Distortion in Credit Availability in India's Lead Bank Scheme: A Transaction Costs-based approach

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Abstract

Do organizational pressure within commercial banks in India distort credit lending across districts in India? I study the Lead Bank Scheme of India where since 1969, for each district a commercial bank (Lead Bank) has been supervising expansion of financial services and for each state a commercial bank (Convenor Bank) is coordinating the activities of the lead banks of the state. In districts, where lead bank and convenor bank are same (aligned districts), credit disbursement is 9.9% higher after controlling for temporal shocks, demand-side and supply-side factors. Further, when a district becomes aligned, credit lending increases by 15.8%. I also show that higher credit provision in aligned districts protect household savings after a negative income shock, such as a scanty monsoon. The results are explained by a Transaction Costs Economics (TCE) approach to a firm where costs of coordinating across firm boundaries are higher compared to transactions within firm boundaries. The paper shows how organizational pressures can create distortions in outcomes of welfare delivery programs.

JEL Codes : L22, D23, O25

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1 Introduction

In India, the Lead Bank Scheme of Reserve Bank of India (RBI) guides the expansion of district-level financial services. Under this scheme, each district is assigned one of 26 Public Sector Bank (PSB)[1], known as Lead Bank, to supervise credit disbursement to priority sector as per Annual Credit Plan (ACP)[2] and conduct financial literacy camps. To coordinate the efforts of Lead Banks of that state, each state is assigned one of 26 PSBs, known as Convenor Bank. RBI evaluates the banks annually against the targets set in ACP.

The organization structure of Lead Bank Scheme implies variation across districts in the relationship between state- and district-level agents. Specifically, some convenor and lead banks fall within the boundary of the firm while some fall outside. Using implications of transaction costs economics (Williamson (1981), Holmstrom and Roberts (1998)), I predict that in districts, where convenor and lead banks belong to the same corporate entity, defined as aligned districts, then credit delivery should be higher. Intuition is simple. When lead bank and convenor bank fall within the same corporate entity, monitoring is easy and rewards for effort exertion are high. This compels aligned lead banks to perform better. As an additional test of higher credit availability, I also predict that after negative income shocks the savings in aligned districts should remain protected, compared to savings in non-aligned districts.

Using district-wise quarterly credit and deposit data from the third quarter of 2003 to fourth quarter of 2018, I show that credit disbursal in aligned district is 9.9% higher, after controlling for temporal variations (quarter-year dummies), supply side factors (lead bank and convenor dummies) and demand-side factors (district and state dummies). Further, I show that after scanty monsoons in a district, while long term deposits in non-aligned districts go down by 20%, no such impact is seen on savings of aligned districts. Thus, higher credit availability in aligned districts prevent them from negative income shocks.

Policies in Indian banking sector have been studied previously to establish the role played by financial inclusion in poverty alleviation (Burgess and Pande (2005), Burgess et al. (2005), Cole (2009), Sarma and Pais (2011), IMF (2017), Young (2019), Mandira and Jesim Pais (2016), Kochar (2018), Acharya and Kulkarni (2019)). Particularly, Burgess and Pande (2005) studies the nationalization of banks in 1969 to show that those areas which received

[1] A Public Sector Bank in India can be considered as a wholly Government of India owned entity which gives it a sovereign guarantee.

[2] Annual Credit Plan and Productivity-Linked Plans are designed by NABARD for each district in India to promote financial inclusion of certain sectors such as agriculture, MSMEs, education etc., known as Priority Sector.

a bank branch under the social banking initiative from 1969 onwards, have lower rates of poverty. Young (2019) studies another major policy reform in Indian banking sector in 2005, which eased restrictions on branch entry to show how new branch openings are correlated with improvement in district-leve firm productivity. Priority Sector Lending, specifically, has been extensively studied as well (Shajahan (1998), Dasgupta (2002), Kumar Panda et al. (2017), Ramesh (2016)). However, in this paper, I analyze a previously unstudied feature of this scheme to show that intra-organizational traits may create distortions in the outcomes of such policies. Thus, this paper investigates the institutional design of the policy to establish why organizational features are important while evaluating a scheme.

The paper also contributes to the literature on resource misallocation due to industrial policies in developing countries (Hsieh and Klenow (2009), Collard-wexler et al. (2011), Restuccia and Rogerson (2017)). Any sustained differences in credit lending across markets should be explained by demand-side and supply-side factors. However, I show that even after controlling for market-level dummies (districts), these differences persist. Midrigan and Xu (2014) has studied misallocation in plant-level productivity due to finance frictions. Peek and Rosengren (2005) finds evidence for credit misallocation in Japan due to a perverse incentive for firms to provide capital to the weakest firms. To the best of my knowledge, this is the first paper to show how welfare schemes led by commercial entities can also lead to misallocation due to organizational transaction costs.

Finally, the paper also contributes to the vast empirical literature on transaction costs economics. Williamson (1981)'s theoretical work has found evidence in wide-ranging fields. Papers in this stream have shown how certain forms of governance structure reduce transactions costs thereby facilitating production. Shelanski and Klein (1995), David and Han (2004) and Crook et al. (2012) provide surveys of empirical evidence for transaction costs economics.

Rest of the paper is organized as follows. Section 2 provides the institutional background for Lead Bank Scheme. Section 3 provides a game-theoretical model building on the institutional features. In Section 4, I test the implications of the model. Section 6 concludes.

2 Institutional Background

Lead Bank Scheme (LBS) was started in 1969 to expand financial services in India. The architects of the scheme adopted a Service Area Approach, wherein, for each district of India, a nationalized bank was appointed as the agency to monitor credit disbursement

activities in a district depending on its operational and business presence. The appointed commercial bank at the district is known as the Lead Bank. Then, in 1977, RBI appointed a commercial bank for each state to oversee the activities of the Lead Banks of a given state and to coordinate their efforts. The coordinating nationalized bank at the state level is termed as Convenor Banks. Collectively, the Convenor Bank at the state and Lead Banks in the districts constitute a State Level Bankers' Committee (SLBC). Figure 1 provides the organization chart for an SLBC.

2.1 Activities of SLBC

Broadly speaking, the task of SLBC is to expand the scope of financial services in its assigned state/UT.

2.1.1 Lead Banks

Lead Banks are responsible for achieving credit delivery targets of district-level Annual Credit Plan set by National Bank for Agricultural and Rural Development (NABARD). According to RBI regulations, 40% of each bank's Adjusted Net Bank Credit (ANBC) is reserved for lending to priority sectors[3]. These sectors include agriculture, Micro, Small and Medium Sized Enterprises (MSMEs), social sector such as schools, hospitals etc. Sub-targets are also set for various sectors. For example, around 18% of each bank's ANBC is to be lent to agricultural sector and 7.5% is reserved for MSMEs.

While the priority sector lending targets are to be achieved at the level of the bank, most of the efforts in this regard is carried out at the branch level. To this end, Lead Banks have the responsibility of spreading financial awareness. Figure 2 provides a schematic of how a lead bank conducts its responsibilities. Following summarizes the roles of a lead bank:

- **Coordination with Financial Institutions**: Lead Banks interact closely with banking and non-banking organizations to monitor credit delivery. These coordination efforts occur through constitution of various local level inter-nodal agencies which have participation from members of government and financial sectors, and the tasks of which is to achieve district credit plan. Further, Lead Banks can also constitute special sub-committees to target credit disbursement to financially excluded sections of the local

[3]ANBC is defined as the total bank credit subtracted by bills rediscounted with RBI and added by investments in non-SLR categories.

market. The local financial institutions also convey the geographical and infrastructural issues faced by them while expanding financial services.

- **Public Outreach**: Lead Banks have an active reach-out program to attain financial literacy and awareness. This task is achieved by conducting financial literacy camps in rural areas or for the financially excluded citizens, establishing financial literacy centres, recommending financial literacy curriculum in schools, etc.
- **Interaction with Government**: Lead Banks interact with the government departments to share the infrastructure requirements for expanding financial and banking services. This is done through frequent meetings.

Currently, around 25 public sector banks and 1 private sector bank act as Lead Banks for India's 641 districts.

2.1.2 Convenor Banks

Convenor Banks monitor the performance of Lead Banks of state through quarterly meetings of SLBC. In these quarterly meetings, the chairman of the commercial bank, acting as Convenor, leads the meetings where the performance of each lead bank is evaluated. Various issues are brought up in these meetings such as financial inclusion, credit-deposit ratio of states, scaling up financial literacy efforts, expansion of bank branches etc. Different sub-committees of the district use this opportunity to share the challenges faced while discharging their duties.

Currently, around 16 public sector banks and 1 private sector bank act as Convenor Banks for India's 36 states/UTs.

2.2 Appointment of Lead Banks and Convenor Banks

Lead Banks are appointed by RBI taking into account the supply capability of a bank in the given district. To assess supply capability of a bank, the RBI takes into account the physical and operational presence of a bank in the given district. Once appointed to a district, Lead Banks of a given district do not change. Further, when new districts are carved out of older ones, RBI selects a lead bank of the new district after assessing supply capacity of different banks present in that district.

Convenor Banks are appointed by RBI similarly. When new states are formed, Convenor

Banks are appointed for these new states. Apart from the formation of new states, in the last 15 years, RBI has also changed Convenor Banks for the state of Manipur and Jharkhand.

Aligned Districts: Define a district as aligned if the lead bank of that district and convenor bank of the state fall within the same corporate entity. Around 44% of the districts in India are aligned. Further, the alignment status of a district changes as convenor bank changes.

2.3 Incentives for Lead Banks and Convenor Banks

Incentives for following the government-set plans are different for Lead Banks and Convenor Bank.

Figure 3 provides a generalized organization chart of a PSB in India. Lead Banks conduct their operations through a district-level branch which is headed by a Chief Manager-level officer. Most public sector banks in India do not have lateral entries. Thus, Chief Managers are mid-to-high level employees in the bank who have climbed up the career ladder in the firm for around 6-7 years. Further, employee attrition in public sector banks remains low in India and thus, most Chief Manager are motivated by promotion. Hence, career concerns provide the incentives for Lead Bank personnel (Holmstrom (1999)).

The role of convenor banks is to supervise the Lead Banks in the SLBC quarterly meetings. As per RBI's guidelines, the Convenor Bank are required to send the Chairman or second-in-command officer to these meetings. Since these banks are wholly-owned government entities, their top most officers are *de facto* government employees, and are thus, fully answerable to the regulator. The close supervision by RBI of the chairman of Convenor Bank acts as the implicit incentive mechanism for the chairman of Convenor Banks.

Thus, while Lead Bank personnel are driven by career motivations, Convenor Bank representatives are motivated by the supervision of regulator, RBI. Further, since the aligned lead banker reports directly to the chairman of her own bank once every quarter, but the non-aligned lead banker does not, the incentive for lead banker changes across aligned and non-aligned districts. However, all bank chairman including those of convenor banks are subject to evaluation only once a year, and the incentives for them remain identical. Thus, while incentives for convenor banks are uniform across states and banks, incentives for lead bankers vary across districts. I formalize the implication of this incentive differential in the next section.

2.4 Change in Alignment

As mentioned above, lead bank of a district does not change. However, alignment of a district does change due to the following reasons:

- Formation of a New State—When a new state is formed, the convenor of the new state may be different from the convenor of the mother state. In such cases, the alignment status of districts in new state may change. For the period of this study, Telangana was carved out of Andhra Pradesh. While Andhra Bank was convenor of Andhra Pradesh, for Telangana, convenorship was allotted to State Bank of Hyderabad.
- Change in Convenorship of a State—RBI also changed convenorship for Manipur in 2004 Q4 from Union Bank of India to State Bank of India. Similarly, Jharkhand's convenor was changed from Allahabad Bank in 2016-17:Q4 to Bank of India.
- Bank Mergers—Alignment may also change if some banks merge. For example, for the period of our study, State Bank of India (SBI) was merged with six other banks. All those districts where the lead bank was one of the six junior banks, but the convenor was SBI and vice versa exhibited a change in alignment.

3 Model

Consider the following game:

- Players: The game has two players. Lead Bank, denoted by L, and Convenor Bank, denoted by C.
- Strategies: Each player has two strategies. Denote by $s_L \in \{E, NE\}$ as the strategy for Lead Bank. $s_L = E(NE)$ is the strategy of Lead Bank to exert effort (not exert effort) in conducting tasks. Denote by $s_C \in \{M, NM\}$ as the strategy for Convenor Bank. $s_C = M(NM)$ is when Convenor Bank monitors (does not monitor) the Lead Bank.
- Payoffs: The payoffs for strategy pairs for L and C are given by Table 1.

  - V is the value received by Lead Bank manager on exerting effort when the Convenor Bank monitors and notices the effort. This can be considered as the reward in terms of career progression.

Table 1: Payoff Matrix

	M	NM
E	$V - C_E, b_M - c_M$	$-C_E, b_{NM}$
NE	$-C_{NE}, v$	$-\delta C_{NE}, -\delta c$

- C_E is the cost of exerting the effort. C_{NE} is the punishment given to the Lead Bank on not exerting effort. This can be considered as delay in career advancements if the Convenor Bank eventually finds out that the Lead Bank did not exert effort.
- $(b_M - c_M)$ is the net benefit received by Convenor Bank for monitoring a Lead Bank which exerts effort, whereas b_{NM} is the benefit received when the Lead Bank exerts effort but Convenor Bank does not monitor. Monitoring by Convenor Bank requires allocating time for supervising the effort. Thus, there are implicit opportunity costs in monitoring.
- v is the value received by Convenor Bank when it monitors a Lead Bank which does not exert effort. This value can be considered as discovering an inefficient Chief Manager in a district and possibly alleviating the reasons for his inefficiencies. Since Convenor Banks have to report to RBI annually, any shortcomings in targets set for Lead Banks are discovered eventually by the regulator which can then discipline the Convenor. c is the cost that the Convenor Bank faces when RBI discovers the shortfall of credit disbursement in a district.
- δ is the discount factor.

Assumption-1: $b_{NM} > b_M - c_M$

Assumption 1 states that the benefit to Convenor Bank for not monitoring is greater than net benefit from monitoring when the Lead Bank exerts effort. Under this condition, there is no pure strategy Nash Equilibrium of the game in Table 1. Thus, I explore a mixed strategy Nash Equilibrium.

3.1 Equilibrium

Let $\alpha \in (0, 1)$ be the probability with which Lead Bank plays $s_L = E$ and let $\beta \in (0, 1)$ be the probability with which Convenor Bank plays $s_C = NM$. Given the above payoff matrix, α and β are given by:

$$\alpha = \frac{v + \delta c}{v + \delta c + b_{NM} - (b_M - c_M)}$$

and

$$\beta = \frac{C_E - \delta C_{NE}}{C_E - \delta C_{NE} + V}$$

3.2 Comparative Statics

The equilibrium strategy profile provides the following comparative statics for the probability of effort put by Lead Bank.

$$\frac{\partial \alpha}{\partial v} = \frac{b_{NM} - (b_M - c_M)}{(v + \delta c + b_{NM} - (b_M - c_M))^2}$$

Thus, as the value received by Convenor Bank on catching an inefficient Chief Manager increases, the probability of effort exerted by the Lead Banker will also increase. The intuition is simple. As the Convenor Bank gains more on catching an inefficient lead banker, the Convenor Chairman would monitor with higher probability. As the Chief Manager in the district realizes that, he will put in more effort.

Given the governance structure explained in Section 2, v is likely to be higher when the convenor and lead bank belong to the same nationalized bank. The intuition is simple. An inefficient employee inside the organization can be disciplined more easily than the one outside. Further, restricting career advancement of inefficient of a Lead Bank Manager has added value for the Convenor when the Lead Manager is in the same firm. This reasoning provides the first testable implication.

Testable Implication-1: Performance of Lead Banks in Aligned Districts is better.

Another comparative static from the above model is:

$$\frac{\partial \alpha}{\partial \delta} = \frac{c(b_{NM} - (b_M - c_M))}{(v + \delta c + b_{NM} - (b_M - c_M))^2}$$

As discount factor increases, the effort exerted by Lead Bank will increase. The intuition is simple. The costs of an inefficient Lead Bank are received by the Convenor in the next period when RBI monitors all Convenors. As the time period of evaluation comes closer,

all nationalized banks would monitor with higher probability. Knowing this, Lead Banks will exert effort with higher probability. Empirical implication of the above reasoning is the following:

Testable Implication-2: Performance of Lead Bank improves as the year ends.

4 Empirical Results

I test the above implications on quarterly credit disbursement and deposits made in each district from fourth quarter of 2003 to first quarter of 2018[4]. The data is publicly available from Reserve Bank of India's Basic Statistical Returns and Database of Indian Economy. Information on Lead Banks and Convenor Banks is available from notifications and guidelines of Reserve Bank of India. These guidelines also provide information on appointment of new Lead and Convenor Banks, or changes in Convenorship of SLBC[5].

Table 2 provides the summary statistics for quarterly credit and deposits for each of India's district. Around 44% of districts are aligned; i.e. Lead Bank in the district and Convenor Bank of the state in that district are the same nationalized bank.

In Table 3, I decompose log of credit in each district on various dummy indicators. In column 1, I add year-quarter dummy indicators only. Adjusted R^2 is 0.104. Thus, temporal variation and business cycles account for only 10% of variation in log of credit availability. In column 2, I add lead bank dummies. Now, adjusted R^2 rises to 0.34. Thus, local supply side factors explain a significant proportion in credit availability. In column 3, I add convenor bank dummies. These can be considered as state-level supply side factors. The adjusted R^2 in column 5 increases to 0.52. Finally, I add state dummies in column 4 and district dummies in column 5. These account for state-level and local demand-side factors. The adjusted R^2 rises to 0.99 in column 5. The model in column 5 controls for temporal, supply and demand side factors. This empirical model will act as baseline for testing the implications of the theoretical model. Table 4 repeats the same analysis for log of deposits.

[4] Click here for data.
[5] Click here for more information on Lead Banks and Convenor banks.

4.1 Credit Disbursements

I first use a Pooled Mean Group regression to show difference in average credit availability between these two types of districts. I use the following empirical model to test the implications of the theoretical model:

$$\log y_{dslcyq} = \beta \mathbb{1}\{Align\} + \phi_d + \phi_s + \phi_l + \phi_c + \phi_{qy} + \epsilon_{dslcyq}$$

where,

- where y_{dslcyq} are measures of financial access. This is log of credit or deposit.
- $\mathbb{1}\{Align\}$ is 1 when Lead Bank and Convenor are same firm; 0 otherwise
- ϕ_d and ϕ_s are district and state dummies to control for demand and administrative factors
- ϕ_l and ϕ_c are lead bank and convenor dummies to control for supply-side interventions
- ϕ_{qy} are quarter-year dummies

Following Abadie et al. (2017), I cluster the standard error at the level of district.

In Table 5, I regress log of quarterly credit disbursement for all districts on an indicator for alignment including all dummies. The coefficient on $\mathbb{1}\{Align\}$ is 0.099 with a standard error of 0.047. Thus, after holding constant, supply, demand and temporal variation, credit availability in aligned district is 9.9% higher. District-level average credit uptake is Rs. 58356 millions. Hence, on average, credit availability in aligned district is around Rs. 1633 millions higher.

Model in column 1 comprises of all 624 districts, and shows the results of a Pooled Mean Group Regression. However, if alignment status is correlated with time-invariant demand-side factors, then the coefficient on $\mathbb{1}\{Align\}$ may be biased. To address this concern, I analyze those 34 districts which underwent a change in alignment status.

Figure 4 plots log of quarterly credit disbursement as a local polynomial curve of periods before and after change in alignment. Horizontal axis to the left (right) of zero represents when a district was non-aligned (aligned). At zero, there is a significant jump in credit disbursement; change in alignment status of a district coincides with a significant jump in credit disbursement.

In column 2, I restrict the sample of analysis to districts which underwent a change in align-

ment status. Variation in alignment status allows me to control for time-invariant demand factors by using district FEs, along with state, year-quarter, lead bank and convenor bank dummies. As explained in section 2.4, these dummies control for the reason for change in alignment. Thus, the coefficient on $\mathbb{1}\{Align\}$ is not biased by demand, supply, or administrative factors which led to the variation in the variable of interest. The coefficient on $\mathbb{1}\{Align\}$ is 0.158 with a standard error of 0.070, implying an increase in credit availability by 15.8% when a district becomes aligned.

To test the second implication, I use the following model:

$$\log y_{dslcyq} = \beta \mathbb{1}\{Align\} + \gamma \mathbb{1}\{Quarter4\} + \theta \mathbb{1}\{Align\} * \mathbb{1}\{Quarter4\} + \phi_d + \phi_s + \phi_l + \phi_c + \phi_y + \epsilon_{dslcy}$$

where apart from the variables explained above, $\mathbb{1}\{Quarter4\}$ is fourth quarter dummies. Thus, instead of using quarter-year dummies, I control for year dummies and observe variation in credit disbursement in fourth quarter compared to other quarters.

Table 6 shows the results. In column 1, I use dummy variables for each quarter separately. The coefficients on quarter 2, quarter 3 and quarter 4 dummies are 0.045, 0.097 and 0.179, respectively, with each of them significant at 1% level. Thus, credit disbursement increases as annual evaluation of bank comes closer. The coefficient on alignment dummy is 0.104 with a standard error of 0.0047, consistent with evidence in Table 5. In column 2, I include a dummy for quarter 4 and an interaction between $\mathbb{1}\{Align\}$ and Q4. Compared to the first three quarters, credit disbursement in the fourth quarter is 12.7% higher, controlling for demand, supply and annual factors. The coefficient on the interaction between alignment and fourth quarter dummy is -0.006 with a standard error of 0.003. Thus, there is weak evidence for convergence in performance of aligned and non-aligned lead banks.

A key takeaway is that the organizational pressure on aligned lead banks are higher than the incentive to meet annual targets.

4.2 Deposits

Provision of higher credit should prevent households to run down their savings in time of distress. To test this hypothesis, I observe the difference in long term savings in aligned and non-aligned districts after a negative income shock. Given Indian agriculture's reliance on monsoons and deep inter-linkages between agricultural sector and overall economy in India (Kaur et al. (2009), Saikia (2011)), inadequate monsoon rainfall in a district can be considered as an appropriate local negative income shock in a district. If credit disbursement

is targetted well, then decline in savings in aligned districts should be lesser compared to non-aligned districts.

I obtain district-wise monsoon rainfall departure from 2012 to 2016. Since monsoon rainfalls occur in second quarter of the financial year, I regress the log of term deposits in quarter 3 on an indicator for scanty rainfall and alignment dummy along with various dummies[6][7]. Table 7 provides the results. In column 1, I regress log of term deposits in quarter 3 of districts on a dummy which takes value 1 if the district received scanty monsoon. The coefficient is -0.118; districts which receive poor rainfall observe an 11% lower deposit in long term savings account. I disaggregate the sample into aligned and non-aligned districts in column (2)and column (3), respectively. While the coefficient on income shock dummy for aligned districts is only -0.011, it is -0.207 for non-aligned districts with a standard error of 0.100. Thus, while non-aligned districts observe a 20% decline in long term savings after a negative income shock, such an impact on aligned districts is negligible. This is consistent with the results in Table 5; higher credit provision protects households from negative income shocks.

In column 4, I pool the observations and control for alignment dummy. The coefficient on indicator for scanty rainfall is -0.121 with a standard error of 0.097. To explore the differential impact of income shock across aligned and non-aligned districts, I interact alignment dummy with income shock indicator in column 5. Now, the coefficient on income shock is -0.262 with a standard error of 0.106. However, the interaction term between scanty monsoon dummy and alignment indicator has a positive coefficient. Thus, the impact of negative income shock on long term savings is lower for aligned districts. In column 6, I control for credit disbursement in the previous quarter to control for credit provision in the previous quarter. The results are qualitatively similar.

In the above models, I do not control for district dummies since alignment status does not change in the time period during which district-wise monsoon rainfall data are available. However, estimates could be biased if monsoon rainfall and alignment status are correlated. For example, if aligned districts have scantier rainfall less often. To address this concern, I run a t-test of district-wise monsoon departures on the indicator for alignment, where monsoon departure is defined as the percentage of rainfall deviation from long-term average. Table 8 shows the results. The difference in the mean of monsoon departures in aligned and non-aligned districts was 0.003 with a standard error of 0.012; the null hypothesis of

[6]Indian Meteorological Department classifies monsoon rainfall as Scanty if the seasonal rainfall was less than 20% of the long-term average.

[7]Term deposits are long term interest-bearing account offered by most major banks in India. Amount deposited in these accounts can be considered as savings from households.

similar monsoon departures between aligned and non-aligned districts cannot be rejected. In table 9, I regress district-wise monsoon rainfall departure on the indicator for alignment along with state and year dummies. The coefficients on alignment indicator is -0.017 with a standard error of 0.013. Thus, alignment status in a district is not correlated with monsoon rainfall in that district.

5 Identification Checks

The above results do not stem from a randomized control trial where the alignment status is randomly assigned to districts. Varying demand-side factors and alternative supply-side factors may also influence higher credit delivery. If status of alignment is correlated with demand-side factors or other supply side factors at the district level, then the results in column 1 of Table 5 may be biased[8].

To address these concerns, I conduct identification checks. Specifically, I test whether district-level demand factors for credit are invariant across aligned and non-aligned districts or not. I also test whether other supply-side factors also remain invariant between aligned and non-aligned districts.

5.1 Demand-side Factors

Annual credit plans consist of lending to priority sector such as agriculture and micro, small and medium-sized entrepreneurs. If RBI internalizes the governance structure of SLBC, then districts with higher demand for credit due to higher rural population or higher presence of enterprises may be assigned aligned status. To test this hypothesis, I regress various factors which reflect the demand for credit.

5.1.1 Demand from Rural Economy

To construct a metric of rural demand in a district, I use Population Census 2011 to compute the share of population living in rural areas in a district. In Table 10, I regress rural density of districts on alignment indicator. The coefficient on alignment is nearly zero with a negative

[8]Note that the model in column 2 of Table 5 controls for the factors which led to the change in alignment status. Thus, the results in column 2 are not likely to be biased.

sign and a standard error of 0.16. Thus, on average, density of rural population is nearly equal between aligned and non-aligned districts.

In Figure 5, I plot the density of share of rural population in aligned and non-aligned districts. The p-value on Combined Kolmogrov-Smirnov test of equality of these two distributions is 0.548. Thus, these two distributions are statistically similar.

5.1.2 Demand from Economic Enterprises

To construct a metric of economic activity, I use Economic Census 2013-14 to measure log of average size of enterprises in the districts and share of agricultural enterprises[9]. In column 1 of Table 11, I regress log of average size of enterprises on indicator for alignment. The coefficient is -0.087 with a standard error of 0.059. In column 2, I regress share of agricultural enterprises on indicator for alignment. The coefficient is -0.001 with a standard error of 0.003 Thus, size and nature of economic enterprises are similar in aligned and non-aligned districts.

Given that lending to MSMEs constitute as priority sector lending, I use MSME Census 2006-07 to construct metrics of MSMEs at the district level. These metrics are average number of workers hired in MSMEs, number of enterprises and average Gross Value Added in 2006-07 by MSMEs in a district. I regress these three measures on indicator for alignment. Table 12 shows the results. For none of these measures, the coefficients are significant, indicating similar size and nature of MSMEs in aligned and non-aligned districts.

5.2 Supply-side Factors

The model and empirical hypothesis posits that lower intra-firm transaction costs compel lead banks in aligned districts to exert effort which facilitates credit uptake. However, banks may vary other forms of supply-side factors to increase credit disbursement. In this section, I show that the districts do not vary in the supply-side factors of banking.

5.2.1 Entry of Bank Branches

Appointment of a bank as a lead or convenor depends on its market presence in the district and state respectively. A bank headquarter may decide to build on its strength of market

[9]Size of an enterprise is defined as the number of people employed.

presence. If a bank head quarter decides to open more branches in aligned districts, then this may imply more outlets for credit disbursement. Thus, the above results may then be driven by a resource-based view of firm (Wernerfelt (1984)), rather than a transaction costs approach (Williamson (1981)).

To test this hypothesis, I obtain data on quarterly opening of commercial bank branches for each district in India from 2003:Q4 to 2016:Q3. I use the following model:

$$I\{BankBranch\}_{dslcyq} = \beta \mathbb{1}\{Align\} + \phi_d + \phi_s + \phi_l + \phi_c + \phi_{qy} + \epsilon_{dslcyq}$$

where, $I\{BankBranch\}_{dslcyq}$ takes value 1 if lead bank l opens a branch in its district d in state s in quarter-year qy.

Table 14 shows the result. The coefficient on $\mathbb{1}\{Align\}$ is -0.011 with a standard error of 0.014. Thus, there is no evidence of additional resource allocation, in the form of branches, to aligned districts.

5.2.2 Targets of Annual Credit Plan

The targets set for districts in annual credit plan are determined by productivity potential of economic activity in that district. While many factors go into the annual credit plan, one concerning feature could be that NABARD internalizes the governance structure of SLBC. This may imply that NABARD sets a higher target for aligned districts. Thus, higher credit delivery in aligned district may simply be the requirement as per annual credit plan and not, as postulated here, due to organizational traits.

To test this hypothesis, I regress the log of annual credit targets in 2018-19 on indicator for alignment[10]. Table 13 provides the results. The coefficient on alignment indicator is -0.084 with a standard errors of 0.13. Thus, on average, the annual credit targets are invariant across aligned and non-aligned districts, and may be lower for aligned districts.

In Figure 6, I plot the distribution of log of annual credit target for priority sector lending for these two types of districts. The p-value of Combined Kolmogrov-Smirnov test of equality of these two distributions is 0.493. Thus, the distribution of annual credit target set by NABARD is statistically similar for these two types of districts.

[10]District-wise data for annual credit targets was only available for 11 states. These are Bihar, Chattisgarh, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra and West Bengal.

6 Conclusion

In this paper, I show that in India's oldest financial inclusion program, organizational transactions cost lead to distortion in credit disbursement across districts. Particularly, in districts where local agency and state-level entity in the financial inclusion program are within the same corporate entity (aligned district), credit disbursement is 9.9% higher controlling for temporal variations, demand-side and supply-side factors. Additionally, when organizational structure changes in a manner that district becomes aligned, credit disbursement increases by 15% in that district. Further, after a negative income shock of scanty monsoon, long term savings of non-aligned districts reduces by 20% but remains unaffected for aligned districts. No impact on savings after a negative income shock is consistent with provision of higher credit availability in these districts.

The paper provides several inferences on decentralization of welfare services. In the current context, sub-regional agencies exert effort to follow certain targets set by the regulator, whereas the upper hierarchies have only a monitoring role. Despite such separation of powers, organizational connections between upper and lower levels seem to distort performance across lower level hierarchies. Thus, while setting up decentralized institutions, one should remain cognizant of personal motives of individuals manning the institution. Further, while limited role of upper-level hierarchy may disallow overreach, it may still create unforeseen circumstances.

Another takeaway from the paper is that inter-firm and intra-firm behaviour may affect welfare services as well. The role of firms in various welfare schemes in India is vast but has remained understudied. For example, crop insurance scheme*Pradhan Mantri Fasal Bima Yojana*, civil aviation scheme *UDAN* involve participation of private corporate sector. The implications of various theories in organizational economics, industrial organization and personnel economics may allow a fresher perspective to design these policies.

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7 Figures

Figure 1: Organization Chart for State Level Bankers' Committee

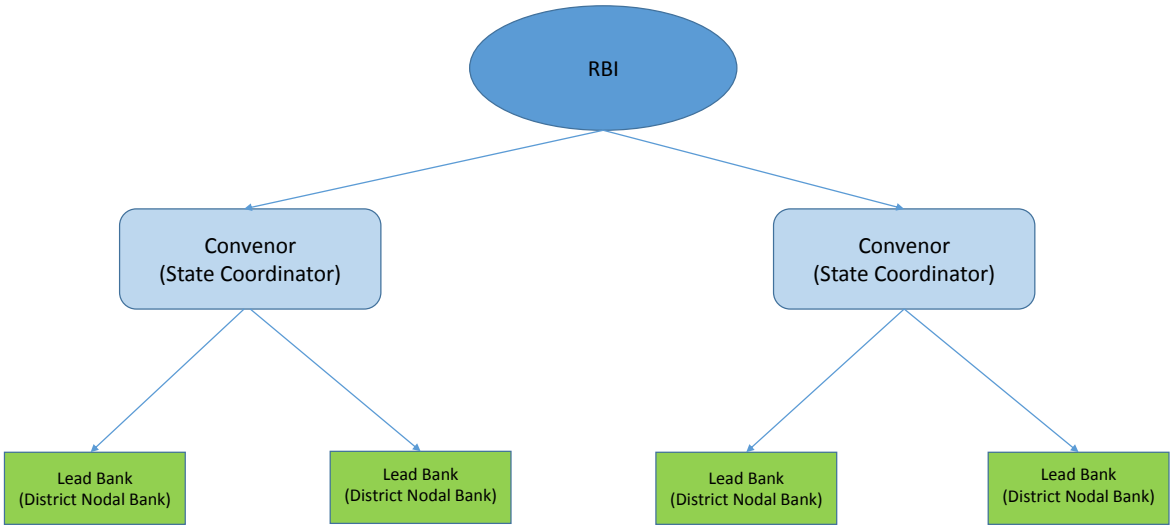

Figure shows the organization chart of State Level Bankers' Committee in the Lead Bank Scheme. Each district is assigned a nodal bank to monitor the activities of credit delivery and financial inclusion. Each state is assigned a Convenor to coordinate the efforts of the Lead Bank. The entire set-up is under the supervision of Reserve Bank of India, the regulator of banking sector.

Figure 2: Activities of Lead Banks

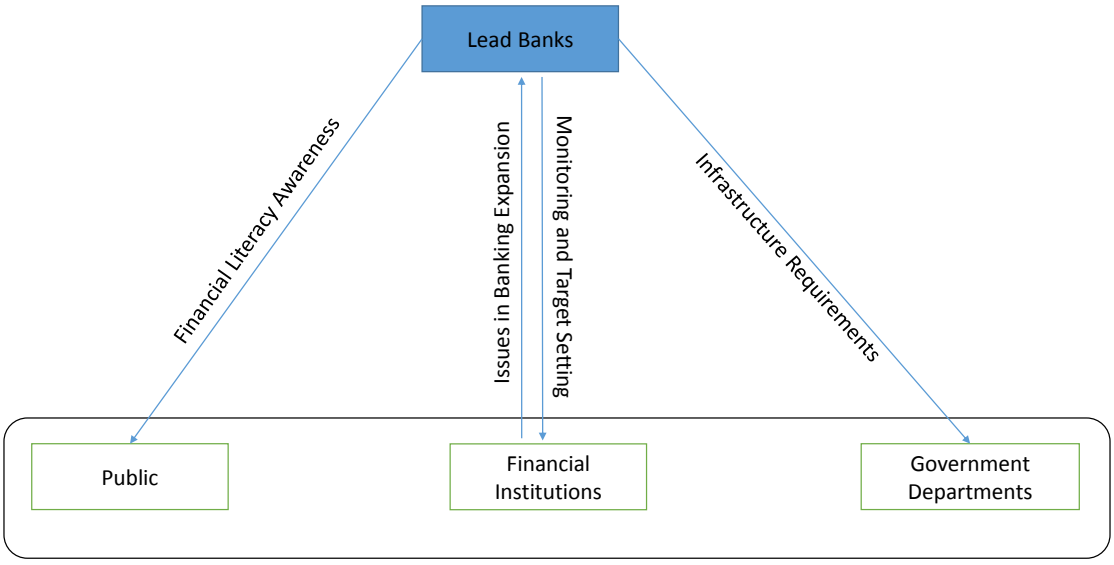

Figure 3: Organization Chart for Nationalized Banks in India

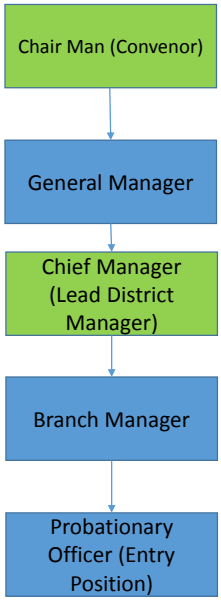

Figure shows the organization chart of a typical nationalized bank in India. Probationary Officer is the entry level position in the firm. Employees work up the ladder. Chief Manager, which is in-charge of Lead Bank activities, is reached after 6-7 years.

Figure 4: Log of Credit Pre- and Post-Alignment

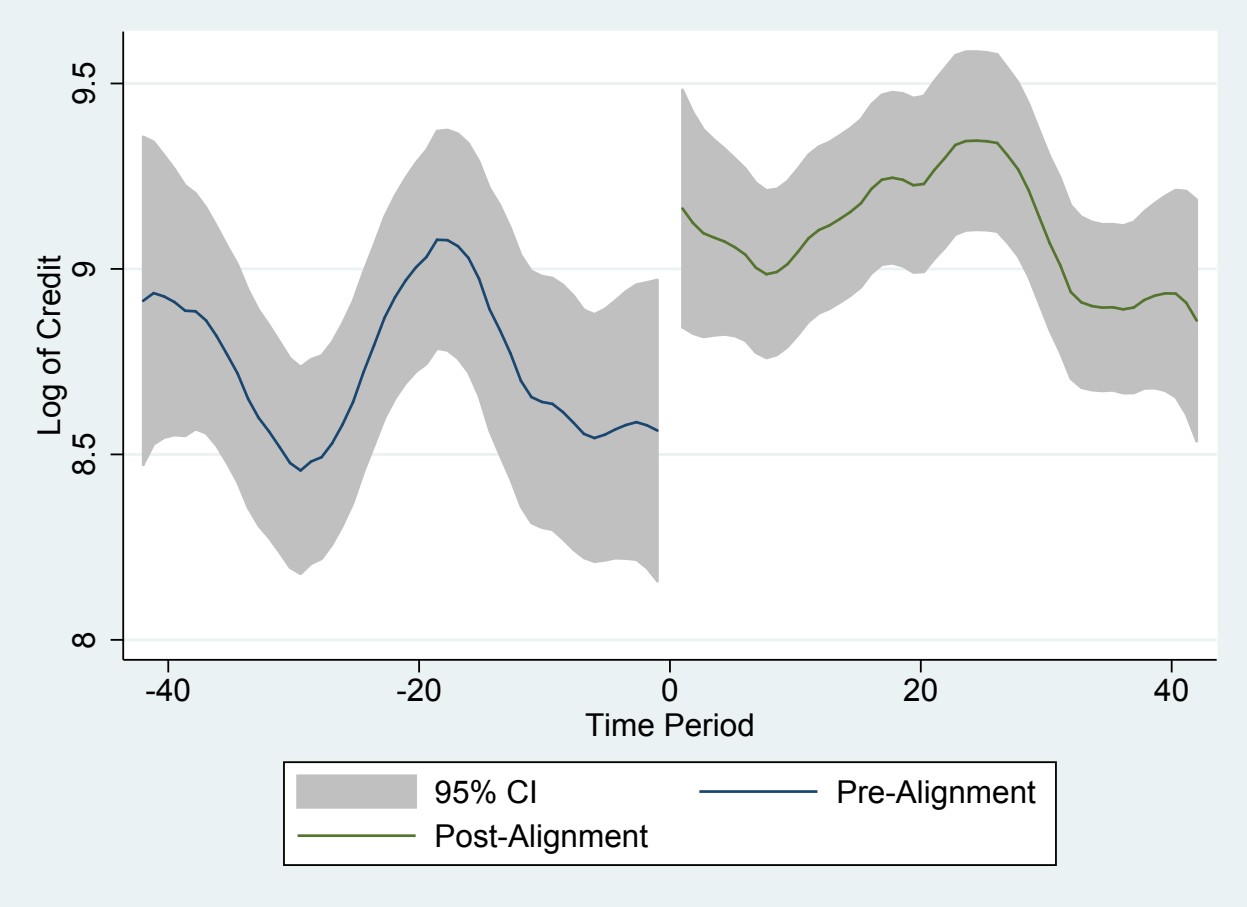

Figure shows the log of credit disbursement in districts which went from being non-aligned (blue) to being aligned (green).

Figure 5: Distribution of Share of Rural Population in a district

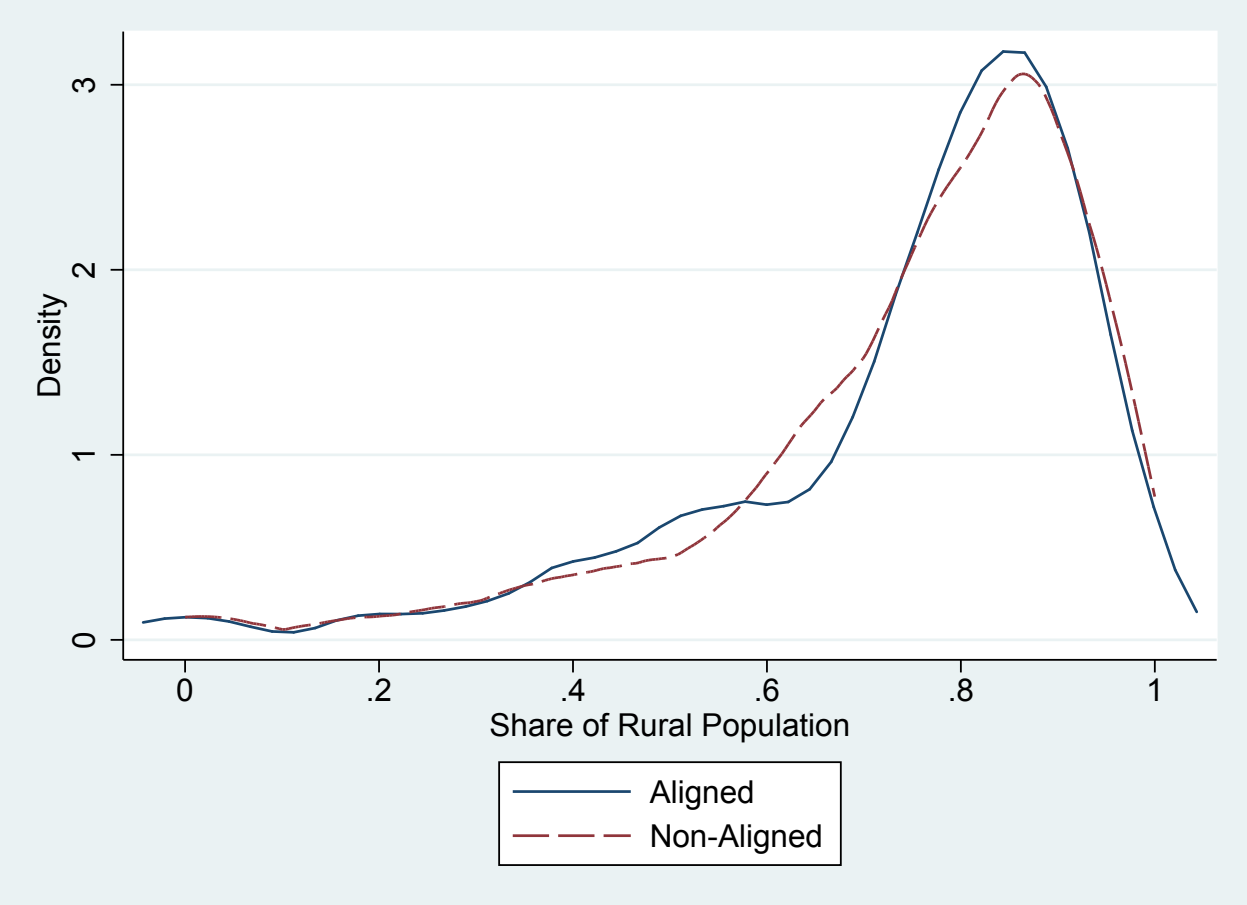

Figure shows the distribution of share of rural population in aligned (solid blue) and non-aligned districts (dashed red).

Figure 6: Distribution of Log of Annual Credit Targets

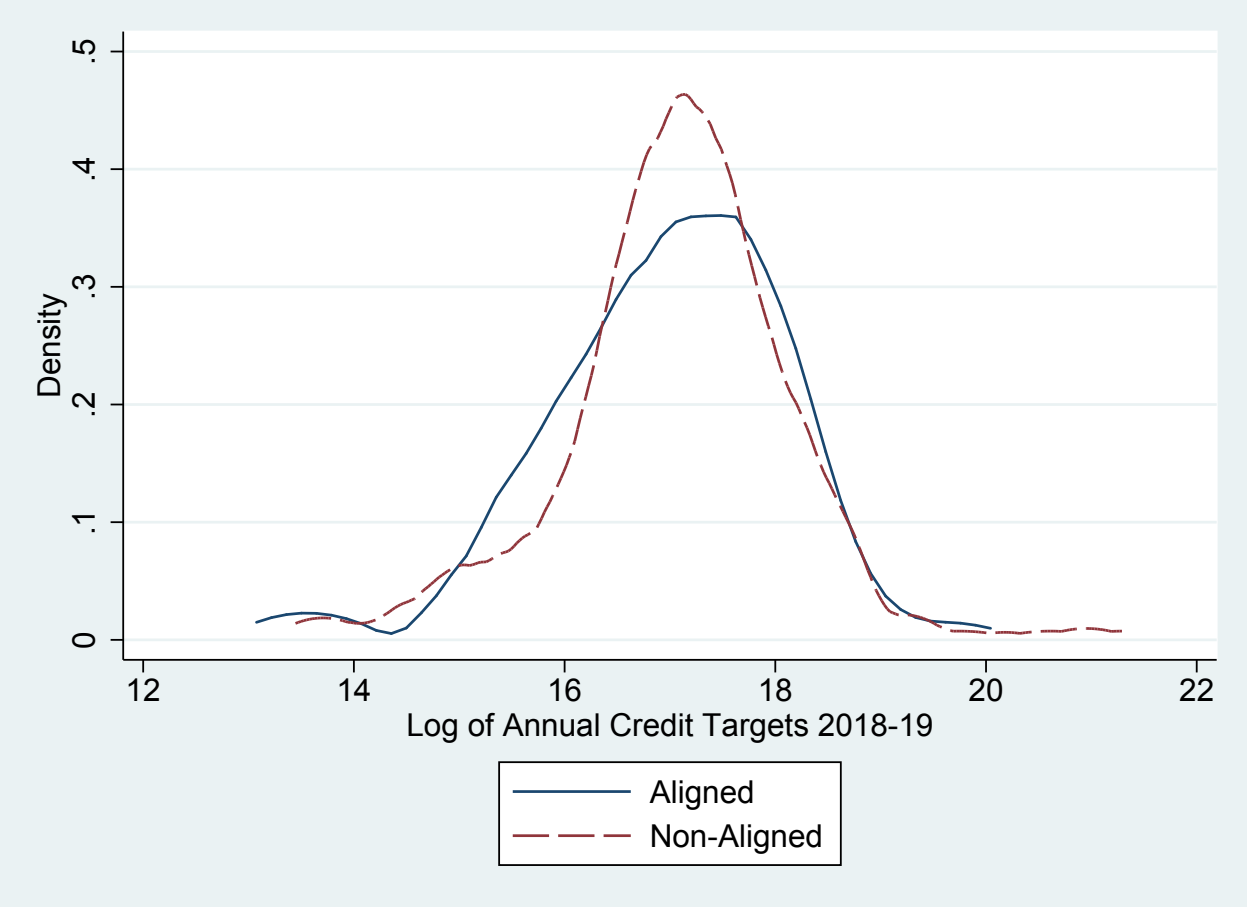

Figure shows the distribution of log of annual credit targets in aligned (solid blue) and non-aligned districts (dashed red).

8 Tables

Table 2: Summary Statistics

Panel A: Aligned Districts

	Mean	Standard Deviation	Minimum	Median	Maximum	Observations
Credit	43443.857	341077.574	0.000	6856.000	9705966.000	13869
Deposit	63747.416	383599.815	2.000	15030.000	9930473.000	13869
Term Deposit	59309.232	171636.380	1.045	13271.978	1845992.951	5008
Saving Deposit	29383.235	52092.376	1.380	15362.625	574588.898	5008
Current Deposit	7536.129	24120.818	0.000	1963.989	325017.506	5008
Rural Density	0.743	0.197	0.000	0.802	1.000	12350

Panel B: Non-Aligned Districts

	Mean	Standard Deviation	Minimum	Median	Maximum	Observations
Credit	73553.596	476318.500	13.000	10609.000	12111158.822	19507
Deposit	94777.791	472421.818	35.000	21931.000	11148226.000	19507
Term Deposit	96416.925	594306.617	5.263	13123.704	9258378.115	6441
Saving Deposit	33062.062	92427.123	9.211	14732.673	1571518.776	6441
Current Deposit	11991.608	75351.910	0.000	2060.927	1532658.657	6441
Rural Density	0.745	0.197	0.000	0.802	1.000	18170

Credit and Deposit, in Rs. Millions, are at the district-quarter-year level from 2003:Q4 to 2016:Q1. Term deposits, saving deposits and current deposits are at the district-quarter-year-level from 2011 to 2016. Rural density is the share of population living in rural areas as per Census 2011.

Table 3: Decomposing Variation in Log of Credit

	(1)	(2)	(3)	(4)	(5)
Quarter-Year Dummies	Yes	Yes	Yes	Yes	Yes
Lead Bank Dummies	No	Yes	Yes	Yes	Yes
Convenor Bank Dummies	No	No	Yes	Yes	Yes
State Dummies	No	No	No	Yes	Yes
District Dummies	No	No	No	No	Yes
Observations	38320	37781	37781	37781	37781
R^2	0.146	0.377	0.534	0.650	0.990
Adjusted R^2	0.144	0.376	0.533	0.649	0.990

Table 4: Decomposing Variation in Log of Deposit

	(1)	(2)	(3)	(4)	(5)
Quarter-Year Dummies	Yes	Yes	Yes	Yes	Yes
Lead Bank Dummies	No	Yes	Yes	Yes	Yes
Convenor Bank Dummies	No	No	Yes	Yes	Yes
State Dummies	No	No	No	Yes	Yes
District Dummies	No	No	No	No	Yes
Observations	38322	37781	37781	37781	37781
R^2	0.163	0.358	0.472	0.607	0.992
Adjusted R^2	0.162	0.357	0.471	0.606	0.992

Table 5: Log of Credit

	(1)	(2)
$\mathbb{1}\{align\}$	0.099***	0.158***
	(0.047)	(0.070)
Observations	37781	2314
R^2	0.990	0.991
Adjusted R^2	0.990	0.991

Both specifications control for quarter-year, district, state, lead bank and convenor bank dummies. Following Abadie et al. (2017), I cluster my standard errors at district level.

Table 6: Quarterly Variation in Log of Credit

	(1)	(2)
$\mathbb{1}\{align\}$	0.104**	0.090*
	(0.047)	(0.048)
Q2	0.045***	
	(0.0011)	
Q3	0.097***	
	(0.0012)	
Q4	0.18***	0.127***
	(0.0011)	(0.001)
$\mathbb{1}\{align\}$*Q4		-0.006**
		(0.003)
Observations	37781	37781
R^2	0.990	0.989
Adjusted R^2	0.990	0.989

District, State, Lead Bank and Convenor Bank dummies are provided in each specification. Following Abadie et al. (2017), I cluster the standard errors at the district level.

Table 7: Log of Term Deposit after a negative income shock

	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{1}\{Scanty\}$	-0.118	-0.011	-0.207**	-0.121	-0.262**	-0.246**
	(0.097)	(0.179)	(0.100)	(0.097)	(0.106)	(0.108)
$\mathbb{1}\{align\}$				0.215	0.079	0.097
				(0.230)	(0.246)	(0.243)
$\mathbb{1}\{align\} \times \mathbb{1}\{Scanty\}$					0.364*	0.351*
					(0.206)	(0.207)
L.logcredit						0.101
						(0.085)
Observations	1854	684	1170	1854	1854	1854
R^2	0.164	0.209	0.180	0.166	0.168	0.171
Adjusted R^2	0.133	0.163	0.142	0.134	0.136	0.139

The dependent variable is log of term deposit in quarter 3 in years 2012 to 2016. State, Year, Lead Bank and Convenor Bank dummies are provided in each specification. Following Abadie et al. (2017), I cluster the standard errors at the district level.

Table 8: Difference of Mean in District-wise Departure of Monsoon Rainfall

Group	Observations	Mean	Standard Error
Non-Aligned	1803	-0.085	0.007
Aligned	1072	-0.088	0.011
Difference		0.003	0.012

Dependent variable is district-wise departure from normal monsoon in percentage points.

Table 9: District-wise Monsoon Rainfall Departure

	(1)
$\mathbb{1}\{Align\}$	-0.017
	(0.014)
Observations	2875

Dependent variable is district-wise departure from normal monsoon in percentage points of monsoon rainfall. State and Year dummies are controlled.

Table 10: Rural Density in Aligned and Non-Aligned Districts

	Share of Rural Population
$\mathbb{1}\{Align\}$	-0.00005
	(0.016)
Observations	622

Table 11: Enterprises in Aligned and Non-Aligned Districts

	Log(Average Size of Enterprise)	Share of Agricultural Enterprises
$\mathbb{1}\{Align\}$	-0.087	-0.001
	(0.059)	(0.003)
Observations	618	618
R^2	0.433	0.223
Adjusted R^2	0.399	0.176

Dependent variables are computed from Economic Census 2013-14. State level dummies are included in both models.

Table 12: MSMEs in Aligned and Non-Aligned Districts

	Average Labour Force of MSMEs	log(Number of MSMEs)	log(Average GVA in 2006-0
$\mathbb{1}\{Align\}$	-0.591	0.087	-0.131
	(0.572)	(0.102)	(0.127)
Observations	561	561	561
R^2	0.340	0.641	0.324
Adjusted R^2	0.298	0.619	0.281

Dependent variables are computed from MSME Census 2006-07. State level dummies are included in models.

Table 13: Annual Credit Targets

	log(Annual Credit Targets)
align	-0.084
	(0.130)
Observations	294

Dependent variable is log of annual credit targets set by NABARD for districts in 2018-19. District-wise credit targets for priority sector were available only for 11 states. These states are Bihar, Chattisgarh, Gujarat, Harayana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra and West Bengal.

Table 14: Opening of Bank Branches

	$I\{BankBranch\}$
$\mathbb{1}\{Align\}$	-0.011
	(0.014)
Observations	30960

Dependent variable is an indicator which takes value 1 when a lead bank opens a branch and 0 otherwise. Quarter-Year, District, State, Lead Bank and Convenor Bank dummies are provided in each specification. Following Abadie et al. (2017), I cluster the standard errors at the district level.