Society for Economics Research in India
Working Paper Series

CASTE, COURTS AND BUSINESS

Tanika Chakraborty
(Indian Institute of Management, Calcutta)
Anirban Mukherjee
(University of Calcutta)
Sarani Saha
(Indian Institute of Technology, Kanpur)
Divya Shukla
(Indian Institute of Technology, Kanpur)

Working Paper No. 16
http://seri-india.org/research

July 2021

Caste, Courts and Business*

Tanika Chakraborty†
Anirban Mukherjee‡
Sarani Saha§
Divya Shukla¶

Abstract

We study the role of formal institutions of contract enforcement in facilitating investments in small and medium firms(MSME). In a framework where established entrepreneurs can enforce contracts informally using their network ties and hierarchical advantage, we argue that an efficient formal judiciary helps entrepreneurs without any ties to informal business networks, disproportionately more. We test our theoretical prediction using a novel administrative panel-data from Indian courts and the nationally representative MSME survey data. Empirically, we treat entrepreneurs from disadvantaged castes (SC-ST) as those without traditional business-network ties. We find that improvement in court quality has a disproportionately larger impact on the investment decisions of SC-ST entrepreneurs. On average, if the time taken for a court to clear all existing cases reduces by 1 year, the initial gap in the probability of investing, between SC-ST and other entrepreneurs, gets reduced by 0.6-0.7 percentage points.

Keywords: Judiciary, Duration Index, MSME, Entrepreneurship

JELcodes: K12, L26, O17

*We thank the seminar participants at the SAMVAAD,2020, for their helpful comments and suggestions. We are grateful to IDRC, Canada for supporting our research. We could not have completed this research without the data shared by multiple High Courts of India.

†Indian Institute of Management, Calcutta. Email:tanika@iimcal.ac.in

‡University of Calcutta. Email:ameco@caluniv.in

§Indian Institute of Technology Kanpur. Email:sarani@iitk.ac.in

¶Indian Institute of Technology Kanpur. Email:dshukla@iitk.ac.in

1 Introduction

Contract enforcement plays a critical role in the proliferation of business and subsequent economic growth. In a developing country such as India, however, bulk of the contracts are enforced through community based informal institutions as formal judiciary remains prohibitively time consuming and costly.[1] The of possibility of substitution between formal and informal institutions of contract enforcement has already been discussed in the literature. Dhillon and Rigolini (2011), for example, examine the interaction between formal and informal institutions in contract enforcement and provide an explanation why developing countries often fail to develop an efficient legal enforcement system. In general, understanding the role of informal institutions in the presence of labor and capital market inefficiencies form the core of an important segment of the literature (Ghatak, 1991; Besley et al., 1993; Munshi, 2003; Banerjee and Munshi, 2004; Munshi, 2011; Chandrasekhar et al., 2018). However, despite high costs of approaching the formal courts in India, a sizeable number of papers show that improvements in the judicial system lead to enhanced business outcomes in India (Amirapu, 2017; Chemin, 2009, 2012). We extend this line of research to ask who benefits from improvements in court.

In our theoretical framework, following Greif (1993), we argue that entrepreneurs belonging to traditional business networks, or placed higher up in the social hierarchy, can, anyway, resolve business disputes costlessly using their networks, or social position, and, therefore, do not need to access the formal institutions to enforce contracts. Hence, these entrepreneurs do not benefit much from any marginal improvement in the formal judiciary. However, first generation entrepreneurs who either do not have access to the resources provided by a well established informal network, or have a disadvantage in the social hierarchy, have to rely on the formal institutions for contract enforcement. Our theoretical model predicts that improvements in formal institutions disproportionately help those entrepreneurs who do not have to access to traditional business networks or are positioned lower down in the social hierarchy.

While our theory is general enough to fit in any business environment characterized by informal business networks and costly judicial processes, our empirical strategy, being based on data from India, takes caste as the unit of informal network and as a proxy for social hierarchy. Even though we acknowledge that *jati* or sub-caste is more operational unit of business network, data restrictions

[1] In January 2013 there were around 30 million cases pending in different courts in India. At present on an average it takes around 15 years for a civil case to get resolved. If the situation does not improve there will be an estimated 150 million pending cases by 2040 (Times of India, January 17, 2013).

do not allow us to examine the problem at the sub-caste level.[2] Specifically, we consider the socially marginalized scheduled castes and tribes (SC-ST) as the business-minority groups. While SC-ST groups constitute around 25% of Indian population as per Indian Census 2011, in terms of business ownership they are indeed minority – a fact that is corroborated by our data as well (refer to Figure 10).

In this specific context, our theoretical model predicts that the entrepreneurs from scheduled castes and tribes are expected to benefit more from any improvement in the judicial system in India than their upper caste counterparts. Our theoretical prediction is based on the argument that formal courts come as a remedy to two types of handicaps faced by the SC-ST entrepreneurs – first, they hold a position of disadvantage in the caste hierarchy and therefore, are dominated by castes placed at higher positions (*social hierarchy*) and second, they have smaller business networks as they are the new entrants in the business ecology (*network*).[3] For formal judiciary to be beneficial for SC-ST entrepreneurs, however, we implicitly assume that unlike informal institutions of contract enforcement, formal judiciary is free of social prejudice related to caste hierarchy. Although evidence on systematic caste bias in the Indian judiciary is non-existent, Ash et al. (2021) document the absence of gender or religious bias in court proceedings in India.

We test our theoretical predictions using information on entry and investment decisions of entrepreneurs in the Micro Medium and Small Enterprises (MSME) Census data from 2006-2007. We empirically investigate how these decisions are affected by improvements in court quality. However, measuring court quality is complicated by the non-availability of disaggregated court data. Hence, part of our contribution is to build a novel data set on court quality at the district level. We collect data on pendency, disposal and filing from each district court, across 14 states in India, and combine the information to create the *Duration Index* as a proxy for court quality. *Duration Index* roughly indicates the amount of time needed for a court to solve all pending cases (see Section 3.1 for details). Combining the district level judicial data with the firm level MSME data we construct a district level panel over 2000-2006 and use a district fixed effects model to estimate the effect of court quality on the decision of an entrepreneur

[2]The caste system in India refers to a hierarchical organization of the Hindu society where one's occupation is determined at birth by his/her caste identity. According to the caste system, the Hindu society is broadly classified in four Varnas – Brahmin (the priests), Khatriya (the warriors), Baishyas (the businessmen) and Sudras (the servants). These groups were further sub-classified as sub castes or jatis. Below these castes, there exists groups of people commonly referred to as Dalits and Tribals. They are outside the caste identity and has been historically subjected to social humiliation and economic deprivation.n recognition of their poor socio-economic condition Indian constitution recognizes them as Scheduled castes and tribes (SC-ST).

[3]In a qualitative study, based in Haryana and Uttar Pradesh, Jodhka (2010) found that most of the SC owned firms are relatively new, the oldest being thirty year old.

to (a) register his/her business early and (b) undertake sunk cost of setting up a manufacturing unit. (a) implies commitment of the firm to operate in the long term and (b) implies early commitment to costly long term investments. We find that improvement in court quality does not matter for decisions to undertake costly long term investments in general. However, in line with our theoretical predictions, entrepreneurs from disadvantaged castes benefit significantly more from a better quality court, compared to entrepreneurs hailing from castes who either have a strong informal business network (OBC) or are much higher up in the social hierarchy (General). Specifically, we find that SC-ST entrepreneurs are much less likely to make long term investments than entrepreneurs from other castes (General and OBC). However, if the time taken for a court to clear all existing cases reduces by 1 year, the gap in the probability of investing, between SC-ST and other entrepreneurs, gets reduced by 0.6-0.7 percentage points. We further investigate the relative importance of the business network vis-a-vis social network argument in driving this result. Our findings indicate that formal courts benefit first generation entrepreneurs by compensating for the lack of informal business networks. We do not find any evidence to suggest that formal courts compensate for the disadvantage in social hierarchy.

That SC-ST entrepreneurs own small self-operated firms run by household labor, are mostly driven by subsistence needs of the entrepreneurs without any prospect of growth and form a minority in the Indian business ecology, are well documented (Deshpande et al., 2013; Thorat and Sadana, 2009; Iyer et al., 2013). Most importantly, entrepreneurs from marginalized castes often receive hostility, ranging from passive non-cooperation to active resistance, from their upper caste counterparts for crossing their traditional occupational boundary lines (Jodhka, 2010). The findings in our paper are significant in that context. We provide theoretical argument and empirical evidence showing that improvements in formal courts disproportionately help those entrepreneurs who do not have to access to traditional business networks. From this perspective, an efficient court system can be perceived as an instrument of social mobility. This way our paper contributes to the literature that examines how institutions such as market or state can enhance social mobility in the caste ridden Indian society. While the existing literature examines the roles played by market reforms (Hnatkovska et al., 2012, 2013) or state induced affirmative action policies (Chin and Prakash, 2011) in labor market outcomes, we examine how less congested judicial system contributes towards the entrepreneurial success of the marginalized castes. In addition, we also test the possible mechanisms through which better courts help these disadvantaged groups and provide evidence on the role of the formal court as a substitute for informal business networks.

The rest of the paper is organized as follows. Section 2 discusses the theoretical framework. Section 3 summarizes the data used to test the implications of our model. Section 4 outlines the empirical framework, followed by section 5 which

reports the findings. Finally section 6 concludes.

2 Theoretical framework

Our theoretical framework outlines the mechanism through which an entrepreneur's decision to invest, by entering in to a contract with an input supplier, depends on the quality of the institutions for contract enforcement. Good quality institutions improve long term business prospects and hence the entrepreneur is more likely to undertake an investment. Our theoretical framework rests on Greif (1993) and Shapiro and Stiglitz (1984). We follow Greif (1993) to construct our baseline model that derives the conditions under which contracts are enforced through informal institutions. However, in our framework, an entrepreneur can can choose between the formal and informal institutions of contract enforcement. Using either of these institutions, the entrepreneur tries to solve a one sided moral hazard problem he faces, in his dealing with his input supplier. We use a variant of the efficiency wage theory proposed by Shapiro and Stiglitz (1984) to derive the solution to this moral hazard problem. Finally we introduce supplier and entrepreneur heterogeneity in Greif's framework and examine how it changes the predictions of the baseline model.

2.1 Model setup

2.1.1 Baseline model

The predictions based on our baseline model are similar to Greif (1993). The problem is that of a typical one sided moral hazard game played between an entrepreneur (the principal) and his input supplier (the agent). The agent supplies input to the entrepreneur who uses this to produce the final product. However, the agent can supply bad quality input which makes the entrepreneur incur loss. Under informal institutions, once cheating is detected the only punishment that the entrepreneur can hand out is to fire the supplier.

We make the following assumptions in structuring this game. First, in any period an entrepreneur is matched with a supplier from the pool of unemployed suppliers who will supply input to him in that period. Second, the supplier cannot supply input to more than one producer in one period. Third, at the end of each period, the entrepreneur evaluates his contract with the supplier. If the supplier is found cheating, he is fired and never rehired again by the entrepreneur. In other words, once cheating is detected, the only punishment that the entrepreneur can hand out is to fire the supplier. Fourth, we assume that a supplier's cheating history becomes public knowledge and affects his/her possibility to get a job in future. In some cases, the reputation mechanism can assume an extreme form where a supplier with a cheating history never gets rehired again. Fifth, even if a supplier has been honest, the contract may get terminated with a positive probability. Such accidental termination can happen for number of reasons not related to input quality such as relocation or some accident in input supplier's firm etc. If the entrepreneur has to let go of his supplier for a reason other than

cheating, he is once again matched with a supplier from the pool of the unemployed suppliers before the next period starts.This matching and the subsequent game is played for infinite times. Finally we assume that the total number of input suppliers (S) is greater than the number of Entrepreneurs (N).

Let us now look at the pay-off structure. An entrepreneur who does not hire a supplier receives a payoff of $\kappa > 0$. An entrepreneur who hires a supplier pays the supplier an input price of P. If the supplier supplies good quality input, the entrepreneur makes the profit of $\pi - P$, the gross gain from cooperation being π. If the supplier cheats, the supplier gets α and the entrepreneur gets 0. The reservation payoff of the supplier is $\bar{w} \geq 0$. It is assumed that $\pi > \kappa + \bar{w}$ - cooperation if efficient; $\pi > \alpha > \bar{w}$ - social payoff of cooperation is greater than social payoff of cheating and for an input supplier cheating is better than receiving reservation pay-off; and $\kappa > \pi - \alpha$ - an entrepreneur prefers getting his reservation pay-off rather than entering in to a contract with a cheater-supplier and paying the cheating pay-off (α) as the input price.

2.1.2 Honesty inducing input price

In our framework, the entrepreneur solves the one-sided moral hazard problem by paying an honesty inducing input price. In what follows we first derive derive the input price. We then analyze how the honesty inducing price depends on the quality of contract enforcement institutions thereby affecting the decision of the entrepreneur to make long term investments. We use the lifetime utility framework of Shapiro and Stiglitz (1984) to determine the honesty inducing input price.

First, let us consider the lifetime utility of an honest input supplier denoted by v_h

$$v_h = P + \tau v_h^u + \delta(1-\tau)v_h \tag{1}$$

where P is the input price, δ is the discount factor, and v_h^u is the lifetime utility of an unemployed honest input supplier. The first term on the right hand side of equation (1) is the input price that the supplier is going to get in the current period. In the next period, even if the supplier has been honest the contract may get terminated for accidental reasons. The probability of accidental termination is τ. In that case, the supplier gets the lifetime utility of an honest unemployed supplier – denoted by v_h^u with probability τ. Hence, with probability $(1-\tau)$ the supplier will get the lifetime utility of an honest supplier, v_h.

Let us now define the lifetime utilities of an unemployed honest supplier, v_h^u, and a cheater supplier, v_c^u. These are, respectively, given by

$$v_h^u = \delta q_h v_h + \delta(1-q_h)(\bar{w} + v_h^u) \tag{2}$$

$$v_c^u = \delta q_c v_h + \delta(1 - q_c)(\bar{w} + v_c^u) \tag{3}$$

The expression in equation (2) shows the lifetime utility of an honest input supplier who lost her job (recall that this can only happen due to accidental reasons). q_h denotes the probability of hiring a supplier who has been honest in the past. If an honest supplier loses her/his job, in the next period, s/he may get rehired with probability q_h and get the utility of an honest supplier. However, with probability $(1 - q_h)$, s/he remains unemployed and earns her/his reservation price, $\bar{w}$, and then in the next period once again looks for a job and gets the lifetime utility of an honest, unemployed supplier – v_h^u.

Equation (3), on the other hand, shows the lifetime utility of an unemployed cheater supplier who was fired after being found cheating. In the next period, he may get hired with probability q_c, where q_c denotes the probability of hiring a supplier with cheating history. Once hired, He may choose to remain honest and earn v_h for the rest of his life. However, with probability $(1 - q_c)$ he may remain unemployed and earn $\bar{w}$ and again in the next period look for a job and get the lifetime utility of an unemployed supplier with cheating history –v_c^u.

Finally, equation 4 shows the condition under which the cheating payoff is less than honesty inducing pay-off for the supplier.

$$v_h \geq \alpha + \delta v_c^u \tag{4}$$

Since the entrepreneur will pay the minimum price required to induce honesty, equation 4 holds with equality. We now have 4 equations (equations 1, 2, 3 and 4) and 4 variables (P, v_h, v_h^u and v_c^u).

Solving these yields the price that the entrepreneur must pay the supplier to induce honesty. We find that input suppliers will remain honest as long as,

$$P \geq (T - \delta\tau Q_h)\Big[\frac{\alpha}{1 - \delta Q_c} + \frac{\delta\bar{w}R_c}{1 - \delta Q_c}\Big] - \delta\tau\bar{w}R_h = P^I \tag{5}$$

where

$$T = 1 - \delta(1 - \tau)$$

$$Q_i = \frac{q_i}{[1 - \delta(1 - q_i)]} \qquad i = h, c$$

$$R_i = \frac{(1 - q_i)}{[1 - \delta(1 - q_i)]} \qquad i = h, c$$

From equation 5 we get our first proposition, the proof for which is provided in Appendix A.2.

Proposition 1 *The honesty inducing price for the input supplier, under informal contract enforcement, is rising in the probability of hiring a cheater supplier.*

2.1.3 Equilibrium

Greif (1993) used this framework to analyze the agency relation of a historical merchant group, known as Maghribi. In an attempt to model their community based institutions governing the agency relations, Grief introduced a strategy called multilateral punishment strategy (MPS) and showed that this constitutes an Sub-game perfect equilibrium (SGPE) in the setting described above. In MPS, an entrepreneur offers P_x^I to the input supplier and rehires the same supplier if he has been honest; fires the supplier if he has cheated; never hires a supplier who has ever cheated any merchant; and in case of forced termination hires a supplier who had never cheated in the past. This is a special case where q_c is set equal to 0 – no entrepreneur in the community hires a supplier who has cheated in the past. This means a cheater supplier is being punished by the entire community and therefore, the name multilateral punishment strategy.

But does an entrepreneur have any incentive to sanction a supplier who has cheated another entrepreneur? This is an important issue which ensures that this equilibrium is a SGPE. In absence of any search costs of finding a new supplier, entrepreneurs cannot do worse by not hiring an agent with cheating history. In other words, they weakly prefer not to hire a supplier with cheating history. What about the strict condition? In our baseline model, entrepreneurs, in fact, strictly prefer not to hire an ex-cheater. If an entrepreneur goes against the community norm and does hire a supplier with cheating history, the community sanctions the defecting entrepreneur so that if any input supplier cheats the defecting entrepreneur the community does not punish the supplier. This means, if an entrepreneur goes against the norm and hires a supplier with cheating history, he has to pay a higher input price to ensure honesty. Therefore, no one has any incentive to break the community norm.

2.2 Decision making under heterogeneity

2.2.1 Community heterogeneity among entrepreneurs

In Greif's paper everyone, merchants and agents alike, came from a single community – Maghribis. This is the framwork we followed in our baseline model. Here we depart from the homogenous framework and introduce multiple communities and allow for cross community linkages. Specifically, we say that entrepreneurs come from $j \quad (j = 1, 2, ...k)$ different communities. As the empirical exercise is done in the context of India, where caste is the most important community marker, we, hereafter, call these communities, castes. The suppliers do not belong to any of

these k castes. We can rationalize this by assuming that all suppliers come from a castes which are different from the k entrepreneurial castes.

The heterogeneity assumption changes the probability of hiring a cheater agent in the baseline model. We maintain the assumption that if a supplier cheats an entrepreneur from caste j, no one from the caste j hires him again. But now that there are non-j entrepreneurs, it is reasonable to consider the possibility that a cheater supplier can be hired by at least some of the non-j entrepreneurs. In this respect, we explicitly introduce two parameters that affect the probability of hiring a cheater and thereby, influence the honesty inducing input price. First, we assume that castes are of different sizes. Specifically, the size of the entrepreneurial caste j is n_j with $\sum_{j=1}^{k} n_j = N$. Second, we introduce social hierarchy across castes within the entrepreneurial community. are also different in terms of social hierarchy which we characterize below.

These changes to the original model leads to conditions for hiring a cheater supplier which are different from that in the baseline model. Suppose an input supplier cheats an entrepreneur from caste j. In response, similar to the baseline model, none of the j-caste entrepreneur will hire him/her. But what about non-j entrepreneurs? Do they have any incentive to sanction a supplier who had previously cheated a a caste-j entrepreneur (for brevity, we call him j-cheater)? There are $(N - n_j)$ non-j entrepreneurs. We assume that a fraction of them also refuse to hire a supplier who has cheated a caste-j entrepreneur. We argue that this fraction, denoted by α_j, depends on the social hierarchy of caste j. Higher the social ranking of caste j, higher will be the value of α_j i.e. the higher the fraction of non-j entrepreneurs who will sanction a j-cheater.

However, implementing this strategy requires some within caste coordination which will decide who can hire him and who cannot, within a caste. We simply assume that the coordination within a caste can seamlessly achieve this. Out of n_m entrepreneurs of caste m, $\alpha_l n_m$ entrepreneurs will not hire an l-cheater and $(1 - \alpha_l)n_m$ may hire him. Once this list is decided, if an m caste entrepreneur who falls in the non-hiring group hires an l-cheater, he will be an outcast. This means that if the supplier cheats the defecting entrepreneur, others entrepreneurs are free to hire the cheater which in turn will increase the honesty inducing price for the defector. Similar to the one in baseline model, this ensures that no one has incentive to break the societal norm.

Let us now calculate the probability of hiring a supplier who has cheated an entrepreneur from caste j. The number of entrepreneurs in group j is n_j and none of the entrepreneurs will employ a *j-cheater*. The rest of the entrepreneurs i.e. $(N - n_j)$ may employ them but not all of them. Recall that only α_j fraction of

these $(N - n_j)$ will believe in the allegation made by an entrepreneur from the group j. Therefore, a *j-cheater* can only get employment with $(1 - \alpha_j)(N - n_j)$ of them. But not all of them will have vacancies. Only τ fraction will experience forced termination with their suppliers. Hence, the number of positions open for an $j - cheater$ is $\tau(1-\alpha_j)(N-n_j)$. The number of competitors for these jobs are $(S - (1 - \tau)N)$ where S is the total number of suppliers while $(1 - \tau)N$ are the number of suppliers who did not experience forced termination and therefore, are still in jobs. Given these, the probability of hiring a j-cheater can be written as:

$$q_c^j = \frac{\tau(1 - \alpha_j)(N - n_j)}{S - (1 - \tau)N} \tag{6}$$

Proposition 1 shows that the honesty inducing price is rising in the probability of hiring a cheater supplier, q_c. From equation (6), we find that q_c^j falls with social hierarchy of the network – j, i.e. with (α_j), and with the size of the network (n_j). Combining these two we can deduce the following proposition:

Proposition 2: *Suppose there are k business networks where the j^{th} business network is characterized by its standing in the social hierarchy (α_j) and size of the network (n_j). Entrepreneurs from different networks would pay different honesty inducing prices to suppliers under the informal contract enforcement. The honesty inducing price paid by members of network j is falling in both α_j and n_j.*

2.2.2 Heterogeneity in Entrepreneurial Ability

Besides caste heterogeneity among entrepreneurs, we also add ability heterogeneity among entrepreneurs in this model. We model an entrepreneur's decision to pay an upfront entry cost in business which may be seen as investment for new business opportunity. There are several ways to rationalise this. Such cost can involve investing in a machine or acquiring a license to start an enhanced line of production. To make the model simple, we assume that such upfront payment will enhance their net profit (π - P_{jx}^I) by a factor A ($A > 1$) where, (P_{jx}^I) is the price of input x paid by an entrepreneur from caste j under the informal (I) system. But such investment is costly and the cost one bears is individual specific. The monetary cost of such an investment is c. But the real cost depends on the entrepreneur's ability. One may rationalize this by arguing that there are usually several transaction costs related to an investment such as paper work, making trips to several government offices etc. We define an ability marker μ_i for individual entrepreneur i such that the higher is the ability of an entrepreneur, the lower is the real costs of making the investment. For instance, an individual endowed with higher entrepreneurial skills would be able to acquire a license or land, to set up a factory, faster. The real cost of investment for an entrepreneur i is given by

$\frac{c}{\mu_i}$. We further assume that within each caste, the distribution of μ_i follows the same distribution function Φ.

For the upfront entry cost to be worthwhile for an entrepreneur i from caste j if the return from paying this cost is greater than that from not investing. This is captured in the the following condition:

$$A(\pi - P^I_{jx}) - \frac{c}{\mu_i} > (\pi - P^I_{jx}) \tag{7}$$

This can be rewritten as

$$\mu_i > \frac{c}{(A-1)(\pi - P^I_{jx})} \tag{8}$$

Hence, the entry cost investment is only worthwhile when the entrepreneur's ability crosses certain threshold $\bar{\mu_j} = \frac{c}{(A-1)(\pi - P^I_{jx})}$. Hence, the fraction of entrepreneurs from caste j who will undertake the upfront investment, β_j, is given by,

$$\beta_j = Pr\Big(\mu_i > \frac{c}{(A-1)(\pi - P^I_j)}\Big) = 1 - \Phi\Big(\frac{c}{(A-1)(\pi - P^I_j)}\Big) \tag{9}$$

Note that the ability threshold that determines β_j is caste specific. For castes which pay low input price either because they have higher network or higher social standing, the ability threshold is also low. Disadvantaged castes with low network and/or low social standing pay high input price and therefore, an entrepreneur from such castes faces a much higher ability threshold than their advantaged caste counterpart for making the investment. This translates in to a lower probability of investment from entrepreneurs of castes with low network and/or low social standing as is observed from Equation 9 – the probability that a caste j entrepreneur makes an investment is a falling function of the input price that the entrepreneurs from caste j need to pay. From *proposition 2* we know that the input price is falling in a caste's social standing and network size. This leads us to our next proposition:

Proposition 3: *Under the informal contract enforcement system, the probability that an entrepreneur makes an upfront investment rises with the social standing and network size of the entrepreneur's caste.*

2.3 Formal contract enforcement

In this section we introduce the formal contract enforcement mechanism. In our framework above, institutions of contract enforcement enter an entrepreneur's decision process through the input price he has to pay and under informal institutions, this price is caste specific. We allow for formal institutions to enter

the payoff function of the entrepreneur in a similar way. The only difference, in comparison to the informal system, is that the probability of punishing a cheater supplier and the input price that results from that are caste independent – they are same for all communities.

We assume that the probability of identifying and punishing a cheater supplier reflects the quality of formal institution of contract enforcement. Let us call that probability q_F. If the input supplier is honest he gets P^F. If he cheats he gets α_F. However, if he gets caught he is fined by an amount $T > \alpha_F$ and he is left with $-\lambda = (\alpha_F - T)$. However, with probability $(1 - q_F)$ he gets away with his cheating payoff α_F. Hence, under a formal contract a supplier will remain honest if the following condition is satisfied,

$$P^F \geq q_F(-\lambda) + (1 - q_F)\alpha_F \tag{10}$$

This means,

$$P^F \geq \alpha_F - (\alpha_F + \lambda)q_F = P^F \tag{11}$$

From equation (11) it is clear that the input price under formal contract enforcement is a falling function of institutional quality, q_F, which is measured by the degree of sanction a cheater faces. The higher the stringency of the sanction, the lower is the honesty inducing price, P^F, that an entrepreneur pays.

2.4 Quality of formal institutions and the decision to incur entry cost

Using this framework we now examine the implications of an improvement in the quality of formal institutions. Recall that the question that we ask in this paper is about an entrepreneur's choice to approach a formal vis-a-vis an informal institution of contract enforcement. In what follows, we derive the condition that determines a) entrepreneurs of which caste will approach the formal institution for enforcing contracts and b) which entrepreneurs will incur upfront entry cost to new business opportunities.

In our theoretical framework, institutions enter an entrepreneur's pay-off function through the input price. Now, consider the decision problem faced by an entrepreneur from caste j. If he decides to use the informal institutions the input price he pays is P_j^I which is a falling function of the network size and social standing of caste j. If he decides to write a formal contract, he pays P^F which is the same for all castes. Hence, he chooses formal over the informal institutions only if $P^F < P_j^I$.

In order to understand the issue more clearly let us rank the input prices paid by different castes. Without loss of generality, we call the caste that pays the lowest input price *caste-1*, the second least input price paying caste the *caste-2* and so on. Hence, the ranking of input prices paid by different castes will look like this: $P_1^I < P_2^I < ..... < P_k^I$. If $P^F < P_1^I$, all castes opt for formal mechanism of contract enforcement i.e. the formal judicial system. On the other hand, if $P^F > P_k^I$, none of the entrepreneurs will choose the formal contract enforcement mechanism. Let us know see what happens when $P_1^I < P^F < P_k^I$. Suppose, $\exists P_d^I$ such that $P_d^I < P^F < P_{d+1}^I$. Hence, castes from $(1, 2, ...d)$ will not opt for formal court system as the bigger network sizes and social standings of these castes allow them to pay lower input prices through the informal system. We loosely call them *High castes*. On the other hand, castes denoted by $(d+1, d+2, ..., k)$ will opt for formal enforcement.

Let us now consider a marginal improvement in the formal institutions that results in a a new input price $P_{new}^F < P^F$. Let us also assume that it is still the case that $P_d^I < P_{new}^F < P_{d+1}^I$.[4] Now, the entrepreneurs from any caste j for which $P_j^I < P_d^I$, still don't use the formal institutions and their pay-off function remains the same. For any caste i, for which $P_d^I < P_i^I$, formal institutions is more preferred to the informal ones.

In equation (9) we derived β_j – the probability that an entrepreneur from caste j makes an upfront investment under informal contract enforcement. Similarly we can get β_F – the probability that an entrepreneur makes an upfront investment under the formal contract enforcement. Unlike β_j , note that β_F will be same for members of all castes and is given by,

$$\beta_F = 1 - \Phi\Big(\frac{c}{(A-1)(\pi - P^F)}\Big) \tag{12}$$

When there is an improvement in q_F, the quality of formal institutions, P^F falls and $beta_F$ rises. This implies that any improvement in formal judicial system provides incentives to invest, but only to those castes which for their lack of network sizes and social standing were using the formal system. The entrepreneurs from the castes with high network size and social standing remain unperturbed by any improvement in the formal court system. We summarize the result in the following proposition.

Proposition 4 *Improvement in the formal judicial system leads to lower input price and higher profit only for entrepreneurs hailing from castes that are*

[4]This assumption is made to illustrate the point in the simplest possible way. However, this can be extended to a more general setting.

characterized by a smaller network size and/or low social standing. This in turn encourages these entrepreneurs to incur entry cost for new business opportunities.

Our empirical exercise tests *Proposition 4* using district level panel data from the Indian judicial system and a census of the Micro Medium and Small scale firms. Specifically, we ask whether access to better quality formal judiciary benefits entrepreneurs from castes that are historically disadvantaged in term of their social standing or have a smaller network size.

3 Data and Descriptive Statistics

3.1 Measuring Court Performance

Testing the implications of our theoretical inferences requires us to measure the efficiency of formal contract enforcement. Indian courts are infamous for their high rates of case pendency. Hence, our measure of court quality captures the delay in case proceedings because of the pendency. Specifically, we use an index used in the existing literature, known as the *Duration Index*, to proxy for the quality of formal contract enforcement institution (Chemin, 2009).

Formally, the *Duration Index* is the sum of pending and filed cases in a specific year as a ratio of the number of cases solved during that year. Thus, the duration index, represented by DI_{it}, for district i and year t is given by,

$$DI_{it} = \frac{pc_{it} + fc_{it}}{dc_{it}}$$

where pc_{it} is the number of cases pending at the beginning of the year t in district court i, fc_{it} is the number of cases filed in district court i, during the year t and dc_{it} is the number of cases disposed or solved in district court i, during the year t. For a specific district in a specific year, the *Duration Index* shows the number of years the court in that district would take to resolve all pending cases provided there are no new cases filed going forward and assuming that cases continue to be solved at the same rate in the future. Hence, the *Duration Index* measures judicial inefficiency since it increases in the time taken to solve a case.

In our discussion, even though we refer to *Duration Index* as a measure of court efficiency, we must clarify it does refer to the efficiency of the judicial process in a particular court. Our measure simply captures how congested a court is, which, besides several administrative reasons, depends on the number of cases originating in the area, which in turn depends on the nature of economic activity in that area, the nature of land ownership etc. It also depends on the age of the court as older courts have higher case load to deal with from the past. While our

measure is based only on civil cases, we do not know if the cases that we count in the *Duration Index* involve business disputes or not. In fact, evidence from the largest judicial survey in India, conducted by Daksh Foundation in 2015-2016, suggest that land and property disputes comprise more than 66% of civil cases across the country(Daksh India, 2016). Rather than trying to understand the issue of court congestion, we analyse the situation from the vantage point of an entrepreneur who is also a potential litigant. For his decision making, the only important thing is how congested a court is and whether he can expect timely resolution if he decides to bring a dispute to a court. For him, it does not matter if the delay is caused by vacant positions in the court or by a large number of land disputes in the area which potentially increases the number of cases filed in his local court. We analyse the situation following the same point of view.

3.2 Data from district courts

3.2.1 Data coverage

Let us now illustrate the situation of court congestion across India using pendency, filing and disposal data. Before going into the details of case load data, it will be worthwhile to take a cursory look at the structure of the Indian judicial system which, like many other former colonies of Britain, follows common law. The structure looks like a pyramid with the *Supreme Court* at the top. Below the highest level, there are 25 *High Courts* in each state, which in turn supervise and govern approximately 672 *District Courts*.[5] Each district court has a civil side and a criminal side. There are, however, courts below the rank of district courts as well. Besides these courts, there are various Tribunals and Family Courts which mostly facilitate arbitration.

Our approach involves constructing a novel district court level panel data on pendency, filing and resolution of civil cases in India, for the period 2000-2015 and use it to measure the *Duration Index* for different district court-year combinations. We collect the raw judicial data from different high courts of India. An alternate source of data from district courts that is publicly available, is published by the National Crime Records Bureau. However, these are published as state level aggregates, posing identification challenges that are more pronounced at this high level of aggregation.

The provisioning of the data was facilitated by court record digitization program that started in 2007 under the aegis of the Government of India's e-governance initiative named Integrated Mission Mode Project. The first phase of the digitization drive started in 2007 and was completed with an extended deadline in March

[5]While there are 28 states and 8 Union Territories (UT) in India, smaller states and UTs are served by High Courts of adjoining larger states. For example, the states of Punjab, Haryana and UT Chandigarh are all served by Chandigarh High Court.

2015. Hence, for most states, which sent us any data, the information on civil cases is available, for majority of the districts, from 2008 onwards. However, prior to 2008, we have information on pendency, filing and resolution of civil cases only for those states where the data was maintained by the district courts themselves in non-digitized formats. Figure 1 and Table A1 (in appendix) provide details of the panel years available for all districts of each state. Our data came from twenty two states. Out of which 13 states have long panels (equal to or more than thirteen years) while for others we have limited data available. These 13 states that are included in our estimation sample.

Figure 1 here

3.2.2 Pendency, filing and disposal of cases

Before getting into the regression analysis, we present a general picture of district court congestion, aggregated at the state level. The mean values of state level pendency, case filing and case disposal between 2000 and 2012 at 4 year intervals are reported in the appendix (see Tables A2, A3 and A4). Figures 2, 3 and 4 show the position of the states relative to the country average on pendency, resolution and filing, respectively, as of 2012 – the earliest year for which we have no district-cell value missing in our data. Thus, if a state shows positive value for relative pendency, this means that on average the district courts in that state have more pending cases than the national average. For example, Figure 2 illustrates that Maharashtra and West Bengal stand out in terms of their high number of pending cases per district compared to the national average. In terms of the absolute numbers, as we can see from table A2, in appendix, there were more than 31000 pending cases in the average district court in West Bengal.

Figure 2 here

We see wide variation in pendency rates across states. From its very definition, pendency depends on the cases filed and cases resolved. Moreover, pendency is a stock variable meaning that it keeps accumulating over the years – pendency in year t depends on pendency in all the previous years $(t-i)\forall(i=1,2,...t)$. While explaining the causes of pendency fully is beyond the scope of our study, a casual observation reveals that there are many variables that contribute to high pendency. For instance one may expect, that the courts that solve fewer cases will show higher pendency. It turns out that this is not the case always. Figure 3, and Table A4 show a mixed picture. While for Uttar Pradesh and West Bengal high pendency is coupled with low resolution rates, for Tamil Nadu we find the opposite.

Figure 3 here

It is also reasonable to expect that, courts with higher pendency, discourage new filing. While there is no clear pattern that emerges from the state level averages, at least some of the states that have higher pendency and lower resolution, like West Bengal and Uttar Pradesh, also have lower levels of new cases filed. This can be seen from Figure 4 and Table A3. On the other hand, states like Maharashtra, Tamil Nadu or Chandigarh have high pendency but a high level of resolution and a high level of filing.

Figure 4 here

Besides other factors like economic activity and land ownership pattern at the district level could affect pendency. The former generating more business disputes and the latter generating more land disputes. In addition age of the court and judge vacancy rates are also likely to affect pendency through cumulative filing and resolution, respectively. Given that number of pending cases in a court is stock variable that accumulates over time, district courts under older high courts such as Calcutta, Delhi, Bombay and Madras are bound to show higher pendency. Let us illustrate the point with an example. Consider two courts with the same number of judge vacancy but different vintage – court A is 100 year old while court B is only 5 year old. Even if the rate of pendency is the same for both the courts from their time of inception, at any point of time when they both are operative, the absolute number of cases pending in A will be much higher than that of court B. Consequently, despite both courts having same number of judges, the time between two hearings will be much higher in court A than in court B.

The other explanation is the number of judge vacancy in a court. We check the correlation between pendency, filing, disposal and the judge vacancy rate at the state level, aggregated from district and subordinate courts, using state level vacancy data published by various High Courts on their websites. Table 1 report the effect of court-vacancy measures on the extent of pendency, resolution and filing in panels A, B and C, respectively. Column 1 uses the number of Judges available per 1 million population while columns 2 uses the ratio of Judges available to the total sanctioned strength as the measures of judge availability. The coefficients imply that pendency decreases and resolution increases when more judges are available either as a proportion of the population (Column 1) or as a proportion of total sanctioned strength (Column 2). However, judge vacancy rate, as shown in the panel C, does not significantly affect new case filing.

Table 1 here

In our theoretical structure, we look at the quality of formal courts from the perspective of an entrepreneur who is also a potential litigant. From this perspective the trend of case filing is a key variable. Hence, now we ask whether people

are less likely to approach courts when the courts have higher pendency rates and/or lower resolution rates. It is important to note that the results in table 1 do not indicate any obvious relationship of filing with vacancies in the courts.

We have already seen that figures 2, 3 and 4 show a cross-sectional variation in pendency, resolution and filing and the Appendix Tables A2, A3 and A4 reflect a stability in the relative positions of the states across the years. Figure 5 shows the trend in average district level pendency, filing and resolution of civil cases across India between 2000-2012, for India as a whole. It shows a gradual increase in all three measures although in more recent years rates of new cases filed have gone down along with a dip in resolution.

Figure 5 here

3.2.3 Duration Index

We now turn to the *Duration Index* (DI) that combines pendency, resolution and filing. Recall that DI for a court captures the time taken to solve all the pending cases if no new cases are accepted henceforth and the rate of case resolution remains the same. Hence, it serves as a proxy for the waiting time of an average litigant. Figure 6 shows the relative position of all states on the DI. As before, we create relative DI of the avergae district court of a state by deducting national DI from the average state level DI. The absolute values of state level DI are reported in Appendix Table A5.

Figure 6 here

We find that states like Orissa, Bihar, West Bengal, Jharkhand and Uttar Pradesh have DI higher than the national average in their district courts. In fact for Bihar, Orissa and West Bengal, district courts will take more than 6 years to clear all the pending cases, (provided that no new cases are allowed during this time) which is 3 years higher than the national average. States such as Andhra Pradesh and Tamil Nadu, and Union Territories like Chandigarh, on the other hand, have DI of 2 to 3.5 years which is lower than the national average. This comes despite the fact the latter group has high number of pending cases.

We depict the duration index in a district level map of India to illustrate the spatial variation of the index across India, for 2006 and 2012. As we explain in sections below, 2006 is the final year in our estimation sample and 2012 is the earliest year when we have data for maximum number of districts. The maps are presented in figure 7 and figure 8, respectively. This exercise illustrates considerable variation in the efficiency of courts across different states as well as across different districts within a state.

Figure 7 here Figure 8 here

As we have seen before, court vacancies predict resolution and pendency to some degree. In table 2 we look at the correlation between the judge vacancy rate and the *Duration Index*.

Table 2 here

The results shown in table 2 indicate that DI is highly correlated with judges vacancy rate. To the extent that vacancy determines quality of a court by enabling it to resolve more cases at a faster rate, these results lend support to our strategy of using DI as the proxy for the quality of formal courts. However, these results also raise a critical question for our empirical strategy. If number of judges are related to pendency and resolution, could we use judge availability as a proxy for the quality of formal institutions directly? There are some issues with the data that prevents us from using it as a proxy for the quality of formal institutions. First of all, in our empirical strategy, we construct a district-panel over 2000-2006. However, the data on judge availability does not allow us to create a district level panel, both because it is available only at the state level as well as only for the more recent years of our panel.

To help understand the relevance of the *Duration Index* better, we further examine its relationship with economic development. We illustrate this relationship in Figure 9 where we plot the average *Duration Index* between 2000-2006 against state level average GDP, at 1999-2000 prices, during the same time. The figure suggests that improvement in courts can have positive impact on the economic activity of the state. However, it does not allow us to infer anything about causality.

Figure 9 here

To sum up, we use the *Duration Index* as a proxy for the quality of formal institutions in India, viz. the judicial system. According to our theoretical framework less congested courts would encourage entrepreneurs from disadvantaged castes (both in terms of network size and hierarchy) to take up long term investment. Having discussed our measure of court quality we now turn to the data on firms that we use for our study.

Figure 9 here

3.3 Data on MSME firms

We use the Fourth All India Census for Medium, Small Scale and Micro Enterprises, 2006-07 (hereafter referred to as MSME data) to measure investment decision of entrepreneurs. It surveyed all MSME firms registered on or before 31st

March 2007 (January-March is observed as the financial year in India) through complete enumeration. The survey covered more than 1.5 million small and medium enterprises across 35 states of India. However, as we explain in Section 3.2.1, judicial data from only 13 states covers the seven year period of the MSME Data. Therefore, our analysis gets restricted to enterprises from these states only. The MSME data is a cross sectional data as the enterprise owners were surveyed in 2007-08. But it also contains the information about the year of inception of these firms, which dates back as far as 1925.

We measure long term investment decision of a firm in two ways. First, as the decision to register the firm with the formal authority and second, to set up manufacturing unit. One way of measuring the decision to register is to simply use the number of months or years it takes a firm to register. The decision to register a business formally indicates a firm's long-term commitment. The process of formal registration involves some costs, but more importantly, after registration the firm is supposed to follow certain rules and regulations which are costly. The problem with using time taken to register is that the MSME data is a cross-section from 2006-2007. Hence, this measure allows the firms that entered the market early more time to be marked as registered compared to firms that entered the market later. For instance, a firm that entered the sample in 2001 might have taken 3 years to register and we would measure the time taken to register as 3 years. However, a firm that entered the market in 2006 can only be observed for one year and if it does not register within that time we would mark the firm as not-registered. This creates the possibility of asymmetric measurement errors depending on the entry date of a firm. Hence, we settle for an indicator whether a firm registers the firm in the same year as when it starts operations. Hence, we drop the 5,658 firms from the sample which started operations in 2007 since for them we are not able to observe a full year when they can complete registration. In addition to this, we restrict to only those firms where the registration happens in the same year or after the start of operations. This is because our aim is to measure delay in registration. Hence we drop 6191 firms that were registered before commencing their operations. This reduces the sample size to 172505 firms. Among several possible registrations, we take registration with District Industries Centre (DIC) as our functional definition of registration as this is used by government agencies for policy intervention and also consistent with the existing literature.(Sharma, 2014; Deshpande et al., 2013). Among these, we cannot compute delay in registration for the 1020 firms registered with the DIC for which we do not have information on the year of registration. Thus, we drop these firms, taking the sample size to 163990 firms. We further restrict the study to Hindu entrepreneurs, for caste-network comparisons, which brings the sample size down to 141097 firms.

Our second measure, to capture a firm's investment-willingness, is the decision of a firm to start a business in the manufacturing sector as opposed to a non-manufacturing unit. Manufacturing requires large set-up costs which are difficult to recover in case the firm decides to shut down. In the MSME data, for instance, the average value of plant and machinery for a manufacturing firm is 280559 INR (roughly 3700 USD at 76 INR to a Rupee) and for non-manufacturing firms it is 34034 INR (roughly 450 USD). Table 3 shows that the average delay in registration for MSME firms is .7 years, roughly 74% of the firms in our sample register within the same year as when they start operations and 60% of the firms in our sample operate in the manufacturing sector.

Table 3 here

Note that the quality of the formal court that is relevant for these investment decisions of firms is the quality of court that prevailed in the district the firm was set up and in the year it started its journey. Hence, a firm from the MSME is matched with the court quality prevailing in its district of operation, in the year it started operating, giving the data a panel structure. However, our judicial data starts from 2000 and hence, we could not use information on enterprises that started its operation before 2000. We further restrict ourselves to firms located in urban centers – i.e. places with population more than 5000. This is because of two reasons. First, district courts are all located in urban areas improving access to formal judicial proceedings in urban areas. Second, entrepreneurs living in urban areas also have better access to people specializing in court procedures such as lawyers and para legals. All these constraints restrict the number of observations for the relevant state-year combination to 184354 firms for which we have judicial data.

The choice of MSME data is driven by two considerations. First, there is a significant focus on the performance of the MSME sector in India given that it employs more than 50 % of industrial workers in India and accounts for close to 40 % of GDP.[6] According to the estimate done by Singh and Paliwal (2017), the MSMEs constitute more than 90% of total enterprises in most economies. The main advantage of the sector is its employment potential at a relatively low capital cost. As a result, the sector has the potential to facilitate employment opportunities to those who may not be employable in large-sized corporations/firms. SEAF (2007) confirms that SMEs generate significant employment. However, the SME sector which is considered as the backbone of the economy in high-income countries, is found to be less developed in low-income countries Bouri et al. (2011). Still, the sector holds a strategic position in the Indian economic structure as is evident from various estimates. For instance, the share of MSME Gross Value Added

[6]https://www.livemint.com/Opinion/zyvNMqIAdbmVEW02DUU5BP/MSMEs-not-large-corporations-are-powering-Indias-growth.html

(GVA) in total GVA during 2016-17 was 31.8% as per estimates provided by the Ministry of Statistics and Programme Implementation, India. The importance of MSME firms as the second largest employment generating sector (agriculture is the largest) employing close to 40% of total workforce, has been noted by other studies (Rajeevan et al., 2015; Goyal, 2013). The increasing importance of the MSME sector in employment generation can further be understood when we look at the estimates provided by the Fourth Census of Registered Enterprises of 2006-07. According to the report, around 93.09 lakh persons were employed across 15.64 lakh enterprises in the year 2006-07. The employment intensity is found to be increasing over the years. To be specific, we find that the per unit employment has gone up from 4.48 in the third census to 5.95 persons in the current census. Hence, any study that focuses on the impediments faced by the sector is significant policy importance. Second, our choice of this data is also guided by a practical consideration. We study whether the decisions made by the MSME firms are affected by the quality of formal contract enforcement and whether these decisions vary by the network ties of the entrepreneur. In absence of any better indicator of an entrepreneur's network marker, we look at his caste identity which is provided in the MSME data. Among other data sets that provide owner's caste information, one prominent example is NSSO. But the NSSO data does not provide us with the date of registration for the firm, which is one key independent variable in our analysis. Therefore, we use the MSME data.

Caste is a hierarchical division of the Hindu society living in India. Traditionally, the four major divisions were the Brahmins (the scholar caste), the Khatriyas (the warrior caste), the Baishyas (the businessman caste) and the Shudras (the Worker caste). Below these castes, there were outcasts known as Dalits and the tribal people. The castes falling under the last group is listed in the schedule of the constitution of India under Article 341 and termed as scheduled castes and tribes (SC-ST). This schedule's original version however, predates the constitution of independent India and was first incorporated in the Government of India Act, 1935 under the British colonial rule. The schedule was based on the census of 1931. After independence, starting from 1951, different kinds of quotas in educational institutions and government jobs were implemented for these groups. The idea of classifying another group of backward castes, who lie between the SC-ST and the privileged castes in the social hierarchy, as Other Backward Classes (OBC) was first conceptualized in the reports of the Kelkar Commission (1953) and plans to bring these groups under affirmative action policies were made more concrete in the Mandal commission report (1978). Finally, in 1990, amid much controversy, the report was implemented. In our work, following the nomenclature used in Indian government documents, the privileged castes, who are neither SC/ST nor OBC, are referred to as the General caste.

3.3.1 Caste identity and firm ownership

In our empirical section, we rely on a broader assumption that scheduled castes and tribes (SC-ST), which are traditionally non-entrepreneurial castes, have limited access to an established business network and consequently, entrepreneurs from these groups will benefit more from improved court quality. Our claim that SC/ST castes are business-minority is further substantiated by evidence from the MSME data.

Figure 10 shows the distribution of caste-ownership across the MSME firms in our sample. The X-axis plots the years in which the firms in the sample started operations. The dashed-line, lying topmost, shows that highest fraction of firms had owners from *Other Backward Castes*(OBC) in each year between 2000-2006. The line lying at the very bottom shows that very few firms had SC-ST owners across all these years. The dotted-line lying in between shows that General-castes, which traditionally hold a higher position in social hierarchy compared to SC-ST and OBC castes, own much more MSME businesses compared to SC-ST castes but own much fewer businesses compared to the OBC entrepreneurs. Overall, the distribution of caste-ownership implies that OBCs are castes with a large business network although the General castes hold the highest position in social hierarchy. SC-ST groups hold a position of disadvantage both with respect to the size of the business network as well as with respect to the traditional social hierarchy. Later in our empirical section, we use these characteristics across caste groups to explain our findings in the context of *Proposition 4*.

Figure 10 here

Further details on the socio-demographic characteristics of the MSME firm-owners in our sample are provided in Table 4. A few characteristics stand out. While the representation of Hindu-ownership of firms is roughly in line with their overall population shares, SC/ST firm-ownership represent a very small fraction – 10%. On the other hand, a vast majority, 52%, of firms are owned by OBC castes. In addition, almost three-quarter of the firms have male-owners and an even higher share of firms have a male manager. Finally, there is an almost equal distribution of the firms across rural and urban regions.

Table 4 here

3.3.2 Caste and investment decisions

We next examine how investment decisions vary by caste of the entrepreneurs. The caste specific averages are summarized in Table 5. For reference we also provide the overall averages. We see that MSME firms in India delay their registration by 0.7 years on average. However, the extent of delay was the least, 0.6 years,

for the OBCs, the high-network caste-group. On the other hand, entrepreneurs from the other two categories experienced delays greater than the national average. Our empirical model uses a binary indicator to capture delay in registration - whether a firm registers in the same year as start of its operations (see Section 4). We find that the composition of firms, by caste, that (failed to) register in the same year, as the start of operations, is also similar to the continuous measure of delay in registration. Unlike the registration decision, though, we find that a high proportion, more than three-quarters, of general category entrepreneurs operate manufacturing enterprises. The SC-ST category entrepreneurs hold second position in terms of operation of a manufacturing unit followed by the OBCs.

Table 5 here

Figure 11 shows the trend in registration decision by the firm-owner's caste. It plots the fraction of firms that registered with the DIC in the same year as when it started operations, for each caste category. Rates of same-year-registration have gone up over the years for all caste categories. However, rates of registration takes the highest value amongst OBC-owners and takes a smaller but similar value for SC-ST and General caste owners.

Figure 11 here

Figure 12 shows the trend in decision to start a business in the manufacturing sector by the firm-owner's caste. It plots the fraction of firms that operate in the manufacturing sector, for each caste category. Fraction of firms in the manufacturing sector has gone up over the years for all caste categories. Interestingly, the gap between general and other castes in terms of their presence in the manufacturing sector has reduced over time.

Figure 12 here

3.4 Court congestion and MSME concentration

Finally, we turn to the fundamental relationship underlying our hypothesis – does judicial delay affect business formation? Figure 13 shows the evolution of duration index between 2000 and 2006 and its variation across states with different concentration of MSME firms. First, we see that the duration index has improved over time, between 2000-2006, for India as a whole. While the average was 3.6 years to solve all pending cases in 2000, it has come down to 3 years by 2006. Moreover, it supports the general view that a more efficient judiciary benefits business. We see that regions with a higher concentration of MSME firms have

a consistently lower value of duration index across all years.[7] In the next section we revisit this question more formally.

Figure 13 here

4 Empirical Method

The focus of this paper is to examine how improvement in court quality differentially affects entrepreneurs from different castes. Specifically, we hypothesize that more efficient courts help entrepreneurs from Scheduled Castes and Tribes more than their upper caste counterpart. We start by running a level regression for the court quality and extend it to include the interaction of court quality with the caste of the entrepreneur. Hence our baseline empirical model takes the following form:

$$Y_{idt} = \alpha + \beta_1 X_{d(t-1)} + \beta_2 Z_{idt} + \beta_3 D_d + \beta_4 D_t + \delta_d + \lambda_t + u_i \tag{13}$$

where, Y_{idt} is a measure of firms' decision-making in two possible dimensions – whether to register the firm in the same year as becoming operational and whether to set up a manufacturing firm. It is important to note that even if the survey was done in 2007, the firms started their business in the past. Hence, the relevant time period (t) for the regression is the year when firm i started its business. We ask if a firm is more likely to register its business in the same year as starting operations if the court quality in its district and year of operation is higher. Similarly, we ask if a firm is more likely to set up a manufacturing unit if the court quality in its district and year of operation is higher. However, the MSME data reports two dates related to the starting point of a business – when a firm started its operation and when it installed its plants and machinery. These two dates are often different and while the date of starting operation is important for the decision to register, the year of installing machinery is relevant for the decision to set up a manufacturing vis-a-vis a non manufacturing firm. For the ease of reading, we report both them as the year of inception in the regression tables even though they mean different things depending on the dependent variables. In regressions with same year registration dummy as the dependent variable, inception year refers to the year of starting operation while in regressions with manufacturing dummy this means year of installing plants and machinery.

[7] We first calculate the share of each state in the total number of MSME firms in India. We then take an average of these fractions to define the average fraction of MSME firms across India. States for whom the fraction of MSME firms is higher than the India-average are marked as *High MSME*. States for whom the fraction of MSME firms is lower than the India-average are marked as low MSME.

In our regressions, we use court quality of the year before the year of inception. For an enterprise which started its journey in the year period t, we will be using $X_{d(t-1)}$ (the court quality index for district d at time $(t-1)$) as the independent variable of interest. Z_{id} are firm specific controls that account for gender of the owner and manager of the firm, religion and caste identities of the owner in explaining delay and are time invariant. We also include district fixed effects to control for any unobserved heterogeneity.

The primary focus of our study is to examine whether court quality has any differential impact on entreprenurs of different castes. In line with our theoretical proposition, we argue that entrepreneurs from SC-ST castes would benefit more from better quality courts. We test the hypotheses by including a caste-court quality interaction term in the model given in equation 14. The modified specification is as follows:

$$Y_{idt} = \alpha + \beta_1 X_{d(t-1)} + \beta_2 C_i + \beta_3 X_{d(t-1)} \times C_i + Z_i \beta_4 + \delta_d + \lambda_t + u_{idt} \tag{14}$$

where the variable C_i takes the value 1 if the i^{th} entrepreneur is from a disadvantaged caste group and 0 otherwise.

Our identification strategy considers the variability in court quality over time and across districts. Accordingly, we include time fixed effects, λ_t, to control for common shocks across all districts and district fixed effects, δ_d to eliminate time invariant district level correlates of court quality and investment decisions. Since our independent variable varies at the firm level, it may happen that firms located in the same district and established in the same year experience common shocks. Thus, the firm level error terms are not i.i.d. We therefore report standard errors clustered by district-year groups.

5 Results

5.1 Baseline

We start with the baseline regression examining whether court quality has any impact on long term investment decision of an entrepreneur. We report the results in Table 6. The negative coefficient on *Court (In)efficiency*, measured by the *Duration Index*, suggests that court inefficiency has a negative impact on the decision to register in the same year as well as the decision to start a manufacturing firm. The coefficients, however, are not significant implying that judicial delay does not affect the decision to invest on average. We also note that SC-ST entrepreneurs are less likely to register in the same year and less likely to start

a manufacturing firm compared to their upper caste counterparts (General and OBC categories). Similarly, enterprises with male managers are more likely to perform better on both counts.

Table 6 here

5.2 Courts and Caste

The central hypothesis of our paper is that improvement in court quality affects entrepreneurs differently based on their caste identities. Entrepreneurs from the most disadvantaged caste groups, in terms of network size and social hierarchy, are likely to benefit the most from improved courts. As explained in the theoretical framework, this could either be due to a lack of informal network resources or due to their position of disadvantage in social hierarchy. In order to test this hypothesis, we add an interaction of court (in)efficiency and caste of the entrepreneur to the baseline regression, as shown in equation 14. Table 7 reports the findings from this estimation. We find that as court inefficiency increases, SC-ST owned enterprises are less likely to register in the same year as they start operations, compared to their higher caste counterparts. Similarly, SC-ST entrepreneurs are less likely to set up a manufacturing firm as court inefficiency increases. These findings imply that better quality formal courts enable SC-ST entrepreneurs more in undertaking long term and risky investment decisions than entrepreneurs from castes that have an advantage either in terms of social hierarchy or in terms of network size.

Table 7 here

To better understand how court (in)efficiency affects investment decisions across castes, Figure 14 plots the predicted probabilities of the two investment decisions across the spectrum of duration-index, separately for SC-ST (red line) vis-a-vis General and OBC entrepreneurs (blue line). Panel A shows the predicted probability of registering a firm in the same year as start of operations and panel B plots the probability of setting up manufacturing firm. Panel A shows that an SC-ST entrepreneur is as likely as other entrepreneurs to register their business in the same year as starting operations when courts, on average, take 2-3 years to dispose off all existing cases. The gap between SC-ST and other entrepreneurs widen with increasing inefficiency of the courts. At the other end of the spectrum, if a court takes 7 years to clear all its backlog, on average, all entrepreneurs are less likely to register their business in the same year as starting operations. However, the likelihood to invest drops much more for SC-ST entrepreneurs than for the non SC-ST entrepreneurs who are 4percentage points more likely to register their business in the same year. On average, if a court gets more efficient such that the time taken for a court to clear all existing cases reduces by 1 year, the gap, in the probability of registering the business in the same year as starting

operations, between SC-ST and other entrepreneurs gets reduced by 0.6 percentage points. In other words, for one year reduction in the time taken to clear the backlog cases, the chance of convergence between advantaged and disadvantaged castes increase by 1% point. We find a similar pattern for the decision to set up a manufacturing firm. When the courts are relatively more inefficient, so that it would take 7 years to clear all existing cases, the predicted chance of setting up a manufacturing firm is 55% for the non SC-ST entrepreneurs and 49% for the SC-ST entrepreneurs. From there on, for each year reduction in the time taken to clear the existing backlog of a court, the SC-ST and non SC-ST groups come closer by 0.7 percentage points.

Figure 14

5.3 Mechanism

The argument underlying the findings in Table 7 is that SC-ST entrepreneurs benefit from formal courts more than General or OBC entrepreneurs because of their disadvantage in network size and social hierarchy. While social hierarchy is pre-determined by virtue of belonging to a specific caste, network size could be context specific. In what follows, we empirically examine these two channels.

5.3.1 Network Size

Our network based theoretical argument is based on the premise that when it comes to contract enforcement, formal court works as a substitute for network based enforcement. The court system is costly but once an entrepreneur is ready to bear the cost, his access to the formal system does not depend on his caste identity. Enforcement based on a specific caste network, although cheap and effective, gives its access to people from that caste only. Hence, any improvement in formal court benefits people more who do not belong to any powerful, large network. From this argument follows our hypothesis that SC-ST entrepreneurs, being socially dominated and minority in business, benefit more from improved courts than their upper caste counterpart. If this argument is correct, then SC-ST entrepreneurs should not benefit more from better courts if they have a large or a socially powerful network. We identify two such situations where people from SC-ST groups could potentially claim relatively more power in the society and test our argument in such scenarios.

First, we test whether the benefits of a formal court for SC-ST entrepreneurs varies by the size of their potential network. We measure the size of the SC-ST network as the proportion of SC-ST in the district population using Census population data. Since the MSME survey was conducted in 2006-2007, which falls midway between two census years 2001 and 2011, we take the average of the

population sizes in these two years. Then we categorize a district to be high SC-ST network district if the proportion of SC-ST population of that district is greater than the country-average and low SC-ST network district otherwise. We report the results in 8. For both same year registration and manufacturing status, the interaction effect is negative and significant only in low SC-ST network districts i.e. SC-ST entrepreneurs benefit relatively more from formal court only in districts where people from SC-ST groups are minority and, therefore, are expected to have a smaller business network. On the other hand, there is no discernible benefit of formal courts for SC-ST entrepreneurs in high SC-ST network districts. These findings supports our argument that for SC-ST entrepreneurs formal courts fill the lack of informal network resources.

Table 8 here

Second, we test whether the benefits of a formal court for SC-ST entrepreneurs varies by their socio-political power. By the same argument as network size, we expect that formal court will benefit SC-ST entrepreneurs more where they have less socio-political power. We use reservation status in assembly constituency for SC or ST candidates. In the reserved seats, only candidates from SC or ST groups, depending on the seat, can contest in the elections. However, it is important to remember that the reservation status given to a particular seat depends on the share of SC or ST population in that area. Hence, besides political power, this variable also captures the size of SC-ST network, as in the first case. The reservation status is constituency based while the lowest level of our geographical identifier is district. Hence, we construct a district level reservation status variable. We divide the districts in two categories. In one we have districts which do not have any reserved constituency while in the other we have districts with at least one reserved constituency. As before, we estimate the effect of formal court quality on investment decision of SC-ST entrepreneurs vis-a-vis high-caste entrepreneurs separately for the two types of districts. The result are reported in Table 9. The results are as expected. In districts with no reserved seats, the coefficient on court-caste interaction is negative and significant, whereas, in districts with at least one reserved seat for SC-ST candidates, the coefficient on court-caste interaction is insignificant. I.e. SC-ST entrepreneurs benefit relatively more from formal court only in districts where SC-ST people are politically weak and have a smaller network. On the other hand, there is no significant benefit of formal courts for SC-ST entrepreneurs in districts where they can claim at least some political power and also have a relatively higher network size. Once again these findings lend support to our hypothesis.

Table 9 here

5.3.2 Network versus Social Hierarchy

In addition to the network based mechanism, our theoretical model argues that social hierarchy also plays a role in determining who benefits from a formal contract enforcement mechanism. Tables 8 and 9 provide evidence in support of the network argument. In this section, we conduct an additional test to understand whether social hierarchy is also empirically relevant.

That SC-ST entrepreneurs belong to the lower rungs of the caste hierarchy is historically determined. Figure 10 shows that SC-ST entrepreneurs face the additional disadvantage of having a much smaller business network, being relatively new entrants in entrepreneurship. Hence, SC-ST entrepreneurs face a dual disadvantage in enforcing business contracts informally. In this situation, formal judiciary benefits SC-ST entrepreneurs more either because formal judiciary delivers fair justice in an otherwise hierarchical society or because formal courts acts as a substitute for the network based informal contract enforcement, or both. We test the relative importance of these two mechanisms.

To do this we divide the sample into three caste groups – SC/ST, OBC and non-OBC upper castes. We refer to the non-OBC upper castes as General castes. In the social ladder, the OBC entrepreneurs are between the SC-ST and General castes. So if we compare between OBC entrepreneurs and General caste entrepreneurs, each group has an edge over the other along a specific dimension. OBC entrepreneurs have a larger network size among the MSME entrepreneurs, as can be seen in Figure 10. However, General castes are ranked higher than the OBC entrepreneurs in social hierarchy. Thus, any differential benefit from a formal judiciary between OBC and General caste entrepreneurs will indicate which underlying channel is at play. Results from this exercise are reported in Table 10. In columns 1 and 2 we compare OBC to General caste entrepreneurs and find that the interaction term (court inefficiency*GEN) is negative for both same year registration and manufacturing, although significant only for the latter. Overall, this implies that General caste entrepreneurs benefit more from formal courts than OBC entrepreneurs, underscoring the importance of network size effect as opposed to social hierarchy effect. Courts substitute compensate for the lack of informal network for General castes but OBCs with their large informal networks do not avail services of the formal court. Conversely, courts do not seem to compensate for the disadvantage in social hierarchy for OBCs.

In a similar vein, columns 3 and 4 compare whether there is any differential benefit from a formal judiciary between SC-ST and General caste entrepreneurs. Although General castes have a dual advantage over SC-ST entrepreneurs, the social hierarchy effect is likely to prevail because of the wide gap between General and SC-ST castes along that dimension. The coefficients on the interaction, although positive implying a relative benefit for SC-ST compared to General castes

from formal judiciary, are not significantly different from zero. Taken together with the findings in columns 1 and 2, we interpret this as a lack of evidence in support of the social hierarchy argument.

Table 10 here

6 Conclusion

Enforcing contract is critical for business proliferation. However, in less developed countries with inefficiencies in judicial procedures, the informal networks are ubiquitous for enforcing contracts. The prohibitively high costs of accessing formal courts in India – mostly because of the time it takes to settle a case in court – make moving court for resolving disputes the last option for an entrepreneur. Therefore, business disputes, at least for small business, are resolved using traditional business networks. Given that such informal methods are costless, business groups which have access to such networks do not avail of judicial services in response to any marginal improvement in the court system. We argue, that any such improvements in the court system benefits those entrepreneurs the most who do not belong to any traditional business networks. We provide a theory of this mechanism and test its predictions empirically.

In the absence of any specific network membership information, we identify the entrepreneurs from scheduled castes and tribes as the ones without access to traditional business network. Our claim that SC-ST entrepreneurs are business-minority is further corroborated by our data set. We find that a very high fraction of MSME firms are owned by OBC entrepreneurs. SC-ST ownership, on the other hand is very low and General castes, who are otherwise topmost in social hierarchy, are somewhere in between OBC and SC-ST in terms of their ownership of MSME firms. Our empirical findings support our overall theoretical predictions. We find that in districts with more efficient courts, SC-ST entrepreneurs are more inclined towards making long-term commitment in business compared to General caste or OBC entrepreneurs. We further investigate the underlying arguments of our theoretical framework that drive these findings – network size and social hierarchy.

The network size channel suggests that SC-ST entrepreneurs benefit more from the court as they do not get the benefit of network based adjudication. This happens because these businesses are not the traditional occupations of the SC-ST entrepreneurs and, therefore, the size of the network of SC-ST entrepreneurs in the business is too small to be effective. The second hypothesis argues that SC-ST entrepreneurs are at the lowest level of the caste ladder and therefore, they find it difficult to enforce contracts against caste members staying higher up in the ladder.

Hence, the potentially non-discriminatory formal court system is likely to help them more. To unveil which mechanism is at work, we follow three approaches. First, if network-size is the channel, we expect the SC-ST entrepreneurs to benefit more from better quality formal courts in areas where they have a smaller network compared to areas where they have a larger network. Using population share of SC-ST as a proxy for network size, we find that SC-ST entrepreneurs benefit more from formal courts, compared to General or OBC entrepreneurs, in districts where the SC-ST network is weaker. Second, we use political reservation of SC-STs as a proxy for their access to network based resources because political representation may facilitate the minority population in ways that a caste based network does. Once again we find that SC-ST entrepreneurs benefit more from formal courts, compared to General or OBC entrepreneurs, in districts with no political reservation but there is no comparable benefit from formal court for SC-ST entrepreneurs in districts where they already have a political representation. Third, we compare between subgroups of castes to disentangle the two channels. For instance in a comparison between OBCs and General castes, the former has the advantage of a larger network size while the latter has an hierarchical advantage. Hence our finding that General caste entrepreneurs benefit more from a better quality formal court than OBC entrepreneurs indicates that formal courts substitute for network size rather than compensating for a disadvantage in social hierarchy. On the other hand, the evidence of an insignificant difference between SC-ST and General caste entrepreneurs in terms of the benefits they derive from an improvement in court quality, inspite of an enormous difference in their social positions, further suggests that courts possibly do not compensate for a disadvantage in social hierarchy.

Overall, our findings indicate that formal judiciary substitutes for informal network based contract enforcement. Our findings can be seen as complementary to the argument provided by Becker (1971) that formal institutions such as market can lead to reduction in discrimination. But unlike the case of market, competitive pressure does not play any role in formal judiciary. It is rather the uniform legal codes that treat all entrepreneurs equally irrespective of the size of their business networks. Hence, an improvement in court quality benefits those entrepreneurs more who do not have the advantage of a traditional caste based network. While theoretically we propose an argument based on contract enforcement, in practice it is also possible that a better quality formal judicial institution that enforces business contracts also makes it easier for entrepreneurs to access the formal financial market. This benefits first generation entrepreneurs, who do not have access to the traditional network resources, relatively more.

Further, our findings underline the importance of formal institutions in advancing social equities by creating *opportunities*. This is in contrast to the role of *guarantees* in reducing social inequalities. Consider for example the effect job reservation policies in reducing the gap between SC-ST and non SC-ST in employment outcomes. Prakash (2020) finds that for 1% increase in employment quota for Scheduled Castes, the likelihood of obtaining a salaried job increases by

0.6%. This can be seen as an evidence of convergence in employment outcomes. In comparison, our estimates imply that an improvement in the quality of formal judiciary reduces the gap between SC-ST and non SC-ST in their entrepreneurship outcomes. This is significant considering that caste convergence is only one of the benefits, beyond the first order socio-economic effects of improvements in judicial efficiency.

Data Availability Statement: One part of the data underlying this article namely data on court efficiency cannot be shared publicly due to the nature of contract with the parent body namely the high courts in different states from which we got the court data.

References

Amirapu, A. (2017). Justice delayed is growth denied: The effect of slow courts on relationship-specific industries in india. Technical report, School of Economics Discussion Papers.

Ash, E., Asher, S., Bhowmick, A., Chen, D. L., Devi, T., Goessmann, C., Novosad, P., and Siddiqi, B. (2021). Measuring gender and religious bias in the indian judiciary. *Center for Law & Economics Working Paper Series*, 2021(03).

Banerjee, A. and Munshi, K. (2004). How efficiently is capital allocated? evidence from the knitted garment industry in tirupur. *The Review of Economic Studies*, 71(1):19–42.

Becker, G. S. (1971). The economics of discrimination. *University of Chicago Press Economics Books*.

Besley, T., Coate, S., and Loury, G. (1993). The economics of rotating savings and credit associations. *The American Economic Review*, 83(4):792–810.

Bouri, A., Breij, M., Diop, M., Kempner, R., Klinger, B., and Stevenson, K. (2011). Report on support to smes in developing countries through financial intermediaries. *Dalberg, November*.

Chandrasekhar, A. G., Kinnan, C., and Larreguy, H. (2018). Social networks as contract enforcement: Evidence from a lab experiment in the field. *American Economic Journal: Applied Economics*, 10(4):43–78.

Chemin, M. (2009). Do judiciaries matter for development? evidence from india. *Journal of Comparative Economics*, 37(2):230–250.

Chemin, M. (2012). Does court speed shape economic activity? evidence from a court reform in india. *Journal of Law, Economics, and Organization*, 28(3):460–485.

Chin, A. and Prakash, N. (2011). The redistributive effects of political reservation for minorities: Evidence from india. *Journal of development Economics*, 96(2):265–277.

Daksh India (2016). Access to justice survey.

Deshpande, A., Sharma, S., et al. (2013). Entrepreneurship or survival? caste and gender of small business in india. Technical report, Citeseer.

Dhillon, A. and Rigolini, J. (2011). Development and the interaction of enforcement institutions. *Journal of Public Economics*, 95(1-2):79–87.

Ghatak, M. (1991). Group lending, local information and peer selection. *Journal of Development Economics*, 60(1):27–50.

Goyal, M. (2013). Smes employ close to 40% of india's workforce, but contribute only 17% to gdp. the economic times.

Greif, A. (1993). Contract enforceability and economic institutions in early trade: The maghribi traders' coalition. *The American Economic Review*, 83(3):525–548.

Hnatkovska, V., Lahiri, A., and Paul, S. (2012). Castes and labor mobility. *American Economic Journal: Applied Economics*, 4(2):274–307.

Hnatkovska, V., Lahiri, A., and Paul, S. B. (2013). Breaking the caste barrier intergenerational mobility in india. *Journal of Human Resources*, 48(2):435–473.

Iyer, L., Khanna, T., and Varshney, A. (2013). Caste and entrepreneurship in india. *Economic and Political Weekly*, 48(6):52–60.

Jodhka, S. S. (2010). Dalits in business: Self-employed scheduled castes in northwest india. *Economic and Political Weekly*, pages 41–48.

Munshi, K. (2003). Networks in the modern economy: Mexican migrants in the us labor market. *The Quarterly Journal of Economics*, 118(2):549–599.

Munshi, K. (2011). Strength in numbers: Networks as a solution to occupational traps. *The Review of Economic Studies*, 78(3):1069–1101.

Prakash, N. (2020). The impact of employment quotas on the economic lives of disadvantaged minorities in india. *Journal of Economic Behavior & Organization*, 180:494–509.

Rajeevan, N., Sulphey, M., and Rajasekar, S. (2015). The critical role of micro, small & medium enterprises in employment generation: An indian experience. *Asian Social Science*, 11(24):258.

SEAF, S. E. A. F. (2007). From poverty to prosperity: Understanding the impact of investing in small and medium enterprises. *Washington, DC: SEAF*.

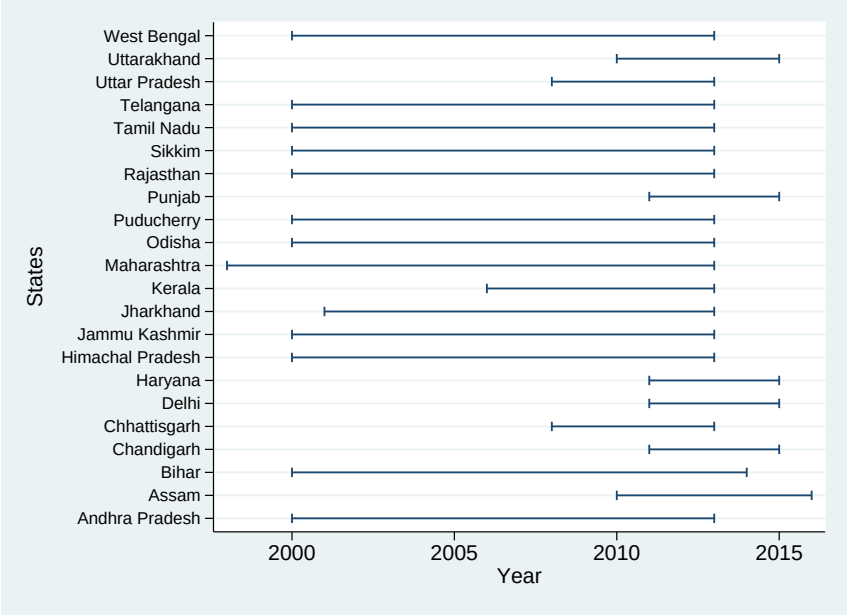
Shapiro, C. and Stiglitz, J. E. (1984). Equilibrium unemployment as a worker discipline device. *The American Economic Review*, 74(3):433–444.

Sharma, S. (2014). Benefits of a registration policy for microenterprise performance in india. *Small Business Economics*, 42(1):153–164.

Singh, S. and Paliwal, M. (2017). Unleashing the growth potential of indian msme sector. *Comparative Economic Research*, 20(2):35–52.

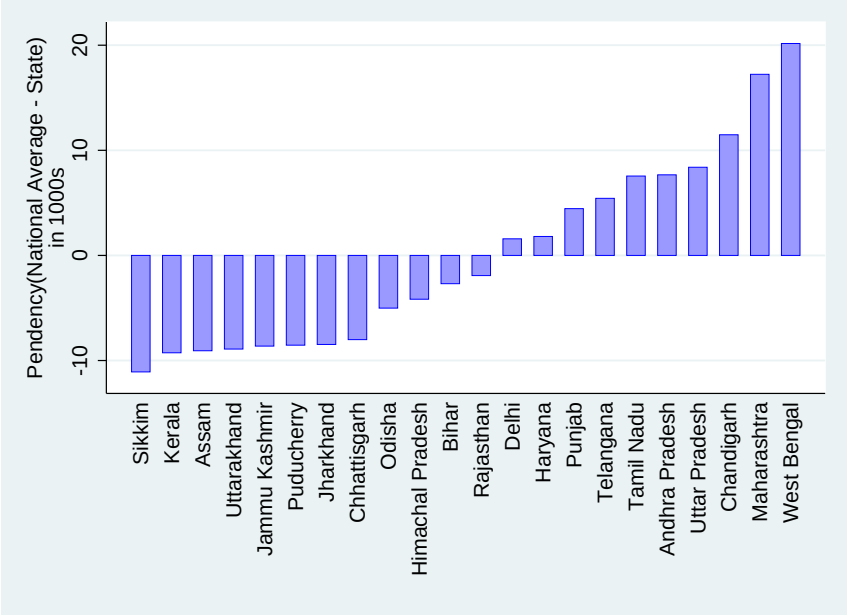
Thorat, S. and Sadana, N. (2009). Caste and ownership of private enterprises. *Economic and Political Weekly*, pages 13–16.

Figure 1: Data Coverage



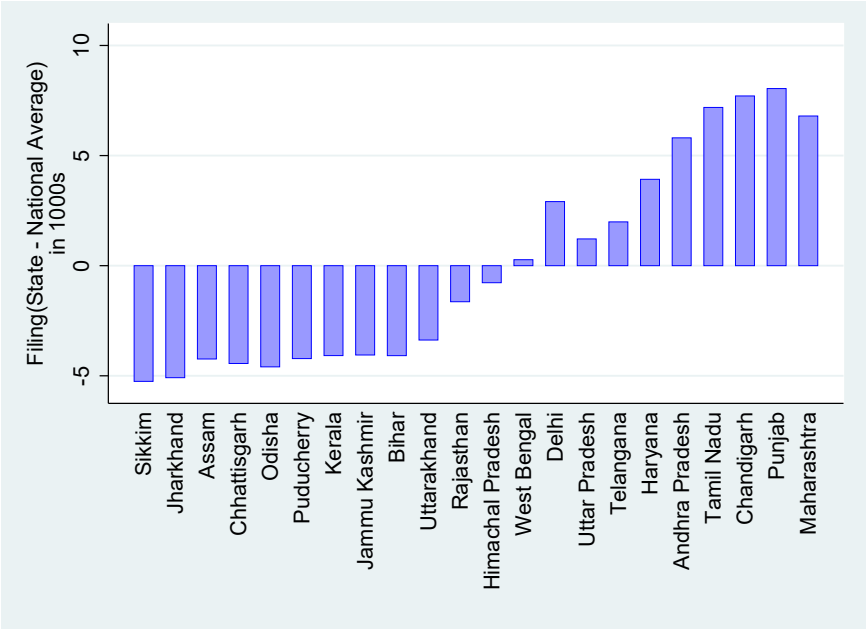
Notes: Each State reflect the respective High Courts. Each High court provided us with annual data from districts under their jurisdiction between 2000-2013/2015. The graph shows the years for which each High Court shared their data with us. While the start date depended on availability of past records, the end date depended on our application and the subsequent approval date.

Figure 2: District average of cases pending in 2012



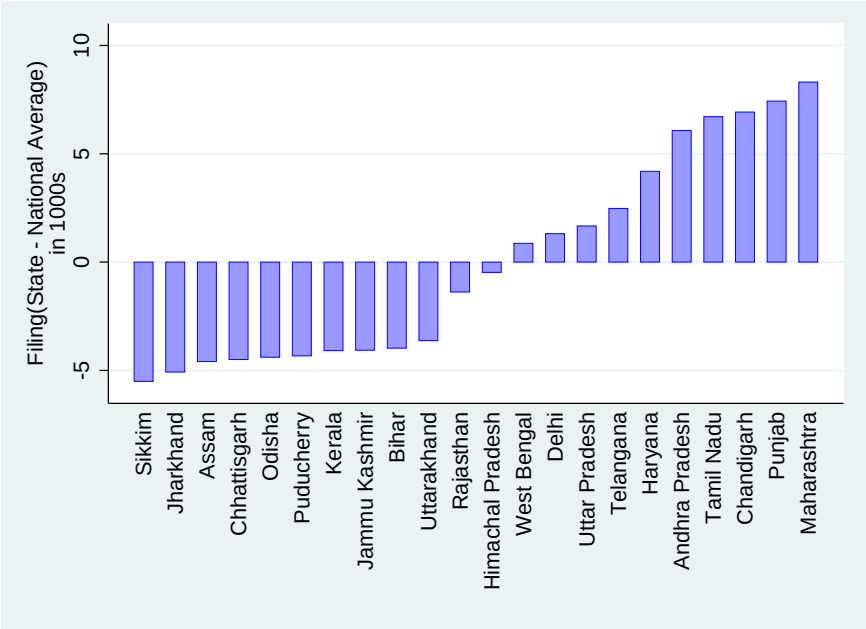
Notes: The bars show the number of pending cases in each State relative to the India. It is measured by deducting the number of pending cases in a district averaged over a state from the corresponding India average.

Figure 3: District average of cases solved in 2012



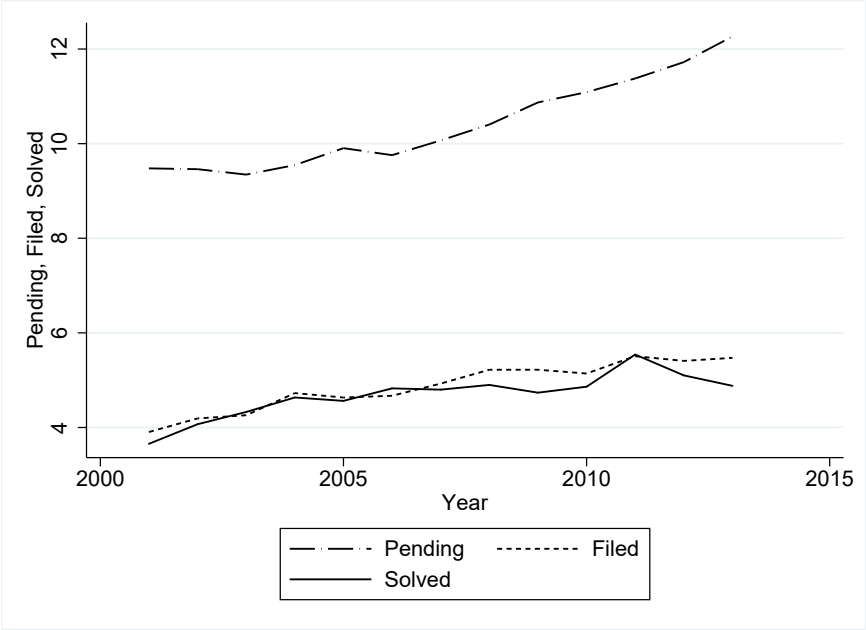
Notes: The bars show the number of resolved cases in each State relative to the India. It is measured by deducting the number of resolved cases in a district averaged over a state from the corresponding India average.

Figure 4: District average of cases filed in 2012



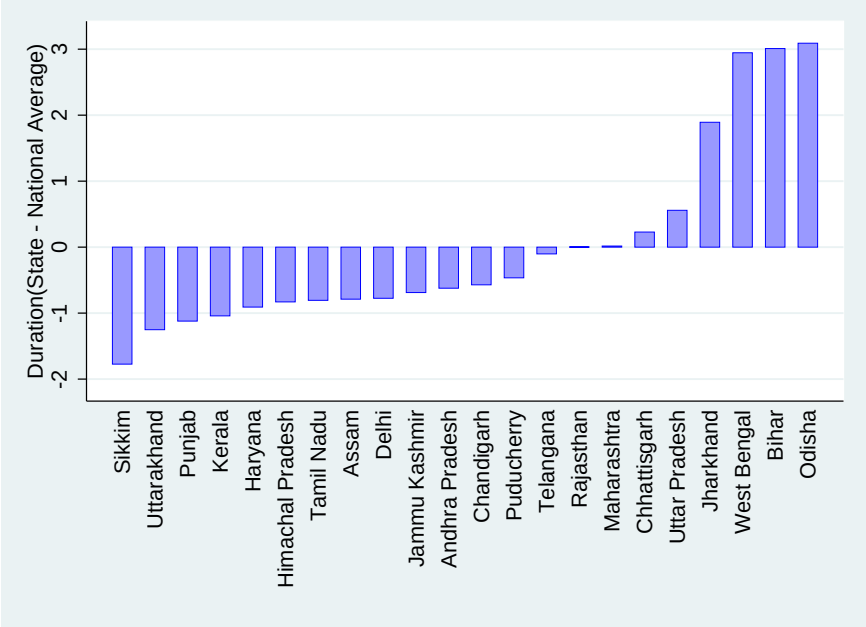
Notes: The bars show the number of filed cases in each State relative to the India. It is measured by deducting the number of resolved cases in a district averaged over a state from the corresponding India average.

Figure 5: Trends in Pendency, Resolution, Filing: 2000-2013



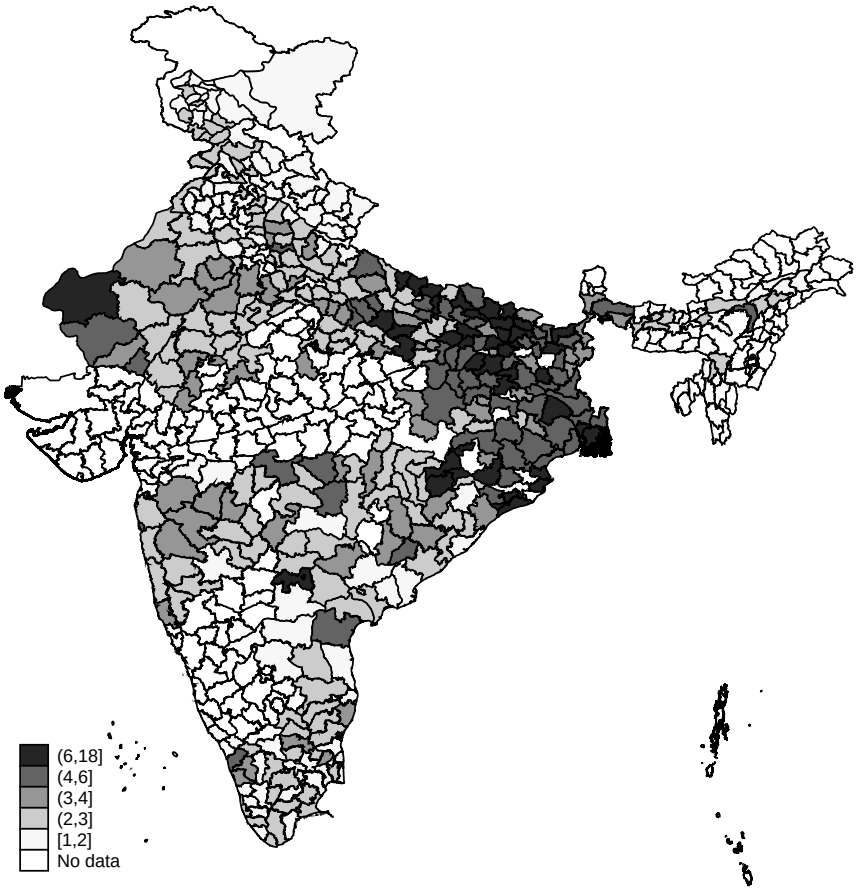
Notes: Y-axis measures average cases pending, filed or solved in a district in 1000s. Sample includes states for which we have data from 2000-2013.

Figure 6: District average of Duration Index in 2012



Notes: The bars plot the average time taken to solve all the pending cases across district courts in a state, if no new cases are accepted henceforth and the rate of case resolution remains the same, relative to the India-average. It is measured by deducting the *Duration Index* in a district averaged over a state from the corresponding India average.

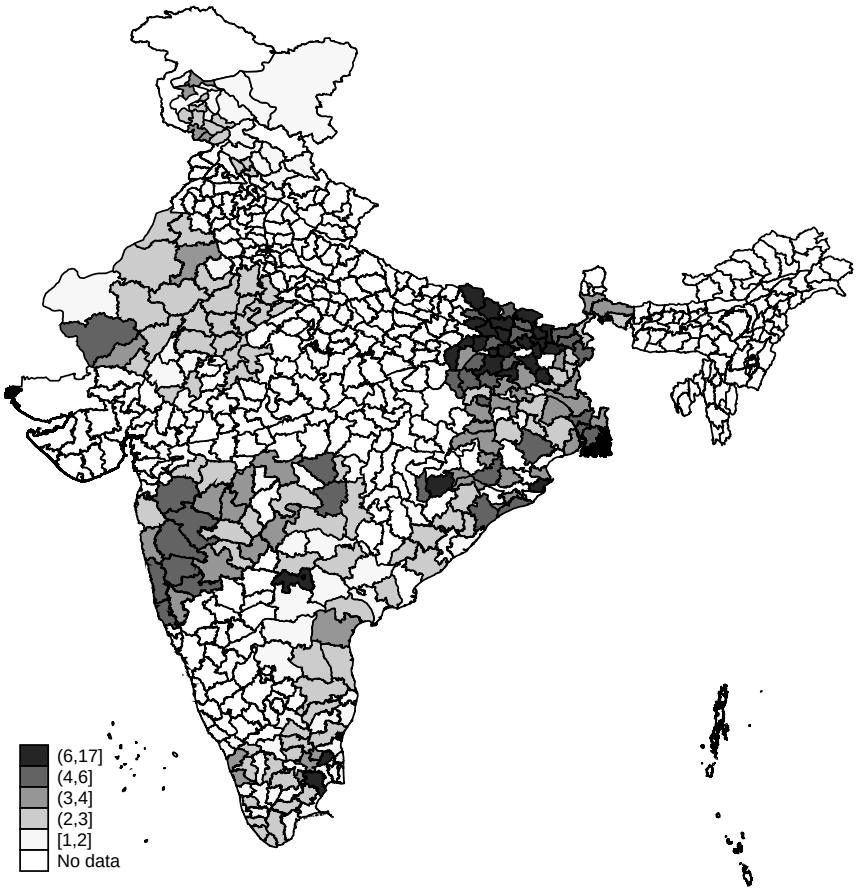
Figure 7: Duration-Index Across Districts: 2012



Source: District Court data, 2012; own calculations

Notes: Shows *Duration Index* for each district court in 2012, the earliest year for which we have maximum court-data coverage. Darker shades imply it will a longer time to solve all the pending cases.

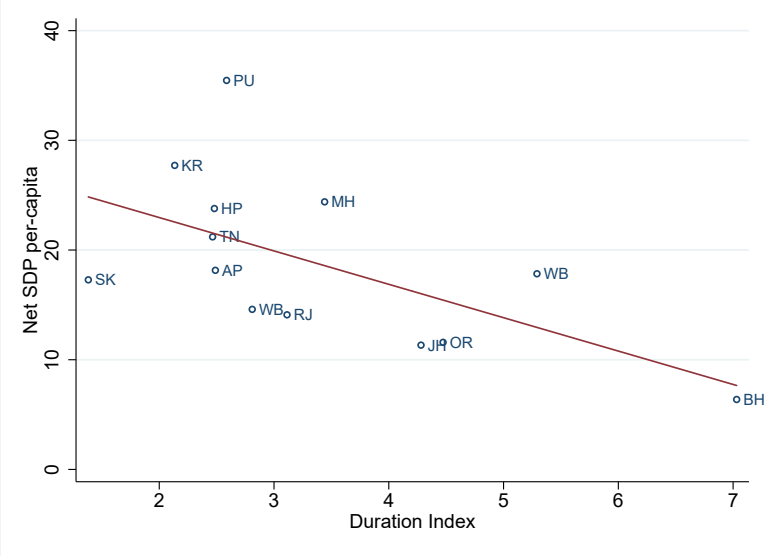
Figure 8: Duration-Index Across Districts: 2006



Source: District Court data, 2006; own calculations

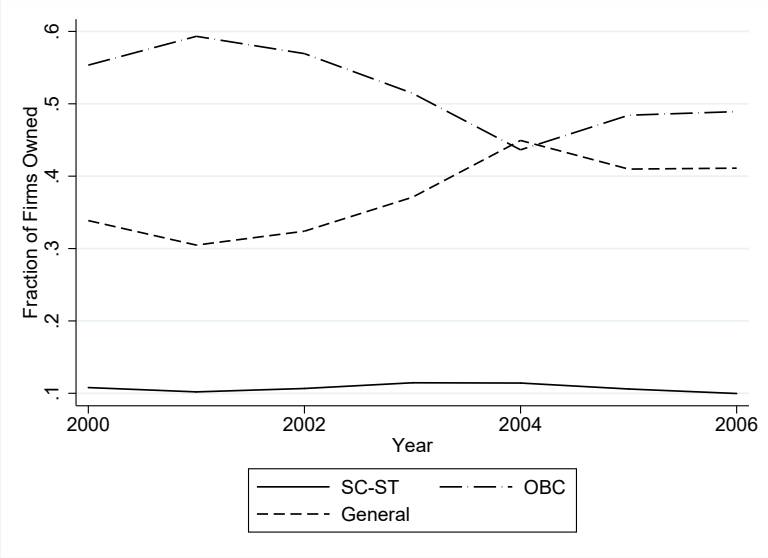
Notes: Shows *Duration Index* for each district court in 2006, the latest year in our estimation sample. Darker shades imply it will a longer time to solve all the pending cases.

Figure 9: Court (In)efficiency and Economic Development



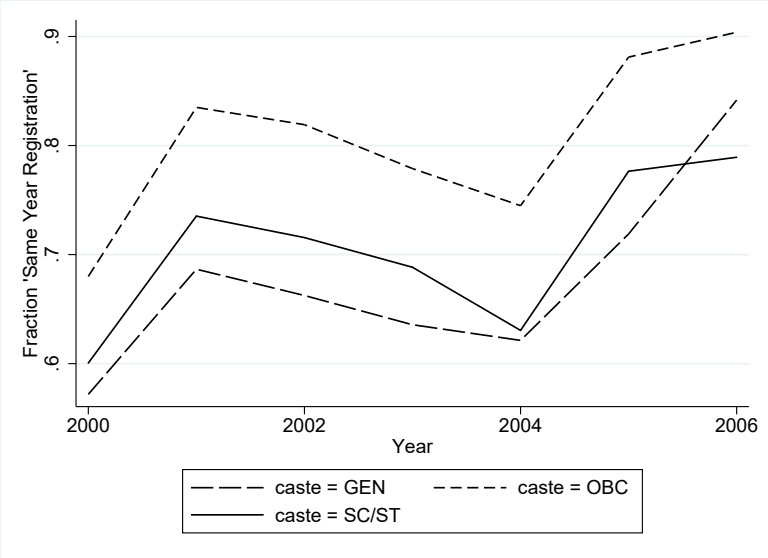
Notes: Y-axis measures per-capita net Domestic Product for each state in 1000 INR at 1999-2000 prices, averaged over 2000-2006. X-axis measures average value of the *Duration Index* in a state, averaged over 2000-2006.

Figure 10: Caste Representation among MSME Firms



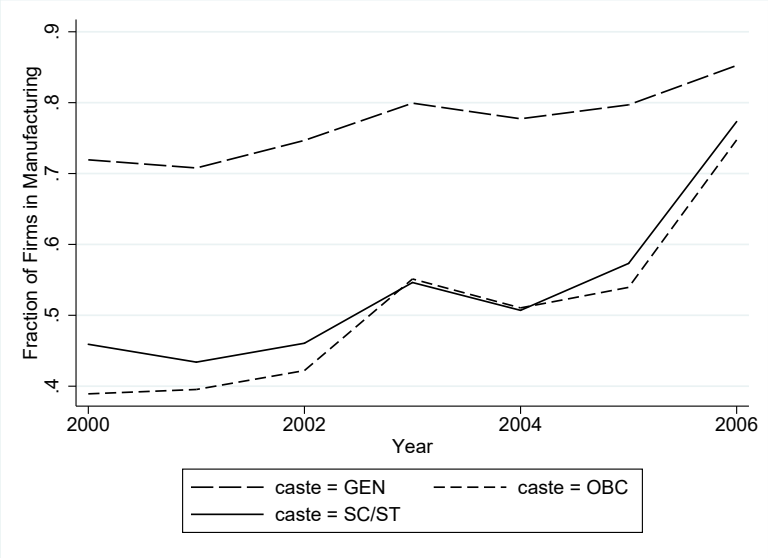
Notes: Distribution of caste-ownership across the MSME firms in the estimation sample. Graph plots proportion of MSME firms owned by each caste between 2000-2006.

Figure 11: Trends in Firm-registration by Caste



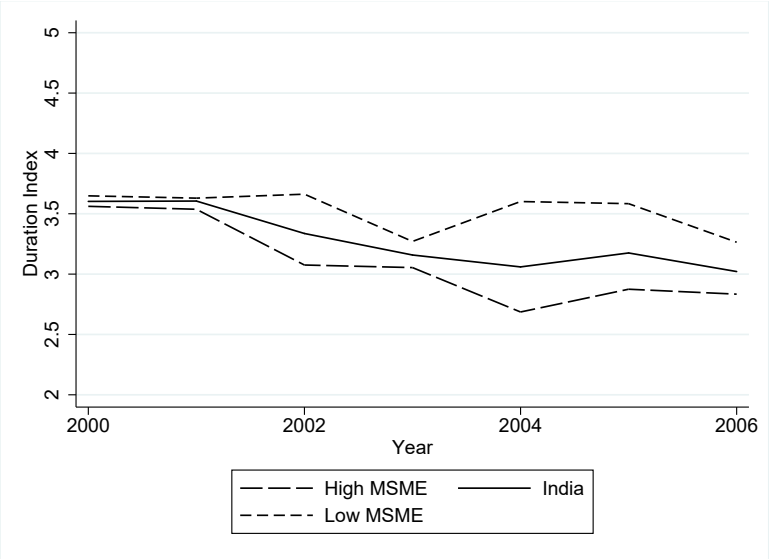
Source: MSME Survey 2006-2007. Own Calculations. *Notes:* Y-axis measures the fraction of firms registering in the same year as start of operations, between 2000-2006

Figure 12: Trends in Manufacturing by Caste



Source: MSME Survey 2006-2007. Own Calculations. *Notes:* Y-axis measures the fraction of firms operating in the manufacturing sector, between 2000-2006

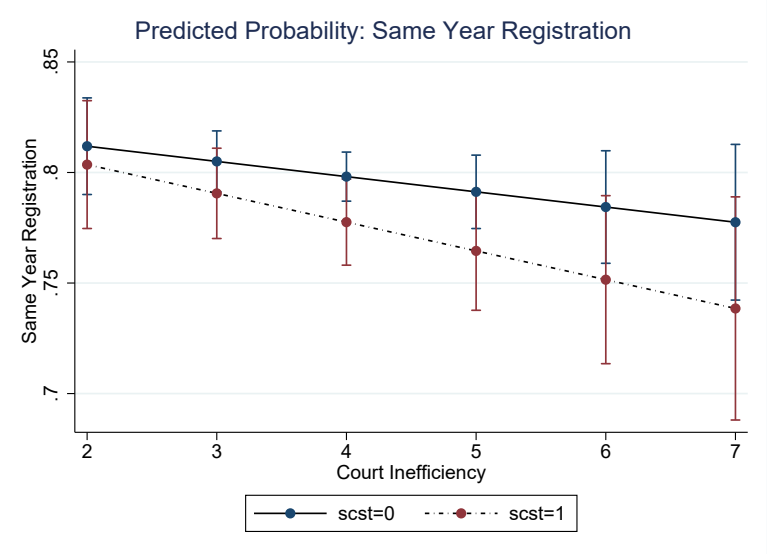
Figure 13: Evolution of *Duration Index*



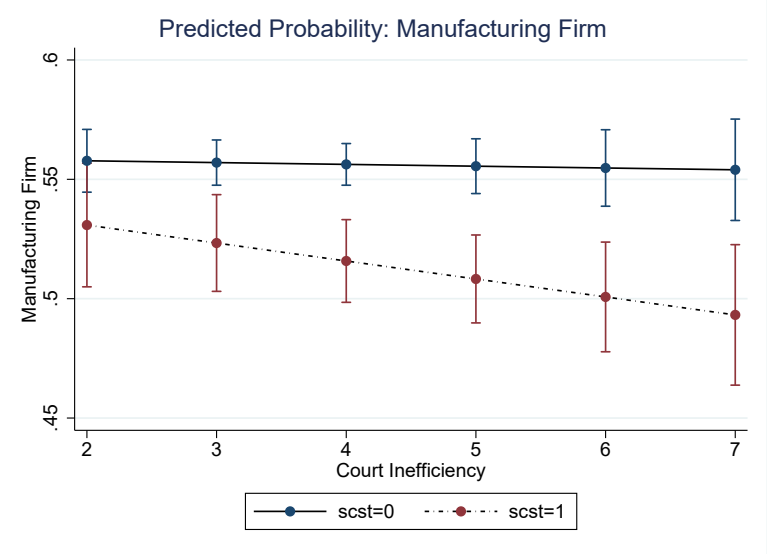
Source: MSME Survey 2006-2007 and district court records. Own Calculations. *Notes:* Graph shows the evolution of duration index between 2000-2006 by concentration of MSME firms. High MSME refers to states that have a higher fraction of MSME firms compared to the average of the fraction across all states. Low MSME refers to states that have a lower fraction of MSME firms compared to the average of the fraction across all states.

Figure 14: Effects of court inefficiency on investment decision by caste

Panel A: Same Year Registration



Panel B: Manufacturing



Notes: Panel A(B) shows how the predicted probabilities of registering business in the year of inception(setting up manufacturing firm) vary across the values of duration index for SC-ST and non-SC-ST entrepreneurs.

Table 1: Vacancy and court congestion

	(1)	(2)
	Judges per million	Judges/ Sanctioned Strength
Panel A: Pending		
Judge Availability	-0.02704**	0.1108
	(0.01338)	(0.2155)
Observations	69	83
Panel B: Solved		
Judge Availability	0.03110*	0.7270**
	(0.01713)	(0.3537)
Observations	68	82
Panel C: Filed		
Judge Availability	0.001494	0.4907
	(0.01487)	(0.3568)
Observations	68	82
State FE	YES	YES
Time FE	YES	YES
State-Time Trend	YES	YES

Notes: Column 1 uses the number of Judges available per 1 million population while columns 2 uses the ratio of Judges available to the total sanctioned strength as the measures of judge availability. All variables vary at the state-time level between 2000-2013. Standard errors are reported in parenthesis below the estimated coefficients. ***, **, * Significant at 0.01, 0.05, 0.10 level, respectively.

Table 2: Vacancy and Duration Index

Dependent Variable: Duration Index		
	Judges per million	Judges/ Sanctioned Strength
	(1)	(2)
Judge Availability	-0.1756***	-2.1482***
	(0.05623)	(0.7596)
Observations	68	82
State FE	YES	YES
Time FE	YES	YES
State-Time Trend	YES	YES

Notes: Column 1 uses the number of Judges available per 1 million population while columns 2 uses the ratio of Judges available to the total sanctioned strength as the measures of judge availability. All variables vary at the state-time level between 2000-2013. Standard errors are reported in parenthesis below the estimated coefficients. ***, **, * Significant at 0.01, 0.05, 0.10 level, respectively.

Table 3: Summary of Firm Performance

	(1)	(2)	(3)	(4)	(5)
	N	mean	sd	min	max
Delay in Registration	154,915	0.695	1.300	0	7
Same Year Registration	163,990	0.746	0.436	0	1
Manufacturing Enterprise	151,940	0.599	0.490	0	1

Notes: Delay in Registration is measured in years. Same Year Registration reports the fraction of MSME firms that registered in the same year as when they started operations.
Manufacturing Enterprise reports the fraction of MSME firms that own a manufacturing unit.

Table 4: Firm-Owner Characteristics

	(1) N	(2) mean	(3) sd	(4) min	(5) max
SC or ST	163,990	0.107	0.310	0	1
OBC	163,990	0.521	0.500	0	1
General	163,990	0.371	0.483	0	1
Male	163,990	0.738	0.440	0	1
Male Manager	163,990	0.774	0.418	0	1
Rural	163,990	0.471	0.499	0	1
Hindu	163,990	0.860	0.347	0	1

Source: MSME Survey 2006-2007.
Notes: Characteristics of firm owners in the estimation sample.

Table 5: Caste wise distributions of dependent variables

Caste	**Delay in Registration**	**Same Year Registration**	**Manufacturing Unit**
GEN	0.8366294	0.676619	0.7644318
	(1.430019)	(0.4677706)	(0.4243569)
OBC	0.5838908	0.8036742	0.4640599
	(1.173175)	(0.3972201)	(0.4987096)
SC/ST	0.7764367	0.7015951	0.5017688
	(1.389105)	(0.4575711)	(0.5000114)
All	0.694923	0.7455577	0.5813357
	(1.299687)	(0.4355486)	(0.4933417)

Source: MSME Survey 2006-2007. Own Calculations.
Notes: Table shows the distribution of various castes by the different dependent variables used in the analysis. Standard Deviations are reported in parenthesis

Table 6: **Baseline: Court (In)efficiency and Business Decision**

	(1)	(2)
VARIABLES	Same Year Registration	Manufacturing
Court Inefficiency	-0.0073	-0.0011
	(0.0054)	(0.0030)
SC or ST	-0.0197**	-0.0390***
	(0.0082)	(0.0091)
Owner-Characteristics		
Male	0.0165	0.0144
	(0.0103)	(0.0118)
Male Manager	0.0295***	0.1944***
	(0.0107)	(0.0143)
Hindu	-0.0078	0.0133*
	(0.0053)	(0.0076)
Constant	0.6347***	0.3521***
	(0.0294)	(0.0230)
Observations	86,717	76,487
R-squared	0.1840	0.3506
District FE	YES	YES
Time FE	YES	YES
Robust standard errors in parentheses		

Notes: In column 1 court efficiency is measured in the year the firm started operations. In column 2 court efficiency is measured in the year the firm installed machinery. Clustered standard errors are reported in parenthesis below the estimated coefficients. ***, **, * Significant at 0.01, 0.05, 0.10 level, respectively.

Table 7: **Court (In)efficiency and Business Decision by Caste**

	(1)	(2)
VARIABLES	Same Year Registration	Manufacturing
Court Inefficiency	-0.0069	-0.0008
	(0.0053)	(0.0030)
SC or ST	0.0039	-0.0134
	(0.0149)	(0.0178)
SC or ST x Court Inefficiency	-0.0061*	-0.0068**
	(0.0034)	(0.0033)
Owner-Characteristics		
Hindu	-0.0078	0.0133*
	(0.0053)	(0.0076)
Male	0.0166	0.0144
	(0.0103)	(0.0118)
Male Manager	0.0296***	0.1944***
	(0.0107)	(0.0143)
Constant	0.6333***	0.3508***
	(0.0292)	(0.0229)
Observations	86,717	76,487
R-squared	0.1841	0.3507
District FE	YES	YES
Time FE	YES	YES
Robust standard errors in parentheses		

Notes: In column 1 court efficiency is measured in the year the firm started operations. In column 2 court efficiency is measured in the year the firm installed machinery. Clustered standard errors are reported in parenthesis below the estimated coefficients. ***, **, * Significant at 0.01, 0.05, 0.10 level, respectively.

Table 8: **Network Size and Formal Contract Enforcement**

Dependent Variable:	Same Year Registration		Manufacturing Enterprise	
	High SC-ST	Low SC-ST	High SC-ST	Low SC-ST
	(1)	(2)	(3)	(4)
Court Inefficiency	0.0024	-0.0102	-0.0100	-0.0018
	(0.0091)	(0.0076)	(0.0069)	(0.0037)
SC or ST	-0.0298	0.0160	-0.1002**	0.0010
	(0.0395)	(0.0172)	(0.0458)	(0.0205)
SC or ST x Court Inefficiency	-0.0013	-0.0073**	0.0138	-0.0091***
	(0.0106)	(0.0037)	(0.0112)	(0.0035)
Owner-Characteristics				
Hindu	-0.0055	-0.0090	0.0058	0.0134
	(0.0107)	(0.0061)	(0.0118)	(0.0095)
Male	0.0515***	0.0085	-0.0201	0.0243**
	(0.0150)	(0.0123)	(0.0332)	(0.0123)
Male Manager	-0.0137	0.0410***	0.1471***	0.2094***
	(0.0167)	(0.0129)	(0.0247)	(0.0167)
Constant	0.5730***	0.6511***	0.4701***	0.3348***
	(0.0423)	(0.0392)	(0.0480)	(0.0255)
Observations	21,152	64,614	19,098	56,685
R-squared	0.1809	0.1839	0.2247	0.3974
District FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Robust standard errors in parentheses				

Notes: In columns 1 and 2 court efficiency is measured in the year the firm started operations. In columns 3 and 4 court efficiency is measured in the year the firm installed machinery. 'High SC-ST' refers to districts where the proportion of SC-ST population is higher than the country average. 'Low SC-ST' refers to districts where the proportion of SC-ST population is lower than the country average. Clustered standard errors are reported in parenthesis below the estimated coefficients. ***, **, * Significant at 0.01, 0.05, 0.10 level, respectively.

Table 9: Political Representation and Formal Contract Enforcement

Dependent Variable:	Same Year Registration		Manufacturing Enterprise	
	Reservation	No Reservation	Reservation	No Reservation
	(1)	(2)	(3)	(4)
Court Inefficiency	0.0085	-0.0120	-0.0054	-0.0015
	(0.0054)	(0.0080)	(0.0065)	(0.0035)
SC or ST	0.0004	0.0032	-0.0587*	-0.0031
	(0.0278)	(0.0180)	(0.0348)	(0.0210)
SC or ST x Court Inefficiency	-0.0023	-0.0070*	0.0066	-0.0100**
	(0.0058)	(0.0041)	(0.0067)	(0.0039)
Owner-Characteristics				
Hindu	-0.0121	-0.0053	0.0240*	0.0095
	(0.0116)	(0.0058)	(0.0127)	(0.0091)
Male	0.0099	0.0195	-0.0020	0.0190
	(0.0169)	(0.0119)	(0.0177)	(0.0141)
Male Manager	-0.0004	0.0377***	0.1456***	0.2092***
	(0.0170)	(0.0125)	(0.0257)	(0.0162)
Constant	0.6596***	0.6297***	0.4294***	0.3387***
	(0.0317)	(0.0404)	(0.0462)	(0.0252)
Observations	19,902	66,559	17,816	58,442
R-squared	0.2027	0.1814	0.2901	0.3714
District FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Robust standard errors in parentheses				

Notes: In columns 1 and 2 court efficiency is measured in the year the firm started operations. In columns 3 and 4 court efficiency is measured in the year the firm installed machinery. 'High SC-ST' refers to districts where the proportion of SC-ST population is higher than the country average. 'Low SC-ST' refers to districts where the proportion of SC-ST population is lower than the country average. Clustered standard errors are reported in parenthesis below the estimated coefficients. ***, **, * Significant at 0.01, 0.05, 0.10 level, respectively.

Table 10: Network vs Social Hierarchy

	(1)	(2)	(3)	(4)
VARIABLES	Same Year Registration	Manufacturing Enterprise	Same Year Registration	Manufacturing Enterprise
	GEN vs. OBC	GEN vs. OBC	GEN vs. SC/ST	GEN vs. SC/ST
Court Inefficiency	-0.0053	0.0024	-0.0142	0.0002
	(0.0047)	(0.0035)	(0.0089)	(0.0049)
General	0.0317	0.0446***	0.0155	0.0396*
	(0.0225)	(0.0151)	(0.0216)	(0.0212)
GEN x Court Inefficiency	-0.0038	-0.0068**	0.0036	0.0021
	(0.0039)	(0.0028)	(0.0042)	(0.0042)
Owner-Characteristics				
Hindu	-0.0053	0.0168**	-0.0075	0.0165**
	(0.0057)	(0.0079)	(0.0082)	(0.0080)
Male	0.0194*	0.0127	0.0000	-0.0199**
	(0.0108)	(0.0123)	(0.0126)	(0.0088)
Male Manager	0.0250**	0.1985***	0.0430***	0.1428***
	(0.0108)	(0.0147)	(0.0126)	(0.0136)
Constant	0.6232***	0.3270***	0.5707***	0.5266***
	(0.0284)	(0.0240)	(0.0503)	(0.0293)
Observations	79,524	70,237	38,080	34,446
R-squared	0.1820	0.3495	0.2262	0.3333
District FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Robust standard errors in parentheses				

Notes: In columns 1 and 2 court efficiency is measured in the year the firm started operations. In columns 3 and 4 court efficiency is measured in the year the firm installed machinery. 'High SC-ST' refers to districts where the proportion of SC-ST population is higher than the country average. 'Low SC-ST' refers to districts where the proportion of SC-ST population is lower than the country average. Clustered standard errors are reported in parenthesis below the estimated coefficients. ***, **, * Significant at 0.01, 0.05, 0.10 level, respectively.

A Appendix

A.1 Derivation of equilibrium input price

$$v_h = P + \delta(1-\tau)v_h + \tau v_h^u \tag{A1}$$

$$v_h^u = \delta q_h v_h + \delta(1-q_h)(\bar{w} + v_h^u) \tag{A2}$$

$$v_c^u = \delta q_c v_h + \delta(1-q_c)(\bar{w} + v_c^u) \tag{A3}$$

$$v_h \geq \alpha + v_c^u \tag{A4}$$

From (1)

$$v_h - \delta(1-\tau)v_h = P + \tau v_h^u$$

$$v_h(1 - \delta(1-\tau)) = P + \tau v_h^u$$

$$v_h T = P + \tau v_h^u \tag{1A}$$

Where

$$(T = 1 - \delta(1-\tau))$$

$$\boxed{v_h^u = (\frac{1}{\tau})(v_h T - P)}$$

$$v_h^u = \delta q_h v_h + \delta(1-q_h)(\bar{w} + v_h^u)$$

$$v_h^u[1 - \delta(1-q_h)] = \delta q_h v_h + \delta(1-q_h)\bar{w}$$

$$v_h^u = \frac{\delta q_h v_h}{[1-\delta(1-q_h)]} + \frac{\delta(1-q_h)\bar{w}}{[1-\delta(1-q_h)]}$$

$$\boxed{= \delta Q_h v_h + \delta R_h \bar{w}} \tag{2A}$$

Where,

$$Q_h = \frac{q_h}{[1-\delta(1-q_h)]}$$

$$R_h = \frac{1-q_h}{[1-\delta(1-q_h)]}$$

Since (1A) = (2A) we have

$$\frac{1}{\tau}(v_h T - P) = \delta Q_h v_h + \delta R_h \bar{w}$$

$$\boxed{v_h(T - \delta Q_h \tau) = P + \tau \delta R_h \bar{w}} \tag{A}$$

$$v_c^u = \delta q_c v_h + \delta(1 - q_c)\bar{w} + \delta(1 - q_c)v_c^u$$

$$v_c^u = \frac{\delta q_c v_h}{(1 - \delta(1 - q_c))} + \frac{\delta(1 - q_c)\bar{w}}{(1 - \delta(1 - q_c))}$$
$$= \delta Q_c v_h + \delta R_c \bar{w}$$

$$v_h \geq \alpha + v_c^u$$

$$v_h - v_c^u \geq \alpha$$

$$v_h - \delta Q_c v_h - \delta R_c \bar{w} \geq \alpha$$

$$v_h(1 - \delta Q_c) \geq \alpha + \delta R_c \bar{w}$$

$$v_h \geq \alpha + \frac{\delta R_c \bar{w}}{1 - \delta Q_c}$$

$$\frac{P + \delta \tau R_h \bar{w}}{(T - \delta Q_h \tau)} \geq \frac{\alpha + \delta R_c \bar{w}}{(1 - \delta Q_c)}$$

$$P \geq (T - \delta Q_h \tau)\frac{(\alpha + \delta R_c \bar{w})}{(1 - \delta Q_c)} - \delta \tau R_h \bar{w}$$

$$= (T - \delta Q_h \tau)[\frac{\alpha}{(1 - \delta Q_c)} + \frac{\delta R_c \bar{w}}{(1 - \delta Q_c)}] - \delta \tau R_h \bar{w} = P^I$$

A.2 Proof of Proposition 1

The honesty inducing input price is given by

$$P^I = (T - \delta \tau Q_h)\Big[\frac{\alpha}{1 - \delta Q_c} + \frac{\delta \bar{w} R_c}{1 - \delta Q_c}\Big] - \delta \tau \bar{w} R_h$$

The only term in this expression for P^I that depends on q_c is $\Big[\frac{\alpha}{1-\delta Q_c} + \frac{\delta \bar{w} R_c}{1-\delta Q_c}\Big]$. Let us define

$$Z = \Big[\frac{\alpha}{1 - \delta Q_c} + \frac{\delta \bar{w} R_c}{1 - \delta Q_c}\Big] \tag{A5}$$

where,

$$T = 1 - \delta(1 - \tau)$$

$$Q_i = \frac{q_i}{[1 - \delta(1 - q_i)]} \qquad i = h, c$$

$$R_i = \frac{(1 - q_i)}{[1 - \delta(1 - q_i)]} \qquad i = h, c$$

The first term of Z is $\frac{\alpha}{1-\delta Q_c}$. Now,

$$1 - \delta Q_c = \frac{1 - \delta(1 - q_c) - \delta q_c}{[1 - \delta(1 - q_c)]} = \frac{1 - \delta}{[1 - \delta(1 - q_c)]}$$

Hence, the first term of Z can be written as $\frac{\alpha[1-\delta(1-q_c)]}{1-\delta}$. Now, the second term of Z is

$$\frac{\delta \bar{w} R_c}{1 - \delta Q_c} = \frac{\delta \bar{w} R_c [1 - \delta(1 - q_c)]}{1 - \delta} = \frac{\delta \bar{w}(1 - q_c)}{1 - \delta}$$

So, Z becomes

$$Z = \frac{\alpha[1 - \delta(1 - q_c)] + \delta \bar{w}(1 - q_c)}{1 - \delta} = \frac{\alpha(1 - \delta) + \delta \bar{w} + \delta q_c(\alpha - \bar{w})}{1 - \delta}$$

From this we get,

$$\frac{\partial Z}{\partial q_c} = \frac{\delta}{1 - \delta}(\alpha - \bar{w})$$

We have already assumed that the cheating pay-off for the input seller is higher than his reservation pay-off $(\alpha - \bar{w}) > 0$. So, $\frac{\partial Z}{\partial q_c} > 0$. We have

$$\frac{\partial P^I}{\partial q_c} = \frac{\partial P^I}{\partial Z} \frac{\partial Z}{\partial q_c}$$

We have already shown that $\frac{\partial Z}{\partial q_c} > 0$. Now we know that

$$\frac{\partial P^I}{\partial Z} = (T - \delta \tau Q_h) = (1 - \delta) + \delta \tau \Big[\frac{(1 - \delta) + \delta(1 - q_h)}{1 - \delta(1 - q_h)} \Big] > 0$$

Hence,

$$\frac{\partial P^I}{\partial q_c} = \frac{\partial P^I}{\partial Z} \frac{\partial Z}{\partial q_c} > 0$$

A.3 Empirical Appnedix

Table A1: Data Coverage: State and Year

State	**Latest Year**	**Earliest Year**
Andhra Pradesh	2013	2000
Assam	2016	2010
Bihar	2014	2000
Chandigarh	2015	2011
Chhattisgarh	2013	2008
Delhi	2015	2011
Haryana	2015	2011
Himachal Pradesh	2013	2000
Jammu Kashmir	2013	2000
Jharkhand	2013	2001
Kerala	2013	2006
Maharashtra	2013	1998
Odisha	2013	2000
Puducherry	2013	2000
Punjab	2015	2011
Rajasthan	2013	2000
Sikkim	2013	2000
Tamil Nadu	2013	2000
Telangana	2013	2000
Uttar Pradesh	2013	2008
Uttarakhand	2015	2010
West Bengal	2013	2000

Table A2: Pendency: District Averages by State and Year

	Year			
State	2001	2004	2008	2012
West Bengal	29791	31244	30447	31503
Maharashtra	27835	25727	26346	28572
Chandigarh				22819
Uttar Pradesh			17705	19729
Andhra Pradesh	16031	16936	18605	19007
Tamil Nadu	15583	13734	18314	18893
Telangana	12390	14348	14956	16770
Punjab				15791
Haryana				13143
Delhi				12920
Rajasthan	7418	7226	7404	9421
Bihar	7250	7815	8441	8649
Himachal Pradesh	6146	5687	5643	7171
Odisha	4800	4870	5012	6326
Chhattisgarh			2813	3327
Jharkhand	2329	2245	2222	2867
Puducherry	1605	1994	2910	2801
Jammu Kashmir	1701	1979	2439	2711
Uttarakhand				2430
Assam				2270
Kerala			1624	2076
Sikkim	85	129	182	257

Table A3: Filing: District Averages by State and Year

	Year			
State	2001	2004	2008	2012
Maharashtra	9874	10227	11174	14287
Punjab				13409
Chandigarh				12904
Tamil Nadu	8327	12492	13791	12689
Andhra Pradesh	11212	12672	13135	12049
Haryana				10167
Telangana	6256	6456	7688	8454
Uttar Pradesh			6676	7646
Delhi				7289
West Bengal	7236	7254	7514	6843
Himachal Pradesh	3795	4443	4527	5503
Rajasthan	3217	3755	3821	4597
Uttarakhand				2355
Bihar	1292	1502	1586	2004
Jammu Kashmir	1130	1215	1369	1909
Kerala			1252	1892
Puducherry	1403	1003	1607	1649
Odisha	1661	1405	1330	1585
Chhattisgarh			1940	1480
Assam				1386
Jharkhand	587	655	779	900
Sikkim	194	345	270	472

Table A4: Resolution: District Averages by State and Year

	Year			
State	2001	2004	2008	2012
Punjab				13820
Chandigarh				13484
Tamil Nadu	7595	13068	12652	12962
Maharashtra	12130	10485	10703	12573
Andhra Pradesh	10774	12193	13028	11582
Haryana				9698
Delhi				8686
Telangana	5782	6232	6904	7765
Uttar Pradesh			6289	6992
West Bengal	6554	6208	7001	6048
Himachal Pradesh	3928	4310	4296	5003
Rajasthan	3359	3748	3584	4139
Uttarakhand				2400
Jammu Kashmir	972	1088	1254	1721
Kerala			1218	1693
Bihar	1125	1448	1566	1692
Puducherry	1375	696	1289	1557
Assam				1539
Chhattisgarh			1877	1335
Odisha	1281	1448	1002	1182
Jharkhand	574	673	728	690
Sikkim	199	282	255	523

Table A5: Duration Index: District Averages by State and Year

	Year			
State	2001	2004	2008	2012
Odisha	4.7	4.4	6.0	6.4
Bihar	7.4	6.4	6.4	6.3
West Bengal	5.5	6.0	5.3	6.2
Jharkhand	5.2	4.3	4.1	5.2
Uttar Pradesh			3.8	3.8
Chhattisgarh			2.5	3.5
Maharashtra	3.0	3.5	3.5	3.3
Rajasthan	3.2	2.9	3.1	3.3
Telangana	3.1	3.3	3.2	3.2
Puducherry	2.2	3.9	3.3	2.8
Chandigarh				2.7
Andhra Pradesh	2.5	2.4	2.4	2.6
Jammu Kashmir	2.8	2.9	2.9	2.6
Delhi				2.5
Assam				2.5
Tamil Nadu	3.1	2.1	2.4	2.5
Himachal Pradesh	2.6	2.3	2.3	2.4
Haryana				2.4
Kerala			2.3	2.2
Punjab				2.1
Uttarakhand				2.0
Sikkim	1.4	1.5	1.7	1.5