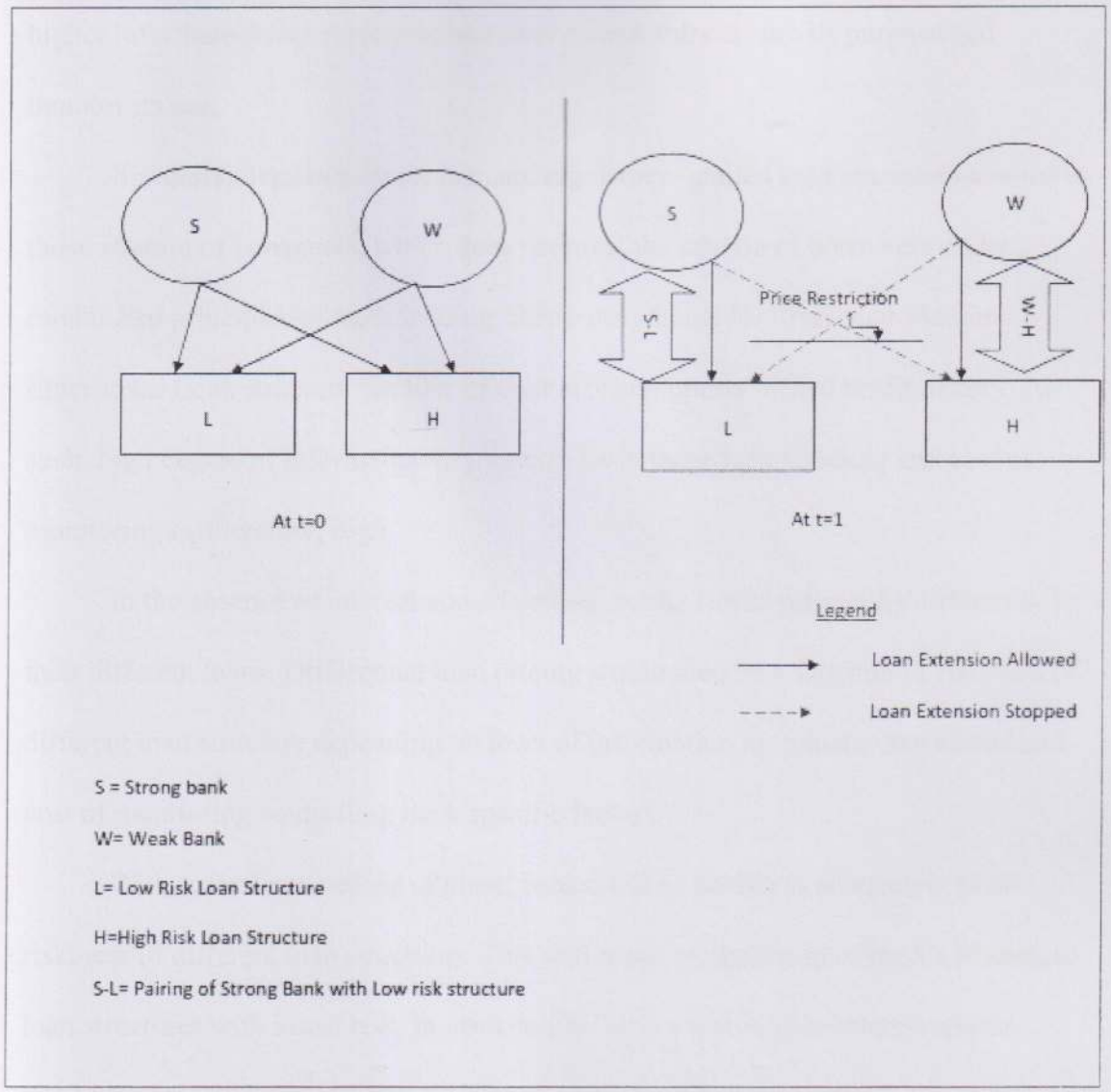
Figure 1

Pairing Effect Framework



A loan structure has specific purpose, feature, level of risk and therefore different prices. The study focuses on four different loan structures viz term loan, working capital loans, deprived sector loan, and small and medium enterprises loan. Detailed definition of each of loan structures as defined and required by NRB monthly reporting by all banks is provided in appendix 1.

Term loan is a scheduled loan with definite investment purpose, horizon and cash flows. This structure has relatively low information asymmetry between

borrower and lender and cost of monitoring is low. On the other hand, working capital loan is a flexible structure. It has higher cost of monitoring and it conveys relatively higher information asymmetry as borrower cannot fully ensure its purpose and monitor its use.

Similarly, deprived sector loan are regulatory- guided loan structures availed to those stratum of borrowers, which does not meet the criteria of borrowers under established principles of bank lending. Same story holds for Small and Medium Enterprises Loan structure because of their size and unestablished credit history. As such, high degree of information asymmetry lie in these loan structure and cost of monitoring is, therefore, high.

In the absence of interest-spread ceiling, banks would price risks differently to their different loans. Differential loan pricing would then be a function of riskiness of different loan structure depending on level of information asymmetry associated and cost of monitoring controlling bank specific factors.

With spread rate ceiling in place, banks will be unable to adequately price riskiness of different loan structures. This will result in clustering of bank's lending to loan structures with lower risk. In other words, banks with higher interest spread would lend to more structured loan with low information asymmetry and therefore low risk. Then, riskier loan structures are availed by banks with narrow interest spread. To the end that high net interest spread banks are good banks there will be a pairing of good bank with good loan and bad bank with bad loan.

CHAPTER III

RESEARCH METHODOLOGY

The chapter deals with methods of data processing and analysis by the help of which we claim causality. It deals with introduction of natural experiment as the method used, the idiosyncratic advantages of using the method in testing causality, the issues taken care of while employing natural experiment. We also deal with difference-in-differences (DID) as a natural experiment to estimate the parameters. We also introduce robustness check to ensure efficiency of the parameters. For this, we introduce Placebo experiment. We then, introduce some recent seminal research works in international setting using DID as natural experiment. We conclude the chapter by developing econometric models for employing DID and Placebo experiment.

Natural Experiment as a Research Design

We employ shock based natural experimental design as our research design. Natural experiment refers to study in which there is no manipulation of exposure, but the assignment of subjects is 'as if' random. Some distinguish such studies from straightforward observational studies where no intervention takes place, and from the large (but also imprecisely defined) class of planned but non-randomized experiments sometimes referred to as quasi-experiments.

The key features of natural experimental design are that the exogenous shock is not undertaken for the purposes of research, and the variation in exposure and outcomes is analysed using methods that attempt to make causal inferences. In other

words, natural experimental studies involve the application of experimental thinking to non-experimental situations.

Natural experimental approaches are important for two reasons. First, they widen the range of interventions that can usefully be evaluated beyond those that are amenable to planned experimentation. Second, they encourage a rigorous and imaginative approach to the use of observational data to evaluate interventions that should allow stronger conclusions about impact.

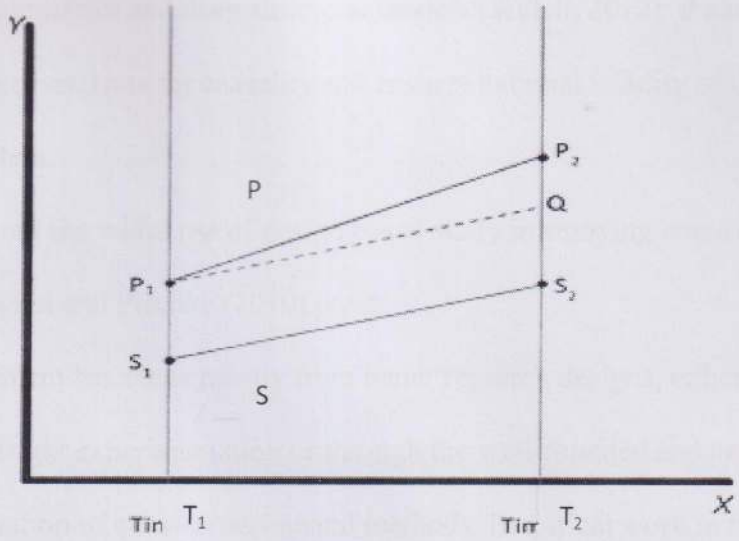
In practice, natural experiments form a spectrum, and the opportunities they provide for research depend on a range of factors including the size of the population affected, the size and timing of impacts, the processes generating variation in exposure, and the practicalities of data gathering. Natural experimental studies should only be attempted when exposed (treated) and unexposed (controlled) populations (or groups subject to varying levels of exposure) can be compared, using samples large enough to detect the expected effects, and when accurate data can be obtained on exposures, outcomes and potential confounders.

Difference-In-Differences (DID) Estimation

DID estimates the effect of a treatment (i.e., an explanatory variable or an independent variable) on an outcome (i.e., a response variable or dependent variable) by comparing the average change over time in the outcome variable for the treatment group to the average change over time for the control group. Difference in differences requires data measured at two or more different periods.

Figure 2

Schematic Representation of DID



In the picture, the there are two distinct group: controlled group (CG) and treatment group (TG). TG is represented by the line P and the CG is represented by the line S. Both groups are measured on the outcome (dependent) variable at Time T_1 before exogenous intervention shock, represented by the points P_1 and S_1. The treatment group then experiences the treatment and both groups are again measured after this at Time T_2.

Not all of the difference between the treatment and control groups at Time T_2, can be explained as being an effect of the treatment, because the treatment group and control group did not start out at the same point at Time T_1. DID therefore calculates the "normal" difference in the outcome variable between the two groups (the difference that would still exist if neither group experienced the treatment), represented by the dotted line Q. (Notice that the slope from P_1 to Q is the same as the slope from S_1 to S_2.) The treatment effect is the difference between the observed outcome and the "normal" outcome (the difference between P_2 and Q).

DID and the Test of Causality

DID as a quasi-experimental design setup provides advantages over conventional econometrics and deep structural models (Welch, 2012). It assures identification strategies, tests for causality and ensures external validity of the estimated parameters.

Talking about the wider use of design based study in studying empirical studies in Economics Angrist and Pischke (2010) posit:

> ...improvement has come mostly from better research designs, either by virtue of outright experimentation or through the well-founded and careful implementation of quasi-experimental methods. Empirical work in this spirit has produced a credibility revolution in the fields of labor, public finance, and development economics over the past 20 years. Design-based revolutionaries have notched many successes, putting hard numbers on key parameters of interest to both policy makers and economic theorists.

To the extent that modern economic analysis heavily rests on natural and quasi experiments, design based study has been a new rule of game in methodology in empirical economics. DID is on of the design-based setup. Other highly resorted methods include regression discontinuity designs and event analysis.

Model

Following econometric functional form is developed to carry the design based DID estimation.

Let L_{it}= Loan structure of i^{th} bank at t time period measured by total amount of loan availed by i^{th} bank in a particular structure in millions of Nepalese rupees. Details of definition of loan structures is presented in Annexure 1.

Then, $L_{i,t} = \alpha + \beta_i + \tau_t + \rho D_{SP} + \lambda d_1 + \gamma D_{SP} d_1 + \varepsilon_{i,t}$ 1)

$$=[E(L_{i,t} / D_{SP} = 1, d_1 = 1) - E(L_{i,t} / D_{SP} = 1, d_1 = 0)] -$$

$$[E(L_{i,t} / D_{SP} = 1, d_1 = 0) - E(L_{i,t} / D_{SP} = 0, d_1 = 0)]$$

$$= \gamma \qquad 6)$$

Data and Sample

Our sample consists of commercial banks and national level development banks. These fall under classes A and B respectively as per NRB Classification. The researcher excludes those banks that have been a part of disciplinary actions or undergoing merger and acquisition during the study period. Our final sample consists of 24 commercial banks and 12 national level development banks. The study analyzes monthly loan structures of these sample banks for a period of 12 months before and after announcement date of the intervention (July 21, 2013). The researcher classifies bank as controlled if the bank has net interest spread within the limit of 5% and treated to those banks whose net interest spread have been more than 5% on announcement date. This gives us 20 controlled and 16 treated groups to conduct natural experiment for causal inference.

The study estimates DID estimator γ in panel setting. The study controls for heterogeneity among banks by using firm dummies. Since there are 36 firms, 35 firm dummies have been used to remove dummy trap. Firm-data have been allowed to vary over time. The study reports heteroscedasticity robust standard errors of the estimators. Statistically and economically significant γs would then give us average treatment effect of the intervention.

Control Variables and Firm Level Heterogeneity

Control variables are those variables which may distort our causal inference of dependent and explanatory variables. In causal relationship between explained and explanatory variables any additional independent variables are control variables.

In causal econometric estimation effect of control variables on dependent variables should be removed to rightly estimate the magnitude and significance of explaining variables. In economics, it is controlling these variables which is widely referred as *ceteris paribus*.

In our DID setting the study controls for firm level heterogeneity by introducing firm level dummies. To incorporate industry effect, the study has used classification dummy as 1 referring to commercial banks and 0 to the development banks in our sample. Factors documented by classic finance that may have possible impact on bank's loan profitability, non-performing loans are available at-least on quarterly basis hence the study has not incorporated these on our model. However, alternative analysis based on quarterly data indicates that there is redundancy of control variables as our firm specific control variables take good care of firm level heterogeneity that results from resultant influence of these firm level control variables. The study follows Dharmapala and Khanna (2012) to address this heterogeneity. Hence, firm level dummies have provided efficient and unbiased control effects for firm level heterogeneity.

Robustness Check

The first condition required for DID is that the shock should be exogenous. This implies that shock should not be a predictive or influential consequence of firms. Referring to the economic theory of regulation by Stigler (1971) cannot be perfectly ruled out this criteria. However, interest spread regulation initially received criticism from various influential banks and bankers' association. To this end, policy announcement can be assigned as exogenous.

Second, the exogenous shock should randomly assign firms into treated and controlled groups. This implies firm should not be able to manipulate itself to fall in

the either of the two category. Since NRB requires banks to calculate interest spread in a standard prescribed way that all the banks should comply with there is less chances of these kind of manipulation. This ensures the application of DID to measure the impact of policy intervention.

As an additional robustness check the researcher employs loan structures as a percentage of total loans. Different inference would then indicate different route of causality or spuriousness of the inference.

Then, $L_{i,t} = \alpha + \beta_i + \tau_t + \rho D_{SP} + \lambda d_1 + \gamma D_{SP} d_1 + \varepsilon_{i,t}$ 7)

where β = bank specific factors affecting loan structure (bank specific dummies)

τ =bank time trend of loan structure

The interest spread intervention separates banks randomly and exogenously into treated and controlled group. The treated has weighted average spread above 5% and controlled group has spread less than or equal to 5%. This allows us to use DID to measure average treatment effect in various loan structures.

Equation 1 has $d_1 = 1$ for period after intervention, 0 otherwise.

$D_{SP} = 1$ for treated, 0 for controlled.

A.Before intervention and treated group

i.e. When $D_{SP} = 1, d_1 = 0$

$E(L_{i,t}) = \alpha + \beta_i + \tau_t + \rho$ 8)

B. Before intervention and controlled group

i.e. When $D_{SP} = 0, d_1 = 0$

$E(L_{i,t}) = \alpha + \beta_i + \tau_t$ 9)

C. After Intervention And Treated Group

i.e. When $D_{SP} = 1, d_1 = 1$

$$E(L_{i,t}^{\sim}) = \alpha^{\sim} + \beta_i^{\sim} + \tau_t^{\sim} + \rho^{\sim} + \gamma^{\sim} \quad 10)$$

D. After Intervention And Controlled Group

i.e. When $D_{SP} = 0, d_1 = 1$

$$E(L_{i,t}^{\sim}) = \alpha^{\sim} + \beta_i^{\sim} + \lambda^{\sim} \quad 11)$$

Then the DID estimator of average treatment effect of the intervention is given by [Equation 10) – Equation 8)] - [Equation 11) – Equation 9)]

$$=[E(L_{i,t}^{\sim} / D_{SP} = 1, d_1 = 1) - E(L_{i,t}^{\sim} / D_{SP} = 1, d_1 = 0)] -$$

$$[E(L_{i,t}^{\sim} / D_{SP} = 1, d_1 = 0) - E(L_{i,t}^{\sim} / D_{SP} = 0, d_1 = 0)]$$

$$= \quad \gamma^{\sim} \quad 12)$$

The significant $\gamma^{\sim}$ would indicate the pairing effect holds for alternative definition of loan structures scaled by total loans. If significance of parameter γ in equation 6) vaporizes when defined alternatively as $\gamma^{\sim}$ as in equation 12) then the estimated parameter γ is not the causal impact of ISI on loan but a spurious estimation due to wrong specification that fails to capture loan targeting of various structures as a percentage of total extended loan. The researcher shall estimate $\gamma^{\sim}$ as an alternative test for robustness.

Finally it is possible that the change in treated and controlled variables using DID is actually a result of cyclical nature of variables and not as reaction of variables to state intervention. For this, the researcher has employed Placebo test. A false shock (pseudo-intervention) as on one year before announcement of the intervention has been identified. The researcher repeats regression by using 12 month before and after monthly bank-loan data on this false shock date. If data respond to this pseudo-shock in the same manner as they respond to our intervention shock, this may signal that our inference is a result of some unobserved cyclical variation and not a causal reaction to

the policy intervention. A positive placebo test would indicate spurious nature of our inference. Equations 7) to 12) represent econometric models used employ placebo *experiment.*

Let L_{it}= Loan structure of i^{th} bank at t time period

Then, $L_{i,t} = \alpha' + \beta'_i + \tau'_t + \rho' D_{SP} + \lambda' d_1 + \gamma' D_{SP} d_1 + \varepsilon'_{i,t}$ 13)

where β'= bank specific factors affecting loan structure (bank specific dummies)

τ'=bank time trend of loan structure

The pseudo intervention separates banks randomly and exogenously into treated and controlled group. The treated has weighted average spread above 5% and controlled group has spread within 5%.

In equation 13 $d_1 = 1$ for period after pseudo-intervention, 0 otherwise and $D_{SP} = 1$ for controlled, 0 otherwise.

A.Before pseudo-intervention and treated group

i.e. When $D_{SP} = 1, d_1 = 0$

$E(L_{i,t}) = \alpha' + \beta'_i + \tau'_t + \rho'$ 14)

B. Before pseudo-intervention and controlled group

i.e. When $D_{SP} = 0, d_1 = 0$

$E(L_{i,t}) = \alpha' + \beta'_i + \tau'_t$ 15)

C. After pseudo-intervention And Treated Group

i.e. When $D_{SP} = 1, d_1 = 1$

$E(L_{i,t}) = \alpha' + \beta'_i + \tau'_t + \rho' + \gamma'$ 16)

D. After pseudo-intervention And Controlled Group

i.e. When $D_{SP} = 0, d_1 = 1$

$E(L_{i,t}) = \alpha' + \beta'_i + \lambda'$ 17)

Then the DID estimator of average treatment effect of the pseudo intervention is given by;

[Equation 16) – Equation 14)] - [Equation 17) – Equation 15)] =

$$[E(L_{i,t} / D_{SP} = 1, d_1 = 1) - E(L_{i,t} / D_{SP} = 1, d_1 = 0)] -$$
$$[E(L_{i,t} / D_{SP} = 1, d_1 = 0) - E(L_{i,t} / D_{SP} = 0, d_1 = 0)]$$

$$= \gamma' \qquad 18)$$

The estimated γ's for various loan structures consistent with γs would indicate a positive placebo effect and spurious inference.

CHAPTER IV

RESULTS

The chapter presents the results of empirical test carried out the find out the impact of ISI on various loan structures. As such the chapter begins with descriptive statistics presented in tables and charts. This is followed by the presentation of regression output of DID setup. The primary DID estimation involves estimation of parameters of equation 1. This is followed by robustness from alternative definition of equation 7 and placebo estimation of equation 13.

DID Regression Output

Figure 2 shows loan growth rates of four different loan structures along with total loan portfolio of sample banks. Whereas total loan has experienced growth of 19.09% in the year following intervention treated bank group have grown at 17.14%, which is 4.04% lower than 21.18% growth experienced by the treated banks. Different loan structures have changed differently and probably have different stories to tell us regarding of the impact of intervention.

As evident by figure 2, banks with net interest spread above 5% (i.e. controlled group) have lower rate of loan growth in comparison to their within spread counterparts (i.e. controlled group) in working capital loan, deprived sector loan and small and medium enterprises loan. Specifically, WCL, DSL and SME loan of these treated banks have growth rates of 0.93%, 7.51% and 11.3% respectively lower than their treated counterparts. However, TL have experienced higher rate of loan growth of nearly 4% in comparison to the controlled. In what follows the researcher contends that these differently changing loan structures following intervention is no statistical

coincidence but an adaptation strategies adopted by these differently affected banks following interest spread intervention.

Table 5A

Descriptive Statistics

Panel A (Full sample)

Variable	Mean		Std. Dev.		Skewness		Ex. Kurtosis	
	Before	After	Before	After	Before	After	Before	After
TL	2454.00	3174.64	2809.77	3545.63	2.62778	2.94262	8.85099	11.1784
WC	7325.40	8754.35	6338.03	7436.09	1.13015	1.02114	0.541696	0.253727
DSL	639.989	850.652	957.783	1111.07	4.16614	3.78086	19.4172	16.6449
OTH (SME)	1700.91	2046.04	2314.09	2495.37	2.37004	2.08842	5.87667	4.41387
TOTAL	16853.4	20070.5	13962.5	16172.3	0.896507	0.840586	-0.303979	-0.316109

Table 5B

Descriptive Statistics

Panel B (Controlled Group)

Variable	Mean		Std. Dev.		Skewness		Ex. Kurtosis	
	Before	After	Before	After	Before	After	Before	After
TL	2056.04	2616.44	1327.41	1316.37	1.27459	0.497419	2.05134	0.0306150
WC	6450.73	7771.45	4004.94	4599.59	0.646793	0.417146	0.202973	-0.00915
DSL	457.711	660.520	303.039	376.953	0.623213	0.488934	0.0183898	0.455737
OTH (SME)	1257.43	1719.01	1331.98	1593.35	1.62553	1.39586	2.04899	1.27878
TOTAL	14624.5	17722.1	8872.19	9862.04	0.681340	0.505854	0.494379	0.590288

Table 5C

Descriptive Statistics

Panel C (Treated Group)								
Variable	Mean		Std. Dev.		Skewness		Ex. Kurtosis	
	Before	After	Before	After	Before	After	Before	After
TL	2951.45	3872.39	3893.89	5031.79	1.82760	1.92596	3.16731	3.70393
WC	8418.72	9982.96	8271.24	9776.11	0.752070	0.666175	-0.942428	-1.14503
DSL	867.837	1088.32	1364.25	1582.93	2.77002	2.51921	7.28857	6.12173
OTH (SME)	2255.26	2454.82	3050.85	3251.47	1.72347	1.63971	2.03134	1.65372
TOTAL	19639.4	23006.0	18093.4	21281.2	0.477436	0.443969	-1.50593	-1.53448

Figure 3

One-year Percentage Change in Average Total Value of Various Loan-Structures Following ISI.

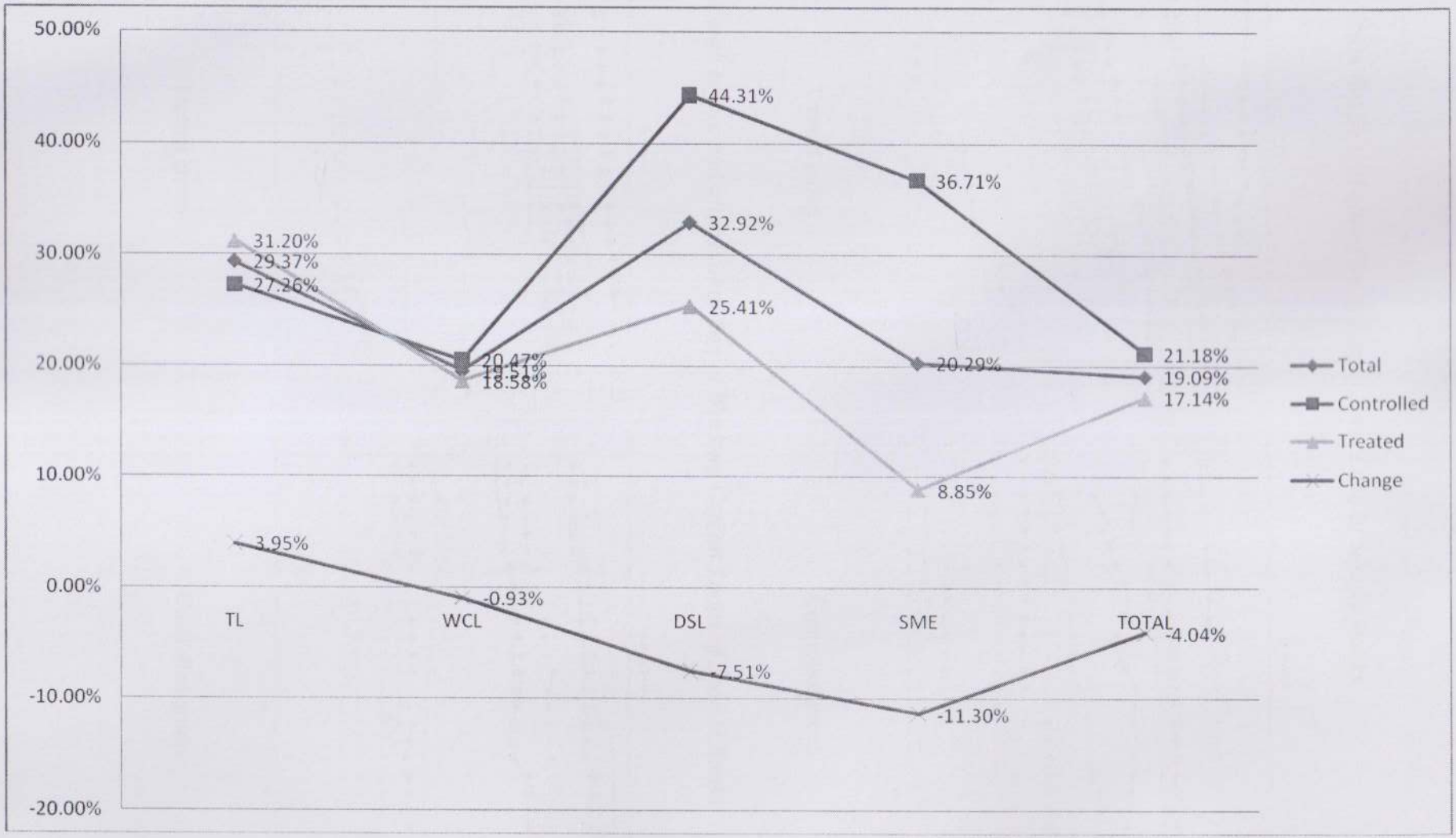
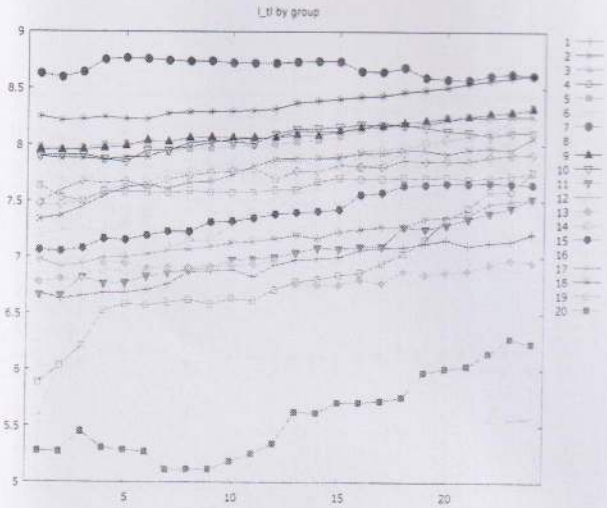
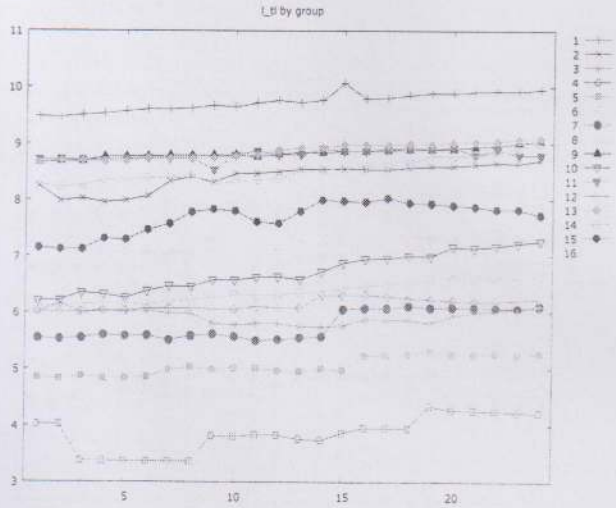


Figure 4

Twelve- Month Before and after Plot of Log of Term Loan of Sample Banks



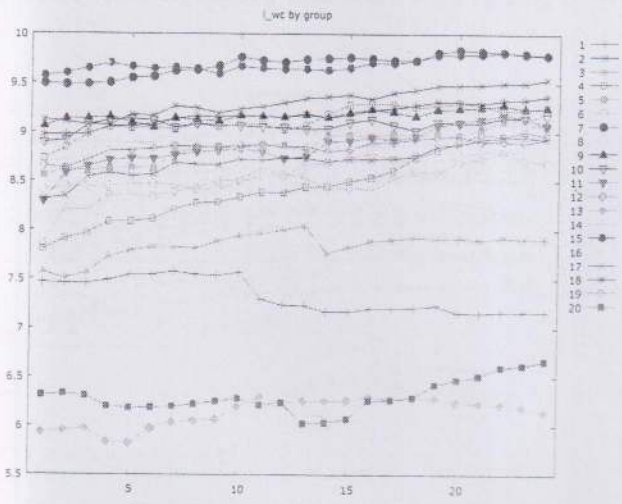
Treated group



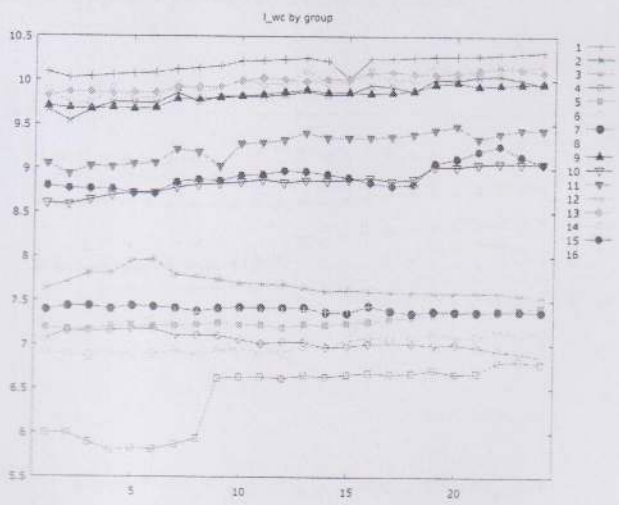
Controlled group

Figure 5

Twelve- Month before and after Plot of Log of Working Capital Loans of Sample Banks



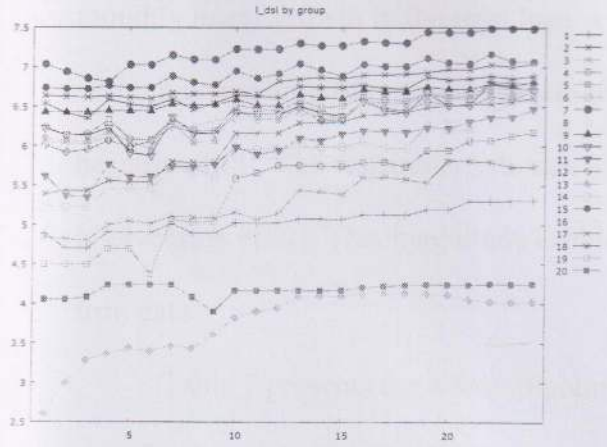
Treated group



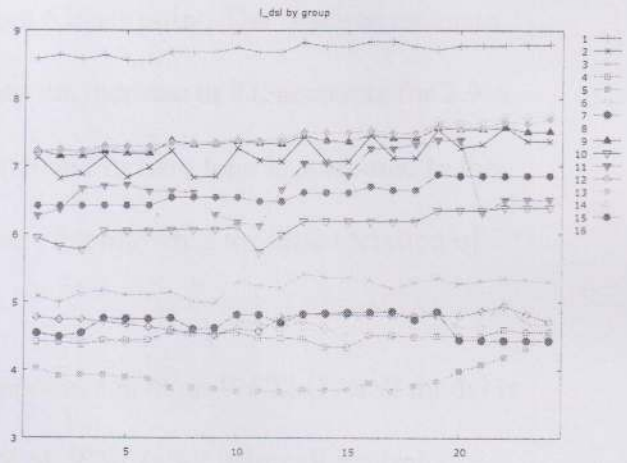
Controlled group

Figure 6

Twelve- Month before and after Plot of log of Working Capital Loans of Sample Banks



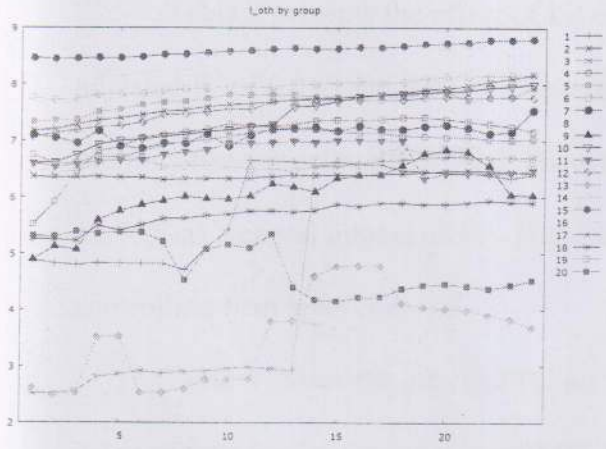
Treated group



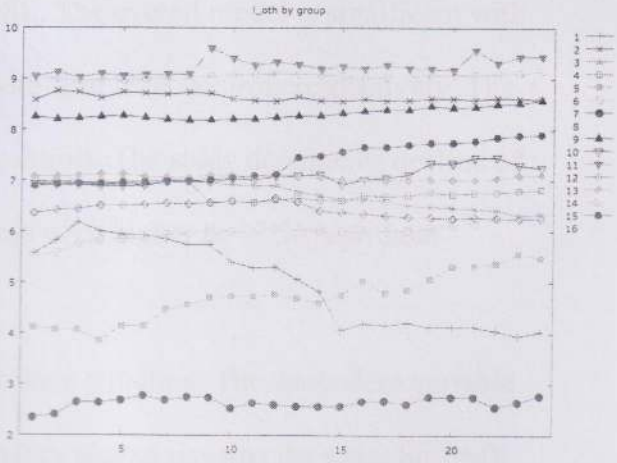
Controlled group

Figure 7

Twelve- Month before and after Plot of Log of Working Capital Loans of Sample Banks



Treated group



Controlled group

Tables from 6 to 9 show DID estimates of TL, WCL, DSL and SME structures. Regression setup is in time varying panel setting. Column 1 shows estimates controlling for firms specific heterogeneity. Column 2 shows estimates without controlling the firm level heterogeneity.

Table 6 shows that controlling for firm specific heterogeneity there has been positive effect of intervention on term loans. The overall model is significant with adjusted R^2 is .94 and the reported standard errors are heteroscedasticity robust. The monthly linear growth in the term loan is about 6 basis point. The baseline estimate without controlling firm specific heterogeneity the increase in TL accounts for 2.9% because of ISI. The researcher estimate 3% increase in term loan is attributed to the intervention effect. This magnitude is obtained after allowing for time variation of firm data.

Table 7 presents the effect of policy announcement on WCL. Overall model is significant as demonstrated by high squared R of .9701 (after using all control variables) WCL has increased at a monthly growth rate of 1.99%and 1.74% with and without controlling for firm level heterogeneity. There is about 2% decrease in working capital loan because of interest intervention controlling for firm level heterogeneity and 2.6% without controlling for firms heterogeneity.

Table 8 presents the effect of ISI on DSL. The overall model is significant with adjusted R^2 of 0.045 and 0.901 without and with firm level controls respectively. The monthly trend is estimated to be 2.1% using controls. The study documents decline of 12.75% as a causal impact of ISI. The decline is even higher as 17.36% without controlling firm level controls.

Table 9 shows the effect of ISI on SME loan structure. The dependent variable is log of total loan extended under SME. The story almost remains the same for SME as it is for DSL. There have been decrease in lending of SME by 22% as a result of ISI.

Taken together the results are in favor of pairing effect postulate. The causal increase in TL which is structure with low information asymmetry and low risk as

oppose to causal decrease in WCL, DSL and SME which are riskier structures with higher information asymmetry as discussed in the conceptual framework is a strong evidence of pairing effect.

Table 6

Effect of ISI on term Loans

	log(term loan)	
Variables	1	2
τ (Trend)	0.0251575***	0.026***
	(0.0006)	(0.0079)
D_1 (After Dummy)	-0.00558***	-0.002
	(0.0070)	(0.113)
D_{SP} (High Spread Dummy)	4.13726***	-0.49***
	(0.0308)	(0.144)
D_1* D_{SP}	0.03***	0.029
	(0.0082)	(0.198)
Observations	864	864
Firm Effects	Yes	Yes
Adjusted R^2	0.994738	.9966

Note: The table reports results for the regression $TL_{i,t} = \alpha + \beta_i + \tau_t + \rho D_{SP} + \lambda d_1 + \gamma D_{SP} d_1 + \varepsilon_{i,t}$ .The dependent variable is logarithm of term loan. Here, i indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for frim level heterogeneity in 1 and 2. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Table 7

Effect of ISI on Working Capital Loans

Variables	log(working capital loan)	
	1	2
τ (Trend)	0.0174***	0.0199**
	(0.00058)	(0.0099)
D_1 (After Dummy)	-0.035***	-0.059
	(0.0076)	(0.137)
D_{SP} (High Spread Dummy)	3.9396***	-0.089
	(0.0258)	(0.5296)
D_1* D_{SP}	-0.0198*	-0.026
	(0.007)	(0.889)
Observations	864	864
Firm Effects	Yes	No
Adjusted R^2	0.997103	0.0084

Note: The table reports results for the regression $WCL_{i,t} = \alpha + \beta_i + \tau_t + \rho D_{SP} + \lambda d_1 + \gamma D_{SP} d_1 + \varepsilon_{i,t}$ .The dependent variable is logarithm of working capital loan. Here, i indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for firm level heterogeneity. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Table 8

Effect of ISI on Deprived Sector Loans

Variables	log(deprived sector loan)	
	1	2
τ (Trend)	0.0217***	0.029
	(0.0009)	(0.009)
D_1 (After Dummy)	0.1144***	0.073
	(0.014)	(0.132)
D_{SP} (High Spread Dummy)	4.494***	0.013
	(0.061)	(0.136)
$D_1 * D_{SP}$	-0.1275***	-0.1736
	(0.0125)	(0.191)
Observations	864	864
Firm Effects	Yes	No
Adjusted R^2	0.9911	0.045

Note: The table reports results for the regression $DSL_{i,t} = \alpha + \beta_i + \tau_t + \rho D_{SP} + \lambda d_1 + \gamma D_{SP} d_1 + \varepsilon_{i,t}$. The dependent variable is logarithm of term loan. Here, i indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for firm level heterogeneity. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Table 9

Effect of ISI on Small and Medium Enterprises Loans

Variables	log(SME-loan)	
	1	2
τ (Trend)	0.0145***	0.0194
	(0.0013)	(0.014)
D_1 (After Dummy)	0.2122***	0.2896
	(0.021)	(0.2121)
D_{SP} (High Spread Dummy)	0.198292	0.3080**
	(0.2648)	(0.1513)
D_1* D_{SP}	-0.2215***	-0.4998**
	(0.0190)	(0.2113)
Observations	864	864
Firm Effects	Yes	No
Adjusted R^2	0.9963	0.015

Note: The table reports results for the regression $SME_{i,t} = \alpha + \beta_i + \tau_t + \rho D_{SP} + \lambda d_1 + \gamma D_{SP} d_1 + \varepsilon_{i,t}$. The dependent variable is logarithm of term loan. Here, I indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for firm level heterogeneity. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Alternative Test of Causation

Even though the pairing effect is supported by the data, there still remains the counterfactual that the result is because of loan targeting. Loan targeting means that banks maintain their loan portfolios as a target proportion of total assets. For this researcher has tested the DID estimation using alternative definition of loan structures which is loan structured scaled as a proportion of total loan. Table 11 to table 14 present the result of scaled loan structures.

Table 10 shows the effect of ISI on term loan structure using alternative definition. Here dependent variable is term loan divided by total loan (TL/TL). There

is 5 basis in term loans as a proportion of total loan portfolio because of ISI controlling for firm level heterogeneity. The increase is as high as 12.4 basis point when the firm levels controls are not used. The overall model is highly significant.

Table 11 depicts the effects of ISI on working capital loans. Here dependent variable is working capital as a fraction of total loans. The study document decrease of WCL/TL by 4.4 basis point and 0.86 basis point without and with firm level controls.

Table 12 shows the impact of ISI on deprived sector loans. Here dependent variable is DSL/TL. The estimated decline of DSL/TL attributed to ISI is .03 and .004 without and with firm level controls. Similarly as depicted by table 14 DSL/TL has declined by 1.6 and 2.1 basis point because of intervention.

Taken together, the effect of ISI holds even with the alternative definitions of loan structures. This increases the strength of inference of the study.

Table 10

Effect of ISI on Term Loan/Total Loans

	(Term Loan/Total Loans)	
Variables	1	2
τ (Trend)	0.010***	0.002
	(0.0003)	(0.0035)
D_1 (After Dummy)	−0.004	0.039
	(0.003)	(0.057)
D_{SP} (High Spread Dummy)	3.63	0.366***
	(0.082)	(0.0462)
D_1* D_{SP}	0.05***	0.124
	(0.008)	(0.08)
Observations	864	864
Firm Effects	Yes	No
Adjusted R^2	0.94738	0.3101

Note: The table reports results for the regression $TL_{i,t}\tilde{} = \alpha\tilde{} + \beta_i\tilde{} + \tau_t\tilde{} + \rho\tilde{} D_{SP} + \lambda\tilde{} d_1 + \gamma\tilde{} D_{SP} d_1 + \varepsilon_{i,t}$ .The dependent variable is of term loan as a fraction of total loan. Here, i indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for firm level heterogeneity in 1 and 2. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Table 11

Effect of ISI on Working Capital Loan/Total Loan

Variables	(Working Capital Loan/Total Loan)	
	1	2
τ (Trend)	0.0013***	0.017**
	(0.0001)	(0.001)
D_1 (After Dummy)	−0.0086***	−0.044
	(0.002)	(.0162)
D_{SP} (High Spread Dummy)	0.497***	0.117
	(0.005)	(0.010)
D_1* D_{SP}	−0.0034*	−0.108
	(0.0018)	(0.01)
Observations	864	864
Firm Effects	Yes	No
Adjusted R^2	0.9703	0.8403

Note: The table reports results for the regression $WCL_{i,t}^{\sim} = \alpha^{\sim} + \beta_i^{\sim} + \tau_t^{\sim} + \rho^{\sim} D_{SP} + \lambda^{\sim} d_1 + \gamma^{\sim} D_{SP} d_1 + \varepsilon_{i,t}$. The dependent variable is working capital loan as fraction of total loan. Here, i indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for firm level heterogeneity. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Table12

Effect of ISI on Deprived Sector Loan/Total Loan

Variables	(Deprived Sector Loan/Total Loan)	
	1	2
τ (Trend)	0.0004***	0.0012
	(0.0003)	(0.0002)
D_1 (After Dummy)	0.0023***	-0.0013
	(0.0003)	(0.003)
D_{SP} (High Spread Dummy)	0.104***	.0098
	(0.0021)	(0.0021)
$D_1 * D_{SP}$	−0.003***	-0.0025
	(0.0004)	(0.003)
Observations	864	864
Firm Effects	Yes	No
Adjusted R^2	0.8897	0.045

Note: The table reports results for the regression

$DSL_{i,t}^{\sim} = \alpha^{\sim} + \beta_i^{\sim} + \tau_t^{\sim} + \rho^{\sim} D_{SP} + \lambda^{\sim} d_1 + \gamma^{\sim} D_{SP} d_1 + \varepsilon_{i,t}$ .The dependent variable is deprived sector loan as a fraction of total loan. Here, i indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for firm level heterogeneity. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Table 13

Effect of ISI on SME-Loan/ Total Loan

Variables	(SME-Loan/ Total Loan)	
	1	2
τ (Trend)	0.0005***	0.0055
	(0.0000089)	(0.0007)
D_1 (After Dummy)	0.0079***	−0.0244
	(0.0011)	(0.010)
D_{SP} (High Spread Dummy)	-0.0146	0.040**
	(0.0034)	(0.0076)
D_1* D_{SP}	−0.016***	−0.021**
	(0.0190)	(0.01)
Observations	864	864
Firm Effects	Yes	No
Adjusted R^2	0.9912	0.045

Note: The table reports results for the regression $SME_{i,t}^{\sim} = \alpha^{\sim} + \beta_i^{\sim} + \tau_t^{\sim} + \rho^{\sim} D_{SP} + \lambda^{\sim} d_1 + \gamma^{\sim} D_{SP} d_1 + \varepsilon_{i,t}$ .The dependent variable is small and medium enterprise loan as a fraction of total loan. Here, I indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for frim level heterogeneity. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Placebo Experiment

We conduct placebo test to test the robustness of inference. For this, we identify a false shock date i.e. July 21, 2012 as discriminating date to classify before and after period. We take monthly loan data of sample banks for a period of 12 month before and after this date. Table 14 to 17 give us the treatment effect of this false experiment. All setting resemble previous DID setting, results of which are presented in table 7 to 10. As presented in the tables 14 to 17 treatment effect is not statistically significant for all four loan structures.

However, we see from table 14 that there has been a decline of term loan by 12.8% which is in opposition to increase of 3% as predicted by DID estimation in true experiment. Similar results have been shown by column 2 of table 5 which shows the estimation without controlling firm level heterogeneity.

Table 15 shows that though statistically insignificant, working capital loan experienced an increase of 2.3% as opposed to 2% decrease in true experimental setup (refer table 3). Similarly there have been 5.5% and 8.5% increase(refer table 7 and 8 respectively) deprived sector loan and small and medium enterprises loan in false experimental setup. In true experiment there have decrease in DSL and SME by 12.75% and 22.15% respectively. However, results are not statistical significance.

The results are seems rationally obvious. In absence of pricing ceilings, banks with higher spread are willing to lend to riskier structures as they could price adequately.

Table 14

Effect of PISI on term loans

Variables	log(term loan)	
	1	2
τ (Trend)	0.0187941***	0.022868**
	(0.00438112)	(0.00952121)
D_1 (After Dummy)	0.120612**	0.0709149
	(0.062852)	(0.129026)
D_{SP} (High Spread Dummy)	4.01944	-0.270942**
	(0.609688)	(0.137819)
D_1* D_{SP}	-0.123499	-0.1235693
	(0.128682)	(0.202043)
Observations	864	864
Firm Effects	Y	N
Adjusted R^2	0.965361	0.045903

Note: The table reports results for the regression

$TL_{i,t} = \alpha' + \beta'_i + \tau'_t + \rho' D_{SP} + \lambda' d_1 + \gamma' D_{SP} d_1 + \varepsilon'_{i,t}$. The dependent variable is logarithm of term loan. Here, i indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2012 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for frim level heterogeneity in 1. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Table 15

Effect of PISI on Working Capital Loans

Variables	log(working capital loan)	
	1	2
τ (Trend)	0.0248403***	0.0280109***
	(0.00102189)	(0.00987462)
D_1 (After Dummy)	0.0163659	-0.0192905
	(0.0108734)	(0.135946)
D_{SP} (High Spread Dummy)	1.90449	0.1184
	(0.1268)	(0.114345)
$D_1 * D_{SP}$	0.0231068	-0.00651727
	(0.122954)	(0.153415)
Observations	864	864
Firm Effects	Y	N
Adjusted R^2	0.993496	0.028307

Note: The table reports results for the regression $WCL_{i,t} = \alpha' + \beta'_i + \tau'_t + \rho' D_{SP} + \lambda' d_1 + \gamma' D_{SP} d_1 + \varepsilon'_{i,t}$. The dependent variable is logarithm of working capital loan. Here, i indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for firm level heterogeneity. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Table 16

Effect of PISI on Deprived Sector Loans

Variables	log(deprived sector loan)	
	1	2
τ (Trend)	0.0257611***	0.0323274***
	(0.00113906)	(0.0108471)
D_1 (After Dummy)	0.0144461	-0.0147454
	(0.148232)	(0.159534)
D_{SP} (High Spread Dummy)	4.35733	0.119093
	(0.0607688)	(0.1392)
D_1* D_{SP}	0.0549523	0.128607
	(0.140529)	(0.186367)
Observations	864	864
Firm Effects	Y	N
Adjusted R^2	0.990	0.028

Note: The table reports results for the regression $DSL_{i,t} = \alpha' + \beta'_i + \tau'_t + \rho' D_{SP} + \lambda' d_1 + \gamma' D_{SP} d_1 + \varepsilon'_{i,t}$. The dependent variable is logarithm of term loan. Here, i indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for firm level heterogeneity. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Table 17

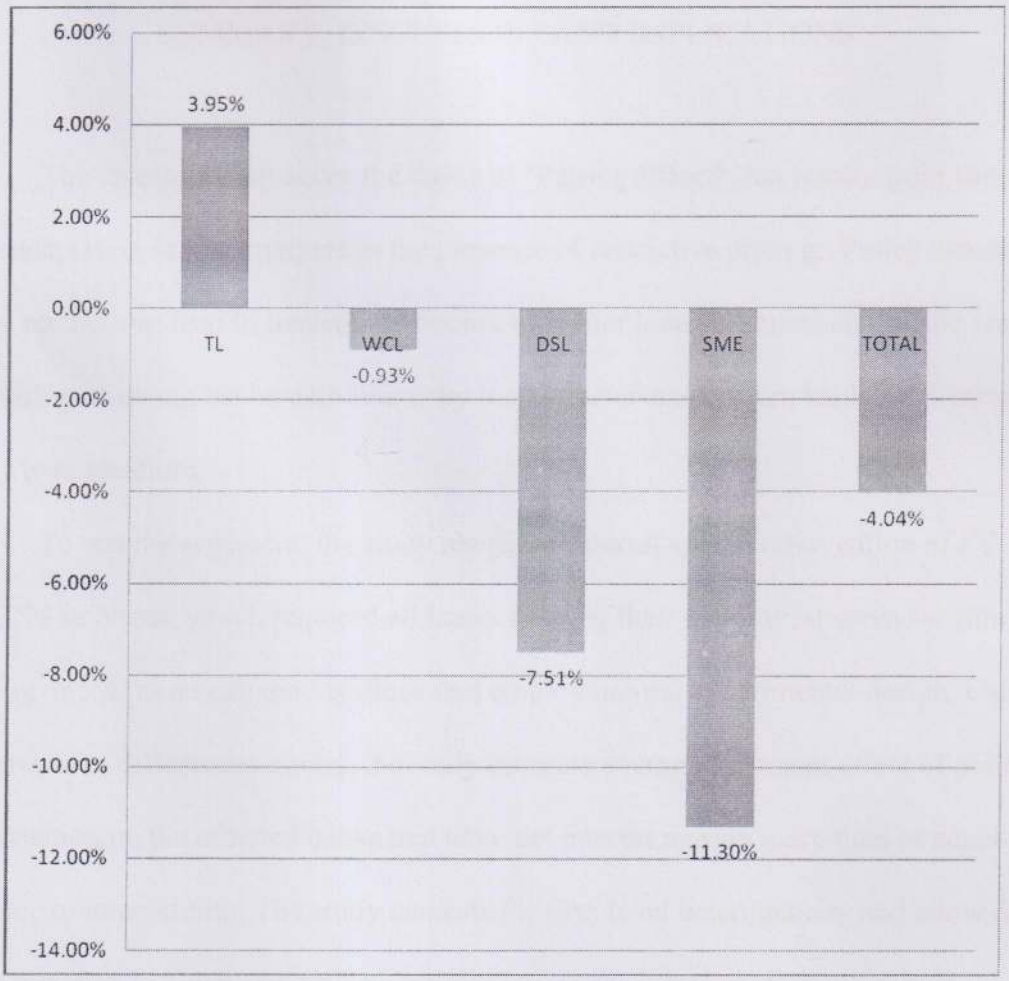
Effect of PISI on Small and Medium Enterprises Loans

	log(SME-loan)	
Variables	1	2
τ (Trend)	0.0329811***	0.0330839***
	(0.00121902)	(0.0164779)
D_1 (After Dummy)	0.15583	0.235972
	(0.0144621)	(0.255778)
D_{SP} (High Spread Dummy)	-0.0485462	0.534026
	(0.139619)	(0.197119)
D_1* D_{SP}	0.0849	0.068831
	(0.149179)	(0.242805)
Observations	864	864
Firm Effects	Y	N
Adjusted R^2	0.989	0.035

Note: The table reports results for the regression $SME_{i,t} = \alpha' + \beta'_i + \tau'_t + \rho' D_{SP} + \lambda' d_1 + \gamma' D_{SP} d_1 + \varepsilon'_{i,t}$. The dependent variable is logarithm of term loan. Here, I indexes firm and t indexes time (month). Here D_{SP} takes value 1 for banks with net interest spread more than five percent on Ashad end 2069, and zero otherwise, d_1 takes value 1 for months after July 2013 and zero otherwise. Standard error is reported in the parentheses. 35 firm specific dummies are taken to control for frim level heterogeneity. ***, ** and * implies significance at 99%, 95% and 90% respectively.

Figure 8

Changes in Loan Structures of Treated and Controlled Banks Following ISI



Note: Change signifies difference in loan structures of treated and controlled banks. TL, WCL, DSL, SME and TOTAL implies term loan, working capital loans, deprived sector loans, small and medium enterprise loan and total loan.

CHAPTER IV

SUMMARY, DISCUSSIONS AND IMPLICATIONS

The researcher advances the thesis of "Pairing Effect" that results from supply side adaptation in loan markets in the presence of restrictive pricing. Policy driven price restrictions lead to inadequate pricing of riskier loan structures and would result in pairing of strong banks with less risky loan structures and weak banks with more risky loan structure.

To test the argument, the study identifies interest spread intervention of FY 2013/14 in Nepal, which required all banks to bring their net interest spread within the ceiling of 5%, as an exogenous shock and employ natural experimental design. Using difference in differences model, the study estimate average treatment effect of policy intervention on the affected banks that have net interest margin more than or equal to 5% due to intervention. The study controls for firm level heterogeneity and allow for time variation in panel setting. The estimation reports heteroscedasticity robust standard errors of the estimates.

We document that when banks are not allowed to freely price their loan structures as a function of riskiness of structure, banks involve in granting more of less riskier loans. The demand of riskier loan structure will, then, be availed by banks with low interest margin. To the extent that higher interest spread is a measure of market power resulted by price efficiency and be referred as strong banks, this results in the pairing of strong banks with less risky loan structures and weak loan with more riskier loan structures.

Major Findings

Results from natural experiment supports our "Pairing Effect" thesis. To the end that term loan, in comparison to working capital, carries low information asymmetry and lower cost of monitoring, therefore are less riskier, intervention has resulted in loan-bank pairing. With price ceiling in place and when unable to adequately price their structures, banks in better conditions have paired themselves with riskier loan structures.

Intervention and TL

Term loan is a scheduled loan with definite investment purpose, horizon and cash flows. This structure has relatively low information asymmetry between borrower and lender and cost of monitoring is low. Figure 4 shows that there is average of 4% increase in growth in TL following intervention.

Controlling for time variation and firm specific heterogeneity we document average treatment effect 3% increase because of ISI. The estimated parameter is consistent with our pairing effect thesis. If we compare to decrease in TL of 12.9% estimated by placebo experiment, the increase is TL seems to be the result of adjustment by banks with higher interest margin.

Intervention and WCL

Working capital loan is a flexible structure. It has higher cost of monitoring and it conveys relatively higher information asymmetry as borrower cannot fully ensure its purpose and monitor its use. We see that following intervention there has been an average of nearly 2% decrease in overdraft loan (refer table 8).

Should pairing effect not hold, there should be increase or no significant change in WCL. However, consistent with pairing effect, WCL not only has decreased significantly but also has moved in opposite direction with respect to TL

following regulation. Comparing this with 2.3% increase in WCL one year before intervention, we can attribute the decrease is caused by ISI.

Intervention and DSL

Deprived sector loan are regulatory- guided loan structures availed to those stratum of borrowers, which does not meet the criteria of borrowers under established principles of bank lending. Policy makers view increase in this structure as expected positive policy outcomes. However, since DSL borrowers do not have established credit history or other criteria this structure are considered as having higher information asymmetry and cost of monitoring is also high. If pairing effect is to hold there should be increase or at-least remain equal in DSL structure. Referring table 10, we find that there is 12.75% decrease in DSL controlling for time variation and firm level heterogeneity.

Intervention and SME

SME is loan structure that is policy directed. This structure aim to cater small and new entrepreneurs who would otherwise be left out from credit market because of unestablished credit criteria. Information asymmetry is high owing their small size and unproven credit history. Pairing effect, to hold among banks and structures, this structure should decrease following ISI. In congruence with the pairing effect expectation, there is 22.15% decrease in SME resulting from ISI.

Discussions

Exploiting the clean natural experimental setup of interest spread intervention of NRB 2013/14, which allowed us to separate the banks into control and treated and allowed us to study before and after effect, we document the prevalence of pairing effect among banks and loan structures as an adjustment to policy reforms. We are the first to document pairing effect resulting from banks' adaptation to policy

intervention when they cannot freely price their product. The evidence is of economic and theoretical significance as the study employs robust design to ensure causality and cleaner data provided by the central bank of Nepal.

International evidence is mixed when we examine the closeness with the finding of the study. There are abundant international studies which have documented the causal relationship between reforms and expected policy outcomes. We will examine first those studies that contrast with our finding and then discuss other studies that are consistent with ours.

There are few notable international studies, which have documented positive link of reforms on firms' performance and value. In their seminal paper "Law and Finance" that examined 49 cross-countries data on law and finance, La Porta et al. (1999) documented that weak investor protection is correlated with thinner debt markets across the sample countries. They documented that improved law (or interventions) leads to greater financial development. A variant to this assertion, Levine(2003) provided empirical evidence of the relationship between more financial development and more growth. As such, policy interventions that promotes legal environment (as in the case of La Porta et. al) or financial regulation improves finance and hence is responsible for more growth (as in the case of Levine) are viewed as positive actions that shatters sub optimality resulting from market imperfections and results in positive economic outcomes.

Using a micro-panel of loans to study in a developing country context, Visaria (2009) documented a positive impact of a judicial reform that improved credit contract enforcement across different states of India. Using the state-time variation in the establishment of the new debt recovery tribunals, she found that stricter enforcement of lender's rights in the event of default significantly improved

repayment behaviour, and subsequently lowered average interest rates on new loans. This evidence is consistent with the findings of La Porta et al (1998) and Levine (1999) and supports policy interventions.

Similar inference has been documented in Korean capital market. Black et al. (2006) constructed a Korean corporate governance index (KCGI), which they used to study the effects of governance on Korean firms. They examined the effect of the KCGI on firm's value, instrumenting for the KCGI using an asset size variable that captures the threshold for the application of the reforms, and documented positive impact of governance reforms on firm's value. Similarly, study by Dharmapala and Khanna (2012) is based on natural experiment of corporate governance reforms in India. Although there has been extensive discussion across the fields of economics, law, and finance of the effects of corporate governance, the central challenge has been to find credible evidence of a causal impact of governance practices on firm value, financial development, and the wider process of economic development. Dharmapala and Khanna (2012) used a sequence of corporate governance reforms in India as a source of exogenous variation. These reforms had several unusual features that facilitate identification of this causal effect. In particular, a large group of firms was exempted from the reforms, and the complex rules for the application of the reforms created considerable overlap in the characteristics of affected and unaffected firms. Moreover, the introduction of more severe financial penalties for the violation of the new corporate governance rules took place after the rules were already in force, thus decoupling the effects of substantive legal rules and of increased sanctions. Using the set of reforms, the study documented a large and statistically significant positive effect of the governance reforms in combination with the sanctions. The study, thus, primarily contributed to the very limited body of causal evidence for the proposition

that corporate governance affects firm's value. Moreover, the study has highlighted the role of sanctions and enforcement—the substantive legal rules are shown to have a fairly weak effect until the enactment of more severe sanctions. Taken together this study and previously mentioned studies provide evidence of counter thesis to our findings.

There are, however, other international studies that document evidence consistent with our findings. Davydenko and Franks (2008) examine the effect of bankruptcy laws on financially distressed firms in the United Kingdom, Germany, and France. They documented two major findings that are pertinent in relation to our study.

First, there is bank level adaptation to minimize the effect of lower creditor's protection in countries with weak debt recovery, for example in France. They found that banks significantly adjust their lending and reorganization practices in response to the country's bankruptcy code. In particular, collateral requirements at loan origination directly reflect the bank's ability to realize assets upon default. Thus, because the proceeds from collateral sales are lower in France, at loan origination French banks demand higher levels of collateral per dollar of debt.

Our finding is close to the study by Davydenko and Franks (2008) in that they document bank level adaptation following reforms. Finally, their findings underscore the importance of understanding broader institutional considerations in discerning the effects of bankruptcy legislation. For example, they document that loan spreads charged by U.K. banks are similar to those in France, notwithstanding higher U.K. loan recovery rates combined with similar default probabilities in the two countries. The ability of U.K. banks to charge high interest rates despite relatively low expected losses is consistent with higher industry concentration and lower levels of

competition in the banking industry in the United Kingdom, with its market-oriented financial system, compared with the bank-oriented systems in Germany and France.

Similarly in other prominent empirical paper, Lilenfeld et al. (2012), documented a contraction of credit, fixed assets and profits for small firms, following an Indian reform which strengthened banks' ability to enforce credit contracts. They explained this by general equilibrium effects in the credit markets arising due to inelastic supply of loans. The finding provided a basis concerning the adverse effect of strong protection of lender rights on smaller, poorer borrowers. The empirical and theoretical results cast doubt on the general presumption that strengthening lender collection rights or expanded scope for collateral will relax credit market imperfections for most borrowers, or that aggregate efficiency and output will necessarily rise. If small firms have higher marginal returns to capital, this redistribution of credit may result in an adverse macroeconomic impact. The analysis that focused on the distributive impacts found that while lenders were found generally better off due to an increase in credit enforcement, a large fraction of borrowers were adversely impacted. This study is evidence that expected positive outcomes of reforms could not be realized when policymakers fail to anticipate and therefore respond to the probable demand side manipulation in the credit market before devising policy reforms. Evidently, the study is a classic example of failure of piecemeal policy intervention.

Similarly, consistent with our evidence, Vig (2013) finds that increased creditor's protection reform has reduced total lending in India controlling for time variation and other firm specific factors. He documents demand side adaptation that reduced total lending despite policy goal of creditors right reform aimed at improving loan market. From a general wisdom it seems as if better enforcement of contracts

reduces borrowing costs, thereby relaxing financial constraints. However, market behavior is not that straight forward. Vig investigated the effect of strengthening creditor rights in India on firms' financial policies. He finds that an increase in the rights of secured creditors led to a reduction in the use of secured debt. These results suggest that welfare implications of strengthening creditor rights are not clear cut. Although there are obvious benefits from strengthening creditor rights, such as better resource allocation, he finds that stronger creditor rights may cause some firms to be worse off. The finding of study by Vig is that creditor rights affect both supply of, as well as demand for, credit. Suppliers of secured credit are clearly better protected by policy reforms. However, stronger creditor protection also makes borrowers more cautious because it makes secured creditors less willing to compromise.

Our findings contrasts with Lilenfeld et al (2012) and Vig (2013) in the mechanism of effects. Whereas the negative distributional effect of creditor's reform on small and financially constrained firms in case of Lilenfeld et al (2012) and decrease in secured debt following creditor's reform in case of Vig (2013) both studies imply the demand side adaptation to the reforms; supply side manipulation is attributed to pairing effect.

The researcher documents strong banks pair up with less risky loan structures leaving weaker banks to finance high risk loan structures as an adjustment to the policy driven restrictive price. Hence, the expected positive outcome of ISI has been unable to achieve. However, consistent with our findings Davydenko and Franks (2008) documented that there is bank manipulations and adjustment to policy reforms at hand; and Robert and Sufi (2009) documented important roles of supply side factors in corporate debt decisions.

Whether operating from supply side or demand side manipulation, studies consistent with our have highlighted that piecemeal reforms will fail in the wake of adaptation strategies followed by affected operators in an economy. This argument borrows from the pioneering contribution of Lipsey and Lancaster (1956) and their theory of second best.

Lipsey and Lancaster (1956) theorize that in a world with a large number of constraints or frictions, a piecemeal policy response that fixes or relaxes one of the constraints can actually reduce welfare rather than increase it. Put differently, in an economy with several sources of market imperfections, an attempt by regulators to fix a market failure may have an unintended effect of reducing welfare rather than increasing it.

In recent seminal paper Jimenez et al. (2014) has analysed the impact of the overnight monetary policy rate on risk-taking by banks. The study finds that a lower overnight interest rate induces banks to engage in higher risk-taking in their lending. Moreover, a lower overnight interest rate induces lowly capitalized banks to grant more loan applications to ex-ante risky firms than highly capitalized banks and that, when granted, the committed loans are larger in volume and are more likely to be uncollateralized. Applications granted by lowly capitalized banks also have a higher ex-post likelihood of default (when the overnight rate is lower). A lower long-term interest rate and other key macro variables such as securitization and current account deficits (which entail capital inflows) have no such effects.

Jimenez et al (2012) documented that monetary policy affects the composition of the supply of credit, in particular with respect to credit risk. As the study exhaustively account for time-varying bank heterogeneity, their results suggest that when the monetary policy rate is lower, the intensity of risk-taking is not simply the

result of more lending by capital-constrained banks but is also consistent with risk-shifting behaviour widely debated in finance literature. As the study finds that monetary policy drives bank risk-taking, their results lend support to the bestowing of new responsibilities to central banks in the realm of macro-prudential supervision (Diamond and Rajan,2012). Monetary and macro-prudential policies may indeed not be independent (Stein , 2012).

In his meta-analytical paper, Foxley (2010) discusses the economic consequence of 2008 global financial crisis and way forward to the post crisis economics the Latin American economies. He posits that the global financial crisis has reignited the fierce debate about the roles of the market and the state in modern economies. He argues that in particular, the Latino economy revisits this debate every time it suffers an external shock. While some blame unregulated markets, others fault states' inability to design institutions or implement policies capable of neutralizing the negative impact of these shocks on output, employment, and social welfare.
He argues "...as they emerge from the most recent crisis, Latin American economies need both—more market and more state". More market will enable them to exploit new opportunities through bilateral or multilateral trade agreements, and expand public-private partnerships. But "more market" also implies more competition, and in many of these economies, that will require better regulation and thus, more state. Foxley (2010) believes that a more intelligent state, acting as a catalyst for development, could encourage creativity and foster entrepreneurship. The state must also play a greater role in creating the social protection networks required to reduce economic insecurity in a region where external shocks have become a recurring phenomenon.

Our study documents evidence in congruence with the argument of Foxley (2010) in that policy makers should re-examine their economic policies from a dispassionate distance before devising or reforming existing policies to mitigate the adverse effect of piecemeal intervention and search for more resilient and pro-welfare policies.

Implications and Future Direction

Policy evaluation has relevance in that it prompts timely correction to the policy at hand and provides valuable feedback to the future policies and interventions. Traditional econometric methods including deep structured regressions have struggled to explain the underlying causation of the variables and therefore, have been highly criticized for in-sample data fitting rather than out-sample validity. Our study addresses this by employing design based approach.

The researcher believes the study has offered unique contribution. The study employs a natural experiment of interest spread regulation as an exogenous shock to assess the impact of interest spread on different lending structures. This will help NRB and the government of Nepal to devise appropriate corrections and amendments for obtaining the broader goals of financial stability and economic growth. Specifically, in line with the findings of Vig(2013), the study shows that piecemeal corrections is not optimal in devising policy instrument to address interest spread issue when high spread is a function of many factors. This is not to argue that intervention is not a policy devise to promote welfare. Rather, researcher argues that policy analysis should look holistically considering various factors increase the probability of benefitting from the reforms.

To the extent that pairing of bank with loan goes beyond structures, future studies may focus on enquiry of pairing of banks with borrowers. The evidence that

policy driven pricing restrictions creates pairing of strong bank with good client and weak bank with bad client, would then complete the thesis of pairing effect which is beyond the scope of this study.

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APENDIX I

Definition of Loan Structures

1. Term Loan:

It includes loan granted for financing capital expenditure and tenure of which is more than one year.

2. Overdraft Loan:

This includes loan disbursed by Financial Institutions in the form of overdraft and is revolving in nature. In reporting, the financial institutions are required to report outstanding loan amount utilized under this facility and not the overdraft limit.

3. Trust Receipt Loan/Import Loan:

Trust Receipt Loans are availed by financial institutions to finance import loan through Letter of Credit. Import loans include short term deficit financing loans for import not exceeding 180 days.

4. Demand Loans and Other working Capital Loans:

This includes Inventory Hypothecation and Assignment of Account Receivables, Working Capital, Short Term Loan, Demand Loan, Time Loan, Cash Credit and other forms of short term loans.

5. Real Estate Loan:

This includes:

a. Residential Real Estate Loan
b. Loan for Commercial building and residential apartment and personal residential colony
c. Loan availed to commercial complex

d. Other real estate loan including loan for purchase of land and loan by land developers

e. Mortgage Loan above NPR 5 mio that are availed without specific purpose in the name of personal loan or flexi loan should be considered real estate loan. However following are not considered real estate loan:

a. Loan used by firms that are not involved in real estate business and that use loan against mortgage in addition to other collateral.

b. Loan upto NPR 10 mio used for personal residential purpose availed after assessment of borrower's paying capacity.

6. Personal Residential Home-Loan:

This loan include Loan upto NPR 10 mio availed for the purchase or construction of residential buildings or after assessment of borrowers' income and paying capacity.

7. Margin Lending:

This loan include loan availed as against the security of shares and debentures of company listed in Nepal Stock.

8. Hire-Purchase Loan:

This include auto loan and vehicle loan availed to borrowers for a) commercial purpose and b) individual use

9. Deprived Sector Loan:

This includes loan disbursed in deprived sector as defined by Nepal Rastra Bank through a) capital investment in micro finance development financial institutions (MFDFIs), b) whole sale loan provided to MFDFIs and c) retail loan to the deprived sector borrowers

10. Bills Purchase:

This includes instruments including cheques, drafts, import bills purchased by financial institutions.

11. Other Products:

This includes loans availed under

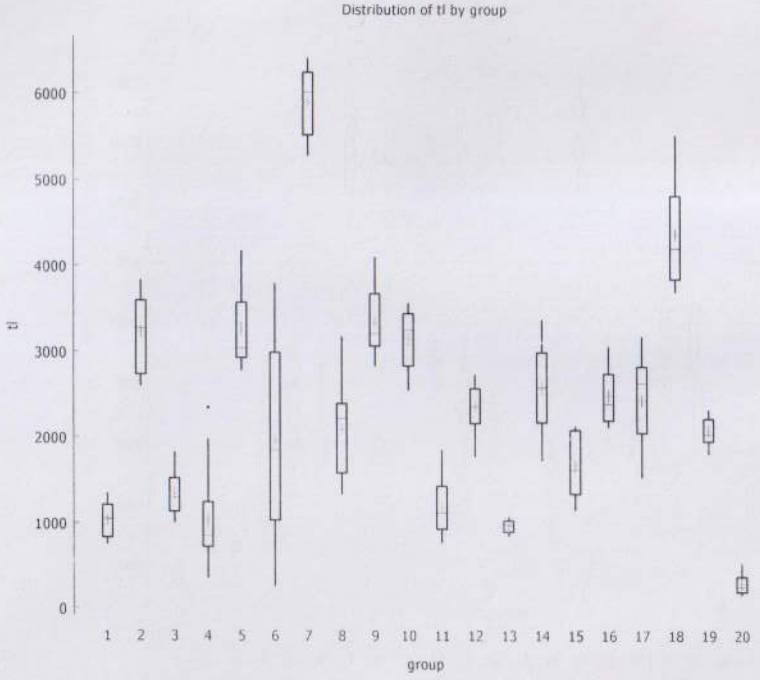
a. Credit Cards
b. Education Loan
c. Small and Medium Enterprises Lending (SME): This loan fulfilling all below mentioned criteria

a. Maximum amount of NPR 5 million.
b. Borrowing firm should have maximum of NPR 50 Mio of paid-up capital
c. Firms should involve in production or service business.
d. Owner himself/herself involved in the business.

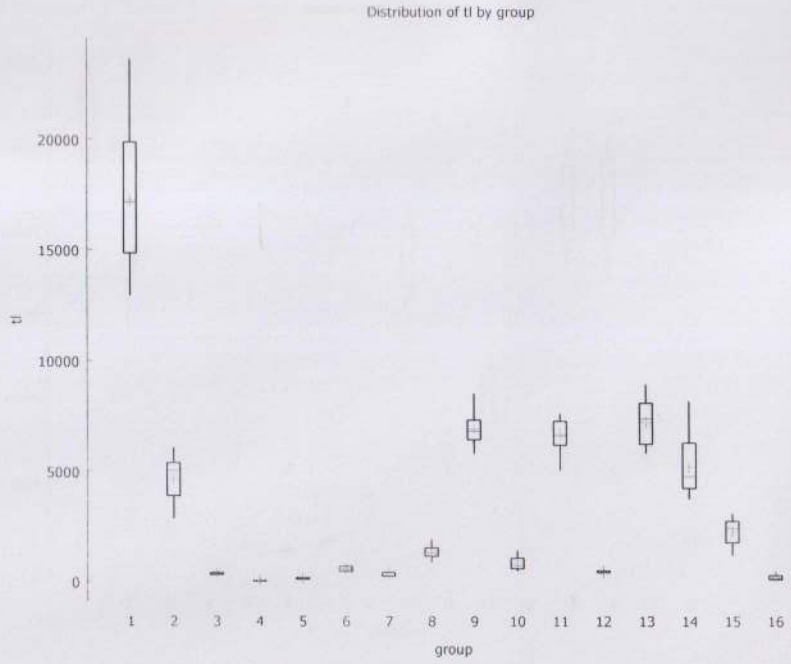
APENDIX II

Figure 9

Heterogeneity Plot of term loans of controlled and Treated group of commercial banks



Controlled Group

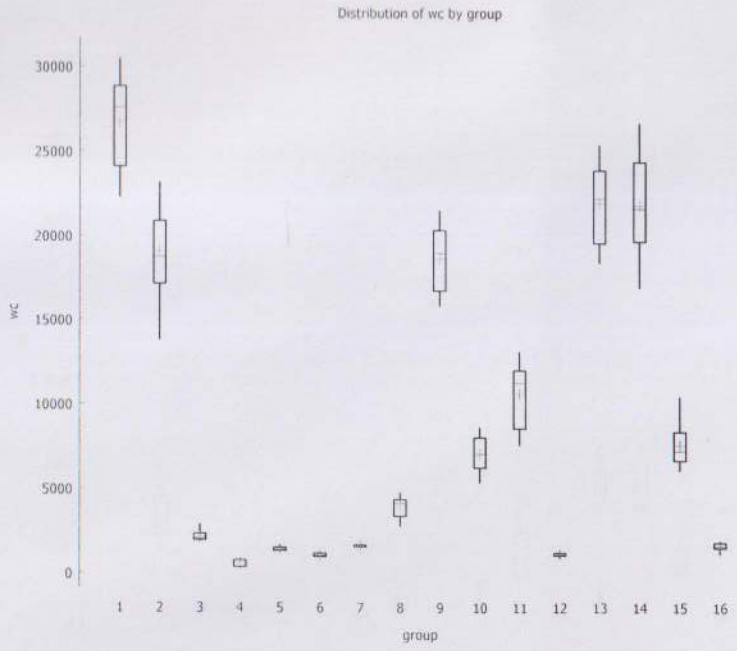


Treated Group

Figure 10.

Heterogeneity Plot of working capital loan of controlled and Treated banks

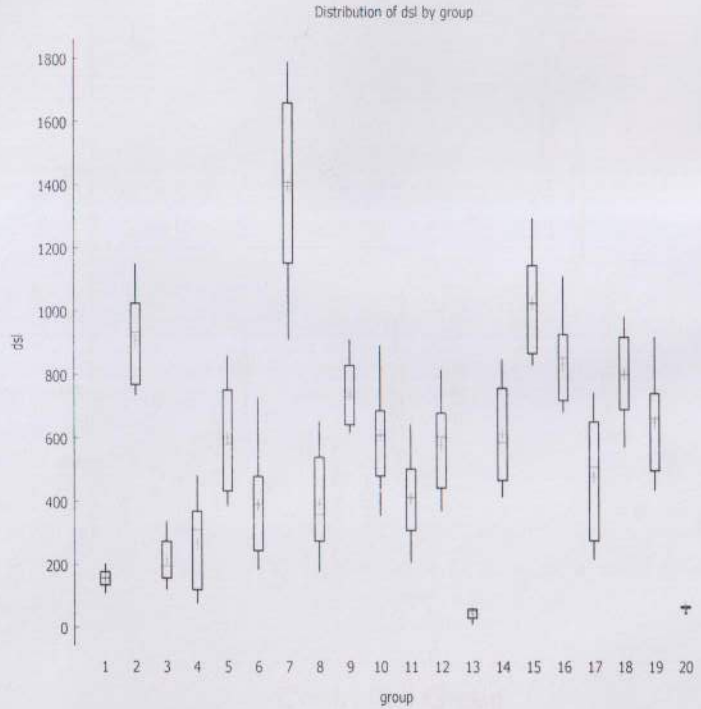
Controlled Group



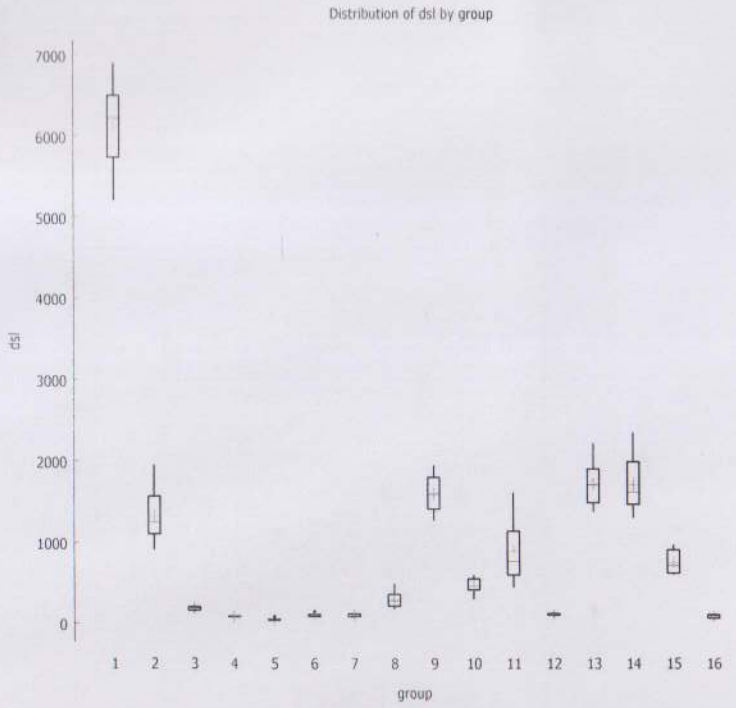
Treated Group

Figure 11

Heterogeneity Plot of deprived sector loans of controlled and Treated banks



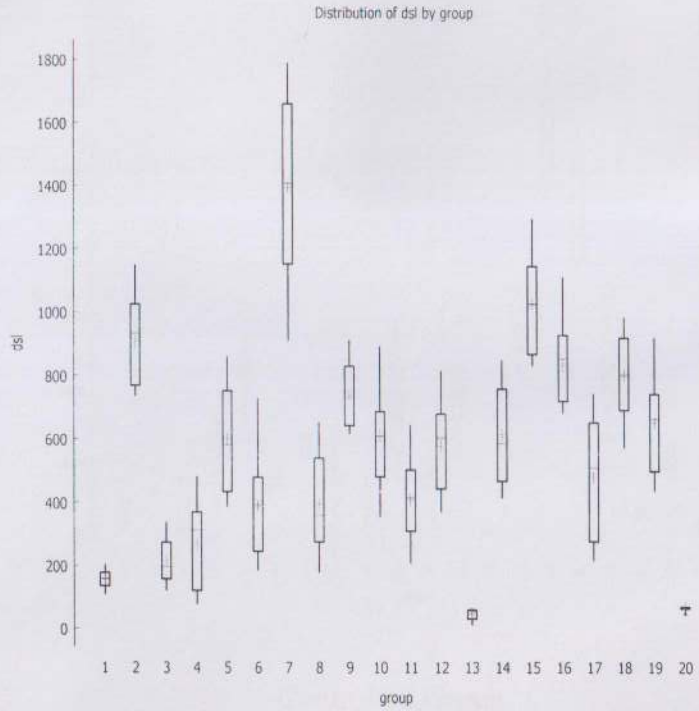
Controlled Group



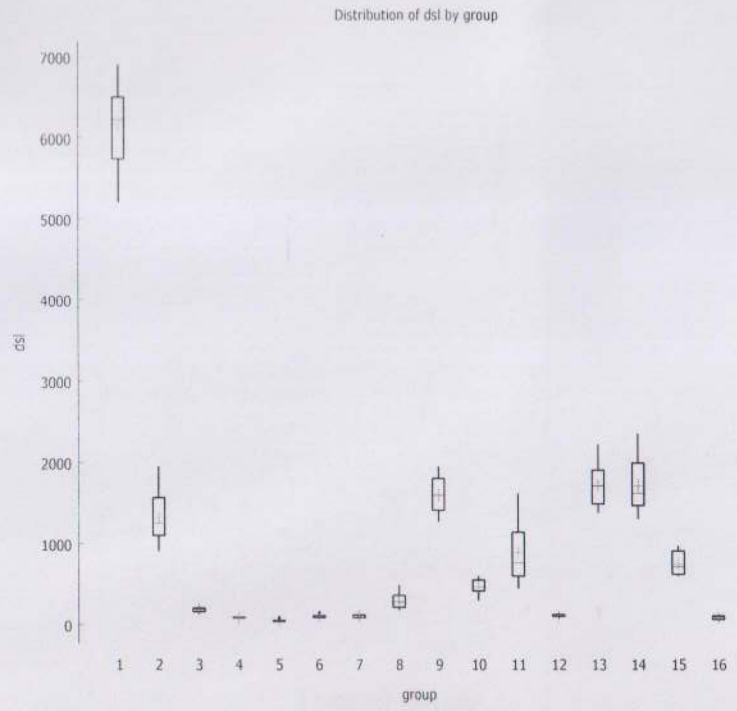
Treated Group

Figure 11

Heterogeneity Plot of deprived sector loans of controlled and Treated banks



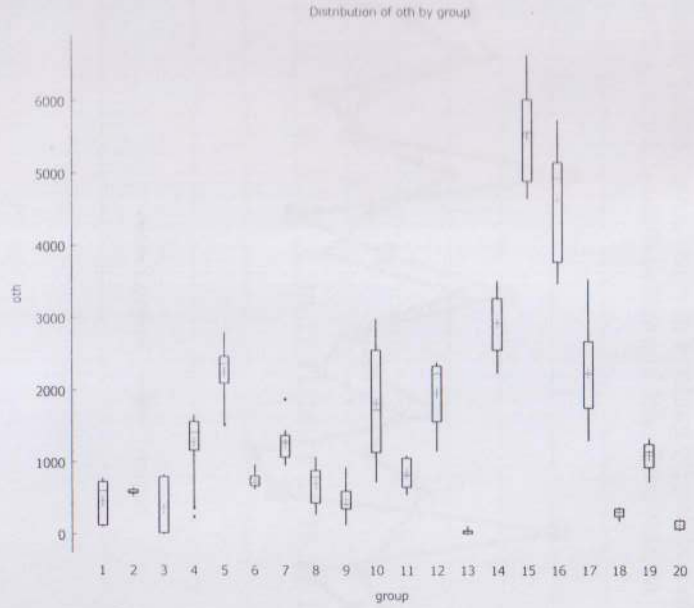
Controlled Group



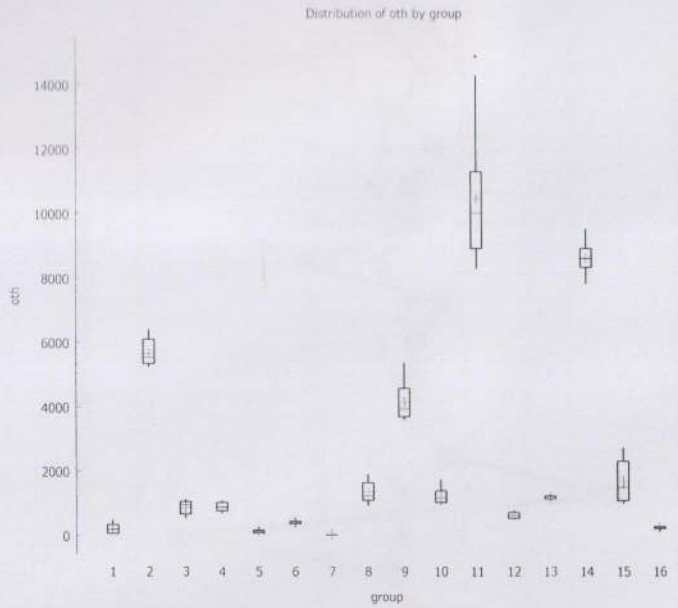
Treated Group

Figure 12

Heterogeneity Plot of SME loan structures of controlled and Treated banks



Controlled Group



Treated Group

Figure 13:
Percentage Change in Term loan in 12 month before and after Intervention

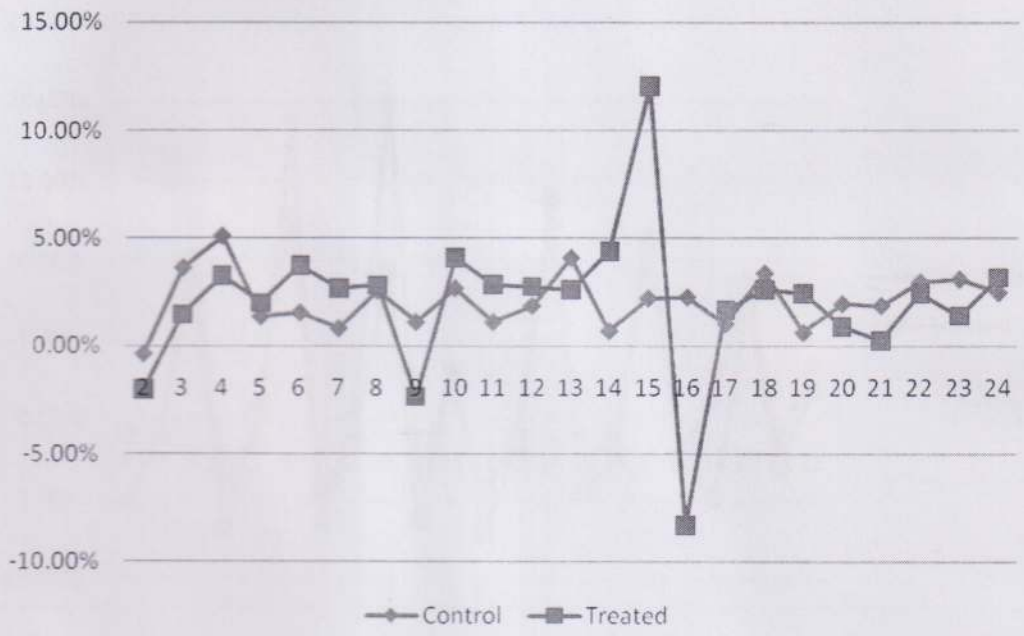


Figure 14:
Monthly percentage Change in working capital loan of treated and control group 12 month before and after Intervention

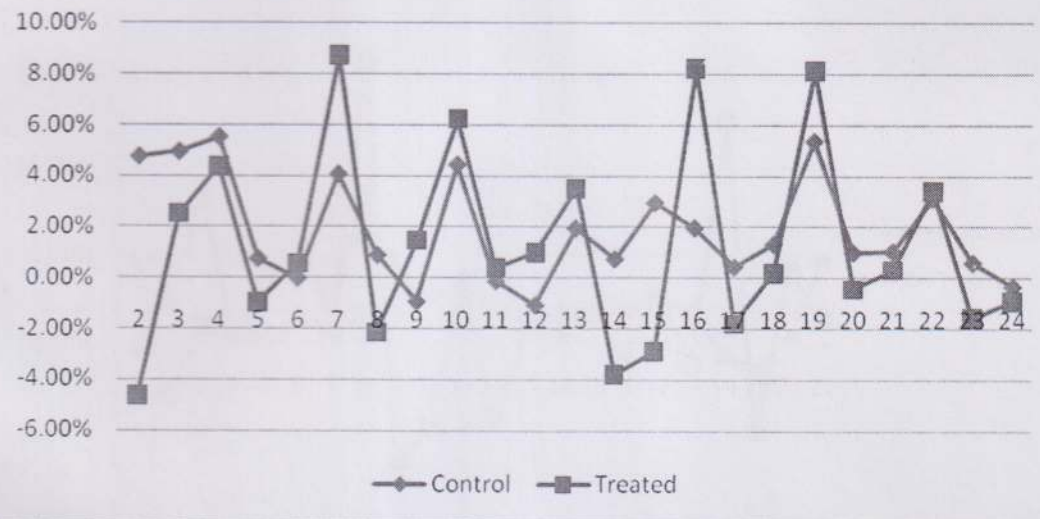


Figure 15:
Percentage change in DSL of treated and Controlled Group in twelve month before and after intervention

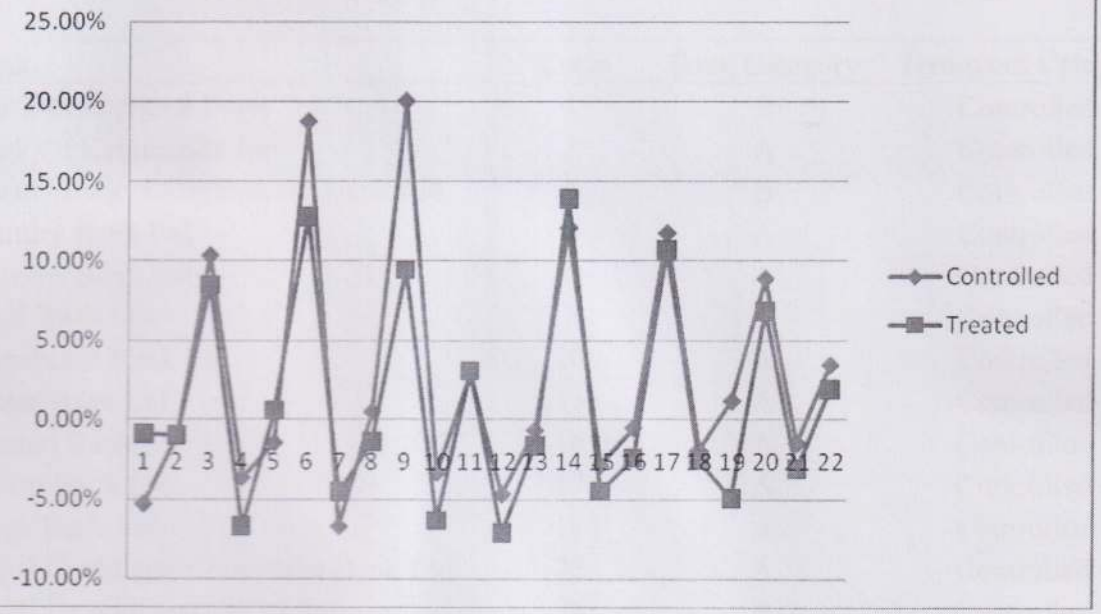


Figure 16:
Percentage change in SME of treated and Controlled Group in twelve month before and after intervention

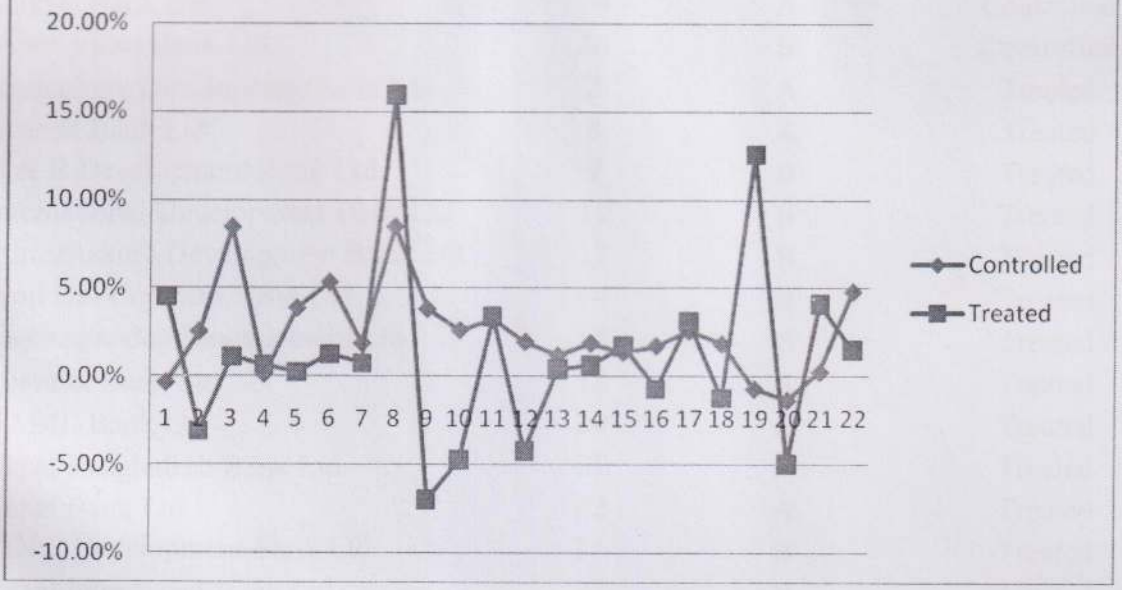


Table 18

List of Sample Banks with Classification and Code

Bank	Code	Bank Category	Treatment Category
Ace Development Bank	1	B	Controlled
Bank Of Kathmandu Ltd	3	A	Controlled
Clean Energy Development Bank Ltd	4	B	Controlled
Century Bank Ltd	5	A	Controlled
Citizens Bank Ltd	6	A	Controlled
Civil Bank Ltd	7	A	Controlled
Himalayan Bank Ltd	10	A	Controlled
Janata Bank Ltd	13	A	Controlled
Kumari Bank Ltd	16	A	Controlled
Laxmi Bank Ltd	17	A	Controlled
Mega Bank Ltd	19	A	Controlled
Nepal Credit and Commerce Bank Ltd	23	A	Controlled
NIDC Development Bank Ltd	26	B	Controlled
NMB Bank Ltd	27	A	Controlled
Nepal SBI Bank Ltd	28	A	Controlled
Prime Commercial Bank Ltd	29	A	Controlled
Sanima Bank Ltd	31	A	Controlled
Siddhartha Bank Ltd	32	A	Controlled
Sunrise Bank Ltd	34	A	Controlled
Vibor Vikas Bank Ltd	36	B	Controlled
Agriculture Development bank Ltd	2	A	Treated
Everest Bank Ltd	8	A	Treated
H & B Development Bank Ltd	9	B	Treated
International Development Bank Ltd	11	B	Treated
Infrastructure Development Bank Ltd	12	B	Treated
Jyoti Development Bank Ltd	14	B	Treated
Kasthamandap Development Ltd	15	B	Treated
Lumbini Bank Ltd	18	A	Treated
NABIL Bank Ltd	20	A	Treated
Nepal Bangladesh Bank Ltd	21	A	Treated
Nepal Bank Ltd	22	A	Treated
NDEP Development Bank Ltd	24	B	Treated
Nepal Investment Bank Ltd	25	B	Treated
Rastriya Banijya Bank Ltd	30	A	Treated
Standard Chartered Bank Ltd	33	A	Treated
Tourism Development Bank Ltd	35	B	Treated