The Impact of Trade Liberalization on Micro Enterprises: Do Banks Matter? Evidence from Indian Manufacturing

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Abstract

This paper looks at the impact of trade liberalization on output, factor intensity and labor productivity of micro enterprises with differential access to banks. I use Indian data on micro enterprises employing less than ten workers in the manufacturing sector to find that trade liberalization, measured by a fall in the tariff, is associated with higher enterprise output, capital-labor ratio and labor productivity in districts with a larger number of bank branches per capita. Evidence is consistent with strong complementarities between trade liberalization effects and better access to credit and greater economic dynamism due to greater bank presence in the enterprise's location. In addition, I find greater likelihood of outsourcing of production activity to micro enterprises in more open industries. My study highlights the role of credit market institutions, labor regulation and linkages between micro enterprises and large firms in determining the effects of trade liberalization on developing country manufacturing.

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1. Introduction

In this study, I analyze the impact of trade liberalization on micro enterprises and examine if trade liberalization effects differ with differential access to banks. I focus on micro enterprises for various reasons. First, micro enterprises are labor-intensive and employ a large portion of the population in developing countries. For instance, the share of the unorganized manufacturing sector (household enterprises and enterprises hiring less than ten workers) in total manufacturing employment was 82 percent in 2000-01 for India (Chandrasekhar and Ghosh, 2003). Micro enterprises are credited with job creation (Berry, 2002 for Latin America) and have elicited numerous subsidies from policy makers in developing economies, who tout micro and small enterprises to be 'a powerful force for poverty reduction" (World Bank Group Review of Small Business Activities, 2001). Second, micro enterprises have a large presence in developing country manufacturing[1]. They provide inputs to larger firms in the formal manufacturing sector[2]. Their competitiveness lies in relatively low overheads. They have low capital requirements and operate in geographically localized factor and product markets (Majumder, 2004 for India). Micro enterprises face low labor costs arising from the lack of burdens of excessive regulation imposed on larger firms. Labor laws like provision of worker's compensation, severance pay and social security benefits are rarely enforced for these enterprises (Harriss-White and Sinha, 2007 for India, Aryeetey et al, 1994 for Ghana and Van Diermen, 1997 for Indonesia). In addition, these enterprises produce differentiated goods that satisfy consumer demand largely among poorer sections of the population.

Access to credit for micro entrepreneurs is limited due to the existence of credit market imperfections like rationing. This has led policy makers in developing countries to target credit subsidies to these enterprises through the financial system to enable them to improve performance through, for instance, investment in better technology and marketing techniques. While the

[1] For Taiwan, Yan Aw (2001) notes that 30 percent of manufacturing firms between 1981 and 1996 employed fewer than five workers. For southern Africa, Daniels (2003) documents that twenty-two percent of the adult population fifteen years or older were employed in enterprises employing fewer than fifty workers versus only fifteen percent in registered firms between 1991 and 1994.

[2] Harriss-White and Sinha (2007) use a computable general equilibrium model of the Indian economy to find that the informal sector fulfils forty-three percent of the intermediate demand for the formal sector.

literature has focused on the impact of better access to finance on the performance of firms in general, and small enterprises in particular, few studies look at the role played by better access to finance in determining how micro entrepreneurs adapt to greater competition brought about by trade liberalization. Given the significance of the micro enterprise sector for development, its importance in policy, and in light of the globalization efforts of developing economies in the past few decades, notably in Asia and Latin America, this is an important question. This study attempts to fill this gap in the literature by looking at the impact of trade liberalization, measured by a fall in the tariff, on the output, factor use and labor productivity of micro enterprises in the manufacturing sector and by examining if these trade liberalization effects differ with differing bank presence in the area where the enterprise is located.

To analyze the effects of trade liberalization on micro enterprises, I posit that the demand curve for the enterprises' product is downward sloping and is a derived demand composed of final demand from the consumer and demand from larger firms in the formal (or organized or registered) sector who outsource or sub-contract labor intensive production tasks to the micro enterprise sector. Trade liberalization produces two responses. First, the enterprise and the firms in the organized sector lose some market share due to increased import competition. Second, they perceive a flatter demand curve due to greater available substitutes for their product. This leads to a downward shift and flattening of the enterprise's demand curve. I argue that in this scenario, enterprises facing high costs might produce less output while enterprises facing low costs might produce more output and charge a lower price. Greater bank presence is associated with lower enterprise cost due to improved access to credit and hence a lower cost of capital. Through its effect on enterprise costs, I argue that it affects outputs. Additionally, since most micro enterprises operate under a severe physical space constraint and face the possibility of a substantial increase in labor costs as they expand and increase their labor input, I contend that enterprises in districts with more banks and better access to credit will employ higher capital-labor ratios and hence see greater labor productivity with trade liberalization.

In this theoretical set up, outsourcing from larger, formal firms is not bank dependent, largely because these firms have alternate sources of credit like equity and debt markets. One would expect that it is the more productive, low costs firms who outsource production activity to micro

enterprises. This is because for larger values of output and employment, the benefit of lower labor costs by outsourcing to micro enterprises outweighs the costs associated with outsourcing. With trade liberalization, the more productive, low cost formal firms expand by charging a lower price and outsource more to the micro-enterprise sector. This implies higher likelihood of outsourcing to micro-enterprises with trade liberalization, a hypothesis I examine in this study.

For my empirical analysis, I use data from a large, nationally representative survey on micro household enterprises and non-household enterprises (enterprises hiring outside workers) hiring less than ten workers if using power and less than twenty workers if not using power in India for the years 1989, 1994 and 2000. These enterprises belong to the unorganized manufacturing sector (sometimes also called the unregistered or informal manufacturing sector) in India[3]. India provides a suitable setting for my study. First, India is one of the few countries with extensive data at the national level on unorganized manufacturing enterprises that can be employed to answer my questions. Second, India undertook extensive trade reforms in 1991 after a balance of payments crisis led the Indian Government to borrow from the IMF[4]. These reforms were exogenously imposed. Tariffs were brought down drastically across manufacturing industries. The reforms provide a useful framework to study the impact of trade liberalization on domestic enterprises. Third, India adopts a policy of directed lending by banks to 'priority sectors', including micro enterprises. This enables me to use information on bank presence to capture access to credit to micro enterprises.

I exploit cross district variation in bank branches per capita within each Indian state to examine the differential effects of trade liberalization on micro enterprises. Using district level variation allows me to control for unobservable state characteristics that might affect greater bank presence and my outcome variables of interest simultaneously. Exploiting this geographical variation also enables me to control for unobservable industry specific time varying shocks affecting tariffs and enterprise outcomes simultaneously. Even though I argue that the number of bank branches per capita captures access to credit and a lower cost of capital for enterprises, greater bank presence can reduce enterprise costs through an alternate channel. Bank presence is often

[3] These enterprises are called differently in different developing countries. For instance, in China, enterprises employing less than seven workers are called 'Getihu' translated as 'Individual Businesses', see Huang (2008).
[4] For details on India's trade reforms, see Mitra and Ural (2008).

associated with greater economic activity, economic dynamism and potential for future growth, all of which result in agglomeration economies which boost productivity and also lower costs for firms.

Firmly establishing a causal link between better access to credit through banks and enterprise outcomes requires randomization in banks across areas with differential economic activity and potential for growth. India's bank expansion was guided by goals of poverty reduction until 1990. Absent such randomization for the time period spanned by my sample, I employ control variables for economic activity and prospects for growth at the district level in my estimation. I use output per capita in the unorganized sector and growth in unorganized sector output in the district to capture economic activity and future growth prospects as seen by entrepreneurs and banks respectively. I expect unorganized sector activity to be strongly correlated with overall economic activity. I show that after controlling for the level and growth of economic activity in the district, bank branches per capita are associated with higher enterprise output, capital-labor ratio and labor productivity. These results suggest that the channel of greater bank presence being associated with greater access to credit, thereby lowering the cost of capital for enterprises and leading to differential effects of trade liberalization on enterprise outcomes is a plausible one.

My results indicate that for household enterprises, a decrease in the tariff is associated with a decrease in enterprise output and capital-labor ratio in the district with mean bank branches per capita and with an increase in enterprise output and capital-labor ratio in the district with bank branches per capita in the seventy-fifth percentile. A 10 percent fall in the tariff is associated with a 0.4 percent decrease in enterprise output and a 0.6 percent decrease in enterprise capital-labor ratio in the district with mean bank branches per capita, while it is associated with a 1 percent increase in enterprise output and a 2 percent increase in enterprise capital-labor ratio in the district with bank branches per capita in the seventy-fifth percentile. This provides evidence for complementarity between trade liberalization effects and bank presence. A decrease in the tariff corresponds to a decrease in output per worker in the district with mean bank branches per capita and in the district with bank branches per capita in the seventy-fifth percentile. However, for a 10 percentage point decrease in tariffs, the percentage decrease in enterprise output per worker is 2 percentage points lower in the district with bank branches per capita in the seventy-fifth percentile than in the district with mean bank branches per capita. Overall, results for household enterprises are consistent with

strong complementarities between trade liberalization effects and bank presence in the district in which the enterprise is located.

For non-household enterprises, a decrease in the tariff is associated with an increase in enterprise output in the district with mean bank branches per capita and in the district with bank branches per capita in the seventy-fifth percentile. For a 10 percentage point decrease in tariffs, the percentage increase in enterprise output is 2 percentage points greater in the district with bank branches per capita in the seventy-fifth percentile than in districts with zero bank branches per capita. A decrease in the tariff is associated with a decrease in the capital-labor ratio and an increase in output per worker in the district with mean bank branches per capita and in the district with bank branches per capita in the seventy-fifth percentile. For a 10 percentage point decrease in the tariff, the percentage increase in enterprise output per worker is 2 percentage points higher in the district with bank branches per capita in the seventy-fifth percentile than in the district with mean bank branches per capita. Results suggest that in contrast to household enterprises, the capital-labor ratio of non-household enterprises is not bank dependent. This is consistent with greater outsourcing from larger, formal firms to non-household enterprises than to household enterprises, resulting in these larger firms substituting for banks by providing access to funds. I also find evidence of greater likelihood of sub-contracting to unorganized enterprises in industries facing a lower tariff. This finding is consistent with evidence from case studies and micro surveys for India providing strong evidence that such 'sub-contracting' from formal to unorganized enterprises has increased post liberalization (Harris-White and Anushree Sinha, 2005 and Marjit and Maiti, 2007). Evidence for likelihood of such outsourcing of activity seems to be stronger for non-household enterprises. As implied by my theoretical framework, I find that likelihood of outsourcing activity to microenterprises is not bank dependent.

This paper makes several contributions. First, it analyzes the impact of trade liberalization on micro enterprises, thereby adding to a literature that is not as extensive as the one on trade liberalization effects on larger formal firms (Harrison, 1994, for Côte d'Ivoire, Tybout and Westbrook, 1995, for Mexico, Pavcnik, 2002, for Chile, Fernandes, 2003, for Colombia). Second, to my knowledge, it is the first study to empirically look at complementarities between trade liberalization effects on domestic firms and bank presence. Since my results are consistent with

better access to credit facilities leading to differential trade liberalization effects on enterprise outcomes, my study contributes to the literature on the impact of access to credit on small enterprises[5]. Also, given that a greater number of bank branches per capita may be associated with more local economic activity, my study finds evidence that micro enterprises located in dynamic areas are differentially affected by trade liberalization. This has bearing on the literature on agglomeration economies and firm performance (Rosenthal and Strange, 2004).

Third, my analysis looks for empirical support for the idea that trade liberalization is associated with greater outsourcing of production activity to micro enterprises, as proposed in case studies and micro surveys (Harris-White and Anushree Sinha, 2007, Marjit and Maiti, 2005, Maiti, 2008 for India). I find greater likelihood of outsourcing to micro enterprises in more open industries. My study hence ties into the literature analyzing the impact of trade liberalization on the size of the informal sector (Goldberg and Pavcnik, 2003 for Brazil and Columbia). Also, greater local outsourcing indicates potential gains from trade liberalization for micro enterprises occurring through linkages with larger formal domestic firms. This is an extension of the literature on the benefits of increased foreign firm presence in an open economy leading to productivity gains to domestic suppliers of intermediate inputs. (Smarzynska, 2004, for Lithuania, Blalock and Gertler, 2008, for Indonesia and Lin, Liu and Zhang, 2009, for China provide evidence for technology spillovers from multinationals to domestic suppliers.) Finally, I believe that my study, by drawing attention to complementarities between trade liberalization, bank presence, local economic dynamism and the role played by labor regulations in interactions between the formal and informal sectors of the economy, has wide ranging implications for development policy.

2. Trade Liberalization and The Unorganized Enterprise

2.1 Trade Liberalization and Output

This paper estimates the impact of trade liberalization measured by a fall in tariffs on enterprise level outcome variables and how this impact is different for enterprises in districts with a larger number of bank branches per capita. For this purpose, I adopt the framework provided by

[5] Akoten, Sawada and Otsuka, 2006 for Kenya and Aryeetey et al, 1994 for Ghana analyze the impact of access to credit on enterprise performance using enterprise data on sources to loans taken.

Rodrik, 1988 and Devarajan and Rodrik, 2002 who analyze the impact of trade liberalization on R&D investments by firms, to interpret my empirical results. I assume that an unorganized enterprise produces a differentiated good and faces a downward sloping demand curve for its product. In addition to differences in quality and product attributes, product differentiation might have a spatial dimension, especially in developing countries, where transportation costs are high. I posit that demand for its product is a derived demand composed of consumer demand for the product as a final good and demand from the organized or formal sector that outsources production processes to the unorganized sector.

Several studies address the existence of labor costs in formal manufacturing in developing economies (Goldberg and Pavcnik, 2003). In the presence of labor market rigidities in the formal or organized sector where labor laws make it costly for firms to hire and fire workers, formal firms can cut costs by outsourcing more labor intensive parts of production to the unorganized manufacturing sector and subsequently buying these parts as inputs from unorganized enterprises. Hence, larger formal firms may find that the costs associated with outsourcing are offset by engaging unorganized enterprises to produce a part or entire finished item and availing of low labor costs. Under such a framework of outsourcing to micro enterprises from the formal sector, the derived demand curve for the micro enterprise behaves like the demand curve for the formal sector product since the product produced by the micro enterprise is like an input into the production of the formal good. If the demand curve for the formal sector shifts downward and is flatter, the demand curve for the micro enterprise does the same (see Hicks, 1932 for properties of the derived labor demand curve).

Import liberalization affects enterprise demand in the short-run in two ways[6]. First, increased competition from foreign imports results in reduced market share for the enterprise and for the organized manufacturing firms. This is a 'market share' effect. Second, the enterprise and the formal firms outsourcing to the enterprise perceive a flatter demand curve due to greater

[6] For my study, I focus on the short-run effects of trade liberalization. Hence, I treat the number of enterprises as fixed. This is reflected in my empirical analysis where I capture trade liberalization by a fall in the tariff lagged by one year. The motivation behind looking at short-run effects is that due to data constraints at the disaggregated level at which I perform my analysis, I am unable to disentangle trade effects from the effect of other economic factors that change in the long run. Additionally, I perform my empirical analysis by adding controls for the total number of enterprises in the geographical area of analysis and ensure that my key results of complementarity between trade liberalization and bank presence hold.

availability of substitutes for their products. These two effects result in a downward shift and a flattening of the demand curve for the product of formal sector firms and also the micro enterprise. Formally, the enterprise demand curve is given by $Q = A(\tau, \bar{P}) - D(\tau, \bar{P})P$ where τ is the exogenous tariff rate on output, Q is quantity, $\bar{P}$ is the industry average output price and P is the price charged by the enterprise. Hence,

$$P = \frac{A(\tau,\bar{P})}{D(\tau,\bar{P})} - \frac{1}{D(\tau,\bar{P})}Q; \quad (2.1)$$

$$A(\tau,\bar{P}), D(\tau,\bar{P}) > 0;\ A_\tau > 0, D_\tau < 0$$

The enterprise maximizes profit

$$\max_Q \pi = [\frac{A(\tau,\bar{P})}{D(\tau,\bar{P})} - \frac{1}{D(\tau,\bar{P})}Q]Q - c(w,B,Q); \quad (2.2)$$

$$c_w > 0, c_B < 0, c_Q > 0, c_{QQ} \geq 0, c_{QB} < 0$$

where $c(w,B,Q)$ is the cost faced by the enterprise, w is the wage rate and B is bank presence, where a higher value of B is associated with lower cost. This is because bank presence is associated with better access to credit and a lower cost of capital r. I argue in the empirical section that bank presence is associated with better access to credit to micro enterprises in India due to a targeted lending policy followed by the government and the central bank. Besides, if formal sources of credit compete with informal sources for micro enterprises, both sources can be cheaper in districts with greater bank presence. Additionally, higher bank presence, by spurring economic activity, innovation and dynamism in the area can generate spillover effects due to agglomeration economies brought about by channels like input and knowledge sharing.

c_w and c_B are partial derivatives of the cost function with respect to w and B respectively, c_Q is marginal cost for fixed w and B, c_{QB} is the partial derivative of c_Q with respect to B and c_{QQ} is the partial derivative of c_Q with respect to Q.

Assuming an interior solution, profit maximization occurs when

$$MR(\tau, \bar{P}) = \frac{A(\tau,\bar{P})}{D(\tau,\bar{P})} - \frac{2}{D(\tau,\bar{P})} Q = c_Q(w, B, Q) \quad (2.3)$$

yielding,

$$Q^* = Q(w, B, \tau, \bar{P}) \quad (2.4)$$

Proposition 1: As long as $\frac{A_\tau(\tau,\bar{P})}{A(\tau,\bar{P})} < \frac{B_\tau(\tau,\bar{P})}{B(\tau,\bar{P})}$, there exists a value of bank presence, say B_0 such that for $B < B_0$, $\frac{dQ}{d\tau} > 0$ and for $B > B_0$, $\frac{dQ}{d\tau} < 0$.

This proposition, for which I present a proof in Appendix A, implies that the impact of import liberalization on output can be different for enterprises in districts with different bank presence if the marginal revenue curve pre and post liberalization intersect in the first quadrant. Proposition 1 implies that in this case, it is possible that for enterprises in districts with higher bank branches per capita and hence lower cost, a fall in the tariff is associated with greater enterprise output. Similarly, a fall in the tariff is associated with lower enterprise output for enterprises in districts with low bank branches per capita and hence higher cost. This suggests complementarities between trade liberalization effects and bank presence in the district in which an enterprise is located.

Figure 1 shows one possible scenario where an enterprise in a district with high bank branches per capita produces more output with a fall in tariff, while an enterprise in a district with low bank branches per capita produces less. The horizontal and vertical axes measure output and prices respectively. Both types of enterprises face a downward sloping demand curve AR with corresponding marginal revenue curve MR. The low cost enterprise faces a lower marginal cost of production MC_L compared to the high cost enterprise which faces cost MC_H. The low cost and high cost enterprises produce output y_L and y_H respectively.

Trade liberalization causes a shift in the demand curve to AR' and a corresponding shift in the marginal revenue curve to MR'. The new demand and marginal revenue curves shift downward and are flatter. From Figure 1, post trade liberalization, the low-cost enterprise produces at y'_L, which is higher than the level of output produced before trade liberalization and the high-cost enterprise produces y'_H which is lower than the output before trade liberalization. Hence, in this scenario, trade liberalization is associated with higher output in the low-cost enterprise and lower output in the high-cost enterprise. Lower costs result in unorganized enterprises producing larger outputs and charging a lower price for their products. Rodrik, 1988 and Devarajan and Rodrik, 2002 call this the 'pro-competitive' effect of trade liberalization. Lower costs enable micro enterprises to take advantage of increased sub-contracting to the formal sector, as low cost formal firms also respond by selling more at a lower price. The above analysis implies that theoretically, the impact of trade liberalization on enterprise output depends on the shift in the demand curve due to trade liberalization and on enterprise cost. If cost is high, trade liberalization is associated with lower enterprise output. Also, with a large downward shift (and flattening) in the demand curve, trade liberalization is associated with lower enterprise output.

I now turn to the complementarity effect between the trade liberalization effect on enterprise output and bank presence.

Proposition 2: $\frac{d^2Q}{d\tau dB} < 0$.

This proposition, proved in Appendix A, states that the positive effect of trade liberalization on output is augmented and the negative effect mitigated with higher bank presence.

2.2 Trade Liberalization, Factor Intensity and Labor Productivity

Micro enterprises or informal manufacturing enterprises are competitive mainly because they face low labor costs. However, as these enterprises produce larger amounts of output, labor becomes costly to use relative to capital. This is due to a variety of reasons. As an enterprise increases its labor input, it approaches the threshold after which it falls under the purview of labor regulation. For instance, in the Indian case, if the enterprise uses more than ten workers, it is

required to pay fixed costs of registration under the central factories act. It subsequently faces higher labor costs in order to adhere to labor laws. Also, in the Indian case, seven workers are allowed by law to form a union. As an unorganized enterprise hiring outside labor employs more workers, it faces the threat of its workers forming a union and demanding greater benefits. Besides, household enterprises rarely operate in separate premises and base their operations at home. Enterprises hiring workers also face physical space constraints and as the enterprise crams more workers into a small space, it gains less output for additional labor used.

This implies that larger enterprises might prefer to substitute capital for labor. Hence, higher enterprise outputs would be associated with higher capital-labor ratios. Combined with the results for enterprise output, this means that a fall in the tariff is associated with higher capital-labor ratios for enterprises in districts with higher bank presence that face a lower cost of capital and lower capital-labor ratios for enterprises with low bank presence that face a higher cost of capital. Additionally, the complementarity effect would imply that the positive effect of trade liberalization on enterprise capital-labor ratio will be augmented and the negative effect mitigated for enterprises in districts with greater bank presence.

Next, I look at the impact of trade liberalization on labor productivity by analyzing the impact of a fall in tariffs on output per worker and value added per worker in enterprises located in districts with differential bank branches per capita. I consider labor productivity as a function of the capital-labor ratio employed by the enterprise and an enterprise specific technology parameter representing vintage of technology or labor efficiency due to learning by doing or skill. If enterprises in districts with a greater number of bank branches per capita use higher capital-labor ratios due to trade liberalization, this will correspond to higher labor productivity. Hence, I hypothesize that trade liberalization effects on labor productivity will mirror effects on the capital-labor ratio. Also, higher bank presence is also associated with agglomeration economies, which can have positive effects on enterprise labor productivity and capital-intensity.

This theoretical set up implies that with trade liberalization, low cost formal firms expand their output due to the 'pro-competitive' effect. This would result in greater outsourcing to micro enterprises since these low cost formal firms have a greater incentive to cut down on labor costs and

incur the cost of sub-contracting production activity as opposed to high cost, small formal firms who may find that outsourcing cost outweigh the benefits from lower labor costs. I therefore also examine the hypothesis that trade liberalization is associated with greater likelihood of outsourcing to micro enterprises and investigate if this effect differs with differing bank presence with the prior that it does not.

In summary, I expect trade liberalization to be associated with higher enterprise output, capital-labor ratio and labor productivity in enterprises located in districts with high bank branches per capita and lower enterprise output, capital-labor ratio and labor productivity in enterprises located in districts with low bank branches per capita. Additionally, I expect the positive effect of trade liberalization on enterprise outcomes to be augmented and negative effects mitigated in enterprises in districts with high bank branches per capita. This is the complementarity effect. I also anticipate greater likelihood of outsourcing to micro enterprises with trade liberalization though I do not expect this effect to be bank dependent, given that outsourcing activity is not. To empirically estimate these trade liberalization effects, I estimate a linear model on survey data, with the outcome variable of interest modeled as a function of district level bank branches per capita, tariffs faced by the enterprise and an interaction of bank branches per capita and the tariff. For my analysis of outsourcing, I employ a dummy variable that equals 1 if the enterprise sells or is on contract to sell all or most of its output to another enterprise. Finally, this study focuses on the direct effect of trade liberalization on enterprise outcome variables and the differential effect of trade liberalization across enterprises located in districts with differing bank presence.

3. Empirical estimation

3.1 Basic Specification

I estimate the impact of trade liberalization and access to credit on micro enterprises in India using the following specification

$$Ln(Z)_{isdj,t} = \alpha + \beta_1 Banks_{sdt} + \beta_2 Tariff_{j,t-1} + \beta_3 Banks_{sdt} * Tariff_{j,t-1} + \gamma_{st} + \eta_{jt} + \varepsilon_{isdjt} \qquad (3.1)$$

The index 'i' represents the enterprise, 'j' represents the industry, 's' represents the state and sector (rural or urban) and 'd' represents the district in which the enterprise is located, while 't' represents time[7]. Z is the outcome variable of interest. It can be output, capital-labor ratio, capital use or labor productivity. '$Banks$' is the number of bank branches per capita in the sector (rural or urban) of district 'd' in state 's' at time 't'. '$Tariff$' is the tariff prevailing in 3 digit industry 'j' lagged one year. γ_{st} are state by sector (rural or urban) by time fixed effects and η_{jt} are 2 digit industry by time fixed effects. Note that my tariff variable varies across time and 3 digit industries while the industry by time fixed effects are at the 2 digit industry level. This allows me to estimate β_2 using variation across 3 digit industries within a 2 digit industry. ε_{isdjt} is the idiosyncratic error term. As discussed earlier, I expect the key coefficient of interest, $\beta_3 < 0$ due to the complementarity effect. This implies that in districts with higher bank branches per capita, a fall in tariffs will be associated with higher enterprise output, capital-labor ratio and labor productivity vis-à-vis districts with low bank branches per capita. β_2 is the effect of the tariff on the outcome variable when bank branches per capita are zero. Here, I note that since my dataset is not a panel, I am unable to control for firm entry and exit. This means that I am unable to comment on any changes in individual firm behavior over time.

This empirical specification allows me to address the endogeneity problem arising in the estimation of the impact of trade liberalization on the capital-labor ratio of the enterprise from policy makers protecting the more labor intensive industries. Developing countries like India may protect their labor intensive industries more than capital intensive ones (Goldberg and Pavcnik, 2004 conclude that the most heavily protected sectors in many developing countries tend to employ a high proportion of unskilled workers earning low wages). This implies that tariffs might be correlated with shocks to industry level capital-labor ratios. I control for these types of shocks to

[7] All my regressions also control for the formal sector wage and rental rate of capital for the 2 digit industry, state in which the enterprise is located and the relevant year. Household enterprises do not pay a wage since they only employ household workers. However, in this case, I argue that the formal wage captures labor's opportunity cost. Controlling for the rental rate of capital in the 2 digit industry, state for the given year, higher bank branches per capita in a district are associated with better access to credit and hence a lower cost of capital in that district within the state. One concern is that trade liberalization may affect the formal sector wage and rental rate due to Stolper-Samuelson effects where trade liberalization results in India specializing in more labor intensive sectors where it has a comparative advantage, driving up the wage-rental ratio. Hence, I also estimate these regressions without the formal sector wage and rental rate of capital. Results are qualitatively unchanged.

the greatest possible extent through the industry by time effects. Hence, I only exploit tariff variation across 3 digit industries within a 2 digit industry to identify trade liberalization effects.

My specification also includes a set of state by rural/urban by time fixed effects. These effects control for time varying unobservable state specific characteristics, policies and other shocks that affect bank presence and enterprise outcomes simultaneously. This is important because there is wide variation in labor policy and institutions across Indian states (Besley and Burgess, 2004). In all my estimation equations, I use enterprise level multipliers, which are the inverse of the probability that the enterprise is sampled, to weight observations and arrive at population estimates. I also cluster standard errors at the village or town level in rural and urban areas respectively. The variable bank branches per capita in the district captures lower cost for micro enterprises located in that district since higher values of this variable are associated with better access to credit and hence a lower cost of capital and also with greater economic activity, growth prospects and dynamism in the area that engender spillovers through agglomeration economies.

I argue that banks per capita at the district level can be useful in explaining better access to credit to unorganized manufacturing enterprises for policy reasons. Prior to the nationalization of the banking industry in India in 1969, the poorest sections of the society relied heavily on informal sources of credit. They were excluded from the formal credit market due to inability to produce collateral for loans. To correct moral hazard issues and to effect redistribution, the central bank introduced 'priority sector lending' in 1969 (see Shajahan, 1998 for more on priority sector lending in India). Under this policy, a certain percentage of net bank credit was to go to 'priority sectors'. 'Priority sectors' consisted of sectors like agriculture, small scale industries, road and water transport operators, retail traders, small businesses, village artisans, professionals and self employed persons. This directed lending program to the priority sector is supportive of banks per capita at the district level being a valid proxy for cheaper and greater access to credit for micro enterprises. I am also able to check that bank branches per capita are positively correlated with total credit outstanding in a district per capita at the district level for the year 2000. The correlation is 0.6 for the urban sector and 0.5 for the rural sector. In addition, more competition among bank branches in a district can lead to lower transaction cost associated with obtaining loans, for instance, through lower bribes demanded by bank officials. In addition, I argue that greater bank presence in districts affects credit

availability from informal lenders positively to the extent that informal lenders see local bank branches as competition. When informal lenders are in competition with banks, greater bank presence and better access to institutional credit will result in lower interest rates for informal loans.

My arguments are supported by Burgess and Pande, 2005, who study the impact of banking on rural poverty. Though they do not directly look at the impact of banking on unorganized enterprises, their study looks at the impact of rural bank expansion on rural non-agricultural output. The authors find that an increase in the number of banked locations in a state increased total output of the state and that this increase was accounted for by increases in non-agricultural output. They contend that their study is consistent with other previous studies using district level data that find rural bank branch expansion increased non-agricultural growth. The authors find that it was the informal or unregistered manufacturing and service sectors that mainly benefited from rural bank expansion, which is consistent with my result that greater bank branches per capita at the district level corresponds to higher enterprise outputs.

3.2 Credit Channel: Estimation with controls

Next, I try to isolate the credit channel through which greater bank presence interacts with trade liberalization to affect enterprise outcomes. As argued previously, higher bank branches per capita can lower enterprise costs through better access to credit resulting in a lower cost of capital. Additionally, greater bank presence may be associated with greater economic activity in a district or better economic prospects which might lower enterprise costs by generating agglomeration economies. To get at the complementarities between trade liberalization effects and better access to credit for enterprises which lowers their cost of capital, I estimate equation (3.1) with control variables in addition to bank branches per capita. I now estimate:

$$Ln(Z)_{isdj,t} = \alpha + \beta_1 Banks_{sdt} + \beta_2 District\ Controls_{sdt} + \beta_3 Tariff_{j,t-1} + \beta_4 Banks_{sdt}*Tariff_{j,t-1} + \beta_5 District\ Controls_{sdt}*Tariff_{j,t-1} + \gamma_{st} + \eta_{jt} + \varepsilon_{isdjt} \quad (3.2)$$

My control variables are the total unorganized sector output per capita and growth in unorganized sector output in the district in which the enterprise is located[8]. I expect that these unorganized sector activity variables to be correlated with formal sector activity (activity in organized manufacturing) at the district level. Hence, I argue that these variables proxy for the level and growth of economic activity in the district and hence control for economic dynamism of or better future economic prospects in the district. Since these variables are at the district level and are a sum of outputs of a large number of micro enterprises operating in all industries in the district, I contend that these controls are uncorrelated with my outcome variables, which are at the micro enterprise level. $\beta_4 < 0$ would imply complementarities between trade liberalization effects and greater bank presence through the credit channel, where greater bank presence lowers enterprise costs by lowering the cost of capital.

4. Data

The data I use for this study come from five different sources. A detailed description of the variables is presented in the Data Appendix. My enterprise level data come from the national level Survey of Unorganized Manufacturing and Repairing Enterprises by the National Sample Survey Organization, India. The data cover unorganized manufacturing and repairing enterprises which are broadly defined as enterprises employing less than ten workers if using power and less than twenty workers if not using power. These enterprises are not required to register under the Factories Act 1948 (see various reports by the NSSO on Unorganized Manufacturing Sector in India for a detailed definition of enterprises covered under the survey). The terms unorganized manufacturing sector, informal manufacturing sector and unregistered manufacturing sector are often used interchangeably in India. I use three rounds of repeated cross-section data for the years 1989-90, 1994-95 and 2000-01. The data I use cover all Indian states and Union Territories except two states, Assam and Jammu and Kashmir and include 390 Indian districts. I restrict my analysis to manufacturing enterprises only.

[8] I also try the total number of unregistered enterprises and growth in unregistered enterprises in the district in which the enterprise is located as controls and ensure that my key result holds. I do not present these results, however, they are available upon request.

Unorganized sector enterprises produce a large variety of products including flour milling, slaughtering, sun drying fish, wooden furniture and baskets, lace, embroidery, rope, medicated water and low end medicines, tooth powder, agricultural metal tools, metal utensils, batteries, valves, cables, bulbs and electric fans. Unorganized manufacturing enterprises in India are classified into household enterprises that do not hire workers (called Own Account Manufacturing Enterprises or OAMEs), enterprises hiring less than six workers including household and hired workers (called Non-Directory Manufacturing Enterprises or NDMEs) and enterprises hiring more than six workers including household and hired workers (called Directory Manufacturing Enterprises or DMEs). DMEs were not surveyed in the 1989-90 data round.

I use Indian output tariff data at the commodity level and aggregate it using a simple average to the NIC 1998 3 digit industry level[9]. My data on the number of rural and urban bank branches in each district for the years 1989-90, 1994-95 and 2000-01 is obtained from Basic Statistical Returns data published by the Reserve Bank of India. I normalize the number of bank branches by the total district population. I have a total of 390 districts across twenty-six Indian states and India's Union Territories for each year in my sample, providing rich variation in the number of bank branches per capita across India. Linking the NSS enterprise data and bank data from the Reserve Bank of India poses a difficulty. The Reserve Bank defines a village as rural if its population is less than 10,000. The Indian Census however, defines a village as rural if its population is less than 5,000. Hence, villages with populations between 5,000 and 10,000 would be classified as urban in the Indian census, but as rural in the bank data. This creates a discrepancy between the numerator and the denominator in my banks per capita variable. To address this, I argue that only a small percentage of Indian villages have a population size of between 5,000 and 10,000. Based on 1991 population census data, Singh, Chakraborty and Roy (see Table 2, page 18) indicate that at 27 percent, Tamil Nadu state had the highest percentage of villages with a population of more than 2,500. Since this percentage will be lower for villages with a population of greater than 5,000, I argue that this discrepancy is not likely to severely bias my estimates[10].

[9] A description of the tariff data can be found in Hasan, Mitra and Ramaswamy, 2007.

[10] In addition, a village can be classified as urban in the Indian Population Census only if, along with having a population of more than 5,000 it satisfies the following two conditions: 1) at least seventy-five percent of the male working population is engaged in a non-agricultural activity and 2) the density of population is more

Moreover, as a robustness check, I add the rural and urban branches in a district and divide it by the total population in a district to construct an overall district level bank measure. I rerun my regressions using this as my bank measure. I lose variation in the bank variable between rural and urban areas within a district. I find that my results are qualitatively unchanged. Table 1 (a) and (b) present summary statistics for key variables. From Table 1 (a), the average tariff fell from 147.2 percent in 1988 to 43.5 percent in 1999. Mean number of bank branches per capita increased from 0.00008 in 1989 to 0.00010 in 2000. Table 1 (b) shows estimated means for the population for both household and non-household firms. Non-household firms are larger – they employ more workers and have larger capital stocks. The value of output per worker is higher in non-household enterprises than household enterprises. In the following sections, I discuss my results focusing on the impact of trade liberalization on the outcome variables and on how these trade liberalization effects differ across districts with differential bank presence.

5. Results

5.1 Trade Liberalization, Bank presence and Enterprise outcomes for Household Enterprises

Since DMEs (enterprises hiring between six and ten workers) are not sampled in the 1989-90 round of my data, I conduct my analysis by pooling all three years of data (1989-90, 1994-95 and 2000-01) for the OAMEs or household enterprises (indicated by HH for household) and the years 1994-95 and 2000-01 for the NDMEs and DMEs which are non-household enterprises hiring outside workers (indicated by NHH for non-household). I look at the impact of trade liberalization measured by a reduction in tariffs on enterprise outcomes and at how the trade liberalization effect differs across districts with differential bank branches per capita. Table 2 (a) presents results for estimation equation (3.1) for all the outcome variables of interest for household enterprises, enterprises employing only household workers.

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than four hundred per square kilometer. This places further restrictions on a village with a population between 5,000 and 10,000 being classified as urban in the population census.

As expected, the interaction term between bank branches per capita and lagged tariff capturing the complementarity effect is negative and significant for all enterprise outcomes. This means that in districts with higher bank branches per capita, trade liberalization is associated with higher enterprise outputs, capital use, capital-labor ratio and labor productivity. Table 2 (b) presents the marginal effect of the tariff on enterprise outcomes in districts with bank branches per capita at the minimum, mean, seventy-fifth percentile and maximum. A reduction in tariffs is associated with a decrease in enterprise output in the district with mean bank branches per capita. On the contrary, in the district with bank branches per capita in the seventy-fifth percentile, a decrease in tariffs is associated with an increase in enterprise output[11]. Also, a 10 percentage point decrease in the tariff is associated with a 0.4 percent decrease in enterprise output in the district with mean bank branches per capita and a 1 percent increase in enterprise output in the district with bank branches per capita in the seventy-fifth percentile. This suggests that household enterprise outputs are higher with trade liberalization in districts with higher bank branches per capita as enterprises are able to avail of lower costs.

Also, from the table, a decrease in the tariff corresponds to a decrease in the capital-labor ratio in the district with mean bank branches per capita and to an increase in the capital-labor ratio in the district with bank branches per capita in the seventy-fifth percentile. A 10 percentage point decrease in the tariff is associated with a 0.6 percent decrease in enterprise capital-labor ratio in the district with mean bank branches per capita and a 2 percent increase in enterprise capital-labor ratio in the district with bank branches per capita in the seventy-fifth percentile. Given that results indicate that trade liberalization is associated with higher capital-labor ratios in districts with high bank branches per capita, I expect labor productivity to be higher with trade liberalization in districts with high bank presence. I find that a decrease in tariff corresponds to a decrease in output per worker in the district with mean bank branches per capita and in the district with bank branches per capita in the seventy-fifth percentile. However, for a 10 percentage point decrease in tariffs, the percentage decrease in enterprise output per worker is 2 percentage points lower in the district with bank branches per capita in the seventy-fifth percentile than in the district with mean bank branches per capita.

[11] I always observe trade liberalization being associated with large effects in districts with the maximum number of bank branches per capita. However, this value of bank branches per capita only applies to very few districts at the extreme tail of the distribution of districts by bank branches per capita.

5.2 Trade Liberalization, Bank Presence and Enterprise outcomes for Non-Household Enterprises

Tables 3 (a) and (b) present the same results for non-household enterprises. The interaction terms between bank branches per capita and lagged tariffs are negative and significant for output and output per worker, providing evidence for the complementarity effect, though for output, the complementarity effect is significant only at the 10 percent level. Table 3 (b) shows marginal effects of the tariff on the outcome variables. For output, a fall in the tariff is associated with an increase in enterprise output in the district with mean bank branches per capita and in the district with bank branches per capita in the seventy-fifth percentile. Further, for a 10 percentage point decrease in tariffs, the percentage increase in enterprise output is 2 percentage points greater in the district with bank branches per capita in the seventy-fifth percentile than in districts with zero bank branches per capita. Turning to labor productivity, a decrease in the tariff is associated with an increase in output per worker in the district with mean bank branches per capita and in the district with bank branches per capita in the seventy-fifth percentile. Also, for a 10 percentage point decrease in the tariff, the percentage increase in enterprise output per worker is 2 percentage points higher in the district with bank branches per capita in the seventy-fifth percentile than in the district with mean bank branches per capita.

Turning to capital use and the capital-labor ratio, from Table 3(b) a decrease in the tariff corresponds to a decrease in the capital-labor ratio and capital in the district with mean bank branches per capita and in the district with bank branches per capita in the seventy-fifth percentile. From Table 3(a), the negative interaction coefficients between the tariff and bank branches per capita measuring complementarity between bank presence and trade liberalization, though negative, are not significant. This suggests that capital use and the capital-labor ratio for non-household enterprises are not bank dependent. This is consistent with a scenario of outsourcing to non-household enterprises from larger, formal firms being accompanied by provision of funds. Anecdotal evidence suggests that outsourcing is more prevalent for non-household enterprises than household enterprises (see Harris-White and Sinha, 2007, page 99). This is reinforced by my data which indicates that the percentage of enterprises reporting selling or being on contract to sell to another enterprise is larger for non-household enterprises than for household enterprises. In

addition, my empirical analysis on the impact of trade liberalization on outsourcing suggests that openness is associated with greater likelihood of outsourcing for non-household than household enterprises. If outsourcing is more prevalent for non-household enterprises and is associated with transfer of funds, one would expect capital use and capital-labor ratios to be more bank dependent in the case of household enterprises than in the case of non-household enterprises. This is in line with my previous finding that for household enterprises, capital use and the capital-labor ratio are indeed bank dependent, in contrast to my finding for non-household enterprises.

Additionally, from Table 3(b), for non-household enterprises, in contrast to household enterprises, a percentage point decrease in tariffs is associated with an increase in output and labor productivity measured by output per worker even in districts with the minimum value of bank branches per capita. This too is consistent with greater outsourcing to these enterprises with trade liberalization and with such outsourcing being associated with technology transfer from parent enterprises. Examination of the data on unorganized enterprises for the year 2000 reveals that eighty-eight percent of non-household enterprises and ninety-seven percent of household enterprises on a contract to sell most of their output to another enterprise also received raw materials from the buyer enterprise. Hence, the data suggest that sub-contracting is accompanied by the provision of raw-materials for production. This is consistent with micro surveys (Marjit and Maiti, 2005 for India, Wiboonchutikula, 2001 for Thailand) that observe that raw materials are often supplied by larger factories sub-contracting to these units (in the case of units tied to larger factories). This is a type of technology transfer from parent enterprises when they sub-contract to micro enterprises – they transfer superior technology embodied in material inputs.

5.3 Trade Liberalization, Bank Presence and Enterprise outcomes: Estimation with Controls

Next, I try to isolate the credit channel through which higher bank presence affects enterprise costs. I do this by estimating equation (3.2) where I include control variables and their interaction with the tariff on the right hand side. My control variables are measures of economic activity at the district level. I use total unorganized sector output across all industries at the district level per capita and the growth in total unorganized sector output at the district level. If the tariff and bank interaction effect is negative and significant with these additional controls, I argue that

evidence is consistent with greater bank presence in a district being associated with a lower cost of capital for enterprises through better access to credit, thereby leading to differential effects of trade liberalization.

I also verify that my district-level control variables if measured instead at the state level, are correlated with GDP at the state level and are hence good proxies for economic activity and growth prospects. I find that the correlation between total output in the unorganized sector and GDP at the state level is 0.8. The correlation between growth in unorganized sector output and GDP growth at the state level is -0.4, suggesting that future growth prospects in a state are associated with negative growth in the unorganized sector.

Table 4 presents results for the estimation of equation (3.2) for household enterprises. The control variables are unorganized sector output per capita and growth in unorganized sector output at the district level. Table 5 presents corresponding results for non-household enterprises. Focusing on the interaction terms between the tariff and banks per capita from Table 4, for all enterprise outcomes, the coefficients are still negative and significant. From Table 5, the coefficients on the interaction mirror the regression without controls in sign and significance for capital, the capital-labor ratio and labor productivity. For output, the interaction term loses significance. Overall, results indicate significant complementarity between trade liberalization effects and higher bank presence even in the presence of controls for economic activity.

Turning to the control variables, the coefficients from both tables suggest that trade liberalization is associated with lower enterprise outcomes in districts with greater economic activity and prospects (note that the correlation between growth in unregistered output and growth in GDP at the state level that captures future economic prospects is negative) hinting at negative externalities from agglomeration. Greater economic activity can be associated with intense competition for inputs like labor and power and for infrastructure facilities. This can lead to a negative effect on firm performance due to the competition effect dominating any gains due to agglomeration economies. Largely, results in this section provide evidence consistent with the story of trade liberalization resulting in differential effects in districts with higher bank branches per capita through the credit channel. Micro enterprises with better access to credit can face lower costs and expand

output, employ higher capital-labor ratios and have higher labor productivity with trade liberalization.

5.4 Outsourcing

To investigate if lower tariffs are associated with greater likelihood of outsourcing to unorganized enterprises and if these effects differ for enterprises in districts with differential bank presence, I estimate the following equation in the cross-section for the year 2000:

$$Outsourcing\ Dummy_{isdj} = \alpha + \beta_1 Banks_{sd} + \beta_2 Tariff_{j,1999} + \beta_3 Banks_{sdt} * Tariff_{j,1999} + \gamma_s + \eta_j + \varepsilon_{isdj} \quad (3.3)$$

As with specification (3.1), the index '*i*' represents the enterprise, '*j*' represents the industry, '*s*' represents the state and sector (rural or urban) and '*d*' represents the district in which the enterprise is located. '*Outsourcing Dummy*' is equal to 1 if the unorganized enterprise sells its output to another enterprise or a contractor or is on contract to sell most of its output to another enterprise. This is an imperfect measure of outsourcing from the formal sector. I am unable to tell from my data if the enterprise is selling to another enterprise in the organized or unorganized sector. If the enterprise is selling to a contractor or is on contract to sell to another enterprise, it is unlikely that the buyer is another unorganized enterprise. First, contractors and middlemen are employed by larger firms in the organized sector to co-ordinate sub-contracting to the unorganized sector. Second, contract enforcement in India is weak and costly and in addition, most unorganized enterprises are unregistered and have minimal access to the legal system.

'*Banks*' is the number of bank branches per capita in the sector (rural or urban) of district '*d*' in state '*s*' in the year 2000. '*Tariff*' is the tariff prevailing in 3 digit industry '*j*' lagged one year for 1999. γ_s are state by sector (rural or urban) fixed effects and η_j are 2 digit industry fixed effects. ε_{isdjt} is the idiosyncratic error term. Note that my tariff variable varies at 3 digit industry level and I have 2 digit industry dummies in my specification. The 2 digit industry dummies control for industry specific shocks that affect tariffs and outsourcing simultaneously. My identification of trade

liberalization effects is from the variation in tariffs across 3 digit industries within a 2 digit industry. $\beta_3 < 0$ will imply that enterprises in 3 digit industries within a 2 digit industry with a lower tariff are more likely to sell or be on contract to sell to other enterprises in districts with more bank branches per capita. Hence, it measures the complementarity effect between trade liberalization and bank presence. β_2 is the effect of the tariff when bank branches per capita are zero.

Table 6 (a) reports estimation results under a linear probability model for household and non-household enterprises[12]. Table 6 (b) shows the marginal effects of the tariff in districts with bank branches per capita at the minimum, mean, seventy-fifth percentile and maximum. At the average value of bank branches per capita, lower industry tariff is associated with a higher probability of selling to another enterprise or contractor or being on a contract to sell to another enterprise. For a 10 percentage point lower tariff, the probability of selling to or being on contract to sell to another enterprise is higher by 6 percent for household and 7 percent for non-household enterprises. Thus, results indicate that likelihood of outsourcing is higher for non-household than household enterprises. As hypothesized, the interaction term between bank branches per capita and the tariff is negative but not significant, indicating that outsourcing activity is not bank dependent. This is sensible given that outsourcing of production activity is done by larger firms that have access to alternate sources of credit like equity and debt markets[13].

Table 7 estimates the same regressions as in Table 6 (a), however, I add the control variables of total output per capita in the unorganized sector and growth in total unorganized sector output in the district. The coefficient on the lagged tariff variable is stable in sign and magnitude. None of the interaction terms are significant as before. Since my results are only for the year 2000 and I cannot look at tariff changes for a 3 digit industry over time, my results only indicate higher probability of outsourcing in 3 digit industries with a lower tariff after controlling for 2 digit industry shocks that affect tariffs and outsourcing at the same time. However, if these cross-section results can be generalized over time, they would mean that trade liberalization is associated with greater likelihood of outsourcing to unorganized enterprises.

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[12] Probit estimation results are not qualitatively different.

[13] In fact, for the year 1994, only about 5 percent of credit accounts with commercial banks belonged to public and private sector companies, while ninety percent belonged to individuals and proprietary and partnership concerns and family undertakings.

My finding of higher likelihood of outsourcing in industries faced with a lower tariff in districts with higher bank presence is consistent with the literature on the role of linkages between small enterprises and larger firms in competing in a global environment. The literature acknowledges linkages between small enterprises and larger firms where small enterprises provide intermediate inputs and sub-contract to larger registered firms. Small enterprise sub-contractors, unburdened by labor and other regulations pertaining to the formal registered manufacturing sector, provide flexibility to larger exporting firms to adjust size to negative global demand shocks and enable import competing firms to cut costs and compete globally.

6. Conclusion

This paper estimates the impact of trade liberalization on output, labor and capital use, capital-labor ratio and labor productivity of enterprises in the unorganized sector in India and the differential effects of trade liberalization on these enterprise outcomes for enterprises in districts with differential bank presence. Using a national dataset of household enterprises and enterprises hiring outside workers for 1989, 1994 and 2000, I find that trade liberalization is associated with higher output, capital-labor ratios and labor productivity for household enterprises and non-household enterprises hiring outside workers where bank presence is higher. Results suggest that micro enterprises in districts with greater bank presence can take advantage of lower costs to expand output due to a flatter demand curve resulting from increased substitutes due to trade liberalization and also capitalize on increased demand from the formal sector that sub-contracts activities to the informal sector. Enterprises in districts with more banks are also able to substitute capital for labor since expanding by using more labor is not strategic for these enterprises that are largely competitive due to their ability to avoid compliance to labor laws. I also find some evidence for greater likelihood of outsourcing in more open industries, providing suggestive evidence that large firms expand by sub-contracting tasks to the unorganized sector to bypass labor regulation.

These results have several implications for policy. First, my results lend some support to the argument made by Harriss-White and Sinha, 2007 that formal firms may sub-contract labor intensive

tasks to the unorganized sector where labor regulations are less enforced to become more competitive. It casts some doubt on the efficacy of labor laws put in place for worker protection. Onerous labor regulation can defeat its purpose by leading to greater activity in the informal or unregistered sector where work conditions may be poor. Second, from a poverty reduction perspective, it is important to consider the impact of trade reform on unorganized manufacturing, given that it employs the poor in developing economies. My results indicate that the impact of trade liberalization on these enterprises is different for enterprises located in districts with a larger number of bank branches per capita and hence face lower costs. Third, many developing countries, including India, have instituted policies to provide credit, infrastructure and technology to small and micro enterprises at concessional rates due to the argument that these enterprises are under a credit crunch and that improving access to credit can help enterprises upgrade technology and improve productivity and technical efficiency in this sector, enabling them to be competitive in a global economy (Harris-White and Sinha, 2007, Majumder, 2004 and Raj, 2007 for India, Admassie and Matambalya, 2002 for Tanzania).This study provides evidence that access to credit can be a determinant of how trade liberalization affects enterprise size, capital-labor ratio and labor productivity of micro enterprises in India.

Figure 1: Trade Liberalization and Output with Differential Access to Banks

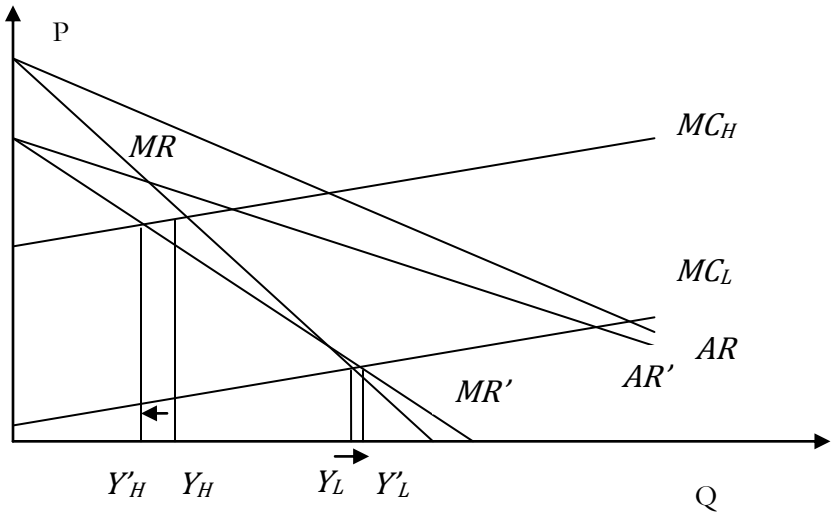

Table 1(a): Manufacturing Tariffs and Bank Branches Per Capita by Year

	1989	1994	2000
Minimum Lagged Tariff (percentage)	90.0	56.7	31.1
Mean Lagged Tariff (percentage)	147.2	84.4	43.5
Maximum Lagged Tariff (percentage)	288.4	150.6	85.3
Minimum number of Bank Branches per Capita	0	0	0
Mean number of Bank Branches per Capita	0.0000826	0.0000815	0.000099
Maximum number of Bank Branches per Capita	0.0011399	0.0021352	0.0021761

Source: Asian Development Bank, Manila, Reserve Bank of India and author's calculations.

Table 1(b): Mean of Enterprise Outcome Variables for Household and Non Household Enterprises by Year

	Household Enterprises (HH)		Non Household Enterprises (NHH)	
	1994	2000	1994	2000
Output (1993 rupees)	19,314.93	22,193.57	228,545.30	347,897.00
Capital (1993 rupees)	12,489.29	16,348.43	145,696.60	173,794.70
Labor (number)	1.97	1.71	4.93	4.68
Capital-Labor Ratio (1993 rupees per worker)	7,629.03	10,929.95	30,269.81	37,390.30
Output per Worker (1993 rupees per worker)	10,616.18	13,118.32	41,185.19	59,600.92

Source: Author's calculations from the Unorganized Enterprise data, NSSO, India. $1 ~ 50 rupees.

Table 2 (a): Trade Liberalization, Banks and Enterprise Outcomes for Household Enterprises

	Ln(Y)	Ln(K/L)	Ln(K)	Ln(Y/L)
Ln(W) formal	-0.124	0.018	-0.037	-0.068
	(0.081)	(0.12)	(0.125)	(0.080)
Ln(R) formal	-0.007	0.034	0.035	-0.008
	(0.025)	(0.024)	(0.025)	(0.023)
Banks per capita	1002	1266	927.8	1340*
	(743.4)	(1386)	(1356)	(722.0)
Lagged tariff	0.003	0.005	0.002	0.005**
	(0.002)	(0.003)	(0.003)	(0.002)
Banks per	-31.92***	-63.35***	-60.46***	-34.61***
capita*Lagged tariff	(11.02)	(21.46)	(20.44)	(10.86)
Constant	10.320***	7.465***	8.933***	8.853***
	(0.933)	(1.276)	(1.265)	(0.919)
State by sector (rural/urban) by year effects	Yes	Yes	Yes	Yes
2 digit industry by year effects	Yes	Yes	Yes	Yes
Observations	302304	303028	303028	302304
R-squared	0.27	0.30	0.29	0.29

Notes: 1) Data are for years 1989, 1994 and 2000. 2) Standard errors in parentheses are robust standard errors clustered at the first stage unit level (Village in rural areas and urban blocks in urban areas). 3) *** p<0.01, ** p<0.05, * p<0.1.

Table 2 (b): Trade Liberalization, Banks and Enterprise Outcomes for Household Enterprises: Marginal Effect of Tariff

	Ln(Y)	Ln(K/L)	Ln(K)	Ln(Y/L)
Minimum banks=0	0.003	0.005	0.002	0.005**
	(0.002)	(0.003)	(0.003)	(0.002)
Average banks=.000065	0.0004	0.0006	-0.002	0.003
	(0.002)	(0.003)	(0.002)	(0.002)
75 percentile	-0.001	-0.002	-0.004*	0.001
banks=.0001101	(0.002)	(0.003)	(0.002)	(0.002)
Maximum	-0.067***	-0.133***	-0.129**	-0.071***
banks=.0021761	(0.023)	(0.045)	(0.043)	(0.023)

Notes: 1) 'Banks" refers to number of bank branches per capita.

Table 3 (a): Trade Liberalization, Banks and Enterprise Outcomes for Non-household Enterprises

	Ln(Y)	Ln(K/L)	Ln(K)	Ln(Y/L)
Ln(W) formal	0.183***	-0.0001	0.124*	0.063
	(0.065)	(0.073)	(0.075)	(0.060)
Ln(R) formal	0.016	0.007	0.011	0.013
	(0.025)	(0.022)	(0.024)	(0.022)
Banks per capita	1477**	1874**	1502*	1898***
	(689.0)	(923.3)	(908.3)	(655.2)
Lagged tariff	-0.022***	0.015***	0.002	-0.008***
	(0.003)	(0.004)	(0.003)	(0.003)
Banks per capita*Lagged tariff	-20.32*	-16.42	-8.835	-28.90***
	(11.71)	(14.17)	(13.93)	(11.03)
Constant	10.97***	8.103***	9.000***	9.967***
	(0.685)	(0.852)	(0.798)	(0.681)
State by sector (rural/urban) by year effects	Yes	Yes	Yes	Yes
2 digit industry by year effects	Yes	Yes	Yes	Yes
Observations	99900	100115	100115	99900
R-squared	0.22	0.34	0.34	0.23

Notes: 1) Data are for years 1994 and 2000. 2) Standard errors in parentheses are robust standard errors clustered at the first stage unit level (Village in rural areas and urban blocks in urban areas). 3) *** p<0.01, ** p<0.05, * p<0.1.

Table 3 (b): Trade Liberalization, Access to Credit and Enterprise Outcomes for Non-household Enterprises: Marginal Effect of Tariff

	Ln(Y)	Ln(K/L)	Ln(K)	Ln(Y/L)
Minimum banks=0	-0.022***	0.015***	0.002	-0.008***
	(0.003)	(0.004)	(0.003)	(0.003)
Average banks=0.0000973	-0.024***	0.013***	0.001	-0.011***
	(0.003)	(0.003)	(0.003)	(0.002)
75 percentile banks=0.0001402	-0.024***	0.012***	0.0006	-0.013***
	(0.003)	(0.003)	(0.003)	(0.003)
Maximum banks=0.0021761	-0.066***	-0.021	-0.017	-0.071***
	(0.024)	(0.030)	(0.029)	(0.023)

Notes: 1) 'Banks" refers to number of bank branches per capita.

Table 4: Trade Liberalization, Banks and Enterprise Outcomes for Household Enterprises with Output controls.

	Ln(Y)	Ln(K/L)	Ln(K)	Ln(Y/L)
Ln(W) formal	-0.046	-0.031	-0.063	-0.012
	(0.080)	(0.156)	(0.160)	(0.077)
Ln(R) formal	-0.012	0.030	0.0147	0.003
	(0.023)	(0.026)	(0.027)	(0.023)
Banks per capita	1745*	5606***	5729***	1635
	(1045)	(1779)	(1796)	(1015)
Output per capita	-16.68***	-15.33***	-18.12***	-13.91***
	(3.366)	(4.504)	(4.170)	(3.547)
Output Growth	-0.003	0.099***	0.121***	-0.025
	(0.039)	(0.029)	(0.031)	(0.037)
Lagged tariff	-0.010***	0.0001	-0.002	-0.009***
	(0.004)	(0.004)	(0.004)	(0.003)
Banks per capita*Lagged tariff	-42.89**	-144.2***	-149.4***	-37.91**
	(18.30)	(33.07)	(33.95)	(18.25)
Output per capita*Lagged tariff	0.391***	0.352***	0.412***	0.331***
	(0.0757)	(0.104)	(0.0945)	(0.081)
Output Growth*Lagged tariff	0.0001	-0.001***	-0.002***	0.0003
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
Constant	8.501***	9.535***	10.93***	9.885***
	(1.614)	(1.645)	(0.870)	(0.829)
State by sector (rural/urban) by year effects	Yes	Yes	Yes	Yes
2 digit industry by year effects	Yes	Yes	Yes	Yes
Observations	238306	239147	239147	238306
R-squared	0.28	0.35	0.33	0.31

Notes: 1) Data are for years 1994 and 2000. 2) Standard errors in parentheses are robust standard errors clustered at the first stage unit level (Village in rural areas and urban blocks in urban areas). 3) Output per capita is scaled down by 100,000 and Output Growth by 1,000,000,000. 4) *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Trade Liberalization, Banks and Enterprise Outcomes for Non-household Enterprises with Output controls.

	Ln(Y)	Ln(K/L)	Ln(K)	Ln(Y/L)
Ln(W) formal	0.186***	0.002	0.126*	0.067
	(0.066)	(0.073)	(0.075)	(0.060)
Ln(R) formal	0.016	0.010	0.016	0.010
	(0.024)	(0.022)	(0.024)	(0.021)
Banks per capita	1038	1816*	1257	1647**
	(678.2)	(957.0)	(928.7)	(652.1)
Output per capita	-10.17***	-2.288	-3.367	-9.107***
	(2.850)	(2.335)	(2.382)	(2.390)
Output Growth	0.083***	0.0008	0.031	0.053**
	(0.0250)	(0.026)	(0.023)	(0.024)
Lagged tariff	-0.024***	0.014***	0.0008	-0.011***
	(0.003)	(0.004)	(0.003)	(0.003)
Banks per capita*Lagged tariff	-13.19	-13.99	-3.078	-25.14**
	(12.02)	(14.75)	(14.50)	(11.34)
Output per capita*Lagged tariff	0.229***	0.060	0.076	0.213***
	(0.069)	(0.056)	(0.057)	(0.057)
Output Growth*Lagged tariff	-0.001***	-0.0001	-0.0006*	-0.0007**
	(0.0003)	(0.0004)	(0.0003)	(0.0003)
Constant	11.12***	8.423***	9.066***	10.08***
	(0.691)	(0.790)	(0.790)	(0.685)
State by sector (rural/urban) by year effects	Yes	Yes	Yes	Yes
2 digit industry by year effects	Yes	Yes	Yes	Yes
Observations	99541	99754	99754	99541
R-squared	0.22	0.34	0.34	0.23

Notes: 1) Data are for years 1994 and 2000. 2) Standard errors in parentheses are robust standard errors clustered at the first stage unit level (Village in rural areas and urban blocks in urban areas). 3) Output per capita is scaled down by 100,000 and Output Growth by 1,000,000,000. 4) *** p<0.01, ** p<0.05, * p<0.1.

Table 6 (a): Trade Liberalization, Banks and Outsourcing: Linear Probability Model

	HH	NHH
	Dummy = 1 if enterprise sells to another enterprise/contractor or on contract to sell mainly to another private enterprise	Dummy = 1 if enterprise sells to another enterprise/contractor or on contract to sell mainly to another private enterprise
Banks per capita	568.1	83.88
	(850.1)	(362.6)
Lagged tariff	-0.005***	-0.007***
	(0.002)	(0.002)
Banks per capita*Lagged tariff	-7.626	-1.087
	(17.90)	(7.944)
Constant	0.496***	0.793***
	(0.109)	(0.123)
State by sector (rural/urban) effects	Yes	Yes
2 digit industry effects	Yes	Yes
Observations	138161	70541
R-squared	0.35	0.24

Notes: 1) Data are for year 2000. 2) Standard errors in parentheses are robust standard errors clustered at the first stage unit level (Village in rural areas and urban blocks in urban areas). 3) *** p<0.01, ** p<0.05, * p<0.1.

Table 6 (b): Trade Liberalization, Banks and Outsourcing: Marginal Effect of Tariff

	HH	NHH
	Dummy = 1 if enterprise sells to another enterprise/contractor or on contract to sell mainly to another private enterprise	Dummy = 1 if enterprise sells to another enterprise/contractor or on contract to sell mainly to another private enterprise
Minimum banks	-0.005***	-0.007***
HH=0; NHH=0	(0.002)	(0.002)
Average banks	-0.006***	-0.007***
HH=.0000635; NHH= .000099	(0.001)	(0.002)
75 percentile banks	-0.006***	-0.007***
HH=.0001214; NHH= .0001447	(0.001)	(0.002)
Maximum banks	-0.022	-0.009
HH=0021761; NHH=.0021761	(0.038)	(0.016)

Notes: 1) 'Banks" refers to number of bank branches per capita.

Table 7: Trade Liberalization, Banks and Outsourcing with Output controls: Linear Probability Model

	HH	NHH
	Dummy = 1 if enterprise sells to another enterprise/contractor or on contract to sell mainly to another private enterprise	Dummy = 1 if enterprise sells to another enterprise/contractor or on contract to sell mainly to another private enterprise
Banks per capita	426.2	-112.5
	(856.8)	(361.8)
Output per capita	1.665	1.249
	(1.635)	(1.098)
Output Growth	0.036*	0.019
	(0.021)	(0.028)
Lagged tariff	-0.004**	-0.006***
	(0.002)	(0.002)
Banks per capita*Lagged tariff	-5.069	1.111
	(18.72)	(7.912)
Output per capita*Lagged tariff	-0.034	-0.028
	(0.039)	(0.026)
Output Growth*Lagged tariff	-0.0007	-0.00004
	(0.0005)	(0.0007)
Constant	0.430***	0.758***
	(0.010)	(0.124)
State by sector (rural/urban) effects	Yes	Yes
2 digit industry effects	Yes	Yes
Observations	138096	70501
R-squared	0.35	0.25

Notes: 1) Data are for years 1994 and 2000. 2) Standard errors in parentheses are robust standard errors clustered at the first stage unit level (Village in rural areas and urban blocks in urban areas). 3) Output per capita is scaled down by 100,000 and Output Growth by 1,000,000,000. 4) *** p<0.01, ** p<0.05, * p<0.1.

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Appendix A: Proof of Propositions 1 and 2

Enterprise demand is given by $Q = A(\tau, \bar{P}) - D(\tau, \bar{P})P$ where τ is the exogenous tariff rate on output, Q is quantity, $\bar{P}$ is the industry average output price and P is the price charged by the enterprise.

$$P = \frac{A(\tau,\bar{P})}{D(\tau,\bar{P})} - \frac{1}{D(\tau,\bar{P})}Q; \quad (A.1)$$

$$A(\tau, \bar{P}), D(\tau, \bar{P}) > 0;\ A_\tau > 0, D_\tau < 0$$

The enterprise maximizes profit

$$\max_Q \pi = [\frac{A(\tau,\bar{P})}{D(\tau,\bar{P})} - \frac{1}{D(\tau,\bar{P})}Q]Q - c(w, B, Q); \quad (A.2)$$

$$c_w > 0, c_B < 0, c_Q > 0, c_{QQ} \geq 0, c_{QB} < 0$$

where $c(w, B, Q)$ is the cost faced by the enterprise, w is the wage rate and B is bank presence in the district in which the enterprise is located, both exogenous to the enterprise. Bank presence is associated with lower enterprise cost since it lowers the rental rate of capital r and because it generates agglomeration economies. c_w and c_B are partial derivatives of the cost function with respect to w and B respectively, c_Q is marginal cost for fixed w and B, c_{QB} is the partial derivative of c_Q with respect to $B$and c_{QQ} is the partial derivative of c_Q with respect to Q.

Assuming an interior solution, profit maximization occurs when

$$MR(\tau, \bar{P}) = \frac{A(\tau,\bar{P})}{D(\tau,\bar{P})} - \frac{2}{D(\tau,\bar{P})}Q = c_Q(w, B, Q) \quad (A.3)$$

yielding

$$Q^* = Q(w, B, \tau, \bar{P}) \quad (A.4)$$

Proposition 1: As long as $\frac{A_\tau(\tau,\bar{P})}{A(\tau,\bar{P})} < \frac{D_\tau(\tau,\bar{P})}{D(\tau,\bar{P})}$, there exists a value of bank presence, say B_0 such that for $B < B_0$, $\frac{dQ}{d\tau} > 0$ and for $B > B_0$, $\frac{dQ}{d\tau} < 0$.

Differentiating the first order condition with respect to τ:

$$\frac{\partial MR(\tau,\bar{P})}{\partial \tau} - \frac{2}{D(\tau,\bar{P})}\frac{dQ}{d\tau} = c_{QQ}(w,B,Q)\frac{dQ}{d\tau} \tag{A.5}$$

$$\frac{dQ}{d\tau} = \frac{\frac{\partial MR(\tau,\bar{P})}{\partial \tau}}{c_{QQ}(w,B,Q) + \frac{2}{D(\tau,\bar{P})}}$$

Since $c_{QQ}(w,r,Q) \geq 0$ and $\frac{2}{D(\tau,\bar{P})} > 0$ the sign of this expression depends on the sign of the numerator.

$$\frac{\partial MR(\tau,\bar{P})}{\partial \tau} = \frac{D(\tau,\bar{P})A_\tau(\tau,\bar{P}) - A(\tau,\bar{P})D_\tau(\tau,\bar{P})}{D(\tau,\bar{P})^2} + 2Q\frac{D_\tau(\tau,\bar{P})}{D(\tau,\bar{P})^2} \tag{A.6}$$

This means that the change in marginal revenue due to a change in the tariff is different for different values of Q. With a fall in the tariff, there is a fall in MR if:

$$\frac{D(\tau,\bar{P})A_\tau(\tau,\bar{P}) - A(\tau,\bar{P})D_\tau(\tau,\bar{P})}{D(\tau,\bar{P})^2} > -2Q\frac{D_\tau(\tau,\bar{P})}{D(\tau,\bar{P})^2} \tag{A.7}$$

Since $D(\tau,\bar{P})^2 > 0$, this happens if $D(\tau,\bar{P})A_\tau(\tau,\bar{P}) - A(\tau,\bar{P})D_\tau(\tau,\bar{P}) > -2QD_\tau(\tau,\bar{P})$ or

$$\frac{D(\tau,\bar{P})A_\tau(\tau,\bar{P}) - A(\tau,\bar{P})D_\tau(\tau,\bar{P})}{-2D_\tau(\tau,\bar{P})} > Q$$

For values of Q higher than the left hand side, a fall in the tariff is associated with an increase in MR. At

$$\frac{D(\tau,\bar{P})A_\tau(\tau,\bar{P}) - A(\tau,\bar{P})D_\tau(\tau,\bar{P}t)}{-2D_\tau(\tau,\bar{P})} = Q$$

$$P = \frac{A(\tau,\bar{P})}{D(\tau,\bar{P})} + \frac{1}{2D(\tau,\bar{P})}\left[\frac{D(\tau,\bar{P})A_\tau(\tau,\bar{P}) - A(\tau,\bar{P})D_\tau(\tau,\bar{P})}{D_\tau(\tau,\bar{P})}\right] \tag{A.8}$$

$$= \frac{A(\tau,\bar{P})}{D(\tau,\bar{P})} + \frac{1}{2}\left[\frac{A_\tau(\tau,\bar{P})}{D_\tau(\tau,\bar{P})} - \frac{A(\tau,\bar{P})}{D(\tau,\bar{P})}\right]$$

Now $P > 0$ if

$$\frac{A_\tau(\tau,\bar{P})}{D_\tau(\tau,\bar{P})} > \frac{A(\tau,\bar{P})}{D(\tau,\bar{P})}$$

or

$$\frac{A_\tau(\tau,\bar{P})}{A(\tau,\bar{P})} < \frac{D_\tau(\tau,\bar{P})}{D(\tau,\bar{P})} \tag{A.9}$$

Intuitively, this condition requires that with a fall in the tariff, the new MR curve intersects the old MR curve in the first quadrant if the proportionate change in the slope of the MR curve is larger than the proportionate change in the intercept. In other words, the flattening effect of the tariff fall on the MR curve dominates the downward shift.

Then, if $\frac{A_\tau(\tau,\bar{P})}{A(\tau,\bar{P})} < \frac{D_\tau(\tau,\bar{P})}{D(\tau,\bar{P})}$, there exists $Q_0 = \frac{D(\tau,\bar{P})A_\tau(\tau,\bar{P}) - A(\tau,\bar{P})D_\tau(\tau,\bar{P})}{-2D_\tau(\tau,\bar{P})} > 0$ and corresponding $P_0 > 0$ such that for $Q > Q_0$, $\frac{\partial MR(\tau,\bar{P})}{\partial\tau} < 0$ and $\frac{dQ}{d\tau} < 0$ and for $Q < Q_0$, $\frac{\partial MR(\tau,\bar{P})}{\partial\tau} > 0$ and $\frac{dQ}{d\tau} > 0$.

Also, differentiating the FOC with respect to B,

$$\frac{2}{D(\tau,\bar{P})}\frac{dQ}{dB} + c_{QQ}(w,B,Q)\frac{dQ}{dB} + c_{QB} = 0 \quad \text{(A.10)}$$

and hence

$$\frac{dQ}{dB} = -\frac{c_{QB}}{\frac{2}{D(\tau,\bar{P})} + c_{QQ}(w,B,Q)} > 0 \text{ since } c_{QB} > 0. \quad \text{(A.11)}$$

If B_0 is the value of bank presence for which Q_0 is the optimal quantity, for $B < B_0$, $Q < Q_0$ and $\frac{dQ}{d\tau} > 0$ and for $B > B_0$, $Q > Q_0$, $\frac{dQ}{d\tau} < 0$.

Proposition 2: $\frac{d^2Q}{d\tau dB} < 0$.

Differentiating the expression for $\frac{dQ}{d\tau}$ with respect to r,

$$\frac{d^2Q}{d\tau dB} = \frac{[c_{QQ}(w,B,Q) + \frac{2}{D(\tau,\bar{P})}]\frac{\partial^2 MR(\tau,\bar{P})}{\partial\tau\partial B} - \frac{dc_{QQ}(w,B,Q)}{dB}\frac{dMR(\tau,\bar{P})}{d\tau}}{[c_{QQ}(w,B,Q) + \frac{2}{D(\tau,\bar{P})}]^2} < 0 \quad \text{(A.12)}$$

assuming $\frac{dc_{QQ}(w,r,Q)}{dB}$ to be small (since it is a third-order derivative), $\frac{\partial^2 MR(\tau,\bar{P})}{\partial\tau\partial B} = 2\frac{D_\tau(\tau,\bar{P})}{D(\tau,\bar{P})^2}\frac{dQ}{dB} < 0$.

Appendix B: Data

All data are for the years 1989-90, 1994-95 and 2000-01 except when noted.

Unorganized Enterprise data (Unorganized Manufacturing, National Sample Survey Organization, India):

Level of Observation: Enterprise level.

Capital and Output: The market value of fixed assets and the value of output and gross value added in rupees deflated by the whole sale price index for all commodities for the Indian economy from the Office of Economic Advisors, Government of India, http://eaindustry.nic.in/asp2/list_d.asp with base year 1993-94 are my measures of physical capital and output for the enterprise. I drop enterprises with total employment<=0, value of materials<0, fixed assets<0, gross output<0 or employment<20 from the sample.

Labor: The average number of workers both household and hired, working full time and part time, in the last month of the year is my measure of employment.

Outsourcing (only for 2000-01): Dummy variable that is coded as 1 if an enterprise sells its output to another enterprise or a contractor or if the enterprise is on a contract to sell most of its output to another enterprise.

Level of Observation: District in an urban/rural sector of a state

Total Output Per Capita: Total enterprise output divided by population[14].

Growth in output: Change in enterprise output between current year and previous NSS round year.

Formal sector data on factor prices (Annual Survey of Industries, Central Statistical Organization, India):

Level of Observation: 2 digit NIC 1998 industry in each state.

[14] Total output and number of enterprises at district level are sums of output and number of enterprises including all household enterprises and non-household enterprises hiring less than 6 workers since data for these enterprises is available for 1989, 1994 and 2000 while data for enterprises hiring between 6 and 10 workers is available only for 1994 and 2000.

Wage rate: Total emoluments for the year deflated by the whole sale price index of all commodities for the economy divided by the total number of employees in the industry in each state is my measure of the annual wage rate.

Rental rate: Total rent paid on fixed assets divided by the book value of total fixed assets in the industry in that state is my measure of the annual rental rate.

Bank data (Basic Statistical Returns, Reserve Bank of India and Indian Population Census (1991, 2001), Central Statistical Organization, India):

Observation level: Rural or Urban area in a district in a state.

Banks per capita (rural or urban): The number of rural and urban branches of all scheduled commercial banks in India in the district divided by population. Scheduled commercial banks include regional rural banks, co-operative banks, public sector banks and private sector banks.

Normalization of bank branches:

I normalize banks with population from the 1991 census for the 1989 and 1994 rounds of my data. For the 2000 round, enterprises are classified as urban or rural based on the 1991 census. However, I argue that using the 1991 census populations to normalize banks for the 2000 round might be outdated. I cannot use population figures for the urban and rural sectors of a district from the 2001 population directly since rural sectors in some districts in the 1991 census and hence my 2000 NSS round may be urban sectors in the 2001 census. Hence for the 2000 round, I create populations for the rural and urban sectors of a district by taking their population in 1991 and allowing them to grow between 1991 and 2001 at the rate of growth of population for the entire district. Second, the NSS classification of an enterprise into rural or urban is based on the 1991 census for the 1994 round. However, the bank data from the Reserve Bank of India classifies areas as rural or urban based on their populations in the 1981 Population Census for the 1994 round. Hence, for the year 1994, the NSS enterprise data classification of a firm as urban or rural may not correspond with the rural or urban number of bank branches associated with it if there have been changes in the classification of a village as a town. However, my results using total district variables instead of splitting them into urban or rural performed as a robustness check address this issue.

Districts:

Since each unorganized manufacturing enterprise survey round incorporates newly formed districts, I code newly formed districts back to the original district in 1989. Sometimes, a new district is formed out of two or more old districts. In this case, I add the two or more old districts and form a consolidated 1989 'super-district'.

Output tariff data (Asian Development Bank, Manila):

Observation level: Commodity level aggregated to 3 digit NIC 1998.

Lagged Tariff: I construct output tariffs at the 3 digit NIC 1998 level by assigning each commodity to its corresponding 3 digit NIC 1998 code. In cases where more than one commodity corresponds to a 3 digit NIC 1998 code, the output tariff for that NIC 1998 industry is constructed as a simple average of the tariffs for the corresponding commodities. For 3 digit NIC 1998 industries with no corresponding commodity, I assign the 2 digit NIC 1998 tariff, where the 2 digit NIC 1998 tariffs are simple averages of tariffs of commodities assigned to that 2 digit industry. I then lag the tariffs by one year.

Industry Concordance:

All my data are concorded to the 2 digit National Industrial Classification (NIC) 1998. For the Unorganized Enterprise data, this meant writing a concordance between 4 digit NIC 1987 and 2 digit NIC 1998. My ASI formal sector data were obtained at the 3 digit industry level, classified under NIC 1987 for the years 1989-90 and 1994-00 and under NIC 1998 for the year 2000-01. Hence I had to write a concordance to transfer the 3 digit NIC 1987 1989-90 and 1994-95 ASI data to 2 digit NIC 1998. First, if a 3 digit NIC 1987 industry corresponded to more than one 3 digit NIC 1998 industry, I assigned the same wage and rental rate to all 3 NIC 1998 industries. Next, I took a simple average of the wage and rental rate and wage-rental ratio of the 3 digit NIC 1998 industries to get the corresponding NIC 1998 2 digit industry wage and rental rates.