Imperfect Capital Mobility as a Constraint on Regional Industrial Growth: Evidence from India

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Abstract

This paper provides evidence that as a result of poor mobility of capital within India, regional wealth constrains the growth of regional manufacturing. It shows that capital market imperfections can help explain the uneven pattern of industrial growth across regions in India. I exploit a policy-induced exogenous increase in the supply of credit to an identifiable set of factories in 1998 to demonstrate that the relative cost of credit to manufacturers are higher in regions with less wealth . Credit constraints on the growth of factories are identified through within-district growth differentials between factories that received more credit and those that saw a decline in the availability of credit. I show that this differential was greater in regions with less wealth, implying that it is in the poorer regions where more new factories were set up in response to a credit shock.

1 Introduction

Poor mobility of capital across the regions of a country can limit the process of structural transformation of the economy. If capital is mobile across areas, then it will move into those where the rates of return to capital are high. However, it is possible that because of imperfections in capital markets or other institutional constraints, savings are invested only in local productive activities. This can result in marked differences in the rates of return to capital across regions, implying that there are gains to be had from a geographic redistribution of capital. Poor geographic mobility of capital can also make regional inequalities more persistent.

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In developing countries such as India, a large informal credit sector still coexists with modern financial intermediaries. Most firms are found to be borrowing from informal sources as well as from modern banks.There is a large literature that shows that individuals or firms in developing countries are credit-constrained [1]. Because traditional capital markets are local in scope, this suggests that manufacturers in different regions may be facing different degrees of credit constraints. This papers provides evidence that regional industry in India has been constrained by the local nature of the credit market. Specifically, it tests the hypothesis that because of the poor mobility of capital, the growth of small firms has been constrained relatively more in the poorer regions of India. It identifies the relative cost of capital to firms across rich and poor regions, and shows that the cost is higher is poorer regions.

Capital immobility implies that local wealth and factors that affect local wealth, such as agricultural productivity, will determine the supply of credit to local firms. Because industry is capital intensive relative to agriculture and services, this means that regional wealth will constrain the size of the industrial sector. But showing that wealthier regions have a larger industrial sector does not establish that wealth is a constraint on the growth of regional industry. Regional wealth is endogenous to other regional characteristics that determine industrial productivity. For example, areas that for some reason have high incomes may have higher levels of schooling, and this schooling may attract manufacturing. There is also the possibility of reverse causation: regions are wealthy because they are good for industry. The ideal experiment, therefore, to test a theory of industrial credit immobility across regions would assign wealth (or, equivalently, household savings) to randomly chosen regions, and see if industrial growth picked up in the regions receiving the wealth shock.

An alternative to this experiment is a technology shock to the non-industrial sector that raises regional income and does this to varying degrees across regions, based on regional characteristics that are exogenous to industrial productivity. While it may be possible to find instances of such technology shocks , the problem with this approach is that it requires that all but capital markets be open across regions. To give an illustration, suppose that regional labor markets are closed.Then, an improvement in agricultural technology will result in higher incomes, and perhaps, in a greater supply of savings to industry. But it will also cause higher wages because of increased labor demand in agriculture. These higher wages will directly affect industry. In a study of agriculture and industry linkages in rural India, Foster and Rosenzweig (2003) show that this labor supply channel has been significant to regional industrial growth in India. Looking at a representative sample of Indian villages across 1982-1999, the authors find that villages with exogenous increases in agricultural productivity saw a rise in the wage rate of unskilled labor and a fall in factory employment. In the

[1] In a recent paper, Banerjee and Duflo (2004a)provide evidence that firms in India are credit constrained and increase output in response to a credit shock.

light of these results, assuming that the only markets that could be closed at the regional level are capital markets is not justified.

This paper shows that capital is immobile across regions in India by identifying how the degree of credit constraints on factories varies by district wealth. It does so by exploiting the fact that there is a formal financial sector that offers limited finance to firms at the same rate across regions. This formal sector coexists with an informal sector that lends to firms and consists of local moneylenders and small finance companies (Timberg (1984), Love (2005)). Now, if the formal sector is closed at the regional level, and if this is a constraint on industrial growth, then the gap between the cost of formal credit and informal credit or self-financing will be greater in regions that are poorer. This implies that an expansion in the supply of formal credit will make credit cheaper to firms , but more so to firms in regions where the gap between the informal and formal rates of interest is higher. So if local wealth is a constraint on industrial growth, industry will grow more in poorer regions in response to an increase in the supply of credit.

I apply this intuition to a policy change that increased the supply of formal credit to an identifiable set of firms and did this to the same extent across all regions in India. This is the change in the policy definition of "Small Scale Industry" that occurred in 1998. In India, factories with a value of plant and machinery below a certain limit are officially classified as small scale. The small scale sector is eligible for directed credit from banks and other financial institutions. The definition change of 1998 meant that some factories that were not eligible for small scale sector credit in 1997 became eligible for this credit in 1998. A recent paper by Banerjee and Duflo (2004a) that aims to test if firms in India are credit constrained finds that banks increased lending to the new small scale factories in response to this policy change. The policy change also increased the availability of long-term credit to the new small scale factories, because it made them eligible for the term-lending schemes of financial institutions that cater exclusively to the small scale sector.

I show that the response of investment in the new small scale segment to this credit shock was greater in regions with less wealth. Because the degree of of the credit shock was similar across regions, this is evidence that manufacturers face a greater degree of credit constraints in poorer regions. Previous literature (Banerjee and Duflo (2004a)) has shown that credit constraints affect the production decisions of incumbent firms. This paper contributes to this literature by showing that credit also constraints the entry of new firms. At the same time, it show that this constraint on fixed investment is stronger in the poorer regions of India. In doing so, it contributes to the literature that seeks to explain regional inequalities in development.

I carry out my analysis at the district level, covering all the districts in 13 major Indian states. There are two features of districts in India that help me in identifying credit constraints. The first is that the district is a primary administrative unit at which banks and non-bank financial institutions that specialize in lending to small industry coordinate their lending decisions. The second feature is that there is wide variation in income and average asset holdings across the nearly 400 districts in India. Further, some of this variation can be attributed to the uneven impact of a technological shock in agriculture in the late 1960s. This shock was introduction of new high yielding seed varieties. Because the early seeds were not suited to all districts to the same extent, some districts gained in the early stages of this introduction. This gain resulted in persistent wealth differentials. Because current wealth measures are endogenous to recent trends in industrial growth, I use this early variation in the adoption of new technology as an instrument for district wealth.

The rest of the paper is organized as follows. In section 2, I describe sources of finance to firms in India. Section 3 describes the natural experiment and the empirical strategy. In section 4, I describe the data that I use. Sections 5.1 presents the main results. In 5.2, I discuss the main identification assumptions behind the results, and in 5.3 and 5.4, I test these assumptions. In section 5.5, I examine the effects of a partial reversal of the policy redefinition in 2000. Section 6 concludes.

2 Sources of Finance to Industry In India

2.1 Classification of Industrial Units : Small-scale and Large-scale

Industrial policy in India makes an official distinction between *small scale* and *large scale industry.* India uses the value of fixed investment to define small scale industry (SSI). In 1980, all units with an investment of Rs. 2 million (in current prices) and below in plant and machinery were categorized as small scale. This ceiling is revised periodically, ostensibly to keep up with inflation. In 1997, it was Rs. 6.5 million. The policy regime for small scale industry (SSI) has been different from that for large scale industry since 1950. It has remained so even after the liberalization of the industrial policy that took place in the early 90s.

In this paper, I use a shock in the supply of formal credit to a certain set of factories to show that small manufacturing units are credit constrained to different extents in rich and poor regions. These factories are those of a size that was just above the cutoff for SSI in 1997. Because the strategy uses the fact that these factories got an exogenous increase in formal credit when they were suddenly classified as SSI in 1998, I should first explain the implications of being a small scale unit in India.

Industrial policy uses a number of support mechanisms to encourage the growth of small industry . There is a set of products that are reserved for production by SSI units. A network of government institutions specializes in providing marketing and technological support to small industry. SSI units are given tax concessions and other subsidies. Finally, there is an extensive credit support mechanism for SSI. The SSI sector is part of the “priority sector ” for credit [2]. Priority

[2] The “priority sector” includes the SSI sector, the agricultural and the export sector

sector lending rules direct credit to the priority sector by imposing a quota on bank lending. At least 40 % of all bank credit must go to the priority sector. Within this sector, there are sub-targets for agriculture; most banks also set sub-targets for small scale industry.

2.2 Formal and Informal Sources of Finance

Firms in India borrow from banks and financial institutions that are part of the formal credit sector. They also borrow from the unregulated or informal sector . This sector is fairly heterogenous, consisting of local, traditional moneylender as well as small "finance companies " Timberg (1984). As for the former sector, there are mainly two formal sources of credit to small firms in India , banks and non-bank financial companies. Banks primarily finance the working capital requirements of firms. They also give long-term loans to firms . Most banks in India are owned by the government. The banking sector is India has an impressive coverage, with an extensive rural branch network Pande and Burgess (2004). Until the mid-nineties, it was heavily regulated . Interest rates were set by the central bank for various categories of borrowers. As mentioned previously, at least 40 percent of bank credit was to be set aside for the priority sector, which includes agriculture and small scale industry. Both private and public banks face the priority sector regulation Banerjee and Duflo (2004b).

Financing long-term investment is primarily the responsibility of specialized long-term lending institutions such as the Industrial Finance Corporation of India. Long-term loans to SSI units have typically been provided by state financial corporations, which are refinanced at subsidized rates of interest by the Small Industries Development Bank of India (SIDBI), and by the National Bank for Agricultural and Rural Development (NABARD). These non-bank financial institutions have been lending to firms at rates stipulated to be lower than the rates for short-term loans, and are reported to suffer from a high rate of bad loans(Mohan (2001)) [3]. Irrespective of the causes behind this high default rate, it has been argued that this high default rate has resulted in a bias against small firms in the banking industry, at the branch manager level. As a result, it is very possible that these financing institutions were more than ready to extend their lending to the new SSI units after the redefinition of the SSI sector in 1998 . The new SSI units were larger than the factories that were SSI before 1997 .

The industrial policy reforms of 1991 were followed by reforms in the financial sector .There was a lowering of barriers to entry for privately owned and foreign banks and a deregulation of interest rates. Stipulations regarding priority sector lending, however, continued. Since the very late nineties, a number of new private banks have entered the banking sector. These banks have grown quickly in the past few years. Over two dozen foreign banks have also set up shop in India

[3] Mohan (2001) quotes an average recovery rate of about 40% for the state financial corporations in the last three decades.

since financial reforms commenced. Thus, competition between banks has increased. However, public sector banks still do the overwhelming majority of banking activity in India (Banerjee and Duflo (2004b)). This is particularly true for non-metropolitan and rural areas. The typical small firm in a rural or even semi-urban area would still be banking with a government owned bank.

Large firms source their funds overwhelmingly from the formal sector. In the nineties, on average about 90% (N.C.A.E.R (2001)) of the funds for private corporate bodies came from banks, financial institutions, the government or foreign investors. Financial deregulation has eased the situation for large firms. Small firms, however, continue to borrow under the priority sector lending rules. At the same time, small firms have little access to non-priority sector credit because, given the high transaction cost of lending to small borrower, banks would not lend to small borrowers unless they absolutely had to.

There is evidence to the effect that small firms borrow significantly from the informal sector. A study of firm financing in India between 1994-2003 by Love (2005) finds that smaller firms tend to finance a relatively smaller fraction of their short and long term credit needs from banks and financial institutions as compared to large firms. The authors use balance sheet information on about 6000 firms, defining "small" firms as those with fixed assets less than Rs. 50 mln (in 2004 prices). They find that small firms ascribe , on average , 21% of their borrowing to "other" sources, a category that mainly covers informal sources of credit such as "chit" funds, finance companies, hire purchase and promoters. For larger firms, this proportion is about 16-14%. Note that many of the "small" firms in this study above the SSI cutoff . It is significant that their study finds that as firm size , there is an increase in informal financing. This indicates that for SSI factories, the fraction of borrowing ascribed to informal sources is higher than 20%.

There is direct evidence that small firms in India are credit constrained. As discussed previously, a recent paper by Banerjee and Duflo (2004a) that test if firms in India are credit constrained by using the redefinition of the SSI sector in 1998. The authors find that banks increased lending to the new small scale factories in response to this policy change. Using the redefinition as an instrument for the supply of bank credit, they then show that this credit shock had a significant impact on firm output, implying that these firm had been constrained in their production decisions by the lack of adequate credit.

How large is the small scale sector in manufacturing? In terms of employment, it is considerably bigger than the large scale manufacturing sector. In 1988, roughly 9 in 10 workers in manufacturing were in the small scale sector; in 1999, this ratio was even higher (see table 2) . In terms of gross value added in manufacturing, the share of the small scale sector was about 45% in 1985 and 30% in 1995 (Mohan (2001)) .

2.3 Districts and Financial Policy

The analysis in this paper is done at the district level. A district is a basic administrative unit in India that is also sufficiently autonomous for the viewpoint of policy implementation. It is large enough to cover several dozen villages, and typically contains at least one town. Most development policies of the government are finally implemented at the district level, so that it is a natural unit of data collection at a level finer than that of states. Indeed, for most data that is collected by government agencies, the district is the finest level at which regional estimates are possible. There are about 500 districts in India at present. This paper uses data on about 350 of these districts . These are all the districts from 13 major states of India [4].

As described in the previous section, the financial sector in India is subject to a high degree of government regulation and planning. One of the aims of this planning is to ensure that credit is targeted to backwards regions and to "priority" sectors such as agriculture and small scale manufacturing. The district has been used as a regional decision-making unit in achieving this goal. Non-bank financial institutions such as SIDBI and NABARD have district-level offices. In addition, the Lead Bank Scheme, introduced towards the end of 1969, assigns a lead role to a particular bank in every district. The lead bank coordinates the efforts of all credit institutions and other developmental agencies in the allotted districts that supply credit to agriculture, small-scale industries and other economic activities included in the priority sector. For these reasons, it is natural to think of the district as a relevant regional unit in analyzing local credit markets.

Table 2 lists some basic facts about the 271 districts that are studied in this paper. The average size of the district working age population [5] was 1.5 million in 1999: these districts are quite populous. They are overwhelmingly rural in character, with the average share of rural areas in the working age population being 77.5 % in 1987. They are on average at a fairly low level of development, with the literacy rate in the working age population being 40% in 1987 and 53% in 1999.

Table 2 summarizes district employment by scale of factory for 1987 and 1999 [6] . It shows that large scale industry is a minor source of employment. In 1999, less than 1% of overall employment was in large scale industry. Roughly nine out of ten workers employed in manufacturing were working in a small scale unit throughout this period; and of these about half were in non-household establishments. The table also shows that the increase in the share of the manufacturing sector in employment appears to have been driven by the non-household small-scale manufacturing sector. Although there is a lot of variation across districts in the size of the SSI sector, the overall fraction

[4]The only major states missing are Assam and Kerala, because of lack of yield data.

[5]between ages 15-60

[6]These figures for district employment have been constructed from the ASI and from Rounds 43 and 55 of the National Sample Survey Organization's Employment and Unemployment Survey

employed in the non-household SSI sector has increased from about 4% to 5% . The fraction employed in large scale industry has actually *declined* overall .This means the overall employment in large scale manufacturing was stagnant during this period [7]. This is significant as it indicates that regional variation in the growth of small scale industry can have strong implications for regional inequality.

3 Empirical Strategy

3.1 SSI Policy Change

In January 1998 , the definition of a small scale manufacturing unit changed. Factories with gross value of plant and machinery between Rs 6.5 mln and Rs. 30 mln were not considered small-scale before 1998, but were considered small-scale in 1998 and 1999. As mentioned before, this policy change has been used in a recent study by Banerjee and Duflo (2004a) to test if firms in India are credit constrained. The authors find that banks increased lending to the new small scale factories in response to this policy change. Further, using this policy change as an instrument for increase in bank lending, the paper shows that firms used the additional credit to increase production, and not just to substitute expensive informal credit. The results in their paper imply that formal credit is limited and that in general, bank credit is cheaper than informal credit. [8].

I use these facts to devise a method for testing if financing constraints on small manufacturers are stronger in poorer districts. This method basically compares the response , in terms of the setting up of new factories, to this policy change across rich and poor districts. As Banerjee and Duflo (2004a) show, the policy change resulted in a increase in lending to the new SSI firms by banks. The policy change also caused the specialized SSI lending institutions to expand their term-lending schemes to include projects in the new SSI category. Thus, the empirical strategy is based on the idea that the response to this policy change is the response to an increase in the supply of cheap institutional credit. In the next section, I describe this approach.

3.2 District credit markets: The cost of credit to manufacturers

Consider, as motivation, a simple two-sector two-factor model of the district economy. The two sectors are agriculture and industry. Both goods are traded, so that prices of the two final goods are exogenously given. The two factors of production are labor and capital. District labor and capital markets are closed. Let θ may be a vector of exogenous parameters of the district economy .

[7] This fact has been pointed out by other studies as well, such as N.C.A.E.R (2001), and Besley and Burgess (2002).

[8] Note that the "small" firms that I look at to test this hypothesis are the larger of the set of small firms, since the ASI only covers the factory sector. These are probably less dependent on informal credit than the non-factory small firms. A priori, looking at the response of these medium sized firms understates the impact of the credit shock.

These are parameters that enter the production functions in industry and agriculture, as well as the utility function of households, who supply labor and capital. θ includes technological parameters in agriculture and industry. It also includes the household endowment of labor and wealth. θ varies across districts and over time. The parameters in θ determine the demand for factors by firms and farmers, as well as the supply of factors by households. In this model, the district equilibrium consists of an equilibrium allocation of labor and capital across agriculture and industry, and an equilibrium set of factor prices - the wage and the interest rate. This equilibrium is a function of θ. Thus, interest rate are endogenous to the district economy.

I modify this framework to take into account the fact that the district credit market consists of two sectors - formal and informal. The formal sector consists of banks and large non-bank financial corporations. The formal sector lends at the same interest rate r^b across districts. This formal sector interest rate is a regulated rate that is set at the national level by the central bank's guidelines [9]. It is therefore exogenous to the district economy. I model the informal credit market as being closed at the district level. This implies that the equilibrium informal interest rate, denoted by r^i, varies across districts and is a function of θ.

Let $\theta_{j,t}$ be the vector of exogenous parameters of the district economy j, at time t. Then, as explained above, the equilibrium informal sector interest rate $r^i_{j,t}$ is a function of $\theta_{j,t}$. In order to finance fixed capital, manufacturers borrow from both banks and the informal sector. The bank lending rule is simple. I assume that banks lend a constant fraction ρ of the amount of total amount of credit that is demanded [10]. Further, I assume that this fraction ρ is a binding constraint on borrowers.

Assumption 1 $r^i_j > r^b$, $\forall j$.

The assumption implies that manufacturers will borrow as much from banks as possible. This is justified by the strong evidence in Banerjee and Duflo (2004a) that firms in India are credit constrained.

Thus, in equilibrium, the interest rate that a manufacturer pays is

$$\begin{aligned} r_{j,t} &= \rho r^b + (1-\rho) r^i(\theta_{j,t}) \\ &= \rho(r^b - r^i(\theta_{j,t})) + r^i(\theta_{j,t}) \end{aligned}$$

Note that in the above equation, the equilibrium informal interest rate $r^i_{j,t}$ is a function of the parameters $\theta_{j,t}$. Assuming a linear form for this relationship between the equilibrium informal sector interest rate $r^i_{j,t}$ and the exogenous parameters $\theta_{j,t}$, we can express change in the informal interest rate as

[9] There has been deregulation of the rate in recent years, but it is still determined at the bank head office level. Because most banks cover several states, this rate does not vary by district.

[10] Explain bank lending schemes have margin requirements . And we know firms are credit constrained.

$$r^i_{j,t} - r^i_{j,t-1} = \alpha^i(\theta_{j,t} - \theta_{j,t-1}) \quad (1)$$

3.3 District credit markets: The number of manufacturing units

As shown in equation 1, the cost of credit to a manufacturer depends on the availability of bank credit. Changes in the availability of bank credit to manufacturers will therefore affect total investment and the number of manufacturing units. The SSI redefinition changed the availability of bank credit for manufacturing units of certain sizes. My empirical strategy exploits the observed impact of this redefinition on growth in the number of factories to estimate the relative cost of credit to manufacturers. Below, I categorize manufacturing units by size, and lay out a framework for t how the thinking about how the number of factories in different categories are affected by changes in the credit cost.

There are three types of manufacturing units, or factories. Classified in increasing order of the value of fixed capital invested in the unit, these are - *SMALL* , denoted by s, *MEDIUM* , denoted by m and *LARGE*, denoted by l. In January 1998 , the SSI ceiling rose from Rs 6.5 mln to Rs. 30 mln .Following this, I define the factory type *SMALL* (s) as one with gross value of plant and machinery less than Rs 6.5 mln, *MEDIUM* (m) as one with gross value of plant and machinery between Rs 6.5 mln and 30 mln, and *LARGE* (l) as one this value above Rs. 30 mln.

The bank lending fraction ρ varies by the type of the manufacturing unit. This captures the notion that small and large factories rely on informal credit to a different extent. It implies that

$$r^c_{j,t} = \rho^c(r^b - r^i_{j,t}(\theta_{j,t})) + r^i(\theta_{j,t}) \quad (2)$$

where c denotes the type of the factory.

Given that plant and machinery - the major portion of fixed investment in a manufacturing unit - is a lumpy variable, there is a positive relationship between the equilibrium allocation of capital to the manufacturing sector and the number of manufacturing units. Thus, θ determines the total number of manufacturing units in a district. Further, I allow θ to include all determinants of how the total number of manufacturing units is distributed across the three size types.

Let $N^c_{j,t}$ be the number of factories of type c in district j at time t. Then, in general terms,

$$N^c_{j,t} = f(r^c_{j,t}(\theta_{j,t}, r^b, \rho^c), \theta_{j,t}) \quad (3)$$

Thus, change in the number of type c factory will depend on change in the credit cost $r^c_{j,t}$ and on change in $\theta_{j,t}$. I specify the following form for this relationship

$$\log N^c_{j,t} - \log N^c_{j,t-1} = \gamma(r^c_{j,t+1}(\theta_{j,t}, r^b, \rho^c) - r^c_{j,t-1}(\theta_{j,t-1}, r^b, \rho^c)) + \eta^c(\theta_{j,t} - \theta_{j,t-1}) \quad (4)$$

The change in the number of type c factories depends on the change in the parameters directly, and also indirectly, through changes in the cost of credit. In the above relationship, γ is negative, because lowering in the cost of credit will lead to an increase in the number of firms by causing an entry of new firms. Because in general *SMALL* factories are more numerous than *MEDIUM* factories, it makes sense to compare proportional change , rather than absolute change, in the number of *SMALL* and *MEDIUM* factories. For this reason, I have specified the relationship in logarithms of the number of factories. Equation 4 assumes that across factory types c, proportional increase in the number of factories is affected to the same degree by change in the type-specific cost of credit $r^c_{j,t}$.

3.4 Empirical specification

Because the district informal credit market is closed, one of the determinants of the informal interest rate $r^i_{j,t}$ is the district endowment of capital. Let W_j be a measure of this endowment, which, for lack of a better term, I will often refer to as just "wealth". Suppose the relationship between $r^i_{j,t}$ and W_j across districts j is

$$r^b - r^i_{j,t} = \alpha W_j + u_{j,t} \tag{5}$$

where $u_{j,t}$ is i.i.d. across time and districts. The central aim of this paper is to identify α. Below, I explain how the SSI policy change can be exploited to identify α.

This policy change resulted in an increase in bank lending to the *MEDIUM* type of factories, at the expense of lending to the *SMALL* factories. I model this as in increase in ρ^m to $\rho^m + a_m$, and a concurrent decrease in ρ^s to $\rho^s + a_s$, between the years 1998 and 2000.

Using equation 2, we can express the cost of credit to *MEDIUM* factories in $t = 2000$ as

$$r^m_{j,t} = (\rho^m + a_m)(r^b - r^i_{j,t}(\theta_{j,t})) + r^i(\theta_{j,t}) \tag{6}$$

The cost of credit to *SMALL* firms in $t = 2000$ is

$$r^s_{j,t} = (\rho^s - a_s)(r^b - r^i_{j,t}(\theta_{j,t})) + r^i(\theta_{j,t}) \tag{7}$$

Let Δx_t denote change in a variable x between $t - 1$ and t. Let $Post_t$ be a dummy that equals one for $t - 1 = 1998$.Then, equation 6 implies that for *MEDIUM* factories, the change in the cost of credit takes the following form

$$\Delta r^m_{j,t} = (1 + \rho^m)\Delta r^i_{j,t} + Post_t a_m(r^b - r^i_{j,t}) \tag{8}$$

The analogous expression for change in the cost of credit to *SMALL* firms in $t = 2000$ is

$$\Delta r^s_{j,t} = (1+\rho^m)\Delta r^i_{j,t} + \Delta r^i_{j,t} - Post_t a_s(r_b - r^i_{j,t}) \tag{9}$$

Using equations 8 and 9 , the within-district difference in the change of credit cost to type m and type s firms can be written as

$$\Delta r^m_{j,t} - \Delta r^s_{j,t} = (\rho^m - \rho^s)\Delta r^i_{j,t} + Post_t(a_m + a_s)(r^b - r^i_{j,t}) \tag{10}$$

The dummy $Post_t$ enters the above equation to express the fact that this differential changes in 1998 because of the policy change.

Since informal interest rates are lower than the bank rate (Assumption 1), the switch in bank lending lowered $\Delta r^m_{j,t} - \Delta r^s_{j,t}$. Equation 10 states that the effect of the total switch $a_m + a_s$ in bank lending from *SMALL* to *MEDIUM* firms on the within-district difference in the change of credit cost to type m and type s firms depended on the gap between bank rate r^b and the district informal market rate $r^i_{j,t}$ in 2000. The costlier the informal credit, the greater the lowering in $\Delta r^m_{j,t} - \Delta r^s_{j,t}$ that was caused by the SSI policy change.

If $r^i_{j,t}$ varies as we vary district average wealth, then by equation 10, the impact of the policy change on the within-district difference in the change of credit cost to type m and type s factories between 1998 and 2000 varied by district wealth. If wealthier districts have lower $r^i_{j,t}$, then the effect of the policy change was lower in the wealthier districts. The intuition behind this is that the gap between the bank rate and $r^i_{j,t}$ in 2000 was lower in the wealthier districts. If we could observe $\Delta r^m_{j,t} - \Delta r^s_{j,t}$, then equation 10 could be used to identify how the cost of informal credit varies by district wealth. While I do not observe $\Delta r^m_{j,t} - \Delta r^s_{j,t}$, it can be inferred by the observed pattern in the within-district difference in the growth of type m and type s factories between 1998 and 2000. This is because growth in the number of type c manufacturing units , as expressed in 4, depends on the change in the cost of credit to the c segment. A reduction in the cost of credit to *MEDIUM* firms should lead to an entry of new *MEDIUM* firms, and perhaps a decline in a rate of entry of *SMALL* firms. If the change in the cost of credit varies by district wealth, $\Delta r^m_{j,t} - \Delta r^s_{j,t}$ can be inferred by how the within-district difference in the change in the number of *MEDIUM* and *SMALL* factories varied by district wealth in the period following the policy change.

However, the overall impact of the policy change on $\Delta r^m_{j,t} - \Delta r^s_{j,t}$ also depended on the change in the informal rate between 1998 and 2000. According to equation 1, this depended on $\Delta\theta_{j,t}$, the change in the exogenous parameters that determine the district equilibrium. Also, by equation 4, aside from the change in cost of credit to type c firms ($\Delta r^c_{j,t}$), the change in the number of factories also depended directly on the change in $\theta_{j,t}$. It is possible to identify the relationship between district wealth and the cost of informal credit through its implications for the policy impact on factory growth only if the other source of district variation in the growth of factories across districts, which is $\Delta\theta_{j,t}$, did not not vary by district wealth in the period following the policy change.

Assumption 2 *$\forall$ elements k of the vector $\theta_{j,t}$,*

$$\theta^k_{j,t} - \theta^k_{j,t-1} = \alpha^k_1 W_j + \alpha^k_2 t + u^k_{j,t}$$

where $u^k_{j,t}$ is i.i.d. across districts and time.

Assumption 2 above rules out the case that the change in the parameters varies over time differentially by wealth. Note that it allows the change $\theta^k_{j,t} - \theta^k_{j,t-1}$ to vary by district wealth and to vary over time.

Assumption 2 is best explained by means of an example. Suppose that technology in manufacturing, a component of θ, grows faster in wealthier districts (positive α^k_1 for technology). Suppose also that an increase in technology increases the demand for capital in manufacturing, thereby raising the equilibrium informal interest rate. Then, in any given period, the increase in the informal interest rate is lower in wealthier districts. By equation 10 , a change in $r^i_{j,t}$ has a differential impact on change in the cost of credit to type m and s firms. This is because in general, they depend on the informal sector to varying degrees. If ρ^m is greater than ρ^s, that is, smaller firms depend more on informal credit, then by equation 10,the within-district differential in the increase in the cost of credit to *MEDIUM* and *SMALL* factories is higher in wealthier districts. This in turn implies that the within-district differential in growth in the number of *MEDIUM* and *SMALL* factories is smaller in wealthier districts. But as long as the gap between the growth rate in technology across wealthy and poor district does not *change* systematically over time, this differential by district wealth in $\Delta N^m_{j,t} - \Delta N^s_{j,t}$ will not vary systematically over time.

Assumption 2 allows for the case described above, a different trend in the *level* of $\theta^k_{j,t}$ across low and high wealth districts. In this case it is still possible to identify the relationship between the cost of informal credit and district wealth. This is so because I observe how the differential by district wealth in $\Delta N^m_{j,t} - \Delta N^s_{j,t}$ *changed* in the period following the policy change.

I now describe my empirical strategy for identifying the relationship α between the cost of informal credit and district wealth. Equations 10 , 1 and 5, along with assumption 2, allow me to express how the variation in $\Delta r^c_{j,t}$ by district wealth changes in the period following the policy change. Let MED_c be a dummy that equals one if the factory type is m. Then, for $c \in \{s, m\}$,

$$\begin{aligned}\Delta r^c_{j,t} &= \alpha^r_1 W_j + \alpha^r_2 MED_c + \alpha^r_3 W_j * MED_c + \alpha^r_4 Post_t * W_j \\ &\quad + \alpha^r_5 Post_t * MED_c + \beta^r Post_t * W_j * MED_c + u^{rc}_{j,t} \end{aligned} \tag{11}$$

The coefficient β^r in the above equation measures how the effect of district wealth on the impact of the policy on the change in $r^c_{j,t}$ differs for *MEDIUM* and *SMALL* categories. It is expected to have the same sign as the coefficient α on district wealth in equation 5 : By assumption 2 and equation 1, $\Delta r^i_{j,t}$ does not depend on $Post_t * W_j$. By equation 5, the gap between the bank rate and the informal interest rate, $r^b - r^i_{j,t}$, varies by W_j. Thus the term $Post_t(a_m + a_s)(r^b - r^i_{j,t})$ in equation 10 translates into the $Post_t * W_j * MEDIUM_c$ term in equation 11.

Plugging in equation 11 and assumption 2 in equation 4, I get

$$\begin{aligned}\Delta \log N^c_{j,t} \quad = \quad & \gamma(\alpha^r_1 W_j + \alpha^r_2 MED_c + \alpha^r_3 W_j * MED_c + \alpha^r_4 Post_t + \alpha^r_5 Post_t * W_j \\ & + \alpha^r_6 Post_t * MED_c + \beta^r Post_t * W_j * MED_c + u^{rc}_{j,t}) \\ & + \sum_k \eta^{kc}(\alpha^k_1 W_j + \alpha^k_2 Post_t + u^{km}_{j,t}) \end{aligned} \tag{12}$$

Re-arranging terms, I get

$$\begin{aligned}\Delta \log N^c_{j,t} \quad = \quad & (\gamma\alpha^r_1 + \sum_k \eta^k c\alpha^k_1)W_j + \gamma\alpha^r_2 MED_c + \alpha^r_3 W_j * MED_c \\ & + (\gamma\alpha^r_4 + \sum_k \eta^{kc}\alpha^k_2)Post_t + \gamma\alpha^r_4 Post_t * W_j + \gamma\alpha^r_5 Post_t * MED_c \\ & + \gamma\beta^r Post_t * W_j * MED_c + (\gamma u^{rc}_{j,t} + \sum_k \eta^{kc} u^{km}_{j,t}) \end{aligned} \tag{13}$$

Equation 13 above shows that growth in the number of type c factories in a district j varies in the *Post* period by district wealth in different ways for *MEDIUM* and *SMALL* factories . Estimating an equation of the same form as equation 12 involves comparing growth in the number of factories across districts. If there is a shock in any period that is common to the growth in *MEDIUM* and *SMALL* factories in a district and is correlated with district wealth, an OLS estimate of equation 13 will yield biased estimates. For this reason, in estimating equation 13 I allow for district-year fixed effects. These are meant to capture the common shock to the growth of *MEDIUM* and *SMALL* factories in a given district-year.

Let $\Delta \log \tilde{N}^c_{j,t}$ be an estimate of $\Delta \log N^c_{j,t}$ for factory type c. For $c \in \{s, m\}$, I test the relationship expressed in equation 13 through the following specification,

$$\Delta \log \tilde{N}^c_{j,t} = \alpha_1 MED_c + \alpha_2 Post_t * MED_c + \alpha_3 W_j * MED_c + \beta Post_t * W_j * MED_c + \delta_{j,t} + u^c_{j,t} \tag{14}$$

$\delta_{j,t}$ is a district-year specific fixed effect. β , the coefficient of interest, picks up the effect of the credit shock alone. It measures the differential effect of $Post_t * W_j$ on factory growth across *MEDIUM* and *SMALL* categories. It depends on the product of γ and β^r . γ is negative, since a higher cost of credit should discourage investment. A negative β then implies that β^r is positive : compared to *SMALL* factories, the decrease in the overall cost of credit to the average *MEDIUM* firm in the period after the policy change was lower in wealthier districts. Through the underlying equation 5, this in turn implies that informal finance is less expensive in the wealthier districts.

My empirical strategy essentially focusses on the within-district differential in the growth of *SMALL* and *MEDIUM* factories across rich and poor districts. Since the policy change resulted in a switch in bank lending from *SMALL* to *MEDIUM* factories in the *post* period, it affected the cost of credit to both types of factories in opposite ways. Thus, the overall response to the policy change is measured in this differential , and not in the growth of any one category alone.

4 Data

4.1 The Annual Survey of Industry

I measure growth in factories by using the Annual Survey of Industries (ASI) . The ASI is a survey of factories that covers all industries in all regions of India [11]. Firms surveyed belong to the "factory" sector .By definition, a factory is a manufacturing establishment that employs at least 10 workers. In fact, the ASI is a *census* of all factories employing 100 workers of more. Smaller factories are then covered in a survey. The sample size of ASI is large enough to cover all districts. Further, the ASI survey sector is stratified by 3-digit industry groups. It is thus possible to get district-level estimates of employment in factories,as well as estimates of the number of factories in each district. I have used ASI surveys conducted in 1987-88, 1993-94, 1997-98 and 1999-2000 to construct district-levels figures for the number in factories in different size categories. The category *SMALL* is all factories with a value of plant and machinery below Rs 6.5 mln. The category *MEDIUM* is those with a value of plant and machinery between Rs 6.5 mln and Rs 30 mln. The category *LARGE* covers all the remaining factories.

4.2 Measuring District Wealth

I use two measures of the district supply of informal credit. The first is a measure of per capita household wealth. I use the 1992 All India Debt and Investment Survey(AIDIS) to measure per capita average household assets at the district level. This variable is called *assets*. The AIDIS was an all-India household survey conducted by the National Sample Survey Organization (NSS0). In the survey, households were asked to list their asset holdings as of April 1992. The survey was stratified by districts. Assets reported included land, building, household durable as well as financial assets [12].

[11] In India the Factory Act defines a *factory* as a manufacturing establishment that employs at least 10 workers if it uses power and at least 20 workers if it does not use power

[12] The last, financial assets, is a minor component of reported assets. This is particularly true in rural areas, where financial assets on average constitute less than 5% of all assets. This indicates that the formal financial sector plays

My second measure of the supply of informal credit in districts is an index of yields, averaged over 1991-94, of four major food grains - rice, wheat, maize and sorghum. This variable is called *yield*. This alternative measure of wealth is meant to capture agricultural incomes in the district. Given that agriculture directly employs about 70% of the rural workforce, income and savings in agriculture could be an important source of capital to firms. This could be through self-finance or through the informal credit market. The dataset used to measure yields is the World Bank India Agricultural and Climate Data Set (constructed by Evenson and McKinsey). This data covers all the districts in thirteen major states in India. It contains information on the output, acreage and price of all major crops grown in the district. As shown later, I find similar results for both wealth measures.

The ASI data enable me to construct figures by sector and by scale of establishment for nearly all the districts in India over the period 1983-1999. To this I add the measure of district agricultural yield from the agricultural data. This step reduces the number of districts for which I have complete data; this occurs because the agricultural data set has information on 13 states . However , these 13 states are the largest states in India and between them cover most of the land area and population [13].

Districts split over time, and so data for the later years must be consolidated so that split-off districts match with their parent districts. I have consolidated the data at the level of districts as they were defined in 1961. This consolidation means that we have complete data on about 271 districts defined in 1961 [14]. However, since many of these districts have since split into multiple districts, this sample covers many more 2001 districts than just 271.

Table 3 gives summary statistics for the number of $SMALL$, $LARGE$ and $LARGE$ factories that are estimated from the ASI. On average, a district has 335 $SMALL$ factories, and about 25 $MEDIUM$ factories, in 1994. Because of these difference in the absolute numbers of $SMALL$ and $MEDIUM$ factories, I measure growth in factories as change in the logarithm of the number of factories [15]. There is some decline in the number of $SMALL$ factories in 1999, as compared to $MEDIUM$ and $LARGE$ factories, but there is considerable variation in these numbers across districts. The district average per capita household assets in 1992 were Rs. 121,000. The average value of yield, measured in 1961 rupees, was Rs. 143.4.

4.3 Empirical specification: Instrumenting for current wealth

I estimate equation 14 using measures of W_j in the early 90s, since 1994 is the closest year before the policy change for which I have data on the number of factories in districts. The variable W_j is a

a minor role in mobilizing household savings in rural India.

[13] with two notable exceptions, Kerala and Assam.

[14] 286 if the 1981 district definition is used

[15] All the results that I report are robust to measuring factory growth in absolute numbers

measure of the average district capital endowment . As described previously, I use two alternative measures of W_j. The first measure, called *assets*, is the log of the per capita value of household assets in the districts, estimated using AIDIS, the debt and investment survey that was undertaken in 1992. The second measure is the log of the estimated value of agricultural yield (in Rs 100 per hectare) in the district averaged over the period 1991-94, called *yield*. This is a measure of agricultural productivity in the district. The agricultural sector has historically been the largest employer in rural India. Agriculture is still the source of income, either directly or indirectly, of the overwhelming majority of the rural population. So it is possible that long-run yields are as good a measure of the regional credit constraint as average household assets in the district.

Neither *assets* nor *yield* is a perfect measure of average district capital endowment. The ideal measure should reflect the long-run supply of savings in the district. Both current assets and current yield have a transient component to them. Further, they are affected by recent income, credit or productivity "shocks" that affect small industry. For example, high yield districts in 1994 may those in which banks have been unusually responsive to the agricultural and small small sector in recent years. In this case, using yields to measure W_j well bias the estimate of how an increase in local wealth lowers the local credit cost downwards. Thus, current wealth and yield are possibly endogenous variables in a regression that estimates equation 14.

For this reason, I also estimate equation 14 using an instrument for the W_j measure. This instrument is the fraction of district gross cultivated area that was planted to High Yield Variety (HYVs) seeds, averaged over the years 1968-71. I call this variable *HYV71*. This district level of adoption of HYVs seeds in the late 60s is a measure of how suitable the district was to the new agricultural technology that was being introduced in the late 1960s as part of the green revolution in agriculture. The introduction of HYVs of wheat and rice in the late 1960s substantially increased farm incomes in India. However, not all areas benefitted to the same extent from the early HYVs, because the new varieties were unsuitable for cultivation in some areas. The gains from the new agricultural technology became more widespread over time as HYVs were developed for a broader range of crops and were cross-bred with local varieties to make them more suitable to regional conditions (Munshi (2004), Munshi and Rosenzweig (2005)). Since the early 1980s, agricultural yield growth has been more equitable across regions (Sawant (1995)), and part of reason behind this is that technological development in agriculture became more region-specific. However, differences in the timing of HYV adoption led to persistent differences in the levels of agricultural income and of household assets. This is shown in table 8, which presents OLS estimates of regressions of the district wealth measures on *HYV71*. Districts with higher *HYV71* have significantly higher levels of *assets* and *yield* in the 1990s.

The instrument that I use appears to have sufficient power. It is possible that areas that adopted HYVs earlier have different characteristics from areas that adopted later, and that these characteristic influenced the growth of small scale industry in later years. It could be that because of these characteristics, or because of some other linkages between agriculture and industry, differences in *HYV71* are associated with different patterns of growth in small scale industry. However, this in itself does not mean that the instrument fails to satisfy the exclusion restriction. The empirical strategy used in this paper exploits the difference *within* the set of small industries in the growth of factories following the policy change. Further, it looks at how this difference *changes* in the period following the policy change. While *HYV71* may be correlated with levels of district characteristics that affect the growth of small industry, it is unlikely to be correlated with changes in these characteristics in the 1990s.

5 Results

5.1 The Impact of SSI Redefinition : OLS and IV Estimates

To test how the response of factory growth to the change in the supply of formal credit varied by district wealth W_j, I estimate the following equation:

$$\Delta \log \tilde{N}^c_{j,t} = \alpha_1 MED_c + \alpha_2 Post_t * MED_c + \alpha_3 W_j * MED_c + \beta Post_t * W_j * MED_c + \delta_{j,t} + u^c_{j,t} \quad (15)$$

Here, $\Delta \log \tilde{N}^c_{j,t}$ is the difference in the log of the number of factories of type c in district j between time t and $t-1$. Using the ASI, I measure the number of factories in district j in 1994, 1998 and 2000. Thus, equation 15 is estimated for factory growth in two periods - 1994-1998, and 1998-2000. Since the SSI redefinition took effect in January 1998, the latter period is defined as the *Post* period. The regression compares two types c of factories - *SMALL* and *MEDIUM.* The *MED* dummy is equal to one if the factory type is *MEDIUM.* The district-year fixed effects $\delta_{j,t}$ account for common shocks to the growth of *SMALL* and *MEDIUM* factories in a district.

I estimate equation 15 by OLS and by IV. I present results for two alternative measures of district wealth W_j, *assets* and *yield.* The instrument for the wealth measure is district level of adoption of HYVs in 1968-71, the variable *HYV71.* Table 9 presents the first-stage results for the IV estimation. For both measures of wealth, the coefficient on *HYV71* is positive and significant [16].

[16]The structure of the first stage regression might seems a bit confusing, because it is the first stage of a FE-IV regression, with district-year FEs. However, what it essentially does is regress the level of wealth (*assets* or *yield*) in 1994 on the level of $HY71$. Thus, in equation 15 with *assets* as W_j, the variable instrumented are $W_j * MED_c$ and $Post_t * W_J * MED_c$, and the instruments are $HYV71 * MED_c$ and $Post_t * HYV71 * MED_c$. The first stage regression for $W_j * MED_c$ is

$$W_j * MED_c = aMED_c + bPost_t * MED_c + cHYV71 * MED_c + dHYV71 * Post_t * MED_c + FE_{j,t} + e_{cjt} \quad (16)$$

and the coefficient of 1.409 (significant at 1%) on $HYV71 * MED_c$ indicates that *HYV71* is a strong and positive

Districts that had high HYV adoption rates in early green revolution years have significantly higher levels of the household per capita assets and of yields in the early 1990s.

Table 4 shows OLS and IV results for equation 15. The coefficient of interest is β, the coefficient on the interaction of the *MED* dummy with $Post_t * W_j$. It measures how the variation by W_j in the difference in the growth of *MEDIUM* and *SMALL* factories changed in the *Post* period. Column (1) in table 4 presents OLS results using *assets* as a measure for W_j. The OLS estimate of β is -0.222, with a standard error of 0.127. As discussed previously, *assets* is endogenous in equation 15. So I instrument for it by district level of adoption of HYVs in 1971, *HYV71*. The IV estimate of β is negative and significant at 1% level of significance. The point estimate of β is -1.181, with a standard error of 0.428. This negative estimate of β implies that in the *Post* period, as compared to the pre-policy change period,the difference in the growth of *MEDIUM* and *SMALL* factories was lower in districts with higher per capita household assets. This shows that the relative entry of new firms into the *MEDIUM* category was significantly greater in poorer districts in the period immediately following the policy change. Because $Post * MED$ measures the impact of the switch in the availability of formal credit from *SMALL* to *MEDIUM* factories on the relative entry of *MEDIUM* factories , this result indicates that the effect of the credit increase was significantly greater in lower wealth districts. This is evidence that credit constraints on small manufacturers are greater in low wealth districts.

Columns (3) and (4) present the corresponding OLS and IV results with *yield* as a measure of W_j. In the OLS regression, the estimate of β is close to zero. This could be because yields measure "permanent" wealth with error. Yields in agriculture are also sensitive to productivity shocks in agriculture, more so than asset holdings. For this reason, the OLS estimate is likely to be biased . The IV estimate of β when *yield* is used to measure W_j is negative and significant. The point estimate of β, with *yield* as W_j (-0.791) is close to the point estimate of β with *assets* as W_j . The variables *assets* and *yield* are of comparable magnitudes, so we should expect this if we believe that they measure the same thing.

What are the magnitudes of the differential response to the credit shock? The magnitude is measured by the how the within-district difference in the growth of *MEDIUM* and *SMALL* factories varies by district wealth in the *Post* period. For ease of interpretation, assume that there was no such variation across districts in the 1994-98 period, and that in all districts, the growth of *SMALL* industry was null in the *Post* period. Then, the point estimate of β in column (2) implies that the gap, between districts at the 95th and the 25th percentile value of*assets* , in the growth rate of *MEDIUM* industries is about 14 percentage points in the *post* period.

predictor of *assets*.

5.2 Identification : A Discussion

My empirical strategy interprets the within-district differential in the growth of *SMALL* and *MEDIUM* factories across rich and poor districts as the differential response to a credit shock across rich and poor districts. This interpretation rests on two assumptions. The first assumption, which was spelled out in section XX, is that that the there is no trend in the unobserved determinants of the *growth* of the manufacturing sector that varies across districts in a way that is correlated with district wealth. Note that a divergent trend in the levels of the number of factories alone would not invalidate the strategy, because such a trend is captured in the $W_j * MED_c$ term. Further, this assumption can be tested by looking at periods a few years after the policy change.If the negative coefficient on $Post_t * W_j * MED_c$ is the result of this divergent trend, then it should show up in later years too. In the next section, I give evidence against such a divergent trend by extending the estimation period to 2002.

The second identification assumption is that the effect of the SSI redefinition on the availability of formal credit to *SMALL* and *MEDIUM* manufacturing did not vary systematically by district wealth. I identify local credit costs by how the response to a treatment - the switch in the supply of formal credit *SMALL* and *MEDIUM* manufacturing - varies by local wealth. Clearly, for the empirical strategy to be valid, it must be that the the treatment itself was comparable across rich and poor districts. This requires that there was no reallocation in formal sector credit from rich to poor districts in the two years immediately following the shock. The justification behind this assumption, as I explain below, is that the district is a primary unit of decision-making for formal sources of credit to the SSI sector.

As mentioned earlier, formal financial institutions that lend to the priority sector coordinate their lending activity at the district level. For banks, regional rural banks and co-operative banks, this coordination is carried out through the District Lead Bank system. The Lead Bank Scheme, introduced towards the end of 1969, assigns a lead role to a particular bank in every district. Typically, a bank having a relatively large network of branches in the rural areas of a given district is entrusted with the lead responsibility for that district. The lead bank acts coordinates the efforts of all credit institutions and other developmental agencies in the allotted districts that supply credit to agriculture, small-scale industries and other economic activities included in the priority sector, in both rural and semi-urban areas R.B.I. (1998). The main focus of Lead Bank Scheme is to enhance the proportion of bank finance to priority sector. The Lead Bank Scheme makes the district the basic geographical unit at which targeted lending to the priority sector through banks is implemented. An implication of the lead bank system is that it imposes constraints on all the banks operating in a district, even if some of them are large banks with a network spanning several districts. This is because one of the responsibilities of the lead bank is to ensure that the banks in its district are responsive to the priority sector in the district.

Term-lending institutions that cater to the SSI sector also operate at the district level. Refinance institutions [17] like the Small Industries Development Bank of India and the National Bank for Agricultural and Rural Development have district offices,as do the State Financial Corporations. In the case of both banks and non-bank financial institutions, the national or state level head office sets annual district level targets for total lending to various sectors. [18]. This regional allocation mechanism works through several layers of bureaucracy. Now, following the policy redefinition, it is possible that a bank increased overall SSI lending in areas where $MEDIUM$ firms were observably "good" propositions. I argue that it is unlikely that such reallocation occurred within a year or two of the policy change. Such reallocation required that information about this new potential of a region be transmitted from the branch to the head office, assimilated at a pace that is simply beyond the bureaucratic structure of the nationalized banks and the NBFCs.

There is an additional concern about identification that has to do with the fact that SSI policy is not about credit alone. It encompasses a range of benefits that are provided to small units. Many of these benefits are essentially some form of subsidy. For instance, small scale units are given fiscal concessions through lower excise duty rates. Government bodies have procurement and "price preference" programs that apply to small scale units. The other class of benefits is that of support programs in technology and marketing. For example, there are about 30 Small Industries Service Institutes scattered across the country that provide technical support to SSI units.

Most of these non-credit aspects of the SSI support policy, however, are not going to matter *differentially* to entrepreneurs in low and high yield districts. Under this category I put all benefits that have an element of subsidy in them, such as fiscal concessions. Then, there are those SSI benefits , such as technology support and training, that involve not subsidization but the provision of knowledge. These may indeed matter more to firms in districts with lower literacy levels. But this non-financial support works to support incumbent manufacturers , and not those considering entry. Hence, it is unlikely to be reflected in changes in the number of firms, unless it is of such significance that it causes an immediate slowdown on the exit of factories. Also, studies indicates that technical and marketing support to the SSI sector has not been of great value to small scale firms (Mohan (2001)) . It is even less likely to matter to the larger of the small firms.

There is one component of the SSI policy package that deserves special consideration . This is the policy of reserving product categories for small scale industry. Before I explain how this could be a problem, I should first point out a feature of the data that is relevant to this case. The ASI measures factory size at the time of the survey. But a firm of *MEDIUM* size in 2000 could have been *SMALL* in 1997. Thus, the measured size of the *MEDIUM* sector in the *Post* period includes

[17] Refinance institutions are those that lend to other banks

[18] Evidence based on interviews with bank branch managers, and with SIDBI and NABARD officers in Delhi

not only new *MEDIUM* factories, but also new transitions from *SMALL* to *MEDIUM* size. Now, if credit cost was a constraint on new projects, then it was also a constraint on the expansion of existing firms to a size beyond Rs. 6.5 mln .Therefore, under the main hypothesis, this transition is expected to follow the same pattern as the entry of new *MEDIUM* factories.

However, this feature of the data could lead to the following problem in interpreting the results from estimating 15. If a product has been reserved for production by small scale units, then in that product category no new unit can be set up with investment above the SSI level. Clearly, in such product categories the raising of the SSI ceiling will, mechanically, have led to an increase in the growth of *MEDIUM* scale units in 1998 . For medium sized projects,the policy change was effectively a removal of entry restrictions [19]. Now suppose that the SSI units producing such reserved products tend to be concentrated in certain districts, and this pattern of concentration is correlated with district wealth. Then there is reason to expect a mechanical correlation between W_j and response to the policy change, irrespective of credit constraints.

While there is no reason to believe this to be case, it is possible to test whether this particular story matters. It so happens that almost 80% of the reserved products are in eleven of the 3-digit industry groups(Mohan (2001)). If the de-reservation effects are driving the observed patterns, then we should expect the results to change when we drop these industries. In the next section, I show evidence that my results are robust to dropping reserved product categories.

5.3 Results : Non-reserved industry groups

It is possible that the effective de-reservation, to *MEDIUM* manufacturers, of products that are reserved for SSI are affecting the results reported in table 5. This would be true if small scale units producing the commodities reserved for the SSI sector are concentrated in the low wealth districts. Table 5 shows that there is no evidence that this mechanism is driving the main results. It presents OLS and IV results for equation 15 for the set of all industries except those 11 3-digit industry groups (out of a total of about 130 groups)in which over 80% of all the reserved products are concentrated [20]. I call this set of industries the non-reserved industries.

Column (2) gives IV estimates for the set of non-reserved industries , using *assets* to measure W_j. The coefficient on the interaction of the *MED* dummy with $Post_t * W_j$ is estimated to be -1.122, with a standard error of 0.491. The corresponding point estimate for the set of all industries is -1.181. Column (4) gives IV estimates for the set of non-reserved industries , using *yield* to measure

[19] There is also evidence that this reservation has in fact been a constraint on the growth of those small-scale units that produce reserved item (Mohan (2001)).

[20] These are: Knitting in mills; Manufacture of plastic products; Manufacture of basic and industrial organic and inorganic chemicals; Paints, varnishes and lacquers; Photochemicals and sensitized fibres; Fabricated metal products, metal boxes, cans safes and vaults; Hand tools and general hardware; Electrical appliances, domestic appliances, switches and sockets; Auto parts; Bicycle, rickshaws and parts; Mathematical and miscellaneous instruments

W_j. The coefficient on the interaction of the *MED* dummy with $Post_t * W_j$ is estimated to be -.775, with a standard error of 0.344. The corresponding point estimate for the set of all industries is -.791.

This shows that the estimates of β for the set of non-reserved industries are identical to the estimates when all industries are included in measuring factory growth.In 1994, about 10 % of all small scale factories in the ASI data were in the 11 industry groups that that I denote as being reserved. Dropping the reserved group factories is thus a significant change to the sample. The fact that the estimates of β do not change substantially is strong evidence that the observed difference by district wealth in the response to the SSI policy change is driven by the lifting of reservation restrictions on *MEDIUM* factories.

5.4 Evidence against a divergent trend: Factory growth after 2000

As previously discussed, the coefficient on the interaction of the *MED* dummy with $Post_t * W_j$ in equation 15 identifies the relative cost of informal credit across rich and poor districts under the assumption that there is no differential trend in the *growth* of *SMALL* and *MEDIUM* factories that also varies across rich and poor districts. This assumption can be tested by seeing if the difference in the growth of *SMALL* and *MEDIUM* factories continues to show a divergence by district wealth in later years. The effect of the policy should not be persistent, because there are limits to the degree of switching in bank credit from *SMALL* to*MEDIUM* factories. The relative reduction in the cost of credit to the new small scale firms is not expected to continue once the switching has run it full course. It is possible, though unlikely, that this switch takes a number of years; however, if later periods do not show the same pattern in the growth of factories as the *Post* period, we can be fairly certain that the results in table 4 are not driven by a differential trend.

In table 6, I present results that show that the change in the pattern of factory growth by $MED * Wealth$ that is apparent in the *Post* period does not repeat for the period following 2000. I estimate the same equation as 15, but now with a third period, called $Post2$, which is 2000-2002. The equation estimated is

$$\begin{aligned}\Delta \log \tilde{N}^c_{j,t} &= \alpha_1 MED_c + \alpha_2 Post_t * MED_c + \alpha_3 Post2_t * MED_c + \alpha_4 W_j * MED_c \\ &\quad + \beta_1 Post_t * W_j * MED_c + \beta_2 Post2_t * W_j * MED_c + \delta_{j,t} + u^c_{j,t} \qquad (17)\end{aligned}$$

$Post2_t$ is a dummy for the period 2000-02. The coefficient β_2 on the interaction of $W_j * MED_c$ with $Post2$ shows how the effect of $W_j * MED_c$ changes in the 2000-02 period, as compared to the initial 1994-98 period. Column (1) presents FE-IV estimated of equation 17 using *assets* , and column (2) presents the same but with *yield* as a measure of district wealth. In both cases, the coefficient on $Post2_t * W_j * MED_c$ is insignificant. This is in sharp contrast to the coefficient on $Post_t * W_j * MED_c$, which, as in the previous estimates, is negative and significant. This is evidence against a trend in the differential growth of *SMALL* and *MEDIUM* factories that diverges by district wealth.

The results in table 6 also suggest that the effect of the policy change was immediate and did not persist beyond the first few years. There is no within-district difference in the growth of *SMALL* and *MEDIUM* factories in the 2000-02 period, as in the 1994-98 period. I should point out here that there is one complication in comparing *SMALL* to all *MEDIUM* factories in the 2000-02 period. This arises because there was a partial policy reversal in 2000. In January 1998, the SSI ceiling was lowered from a value of Rs 30 mln to Rs 10 mln of investment in plant and machinery. This policy reversal meant that after 2000, banks and financial institutions could no longer classify lending to firms with a value of plant and machinery between Rs 10 and Rs 30 mln under small scale lending. As a result, there may have been some switch in bank lending from factories with plant and machinery between Rs 10 and Rs 30 mln to factories below Rs 10 mln. This switch could affect growth within *MEDIUM* factories differentially , and I examine this in the next section. In particular, I examine if the effect of the policy reversal too was felt differentially across rich and poor districts. Before moving on to this examination, I should point that that despite the second policy change in 2000, the conclusion that I draw from table 6 remain valid : if the a negative estimated β in equation 15 merely reflects a diverging trend by factory size and district wealth, then we would expect a negative coefficient on the interaction of $Post2_t * W_j$ with MED_c, irrespective of the policy reversal.

5.5 Partial policy reversal and within- *MEDIUM* Growth

As discussed in the previous section, there may have been some switch in bank lending from factories with plant and machinery between Rs 10 and Rs 30 mln to factories below Rs 10 mln as a result of the partial reversal of the 1998 policy in 2000. Following this, I break up the *MEDIUM* category into two types - *MED1*, those with a value of plant and machinery between RS 10 mln and Rs 30 mln , *MED2*, those with a value of plant and machinery between Rs 6.5 mln and Rs 10 mln. It is not possible to say how the reduced credit to the *MED2* segment after 2000 was reallocated among the SSI factories in the *MED1* and *SMALL* segment. If, and only if most of this credit went from *MED2* to *MED1* segments, then one would expect even faster growth in the *MED1* segment in $Post2$ period, as compared to the *SMALL* segment. As for the *MED2* segment, one does not expect an immediate impact of the partial reversal on growth in the 2000-2002 period. This is because the affect of the credit policy change is asymmetric. If growth in factories is constrained by the cost or the amount of credit, an increase in formal credit availability has an immediate impact on the number of firms through entry of new firms. A decrease in the availability of formal credit, on the other hand, may increase the rate of exit, through closure, but this effect is expected to be gradual.

I examine the partial policy reversal in 2000 by estimating the following modification to equation 17 through FE-IV -

$$\begin{aligned}\Delta \log \tilde{N}^c_{j,t} &= \sum_i (\alpha_{1i} MEDi_c + \alpha_{2i} Post_t * MEDi_c + \alpha_{3i} Post2_t * MEDi_c + \alpha_{4i} W_j * MEDi_c) \\ &\quad + \sum_i (\beta_{1i} Post_t * W_j * MEDi_c + \beta_{2i} Post2_t * W_j * MEDi_c) + \delta_{j,t} + u^c_{j,t} \qquad (18)\end{aligned}$$

where $i \in \{1, 2\}$.As in all other estimations, I present results for both wealth measures. Table 7 shows results from estimating equation 18 using $HYV71$ as an instrument for district wealth. Results are similar for both wealth measures. Consistent with previous results, the coefficient on $Post_t * W_j * MED1_c$ is negative and significant. But the coefficient on $Post_t * W_j * MED2_c$, while of the same sign, has a large standard error. Both segments, *MED1* and *MED2*, received the credit shock in 1998. According to my main hypothesis, both coefficients should be negative. The weaker effect of the first policy change on *MED2* factory growth suggests that the credit shock mainly operated by easing credit constraints on the entry of the smaller of the *MEDIUM* factories, or by easing credit constraints on the transition of existing SSI firms into the *MEDIUM* category [21].

The coefficient on both $Post2_t * W_j * MED1_c$ and $Post2_t * W_j * MED1_c$ is insignificant. The interaction of $Post2_t$ with $W_j * MEDi_c$ measures how the relationship between district wealth and growth of the MED_i type factories relative to *SMALL* factories changed in the 2000-02 period relative to the 1994-98 period. The results indicate that for both segments, relative growth in the 2000-02 period was similar to relative growth in the 1994-98 period. The results are consistent with the hypothesis discussed previously that the main effect of the credit shock in 1998 was through the entry of new factories (or the transition of *SMALL* factories into *MEDIUM*) that had been constrained by credit, and not through a slowdown in the rate of exit of incumbent *MEDIUM* factories. If the latter was the case, then the coefficient on $Post2_t * W_j * MED2_c$ should have been positive, because the withdrawal of credit after 2000 would have raised the rate of exit of *MED2* factories more in the low wealth districts.

6 Conclusion

Poor financial intermediation implies that local wealth will matter to local investment. This imperfect mobility of capital constrains the growth of an economy by preventing investment from flowing into regions with the highest returns. In addition, it acts to increase regional inequality . In India,

[21] It is possible that the insignificance of the $Post_t * W_j * MED2_c$ coefficient is because of small sample size. Most districts have few *MEDIUM* factories, and when we break up *MEDIUM* into *MED1* and *MED2*, the effective sample per district is quite small

given the facts that small firms seems to borrow substantially from the informal sector, this geographic fragmentation of credit markets serving industry is a real possibility. In this paper, I used a natural experiment to examine if credit constraints on manufacturers in India are greater in regions with less wealth. The results from the natural experiment provide clear evidence in favor of this credit market imperfection. When there was in increase in the availability of cheap formal sector credit, investment in small scale factories responded more positively in lower wealth districts.

This paper contributes to the literature that examines whether growth in developing countries is constrained by capital market imperfections by giving direct evidence that poor regions grow more when the there is an increase in the supply of capital. The results of this study can help explain why regional inequalities in industrialization persist in India. Because small scale industry is a much larger employer than than large industry, my finding that growth in small manufacturing establishments is constrained by regional wealth has important implications for the removal of regional inequalities in income. It shows that this inequality can be lowered by improving the flow of credit to small manufacturers.

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Table 1: District Workforce Characteristics in 1987 and 1999

Variable	**Mean**	**(Std. Dev.)**	**N**
Workforce size in 1987(mln)	1.411	(1.205)	271
Workforce size in 1999(mln)	1.509	(0.896)	271
Rural wrkforce size 1987(mln)	1.115	(1.007)	271
Rural wrkforce size 1999(mln)	1.139	(0.659)	271
Rural pop. share 1987	77.553	(9.154)	271
Literacy (%) in 1987	39.703	(10.079)	271
Literacy (%) in 1999	53.648	(14.007)	271

1. District workforce size-weighted estimates for 271 rural districts from 13 Indian states.

2. Source of employment and population figures : NSS surveys of Employment; Literacy figures : World Bank India Agricultural and Climate Dataset

Table 2: District Employment in India by main sectors : 1987 and 1999

Sector	1987 (in %)	1999 (in %)
Agriculture :		
(a)Cultivators	39.82	36.23
	(14.81)	(15.16)
(b) Farm Wage Workers	25.20	25.62
	(14.83)	(7.72)
Manufacturing :		
(a)Large scale factories	1.16	0.65
	(2.05)	(1.08)
(b)Small scale		
(b1) (Non-household) Small scale factories	4.24	5.07
	(4.84)	(5.16)
(b2) Household Industry	5.34	5.27
	(2.94)	(3.63)
Services	17.65	20.82
	(7.72)	(9.39)

1. District workforce size weighted estimates for 271 rural districts (1981 definition) from 13 Indian states.

2. Figures are estimates of employment in sector as a percentage of district workforce in ages 15-60. Source : NSS and ASI.

3. Standard Deviation across districts in Parenthesis.

4. The *small scale* sector includes *small scale* factories as well as household manufacturing units. *small scale* factories are manufacturing units that employ workers for a wage and that have a value of their plant and machinery was below Rs. 3.5 million (in 1987 prices).

5. The *household* sector includes all employment in manufacturing that is in household manufacturing units , with no wage labor.

Table 3: Summary Statistics for Main Variable

Variable	Mean	(Std. Dev.)	N
Number of factories			
SMALL in 1994	335.09	(828.4)	271
SMALL in 1999	326.38	(798.182)	271
MEDIUM in 1994	25.993	(72.202)	271
MEDIUM in 1999	35.436	(91.894)	271
LARGE in 1994	17.975	(42.432)	271
LARGE in 1999	32.203	(86.089)	271
Wealth Measures			
Per capita assets (in Rs 1000)	121.130	(62.78)	271
Yield in 1994	143.433	(83.181)	271
Instrumental Variable			
HYV71	.102	(.108)	271

1. Averages for 271 districts.

2. *SMALL* is a factory with a value of plant and machinery below Rs. 6.5 mln, *MEDIUM* is between 6.5 and 30 mln, while *LARGE* is above Rs 30 mln. The sources for the number of factories are ASI 1994 and ASI 1999.

3. Per capita household assets measured from AIDIS , 1992.

4. Yield is a value of output per hectare (in Rs.) of four crops - wheat, maize, rice and sorghum, average over 1991-94.. Source : World Bank Climate and Agricultural Dataset.

5. *HYV71* is fraction area cultivated that was planted to HYV seeds, averages over 1968-71. Source :World Bank Climate and Agricultural Dataset.

Table 4: Relation between district wealth and growth in number of factories (in logs) in small and medium industry: The response to the SSI Sector Expansion in 1998

Industry Groups	All	All	All	All
Dependent variable	Δ (log no. factories)	Δ (log no. factories)	Δ (log no. factories)	Δ (log no. factories)
	(1)	(2)	(3)	(4)
Wealth Measure	Household assets	Household assets	Yield	Yield
	FE	FE-IV	FE	FE-IV
MED	-.187	-.688	.125	.097
	(.423)	(1.418)	(.045)**	(.058)
Wealth**MED*	.065	.172	-.039	.115
	(.09)	(.302)	(.077)	(.2)
Post**MED*	.678	5.174	-.365	-.222
	(.599)	(2.005)**	(.064)**	(.082)**
Wlth*Post**MED*	-.222	-1.181	.005	-.791
	(.127)	(.428)**	(.109)	(.283)**
District-Year FE	Y	Y	Y	Y
Obs.	1084	1084	1084	1084
R^2	.536		.536	
F statistic	11.18		11.18	

1.OLS and IV Results for district-wise growth in the (log) number of factories in 271 districts during two periods- 1994 to 1998 and 1998 to 2000, and for two industry segments in each district- *SMALL* and *MEDIUM*.

2. The omitted industry segment dummy is *SMALL* , so that the *MED* dummy measures differential growth between medium and small segments.

3. Period 1998-2000 is *Post*.

4. Standard errors in parenthesis; **indicates significant at 1%.

5. All regressions include district-year fixed effects.

6. District Wealth is measured by the log of average household assets (in Rs. 000) in 1992 (*assets*) in columns (1) and (2), and by log of agricultural yield (in Rs.), averaged over 1991-94 (*yield*) in columns (3) and (4).

7. In Columns (2) and (4) , the district wealth measure is instrumented by fraction of district gross cultivated area planted to HYV seeds, averaged over 1968-1971 (the variable *HYV71*).

Table 5: Relation between district wealth and growth in number of factories (in logs) in small and medium industry in response to the SSI Sector Expansion in 1998 : Results for unreserved industry

Industry Groups	Non-reserved	Non-reserved	Non-reserved	Non-reserved
Dependent variable	Δ (log no. factories)	Δ (log no. factories)	Δ (log no. factories)	Δ (log no. factories)
	(1)	(2)	(3)	(4)
Wealth Measure	Household assets	Household assets	Yield	Yield
	FE	FE-IV	FE	FE-IV
MED	-.54	-.794	.311	.267
	(.503)	(1.628)	(.053)**	(.07)**
Wlth**MED*	.179	.233	-.078	.161
	(.107)	(.347)	(.085)	(.243)
Post**MED*	.858	4.747	-.53	-.37
	(.711)	(2.302)*	(.075)**	(.099)**
Wlth*Post**MED*	-.291	-1.122	.106	-.775
	(.151)	(.491)*	(.12)	(.344)*
District-Year FE	Y	Y	Y	Y
Obs.	1084	1084	1084	1084
R^2	.535		.532	
F statistic	14.055		13.244	

1.OLS and IV Results for district-wise growth in the (log) number of factories in *non-reserved* industry groups in 271 districts during two periods- 1994 to 1998 and 1998 to 1999 (*post*) - and for two industry segments in each district- $SMALL$ and $MEDIUM$.The omitted industry segment dummy is $SMALL$.

2. Standard errors in parenthesis; **indicates significant at 1%.

3. All regressions include district-year fixed effects.

4. District Wealth is measured by the log of average household assets (in Rs. 000) in 1992 (*assets*) in columns (1) and (2), and by log of agricultural yield averaged over 1991-1994 (*yield*) in columns (3) and (4).

5. In Columns (2) and (4) , the district wealth measure is instrumented by fraction of district gross cultivated area planted to HYV seeds, averaged over 1968-1971.

6. The *non-reserved* industry groups are all but 11 of the 3-digit industry groups (from 130 groups). The excluded industry groups are those in which 80% of the products reserved for small scale industry are concentrated .

Table 6: Relation between district wealth and growth in number of factories in small and medium industry: Comparing 1998-2000 and 2000-2002 to the pre-policy change period

Dependent variable	Δ (log no. factories)	Δ (log no. factories)
	(1)	(2)
Wealth Measure	Household assets	Yield
	FE-IV	FE-IV
Wealth**MEDIUM*	.171	.118
	(.306)	(.214)
Post**MEDIUM*	4.755	-.217
	(2.029)*	(.086)*
Wlth*Post**MED*	-1.09	-.751
	(.433)*	(.302)*
Post2**MEDIUM*	-.6	-.126
	(2.029)	(.086)
Wlth*Post2**MED*	.104	.072
	(.433)	(.302)
District-Yr FE	Y	Y
Obs.	1626	1626

1.OLS and IV Results for district-wise growth in the (log) number of factories in 271 districts during three periods- 1994 to 1998, 1998 to 2000, and 2000 to 2002 -, and for two industry segments in each district- *SMALL* and *MEDIUM.*

2. The omitted industry segment dummy is *SMALL* , so that the *MED* dummy measures differential growth between medium and small segments.

2b. The coefficient on *MEDIUM* is not reported.

3. Period 1998-2000 is *Post.* Period 2000-2002 is *Post2*

4. Standard errors in parenthesis; **indicates significant at 1%.

5. All regressions include district-year fixed effects.

4. District Wealth is measured by the log of average household assets (in Rs. 000) in 1992 (*assets*) in column (1) , and by log of agricultural yield in 1991-1994 (*yield*) in column (2). It is instrumented by *HYV71.*

Table 7: SSI Policy Change in 1998 and partial reversal in 2000: Comparing 1998-2000 and 2000-2002 to the pre-policy change period

Dependent variable	Δ (log no. factories)	Δ (log no. factories)
	(1)	(2)
Wealth Measure	Household assets	Yield
	FE-IV	FE-IV
Wealth**MED1*	.347	.239
	(.322)	(.228)
Wealth**MED2*	.097	.067
	(.322)	(.228)
Wealth*Post**MED1*	-1.914	-1.319
	(.456)**	(.323)**
Wealth*Post**MED2*	-.8	-.551
	(.456)	(.323)
Wealth*Post2**MED1*	.367	.253
	(.456)	(.323)
Wealth*Post2**MED2*	-.016	-.011
	(.456)	(.323)
District-Year FE	Y	Y
Obs.	2439	2439

1.OLS and IV Results for district-wise growth in the (log) number of factories in 271 districts during three periods- 1994 to 1998, 1998 to 2000, and 2000 to 2002 - and for three industry segments in each district- *SMALL*, *MED1* and *MED2*. *SMALL* - below Rs 6.5 mln, *MED1* - Rs 6.5 - 10 mln, and *MED2* - Rs 10 - 30 mln. *SMALL* dummy is omitted. Coefficients on *MED1* , *MED2*, and interactions of $Post1$ and $Post2$ with the above two are not reported.

2. Period 1998-2000 is *Post*. Period 2000-2002 is *Post2*

3. Standard errors in parenthesis; **indicates significant at 1%.

4. District Wealth is measured by the log of average household assets (in Rs. 000) in 1992 (*assets*) in column (1) , and by log of agricultural yield in 1991-1994 (*yield*) in column (2). It is instrumented by *HYV71*.

Table 8: Relation between district wealth in 1994 and HYV adoption area in 1971 : OLS Results

Wealth measure	*assets* (1)	*yield* (2)
HYV71	1.409	2.045
	(.253)**	(.315)**
Const.	4.539	4.577
	(.038)**	(.047)**
Obs.	271	271
R^2	.103	.135
F statistic	31	42.141

1.OLS results

2. Standard errors in parenthesis; **indicates significant at 1%.

3. Dependent variable in column (1), *assets*, is the log of average household assets (in Rs. 000) in 1992. Dependent variable in column (2), *yield* is the log of district agricultural yield in Rs 100 per hectare, averaged over 1991-94.

4.*HYV71* is the fraction of district gross cultivated area planted to HYV seeds, averaged over 1968-1971.

Table 9: First-stage Regressions for FE-IV specification with *assets* and *yield* as measures for district wealth

Dependent variable	$assets*$ MED (1)	$assets * Post*$ MED (2)	$Yield*$ MED (3)	$Yield * Post*$ MED (4)
MED	4.539	2.59e-15	4.577	1.73e-15
	(.038)**	(.027)	(.047)**	(.033)
$Post * MED$	8.28e-15	4.539	1.50e-15	4.577
	(.053)	(.038)**	(.067)	(.047)**
$HYV71 * MED$	**1.409**	-1.66e-14	**2.045**	-9.47e-15
	(**.253**)**	(.179)	(**.315**)**	(.223)
$HYV71 * Post * MED$	-8.03e-14	**1.409**	-1.41e-14	**2.045**
	(.358)	(**.253**)**	(.446)	(**.315**)**
Obs.	1084	1084	1084	1084
R^2	.991	.991	.987	.987
F statistic	14640.85	14640.85	9879.575	9879.575

1. FE Results for district wealth measures - *assets* and *yield* - interacted with *MED* and *post*MED*. Explanatory variables are district fraction of cultivated area on which HYV seeds were being sown in 1971 (*HYV71*) interacted with *MED* and *post*MED*.

2. The omitted industry segment dummy is *SMALL* , so that the *MED* dummy measures differential growth between medium and small segments.

3. Period 1998-2000 is *Post*.

4. Standard errors in parenthesis; **indicates significant at 1%.

5. All regressions include district-year fixed effects.

6. Depvar in columns (1) and (2) is *assets*, interacted with *MED* and *post*MED*, respectively. *assets* is the log of average household assets (in Rs. 000) in 1992. Depvar in columns (3) and (4)is *yield*, interacted with *MED* and *post*MED*, respectively. *yield* is log of agricultural yield in 1994 .