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Effects of Land Misallocation on Capital Allocations in India

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Abstract

Growing research and policy interest focuses on the misallocation of output and factors of production in developing economies. This paper considers the possible misallocation of financial loans. Using plant-level data on the organized and unorganized sectors, the paper describes the temporal, geographic, and industry distributions of financial loans. The focus of the analysis is the hypothesis that land misallocation might be an important determinant of financial misallocation (for example, because of the role of land as collateral against loans). Using district-industry variations, the analysis finds evidence to support this hypothesis, although it does not find a total reduction in the intensity of financial loans or those being given to new entrants. The analysis also considers differences by gender of business owners and workers in firms. Although potential early gaps for businesses with substantial female employment have disappeared in the organized sector, a sizeable and persistent gap remains in the unorganized sector.

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1. Introduction

A central challenge for developing countries is to reduce the misallocation of factors across producers. While there may not be such a thing as a perfectly efficient factor allocation, past research identifies large potential gains from improved allocation. In essence, efficiency requires more efficient firms to produce more and use more factors. In their pioneering work, Hsieh and Klenow (2009) predict a 60% increase in Indian manufacturing productivity if their model-based measure of misallocation for India is brought down to US levels. They also claim that over 1987-1994, a worsening allocation of factors in India probably reduced productivity growth by 2% a year, whereas improvements in factor allocation in China added 2% a year to Chinese productivity growth. Hence, differences in misallocation may explain much of the difference between Chinese and Indian growth.

Duranton et al. (2015) have made a number of advances looking at the misallocation of land and buildings between firms within Indian districts. They find that for land and buildings, the allocation across firms within districts is on average barely better than random, and in many districts, actually worse than random. Put differently, low productivity firms have better access to land and buildings than high productivity firms in much of India. Although the allocation of land and buildings is generally inefficient in India, there is nonetheless considerable variation across districts.

When Duranton et al. (2015) correlate the misallocation of land and buildings at the district level with the misallocation of output and with output per worker, land and buildings misallocation appears to be at the root of much of the misallocation of output and it accounts for a large share of the observed differences in output per worker. More precisely, across districts, a standard deviation increase in the misallocation of land and buildings accounts for about a 20% difference in output per worker. They also trace changes in land and building misallocation to policy changes. In particular, the repeal of the Urban Land Ceiling and Regulation Act (ULCRA) between 1999 and 2003 led to large reductions in the misallocation of land and buildings in the areas where this strict regulation was in place. Their calculations indicate that the repeal of

ULCRA for the combined organized and unorganized sectors led to an increase in output per worker of about 3% in treated areas.

Our current study ties the problem of access to finance in India to misallocation in input markets, particularly land and buildings which work as collateral in obtaining credit. Thus, the main purpose of this study is to examine if land misallocation in India is being amplified and entrenched by distorting the allocation of other inputs to firms. Is finance misallocation partly or mostly due to land issues? If so, then correcting land allocation will remedy this problem too, at least partially. On the other hand, if finance misallocation is distinct and not connected to land allocation, then separate interventions are required. The history of economic policy is littered with examples of over-adjustments and adverse effects, where the treatments ended up worse than the original illness. It is thus very important to separate the root causes as best as possible in order to design powerful and safe interventions.

This paper specifically examines the connection of land misallocation to poorly functioning finance markets and its impacts on jobs. There is an important reason to suspect these are connected. The development of well-functioning banking markets is an important step for economic growth. Most bank loans require some form of collateral to guarantee the loan. Land is simply the best form of collateral possible due to its immobility (i.e. the debtor can't run off with land) and its high rate of re-usability in other contexts besides its current form. This can be contrasted with a piece of specialized machinery, for example, where the borrower could seek to hide it from debt collectors or where the saleability to other parties after repossession is weak. This difference is visible in terms of the amount of loan collateral possible against asset classes. While borrowers can often pledge 80% of land values against loans, for most other forms of fixed investment the loan-to-collateral value ratio is substantially lower (e.g. 25%).

Thus, if land markets are highly distorted compared to what they should be, then it is likely that the finance market is also distorted, given the misplaced collateral channel. This can in turn lead to its own economic consequences. For example, rapidly growing firms in asset-intensive sectors require external finance due to their capital growth needs. If this is reduced due to land misallocation, this would help explain why India's firms have trouble scaling up. Similarly, start-ups are often backed by bank loans for which land is used as collateral. Poorly-functioning land markets may prevent effective entry and concomitant competition for incumbents.

One important question exists about whether financial loans are similar to the other inputs into manufacturing firms with respect to misallocation. There are some clear distinctions, and unlike labor, it is possible to run a firm without financial loans, whereas at least one worker is always needed. Similarly, it may be that the most productive firms are so good and profitable that loans are not required, and at some level implicit financial strength is the clearest conceptual construct for which loans are serving as a measureable proxy. That said, the distinctions are less sharp than they initially appear. First, almost all firms retain bank loans even when quite successful, potentially due to debt tax shields (e.g. Lakshmi, 2010), the need to finance growth for asset-intensive businesses, “pecking order” phenomena where debt issuance is preferred to new equity issuances (e.g. Myers and Majluf, 1984), and so on. The fact that roughly 90% of organized sector plants in India hold external finance, shown below (in Figure 1/Table 1a), speaks to this. Second, most highly productive firms seek to optimize the use of inputs and lower costs, and thus financial loans are not different in this regard. However, as these concepts are less certain, we will experiment with several alternative approaches for exploring distortions in loan markets.

We begin with some descriptive evidence on financial loans in Indian manufacturing. Several facts emerge: (i) An average of about 88% of plants in the organized sector have access to loans, while this figure is only 8% for the unorganized sector. (ii) There are urban-rural disparities in access to finance, with rural locations lagging behind their urban counterparts. (iii) The share of organized plants with external loans is increasing over the 1989-2010 period of our study, while this share is declining in the unorganized sector. (iv) There are large regional disparities in access to finance, with the share of plants accessing loans being significantly higher in leading states with higher GDP per capita. (v) Ordering industries by the degree to which they are dominated by firms in the organized sector, a basic measure of formality, we find that organized sector plants have equal loan access in all industries, while loan access in the unorganized sector is positively associated with greater overall industry formality.

Next we define several measures of financial access outcome variables at the district-industry-year level. These include the log total value of loans, the intensity of loans compared to total output, misallocation in financial loans à la Duranton et al. (2015), the sum of absolute or squared deviations between the actual loan levels of plants and their expected levels based upon observable establishment traits, and the share of local loans accounted for by young entrants. To formally establish a relationship between financial outcomes, we regress these alternative outcome variables on the input misallocation index defined in Duranton et al. (2015). Specifically, we choose to work with land and building misallocation and labor misallocation. Clearly, our choice of land and building misallocation is driven by our objective of establishing that poor allocation in the collateral inputs is likely going to distort access to finance. We additionally work with misallocation of labor because Duranton et al. (2015) identified this input to be highly misallocated across Indian districts during our study period and the contrast with land inputs is informative. Our results indicate that misallocation of land and buildings is not significantly related to the intensity of loans compared to local output, but we do observe a positive relationship with misallocation in access to finance in the organized sector. These connections are quite robust, including using alternative misallocation metrics and when considering overall misallocation of inputs that combine the organized and unorganized sectors. In contrast to some predictions from the literature, we do not observe evidence that start-up funding is dampened due to misallocation.

Finally, we also begin to explore gender disparity in access to finance across the organized and unorganized sectors. Our work suggests that there is significant disparity against women-owned enterprises in the unorganized sector. Measuring gender inequality in terms of the share of female employees for both the organized and unorganized sectors, we find that although the gap between the access shares of female-employee-dominated plants vis-à-vis male-employee-dominated plants is closing in the organized sector, this gap is not shrinking in the unorganized sector. The same is true for female-owned plants in the unorganized sector.

The paper beyond this point is organized as follows. Section 2 describes the related literature, section 3 presents the data description, and section 4 summarizes how we calculate misallocation and productivity metrics. Section 5 presents some descriptive results on financial loans, and then we document formal estimations of factor misallocation and financial outcomes. We finally conclude with our main findings and directions for future work in section 6.

2. Literature Review

Access to finance is critical for innovation and investment, entrepreneurship, participation in international trade, and growth in GDP and productivity.[1] In the recent World Bank Enterprise Survey, 17% of firms in developing countries report access to finance as the biggest obstacle to their operations. Evidence also confirms that this inequality in access to credit is even more severe for smaller firms. For instance, the World Development Report finds that only 30% of capital needs for small firms is financed from external sources, while this figure is close to 50% for large firms. This is broadly true across all regions of the world (World Bank, 2004).

Several barriers constrain access to external finance: lack of collateral to pledge against loans, banks' unwillingness to lend to risky businesses or smaller entities, wedges created due to costly evaluation processes for loans, problematic tax payment reports, unsound business plans, and the impact of asymmetric information on lending rates. Studies reveal that small and medium enterprises (SMEs) are more financially constrained than larger firms and are less likely to have access to formal finance (e.g. Calomiris and Hubbard, 1990; Beck et al., 2006). This inequality in access is more acute in the case of developing countries (e.g. Beck et al., 2005, 2006a). Moreover, even when accessing financing through informal markets or trade credits, the cost of these loans can be substantially higher (e.g. Tang, 1995; Malesky and Taussig, 2009). For instance, the top five banks serving SMEs in non-OECD countries reach only 20% of formal micro enterprises and SMEs, and this figure is as low as 5% in Sub-Saharan Africa. In emerging

[1] Representative papers for innovation and investment include Hubbard, 1998; Carpenter et al., 1998; Guariglia, 2000; Benito, 2005; Kerr and Nanda, 2015; for entrepreneurship, Klapper et al., 2006; Alfaro and Charlton, 2006; Aghion et al., 2007; Midrigan and Xu, 2014; for participation in international trade, Greenaway et al., 2007; Berman and Hericourt, 2010; Chaney, 2013; Manova, 2006; and for growth in GDP and productivity, Beck et al., 2000; Arcand et al., 2012; Levine, 2005; Beck, 2008; Demirguc-Kunt and Maksimovic, 1998; Rajan and Zingales, 1998; Beck et al., 2007. Important theoretical literature evaluates the interplay between financial constraints and entrepreneurship (e.g. Stiglitz and Weiss, 1981; Evans and Jovanovic, 1989; Lloyd-Ellis and Bernhardt, 2000) and firm growth (e.g. Albuquerque and Hopenhayn, 2002).

economies, about 60% of SMEs that need a loan are unable to obtain one due to various constraints (Dalberg, 2011).[2]

A number of studies have investigated the determinants of firms' access to banking finance.[3] These studies reveal that the human capital of a firm's management (e.g. education, age, work experience, social background) critically impacts the probability of obtaining credit from banks (e.g. Storey, 2004; Kumar and Francisco, 2005; Irwin and Scott, 2010). The size of the firm also influences credit-worthiness by affecting the availability and transparency of financial information,[4] the ability to offer collateral (e.g. Berger and Udell, 1995) and the risk perception of the lender (e.g. Schiffer and Weder, 2001). All these factors make it more difficult for smaller firms to borrow. Multiple studies in developing economies show a strong and positive association between a firm's age and access to credit, as survival works to lower uncertainty, boost information, and increase accumulated assets that could potentially be offered as collateral (e.g. Aryeetey et al., 1994; Levy, 1993). Further, research confirms that ownership and legal structure also influence access to external credit in the sense that listed firms and foreign-owned firms face weaker financial constraints (e.g. Harrison and McMillan, 2003; Beck et al, 2006b; Storey, 1994). Among other firm characteristics, studies reveal that firm productivity is positively associated with greater access to credit (e.g. Bigsten et al., 2000; Topalova, 2004).

The industry sector of a firm can also be important in affecting access to finance. For instance, finance-dependent or capital-intensive industries such as textiles seem to grow more rapidly in countries with greater financial development or that are otherwise constrained (e.g. Rajan and Zingales, 1998; Levine, 2005; Kumar and Francisco, 2005; Byiers et al., 2010). By contrast, firms in service industries may find it harder to access finance because they do not have enough assets (capital, machinery, land) to pledge as collateral against the loan (e.g. Silva and Carreira, 2010) due to the human capital-intensive nature of these firms.

[2] In this regard, credit information sharing systems and reforms relating to credit bureaus and credit registries could be helpful. See Peria and Singh (2014) for one such study.

[3] For a cross-country study on households' access to financial services see Beck et al. (2008)

[4] Sacerdoti (2005) and Allee and Yohn (2009) assert that firms with audited financial statements have a higher probability of getting credit. Uchida (2008) finds that firms that are audited regularly have a higher probability of obtaining loans in the United States, although not so in Japan.

Studies also find that the spatial location of firms affects access to credit. Banks may be reluctant to lend to small firms located in rural areas, as the collateralized assets may have less market value or property titles may not be not legally secure (e.g. Keeble, 1990; O'Farrell, 1990; Kumar and Francisco, 2005). On the other hand, government programs often seek to promote businesses in rural regions, which may raise the probability of obtaining bank finance in disadvantaged regions (e.g. Rand, 2007).[5]

In our work, we particularly underscore the importance of land as useful collateral in obtaining access to credit. Several proxies for collateral are used in the literature: land, plants and machinery, and inventories (e.g. Bennett and Donnelly, 1993; Bhaduri, 2002; Kumar and Francisco, 2005). Land is the strongest form of collateral, both in terms of the share of firms using it and the amount that can be lent against it. Minh Le (2012) documents that more than 72% of firms in Vietnam use land and buildings as a guarantee, while machinery and equipment and personal assets were used only in about 50% and 36% of cases, respectively.[6] Ceteris paribus, research suggests that firms with more intangible assets borrow less, vis-à-vis firms with more tangible assets, because of the collateral factor (Johnsen and McMahon, 2005). Collateral requirements can have a significant impact on access to credit in low-income areas (Swaminathan, 1991).[7]

In sum, research confirms that bank financing is facilitated if secured by collateral (Storey, 1994; Berger and Udell, 1998). Nonetheless, in periods of financial crisis when the value of property crashes, the loans guaranteed by land or buildings are more likely to be at risk. Taking such possibilities into account, the lender frequently underestimates the collateral value and in most cases offers a loan for less than the value of the collateral.[8] For example, in South Africa, 70% of firms have to post collateral to secure loans, of which 60% use more than one type of collateral.

[5] Government policy on monetary regimes and expansions as well as changes in business cycles may also have an impact on access to finance. For instance, Kashyap et al. (1993, 1996) examine the impact of monetary policy actions on the financing mix of firms.
[6] This study finds that even small firms offer land as collateral in over 70% of the cases, while it is mainly large businesses that can borrow against plants and machinery and other personal assets, since smaller firms do not have such accumulated wealth.
[7] Wealth-biased access to credit may restrict low-wealth households from participating in a country's economic development, producing unbalanced growth (Binswanger and Deininger, 1997; Carter et al., 1994).
[8] In the case of household loans, collateral plays a much smaller role in determining creditworthiness relative to traditional banking approaches (e.g. Johnston and Morduch, 2008).

These include land and buildings, machinery and equipment, and personal assets. Unacceptable collateral is often the primary reason for denial of loan to micro and small firms, respectively, in 31% and 39% of cases (World Bank, 2010).

The issue of access to finance has been widely studied for India, especially with regard to significant policy changes it has experienced over the last decades (e.g. Besley et al., 2007; Ayyagari et al., 2013, 2014). Specifically, two of these policy changes include: (i) the expansion of rural bank branches across Indian states during 1977 to 1990 and concomitant changes in financial breadth and outreach, and (ii) the massive financial sector liberalization reforms of 1991.[9] These studies mainly explore the impact of increased financial depth and breadth on poverty (e.g. Burgess and Pande, 2005; Ayyagari et al., 2013) by emphasizing the entrepreneurship channel. Such studies contend that financial deepening primarily facilitates the operations of the self-employed in rural areas and hence leads to a decline in poverty. Ayyagari et al. (2014) however show some limits of financing's impact for Indian business growth.

Banerjee and Duflo (2014) compare the impact of a directed credit policy change in 1998 on firms that became eligible for such a program but lost eligibility as a result of the reversal of this reform in 2000, relative to smaller firms that were already eligible for the preferential credit before 1998 and remained eligible in 2000. Their work finds no evidence that directed credit was used as a substitute for other forms of credit but was instead used towards more production. In fact, firms that became eligible for this credit had higher rates of growth, but this trend was reversed with the withdrawal of the policy. Their results thus confirm that many Indian firms must have been severely credit constrained, and that the marginal rate of return to capital was very high for these firms.

Access to finance has also been linked to the extent of informality.[10] Following the seminal work by Rajan and Zingales (1998), cross-industry variation in the need for external finance has been

[9] The Reserve Bank of India instituted a 1:4 licensing policy whereby commercial banks in India had to open four branches in rural unbanked locations for every branch opening in an already banked location. Such a policy led to a significant increase in rural bank branches in financially less-developed states, while the reverse was true after 1990.
[10] See Boadway and Sato (2010), Straub (2005) and Beck et al. (2014) for a more detailed exposition. Additionally, La Porta and Shleifer (2014) use World Bank Enterprise Surveys to demonstrate high levels of informality in developing countries. Their findings suggest that operations in 44% of informal enterprises are constrained by

exploited to investigate the impact of a variation in financial sector development on the incidence of informality and productivity differences between the formal and informal sectors in India (Beck and Hoseini, 2014; Beck et al., 2014). This work finds that better access to financial services helps reduce informality in India by increasing transparency and enhancing productivity.

Besides India, access to finance in other developing countries has been noted to constrain development. For instance, in Vietnam, private enterprises contributed to 40% of GDP but obtained only 13% of the lending capital due to lengthy lending procedures, corruption, lack of adequate collateral and high interest rate (Minh Le, 2014; Rand et al., 2009). In Sri Lanka, entrepreneur characteristics, firm characteristics and financial characteristics seem to constrain the use of bank credit (Pandula, 2011). Anecdotal evidence on micro-credit suggests that better access to finance promoted growth of small businesses in the Philippines, Indonesia, Senegal, Nicaragua, Kenya, Argentina, and the Kyrgyz Republic (Robinson, 2001), although the role of collateral in these transactions has not been significant. Johnston and Morduch (2008) and Takahashi et al. (2010) provide evidence on Indonesia.[11]

Some evidence on developed countries reveals that firm characteristics may not be pivotal in access to finance for firms. For instance, in the case of Spain, firms are more dependent on short-term non-bank financing (such as trade credit) as opposed to bank financing. This type of external finance does not depend much on a firm's traits (Gonzalez et al., 2007). Nonetheless, for long-term loans, studies in several countries confirm that access to external financing, whether from banks or non-banks, is affected by the nature of borrowing firms' bank relationships and collateral (e.g. Jiménez et al., 2006; Jiménez and Saurina, 2004; Chakraborty and Hu, 2006; Berger and Udell, 1995; Harhoff and Korting, 1998; Niskanen, 2010; Hyytinen and Pajarinen, 2008; Woordeckers and Steijvers, 2006). [12]

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access to finance, while only 21% and 14% of small and large formal enterprises, respectively, report finance as a top constraint.

[11] A substantial number of both Lakota Fund micro-entrepreneurs and small business owners report having insufficient collateral to seek a bank loan for their business (Pickering and Mushinski, 2001).

[12] The collateral channel also figures prominently in research studying regional changes in real estate prices. An increase in the value of real estate can potentially facilitate better access to credit markets because a higher value of the collateral can be pledged to the bank and may therefore boost the willingness of banks to lend (e.g. Mian and Sufi, 2011; Chaney et al., 2012; Kaas et al., 2014). Another set of studies consider the extent to which booming real estate sector significantly activates entry into entrepreneurship and job creation (e.g. Harding and Rosenthal, 2013; Adelino et al., 2013; Kerr et al., 2015).

In conclusion, access to finance and its determinants have been studied in reasonable depth in the literature, and multiple sources emphasize the importance of collateral requirements in obtaining external finance. Despite this progress, the overall allocative efficiency of loans is under-studied. Most research on financial allocations is concerned with the issues of financial deepening versus allocation and the impact thereof. Our paper is concerned with the extent of misallocations in access to finance for establishments across India and how this misallocation is deepened due to inefficient allocation of land. We correlate this misallocation in access to external finance with that found in Duranton et al. (2015) on misallocation in ownership and use of land and buildings, since the latter asset works as collateral in appropriating access to finance.

In conducting this work, we are also mindful that there could be reverse causality as well. For instance, literature suggests that inefficiencies in access to finance could also lead to distortions in factor markets such as land, labor, or other productive inputs. Said differently, without access to finance, a business may inefficiently alter its use of land for production, rather than vice versa. Likewise, lower access to credit markets can push firms experiencing a negative shock to exploit other mechanisms, such as liquidating assets with high long-term returns, to resolve their financing problems (Barrett, 2007). Below, we consider an instrumentation strategy to help with these issues, recognizing our assembled evidence is not yet foolproof in this regard.

3. Data

We use the same firm-level information as much of the prior research on the Indian economy, including Ghani et al. (2014) and Duranton et al. (2015), which this section builds on.

This project draws upon five surveys from two major sources of data: the Annual Survey of Industries (ASI) and National Sample Survey Organization (NSSO). ASI is a survey of the organized sector undertaken annually by the Central Statistical Organization, a department in the Ministry of Statistics and Program Implementation, Government of India. Under the Indian Factory Act of 1948, all establishments employing more than 20 workers without using power or 10 employees using power are required to be registered with the Chief Inspector of Factories in each state. This register is used as the sampling frame for the ASI. The ASI extends to the entire country, except the states of Arunachal Pradesh, Mizoram, and Sikkim and the union territory (UT) of Lakshadweep.[13]

ASI is the principal source of industrial statistics for the organized manufacturing sector in India. It provides statistical information to assess changes in the growth, composition, and structure of the organized manufacturing sector, comprising activities related to manufacturing processes, repair services, gas and water supply, and cold storage. As noted in Ghani et al. (2012), organized manufacturing contributes the substantial majority of India's manufacturing output, while the unorganized sector accounts for the substantial majority of employment for Indian manufacturing workers.

Manufacturing activity undertaken in the unorganized sector, such as households (own-account manufacturing enterprises, or OAMEs) and unregistered workshops, is covered by the NSSO. Following the first Economic Census in 1977, small establishments and enterprises not employing any hired workers (i.e. OAMEs) engaged in manufacturing and repairing activities were surveyed on a sample basis in the 33rd round of the NSSO during 1978-79. Subsequent surveys covering OAMEs and Non-Directory Manufacturing Establishments (NDMEs) were conducted in the 40th and 45th rounds of the NSSO during 1984-85 and 1989-90, respectively. In 1994-95, a first integrated survey on unorganized manufacturing and repairing enterprises covering OAMEs, NDMEs, and DMEs was undertaken during the 51st round of NSSO. Subsequently, surveys of manufacturing enterprises in the unorganized sector were conducted in the 56th (2000-01), 62nd (2005-06), and 67th (2010-11) rounds.[14]

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[13] The sampling design followed in most ASI surveys is a stratified circular systematic one. All factories in the updated frame (universe) are divided into two sectors: Census and Sample. The Census sector is comprised of industrial units that belong to the six states/UTs that are less industrially developed: Manipur, Meghalaya, Nagaland, Tripura, Sikkim, and Andaman & Nicobar (A&N) Islands. For the rest of the states/UTs, the Census Sector includes (i) units having 100 or more workers and (ii) all factories covered under Joint Returns. All other units belonging to the strata (state x four-digit industry of the NIC-04 framework) having four or fewer units are also considered as Census sector units. Finally, the remaining units, excluding those of Census sector, called the Sample sector, are arranged in order of their number of workers and samples are then drawn circularly and systematically, considering a sampling fraction of 20% within each stratum (state x sector x four-digit industry) for all states. An even number of units with a minimum of four are selected and evenly distributed in two sub-samples.

[14] The surveys on unorganized manufacturing enterprises usually covered: (a) manufacturing enterprises not registered under Sections 2m(i) and 2m(ii) of the Factories Act of 1948; (b) manufacturing enterprises registered under Section 85 of the Factories Act; (c) non-ASI enterprises engaged in cotton ginning, cleaning, and baling (NIC-

The survey years from both organized and unorganized sectors that are included in our study are 1989-90, 1994-95, 2000-01 and 2005-06. Additionally, 2009-10 data from the ASI for the organized sector is included, while 2010-11 data from the NSSO for the unorganized sector is also incorporated. For the sake of simplicity, we normally refer to the sample year by the starting year—for instance, the sample survey in the year 2005-06 is referred to as the 2005 survey. We likewise use 2010 to refer to the years 2009-10 for ASI data and years 2010-11 for NSSO data. As depicted above, the NSSO data provide the maximum possible coverage in terms of included years for the unorganized sector. Our development procedures below seek to address changes in the internal organization of surveys, as well, to the extent they exist.

Establishments in both the organized and the unorganized sectors provide information on their financial loans, if any. For the organized sector, we have information on opening and closing values of outstanding loans as well as the overdraft, cash credit, and other short-term loans from banks and other financial institutions. For our purposes, we consider the closing values of these variables. We also have information on the interest paid on these loans.

For the unorganized sector, we theoretically have more detailed information vis-à-vis the organized sector. For some rounds, information on loans is available from the following sources: (i) institutional sources (data separately available for central- and state-level term lending

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2004, code 01405); and (d) non-ASI enterprises manufacturing bidis and cigars (those registered under bidi and cigar workers (condition of employment) Act of 1966, as well as those un-registered). Some of the surveys (such as 2010-11) covered trading enterprises and service establishments, but we exclude them for the purposes of our paper. Additionally, the NSSO excluded: (a) repairing enterprises not falling under Section D of NIC-2004; (b) departmental units, such as railway workshops, RTC workshops, government mints, sanitary, water supply, gas, storage, etc. in line with ASI coverage; (c) units covered under ASI; and (d) public sector units.

As for the sample design in the unorganized sector, a stratified multi-stage design has been adopted. The first stage units (FSU) are the census villages in the rural sector and Urban Frame Survey (UFS) blocks in the urban sector. The ultimate stage units are enterprises in both sectors. In case of large FSUs, one intermediate stage of sampling is the selection of three hamlet-groups/sub-blocks from each large rural/urban FSU. Two frames were used (as per the 62nd round survey): the List frame and the Area frame. The List frame was used only for the urban sector and that too for selection of manufacturing enterprises only. For unorganized manufacturing enterprises, a list of about 8000 big non-ASI manufacturing units in the urban sector prepared on the basis of the data of the census of manufacturing enterprises conducted by Development Commissioners of Small Scale Industries in 2003 was used as list frame for surveys in 2005-06 and 2010-11. Area frame was adopted for both rural and urban sectors. The list of villages as per the 2001 census was used as the frame for the rural sector, and the latest available list of UFS blocks was used as frame in the urban sector. The relevant year's economic census was used as frame for the towns with population 10 lakhs or more (as per Census 2001).

institutions), government (central, state, and local bodies), commercial banks, co-operative banks and societies, and micro-finance institutions; (ii) other institutional agencies; (iii) money lenders; (iv) business partners; (v) suppliers and contractors; (vi) friends and relatives; and (vii) others. In these rounds, the information on interest payment is also very detailed.

However, not all NSSO survey rounds provide such detailed information. For instance, only later rounds of the NSSO survey (specifically, the 56th, 62nd and 67th) include loan information from business partners and suppliers, while different sets of institutions are included in earlier NSSO rounds. Therefore, to maintain consistency of information across all years and with the organized sector, we combine all institutional and other agency sources into one group, while loans from business partners and suppliers is grouped into the "others" category. In sum, we have the following categories in sources of loans and interest payments for establishments in the unorganized sector:

- Institutions and other agencies
- Money lenders
- Family and friends
- Others (including partners, contractors and others)

Appendix Tables 1 and 2 describe the detailed financial access data fields in the ASI and NSSO across the various survey years considered in our study. The two-digit industries and the basic traits included in our work are described in Appendix Table 3.

Establishments in both the organized and unorganized sectors (which broadly capture the difference between formal and informal sectors) provide information on the value of the land and buildings that they own. Although both sectors provide this information, only the organized sector offers the distinction between land and buildings consistently for all the survey years under consideration. For the unorganized sector, this separation between land and buildings stopped after the 56th round of NSSO survey in the year 2000.

Not all plants own the land that they operate on. Thus, in both the organized and the unorganized surveys, the questionnaire asks plants to also provide information on the rent paid for land and buildings. The unorganized sector goes a step further and also requires establishments to report the value of the land and buildings that they hire. The downside, however, is that the NSSO survey does not consistently distinguish between the value of rented land and buildings across rounds. Additionally, the organized sector provides information on the rent received for land and buildings, but this information is provided only for the years 2000, 2005 and 2009.[15]

For the organized sector, the survey collects information on the value of land and buildings separately. The survey provides data on opening value, closing value, gross value, depreciation, and so on for land and buildings. Closing net value of land and buildings is taken as the value of land and buildings owned. To obtain the value of the total land and buildings owned by plants in the organized sector, we simply sum the separate values of land and buildings. For the unorganized sector, the NSSO survey consistently provides information on the market value of land and buildings for all survey rounds. As noted earlier, the survey provides this information for land and buildings separately only for the 45th and 51st rounds. Thus, for the unorganized sector, we always consider land and buildings together.

It is noteworthy that many of the plants in the organized and the unorganized sector do not own land and/or buildings; they simply rent it. In such cases, we need to impute the value of land and buildings rented by plants. Fortunately, the unorganized sector survey provides information on the value of rented land and buildings, alongside the rent that these plants pay. As noted, this information is available separately for land and buildings for the 45th and 51st rounds.

Duranton et al. (2015) describe many data preparation steps for our misallocation metrics with respect to inputs that we do not repeat here. The final sample that we work with for our base productivity and misallocation metrics consists of 145,174 plant-level observations from the organized sector and 569,858 observations from the unorganized sector. Our sample restrictions are not very significant in terms of economic activity. The resulting panel accounts for over 95% of plants, employment, and output in the manufacturing sector throughout the period of study.

[15] Appendix Tables 1a and 1b of Duranton et al. (2015) provide details and the exact wording of the questions pertaining to land and building values that appear in the respective survey questionnaires.

4. Measuring misallocation and Total factor productivity

Misallocation Measures

Firm heterogeneity is now well known in the economics literature (Fox and Smeets, 2011; Syverson, 2011). For instance, the productivity of the firm at the top decile is perhaps five times as high as that of the firm at the bottom decile in India or China (Hsieh and Klenow, 2009). This distribution of firm productivity within a given industry, however narrowly defined, need not be inefficient (Lucas, 1978). However, what matters more for efficiency is the distribution of factors across firms of varying productivity. It is widely believed that more productive firms should use more factors and produce more. Otherwise, equilibrium aggregate output may potentially be enhanced by some reallocation of the factors of production from a less-productive to a more-productive firm. Thus, the ranking of firms by factor usage should reflect their relative productivity ranking and hence be perfectly correlated under optimum allocation. Conversely, a less-than-perfect correlation between productivity and factor usage indicates a misallocation of factors across firms. The lower this correlation between productivity and factor usage, the greater is the extent of misallocation of factors of production.

Using the above insight, Olley and Pakes (1996, OP hereafter)[16] measured the efficiency of factor and output allocation using the covariance between firm productivity and the use of one factor of production or output. This measure of allocation is equal to the difference between weighted and un-weighted productivity, where the weights are the firm shares of the factor under consideration. Depending on the factor used to measure firm shares, we can build measures of misallocation for output, value added, labor, land, land and buildings, financial loans, fixed assets and so on. As in Duranton et al. (2015), we compute the OP measure of misallocation that allows us to explore how various measures of misallocation are related to each other and which ones matter for financing outcomes. Appendix Box 1 provides a mathematical formula, and Duranton et al. (2015) offer greater details with a formal framework and methodology for computing the index.

[16] The OP measure of allocation efficiency – sometimes referred to as the OP decomposition – has been widely used to explore a variety of issues such as, originally, changes in factor allocation in the telecom industry after deregulation (Olley and Pakes, 1996), the effects of structural reforms in developing countries (Eslava et al., 2006), productivity differences across countries (Bartelsman et al., 2013), or the role financial institutions in factor allocation (Midrigan and Xu, 2014).

There are some other available measures of the efficiency of factor allocation across firms. These include the Hsieh and Klenow (2009) metrics that measures the efficiency of factor allocation across firms through dispersions in observed firm productivity. Unfortunately, the Hsieh and Klenow approach offers only one general measure of misallocation and does not allow us to distinguish between output and factor misallocation or identify differences in misallocation among factors. To evaluate the effects of misallocation, we take a regression-based approach which we contrast with the model-based approach of Hsieh and Klenow (2009) and others.[17]

As in Duranton et al. (2015), we compute an index of misallocation for each Indian district for the organized and unorganized sectors separately. The indices of misallocation for output, value added, and factors of production are computed individually for factors such as labor and the extent of financial loans. These measures of misallocation are then used in various district-industry level regressions that seek to examine both the determinants and the implications of misallocation, especially how the misallocation in access to finance is linked to the misallocations in land and buildings and labor found in Duranton et al. (2015).

This approach for computing misallocation metrics in the way described above has two broad concerns discussed in Duranton et al. (2015). First, the OP measure of misallocation, although intuitive and informative, is not structural. Duranton et al. (2015) describe how this sort of work is a necessary reduced-form step towards the development of better models of misallocation. The empirical depictions are also directly useful for policy purposes. Second, in our measure, misallocation for the entire district and in aggregate across firms is computed from different industries with varying levels of factor intensity. Therefore, it is difficult to interpret the magnitude of the index because, for instance, it is not immediately obvious that the lower-productivity firm in the more capital-intensive sector should be using less capital than the more-productive firm in the less capital-intensive sector. Because of the way misallocation index is aggregated across firms in a given district, Duranton et al. (2015) explains, this could lead to an overstatement of true levels of misallocation.

[17] This alternative approach has also been widely used. See Restuccia and Rogerson (2013) for a discussion. We note in particular the work of Adamopoulos and Restuccia (2014) and Restuccia and Santaeulalia-Llopis (2014).

To deal with these concerns, we compute a baseline misallocation index that sums industry-level misallocation across all industries within a district, weighting each industry by its corresponding local share of manufacturing activity. This measures the extent of misallocation within an industry in a given district. Intuitively, total misallocation in a district should be the sum of within-industry misallocation and the misallocation across the industries in a given district. Appendix Box 1 provides a simple formula for computing this index while Duranton et al. (2015) offer more details on a formal methodology and derivation.

To compute the baseline district level misallocation of labor, for instance, employment misallocation at district-industry level is summed across industries using the employment share of industries in the district as weights. This is the within-industry component of misallocation in a district. Further, we add the between-industry component by looking at the deviation of the average productivity in a given district-industry cell relative to the average district productivity. This is weighted by the deviation of the employment share of industries in the district from the average number of firms in the district-industry cell relative to that in the district. This measure, however, can only be meaningfully implemented in larger districts, and by ignoring any systematic misallocation taking place across sectors.

Estimating Total Factor Productivity

To compute the indices of misallocation defined above, we need a measure of firm productivity. Since productivity is not directly observed, it is usually estimated as a residual measuring the ability of a firm to produce conditional on the input it uses. There are two main issues associated with this approach. First, we measure the revenue that a firm receives, not the physical quantity of output it produces. Even if the number of units produced is observed, it is unclear what this measure means in most industries given that product quality is highly heterogeneous. So while we are able to observe the ability of firms to generate revenue, we are not able to observe their ability to produce a quantity and a quality of output. Following prior literature (Foster et al., 2008), we call the productivity residual that we estimate TFPR, which stands for revenue TFP. The worry here is that technological productivity can be confounded with market pricing power. Under some conditions, TFPR can be directly linked to the marginal revenue of the firm (Hsieh and Klenow, 2009). At the (efficient) competitive equilibrium, the marginal product should be equalized across firms. Hence, the very dispersion across firms that we measure through TFPR is a measure of misallocation.

The second important estimation issue with production functions relates to the endogeneity of inputs. Any firm-specific demand or productivity shock will affect both the residual of the production function estimation and the demand for factors of production. This endogeneity of input choices has received much attention since Olley and Pakes' (1996) seminal work. In our work below, we follow the approach subsequently developed by Levinsohn and Petrin (2003) (LP), who rely on the use of intermediate inputs, in particular energy consumption, to detect demand and productivity shocks. The key idea that underlies this approach is that demand and productivity shocks will affect energy consumption but not capital, which is decided before those shocks are known. The main implementation problem is that the LP estimation of productivity requires a panel of firms which is unavailable to us from the ASI and NSSO surveys in the version with district identifiers. Using information for firms in the same location and industry, we can nonetheless implement an approach in the same spirit as LP that only requires information from repeated cross-sections. This approach was initially developed by Sivadasan (2009). We follow Duranton et al. (2015) in appropriately tailoring this TFP measure to our specific needs, and Appendix Box 2 provides the details of this methodology.

5. Results

Some Facts about Access to Finance in Indian Manufacturing

Panel A of Table 1a reports the detailed observation counts in organized and unorganized sectors by urban and rural locations. Summing over surveys, a total of 169,754 plants in the organized sector and 651,808 plants in the unorganized sector report their urban or rural locations. In Panel B of Table 1a, we apply sampling weights to the plants and estimate that the organized sector has a combined population-level establishment count of 490,309, while the unorganized sector has a plant count of 76,694,603.

Panel B suggests that, on average over the 1989-2010 period, about 66% of plants in the organized sector are in urban areas versus 29% in the unorganized sector. Over the years, the share of urban plants in the organized sector has declined from 72% in 1989 to 62% in 2010, while that in the unorganized sector has increased from 21% in 1989 to 42% in 2010. This finding that the organized sector is de-urbanizing while the reverse holds for the unorganized sector has been explored in much detail in Ghani et al. (2012). Appendix Table 4 presents more details on the share of plants in urban and rural regions across the two sectors.

In Panels C and D of Table 1a, we document the share of plants recording access to external finance, while Panel E presents the district count for each year where a positive value of loans is observed across the two sectors. Access to finance is assigned a value of one for an organized sector plant if it has non-zero value of an outstanding loan, whether short term or long term, in the form of overdraft or otherwise. The binary variable also assumes the value one when the plant reports paying interest on loans. In all other cases, the access variable is assigned a value of zero. For the unorganized sector, we assign a value of one for a plant accessing external finance if there is an outstanding loan from money lenders, family or friends, or institutions, or if interest is reported being paid to any category of these lenders.

Panel C considers observation counts for the surveyed plants, while Panel D applies sampling weights in computing the shares. Panel D suggests that irrespective of urban or rural locations, on average over the period 1989-2010, about 90% of plants in the organized sector accessed the external credit market, while only 8% of plants in the unorganized sector were able to take advantage of financial loans. Taking the two sectors together, an average of 8% of establishments over the 1989-2010 period utilized financial loans. The percentage of plants accessing financial loans is slightly less in rural areas than in urban areas.

Thus, an average of only 8% of Indian manufacturing establishments over the 1989-2010 period report financial loans, but this average masks huge sectoral differences. Irrespective of the urban/rural location, the share of plants accessing external loans in the organized sector increased from 85% in 1989 to 89% in 2010, as shown in Panel A of Figure 1. By contrast, Panel B of Figure 1 shows a decline from 10% to 6% for the unorganized sector during the same period. This trend appears consistent with the documented rise in one-person enterprises within the informal tradables sector (Ghani et al, 2015). Micro-enterprises in the unorganized sector grew from 6% of the informal sector workforce in 1989 to 21% by 2010 and may account for the depressed loan shares in the informal sector over our study period.

Table 1d shows the breakout of the unorganized sector by one-person plants vis-à-vis larger unorganized plants.[18] Panel A shows the raw observation count of one-person and larger plants, while Panel B applies sampling weights to these observation counts. The latter panel suggests that the share of one-person plants in the unorganized sector has increased steadily from 32% in 1994 to 57% in 2010. Panel C shows the share of plants reporting access to financial loans without applying sampling weights, while Panel D uses sample weights. The share of one-person plants reporting access to financial loans is considerably lower than larger plants, and we see this gap widen with the recent explosion in one-person firms. The sample shift towards one-person firms plays an important role in the financial trends observed for the unorganized sector.

Table 1b reports some descriptive statistics for misallocation indices for Indian districts. Given the background of Table 1a, we focus our empirical analysis on the misallocation of financial loans in the organized sector only. While it is certainly feasible to estimate misallocation for loans across the informal sector as well, we hesitate to do so given the small fraction of unorganized businesses reporting loans – which would translate into the majority of observations having zero shares for this input. It seems prudent to instead start with the organized sector and its well-populated and mostly non-zero financial loan data, given our understanding of the misallocation metrics in this setting, and then expand outward in future work.

Panel A of Table 1b shows the average misallocation metrics using our baseline computation of misallocation at the district-industry level but aggregated to the district level using the shares in the concerned factor. Panel B shows descriptive statistics using the misallocation metric calculated from LP-Sivadasan style TFP but without the industry aggregation step, while Panel C uses OLS TFP to compute the misallocation index. When interpreting Table 1b, it is important to recall that higher numbers indicate greater misallocation.

There are two points of Table 1b that are worth highlighting. First, access to external finance in the organized sector started with lower misallocation in 1989 vis-à-vis land and buildings and

[18] In most analyses we assign a 0.5 value for part-time employees when calculating total employment of a plant. For this exercise, we assign a plant with one employee, whether full time or part time, as a one-person firm.

labor, but over time the extent of misallocation in access to finance has increased more than for these other inputs. In fact, the gap between misallocation in output (not shown in the table) and access to external finance also seems to have widened over the last two decades. Second, the extent of misallocation in land and labor inputs for the combined organized and unorganized manufacturing is lower than that in organized manufacturing. This is a natural consequence of the substantially lower productivity and input shares for unorganized sector firms compared to organized sector businesses.

Table 1c reports the correlation across the misallocation indices for financial loans, land and buildings, and labor for our baseline metrics for each of the survey years. For each year, there is a very strong correlation between financial loan misallocation in the organized sector and that of land and buildings and labor in the organized sector. The extent of within-sector correlations, as expected, is larger with land and buildings vis-à-vis labor. When both organized and unorganized sectors are pooled to compute the misallocation metrics, the correlations of misallocation in financial loans and other inputs are much lower. We also note that over time the within-organized-sector correlation of misallocation in finance with labor has only marginally changed, while that with land and buildings dropped considerably between 1994 and 2005.

Figure 2 shows that long-term shares of plants in access to external loans are linked to the state's development level. The horizontal axis in all panels is state GDP per capita in 2000-01 (constant prices; 1999-2000 series in Rupees). The vertical axis in Panels A and B is the average share of plants in the state that have reported financial loans, split by sector. Exact values for each data point are included in Table 2b. There is a clear positive relationship, with share of plants accessing loans being higher in leading states, especially for the unorganized sector. By contrast, Panels C and D present the change in shares from 1989 to 2010 for each state, split by sector, and we do not find any clear association with the development level of the state.

Table 2a disaggregates the raw aggregate establishment count in the two sectors by 28 states and union territories (UTs). The table also shows the total share of plants that have access to external finance in each of these states/UTs after sample weights have been applied. Some UTs, such as Chandigarh and Pondicherry, and larger states like Maharashtra show important depth of financing for manufacturing firms, with about 15% of plants accessing external credit markets for their finance needs in Maharashtra. At the other extreme are states like Bihar and Manipur, where this figure is only 5%.

Table 2b splits the share of plants having access to external finance in each state by organized and unorganized sectors across the five years of data available for our study. The table suggests that on average over the period 1989-2010, states like Gujarat, Punjab, Haryana and Rajasthan enabled access to financial loans for over 95% of the organized sector plants, while Maharashtra and Himachal Pradesh score higher (14% share for each) in facilitating borrowing for unorganized sector plants. States like Bihar and Manipur perform poorly in providing external credit support for both the organized and unorganized sectors. For instance, the share of organized and unorganized plants borrowing from an external credit market in Bihar is 58% and 5% for the respective sectors.

Nationwide, the percent of plants having access to financial loans over the period 1989-2010 has increased for the organized sector (an average of 0.27% per annum) while it declined for those in the unorganized sector (an average of 0.2% per annum). The increase in access to formal credit in the organized sector is mainly driven by a few states like Andhra Pradesh, where access increased tremendously (an average of 1.7% per annum). For most states, such as Haryana, access to finance for organized plants remained broadly stable, while it declined in a few states like Rajasthan (an average of 0.16% per annum). For the unorganized sector plants, access to credit has declined the most in Himachal Pradesh (from 35% in 1989 to 4% in 2010, a decline of an average of 1.47% per annum) while the increase came about only sluggishly in a few states, such as Andhra Pradesh (an average of 0.09% per annum).

Table 3a presents the breakdown of plant count by two-digit industry and their respective shares in accessing the external loan market for each of the five survey years used in our study. The table helps understand whether specific industries are more likely than others to access financial loans. In industries such as “Office, accounting and computing machinery”, “Medical, precision and optical instruments, watches” and “Motor vehicles, trailers and semi-trailers”, where over 90% of the plants belong to the organized sector, the average share of plants having access to external credit is the highest (over 36% in each). However, it is also noteworthy that this share has been declining over the years during our study period. At the other end of the spectrum are industries producing “Tobacco products”, “Wood and wood products” and “Paper and paper products”, which have the lowest access shares (averaging about 1% in tobacco and 6%-7% in the other two).

Table 3b splits the shares of plants having access to financial loans by organized and unorganized sectors within the two-digit industries of Indian manufacturing. The table suggests that, regardless of the sector, manufacturers of computers, medical instruments and motor vehicles are among the industries with the highest share of plants accessing financial loans. For example, 92% of the organized plants and 35% of the unorganized plants in the medical instruments industry borrow from the external credit market. Conversely, plants in the tobacco and wood products industries, irrespective of the sector, are less likely to borrow. For instance, only 44% of organized plants and 1% of unorganized plants in the tobacco industry have financial loans. By contrast, for some industries, the organization of sector matters. For example, the share of organized plants accessing external finance in the paper industry is among the highest (95%), while the share for unorganized plants in the industry is among the lowest (5%).

Differences in financial loans partly reflect the nature of industrial production processes and chosen scale that makes some industries generally more likely to approach the credit market. However, Panel A of Figure 3 shows that the organized sector’s financial loan penetration is not closely linked to the degree to which the output level of the industry is concentrated in the organized sector, while the unorganized sector shows a positive connection in Panel B. For both sectors, the change in financial shares shows a modest negative association with the organized sector’s share in output (Panels C and D).

Table 3c presents the share of organized sector plants having financial loans by rural and urban locations by industry. The table suggests that urban-rural location does not seem to determine access to financial loans for the organized plants in most industries. For example, the share of plants accessing external finance in the basic metals industry in urban and rural locations is among the highest (an average of 97% for each location during 1989-2010) while this share is among the lowest in the tobacco industry, irrespective of the location (an average of 49% in urban and 36% in rural). However, an exception to this is computer manufacturing where a gap of 93% versus 76% exists along urban-rural dimensions.

Table 3d presents some results on the value of financial loans relative to industry output and employment in the organized sector. “Office, accounting and computing machinery” and “Textiles” are two examples of industries where the average value of the loan-to-output ratio during the 1989-2010 period is over 0.5. Computer manufacturers also have a high loan-per-employee ratio during 1989-2010. At the other end of the spectrum is the tobacco industry where the average loan-to-output intensity during 1989-2010 is barely 0.1, and loans per employee is similarly low.

In sum, Tables 3b and 3d suggest that a larger proportion of plants in advanced industries access financial loans, and the relative value of these loans is also higher. An exception to this rule is the non-metallic mineral products industry where only 79% of plants access external credit but the extent of their loan-to-output ratio is 0.48. Given the high dependence of this industry on financial loans for plants that are able secure them, it seems that other plants in this industry may also be in need of external finance but are unable to obtain access.

Table 4a presents the share of organized plants having financial loans by their age cohort and two-digit manufacturing industry. We define young plants as those that are less than three years old, while incumbents are those that have been in operation for three years or longer. The table suggests that incumbents have a marginal advantage in accessing loans, with the national average share over the 1989-2010 period being 88% for incumbents and 86% for young plants. National differences are mainly driven by a few industries. For instance, in the tobacco industry, where the share of plants with access to external finance is the lowest, there is a stark difference in participation by incumbents and young plants. An average of 46% of incumbents in the tobacco industry successfully secured loans, while only 34% of young plants borrow from the external market. At the other end, young firms have greater loan shares in the publishing and printing industries, and to a lesser extent the paper industry. For most industries, however, the differences between incumbents and young plants are minimal with respect to financial loans.

Next, Table 4b shows financial loans among organized plants by the share of the value of land and buildings that are rented. Using the imputed values for land and buildings from Duranton et al. (2015), we categorize plants by whether the total imputed value of rented land and buildings is greater than 50% of the total value of land and buildings used for operations, labelled as "renter" and "owner". The table suggests that renters are slightly disadvantaged when it comes to accessing external credit markets. Nationally, an average of 91% of the owners versus 86% of renters accessed financial loans over the 1989-2010 period. This difference comes mainly from the non-metallic and mineral products industry where the average share of owner plants borrowing from the external credit market during 1989-2010 is 84%, compared with 68% in the renters category. In Table 3d, we noted that the average value of loan disbursements relative to output during 1989-2010 for this industry is 0.48. Thus, owners may be able to secure larger loans due to their ability to offer deeper collateral security.[19] By contrast, in industries such as tobacco products, where the access share is the lowest across both categories, a greater share of renters seem to borrow relative to owners. As noted in Table 3d, the value of loans for the tobacco industry relative to output is only 0.1, and thus, land may not really be useful or needed as collateral in obtaining loans. In general, for most industries, it does not make a substantial difference whether a plant is primarily an owner or a renter when it comes to accessing loans.

Table 4c further disaggregates the renter and owner plants into young and incumbent plants and presents their average shares in financial loans over the 1989-2010 period. The table suggests that on average, whether young or incumbent, owners have a slight advantage over renters in accessing the external credit market. While the differences between young and incumbent plants within the owners category is small (over 90% in each), by contrast, this difference is higher among renters. In the latter category, 82% of young plants accessed external finance, while this figure was 86% for incumbents. This result is mainly driven by the non-metallic and mineral products industry where the access share is only about 52% for young renters, while that of incumbent renters is 70%. For other industries, these differences are not as striking.

Financial Access Outcomes - The Impact of Misallocation in Input Markets

We now consider the relationship of land misallocation to financial loan access, primarily in the organized sector of Indian manufacturing. We use a set of seven outcome variables and describe

[19] This may not always be true. For example, in the office, accounting and computing machinery industry, where the average loan to output ratio is 0.55, renters have an advantage over owners in obtaining access to credit. There could be other features of plants in this industry that make the renters more attractive borrowers vis-à-vis the owners.

the effect of misallocation in input markets on access to external finance. We begin by defining the following outcome variables at a district-industry-year level:

(i) Total loan amount is defined as the sum of all plant-level outstanding long-term or short-term loans in a given district-industry-year cell.

(ii) Loan intensity is defined as the average total loans over total output in a given district-industry-year cell.

(iii) Misallocation in loans: Building upon Duranton et al. (2015), we obtain three distinct metrics for misallocation in loans that parallel our earlier work with other inputs. The simplest misallocation index of a factor is computed as the difference between the plant-level TFP and the average district TFP, weighted by the share of the plant in the given factor vis-à-vis the average establishment share in the district. Duranton et al. (2015) compare this factor misallocation index, labelled as the "without the industry aggregation step," with two other factor misallocation indices. Their preferred estimates, and our baseline approach in this paper, compute the factor misallocation index at the district-industry level and then aggregate to the district level, weighting the district-industry misallocation measure by the share of the given factor in a given district-industry cell. This measures the extent of misallocation within industries in a given district. Additionally, the misallocation of the district should also account for the between-industry misallocation. A formal framework and methodology for computation of misallocation is offered in Duranton et al. (2015), and Appendix Box 1 summarizes this methodology. In both the indices mentioned above, the LP-Sivadasan style TFP estimation is used. In a third version, the misallocation index is computed without the industry aggregation step and using OLS-based TFP rather than LP-Sivadasan style TFP.

(iv) Sum of absolute deviations in actual loans from expected loans: This and the next metric provide alternative approaches to OP metrics. To obtain this, we calculate predicted loan values from a regression of actual loan values as the dependent variable (in levels, retaining zeros) on total output, total employment, young plant indicator, urban indicator and state-year fixed effects. We do this separately for each two-digit industry using sample weights. Once the predicted value is obtained for each plant, we bottom code any negative expected values to be zero and winsorize the predicted values similar to our typical data development. We then calculate the absolute deviation of actual from expected loan values. These deviations are summed at district-industry level for each survey year. This measures how much loans differ from what would be expected based upon observable features. In an alternative specification, we also consider the average deviation in a district which is obtained by dividing the sum of absolute deviations in actual loans from expected loans with the total plant count in the district-industry cell. The latter specification helps us validate that our findings are not due to larger districts summing over larger plant counts.

Table 5a presents regressions to elucidate the factors that determine an effective demand for loans by each establishment. In principle, this should depend on a number of establishment characteristics, including ability to qualify for loans. Ability to offer collateral in the form of land and building holdings or other fixed assets can enhance borrowing potential. Evidence described in section 2, especially from developing countries, suggests land and buildings is the strongest form of collateral, both in terms of the share of firms using it and the amount that can be lent against it. Nonetheless, collateral in the form of plants and machinery is also helpful in obtaining loans to purchase complementary machinery or equipment. In the organized manufacturing sector for India, land and building values comprise 20-25% of an average establishment's asset values, while plants and machinery account for 50-60%. Thus, both land and building and plants and machinery or other fixed assets could potentially be offered as collateral against financial loans.

Using the log value of the total loans as dependent variable, we present the loan demand regressions in Table 5a. Although there are 169,754 plant observations for the organized sector, 137,343 plants have complete information for this analysis. All regressions in Table 5a include state-year and industry-year fixed effects. Column 1 pools owners and renters, while Columns 2 and 3 separate these groups. A renter is defined as an establishment whose value of hired land and building assets relative to its total holding of land and building value is higher than 0.1.[20]

Columns 1-3 suggest that output and employment levels, value of land and buildings on which a plant operates (irrespective of ownership), plant machinery holdings, and other fixed assets correlate strongly with loan usage. The coefficient for land and building usage is quite high compared to other assets given its share in total assets. Columns 2 and 3 suggest that land and building values relate much more closely to loan levels for owners of these assets compared to renters, which is to be expected. The importance of plant machinery and other fixed assets in establishing loans is slightly higher for renters, perhaps due to insufficient collateral in the form of land and building holdings.

District banking penetration also matters for an effective loan demand/supply. Columns 4-9 repeat these specifications by whether the district is above the median in terms of household banking facilities as measured in the 2000 Census. For the organized plants in districts with above-median banking penetration, land and building values comprise 22-26% of an average establishment's asset values depending on survey year; for below-median districts, this range is 14-19%. The sample split suggests that land and buildings are more important in settings where banking conditions are weak. This is evident in the combined regression of Column 4 and in the owner-renter split in Columns 5 and 6, compared to those for stronger banking markets. In the latter, land and building assets resemble much more plant machinery and other fixed assets, although the owner differential persists. We find similar patterns when splitting districts based upon terciles of banking access.

Table 5b illustrates how we calculate expected loan values for measuring overall loan misallocation. Compared to the estimations in table 5a, we remove asset holdings. While our complete procedure estimates loan access at the industry level, we pool industries and include industry-year fixed effects in this showcase regression. As in

[20] This cut-off is based on the distribution of the rentals shares for land and building. This distribution is fairly bimodal, mostly split between those who own almost all of their land and building assets and those who rent completely.

Table 5a, the dependent variable in these regressions is the log value of the total loans. We include 142,639 plants that have the necessary information, with this count dropping slightly when considering district covariates.[21]

The estimation table shows that the expected loan value of a plant depends positively on plant employment and output and negatively on the age of the plant and its urban status (conditional on the output and employment controls). Overall, these regressions explain about half of the variation in loan amounts. Columns 2-5 run various robustness checks on the base estimation. Column 2 controls for district traits, namely, population density, median manufacturing wage, urban share of district's organized manufacturing plants, minimum distance to the three largest cities (Delhi, Mumbai and Kolkata), percent of households with access to banking, and infrastructure composite index. The latter index measures the percent of villages in a district with access to telecommunications, power, paved roads and safe drinking water. Specifications in Column 3 control for district-industry fixed effects, while those in Column 4 include state-industry-year fixed effects. The last column drops sampling weights from the regression. The results across all specifications in Columns 1-5 remain broadly similar.

For our regressions, we also use the squared deviation of the actual loan values from the expected loan values. These are then summed to the district-industry level for each year.

(v) Share of loans for young plants is the total loan amount allocated to young plants relative to total loan amount in a given district-industry cell. This variable is used in both levels and log format.

Our baseline estimating equation is

[21] There are 152,743 plants that appear to access external finance, either by reporting their short-term loans, long-term loans, or interest payments. However, only 125,484 of these plants report the value of their loans.

$$Y_d = \beta_0 + \sum_f \beta_f M_{d,f} + \eta_{dk} + \eta_{sy} + \eta_{ky} + e,$$

where Y_d is the outcome variable from the set just described. $M_{d,f}$ is the misallocation index for district d and factor f, with the set comprised of land and buildings and labor. η are vectors of fixed effects used for our estimations, with the subscript d standing for district, k for industry, s for state, and y for year. Thus, we use district-industry, state-year and industry-year fixed effects in our base model.

In all our district-industry work, we standardize the explanatory variables reported in the tables to have unit standard deviation. The district count for which the dependent variable, financial misallocation index, is observed ranges from 320 in 2000 to 361 districts in 1994, leading to a total observation count of 15,862. However, we retain a consistent set of observations for which all the covariates, including district variables, are observed in a given year so that we can compare the coefficients across specifications. This leaves us with 14,852 observations over the five years of survey data. None of our results are impacted by this sample restriction. We cluster standard errors by district.

Tables 6a-8b have a mostly standard format. Column 1 shows the base estimation with controls for district-industry, state-year and industry-year fixed effects. In the base estimation, we consider the misallocation index of Duranton et al. (2015) that computes misallocation at the district-industry level and then aggregates it to district level using the share of the factor under consideration. Regressions are weighted by an interaction of the log value of the district's organized sector employment in the year 2000 with the log value of industry employment nationally in that same year.

Column 2 starts robustness checks by substituting district covariates for district-industry fixed effects (same set as Table 5b). Column 3 drops regression weights, Column 4 models state-industry-year fixed effects, Column 5 controls for log current employment in the given district-industry cell, and Column 6 considers a balanced panel of district-industry observations present in all five surveys. Column 7 repeats the base estimation when the misallocations in inputs are calculated using the LP-Sivadasan-style TFP directly at a district level, without the additional step of aggregating from district-industry level, and Column 8 similarly considers district-level computation of misallocation metrics using OLS-style TFP estimates.

Each table has two panels. Panel A provides estimations using misallocation metrics calculated from the organized sector only, while Panel B uses measures calculated over the combined organized and unorganized sectors.

Tables 6a and 6b present estimates of the total sizes of loan markets with misallocation, looking at panel variation in these economic features. Panel A of Table 6a finds that misallocation in land and buildings is negatively associated with the size of financial markets in terms of their log value of loans. However, this relationship is insignificant in most specifications except where we additionally control for current employment. By contrast, the estimates for labor misallocations are positive, though these are also insignificant in most specifications. In Panel B, where we use the misallocation metrics of the combined sectors, we observe a similar pattern in the relationship between input misallocation and the value of total loans. As in the case of total value of loans, Table 6b suggests that there is no significant relationship between misallocation in inputs and loan intensity, irrespective of whether the misallocation is sector specific (Panel A) or represents that of the entire manufacturing sector (Panel B). The coefficient estimates in Table 6b are consistently quite small in economic magnitude.

Tables 7a-7c examine the association between misallocation in inputs and performance of the financial loans market either in terms of misallocation or the deviation in expected versus realized loans. The dependent variables in these Tables are normalized to unit standard deviation. Table 7a assesses the relationship between financial loan misallocation with misallocation in other inputs. There is a very strong positive correlation of land and building misallocation with that of financial access. This is consistent with the fact that land and buildings can provide strong collateral support for accessing finance from the credit market. This result remains robust to considering alternative specifications in Columns 2-8, and the result is also robust to using misallocation from the combined sector in Panel B, although the magnitude of the relationship is smaller. Labor market misallocations serve as an important contrast to land and building misallocation, with the former showing an inconsistent relationship with financial loan misallocation. Misallocation in labor has a positive and significant association with misallocation in financial loans in Panel A; the association is mostly insignificant in Panel B.

Tables 7b and 7c use the sum of absolute and squared deviations of actual loans from their expected values as the dependent variable. These tables examine whether growing misallocation in land and buildings or in the labor market explain increasing rates of deviation locally between expected loans and those realized. We find that (i) the estimates in Tables 7b-7c agree with the misallocation metric observed in Table 7a, and the importance of land and building misallocation is again quite robust across specification variations. (ii) By contrast, the impact of misallocation in the labor market is negative in all specifications, although the strength of this relationship is insignificant in most of these models. (iii) The nominal coefficient value for land and buildings input misallocation is lower in the absolute and squared differences estimations relative to that in Table 7a. By transforming the dependent variables in Tables 7a-7c to unit standard deviation, we rule out the possibility that this difference in coefficient estimates can be attributed to different levels of variation in the dependent variable. We nonetheless feel more comfortable with the results in Tables 7b-7c that have a different metric design to the misallocation regressors. (iv) In Column 9 of Tables 7b-7c, we confirm that our result remains robust to considering average deviations for each district-industry.[22] These results show that our outcomes are not driven by larger districts where the sum of deviation is larger because of larger numbers of plants.

Through this point, we have considered panel estimations of land and building and labor misallocations with that of financial misallocation, an approach that requires identification of the empirical relationships that come from contemporaneous changes in these misallocation measures. The stability of our coefficients, moreover, in the presence of strict controls like state-industry-year fixed effects is further suggestive (if not fully conclusive) that this measured relationship is not reflective of omitted factors like other local policy changes or economic development. There remains, however, one deeper concern in the possible role of reverse causality. That is, rather than land misallocation distorting loan markets, it could be that loan markets distort land markets by keeping some businesses from accessing the land and buildings that they need. This is a very difficult knot to untangle given the complex relationship among these markets.

[22] Average deviation in loans is obtained by dividing the dependent variable, pre-standardization, with the total number of plants in a district-industry cell. This average is then transformed into a unit standard-deviation format.

We approach this problem by taking advantage of the fact that Indian financing markets appear mostly distinct, whereas land markets do not. We have noted at several points that only a small share of plants in the unorganized sector have loans, usually under 10%, while most firms in the organized sector have financial loans. Across the survey years, in fact, the organized sector accounts for 97% of the aggregate value of loans made to manufacturing establishments, even though these firms are a tiny minority of all firms and account for only 45% of land and building usage. We can thus make progress towards confirming a causal role by using land and building misallocation in the unorganized sector to instrument for the total district land and building misallocation that the firm faces. The exclusion restriction is that an increase in land and building misallocation among informal firms only impacts loan markets for organized sector firms through the degree that it creates overall misallocation in real estate markets. The fact that the unorganized sector firms represent such a small share of loans, especially relative to their land and building consumption, suggests that this is a reasonable starting point.

We focus on average and squared deviation metrics for this exercise. Computationally, it is very difficult to estimate this relationship with our baseline specification due to the many fixed effects incorporated. We thus move to a first-differenced format where we look at the changes from survey to survey, thereby differencing out the district-industry fixed effects. The first two columns of Table 7d confirm that our results under this alternative approach resemble the core levels estimations, which is comforting to observe on its own.

Column 3 instruments for the change in overall land and building and labor misallocation with the change in the unorganized sector's land and building and labor misallocation. We are just identified with two endogenous regressors and two instruments. Coefficients in the first stage for the change in total land misallocation are 0.684 (0.102)+++ for the change in unorganized sector land misallocation and 0.006 (0.144) for the change in unorganized sector labor misallocation. This asymmetry suggests a tight link of land and building misallocation channels. Comparable coefficients in the first stage for the change in total labor misallocation are 0.248 (0.136)+ and 0.740 (0.157)+++, respectively. These coefficients are strong and precisely estimated.

When instrumenting, we find growth in the estimated role of land and building misallocation, while labor misallocation does not play a role. This is interesting as it suggests, if anything, that our baseline estimation is downward biased due to either an omitted factor working against the relationship or due to measurement error in our misallocation metrics (which downward biases coefficient estimates). Column 3 provides the simplest approach, Column 4 adds in a log employment growth control that sharpens up the estimation, Column 5 considers extra lags as additional instruments, and Column 6 considers average deviations. The coefficients in Panel B are always statistically significant, while those in Panel A come in and out of being precisely measured. We comfortably pass the overidentification test in Column 5.

While these results do not provide a final answer to the causal connections between input misallocation and misallocation in financial markets, they do provide a substantial early confirmation in this regard. We hope to continue this in future work, with an important first step being the development of a better understanding of the financial misallocation in the unorganized sector, which needs to be accounted for. Given the very limited reporting and loan sizes for the informal sector, this requires some careful thought. We also want to extend this work to consider more closely exogenous reforms in land, labor, and financial markets that can provide new insights.[23]

Tables 8a and 8b present estimations regarding the share of young plants in the total value of loans in levels and in logs, respectively. The share of loan value accessed by young plants seems, if anything, to increase with land and building misallocation. The results are, however, too inconsistent and insignificant across specifications to draw strong conclusions except to the extent that we can deem that land and building misallocation does not particularly disadvantage young firms. This is perhaps in contrast to what might have been anticipated from the prior literature. These estimations do not mean that start-ups in India do not face financing constraints, only that we do not observe differences across Indian districts that would be consistent with land and building misallocation making matters worse.

[23] Duranton et al. (2015) identify land misallocation's role through policy changes related to the repeal of the Urban Land Ceiling Regulation Act (ULCRA) and changes in stamp duties. We are not yet able to utilize these policies in this analysis because they do have a significant relationship to land and building misallocation within the organized sector specifically. We hope in the next phase to build a combined platform to better assess.

Interestingly, unreported estimations also consider interactions of our misallocation metrics with an industry's land and building intensity and/or external financing needs, following the methodology popularized by Rajan and Zingales (1998) and Fisman and Love (2003). These interaction terms do not provide a consistent pattern and are rarely significant. Thus, the impacts of misallocation also do not appear to be differentiated or exacerbated along these industry dimensions using the popular technique from the literature.

Gender Differences in Access to Financial Loans

We close our analysis by considering gender differences in loan access. Table 9a presents the financial loan shares by gender of business owners for unorganized plants from 1989-2010. Unfortunately, this information is available only for the informal sector and hence a comparison with the formal sector is not feasible. Panel A presents the unweighted shares, where over the last two decades only 4% of female-owned plants had access to the credit market on average, compared to 12% for male-owned plants. The comparisons remain similar when we look at weighted plant shares in Panel B, suggesting that, nationally, female-owned enterprises have much lower access to external finance in the informal sector. The last row of each panel presents the gender difference in accessing external finance, defined as the difference in the share of male-owned plants and female-owned plants accessing external finance. Both panels suggest that gender difference is very persistent (see Figure 4, Panel C).

Table 9b presents the share of plants with financial loans for plants with mostly female employees versus those with mostly male employees, which we can calculate for both sectors.[24] Looking at the raw shares in Panel A for the organized sector, the table suggests that the gender difference is converging, and plants with a higher share of female employees seem to have only a small disadvantage in accessing external finance as compared to their male-dominated counterparts. We arrive at the same conclusion even when looking at weighted shares in Panel B for the organized sector. Panel A of Figure 4 shows this remarkable convergence. For the

[24] The World Development Indicator suggests that the labor force participation rate for females in India in 2010 was about 29% (ILO estimates). However, a lot of this is driven by participation in the agricultural sector rather than manufacturing.

unorganized sector, on the other hand, we do not see evidence of a similar pattern, with the gender differences not displaying a trend.

We also break down Tables 9a and 9b by state and industry (see Appendix Tables 5 and 6, respectively). The table suggests that only in rare cases like Delhi are the financial loans evenly distributed along gender lines. For most states, male-owned plants and plants with mostly male employees maintain substantially higher loan shares. The tilt is especially strong in the organized sector for Bihar and Assam, while the unorganized sector is more balanced in these states. Figure 5 shows a modest organized sector correlation of gender differences to development, but overall these levels and their changes appear to be driven by other factors rather than the state of development. Gender differences in financial loans by industry appear to be of second-order.

6. Conclusions

This paper explores how the misallocation of inputs across Indian districts can distort financial loans for manufacturing firms. The paper outlines a few facts about access to loans: (i) more than 90% of plants in the organized sector have access to loans compared to less than 10% in the unorganized sector; (ii) rural regions in both sectors lag behind their urban counterparts in access to finance; (iii) the access share among organized plants is increasing over the study period 1989-2010, while this share is declining in the unorganized sector; and (iv) gender disparities in access to loans are closing in the organized sector, but they are far from converging in the unorganized sector.

More critically, our study is the first to examine the impact of misallocation in land and buildings and labor markets on several outcomes in financial access. We find modest aggregate declines in loan activity with higher misallocation. Our outcomes are strongest with respect to various metrics that measure misallocation in access to finance, where we find a positive and highly significant association of these metrics with misallocation in land and buildings. This conclusion is robust to different empirical approaches, to using alternative measures of financial misallocation, and to modelling the combined sectoral misallocation in land and buildings. We also reach similar conclusions with an instrumentation strategy focusing on the unorganized sector. By contrast, our study finds that misallocation in labor inputs does not significantly impact the allocative efficiency of financial loans in the organized sector.

Future research should consider several issues. First, a large proportion of plants in the unorganized sector do not report loans. This could mean either that they do not get loans, or that their access is missed in formal reporting. We need to consider in greater depth what can be done on this front. The unorganized sector roughly accounts for nearly 80% of employment and 20% of output. This sector accounts for about half of the value of land and buildings held in the overall Indian manufacturing industry. Yet, the value of financial loans reported in this sector is barely 2-6% of the value of total loans reported by the overall manufacturing sector. One question that is worth asking is whether misallocation in land and buildings in the unorganized sector acutely accentuates the misallocation in access to finance. Second, we hope to refine and strengthen our identification approach and to consider annual data for the organized sector. Third, we should also consider misallocation in other forms of collateral like plants and machinery and perhaps run a horse race against misallocation in land and buildings to examine if these have any significant relationship with financial access variables. Fourth, we also hope to examine cross-state differences and traits that may affect the efficiency of financial markets. Finally, and for the longer-term, linking these features to financial liberalization policies that affected the Indian economy during 1990s is attractive.

Appendix Box 1: Misallocation metrics

Define the share weighted aggregate productivity for a group of establishments as:

$$\Phi_g = \sum_{i=1}^{n} s_i \, \varphi_i$$

where n is the number of establishments, s_i is the share of establishment i in the group g such that $\sum_{i=1}^{n} s_i = 1$, and φ_i is the measure of productivity for establishment i. g could be any group, such as a district, district-industry, and so on. One could use many variants for the measure of productivity and the "share." In our work, we use a combination of OLS- and LP-based TFP estimations. For the shares part, we use two main factors of production, land and buildings and labor. In addition to these inputs, we also calculate the shares in terms of the value of external loans accessed by the plant.

There are many ways to decompose aggregate productivity (Melitz and Polanec, 2013), but we choose the Olley Pakes (1996) methodology. In particular, aggregate productivity can be written as:

$$\Phi_g = \bar{\varphi}_g + \sum_{i=1}^{n} \left(s_i - \bar{s}_g\right) \left(\varphi_i - \bar{\varphi}_g\right) = \bar{\varphi} + n_g \, Cov\left(s_{ig} \, , \varphi_i\right)$$

where $\bar{\varphi}_g = \frac{1}{n} \sum_{i=1}^{n} \varphi_i$ is the unweighted productivity mean across establishments in group g and $\bar{s}$ is the mean establishment share, s_{ig} is the factor or value-added share of establishment i in group g and n_g is the number of establishments in that group.

Thus, a measure of allocation efficiency can be written as:

$$E_g = \Phi_g - \bar{\varphi}_g = n_g \, Cov\left(s_{ig} \, , \varphi_i\right)$$

As explained, efficiency is maximized when most productive establishments have the highest input shares and hence the covariance is maximized. Conversely, the extent of misallocation can written as the negative of allocation efficiency, that is,

$$M_g = -E_g$$

For our misallocation metrics "without the industry aggregation step" where the LP-style TFP estimates are used or the one where we use residuals for TFP from simple OLS estimation, we directly compute M_g at the level of district.

As noted in main text, we compute the baseline misallocation index at the district-industry level to ease the comparisons across industries. This measure basically defines the group as a district-industry and hence the misallocation index M_g is first calculated at a district-industry level and then summed to the district level. Misallocation within the district *d* and industry *k* is defined as before (the group is now district-industry pair):

$$M_d^k = -n_d^k \, Cov\left(s_{i,d}^k \, , \varphi_i\right)$$

where $s_{i,d}^k$ is the share of establishment *i* in district d and industry *k*. By analogy, the misallocation for the entire population of establishments at the district level can then be defined as:

$$M_d = -n_d \, Cov\left(s_d^k \, , \varphi_d^k\right)$$

where s_d^k is the share of the industry *k* in district *d* and φ_d^k is the average TFP of industry *k* in district *d*. An L-P Sivadasan style TFP used in this case. Duranton et al. show that the misallocation in a district can be written as:

$$M_d = \sum_k s_d^k \, M_d^k - \sum_k \left(s_d^k - \frac{n_d^k}{n_d}\right)\left(\overline{\varphi_d^k} - \overline{\varphi_d}\right)$$

Appendix box 2. Sivadasan's modified Levinsohn and Petrin methodology

This section is taken from Appendix B of Sivadasan (2009) where he reports his methodology. This has been appropriately adjusted for our panel analysis over the 1994-2009 period.

We assume that our value-added production function $v = f(l,n,k,\omega)$ is part of a more general production function separable in all intermediate inputs $Y = g(f(l,n,k,\omega),h(\Gamma,\omega))$, where Γ is a vector of intermediate inputs.

Let ι be one intermediate input, which LP assumes has a demand function of the form $\iota_{it} = \iota_t(\omega_{it},k_{it})$. Other possible state variables not explicitly included in the above input demand function include prices of inputs and output(s). We assume input and output prices are fixed across firms within the same industry, but allow for the common prices to change over time by indexing the input demand function by t.[1] Assuming monotonicity, i.e., input choice is strictly increasing in productivity for all relevant capital levels,[2] the input demand function can be inverted to yield a representation for the unobserved productivity: $\omega_{it} = \omega_t(\iota_{it},k_{it})$.

Then, assuming the monotonicity condition holds, we can estimate the coefficients on the labor inputs by estimating the following regression:

$$v_{it} = \beta_l l_{it} + \beta_n n_{it} + \phi_t(\iota_{it},k_{it}) + \eta_{it} \qquad \text{(Step 1)}$$

where

$$\phi_t(\iota_{it},k_{it}) = \beta_k k_{it} + \omega_t(\iota_{it},k_{it}).$$

We use quantity of electricity consumed ς_t as the input proxy ι_t. We specify $\omega_t(\iota_{it},k_{it})$ as a polynomial function in its arguments (including the absorbed intercept term and dropping the firm index i for expositional convenience) as follows:

$$\begin{aligned}
\omega_t(\varsigma_t,k_t) \;=\; & \alpha_{11}\varsigma_t + \alpha_{12}\varsigma_t^2 + \alpha_{13}\varsigma_t^3 + \alpha_{14}k_t + \alpha_{15}k_t\varsigma_t + \alpha_{16}k_t\varsigma_t^2 \\
& +\alpha_{17}k_t^2 + \alpha_{18}k_t^2\varsigma_t + \alpha_{19}k_t^3 \\
& +\alpha_{21}t_2\varsigma_t + \alpha_{22}t_2\varsigma_t^2 + \alpha_{23}t_2\varsigma_t^3 + \alpha_{24}t_2k_t + \alpha_{25}t_2k_t\varsigma_t + \alpha_{26}t_2k_t\varsigma_t^2 \\
& +\alpha_{27}t_2k_t^2 + \alpha_{28}t_2k_t^2\varsigma_t + \alpha_{29}t_2k_t^3 \\
& +\alpha_{31}t_3\varsigma_t + \alpha_{32}t_3\varsigma_t^2 + \alpha_{33}t_3\varsigma_t^3 + \alpha_{34}t_3k_t + \alpha_{35}t_3k_t\varsigma_t + \alpha_{12}\varsigma_t^2 + \alpha_{36}t_3k_t\varsigma_t^2 \\
& +\alpha_{37}t_3k_t^2 + \alpha_{38}t_3k_t^2\varsigma_t + \alpha_{39}t_3k_t^3
\end{aligned}$$

where $t_2 = 1$ for years 1990, 1991 and 1992, and $t3 = 1$ for years 1993, 1994 and 1995.

Identifying the coefficient on the capital variable requires additional assumptions and a second stage estimation procedure. The moment condition that LP proposes uses panel information to identify the capital coefficient. LP assumes that:

$$E[k_{i,t\cdot}\{\omega_{i,t} - E[\omega_{i,t}|\omega_{i,t-1}]\}] = 0. \tag{1}$$

This follows from a behavioral assumption that capital does not respond to "surprises" in productivity, or equivalently from assuming that $\{\omega_{i,t}\}_{i=1}^{\infty}$follows a stochastic first order Markov process.

The LP methodology could be adapted to a repeated cross-section context by making the broader assumption that $\omega_{i,t}$is uncorrelated with the choice of capital $k_{i,t}$, (which is arguably fixed in the short run). This moment condition is discussed by Griliches and Mairesse (1998), but they suggest this assumption may be too restrictive, as capital is likely to respond to any persistent component of ω_{it}. Instead we propose a less-restrictive moment condition, which can be used in the repeated cross-section context. Instead of using last period's productivity for each firm (unobservable in our data), we use the average productivity in the previous period for a closely matched industry-location-size cell (observable in our data) as the predictor for this period firm productivity. This attempts to approximate the moment condition in equation 1 as closely as possible, given the limitations of our data.[3]

To implement this approach, we sub-divide the data into industry-location-size cells and estimate the average productivity for each cell in every period. Then our modified moment condition replacing equation 1 is given by:

$$k_{i,t\cdot}\{\omega_{i,t} - E[\omega_{i,t}|\bar{\omega}_{i,t-1}]\} = 0 \tag{2}$$

where

$$\bar{\omega}_{i,t-1} = \frac{1}{m_{j_i}} \sum_{s=1}^{m_{j_i}} \omega_{s,t-1} \tag{3}$$

where j_i indexes the industry-location-size cell to which firm i belongs, and m_{j_i} is the number of observations in cell j.

As in the LP methodology, we then identify the coefficient on the capital variable (β_k) by considering the second step regression:

$$v^*_{i,t} = (\beta_k k_{i,t} + E[\omega_{i,t}|\bar{\omega}_{i,t-1}] + \eta^*_{i,t} \qquad \text{(Step 2)}$$

where $v^*_{i,t} = v_{i,t} - (\beta_l l_{i,t} + \beta_n n_{i,t})$ and $\eta^*_{i,t} = \{\omega_{i,t} - E[\omega_{i,t}|\bar{\omega}_{i,t-1}]\} + \eta_{i,t}$.

The specific estimation algorithm to obtain the capital coefficient is as follows:

i. Start with a candidate estimate[4] of the capital coefficient β_{k*}.

ii. From the results of the first stage regression, obtain:

$$\hat{\phi}_t = \hat{v}_t - \hat{\beta}_l l_t - \hat{\beta}_n n_t.$$

iii. Then obtain:

$$\widehat{\omega_t} = \hat{\phi}_t - \hat{\beta}_{k*} k_t.$$

iv. Estimate the mean productivity for each industry-size-location cell using:

$$\widehat{\bar{\omega}_{t-1}} = \frac{1}{m_j} \sum_{s=1}^{m_j} \widehat{\omega_{s,t-1}}$$

where m_j is the number of observations in cell j.

v. Regress $\hat{\omega}_t$ on $\widehat{\bar{\omega}_{t-1}}$ and $\widehat{\bar{\omega}^2_{t-1}}$ and use the predicted values to form $E[\widehat{\omega_t|\bar{\omega}_{t-1}}]$. vi. Obtain $\hat{v}^*_t = v_t - \hat{\beta}_l l_t - \hat{\beta}_n n_t$.

vii. Form $\hat{\eta}^*_t = \hat{v}^*_t - \beta_{k*} k_t - E[\widehat{\omega_t|\bar{\omega}}_{t-1}]$.

viii. Estimate β_k by minimizing the sum (over all the firm-year observations) of the squared residuals in Step 2:

$$\min_{\beta_{k*}} \left\{ \sum_i \left(\hat{v}^*_{it} - \beta_{k*} k_{it} - E[\omega_{it}|\bar{\omega}_{it-1}]\right)^2 \right\}$$

As discussed in Levinsohn and Petrin (2003), a bootstrapping procedure is used to estimate the standard errors.

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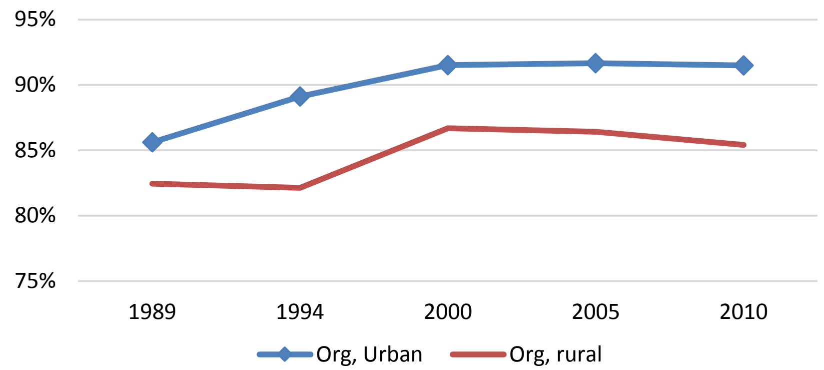
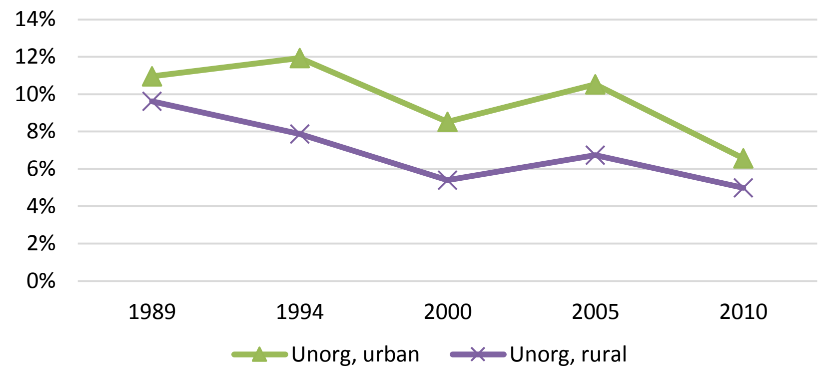
Figure 1: Share of manufacturing plants with financial loans

A. Organized sector

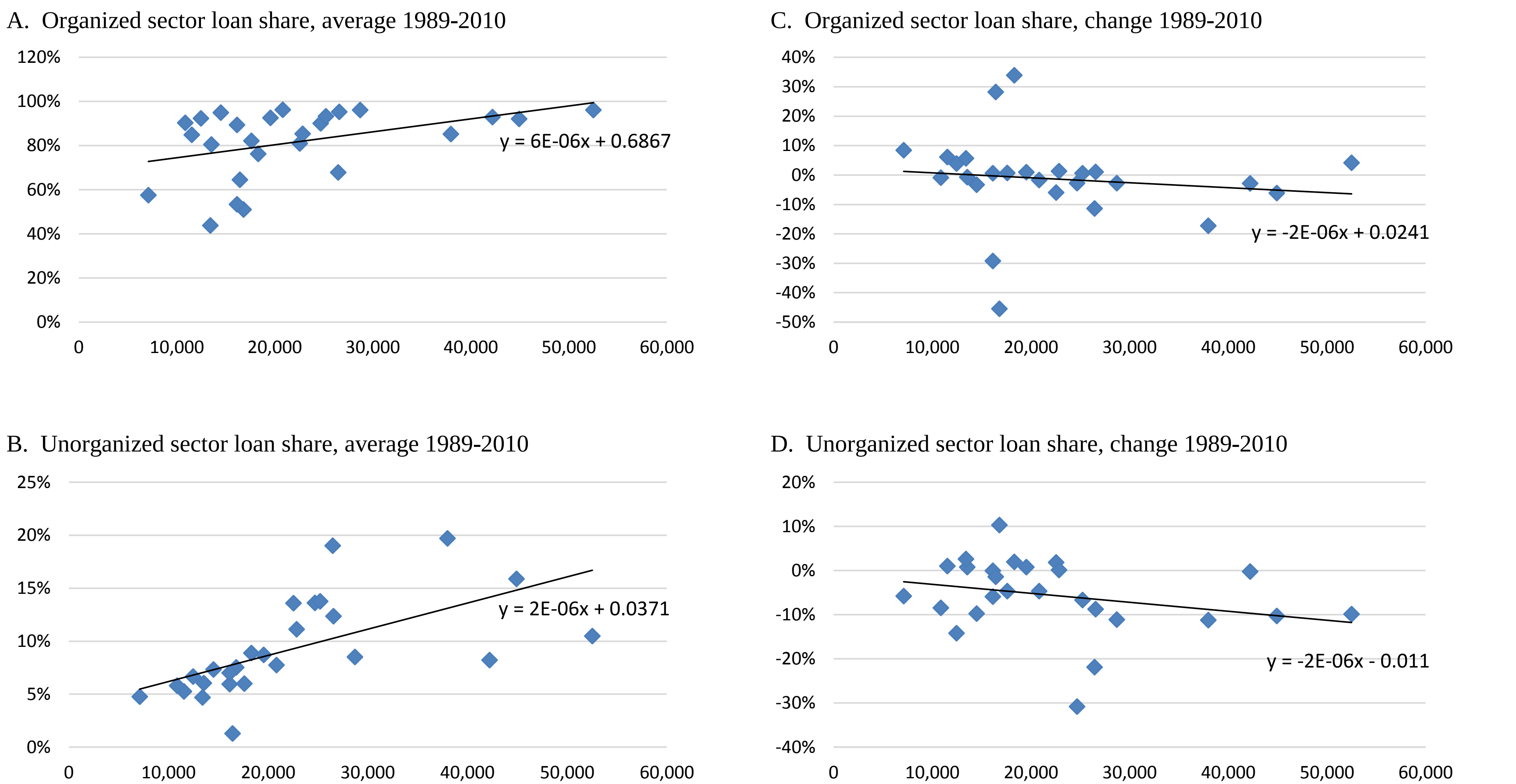


B. Unorganized sector



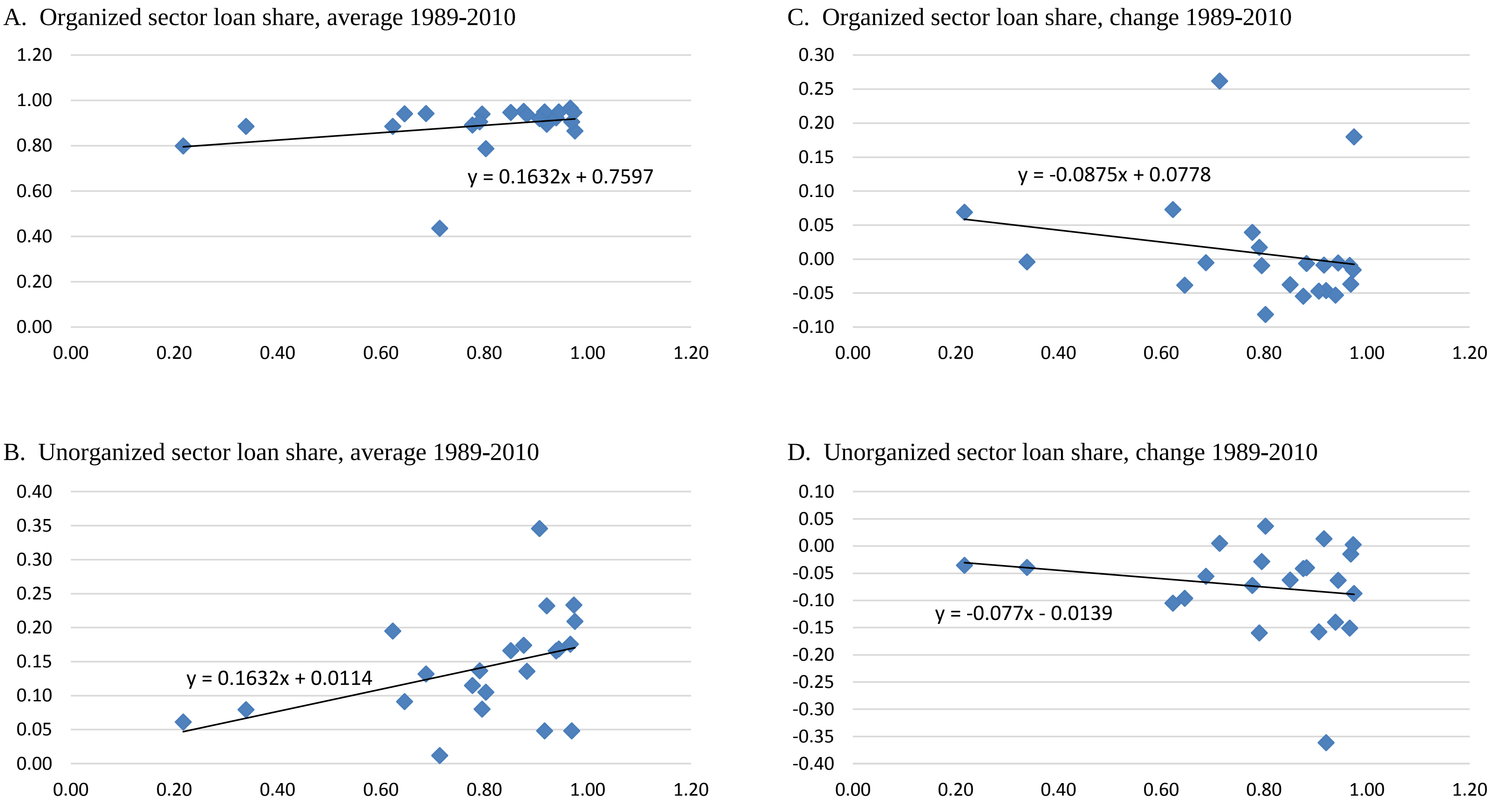
Notes: See Table 1a.

Figure 2: State-level access to financial loans for manufacturing plants



Notes: See Table 2b. The horizontal axis in all panels is state GDP per capita in 2000-01 (constant prices; 1999-2000 series in Rupees). The vertical axis in Panels A and B is the average share of plants in the state that have reported financial loans, split by sector. The vertical axis in Panels C and D is the change from 1989 to 2010 in these shares for each state, split by sector.

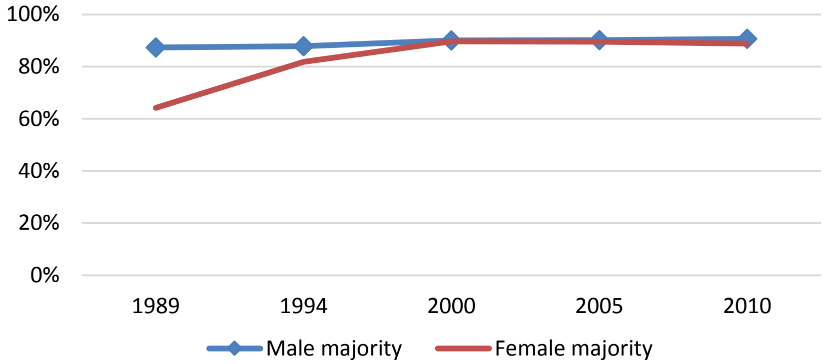
Figure 3: Industry-level access to financial loans for manufacturing plants



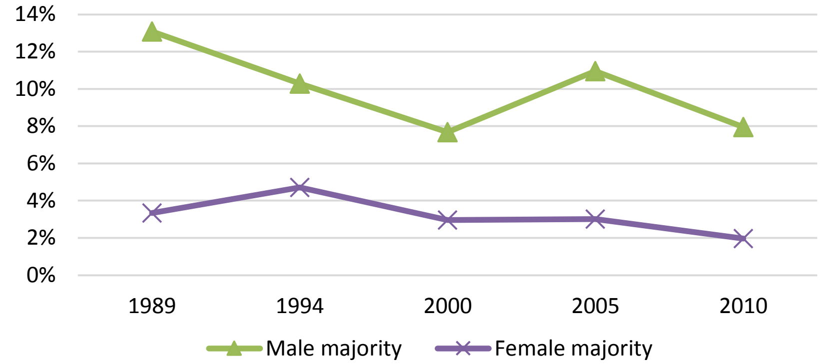
Notes: See Table 3b. The horizontal axis in all panels is the average organized sector share of output in an industry across 1989-2010. The vertical axis in Panels A and B is the average share of plants in the industry that have reported financial loans, split by sector. The vertical axis in Panels C and D is the change from 1989 to 2010 in these shares for each industry, split by sector.

Figure 4: Share of plants with financial loans by gender of employees and owners

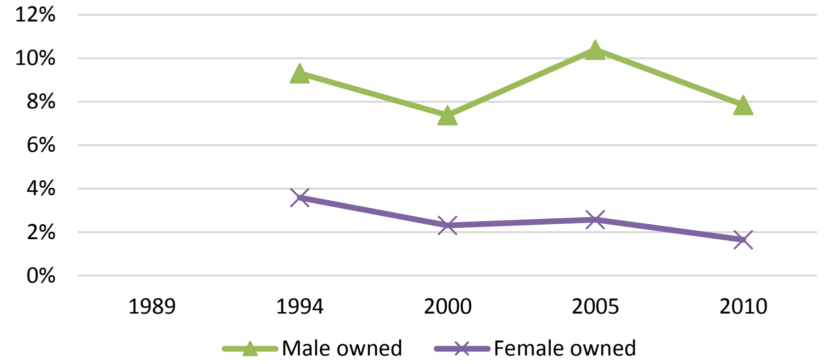
A. Organized sector using employee split



B. Unorganized sector using employee split

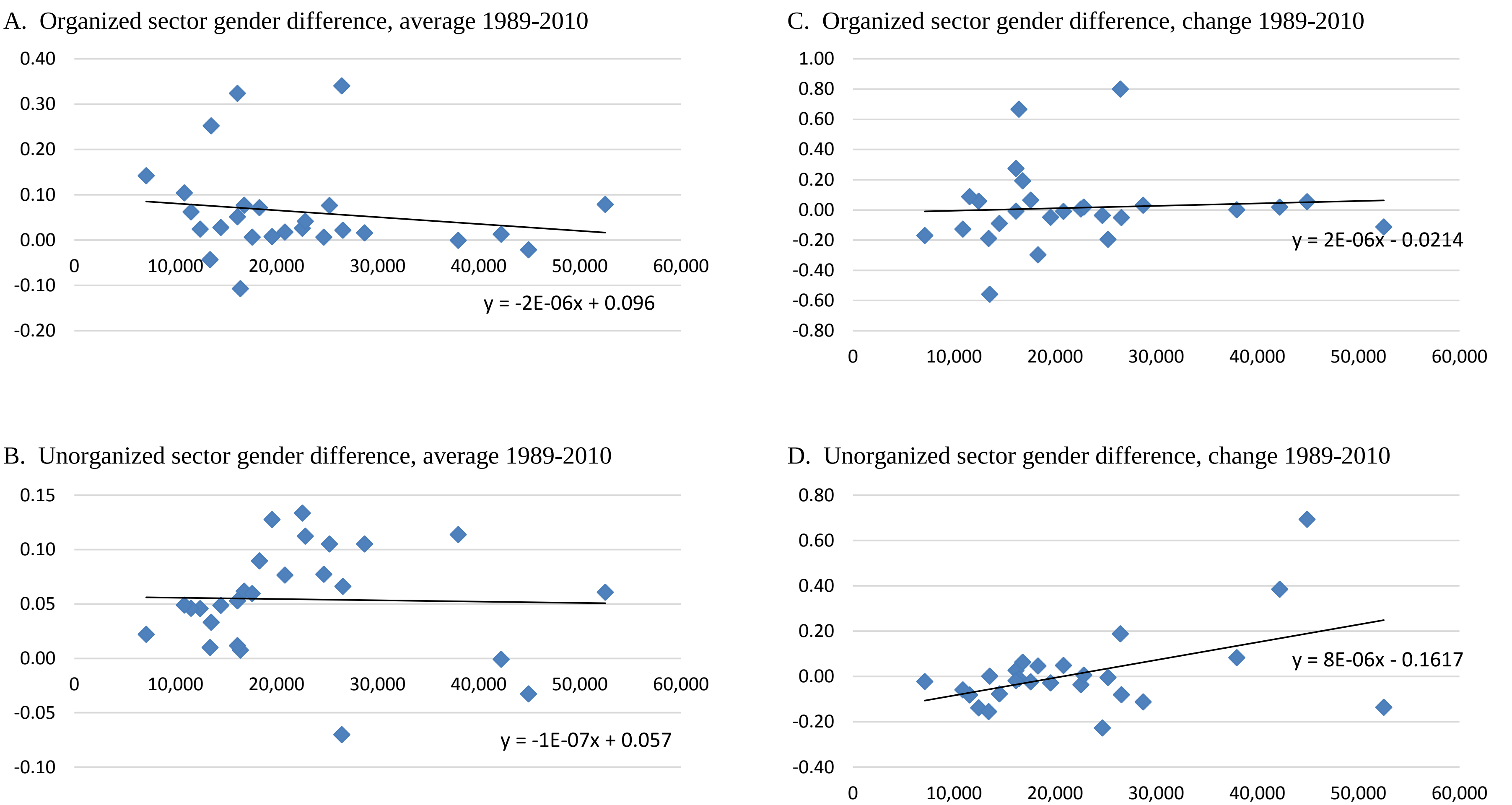


C. Unorganized sector using gender of business owner



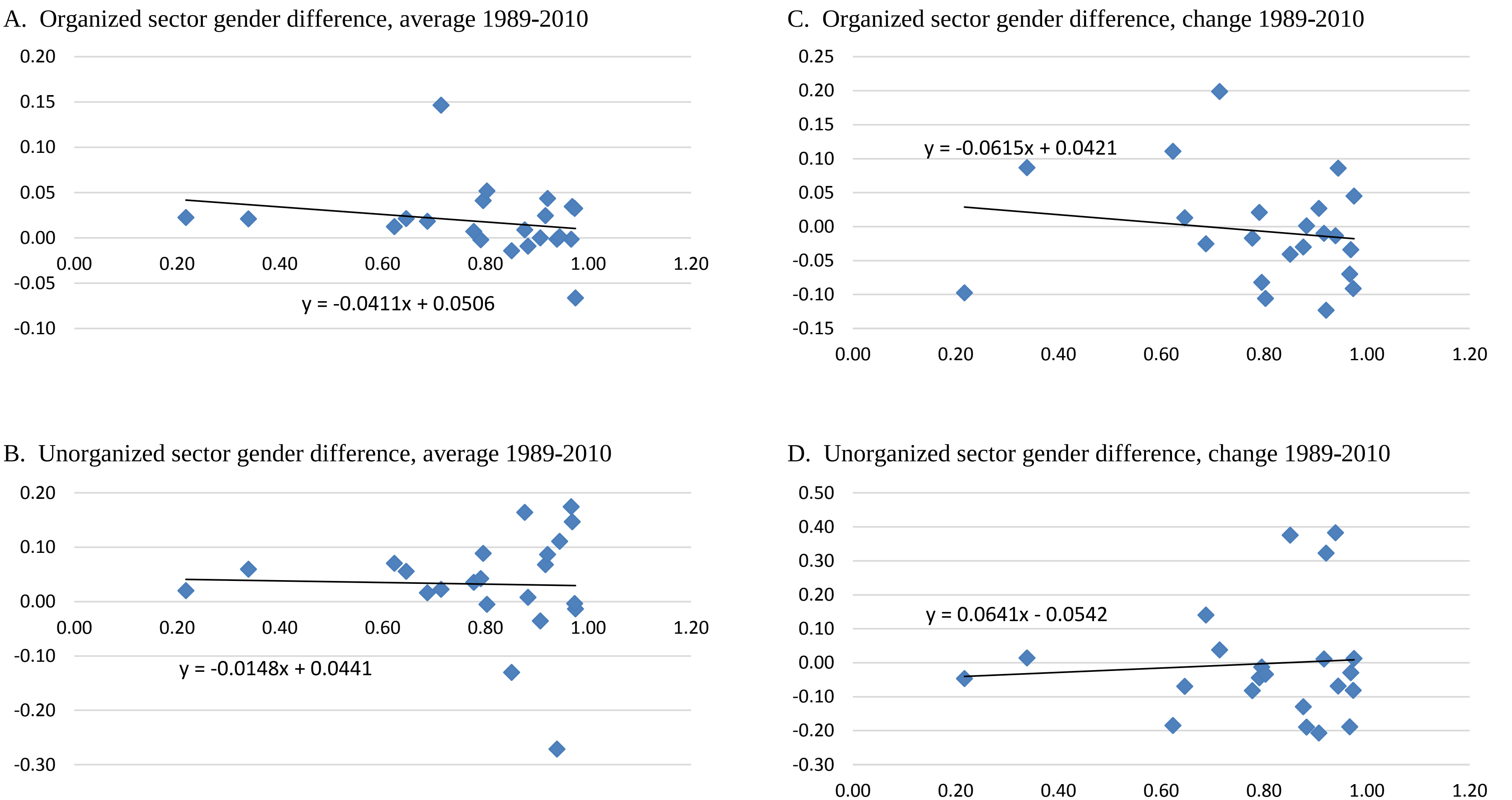
Notes: See Table 9a.

Figure 5: Gender differences in state-level access to financial loans for manufacturing plants



Notes: See Table 9b and Appendix Table 5. The horizontal axis in all panels is state GDP per capita in 2000-01 (constant prices; 1999-2000 series in Rupees). The vertical axis in Panels A and B is the gender difference in financial loan shares in the state using the majority of employees to classify firms, split by sector. The vertical axis in Panels C and D is the change from 1989 to 2010 in these gender differences for each state, split by sector.

Figure 6: Gender differences in industry-level access to financial loans for manufacturing plants



Notes: See Table 9b and Appendix Table 6. The horizontal axis in all panels is the average organized sector share of output in the industry across 1989-2010. The vertical axis in Panels A and B is the gender difference in financial loan shares in the industry using the majority of employees to classify firms, split by sector. The vertical axis in Panels C and D is the change from 1989 to 2010 in these gender differences for each industry, split by sector.

Table 1a: Financial loan data for Indian manufacturing plants

	1989	1994	2000	2005	2010
	A. Raw count of data observations after basic pruning				
Total	127,786	197,992	244,339	116,175	135,270
Organized sector	33,356	42,649	25,571	35,101	33,077
Urban areas	22,899	29,024	15,296	20,379	19,323
Rural areas	10,457	13,625	10,275	14,722	13,754
Unorganized sector	94,430	155,343	218,768	81,074	102,193
Urban areas	40,584	53,262	131,652	40,062	49,818
Rural areas	53,846	102,081	87,116	41,012	52,375
	B. Estimated number of plants in India using sample weights from Panel A				
Total	13,350,304	12,120,050	16,978,168	16,938,433	17,797,958
Organized sector	75,442	93,035	99,101	104,581	118,150
Urban areas	54,675	64,921	62,835	63,044	72,750
Rural areas	20,767	28,114	36,266	41,537	45,400
Unorganized sector	13,274,862	12,027,015	16,879,067	16,833,852	17,679,808
Urban areas	2,823,783	2,967,126	5,048,512	4,901,061	7,396,214
Rural areas	10,451,079	9,059,888	11,830,554	11,932,791	10,283,594
	C. Share of raw data observations from Panel A that report positive levels of financial loans				
Total	0.34	0.28	0.19	0.38	0.28
Organized sector	0.90	0.90	0.90	0.90	0.89
Urban areas	0.92	0.91	0.91	0.91	0.91
Rural areas	0.88	0.88	0.88	0.88	0.87
Unorganized sector	0.13	0.11	0.10	0.16	0.09
Urban areas	0.14	0.12	0.11	0.14	0.08
Rural areas	0.13	0.10	0.10	0.17	0.10
	D. Share of weighted manufacturing plants from Panel B that report positive levels of financial loans				
Total	0.10	0.09	0.07	0.08	0.06
Organized sector	0.85	0.87	0.90	0.90	0.89
Urban areas	0.86	0.89	0.92	0.92	0.91
Rural areas	0.82	0.82	0.87	0.86	0.85
Unorganized sector	0.10	0.09	0.06	0.08	0.06
Urban areas	0.11	0.12	0.09	0.11	0.07
Rural areas	0.10	0.08	0.05	0.07	0.05
	E. District count where financial loans are observed				
Organized sector	352	358	315	346	345
Unorganized sector	342	362	356	357	334

Notes: Descriptive statistics taken from the Annual Survey of Industries (ASI) and National Sample Survey (NSS). Positive levels of financial loans are taken to be where loans and/or interest is reported.

Table 1b: Role of one-person plants in unorganized sector trend

	1989	1994	2000	2005	2010
	A. Raw count of data observations after basic pruning				
Unorganized sector	94,430	155,343	218,768	81,074	102,193
More than one-person plant	65,019	111,736	144,857	50,062	56,963
One-person plant	29,411	43,607	73,911	31,012	45,230
	B. Estimated number of plants in India using sample weights from Panel A				
Unorganized sector	13,274,862	12,027,015	16,879,067	16,833,852	17,679,808
More than one-person plant	8,276,138	8,177,452	9,763,850	9,056,699	7,644,606
One-person plant	4,998,723	3,849,563	7,115,217	7,777,153	10,035,202
	C. Share of raw data observations from Panel A that report positive levels of financial loans				
Unorganized sector	0.13	0.11	0.10	0.16	0.09
More than one-person plant	0.16	0.13	0.14	0.22	0.13
One-person plant	0.07	0.05	0.03	0.06	0.03
	D. Share of weighted manufacturing plants from Panel B that report positive levels of financial loans				
Unorganized sector	0.10	0.09	0.06	0.08	0.06
More than one-person plant	0.12	0.11	0.09	0.11	0.10
One-person plant	0.06	0.05	0.03	0.04	0.02

Notes: Descriptive statistics taken from the National Sample Survey (NSS). Positive levels of financial loans are taken to be where loans and/or interest is reported. A one-person plant is an establishment with only one employee, irrespective of whether the employee is full time or part time.

Table 1c: Average misallocation metrics

	1989	1994	2000	2005	2010
	A. Baseline misallocation metrics				
Organized sector					
Financial loans	-0.260	-0.164	-0.099	-0.140	-0.013
Land and building	-0.215	-0.169	-0.113	-0.209	-0.092
Labor	-0.155	-0.091	-0.090	-0.163	-0.043
Combined organized and unorganized sectors					
Land and building	-0.800	-0.437	-0.703	-0.476	-0.371
Labor	-0.684	-0.258	-0.555	-0.446	-0.270
	B. Misallocation metrics without the industry aggregation step				
Organized sector					
Financial loans	-0.244	-0.061	-0.087	-0.193	0.132
Land and building	-0.461	0.001	0.027	-0.038	0.075
Labor	-0.248	0.020	-0.017	-0.029	0.086
Combined organized and unorganized sectors					
Land and building	-0.621	-0.433	-0.628	-0.406	-0.307
Labor	-0.468	-0.391	-0.409	-0.343	-0.245
	C. Misallocation metrics using OLS TFP				
Organized sector					
Financial loans	-0.114	-0.117	-0.024	-0.009	0.055
Land and building	-0.069	-0.111	-0.037	-0.070	-0.029
Labor	0.014	-0.016	0.004	-0.016	0.063
Combined organized and unorganized sectors					
Land and building	-0.391	0.023	-0.087	-0.023	-0.080
Labor	-0.305	0.230	-0.002	0.085	-0.105

Notes: See Table 1a. Authors' calculations using the OP decomposition index and other variants described in the text.

Table 1d: Correlations over misallocation metrics

	Organized sector			Combined	
	Financial loans	Labor	Land	Labor	Land
			A. 1989 Correlations		
Organized loans	1				
Organized labor	0.501	1			
Organized land	0.538	0.663	1		
Total labor	0.046	0.203	0.087	1	
Total land	0.087	0.149	0.216	0.750	1
			B. 1994 Correlations		
Organized loans	1				
Organized labor	0.593	1			
Organized land	0.618	0.634	1		
Total labor	0.230	0.222	0.183	1	
Total land	0.195	0.151	0.273	0.611	1
			C. 2000 Correlations		
Organized loans	1				
Organized labor	0.442	1			
Organized land	0.550	0.654	1		
Total labor	0.121	0.076	0.106	1	
Total land	0.193	0.094	0.276	0.718	1
			D. 2005 Correlations		
Organized loans	1				
Organized labor	0.460	1			
Organized land	0.415	0.576	1		
Total labor	0.087	0.148	0.069	1	
Total land	0.105	0.138	0.312	0.645	1
			E. 2010 Correlations		
Organized loans	1				
Organized labor	0.600	1			
Organized land	0.501	0.627	1		
Total labor	0.026	0.090	0.070	1	
Total land	0.104	0.179	0.280	0.740	1

Notes: See Table 1a. Authors' calculations using the OP decomposition index and other variants described in the text.

Table 2a: Shares of plants with financial loans by state

	Total cell count						State GDP per capita	Total share with financial loans					
	1989	1994	2000	2005	2010	Average	in 2000-01	1989	1994	2000	2005	2010	Average
A & N Islands	382	558	597	225	273	407	26,469	0.34	0.28	0.14	0.09	0.12	0.19
Andhra Pradesh	10,666	17,883	19,386	9,356	12,451	13,948	18,320	0.09	0.11	0.08	0.09	0.11	0.09
Assam	2,738	4,087	6,575	3,559	3,225	4,037	13,545	0.02	0.10	0.07	0.10	0.03	0.06
Bihar	8,089	12,885	18,279	6,550	7,008	10,562	7,111	0.09	0.06	0.03	0.03	0.03	0.05
Chandigarh	321	557	445	216	311	370	52,520	0.20	0.30	0.09	0.20	0.05	0.17
Dadra & Nagar Haveli	265	327	508	548	482	426	n.a.	0.16	0.14	0.41	0.47	0.36	0.31
Daman & Diu	128	359	519	643	565	443	n.a.	0.13	0.29	0.53	0.32	0.37	0.33
Delhi	1,829	3,217	2,721	1,376	2,788	2,386	42,220	0.08	0.14	0.05	0.18	0.05	0.10
Goa	252	558	1,049	585	429	575	44,934	0.27	0.15	0.11	0.20	0.18	0.18
Gujarat	7,079	10,526	11,846	6,676	7,818	8,789	20,827	0.11	0.12	0.09	0.08	0.06	0.09
Haryana	2,281	3,432	5,248	3,561	4,258	3,756	26,568	0.16	0.20	0.12	0.15	0.08	0.14
Himachal Pradesh	1,505	2,223	4,026	1,984	2,016	2,351	24,690	0.35	0.10	0.10	0.09	0.06	0.14
Jammu & Kashmir	2,696	1,431	6,010	2,856	2,182	3,035	16,145	0.07	0.06	0.03	0.08	0.07	0.06
Karnataka	6,288	9,892	10,066	5,285	5,870	7,480	19,551	0.09	0.11	0.08	0.08	0.10	0.09
Kerala	5,631	7,104	11,081	5,064	6,260	7,028	22,549	0.11	0.12	0.17	0.18	0.13	0.14
Madhya Pradesh	6,461	7,691	14,745	6,024	9,033	8,791	12,459	0.16	0.08	0.05	0.04	0.02	0.07
Maharashtra	11,982	13,938	21,732	10,639	10,724	13,803	25,228	0.17	0.18	0.13	0.16	0.10	0.15
Manipur	1,951	1,704	3,449	1,195	860	1,832	13,422	0.04	0.02	0.03	0.08	0.07	0.05
Meghalaya	532	673	1,069	598	427	660	16,440	0.02	0.02	0.01	0.02	0.01	0.01
Nagaland	349	1,079	1,584	759	759	906	16,805	0.04	0.04	0.05	0.15	0.13	0.08
Orissa	4,305	8,368	7,314	3,844	4,008	5,568	11,543	0.06	0.02	0.03	0.07	0.08	0.05
Pondicherry	388	327	756	636	672	556	37,985	0.24	0.36	0.16	0.21	0.14	0.22
Punjab	5,587	6,171	10,973	5,476	5,189	6,679	28,714	0.17	0.14	0.08	0.09	0.06	0.11
Rajasthan	5,283	6,536	11,125	5,968	5,932	6,969	14,504	0.14	0.09	0.06	0.07	0.04	0.08
Tamil Nadu	12,476	27,716	22,302	10,683	13,367	17,309	22,846	0.11	0.14	0.12	0.11	0.11	0.12
Tripura	1,601	2,615	3,725	1,839	1,801	2,316	16,143	0.08	0.10	0.01	0.15	0.02	0.07
Uttar Pradesh	16,070	25,196	28,552	11,877	15,642	19,467	10,874	0.11	0.07	0.05	0.06	0.02	0.06
West Bengal	10,664	20,986	18,657	8,153	10,920	13,876	17,607	0.07	0.09	0.04	0.07	0.03	0.06
Nationwide	127,799	198,039	244,339	116,175	135,270	164,324		0.10	0.09	0.07	0.08	0.06	0.08

Notes: See Table 1a. Table provides state-level estimates of the share of manufacturing plants with financial loans. GDP per capita is in 1999-2000 Rupees. Shares use sample weights for population-representative values.

Table 2b: Shares of plants with financial loans by state and sector

	ASI share						NSS share					
	1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average
A & N Islands	0.74	0.63	0.73	0.67	0.63	0.68	0.34	0.27	0.14	0.09	0.12	0.19
Andhra Pradesh	0.52	0.72	0.86	0.86	0.85	0.76	0.09	0.10	0.07	0.08	0.11	0.09
Assam	0.81	0.83	0.83	0.76	0.80	0.80	0.02	0.10	0.06	0.10	0.03	0.06
Bihar	0.46	0.67	0.61	0.59	0.54	0.58	0.09	0.06	0.03	0.03	0.03	0.05
Chandigarh	0.93	0.96	0.99	0.96	0.97	0.96	0.12	0.25	0.06	0.07	0.02	0.10
Dadra & Nagar Haveli	0.99	0.95	0.91	0.90	0.92	0.93	0.03	0.08	0.08	0.02	0.07	0.06
Daman & Diu	0.96	0.95	0.88	0.90	0.90	0.92	0.10	0.13	0.13	0.01	0.06	0.09
Delhi	0.95	0.92	0.93	0.93	0.92	0.93	0.04	0.12	0.04	0.16	0.04	0.08
Goa	0.95	0.96	0.92	0.90	0.88	0.92	0.25	0.13	0.09	0.16	0.15	0.16
Gujarat	0.97	0.97	0.97	0.96	0.95	0.96	0.09	0.11	0.07	0.07	0.05	0.08
Haryana	0.94	0.95	0.95	0.97	0.95	0.95	0.15	0.18	0.10	0.13	0.06	0.12
Himachal Pradesh	0.92	0.92	0.91	0.87	0.89	0.90	0.35	0.10	0.10	0.09	0.04	0.14
Jammu & Kashmir	0.89	0.87	0.90	0.92	0.90	0.89	0.07	0.05	0.03	0.08	0.07	0.06
Karnataka	0.92	0.92	0.93	0.93	0.93	0.93	0.08	0.11	0.07	0.08	0.09	0.09
Kerala	0.82	0.82	0.80	0.85	0.76	0.81	0.11	0.11	0.16	0.17	0.13	0.14
Madhya Pradesh	0.91	0.91	0.91	0.93	0.95	0.92	0.16	0.08	0.04	0.03	0.02	0.07
Maharashtra	0.93	0.92	0.94	0.94	0.94	0.93	0.16	0.17	0.12	0.15	0.09	0.14
Manipur	0.36	0.64	0.48	0.29	0.42	0.44	0.04	0.02	0.03	0.08	0.07	0.05
Meghalaya	0.50	0.57	0.63	0.75	0.78	0.65	0.02	0.01	0.01	0.02	0.01	0.01
Nagaland	0.80	0.70	0.36	0.35	0.35	0.51	0.02	0.03	0.04	0.15	0.13	0.08
Orissa	0.80	0.83	0.86	0.89	0.86	0.85	0.06	0.02	0.03	0.07	0.07	0.05
Pondicherry	0.96	0.86	0.80	0.86	0.78	0.85	0.23	0.32	0.13	0.18	0.12	0.20
Punjab	0.98	0.97	0.96	0.95	0.95	0.96	0.15	0.11	0.06	0.07	0.04	0.09
Rajasthan	0.96	0.96	0.96	0.93	0.93	0.95	0.13	0.08	0.05	0.06	0.03	0.07
Tamil Nadu	0.86	0.85	0.85	0.84	0.87	0.85	0.10	0.13	0.12	0.10	0.10	0.11
Tripura	0.70	0.56	0.55	0.45	0.40	0.53	0.07	0.10	0.01	0.15	0.02	0.07
Uttar Pradesh	0.90	0.92	0.90	0.91	0.89	0.90	0.10	0.07	0.04	0.06	0.02	0.06
West Bengal	0.86	0.73	0.81	0.84	0.87	0.82	0.07	0.09	0.04	0.07	0.03	0.06
Nationwide	0.84	0.87	0.90	0.90	0.89	0.88	0.10	0.09	0.06	0.08	0.06	0.08

Notes: See Table 2a.

Table 3a: Shares of plants with financial loans by industry

		Total cell count						Average industry organized sector share in output, 1989-2010	Total share with financial loans					
		1989	1994	2000	2005	2010	Average		1989	1994	2000	2005	2010	Average
15	Food products and beverages	25,170	32,502	39,544	39,544	20,425	31,437	0.777	0.16	0.12	0.10	0.13	0.09	0.12
16	Tobacco products	8,579	17,207	12,996	12,996	3,624	11,080	0.714	0.01	0.02	0.01	0.00	0.02	0.01
17	Textiles	23,289	45,945	35,806	35,806	11,246	30,418	0.796	0.10	0.10	0.07	0.07	0.07	0.08
18	Wearing apparel; dressing and dyeing of fur	1,760	2,475	42,254	42,254	19,855	21,720	0.646	0.14	0.19	0.04	0.07	0.04	0.10
19	Leather tanning; luggage, handbags, footwear	2,876	3,738	4,229	4,229	1,569	3,328	0.791	0.22	0.16	0.12	0.15	0.07	0.14
20	Wood and wood products; straw and plating articles	14,397	24,492	26,942	26,942	8,508	20,256	0.217	0.09	0.06	0.05	0.07	0.05	0.06
21	Paper and paper products	1,680	1,806	2,402	2,402	1,816	2,021	0.917	0.07	0.09	0.08	0.05	0.09	0.07
22	Publishing, printing and media reproduction	2,375	2,608	4,809	4,809	2,280	3,376	0.623	0.25	0.20	0.20	0.24	0.15	0.21
23	Coke, refined petroleum and nuclear fuel	344	476	353	353	373	380	0.975	0.34	0.29	0.16	0.28	0.46	0.31
24	Chemicals and chemical products	4,385	6,285	5,685	5,685	4,780	5,364	0.969	0.08	0.10	0.10	0.06	0.07	0.08
25	Rubber and plastic products	2,236	2,975	3,713	3,713	2,696	3,067	0.876	0.20	0.29	0.22	0.28	0.12	0.22
26	Other non-metallic mineral products	8,797	14,356	13,906	13,906	8,692	11,931	0.803	0.11	0.10	0.09	0.13	0.16	0.12
27	Basic metals	2,569	3,163	2,882	2,882	2,798	2,859	0.967	0.37	0.33	0.22	0.41	0.15	0.30
28	Fabricated metal products, except machinery	7,107	8,751	14,346	14,346	6,924	10,295	0.687	0.18	0.15	0.11	0.14	0.12	0.14
29	Machinery and equipment, n.e.c.	6,031	8,060	6,069	6,069	4,443	6,134	0.883	0.15	0.13	0.22	0.20	0.12	0.16
30	Office, accounting and computing machinery	134	131	79	79	103	105	0.921	0.69	0.35	0.44	0.35	0.23	0.41
31	Electrical machinery and apparatus, n.e.c.	1,647	2,151	2,501	2,501	2,725	2,305	0.851	0.23	0.26	0.25	0.19	0.21	0.23
32	Radio, television, and comm. equipment	615	760	508	508	497	578	0.939	0.27	0.20	0.41	0.31	0.04	0.25
33	Medical, precision and optical instruments, watches	508	563	671	671	606	604	0.907	0.45	0.49	0.28	0.41	0.31	0.39
34	Motor vehicles, trailers and semi-trailers	679	955	1,387	1,387	1,206	1,123	0.973	0.37	0.41	0.23	0.51	0.28	0.36
35	Other transport equipment	1,149	1,498	1,104	1,104	993	1,170	0.944	0.24	0.31	0.24	0.17	0.19	0.23
36	Furniture, manufacturing n.e.c.	11,472	17,142	22,153	22,153	10,016	16,587	0.339	0.09	0.07	0.06	0.12	0.05	0.08
	Nationwide	127,799	198,039	244,339	244,339	116,175	186,138	0.820	0.10	0.09	0.07	0.08	0.06	0.08

Notes: See Table 1a. Table provides industry-level estimates of the share of manufacturing plants with financial loans. Shares use sample weights for population-representative values.

Table 3b: Shares of plants with financial loans by industry and sector

		ASI share						NSS share					
		1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average
15	Food products and beverages	0.88	0.87	0.89	0.90	0.92	0.89	0.15	0.12	0.10	0.13	0.08	0.11
16	Tobacco products	0.22	0.47	0.50	0.51	0.48	0.44	0.01	0.02	0.01	0.00	0.02	0.01
17	Textiles	0.95	0.94	0.94	0.94	0.94	0.94	0.10	0.09	0.07	0.07	0.07	0.08
18	Wearing apparel; dressing and dyeing of fur	0.98	0.94	0.93	0.93	0.94	0.94	0.13	0.17	0.04	0.07	0.04	0.09
19	Leather tanning; luggage, handbags, footwear	0.92	0.90	0.90	0.87	0.93	0.91	0.21	0.16	0.11	0.14	0.06	0.14
20	Wood and wood products; straw and plating articles	0.78	0.77	0.74	0.85	0.85	0.80	0.08	0.06	0.04	0.06	0.05	0.06
21	Paper and paper products	0.95	0.95	0.96	0.95	0.94	0.95	0.04	0.06	0.05	0.03	0.06	0.05
22	Publishing, printing and media reproduction	0.85	0.85	0.90	0.90	0.92	0.89	0.24	0.18	0.19	0.22	0.14	0.19
23	Coke, refined petroleum and nuclear fuel	0.78	0.86	0.90	0.83	0.96	0.87	0.31	0.23	0.08	0.21	0.22	0.21
24	Chemicals and chemical products	0.92	0.92	0.91	0.89	0.88	0.91	0.05	0.06	0.06	0.04	0.03	0.05
25	Rubber and plastic products	0.98	0.95	0.96	0.95	0.92	0.95	0.14	0.25	0.17	0.21	0.10	0.17
26	Other non-metallic mineral products	0.82	0.82	0.79	0.77	0.74	0.79	0.10	0.09	0.08	0.11	0.14	0.10
27	Basic metals	0.97	0.97	0.96	0.97	0.96	0.97	0.19	0.23	0.10	0.31	0.04	0.18
28	Fabricated metal products, except machinery	0.95	0.95	0.94	0.94	0.94	0.94	0.17	0.14	0.11	0.14	0.11	0.13
29	Machinery and equipment, n.e.c.	0.95	0.94	0.93	0.94	0.94	0.94	0.13	0.11	0.19	0.16	0.09	0.14
30	Office, accounting and computing machinery	0.95	0.96	0.82	0.83	0.91	0.90	0.54	0.10	0.07	0.28	0.18	0.23
31	Electrical machinery and apparatus, n.e.c.	0.96	0.96	0.96	0.94	0.92	0.95	0.16	0.18	0.21	0.17	0.10	0.17
32	Radio, television, and comm. equipment	0.95	0.92	0.96	0.88	0.90	0.92	0.18	0.07	0.34	0.21	0.04	0.17
33	Medical, precision and optical instruments, watches	0.95	0.94	0.91	0.90	0.90	0.92	0.42	0.46	0.22	0.37	0.26	0.35
34	Motor vehicles, trailers and semi-trailers	0.96	0.95	0.95	0.94	0.94	0.95	0.15	0.27	0.16	0.43	0.16	0.23
35	Other transport equipment	0.95	0.96	0.95	0.95	0.94	0.95	0.18	0.26	0.16	0.12	0.12	0.17
36	Furniture, manufacturing n.e.c.	0.88	0.87	0.89	0.92	0.87	0.89	0.09	0.07	0.06	0.12	0.05	0.08
	Nationwide	0.84	0.87	0.90	0.90	0.89	0.88	0.10	0.09	0.06	0.08	0.06	0.08

Notes: See Table 3a.

Table 3c: Shares of plants with financial loans by urban/rural setting for ASI plants

		Urban share						Rural share					
		1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average
15	Food products and beverages	0.89	0.89	0.89	0.90	0.90	0.90	0.85	0.86	0.90	0.90	0.93	0.89
16	Tobacco products	0.24	0.54	0.55	0.56	0.57	0.49	0.27	0.29	0.44	0.43	0.38	0.36
17	Textiles	0.95	0.94	0.95	0.94	0.94	0.94	0.95	0.93	0.93	0.93	0.94	0.93
18	Wearing apparel; dressing and dyeing of fur	0.98	0.93	0.93	0.94	0.94	0.94	0.96	0.96	0.91	0.88	0.92	0.93
19	Leather tanning; luggage, handbags, footwear	0.92	0.91	0.90	0.87	0.92	0.90	0.90	0.89	0.92	0.89	0.96	0.91
20	Wood and wood products; straw and plating articles	0.81	0.80	0.80	0.87	0.84	0.83	0.75	0.73	0.68	0.82	0.86	0.77
21	Paper and paper products	0.96	0.95	0.97	0.96	0.94	0.96	0.94	0.95	0.94	0.94	0.95	0.94
22	Publishing, printing and media reproduction	0.85	0.85	0.91	0.90	0.92	0.89	0.85	0.85	0.85	0.87	0.95	0.87
23	Coke, refined petroleum and nuclear fuel	0.77	0.84	0.91	0.87	0.93	0.87	0.79	0.87	0.89	0.81	0.97	0.86
24	Chemicals and chemical products	0.93	0.94	0.92	0.92	0.89	0.92	0.89	0.89	0.90	0.85	0.87	0.88
25	Rubber and plastic products	0.99	0.96	0.96	0.96	0.93	0.96	0.96	0.93	0.95	0.93	0.91	0.93
26	Other non-metallic mineral products	0.86	0.87	0.87	0.84	0.85	0.86	0.78	0.77	0.74	0.74	0.68	0.74
27	Basic metals	0.97	0.97	0.96	0.98	0.96	0.97	0.97	0.97	0.96	0.96	0.96	0.97
28	Fabricated metal products, except machinery	0.94	0.95	0.93	0.93	0.94	0.94	0.96	0.94	0.94	0.95	0.93	0.94
29	Machinery and equipment, n.e.c.	0.95	0.94	0.93	0.94	0.94	0.94	0.95	0.96	0.92	0.94	0.95	0.94
30	Office, accounting and computing machinery	0.97	0.97	0.88	0.90	0.93	0.93	0.92	0.90	0.51	0.62	0.87	0.76
31	Electrical machinery and apparatus, n.e.c.	0.96	0.96	0.96	0.94	0.93	0.95	0.94	0.94	0.94	0.93	0.90	0.93
32	Radio, television, and comm. equipment	0.95	0.93	0.96	0.87	0.92	0.93	0.97	0.87	0.96	0.88	0.84	0.90
33	Medical, precision and optical instruments, watches	0.94	0.93	0.93	0.90	0.92	0.93	0.99	0.96	0.83	0.89	0.82	0.90
34	Motor vehicles, trailers and semi-trailers	0.96	0.94	0.95	0.94	0.95	0.95	0.96	0.96	0.94	0.94	0.91	0.94
35	Other transport equipment	0.94	0.96	0.95	0.95	0.94	0.95	0.97	0.94	0.95	0.95	0.95	0.95
36	Furniture, manufacturing n.e.c.	0.87	0.87	0.90	0.93	0.87	0.89	0.89	0.87	0.87	0.87	0.86	0.87
	Nationwide	0.86	0.89	0.92	0.92	0.91	0.90	0.82	0.82	0.87	0.86	0.85	0.85

Notes: See Table 3a.

Table 3d: Loan intensity for ASI plants

		Loan to output levels						Loan per employee levels					
		1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average
15	Food products and beverages	0.22	0.27	0.37	0.33	0.33	0.30	14,388	18,084	30,788	32,867	44,129	28,051
16	Tobacco products	0.11	0.15	0.13	0.13	0.09	0.12	1,877	1,915	2,294	2,097	1,781	1,993
17	Textiles	0.42	0.51	0.56	0.49	0.58	0.51	12,998	16,275	27,563	31,283	44,015	26,427
18	Wearing apparel; dressing and dyeing of fur	0.25	0.24	0.28	0.33	0.34	0.29	7,030	6,478	11,590	12,875	15,872	10,769
19	Leather tanning; luggage, handbags, footwear	0.27	0.27	0.26	0.21	0.27	0.26	10,106	12,522	14,928	13,157	18,280	13,799
20	Wood and wood products; straw and plating articles	0.41	0.47	0.42	0.38	0.35	0.41	16,968	11,335	13,751	18,809	25,461	17,265
21	Paper and paper products	0.34	0.52	0.50	0.41	0.50	0.46	24,505	33,025	37,164	39,114	57,419	38,245
22	Publishing, printing and media reproduction	0.32	0.27	0.43	0.55	0.54	0.42	8,298	9,758	17,348	28,852	39,149	20,681
23	Coke, refined petroleum and nuclear fuel	4.23	0.25	0.13	0.19	0.22	1.00	747,742	46,258	27,341	50,052	44,766	183,232
24	Chemicals and chemical products	0.43	0.47	0.46	0.35	0.33	0.41	43,359	46,927	51,959	47,735	53,693	48,735
25	Rubber and plastic products	0.33	0.40	0.44	0.31	0.30	0.35	24,406	27,426	37,502	34,552	40,167	32,811
26	Other non-metallic mineral products	0.46	0.52	0.63	0.44	0.36	0.48	18,981	19,668	37,941	26,303	27,525	26,083
27	Basic metals	0.33	0.45	0.58	0.41	0.50	0.45	24,900	50,509	80,147	76,810	89,505	64,374
28	Fabricated metal products, except machinery	0.31	0.44	0.40	0.29	0.37	0.36	14,125	21,504	21,658	24,044	33,272	22,921
29	Machinery and equipment, n.e.c.	0.75	0.33	0.31	0.25	0.25	0.38	32,275	15,217	22,525	26,898	32,672	25,918
30	Office, accounting and computing machinery	0.43	0.26	0.38	1.07	0.62	0.55	28,652	26,223	57,050	171,016	87,389	74,066
31	Electrical machinery and apparatus, n.e.c.	0.37	0.31	0.39	0.24	0.21	0.30	21,484	20,544	34,001	31,008	31,803	27,768
32	Radio, television, and comm. equipment	0.75	0.43	0.43	0.38	0.38	0.47	44,716	28,165	49,593	44,201	58,976	45,130
33	Medical, precision and optical instruments, watches	0.59	0.71	0.47	0.41	0.28	0.49	7,093	30,032	28,636	30,055	8,979	20,959
34	Motor vehicles, trailers and semi-trailers	0.40	0.30	0.53	0.22	0.26	0.34	21,168	18,169	48,417	27,769	34,407	29,986
35	Other transport equipment	0.47	0.32	0.35	0.24	0.39	0.35	18,250	14,254	22,970	25,992	51,747	26,643
36	Furniture, manufacturing n.e.c.	0.37	0.27	0.35	0.41	0.41	0.36	13,244	15,078	30,301	51,847	47,015	31,497
	Nationwide	0.45	0.39	0.44	0.35	0.37	0.40	23,180	22,057	32,867	32,944	40,707	30,351

Notes: See Table 3a.

Table 4a: Shares of plants with financial loans by young/old status for ASI plants

		Old share						Young share					
		1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average
15	Food products and beverages	0.87	0.87	0.89	0.90	0.92	0.89	0.91	0.87	0.92	0.90	0.88	0.90
16	Tobacco products	0.21	0.55	0.53	0.51	0.48	0.46	0.52	0.03	0.22	0.48	0.45	0.34
17	Textiles	0.95	0.94	0.94	0.94	0.94	0.94	0.97	0.93	0.92	0.91	0.92	0.93
18	Wearing apparel; dressing and dyeing of fur	0.98	0.94	0.92	0.95	0.94	0.95	0.98	0.93	0.93	0.87	0.92	0.93
19	Leather tanning; luggage, handbags, footwear	0.91	0.90	0.91	0.88	0.94	0.91	0.95	0.91	0.87	0.81	0.87	0.88
20	Wood and wood products; straw and plating articles	0.78	0.78	0.74	0.85	0.86	0.80	0.76	0.72	0.79	0.80	0.79	0.77
21	Paper and paper products	0.95	0.95	0.95	0.95	0.94	0.95	0.98	0.93	0.96	0.97	0.95	0.96
22	Publishing, printing and media reproduction	0.84	0.85	0.90	0.90	0.92	0.88	0.96	0.93	0.94	0.89	0.96	0.94
23	Coke, refined petroleum and nuclear fuel	0.79	0.85	0.92	0.83	0.96	0.87	0.71	0.88	0.76	0.82	1.00	0.84
24	Chemicals and chemical products	0.92	0.92	0.91	0.90	0.88	0.91	0.93	0.91	0.89	0.83	0.88	0.89
25	Rubber and plastic products	0.98	0.95	0.96	0.95	0.93	0.96	0.97	0.94	0.92	0.89	0.87	0.92
26	Other non-metallic mineral products	0.82	0.81	0.79	0.79	0.74	0.79	0.82	0.83	0.76	0.69	0.72	0.76
27	Basic metals	0.97	0.97	0.96	0.97	0.96	0.97	0.97	0.96	0.94	0.97	0.95	0.96
28	Fabricated metal products, except machinery	0.95	0.95	0.94	0.94	0.94	0.94	0.95	0.95	0.92	0.90	0.91	0.92
29	Machinery and equipment, n.e.c.	0.95	0.94	0.93	0.95	0.94	0.94	0.94	0.95	0.87	0.89	0.91	0.91
30	Office, accounting and computing machinery	0.96	0.96	0.84	0.85	0.95	0.91	0.95	1.00	0.77	0.75	0.66	0.83
31	Electrical machinery and apparatus, n.e.c.	0.97	0.96	0.96	0.95	0.93	0.95	0.90	0.91	0.93	0.86	0.88	0.90
32	Radio, television, and comm. equipment	0.96	0.92	0.96	0.89	0.92	0.93	0.95	0.95	0.98	0.79	0.80	0.89
33	Medical, precision and optical instruments, watches	0.95	0.93	0.93	0.90	0.92	0.93	0.98	0.95	0.68	0.86	0.78	0.85
34	Motor vehicles, trailers and semi-trailers	0.96	0.95	0.96	0.94	0.96	0.96	0.89	0.91	0.90	0.88	0.84	0.88
35	Other transport equipment	0.95	0.96	0.95	0.95	0.95	0.95	0.97	0.86	0.89	0.97	0.89	0.92
36	Furniture, manufacturing n.e.c.	0.88	0.87	0.89	0.92	0.88	0.89	0.87	0.86	0.88	0.90	0.80	0.86
	Nationwide	0.83	0.88	0.90	0.90	0.90	0.88	0.91	0.80	0.88	0.86	0.86	0.86

Notes: See Table 3a. Plants at least 3 years of age are coded as old.

Table 4b: Shares of plants with financial loans by share of land and building values rented for ASI plants

		<=50% share						>50% share					
		1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average
15	Food products and beverages	0.91	0.89	0.90	0.92	0.93	0.91	0.91	0.90	0.94	0.93	0.94	0.92
16	Tobacco products	0.32	0.35	0.50	0.45	0.47	0.42	0.28	0.62	0.59	0.73	0.52	0.55
17	Textiles	0.95	0.95	0.96	0.95	0.95	0.95	0.97	0.95	0.95	0.97	0.96	0.96
18	Wearing apparel; dressing and dyeing of fur	0.98	0.94	0.93	0.95	0.95	0.95	1.00	0.97	0.94	0.96	0.96	0.96
19	Leather tanning; luggage, handbags, footwear	0.93	0.92	0.92	0.89	0.92	0.92	0.95	0.90	0.93	0.99	0.97	0.95
20	Wood and wood products; straw and plating articles	0.80	0.80	0.76	0.87	0.89	0.82	0.84	0.84	0.81	0.87	0.79	0.83
21	Paper and paper products	0.97	0.96	0.95	0.97	0.96	0.96	0.95	0.96	0.98	0.97	0.95	0.96
22	Publishing, printing and media reproduction	0.83	0.85	0.92	0.92	0.94	0.89	0.90	0.94	0.90	0.94	0.94	0.92
23	Coke, refined petroleum and nuclear fuel	0.76	0.84	0.88	0.82	0.96	0.85	0.94	0.94	0.99	0.87	1.00	0.95
24	Chemicals and chemical products	0.93	0.93	0.94	0.91	0.89	0.92	0.94	0.94	0.95	0.92	0.93	0.94
25	Rubber and plastic products	0.99	0.95	0.97	0.95	0.94	0.96	0.97	0.99	0.98	0.98	0.95	0.97
26	Other non-metallic mineral products	0.88	0.87	0.82	0.82	0.80	0.84	0.69	0.68	0.70	0.66	0.64	0.68
27	Basic metals	0.98	0.98	0.98	0.97	0.97	0.97	0.97	0.98	0.91	0.98	0.94	0.96
28	Fabricated metal products, except machinery	0.96	0.96	0.95	0.95	0.95	0.95	0.97	0.96	0.94	0.96	0.95	0.96
29	Machinery and equipment, n.e.c.	0.96	0.95	0.94	0.95	0.94	0.95	0.94	0.94	0.93	0.95	0.95	0.94
30	Office, accounting and computing machinery	0.97	0.92	0.83	0.79	0.89	0.88	0.97	1.00	0.95	0.89	1.00	0.96
31	Electrical machinery and apparatus, n.e.c.	0.98	0.97	0.98	0.95	0.94	0.96	0.98	0.97	0.97	0.95	0.92	0.96
32	Radio, television, and comm. equipment	0.95	0.92	0.96	0.90	0.88	0.92	0.99	0.95	0.98	0.85	0.95	0.94
33	Medical, precision and optical instruments, watches	0.96	0.97	0.93	0.92	0.92	0.94	0.97	0.96	0.93	0.94	0.93	0.95
34	Motor vehicles, trailers and semi-trailers	0.96	0.95	0.97	0.95	0.95	0.96	0.95	0.97	0.99	0.95	0.96	0.97
35	Other transport equipment	0.96	0.95	0.96	0.95	0.95	0.95	0.95	0.98	0.95	0.96	0.90	0.95
36	Furniture, manufacturing n.e.c.	0.88	0.87	0.88	0.93	0.90	0.89	0.93	0.88	0.93	0.96	0.94	0.93
	Nationwide	0.91	0.91	0.92	0.92	0.92	0.91	0.78	0.85	0.90	0.89	0.86	0.86

Notes: See Table 4a. Thresholds refer to share of total land and building values attributable to hired assets.

Table 4c: Shares of plants with financial loans by age and rent intensity for ASI plants

		Young, non-intensive	Old, non-intensive	Young, intensive	Old, intensive
15	Food products and beverages	0.94	0.91	0.92	0.92
16	Tobacco products	0.30	0.49	0.79	0.55
17	Textiles	0.96	0.95	0.97	0.96
18	Wearing apparel; dressing and dyeing of fur	0.94	0.95	0.97	0.96
19	Leather tanning; luggage, handbags, footwear	0.93	0.92	0.99	0.95
20	Wood and wood products; straw and plating articles	0.86	0.82	0.74	0.84
21	Paper and paper products	0.97	0.96	1.00	0.96
22	Publishing, printing and media reproduction	0.95	0.89	0.95	0.92
23	Coke, refined petroleum and nuclear fuel	0.83	0.86	0.88	0.95
24	Chemicals and chemical products	0.91	0.92	0.93	0.94
25	Rubber and plastic products	0.95	0.96	0.94	0.98
26	Other non-metallic mineral products	0.85	0.84	0.52	0.70
27	Basic metals	0.98	0.97	0.93	0.96
28	Fabricated metal products, except machinery	0.96	0.95	0.95	0.96
29	Machinery and equipment, n.e.c.	0.95	0.95	0.90	0.94
30	Office, accounting and computing machinery	0.79	0.89	0.98	0.96
31	Electrical machinery and apparatus, n.e.c.	0.91	0.97	0.95	0.96
32	Radio, television, and comm. equipment	0.88	0.93	0.96	0.94
33	Medical, precision and optical instruments, watches	0.88	0.95	0.84	0.95
34	Motor vehicles, trailers and semi-trailers	0.91	0.96	0.86	0.97
35	Other transport equipment	0.94	0.95	0.84	0.95
36	Furniture, manufacturing n.e.c.	0.91	0.89	0.87	0.93
	Nationwide	0.90	0.91	0.82	0.86

Notes: See Table 4a. An entity is rent intensive if over half of the land and building values are attributable to hired assets.

Table 5a: Estimations of financial loan levels by asset holdings and district-level banking conditions

	Estimation with state-year and industry-year FE								
	Full sample			Districts with below median banking			Districts with above median banking		
	Baseline estimation	Considering owners of land and buildings	Considering renters of land and buildings	Baseline estimation	Considering owners of land and buildings	Considering renters of land and buildings	Baseline estimation	Considering owners of land and buildings	Considering renters of land and buildings
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Total output	0.267+++	0.255+++	0.277+++	0.277+++	0.275+++	0.262+++	0.254+++	0.239+++	0.277+++
	(0.010)	(0.011)	(0.015)	(0.019)	(0.019)	(0.027)	(0.012)	(0.013)	(0.018)
Total employees	0.055+++	0.043+++	0.094+++	0.053++	0.036	0.108+++	0.063+++	0.052+++	0.095+++
	(0.015)	(0.015)	(0.021)	(0.025)	(0.026)	(0.030)	(0.018)	(0.019)	(0.026)
Indicator for young plant	-0.009	0.031	-0.114+++	0.001	0.043	-0.098+	-0.010	0.029	-0.114++
	(0.024)	(0.027)	(0.039)	(0.034)	(0.040)	(0.059)	(0.031)	(0.034)	(0.052)
Indicator for rural/urban	0.031	0.034	0.007	0.059+	0.050	0.036	0.004	0.011	-0.014
	(0.020)	(0.022)	(0.027)	(0.032)	(0.032)	(0.041)	(0.025)	(0.028)	(0.034)
Land and building assets	0.174+++	0.219+++	0.119+++	0.229+++	0.276+++	0.167+++	0.150+++	0.189+++	0.100+++
	(0.011)	(0.012)	(0.012)	(0.013)	(0.017)	(0.018)	(0.011)	(0.013)	(0.013)
Plant machinery assets	0.199+++	0.188+++	0.192+++	0.189+++	0.177+++	0.182+++	0.201+++	0.192+++	0.195+++
	(0.006)	(0.008)	(0.008)	(0.012)	(0.013)	(0.014)	(0.007)	(0.008)	(0.009)
Other assets	0.098+++	0.088+++	0.128+++	0.084+++	0.071+++	0.124+++	0.106+++	0.097+++	0.130+++
	(0.004)	(0.004)	(0.007)	(0.006)	(0.006)	(0.010)	(0.005)	(0.005)	(0.010)
Observations	137434	83784	53650	45687	28654	17033	91382	54881	36501
Adjusted R-squared	0.499	0.490	0.518	0.552	0.537	0.588	0.468	0.462	0.474

Notes: Table shows regressions of financial loan levels for ASI plants. Estimations consider the log amount of financial loans for each plant as a function of basic plant traits. Estimations include state-year and industry-year FE, with additional controls added as indicated by column headers. The second and third columns of each triplet partition the sample by whether the plant owns its land and buildings. Columns 4-6 and 7-9 partition the sample by whether the district's banking conditions in 2000 are above or below the median in terms of household banking access as reported in Census. Observations are weighted by ASI sample weights. Estimations cluster standard errors by district. +, ++, and +++ indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Table 5b: Representative plant-level regressions for log expected loans

	Estimation with state-year and industry-year FE				
	Baseline estimation	Including district covariates	Including district-industry FE	Using state-industry-year FE	Dropping weights
	(1)	(2)	(3)	(4)	(5)
Total output	0.531+++	0.525+++	0.476+++	0.514+++	0.492+++
	(0.013)	(0.013)	(0.012)	(0.012)	(0.014)
Total employees	0.330+++	0.340+++	0.391+++	0.347+++	0.374+++
	(0.018)	(0.018)	(0.016)	(0.017)	(0.020)
Indicator for young plant	0.408+++	0.405+++	0.403+++	0.417+++	0.416+++
	(0.026)	(0.027)	(0.025)	(0.025)	(0.027)
Indicator for rural/urban	-0.043+	-0.067+++	-0.114+++	-0.080+++	-0.089+++
	(0.026)	(0.024)	(0.021)	(0.023)	(0.025)
Observations	142639	137970	142639	142639	142639
Adjusted R-squared	0.450	0.452	0.492	0.467	0.445

Notes: See Table 5a. Table shows representative regressions for determining expected loan size for ASI plants. Estimations consider the log amount of financial loans for each plant as a function of basic plant traits. Estimations include state-year and industry-year FE, with additional controls added as indicated by column headers. Actual expected loan levels for plants are determined using industry-specific regressions as described in the text.

Table 6a: District-industry-year regressions for log total loans

	Panel estimation with district-industry, state-year and industry-year FE							
	Baseline estimation	Using district covariates instead of FE	Dropping weights	Using state-industry-year FE	Adding employment control	Using balanced panel	Misallocation without industry aggregation step	Misallocation using OLS TFP metric
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A. Using land and labor misallocation in organized sector							
Land misallocation index	-0.083	-0.063	-0.081+	-0.081	-0.053+	-0.066	-0.062	-0.071
	(0.053)	(0.045)	(0.049)	(0.057)	(0.028)	(0.073)	(0.052)	(0.049)
Labor misallocation index	0.113+	0.051	0.109+	0.108	0.047+	0.076	0.161++	0.189+++
	(0.067)	(0.053)	(0.058)	(0.077)	(0.026)	(0.104)	(0.064)	(0.062)
Log employment in district-industry-year					1.055+++			
					(0.020)			
Observations	14053	14053	14053	14053	14053	6439	14053	14053
Adjusted R-squared	0.629	0.314	0.631	0.629	0.817	0.611	0.629	0.630
	B. Using land and labor misallocation in total manufacturing sector							
Land misallocation index	0.013	-0.041	0.007	0.005	-0.058+	-0.041	-0.051	-0.013
	(0.056)	(0.054)	(0.055)	(0.063)	(0.033)	(0.070)	(0.054)	(0.058)
Labor misallocation index	-0.045	-0.069	-0.054	-0.039	0.014	0.032	0.240+++	0.244+++
	(0.070)	(0.059)	(0.067)	(0.078)	(0.031)	(0.081)	(0.070)	(0.063)
Log employment in district-industry-year					1.057+++			
					(0.020)			
Observations	14053	14053	14053	14053	14053	6439	14053	14053
Adjusted R-squared	0.628	0.314	0.630	0.628	0.817	0.610	0.631	0.632

Notes: Estimations consider the log amount of financial loans in district-industry-year observations taken from the ASI as a function of local land and labor misallocation. In Panel A, land and labor misallocation are calculated using ASI plants only. In Panel B, misallocation is calculated using ASI and NSS data, to combine the organized and unorganized sectors. Estimations include district-industry, state-year, and industry-year FE, excepting column 2 that drops district-industry fixed effects and instead controls for local district traits. Observations are weighted by an interaction of log district size and log industry size measured in terms of employment in 2000. Estimations cluster standard errors by district. +, ++, and +++ indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Table 6b: District-industry-year regressions for log loan intensity compared to output

	Panel estimation with district-industry, state-year and industry-year FE							
	Baseline estimation	Using district covariates instead of FE	Dropping weights	Using state-industry-year FE	Adding employment control	Using balanced panel	Misallocation without industry aggregation step	Misallocation using OLS TFP metric
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A. Using land and labor misallocation in organized sector							
Land misallocation index	-0.014	0.005	-0.012	-0.012	-0.016	0.014	0.027	0.029
	(0.026)	(0.022)	(0.027)	(0.027)	(0.026)	(0.028)	(0.029)	(0.028)
Labor misallocation index	0.028	0.012	0.028	0.022	0.034	0.008	0.035	0.028
	(0.028)	(0.022)	(0.029)	(0.031)	(0.027)	(0.029)	(0.031)	(0.030)
Log employment in district-industry-year					-0.090+++			
					(0.020)			
Observations	14053	14053	14053	14053	14053	6439	14053	14053
Adjusted R-squared	0.274	0.061	0.291	0.274	0.280	0.232	0.275	0.275
	B. Using land and labor misallocation in total manufacturing sector							
Land misallocation index	-0.005	-0.004	0.005	-0.006	0.001	-0.025	0.014	0.029
	(0.031)	(0.022)	(0.032)	(0.031)	(0.031)	(0.029)	(0.035)	(0.030)
Labor misallocation index	0.032	0.044++	0.032	0.034	0.027	0.063++	0.049	0.027
	(0.029)	(0.020)	(0.030)	(0.029)	(0.028)	(0.026)	(0.036)	(0.030)
Log employment in district-industry-year					-0.089+++			
					(0.020)			
Observations	14053	14053	14053	14053	14053	6439	14053	14053
Adjusted R-squared	0.274	0.062	0.291	0.274	0.279	0.233	0.275	0.275

Notes: See Table 6a.

Table 7a: District-industry-year regressions for misallocation in financial loans

	Panel estimation with district-industry, state-year and industry-year FE							
	Baseline estimation	Using district covariates instead of FE	Dropping weights	Using state-industry-year FE	Adding employment control	Using balanced panel	Misallocation without industry aggregation step	Misallocation using OLS TFP metric
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A. Using land and labor misallocation in organized sector							
Land misallocation index	0.389+++	0.376+++	0.371+++	0.389+++	0.389+++	0.451+++	0.476+++	0.476+++
	(0.049)	(0.036)	(0.049)	(0.051)	(0.049)	(0.048)	(0.053)	(0.051)
Labor misallocation index	0.266+++	0.265+++	0.288+++	0.266+++	0.266+++	0.229+++	0.298+++	0.304+++
	(0.065)	(0.050)	(0.064)	(0.067)	(0.065)	(0.068)	(0.053)	(0.052)
Log employment in district-industry-year					-0.004			
					(0.014)			
Observations	14839	14839	14839	14839	14839	6546	14839	14839
Adjusted R-squared	0.429	0.410	0.444	0.429	0.429	0.437	0.542	0.546
	B. Using land and labor misallocation in total manufacturing sector							
Land misallocation index	0.293+++	0.247+++	0.290+++	0.294+++	0.293+++	0.344+++	0.398+++	0.417+++
	(0.064)	(0.044)	(0.064)	(0.065)	(0.064)	(0.068)	(0.074)	(0.063)
Labor misallocation index	-0.057	-0.055	-0.053	-0.060	-0.057	-0.050	0.126+	0.102
	(0.059)	(0.039)	(0.059)	(0.061)	(0.059)	(0.064)	(0.069)	(0.062)
Log employment in district-industry-year					0.001			
					(0.015)			
Observations	14839	14839	14839	14839	14839	6546	14839	14839
Adjusted R-squared	0.217	0.171	0.234	0.217	0.217	0.215	0.344	0.375

Notes: See Table 6a. Misallocation variables are expressed in unit standard deviations.

Table 7b: District-industry-year regressions for absolute deviation in actual loans and expected loans

	Panel estimation with district-industry, state-year and industry-year FE								
	Baseline estimation	Using district covariates instead of FE	Dropping weights	Using state-industry-year FE	Adding employment control	Using balanced panel	Misallocation without industry aggregation step	Misallocation using OLS TFP metric	Using average deviation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	A. Using land and labor misallocation in organized sector								
Land misallocation index	0.038++	0.036++	0.036+	0.037+	0.045+++	0.041+	0.055++	0.049++	0.037++
	(0.019)	(0.015)	(0.019)	(0.020)	(0.016)	(0.024)	(0.022)	(0.022)	(0.018)
Labor misallocation index	-0.013	-0.041++	-0.012	-0.011	-0.029+	-0.024	-0.001	0.010	-0.019
	(0.021)	(0.017)	(0.020)	(0.021)	(0.017)	(0.027)	(0.024)	(0.024)	(0.020)
Log employment in district-industry-year					0.224+++				
					(0.011)				
Observations	14839	14839	14839	14839	14839	6546	14839	14839	14839
Adjusted R-squared	0.259	0.097	0.270	0.259	0.318	0.224	0.259	0.259	0.147
	B. Using land and labor misallocation in total manufacturing sector								
Land misallocation index	0.049++	0.044++	0.047+	0.045+	0.034	0.057++	0.062++	0.044+	0.032
	(0.025)	(0.019)	(0.024)	(0.026)	(0.022)	(0.027)	(0.024)	(0.023)	(0.026)
Labor misallocation index	-0.034	-0.057+++	-0.039+	-0.032	-0.021	-0.024	0.025	0.051++	-0.020
	(0.023)	(0.018)	(0.023)	(0.024)	(0.019)	(0.025)	(0.025)	(0.023)	(0.021)
Log employment in district-industry-year					0.223+++				
					(0.011)				
Observations	14839	14839	14839	14839	14839	6546	14839	14839	14839
Adjusted R-squared	0.259	0.098	0.270	0.259	0.317	0.225	0.261	0.262	0.146

Notes: See Table 6a. Misallocation variables and loan deviations are expressed in unit standard deviations.

Table 7c: District-industry-year regressions for squared deviation in actual loans and expected loans

	Panel estimation with district-industry, state-year and industry-year FE								
	Baseline estimation	Using district covariates instead of FE	Dropping weights	Using state-industry-year FE	Adding employment control	Using balanced panel	Misallocation without industry aggregation step	Misallocation using OLS TFP metric	Using average deviation
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	A. Using land and labor misallocation in organized sector								
Land misallocation index	0.034++	0.023++	0.031+	0.032+	0.036++	0.034	0.049++	0.045++	0.025
	(0.017)	(0.011)	(0.016)	(0.019)	(0.017)	(0.022)	(0.019)	(0.019)	(0.017)
Labor misallocation index	-0.021	-0.029++	-0.018	-0.019	-0.027	-0.047++	-0.021	-0.017	-0.011
	(0.019)	(0.013)	(0.018)	(0.022)	(0.019)	(0.023)	(0.022)	(0.022)	(0.020)
Log employment in district-industry-year					0.080+++				
					(0.012)				
Observations	14839	14839	14839	14839	14839	6546	14839	14839	14839
Adjusted R-squared	0.099	0.036	0.108	0.099	0.106	0.132	0.099	0.099	0.090
	B. Using land and labor misallocation in total manufacturing sector								
Land misallocation index	0.041+	0.037++	0.039	0.040	0.036	0.049+	0.051++	0.036+	0.026
	(0.024)	(0.015)	(0.024)	(0.026)	(0.024)	(0.025)	(0.023)	(0.022)	(0.026)
Labor misallocation index	-0.034+	-0.037+++	-0.037+	-0.033	-0.030	-0.023	-0.011	0.016	-0.016
	(0.020)	(0.013)	(0.020)	(0.022)	(0.020)	(0.021)	(0.021)	(0.022)	(0.020)
Log employment in district-industry-year					0.079+++				
					(0.012)				
Observations	14839	14839	14839	14839	14839	6546	14839	14839	14839
Adjusted R-squared	0.099	0.036	0.108	0.099	0.106	0.132	0.099	0.099	0.090

Notes: See Table 6a. Misallocation variables and loan deviations are expressed in unit standard deviations.

Table 7d: IV estimations using first-differences format

	Baseline OLS estimation with district-industry, state-year, and industry-year FE	FD OLS estimation with state-year and industry-year FE	FD IV estimation with state-year and industry-year FE	Column 3 with log employment change control	Column 3 with log employment change control and extra IV lags	Column 3 using average deviations
	(1)	(2)	(3)	(4)	(5)	(6)
			A. Absolute deviations in expected and actual loans			
Land misallocation index	0.049++	0.047++	0.129	0.159+	0.146++	0.141
	(0.025)	(0.024)	(0.111)	(0.093)	(0.058)	(0.091)
Labor misallocation index	-0.034	-0.037	-0.126	-0.089	-0.060	-0.042
	(0.023)	(0.024)	(0.124)	(0.106)	(0.065)	(0.100)
Log employment in district-industry-year				0.221+++	0.222+++	
				(0.013)	(0.012)	
Observations	14852	8525	8525	8525	8525	8525
Overid test p-value					0.823	
			B. Squared deviations in expected and actual loans			
Land misallocation index	0.041+	0.036	0.229++	0.239++	0.169++	0.205++
	(0.024)	(0.025)	(0.105)	(0.103)	(0.068)	(0.097)
Labor misallocation index	-0.034	-0.032	-0.141	-0.129	-0.045	-0.112
	(0.020)	(0.022)	(0.105)	(0.105)	(0.069)	(0.096)
Log employment in district-industry-year				0.072+++	0.074+++	
				(0.015)	(0.015)	
Observations	14852	8525	8525	8525	8525	8525
Overid test p-value					0.492	

Notes: See Tables 7a-7c. Column 1 repeats the levels specification with panel fixed effects, and Column 2 shows a comparable first-differences form. Column 3 instruments for the change in total land and labor misallocation within the district's manufacturing sector with the change in the unorganized sector's land and labor misallocation. Coefficients in the first stage for the change in total land misallocation are 0.684 (0.102)+++ for the change in unorganized sector land misallocation and 0.006 (0.144) for the change in unorganized sector labor misallocation. Comparable coefficients in the first stage for the change in total labor misallocation are 0.248 (0.136)+ and 0.740 (0.157)+++. Column 4 introduces the employment change control. Column 5 introduces lags of ASI land and labor misallocation as added instruments. Column 6 considers average deviations as the outcome.

Table 8a: District-industry-year regressions for share of financial loans for young plants

	Panel estimation with district-industry, state-year and industry-year FE							
	Baseline estimation	Using district covariates instead of FE	Dropping weights	Using state-industry-year FE	Adding employment control	Using balanced panel	Misallocation without industry aggregation step	Misallocation using OLS TFP metric
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A. Using land and labor misallocation in organized sector							
Land misallocation index	0.008	0.012+++	0.009	0.008	0.008	0.010	0.015+++	0.015++
	(0.006)	(0.004)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)
Labor misallocation index	-0.003	-0.009++	-0.003	-0.004	-0.003	-0.005	0.001	-0.001
	(0.005)	(0.004)	(0.005)	(0.006)	(0.005)	(0.007)	(0.006)	(0.006)
Log employment in district-industry-year					-0.004			
					(0.004)			
Observations	14053	14053	14053	14053	14053	6439	14053	14053
Adjusted R-squared	0.148	0.066	0.173	0.148	0.148	0.089	0.149	0.149
	B. Using land and labor misallocation in total manufacturing sector							
Land misallocation index	-0.005	0.004	-0.005	-0.003	-0.005	-0.006	0.008	0.012+
	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)	(0.008)	(0.007)	(0.007)
Labor misallocation index	0.014++	0.002	0.014++	0.013++	0.014++	0.018++	0.006	-0.004
	(0.006)	(0.004)	(0.006)	(0.006)	(0.006)	(0.008)	(0.007)	(0.007)
Log employment in district-industry-year					-0.004			
					(0.004)			
Observations	14053	14053	14053	14053	14053	6439	14053	14053
Adjusted R-squared	0.148	0.066	0.173	0.148	0.148	0.090	0.148	0.148

Notes: See Table 6a.

Table 8b: District-industry-year regressions for log share of financial loans for young plants

	Panel estimation with district-industry, state-year and industry-year FE							
	Baseline estimation	Using district covariates instead of FE	Dropping weights	Using state-industry-year FE	Adding employment control	Using balanced panel	Misallocation without industry aggregation step	Misallocation using OLS TFP metric
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	A. Using land and labor misallocation in organized sector							
Land misallocation index	-0.064	0.108++	-0.033	-0.079	-0.076	-0.082	-0.006	-0.003
	(0.083)	(0.049)	(0.081)	(0.104)	(0.080)	(0.085)	(0.092)	(0.090)
Labor misallocation index	0.025	-0.039	0.009	0.059	0.083	0.092	0.043	0.005
	(0.076)	(0.063)	(0.078)	(0.103)	(0.078)	(0.080)	(0.091)	(0.094)
Log employment in district-industry-year					-0.425+++			
					(0.059)			
Observations	5231	5231	5231	5231	5231	3189	5231	5231
Adjusted R-squared	0.216	0.139	0.247	0.216	0.255	0.193	0.216	0.216
	B. Using land and labor misallocation in total manufacturing sector							
Land misallocation index	-0.090	0.070	-0.081	-0.073	-0.040	-0.098	-0.086	-0.090
	(0.093)	(0.052)	(0.091)	(0.122)	(0.091)	(0.101)	(0.102)	(0.100)
Labor misallocation index	0.107	0.000	0.097	0.123	0.088	0.116	0.057	0.002
	(0.087)	(0.058)	(0.090)	(0.116)	(0.089)	(0.089)	(0.094)	(0.097)
Log employment in district-industry-year					-0.421+++			
					(0.058)			
Observations	5231	5231	5231	5231	5231	3189	5231	5231
Adjusted R-squared	0.217	0.139	0.248	0.217	0.255	0.193	0.216	0.217

Notes: See Table 6a.

Table 9a: Financial loans by gender of business owner for unorganized plants

	1989	1994	2000	2005	2010
	A. Share of raw data observations that report positive levels of finance				
Total	0.13	0.11	0.10	0.16	0.09
Female-owned		0.04	0.04	0.06	0.03
Male-owned		0.11	0.11	0.16	0.10
Gender share difference		0.08	0.07	0.10	0.07
	B. Share of weighted manufacturing plants that report positive levels of finance				
Total	0.10	0.09	0.06	0.08	0.06
Female-owned		0.04	0.02	0.03	0.02
Male-owned		0.09	0.07	0.10	0.08
Gender share difference		0.06	0.05	0.08	0.06

Notes: See Table 1a.

Table 9b: Financial loans by gender of majority of employees

	1989	1994	2000	2005	2010
	A. Share of raw data observations that report positive levels of finance				
Organized sector	0.90	0.90	0.90	0.90	0.89
Female majority	0.83	0.82	0.90	0.90	0.89
Male majority	0.92	0.91	0.91	0.91	0.91
Gender share difference	0.09	0.09	0.01	0.01	0.02
Unorganized sector	0.13	0.11	0.10	0.16	0.09
Female majority	0.06	0.06	0.05	0.06	0.05
Male majority	0.15	0.13	0.12	0.19	0.10
Gender share difference	0.10	0.07	0.07	0.12	0.05
	B. Share of weighted manufacturing plants that report positive levels of finance				
Organized sector	0.84	0.87	0.90	0.90	0.89
Female majority	0.64	0.82	0.90	0.89	0.89
Male majority	0.87	0.88	0.90	0.90	0.91
Gender share difference	0.23	0.06	0.00	0.01	0.02
Unorganized sector	0.10	0.09	0.06	0.08	0.06
Female majority	0.03	0.05	0.03	0.03	0.02
Male majority	0.13	0.10	0.08	0.11	0.08
Gender share difference	0.10	0.06	0.05	0.08	0.06

Notes: See Table 1a. Plants with equal counts of male and female employees are grouped with male majority.

Appendix Table 1: ASI financial loan data fields

Items	Years
Section: Working capital and loans	
Loan value	
- Outstanding loans	1989, 1994, 2000, 2005, 2009
- Overdraft, cash credit, other short-term loans from banks	1989, 1994, 2000, 2005, 2009
Section: Other expenses	
- Interest paid	1989, 1994, 2000, 2005, 2009

Note: ASI fields providing financial loan information.

Appendix Table 2: NSS financial loan data fields

Items	Years
Section: Assets, indebtedness and investment	
Value of loans outstanding by source	
- Friends and family	1989, 1994, 2000, 2005
- Moneylender	1989, 1994, 2000, 2005
- Institutional	1989, 1994, 2000, 2005, 2009
- Other	1989, 1994, 2000, 2005
Interest expense by source	
- Friends and family	1989, 1994, 2000, 2005
- Moneylender	1989, 1994, 2000, 2005
- Institutional	1989, 1994, 2000, 2005, 2009
- Other	1989, 1994, 2000, 2005
Total interest amount	2000

Note: NSS fields providing financial loan information. Loan amounts from and interest to friends and family, moneylender, and other are non-missing for about 1% of observations in 2009. Total interest amount is populated for about 10% or less of observations in all years except 2000.

Appendix Table 3: Sizes of industries, 2000

NIC	Industry Description	Organized sector Plants	Organized sector Empl	Organized sector Output	Unorganized sector Plants	Unorganized sector Empl	Unorganized sector Output
15	Food products and beverages	21.4	1,261.4	1,234,459	1,743.6	4,622.3	392,886
16	Tobacco products	2.2	475.2	103,597	169.7	485.8	16,820
17	Textiles	12.3	1,245.9	773,018	724.5	2,034.3	149,788
18	Wearing apparel; dressing and dyeing of fur	2.8	329.2	141,507	2,018.0	3,257.1	93,687
19	Leather; luggage, handbags, saddlery, harness and footwear	2.2	135.7	88,793	130.5	287.3	22,159
20	Wood and wood products, except furniture; straw and plating	2.7	45.6	18,731	1,226.7	2,646.0	76,124
21	Paper and paper products	3.2	176.1	178,617	59.6	189.9	17,998
22	Publishing, printing and reproduction of recorded media	3.0	116.7	53,516	109.4	382.3	36,042
23	Coke, refined petroleum and nuclear fuel	0.8	66.7	771,868	5.6	19.0	2,807
24	Chemicals and chemical products	9.9	779.8	1,439,134	38.8	198.9	40,877
25	Rubber and plastic products	6.4	251.1	258,618	50.5	216.3	42,320
26	Other non-metallic mineral products	10.5	428.3	288,191	623.9	2,562.2	116,946
27	Basic metals	6.5	551.0	820,940	15.5	73.1	28,293
28	Fabricated metal products, except machinery and equipment	7.9	292.6	181,534	282.1	797.0	80,883
29	Machinery and equipment, n.e.c.	8.9	422.9	373,526	52.5	224.1	43,967
30	Office, accounting and computing machinery	0.2	17.1	36,757	0.2	0.9	309
31	Electrical machinery and apparatus, n.e.c.	3.7	229.0	237,760	35.8	183.6	283,943
32	Radio, television, and communication equipment and apparatus	1.0	109.1	166,577	4.0	25.7	2,995
33	Medical, precision and optical instruments, watches and clocks	0.9	58.8	42,137	4.7	19.3	3,511
34	Motor vehicles, trailers and semi-trailers	2.5	257.3	389,512	9.3	45.9	9,931
35	Other transport equipment	1.8	182.7	200,111	8.3	38.2	7,273
36	Furniture, manufacturing n.e.c.	2.1	119.3	105,705	435.0	1,078.1	90,704
	Traditional	70.3	4,626.0	3,167,666	7,523.1	18,342.3	1,094,037
	Modern	42.8	2,925.5	4,736,939	225.1	1,045.0	466,225

Notes: Plants and employments are expressed in thousands. Output is expressed in millions of Rupees. "n.e.c." stands for Not Elsewhere Classified. Taken from Ghani et al. (2013).

Appendix Table 4: Shares of activity by type

	Share of total Indian mfg plants					Distribution by sector				
	1989	1994	2000	2005	2010	1989	1994	2000	2005	2010
Organized sector, urban areas	0.4%	0.5%	0.4%	0.4%	0.4%	72%	70%	63%	60%	62%
Organized sector, rural areas	0.2%	0.2%	0.2%	0.2%	0.3%	28%	30%	37%	40%	38%
Unorganized sector, urban areas	21%	24%	30%	29%	42%	21%	25%	30%	29%	42%
Unorganized sector, rural areas	78%	75%	70%	70%	58%	79%	75%	70%	71%	58%
	Share of total Indian mfg employment					Distribution by sector				
	1989	1994	2000	2005	2010	1989	1994	2000	2005	2010
Organized sector, urban areas	12%	13%	10%	11%	13%	69%	68%	61%	57%	58%
Organized sector, rural areas	6%	6%	6%	8%	9%	31%	32%	39%	43%	42%
Unorganized sector, urban areas	20%	25%	30%	30%	37%	25%	31%	36%	37%	48%
Unorganized sector, rural areas	62%	55%	53%	51%	41%	75%	69%	64%	63%	52%
	Share of total Indian mfg output					Distribution by sector				
	1989	1994	2000	2005	2010	1989	1994	2000	2005	2010
Organized sector, urban areas	59%	54%	43%	43%	44%	68%	65%	56%	53%	54%
Organized sector, rural areas	28%	30%	34%	38%	38%	32%	35%	44%	47%	46%
Unorganized sector, urban areas	6%	10%	15%	13%	12%	46%	62%	65%	66%	66%
Unorganized sector, rural areas	7%	6%	8%	7%	6%	54%	38%	35%	34%	34%

Notes: See Table 1a.

Appendix Table 5: Gender balance for plants with financial loans by state and sector

	ASI using employee split						NSS using employee split						NSS using owner's gender					
	1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average
A & N Islands	-0.30	0.14	0.36	1.00	0.50	0.34	-0.10	-0.17	-0.08	-0.08	0.08	-0.07	n.a.	-0.12	0.00	-0.05	0.13	-0.01
Andhra Pradesh	0.36	-0.18	0.04	0.08	0.06	0.07	0.10	0.06	0.06	0.09	0.14	0.09	n.a.	0.07	0.07	0.11	0.14	0.10
Assam	0.55	0.50	0.16	0.06	-0.01	0.25	0.01	0.03	0.03	0.09	0.01	0.03	n.a.	0.06	0.03	0.08	0.02	0.05
Bihar	0.17	0.50	0.02	0.02	0.00	0.14	0.05	-0.01	0.01	0.02	0.03	0.02	n.a.	-0.01	0.02	0.02	0.03	0.02
Chandigarh	0.10	0.25	0.01	0.05	-0.01	0.08	0.13	0.00	0.08	0.10	0.00	0.06	n.a.	0.06	0.06	0.09	0.01	0.05
Dadra & Nagar Haveli	-0.01	0.07	0.10	-0.05	0.08	0.04	0.03	0.08	0.08	0.03	0.06	0.06	n.a.	0.08	-0.02	0.01	0.05	0.03
Daman & Diu	-0.04	-0.01	-0.01	-0.12	-0.01	-0.04	0.10	0.14	0.17	0.02	0.11	0.11	n.a.	0.06	0.11	0.02	0.11	0.08
Delhi	-0.01	0.03	0.04	0.01	0.00	0.01	-0.35	0.11	0.03	0.17	0.03	0.00	n.a.	-0.01	0.02	0.00	0.03	0.01
Goa	-0.02	0.00	-0.05	-0.06	0.03	-0.02	-0.52	0.11	0.05	0.02	0.18	-0.03	n.a.	0.12	0.06	-0.04	0.16	0.08
Gujarat	0.01	0.04	0.00	0.03	0.00	0.02	0.05	0.10	0.07	0.07	0.10	0.08	n.a.	0.06	0.05	0.06	0.09	0.06
Haryana	0.09	0.00	-0.02	0.01	0.04	0.02	0.15	-0.13	0.11	0.14	0.07	0.07	n.a.	-0.02	0.09	0.11	0.05	0.06
Himachal Pradesh	0.01	0.06	0.03	-0.05	-0.02	0.01	0.27	0.05	-0.07	0.10	0.04	0.08	n.a.	0.04	-0.11	0.09	0.04	0.01
Jammu & Kashmir	0.06	0.21	-0.07	0.01	0.05	0.05	0.07	0.00	0.03	0.07	0.10	0.05	n.a.	0.05	0.02	0.08	0.09	0.06
Karnataka	0.04	-0.01	0.00	0.01	-0.01	0.01	0.16	0.11	0.09	0.13	0.14	0.13	n.a.	0.13	0.12	0.15	0.14	0.14
Kerala	0.05	0.03	0.00	-0.01	0.06	0.03	0.16	0.09	0.10	0.18	0.13	0.13	n.a.	0.11	0.13	0.20	0.14	0.15
Madhya Pradesh	-0.04	0.07	0.05	0.02	0.02	0.02	0.14	0.00	0.04	0.03	0.00	0.05	n.a.	0.01	0.04	0.02	0.01	0.02
Maharashtra	0.19	0.19	0.00	0.01	0.00	0.08	0.09	0.09	0.12	0.14	0.09	0.11	n.a.	0.02	0.09	0.13	0.09	0.08
Manipur	0.00	0.26	-0.10	-0.18	-0.19	-0.04	0.10	0.00	0.01	-0.01	-0.06	0.01	n.a.	-0.01	0.02	-0.01	-0.06	-0.01
Meghalaya	-0.73	0.20	0.43	-0.37	-0.06	-0.11	0.02	0.01	0.00	0.00	0.01	0.01	n.a.	0.01	0.01	0.02	0.01	0.01
Nagaland	-0.21	0.00	0.18	0.43	-0.01	0.08	0.00	0.06	0.03	0.16	0.06	0.06	n.a.	0.05	0.04	0.12	0.06	0.07
Orissa	0.05	0.00	0.09	0.04	0.14	0.06	0.10	0.02	0.02	0.08	0.01	0.05	n.a.	0.02	0.04	0.08	0.02	0.04
Pondicherry	-0.05	-0.02	0.10	0.02	-0.05	0.00	0.04	0.17	0.06	0.18	0.12	0.11	n.a.	0.25	0.06	0.18	0.13	0.16
Punjab	0.00	0.08	0.02	-0.05	0.03	0.02	0.16	0.12	0.09	0.10	0.05	0.11	n.a.	0.10	0.07	0.09	0.05	0.08
Rajasthan	0.06	0.08	-0.01	0.04	-0.03	0.03	0.11	-0.02	0.06	0.07	0.03	0.05	n.a.	-0.05	0.06	0.04	0.02	0.02
Tamil Nadu	0.04	0.04	0.03	0.03	0.06	0.04	0.12	0.12	0.09	0.12	0.12	0.11	n.a.	0.13	0.11	0.13	0.14	0.13
Tripura	0.16	0.30	0.17	0.55	0.44	0.32	0.02	-0.02	0.00	0.06	0.00	0.01	n.a.	0.03	0.00	0.05	0.01	0.02
Uttar Pradesh	0.17	0.32	0.03	-0.04	0.04	0.10	0.08	0.06	0.05	0.04	0.02	0.05	n.a.	0.05	0.04	0.04	0.02	0.04
West Bengal	-0.02	-0.11	0.04	0.08	0.04	0.01	0.06	0.04	0.04	0.11	0.04	0.06	n.a.	0.07	0.04	0.11	0.04	0.06
Nationwide	0.23	0.06	0.00	0.01	0.02	0.06	0.10	0.06	0.05	0.08	0.06	0.07	n.a.	0.06	0.05	0.08	0.06	0.06

Notes: See Tables 9a and 9b.

Appendix Table 6: Gender balance for plants with financial loans by industry and sector

		ASI using employee split						NSS using employee split						NSS using owner's gender					
		1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average	1989	1994	2000	2005	2010	Average
15	Food products and beverages	0.01	0.04	-0.01	0.00	-0.01	0.01	0.08	0.01	0.02	0.06	0.00	0.04	n.a.	0.04	0.03	0.06	0.02	0.03
16	Tobacco products	0.11	-0.33	0.29	0.35	0.31	0.15	0.02	0.02	0.00	0.00	0.06	0.02	n.a.	0.02	0.01	0.01	0.06	0.02
17	Textiles	0.09	0.12	0.00	-0.02	0.01	0.04	0.11	0.07	0.07	0.09	0.10	0.09	n.a.	0.09	0.07	0.10	0.10	0.09
18	Wearing apparel; dressing and dyeing of fur	0.03	0.02	0.01	0.01	0.04	0.02	0.11	0.06	0.03	0.04	0.04	0.06	n.a.	0.01	0.03	0.04	0.04	0.03
19	Leather tanning; luggage, handbags, footwear	0.01	-0.05	0.02	-0.01	0.03	0.00	0.04	0.03	0.03	0.11	0.00	0.04	n.a.	0.12	0.07	0.05	-0.01	0.06
20	Wood and wood products; straw and plating articles	0.09	0.14	-0.10	-0.02	0.00	0.02	0.06	0.03	-0.02	0.02	0.01	0.02	n.a.	0.03	-0.01	0.01	0.02	0.01
21	Paper and paper products	0.03	0.05	0.03	0.00	0.02	0.02	0.05	0.06	0.07	0.10	0.06	0.07	n.a.	0.05	0.04	0.09	0.07	0.06
22	Publishing, printing and media reproduction	-0.08	0.12	0.00	-0.02	0.03	0.01	0.18	0.05	0.01	0.11	0.00	0.07	n.a.	-0.02	0.07	0.02	-0.02	0.01
23	Coke, refined petroleum and nuclear fuel	-0.09	-0.15	-0.05	-0.01	-0.04	-0.07	-0.20	0.02	0.08	0.22	-0.19	-0.01	n.a.	0.20	0.07	0.23	-0.81	-0.08
24	Chemicals and chemical products	0.05	0.06	0.02	0.02	0.01	0.03	0.11	0.17	0.15	0.23	0.08	0.15	n.a.	0.10	0.11	0.16	0.08	0.11
25	Rubber and plastic products	0.04	0.02	-0.01	-0.01	0.01	0.01	0.20	0.22	0.19	0.13	0.07	0.16	n.a.	0.06	0.09	0.05	0.13	0.08
26	Other non-metallic mineral products	0.10	0.15	0.02	-0.01	0.00	0.05	0.06	-0.04	-0.02	-0.04	0.02	0.00	n.a.	-0.02	0.04	0.05	0.06	0.03
27	Basic metals	0.06	-0.01	-0.01	-0.03	-0.01	0.00	0.20	0.23	0.10	0.32	0.01	0.17	n.a.	0.18	-0.01	0.24	0.05	0.12
28	Fabricated metal products, except machinery	0.03	-0.01	0.02	0.04	0.01	0.02	-0.08	0.08	0.03	-0.01	0.06	0.02	n.a.	-0.02	0.02	-0.17	-0.05	-0.05
29	Machinery and equipment, n.e.c.	-0.01	-0.01	-0.03	0.01	-0.01	-0.01	0.07	0.09	-0.12	0.11	-0.12	0.01	n.a.	0.01	-0.03	-0.20	-0.15	-0.09
30	Office, accounting and computing machinery	0.03	0.06	0.18	0.05	-0.10	0.04	-0.13	0.00	0.07	0.31	0.19	0.09	n.a.	0.00	0.00	0.00	0.00	0.00
31	Electrical machinery and apparatus, n.e.c.	0.02	0.00	-0.06	-0.01	-0.02	-0.01	-0.46	0.09	0.06	-0.26	-0.08	-0.13	n.a.	0.08	0.15	0.00	0.09	0.08
32	Radio, television, and comm. equipment	-0.03	-0.03	0.05	0.05	-0.04	0.00	-0.37	-0.19	-0.33	-0.48	0.01	-0.27	n.a.	-0.96	0.17	-0.81	0.04	-0.39
33	Medical, precision and optical instruments, watches	-0.03	0.06	0.00	-0.02	-0.01	0.00	0.16	-0.58	0.24	0.05	-0.05	-0.04	n.a.	0.45	0.19	-0.17	0.27	0.18
34	Motor vehicles, trailers and semi-trailers	0.12	0.03	0.01	-0.03	0.03	0.03	0.00	-0.39	0.03	0.43	-0.08	0.00	n.a.	0.02	-0.10	0.08	-0.24	-0.06
35	Other transport equipment	-0.05	-0.05	0.05	0.03	0.03	0.00	0.19	0.04	0.08	0.13	0.12	0.11	n.a.	0.20	0.06	0.17	0.12	0.14
36	Furniture, manufacturing n.e.c.	-0.02	0.02	0.04	0.00	0.07	0.02	0.05	0.05	0.03	0.11	0.06	0.06	n.a.	0.00	0.04	0.11	0.05	0.05
	Nationwide	0.23	0.06	0.00	0.01	0.02	0.06	0.10	0.06	0.05	0.08	0.06	0.07	n.a	0.06	0.05	0.08	0.06	0.06

Notes: See Tables 9a and 9b.