A Gender Penalty for Firm Performance in India's Informal Manufacturing Sector

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Abstract

Women entrepreneurs are preponderant in the informal sector of developing economies. Compared to the gender wage gap, disparities among self-employed workers have received little attention, particularly outside the OECD context. In this study I use Indian National Sample Survey (NSS) data to show that female-headed firms perform significantly worse than male-headed firms, controlling for differences in education, assets, working hours, industry, geographical region, and other relevant controls. Oxaca-Blinder decomposition shows that 75 percent of the performance gap is driven by differences in endowments. The gender performance gap does not exist for those female-owned firms that are able to employ wage-workers, suggesting that women are penalized for their care-work responsibilities. I also show that State-level variation in the size of the gender penalty is correlated with women's status as measured by the Gender Development Index.

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1 Introduction

An important question in the literature on gender, entrepreneurship, and firm performance is whether female-owned firms perform worse than male-owned firms, and if so, why. While significant in itself, in the context of developing countries such as India, this question assumes an even greater importance because the majority of the workforce is in the so-called "informal sector" where self-employment is common. The informal economy accounts for 90 percent of employment in India and nearly 50 percent of informal workers are self-employed (Mehrotra et al., 2014). Unlike the formal sector, women constitute a substantial proportion of firm-owners in the informal sector, managing their own micro and small enterprises with or without paid and unpaid workers (Daymard, 2015). It is thus of great policy importance to understand the challenges faced by women entrepreneurs in the informal sector and to investigate how female-owned firms perform vis-a-vis male-owned ones. This issue has thus far not received the attention it deserves, especially for India.

Self-employed women can be at a disadvantage vis-a-vis men due to social restrictions on mobility and resulting limited access to information, credit, and markets as well as discrimination in product as well as factor markets. Further, for those informal self-employed workers who are home-based, factors such as asymmetric responsibilities for housework and care-work are important as well (Mies, 1986; Beneria and Roldan, 1987; Prügl and Tinker, 1997; Balakrishnan, 2002). Gender disparities along all these dimensions may lead to female-owned firms performing worse and as a consequence result in lower earnings from self-employment for women than men. Disadvantages experienced by self-employed women workers may be manifested in lower productivity, smallness of firm size compared to male-owned firms etc. It is important to quantify such as performance gap, if it exists, and to explore the reasons for it so that appropriate policy responses may be designed.

In the OECD context as well as to some extent for developing countries, there is a well-established literature on occupational segregation and discrimination that analyzes the disadvantages faced by women in the labor market (Albelda, 1986; Treiman and Hartmann, 1981; Jacobsen, 1998, 2003; Mies, 1986; Blau and Kahn, 2000). Compared to this literature that focuses primarily on the gender *wage* gap, studies on self-employed workers are much fewer. While large-scale labor force or household surveys may report earnings from self-employment, they usually do not carry

information such as assets owned by the firm, workers employed, and so on. Firm-level surveys do carry such information and are more suited to identifying gender disparities in earnings of self-employed workers. Using firm-level data some studies on OECD countries find that female-owned businesses underperform male-owned ones along key dimensions such as sales, profit, and productivity (Watson, 2001; Fairlie and Robb, 2009). However this finding is by no means unanimous and varies with country, types of firms, and controls used. Further as Sabarwal and Terrell (2008) observe, most studies looking at such differences are based on small samples. Thus it is useful to revisit this issue, especially in a developing country context, using a large dataset.

The present study is based on a nationally representative sample of informal manufacturing firms and presents, for the first time, estimates of the gender penalty faced by women entrepreneurs in the Indian informal sector. The dataset used in this study is the 2005-2006 survey of unorganized manufacturing enterprises carried out by India's National Sample Survey Organization. The gross value added by the firm during the reference month is used as the measure of firm performance. The primary question is whether there exists a gap in performance between male- and female-owned firms. If so, does this gap close after controlling for relevant differences in physical capital, labor, human capital, industry of operation and location (state of operation)? Using OLS and controlling for the above factors, we find a robust correlation between the gender of the owner and firm performance. While we cannot draw causal conclusions from such an analysis, it is nevertheless worthwhile to describe the nature of the performance gap and its contributing factors, firstly because no such estimates exist in the literature and secondly, as a basis for further research.

We find that female-owned firms are 45 percent less productive than male-owned firms. Stratifying the regression by gender of the firm owner and performing a Oaxaca-Blinder decomposition shows that differences in endowments explain 75 percent of the difference in performance between male- and female-owned firms. Analyzing the decomposition in detail we find that differences in labor input are the single biggest contributor to the overall endowment effect accounting for nearly 50 percent of it. One key way in which women-owned firms differ from male-owned firms is that they tend to employ far fewer paid workers, operating instead as single-person firms or with unpaid family workers. The literature on firm performance and gender highlights differences in motivation

as one likely reason for differences, with men operating firms for growth and profitability motives and women for subsistence (Daymard, 2015). The presence of paid wage workers is taken as an indication that the entrepreneur is motivated by profitability considerations rather than subsistence. Of course, there can be many other factors such as social norms that influence the ability of women entrepreneur to hire workers. Regardless of the causal factors, which can be difficult to identify, it is worth asking the question, do female-owned firms that employ paid workers also face a gender penalty? Stratifying our basic model by the presence or absence of paid workers reveals an interesting result. The gender penalty disappears if we restrict the analysis to firms with paid workers. The decomposition shows that female-owned firms that are in a position to employ paid workers are mostly penalized for endowment differences only. Once assets, labor input and other key endowments are controlled for, there is only a weak correlation between the gender of the firm owner and firm performance. On the other hand, the gender of the firm owner matters a great deal for firms with no paid workers. Here women are penalized not only in terms of owning poorly endowed firms and but also in terms of poorer returns to those endowments. Finally, there is a spatial or geographical dimension to the gender performance gap. India is a large and diverse country with gender relations differing vastly in different parts of the country. We show that the size of the gender penalty varies substantially between different states and is correlated, albeit weakly, with the state's Gender Development Index (GDI) and the male-female literacy gap. The Northeastern states, known for more egalitarian gender relations, display a much smaller gap or no gap at all, compared to the states of central India such as Bihar and Madhya Pradesh. But even within the major states of north and south India there exists a substantial variation in the size of the gender penalty.

The results of the present study have implications for industrial policy targeted towards micro and small enterprises. Such enterprises have traditionally been considered employment and growth engines in developing countries. Female entrepreneurs constitute an important part of this sector. To the extent that policy can alleviate the specific constraints faces by women, this sector can become a strong vehicle for income generation and poverty alleviation.

The remainder of this paper is organized as follows. Section Two reviews the literature, Section

Three describes the data and methods used in the study, Section Four presents the results, Section Five discusses the implications and presents caveats, and Section Six concludes.

2 Literature Review

While feminist scholarship has long engaged with the question of discrimination, several aspects remain understudied. A particularly understudied dimension of gender relations that nonetheless affects millions of women worldwide is the difference between male and female entrepreneurs in the informal economy of developing countries. Do women entrepreneurs face a gender penalty? If such a penalty exists, it becomes important to characterize it further. Is it a result of the differences in characteristics of male- and female-owned firms (if so, which characteristics)? Is it due to differences in returns to these characteristics?

The question of gender differences in the performance of small firms is somewhat better studied in the context of developed countries. Research on OECD countries finds that female-owned small businesses may underperform male-owned ones along key dimensions such as sales, profit, and productivity (Watson, 2001; Fairlie and Robb, 2009). Sabarwal and Terrell (2008) extend this work to Eastern Europe and Central Asia. They also provide a detailed review of the literature on gender and firm performance. They note that the evidence is mixed, though tending towards the existence of a gender penalty. Findings depend somewhat on the measure of performance employed in a particular study and whether appropriate controls have been used. Several studies, in different countries (mainly developed) have shown that female-owned firms are smaller, as measured by asset size and employment (Sabarwal and Terrell, 2008). Coleman (2007) drawing on the 1998 US Survey of Small Business Finances, shows that women-owned firms are smaller than male-owned firms as measured by total sales, total assets, and total number of employees. Women-owned firms are also more likely to be organized as sole proprietorships (56.51 percent versus 45.91 percent).

Among the reasons advanced in the literature for lower performance of female-owned firms is that they are disproportionately concentrated in industries that tend to be more competitive or display lower productivity (perhaps due to technological differences). Coleman (2007) notes that women-owned businesses tend to be concentrated in service and retail sectors, both highly

competitive areas offering more limited opportunities for growth and profitability. Such systematic gender differences in industry composition exist in other countries also (Sabarwal and Terrell, 2008). Another reason is asymmetric access to capital. Watson (2001) shows, for Australia, that women owners have less start up capital, which may explain their lower incomes and profits. Institutional factors such as discrimination in access to credit have also been studied in the context of developed countries. Some OECD researchers argue that when appropriate controls are used to account for the above differences in endowments and industrial segregation, no gender performance gap exists (Du Rietz and Henrekson, 2000) or that male- and female-owned small firms behave similarly as far as growth decisions are concerned (Orser and Hogarth-Scott, 2002). Kepler and Shane (2007) find no significant gender penalty in the case of new entrepreneurs, but it is of course possible that differences may develop over time. And Watson (2002) uses Australian Business Longitudinal Surveys to show that after controlling for industry and age of business, there are no significant differences in return on assets, returns on equity or total income to total assets.

Two related studies use the World Bank Enterprise Surveys to explore this question for formal firms in developing countries. Bardasi et al. (2007) show female-owned firms to be as productive as male-owned ones as measured by value added per worker and total factor productivity holding constant the industry in which they work. A more recent study, Bardasi et al. (2011), explores this issue for Eastern Europe and Central Asia (ECA), Sub-Saharan Africa (SSA) and Latin America (LA). Using OLS and a gender dummy along with relevant controls the authors show a sales gap of 38 percent for ECA and 12 percent for SSA. Using a model for productivity similar to the one used in this paper, they also show that the average female-owned firm is significantly less efficient in ECA and LA. However there is no significant difference for SSA. Thus while female-owned firms are both smaller and less efficient in LA, they are smaller but not necessarily less efficient than their male counterparts in SSA.

Compared to the literature on OECD countries and on formal sector firms in developing countries, direct measurements of gender disparities in the informal sector are rarer. But the vast majority of workers as well as entrepreneurs in developing countries such as India work in the informal sector, that accounts for 99% of all firms (Daymard, 2015). These are micro and small

enterprises that are not formally registered and are not covered by labor laws, tax regulation etc. Second, compared to the formal sector, women are found in the informal sector in significant numbers not only as workers but also as owners also. Daymard (2015) finds that the number of female entrepreneurs in the non-agricultural sector has doubled over the past ten years in India to about 10 million. In his study women accounted for nearly half of total entrepreneurs without workers in manufacturing. One may surmise that informal credit and product markets in developing countries are more likely to suffer from problems of incompleteness, lack of information, discrimination etc., possibly in more intensified forms, than their counterparts in developed countries. As self-employed workers, women participate in factor and product markets, purchasing inputs and selling output. Further the vast majority of women work from home. Home-based work, even as it allows women to integrate paid and unpaid work within a working day, also creates new information asymmetries and vulnerabilities that women in formal sector wage-work do not face. These include reliance on intermediaries for inputs and sale, ignorance of market prices and opportunities, and integration into long (at times transnational) sub-contracting chains (Mies, 1982; Beneria and Roldan, 1987; Balakrishnan, 2002). All this suggests that gender penalties may exist to a larger extent in the informal sector compared to the formal.

Sethuraman (1998), in a cross-country meta-study on gender disparities in the informal sector, reports that in Brazil women earn 34% of men's income, while in Mexico it ranges from 55% for self-employed workers to 75% for wage-workers. In Bombay the ratios were 53, 58 and 46 % for self-employment, regular wage-work and piece work respectively. Research on self-employed men and women in Abidjan concludes that differences in capital (physical and human), legal status, age of enterprise, and geographical location explain around half of the differences in profits between male and female owned enterprises. Hahn (1996, p. 225), based on a 1986 report of the National Commission on Self Employed Women and Women in the Informal Sector concludes that "in all informal sector categories women's earnings are less than half of men's, with those of home-based workers the lowest." But recent work that estimates a gender penalty for informal entrepreneurs in India is missing and it is this gap that the present study seeks to fill.

3 Data, Methods, and Summary Statistics

3.1 Data Source

This paper uses data from the Survey of Unorganized Manufacturing Enterprises (Indian National Sample Survey 62nd Round, July 2005 – June 2006).[1] Although the 62nd round is not the most recent survey of the unorganized manufacturing sector, it remains the best source to address the question. This is because, unlike the later 67th round (2010), it is focused only on the manufacturing sector (instead of the more general category of the "non-agricultural informal sector") and it contains information on the educational background of the firm's owner, that is missing from the later round.

The 62nd round consists of a sample of 82897 firms. In this paper we exclude all firms with more than 20 total workers (paid or unpaid) as well as firms that do not operate on a proprietary (including partnership) basis, to conform to the Indian definition of the informal sector.[2] With these adjustments, our final sample includes 81333 firms. After applying frequency weights supplied by the NSSO this sample represents a population of 17 million firms. Throughout our analysis we apply sampling weights to estimate population averages and parameters. In the next sub-section we present some descriptive statistics that are useful in motivating the subsequent analysis.

3.2 A comparison of male- and female-owned informal firms

Of the total population of informal manufacturing firms, 62.5 percent are male-owned and 37.5 percent female-owned. This is similar to the share of women owners in Latin America and OECD countries but higher than that in Central Asia and Africa (Bardasi et al., 2011). An important distinction among informal firms is whether the firm employs workers or whether the owner works on his or her own-account. Three types of firm can be distinguished; single-worker firms which employ no paid or unpaid workers, firms that employ only unpaid (usually family) workers, and

[1] In official Indian terminology the "informal sector" is known as the "unorganized" sector. There is a small difference in the two definitions. The term "unorganized" refers to all enterprises that employ ten workers or less with power or less than twenty workers without power while the term "informal" is generally used for enterprises employing less than ten workers.

[2] The results do not change substantially if we restrict the sample to firms employing ten workers or less.

firms that employ paid (and maybe also unpaid) workers. Based on entrepreneurial motivation a distinction is usually made between single-worker and family firms on the one hand and those employing paid workers on the other. The former are seen as primarily subsistence oriented while the latter are seen to be profit-oriented. There is a strong difference between male and female-owned firms in this respect. Among own-account firms that employ no workers (paid or unpaid) women account for 43 percent of all owners. This drops to a mere 7 percent for firms that have at least one worker (paid or unpaid). And while 21 percent of male-owned firms employ at least one wage worker and only 3 percent of female-owned firms do so. While obviously entrepreneur motivation may be one factor deciding the employment of wage-workers, other factors such as social norms are also likely to be relevant. In any case, this has important implications for firm performance as we discuss later.

There are several measures of firm performance in the literature including sales, profits, value-added, and total factor productivity. Here we use monthly gross value added (GVA) as a measure of performance. GVA is defined as total receipts minus total expenses (other than wages paid). It thus includes paid wages, imputed wages of family workers and profits of the entrepreneur. How do female-owned firms perform when compared to male-owned firms? How do their endowments compare? Table 1 summarizes data on performance, key endowments (physical and human capital), and other demographic and location characteristics of all firms and of male- and female-owned firms. While median log GVA of male-owned firms is 7.65 (Rs. 2100 in nominal 2005 currency), it is only 6.31 (Rs. 550) for female-owned firms. Thus, in terms of raw averages, female-owned firms clearly perform much worse than male-owned firms.

We expect that part of this raw difference will be accounted for by differences in observable characteristics like human and physical capital, mix of worker types, etc. Turning to these we see that 61 percent of male-owned firms are home-based; the corresponding proportion for female-owned firms is 94 percent. It is well-known that restrictions on mobility or responsibilities for housework limit women to their homes even when they run their own businesses. As mentioned in the literature review, feminist economists have agued that being home-based exposes women to greater vulnerabilities resulting from lack of access to information on credit, markets, inputs, etc.

As expected, there are also significant differences between the two types of firms in the amount of physical capital owned. Female-owned firms have median log assets of 8.99 (Rs. 8022 in nominal 2005 currency) while male-owned firms have median log assets of 10.19 (Rs. 26,635). Figure 1 displays the distribution of log GVA for male and female-owned firms. Figures 2 and 3 do the same for physical assets and working hours respectively. Despite substantial overlap in the distributions it is clear that male-owned firms are better endowed, work longer hours and are more productive than female-owned firms. Further, Table 1 also shows large human capital differences. While 33 percent of female owners have no schooling, the corresponding proportion for male owners is only 20 percent. Note that the level of education in the sample is low overall. Even among male owners only 8 percent report schooling beyond the secondary level. The corresponding proportion for women is 4 percent.

In addition to the above differences at the firm level, it is also well-known that the distribution of male- and female-owned firms differs across industries. Figure 4 shows this data for the Indian informal manufacturing sector.[3] Female-owned firms tend to be more concentrated in a few industries compared to male-owned firms, consistent with what has been observed for other developing countries (Bardasi et al., 2011). Of course concentration by itself does not imply differences in performance or productivity. The question is, are those industries in which female-owned firms tend to concentrate also industries that tend to be lower in productivity. As alluded to above in the literature review, the OECD research shows that female entrepreneurs tend to be overrepresented in those industries that are less profitable. Figure 5 offers some support for this showing the proportion of female-owned firms in a given industry as a function of average GVA of male-owned firms in that industry.[4] The relationship is clearly negative, showing that women entrepreneurs tend to concentrate in those industries where male-owned firms are also less productive compared to those industries where male-owned firms are predominant.

To sum up the results shown above, female-owned firms have lower GVA, are endowed with lower physical and human capital, have fewer paid workers, are more likely to be home-based, and

[3]Industries that account for less than 1 percent of all firms have been left out to reduce clutter.

[4]Since there is an endogeneity problem in looking at total GVA that may be driven down due to preponderance of female-owned firms in a given industry we measure average industry productivity only for male-owned firms.

more likely to be concentrated in lower productivity industries. We would like to analyze the raw gender performance gap in more detail to see how much of it can be explained by these differences.

3.3 Empirical Methods

The dependent variable in all models is log(GVA) for the reference month. The estimation technique is OLS with standard errors clustered on thirty-four states and nineteen industry groups.

We first estimate the following pooled model:

$$y_{ijk} = \gamma F + \alpha_K K + \alpha_L L + \mathbf{x}'\boldsymbol{\beta} + \delta_S S + \delta_I I + \varepsilon_{ijk} \tag{1}$$

Where, y is log(gva) for firm i in industry j, and state k. F is a dummy for the gender of the firm owner, and K and L stand for capital (log(assets)) and labor (log(hours worked)). Other than capital and labor, firm performance is expected to depend on education of the owner, whether the firm is home-based, its rural or urban location, and the ratio of paid workers to total workers. This ratio is designed to capture the relative importance of paid or wage workers in the firm's workforce, with the assumption that a higher value indicates a greater tendency for the firm to be profit rather than subsistence oriented. These control variables are in vector $\mathbf{x}'$. Finally, we include State (S) and Industry (I) dummies. Note that the survey does not provide data on enterprise age but based on Bardasi et al. (2011) it may be surmised that this omission is unlikely to change the picture much. We estimate this model for the entire sample of firms as well as subsamples stratified by type of firm. Firms are divided into to types depending of whether they employ wage-workers or not. This model gives us an estimate of the gender penalty by looking at the sign, size, and significance of the coefficient on the Female dummy.

However, the shortcoming of the above model is that it forces all other coefficients for male and female-owned firms to be the same. But there are good reasons to expect that male and female entrepreneurs are different in their ability to convert endowments into output. Thus the next step is to interact all variables in the above model with the Female dummy, effectively stratifying it by gender of the owner. This allows us to analyze the coefficients separately. We also perform a Oaxaca-Blinder decomposition on the gender performance gap. The literature on the gender

earning gap has addressed the following question: what fraction of the observed earning gap can be attributed to the differences in endowments and what fraction to differences in returns to those endowments. Building on Blinder (1973) and Oaxaca (1973), a large literature has asked this question in very different contexts (Idson and Feaster, 1990; Main and Reilly, 1993; Neuman and Oaxaca, 2004; Yun, 2007).

We perform a three-way Oaxaca-Blinder decomposition of log-GVA (Jann, 2008):

$$\bar{y}_{male} - \bar{y}_{female} = \bar{\mathbf{x}'}_{female} \left(\boldsymbol{\beta}_{male} - \boldsymbol{\beta}_{female}\right) + \boldsymbol{\beta}_{female} \left(\bar{\mathbf{x}'}_{male} - \bar{\mathbf{x}'}_{female}\right) + \left(\bar{\mathbf{x}'}_{male} - \bar{\mathbf{x}'}_{female}\right) \left(\boldsymbol{\beta}_{male} - \boldsymbol{\beta}_{female}\right) \tag{2}$$

The first term in equation (2) gives the contribution to observed difference in log-GVA coming from differences in returns to endowments (expected change in female mean if female-owned firms had male coefficients), the second term gives the contribution of differences in endowments (expected change in female mean if female-owned firms had male characteristics) and the third term gives the interaction effect. This effect will be non-zero if differences in endowments and coefficients exist simultaneously between the two groups. A three-way decomposition is easier to interpret than the two-way and also gives us the interaction effect (Jann, 2008). We also employ the "categorical" option on the decomposition that identifies dummy and categorical variables and transforms their coefficients making the results invariant to the choice of the (omitted) base category.

4 Results

We now present results from the OLS model described in the previous section. First we present results for the full sample of 81,333 informal firms. Next results are presented for the sample stratified by firm type (those employing paid workers or not). Finally we analyze the gender effect by State.

4.1 Full Sample

Table 2 displays the results of the OLS estimation for the pooled model in Column 1 and the interaction model in Columns 2 and 3. Errors have been clustered on State and Industry. Controlling for physical and human capital, paid-unpaid worker ratio as well as whether the firm is home-based and urban or rural, together with State and Industry fixed-effects, we find a robust correlation between the gender of the owner and firm performance. A coefficient of -0.46 indicates that GVA for female-owned firms is 46% less than that for male-owned firms. The other effects are as follows. The assets elasticity of value-added is 0.16 while the labor elasticity is 0.58. We observe a significant penalty for home-based firms (28 percent less value-added). This is consistent with the existing literature that identifies specific problems faced by home-based workers such as lack of information, lack of access to infrastructure, and lack of opportunities to utilize economies of scale. An urban location improves firm performance by 7.6 percent. A strong effect is observed of the paid-unpaid workers ratio. While no causal inferences can be drawn, this is consistent with theory that suggests that firms employing more paid workers tend to be more profit (rather than subsistence) oriented. We do not observe any significant returns to primary level schooling. But if the owner reports a secondary school or college education this is correlated with strong, significant effects on firm performance.

The model with a female dummy forces all coefficients to be identical for male and female-owned firms. But it is reasonable to suppose that returns to physical capital, education, etc. may differ for male versus female entrepreneurs. Fully interacting with the gender of the firm owner will enable us to identify such differences, if any. Columns 2 and 3 in Table 2 show the results of the fully interacted model. The capital and labor elasticities are similar across male and female owned firms as seen by a small statistically insignificant interaction effect. Interestingly even penalty for being home-based, though marginal higher for females is not statistically different from that for males. Larger differences emerge when we look at the coefficients for the urban dummy, the paid worker ratio, and education dummies. At first glance the home-based dummy result appear to be perplexing since there is a literature in feminist economics that identifies problems specifically faced by women at home, most significantly, being primarily responsible for childcare, eldercare and other

housework. This should have an impact on the performance of female-owned firms. But the absence of an interaction effect is possibly explained by the fact that there is no independent penalty for being home-based once differences in assets, working hours, and worker types are controlled. This is supported by the observation that the difference in GVA between firms with and without paid workers is much higher for female-owned firms than male-owned ones (the interaction effect is large and significant). One interpretation is that men are already dedicating most of their working time to working for the firm, even while being home-based, while women may be dividing their time between housework and firm-work. When this constraint is lifted via hiring of paid work, we find a much bigger effect on firm performance. Thus in the presence of the paid worker control, the home-based dummy captures those disadvantages to being home-based that are common to both male and female owners.

Strikingly, the advantages associated with urban male-owned firms disappear in the case of female-owned firms (the interaction effect is negative and almost equal magnitude), indicating that controlling for other factors, urban female-owned firms do not perform any better than firms in a rural location. Finally, education of the owner is correlated with a large difference in the performance of male-owned firms but not for female-owned firms. In part this may be due to small sample sizes at the higher end of the education spectrum, but is unlikely to be a reason for the lower end. It may suggest, worryingly, that women are, for some reason, not able to translate their education into better firm management and operation.

Next we analyze the results from the Blinder-Oaxaca decomposition (Table 3). The top two rows give observed GVA and GVA predicted by the model, as well the difference between male and female-owned firms. The decomposition results are presented in the remainder of the table. Differences in endowments explain 75 percent (0.99) of the difference in log(GVA) between male- and female-owned firms (1.32). Differences in returns to these endowments account for 18 percent while the interaction term accounts for the rest. Looking at the detailed decomposition results we find that differences in labor input are the single biggest contributor to the overall endowment effect accounting for 48 percent of the effect. The other big contributors are differences in assets owned, paid workers employed and whether the firm is home-based. Looking at the return and

interaction terms, we see smaller effects and also a lesser degree of statistical significance. However, the importance of worker-type is clear. The presence of paid workers is associated with better female-owned firm performance (as we also saw earlier when discussing the OLS results). This is seen in the negative sign on the returns and interaction components of the paid-unpaid ratio variable.

We now turn to results of stratifying the basic model by type of firm, distinguishing between firms that employ no paid workers versus those that do.

4.2 Analysis by firm type

Existing literature as well as the foregoing analysis point to the importance of having wage workers in a firm to the firm's performance. One important reason women-owned firms perform poorly compared to male-owned firms is that the former tend to employ far fewer paid workers, operating instead either as single worker firms or with unpaid family labor. It is thus of interest to stratify the sample of firms by whether they employ wage-workers or not and then redo the analysis. We expect the gender penalty to be significantly reduced for those female-owned firms that are able to employ wage labor.

Table 4 shows the result for the OLS estimation on the sub-sample of firms that employ no paid workers. As before, the first column displays results for the combined model with a Female dummy while the second and third columns show results for male-owned firms and interaction effects with the Female dummy, respectively. The gender penalty is higher for firms employing no paid workers than it is for the entire sample (50 percent compared to 46 percent). The asset and labor elasticities of value-added are approximately the same as before. However, interestingly, the penalty for being home-based is much larger at 33 percent as opposed to 28 percent for the entire sample. While the urban and secondary school premiums are similar for the subsample as well as the entire sample, the college premium is much lower for the subsample of firms with no paid workers. Taken together these results offer a picture of such firms that indicates that they are as efficient as firms overall as far as capital and labor are concerned, but home-based firms are associated with a higher penalty, while not benefitting as much from an urban location or from higher education.

On stratifying the sample by gender of owner we find, as we did for the entire sample in the previous section, that the returns to labor and capital are similar but the urban dummy and the human capital variables diverge. Male-owned urban firms do significantly better than rural firms but the same is not the case for female-owned firms. Similarly, firms owned by male entrepreneurs educated up to or beyond the secondary school level perform better than those owned by uneducated entrepreneurs, but this difference is almost absent for female-owned firms. There is a large premium for secondary school and college educated owners (23-30 percent higher value-added) that is absent for female owners as indicated by the large interaction negative effects. One caveat here is that the sample of female college-educated owners is very small and hence the estimation suffers from lack of statistical power.

Before looking at the results of the Oaxaca-Blinder decomposition we first analyze the results of the same model for the subsample of firms that employ paid workers. The most striking result in Table 5 is that the gender penalty is significantly reduced for these firms to only 13 percent as opposed to 50 percent for firms that employ no paid workers (Column 1). The asset and labor elasticities are also much higher for these firms indicating that they are in a better position to utilize their resources more efficiently. There is no home-based penalty either. The college premium is also the highest for this subsample compared both to the subsample of firms with no paid workers and the entire sample.

Stratifying by gender of the owner we find that male-owned firms display a higher asset elasticity than female-owned firms (albeit not statistically significantly higher) but a significantly lower labor elasticity. This is also an interesting result. The higher labor elasticity fits with our earlier conclusion that female-owned firms, when they are in a position to employ workers, may benefit more from their presence than male-owned firms. One hypothesis we have advanced is that male entrepreneurs may not have housework responsibilities and thus may be able to dedicate themselves fully to firm-related activities. This may not be the case for female entrepreneurs who are likely to undertake housework and careworn responsibilities in addition to managing their firms. Thus for the latter, the presence of dedicated wage-workers may be expected to have a larger impact on firm performance. Of course, no causal interpretation is possible from the present analysis and this

hypothesis is offered a a suggestion for future research.

Another striking aspect of the results in Table 5 is the set of human capital coefficients. Unlike firms with no paid workers, here higher education is correlated with better firm performance for female entrepreneurs. This leads us to the conclusion that education of the female entrepreneur can indeed be positively related to firm performance on the condition that these are not single-worker, subsistence-oriented firms but rather when these entrepreneurs have a paid workforce to supervise. The college premium, in particular, is very large for female-owned firms. But again the caveat is that the sample size for college-educated female entrepreneurs is very small.

Finally, we take a look at the results of the Oaxaca-Blinder decomposition performed separately for firms with no paid workers and for firms with paid workers (Table 6). First off, note that the difference in predicted GVA is smaller, as expected, for firms that employ paid workers. For firms with no paid workers, differences in endowments account for 59 percent and differences in returns for 28 percent of the total difference, with the interaction term accounting for the remainder. The corresponding numbers for firms employing paid workers are 89 percent (endowments), 37 percent (returns), and -26 percent (interaction). This shows, firstly, that difference in endowments are much more important in explaining the gap for firms with paid workers. Second, this also shows the importance of doing a three-way rather than a two-way decomposition that calculates an interaction effect (Biewen, 2012). Recall that the interaction term captures that part of the gap that is the result of differences in both endowments and returns acting together. Looking at the results of the detailed decomposition (data not shown) reveals that while women work lesser hours than men, their return to labor input exceed that for men, for the case of firms employing paid workers (as seen earlier in the regression results). Such simultaneous changes in endowments and returns result in a negative sign on the interaction terms. The Oaxaca-Blinder result that differences in endowments account for a very large portion of the gap is also consistent with the OLS result showing that the coefficient on the female dummy is much smaller for the paid-worker sample.

The implication is that female-owned firms that are in a position to employ paid workers are penalized for endowment differences only. Once assets, labor input and other key endowments are

controlled for, there is little independent effect of the gender of the firm owner. On the other hand, the gender of the firm owner matters a great deal for firms with no paid workers. Here women are penalized not only in terms of owning poorly endowed firms and but also in terms of poorer returns to those endowments. We offer some further comments on this difference in the Discussion section.

4.3 Analysis by States

The foregoing analysis has been carried out at the all-India level. However, it is well-known that states in India differ significantly from each other with respect to the general status of women in society, freedoms enjoyed by women, as well as gender parity in education, health, employment, and other outcomes. One question that arises, therefore, is to what extent does the gender penalty for informal self-employment analyzed above, differ from state to state? Secondly, are measures of gender empowerment or the status of women in society, correlated with the extent of the gender penalty?

To address this question we calculate the marginal effects by State for the fully interacted model (Figure 6). There is clearly a wide variation in the size of the gender penalty across states, going from nearly 60 percent less value-added (in West Bengal) to more than 40 percent higher value-added (in Nagaland) than male-owned firms. For states such as Manipur, Delhi, Uttarakhand, Orissa, Assam, Mizoram, Himachal Pradesh, and Sikkim the penalty is not statistically distinguishable from zero, while it is reversed for Meghalaya and Nagaland. Interestingly, the states from India's Northeast, a region well-known for very different gender relations compared to the rest of the country, are over-represented here (also see Figure 7). In broad terms, the South and the Northeast perform better while the North and West perform worse in terms of this (and other) gender indicators. Figure 7 shows effects in map form so that we get a better geographical sense of the variation. Most of the country is shaded blue, indicating the existence of a gender gap, but substantial variation is also found between states such as Madhya Pradesh, Odisha, and West Bengal on the one hand, and Gujarat and Maharashtra on the other.

Knowing that there is large state-level variation in the size of the gender gap in our data, we can next ask if measures of gender empowerment such as the Gender Development Index (GDI) or

the male-female literacy gap are good predictors of the status of female entrepreneurs in a given state. We can, for example, examine the correlation between the size of the gender penalty in a particular state and its GDI[5] or the gap between male and female literacy rates. It is reasonable to expect that State-level variation in women's access to health and education, and their standard to living should correlate with variation in the gender performance gap. Figure 8 shows the correlation between the size of gender penalty and GDI (left panel) as well as the male-female literacy gap (right panel). Despite substantial scatter in the data, it can be seen that states with higher GDI or a smaller male-female literacy gap show a smaller gender penalty. Taken together with the data on state-level variation presented earlier, we can see that important differences exist between states and that these are correlated with the status of women in a particular state.

5 Discussion

The foregoing analysis of firm-level data on the Indian informal manufacturing sector has attempted to describe the existence of a gender gap in firm performance and to characterize the nature of that gap. Controlling for human and physical capital, labor, and other relevant factors we have seen the presence of a large gender gap in firm performance at the all-India level. Most of the gap is accounted for by differences in endowments, but a substantial portion is a result of differences in returns to those endowments also. The most significant difference emerges for labor endowments. Women owners are at a disadvantage because they tend to employ far fewer wage-workers than their male counterparts. In those cases where women do employ wage workers, the gender gap is vastly reduced. Finally, we also see that the size of the gender penalty varies widely across Indian states, with the Northeastern states offering a very different picture.

One caveat while interpreting these results is that given data limitations we can only descriptively analyze the gender gap. Since firm are not assigned male and female owners randomly, but rather selection forces are at work in which types of firms are male-owned and which are female-owned, no straightforward causal conclusions are possible. This, however, does not mean that nothing useful

[5] A derivative of the Human Development Index (HDI), the GDI measures gender gaps in health, education, and living standards, the same indicators as used in the HDI. The GDI is the ratio of male and female HDIs calculated separately, i.e. it shows female HDI as a percentage of the male HDI.

can be learned from the above exercise. Conceptually we can still divide the gender gap into three components: due to poorer endowments, due to discrimination that prevents women from earning the same returns to endowments as men do, and due to selection factors at work that may either increase or reduce the gap depending on their nature.

The endowments gap is self-explanatory. The returns component of the Oaxaca-Blinder decomposition is conventionally interpreted as "discrimination" or "treatment" effect. Absent selection bias this would be a measure of the disadvantage that female-owned firms face *because* they are female owned. Such a pure "treatment effect," of course, can only be obtained if otherwise identical firms were randomly assigned to male and female owners. This is almost never the case in the real world where men and women select into certain types of firms depending on social factors. For example, women may be socially restricted to working from home affecting their ability to expand the firm, hire outside workers and so on. Only those women may choose to start a firm who do not have access to other livelihood options, possibly increasing the size of the gap. Conversely, there may be a tradeoff between the social costs incurred by venturing outside the home or hiring paid workers and the returns to such economic activity, so that only those women who earn high enough economic returns participate in such activity. This would act to reduce the performance gap.

Despite our inability to separate out such selection effects, it is clear that women's obligations to perform care work and other housework that men are not similarly burdened with have something to do with the firm performance gap. This is because those female-owned firms that hire paid workers perform much more like male-owned firms. Of course, we cannot attribute a causal effect to the hiring of paid workers per se, since unobserved differences between women entrepreneurs can be responsible for hiring decisions. But we can nevertheless say that the existence of paid workers is correlated with a reduction in the gap.

In the larger economic and social context, it should be pointed out that, regardless of whether or not, and how much, selection factors are relevant, a descriptive characterization of the gender performance gap is of value because such estimates are extremely sparse in the literature and the demonstration of its existence is the first step towards more causal attempts to identify it.

6 Conclusion

In India 90 percent of the laborforce is employed in the informal sector. Of these informal workers, up to 50 percent are self-employed, owning and managing their own micro-enterprises. Unlike the formal sector, in the informal sector up to 30-40 percent of firm owners may be women. While we know a lot about the gender gap in wages, much less is known about the differences between male and female firm-owners. Designing appropriate gender-sensitive policy for the informal sector requires us to know more about the disadvantages faced by women entrepreneurs. As a first step, the gender gap in firm performance needs to be documented and explained. It is this gap that the present study has tried to address.

One conclusion that follows from the above analysis is that the single most important constraint on women is the labor constraint. Thus, if female earnings from self-employment in the informal sector are to be augmented via policy, in addition to efforts at making credit available or ensuring better marketing of products, freeing up women's own labor-time as well as enabling women entrepreneurs to employ wage workers should be important policy targets.

References

Albelda, R. P. (1986). Occupational segregation by race and gender, 1958-1981. *Industrial and Labor Relations Review 39*(3), 404–411.

Balakrishnan, R. (2002). *The Hidden Assembly Line: Gender Dynamics of Subcontracted Work in a Global Economy*. Kumarian Press.

Bardasi, E., C. Blackden, and J. Guzman (2007). Gender, entrepreneurship, and competitiveness. *The Africa Competitiveness Report*.

Bardasi, E., S. Sabarwal, and K. Terrell (2011). How do female entrepreneurs perform? evidence from three developing regions. *Small Business Economics 37*(4), 417–441.

Beneria, L. and M. Roldan (1987). *The Crossroads of Class and Gender: Industrial Homework, Subcontracting, and Household Dynamics in Mexico City*. The University of Chicago Press.

Biewen, M. (2012). Additive decompositions with interaction effects. *IZA Discussion Paper*.

Blau, F. D. and L. Kahn (2000). Gender differences in pay. *Journal of Economic Perspectives 14*(4), 75–99.

Blinder, A. S. (1973). Wage discrimination: Reduced form and structural estimates. *Journal of Human Resources 8*, 436–455.

Coleman, S. (2007). The role of human and financial capital in the profitability and growth of women-owned small firms. *Journal of Small Business Management 45*(3), 303–319.

Daymard, A. (2015). Determinants of female entrepreneurship in India. *OECD Working Papers No. 1191*.

Du Rietz, A. and M. Henrekson (2000). Testing the female underperformance hypothesis. *Small Business Economics 14*(1), 1–10.

Fairlie, R. W. and A. M. Robb (2009). Gender differences in business performance: evidence from the characteristics of business owners survey. *Small Business Economics 33*(4), 375–395.

Hahn, J. (1996). *Homeworkers in Global Perspective: Invisible No More*, Chapter "Feminzation Through Flexible Labor": The Political Economy of Home-Based Work in India, pp. 219–238. Routledge, New York.

Idson, T. L. and D. J. Feaster (1990). A selectivity model of employer-size wage differentials. *Journal of Labour Economics 8*(1), 99–122.

Jacobsen, J. P. (1998). *The Economics of Gender*. Blackwell.

Jacobsen, J. P. (2003). *Women, Family, and Work: Writings on the Economics of Gender*, Chapter The Human Capital Explanation for the Gender Gap in Earnings, pp. 161–176. Blackwell Publishing.

Jann, B. (2008). A stata implementation of the Blinder-Oaxaca decomposition. *Stata Journal 8*(4), 453–479.

Kepler, E. and S. Shane (2007). Are male and female entrepreneurs really that different? *Small Business Research Summary* (309).

Main, B. G. M. and B. Reilly (1993). The employer size-wage gap: Evidence for Britain. *Economica 60*(238), 125–142.

Mehrotra, S., J. Parida, S. Sinha, and A. Gandhi (2014). Explaining employment trends in the Indian economy: 1993-94 to 2011-12. *Economic and Political Weekly 49*(32), 49–57.

Mies, M. (1982). *The lace makers of Narsapur : Indian housewives produce for the world market*. Zed Press, London.

Mies, M. (1986). *Patriarchy and Accumulation on a World Scale: Women in the International Division of Labour*. Zed Books, London.

Neuman, S. and R. L. Oaxaca (2004). Wage decompositions with selectivity-corrected wage equations: A methodological note. *Journal of Economic Inequality 2*, 3–10.

Oaxaca, R. L. (1973). Male-female wage differentials in urban labour markets. *International Economic Review 14*(3), 693–709.

Orser, B. and S. Hogarth-Scott (2002). Opting for growth: Gender dimensions of choosing enterprise development. *Canadian Journal of Administrative Sciences 19*(3), 284–300.

Prügl, E. and I. Tinker (1997). Microentrepreneurs and homeworkers: convergent categories. *World Development 25*(9), 1471–1482.

Sabarwal, S. and K. Terrell (2008). Does gender matter for firm performance? evidence from eastern europe and central asia. *World Bank Policy Research Working Paper Series*.

Sethuraman, S. (1998). Gender, informality and poverty: Gender bias in female informal employment and incomes in developing countries. Technical report, The World Bank.

Treiman, D. and H. Hartmann (1981). *Women, Work and Wages: Equal Pay for Jobs of Equal Value*, Chapter Evidence Regarding Wage Differentials, pp. 13–42. National Academies Press.

Watson, J. (2001). Examining the impact on performance of demographic differences between male and female controlled smes. *Small Enterprise Research 9*(2), 55–70.

Watson, J. (2002). Comparing the performance of male-and female-controlled businesses: relating outputs to inputs. *Entrepreneurship: Theory and Practice 26*(3), 91–101.

Yun, M.-S. (2007). An extension of the oaxaca decomposition using generalized residuals. *Journal of Economic and Social Measurement 32*, 15–22.

Figure 1: *Distribution of Log GVA for male (red) and female (blue) operated firms.*

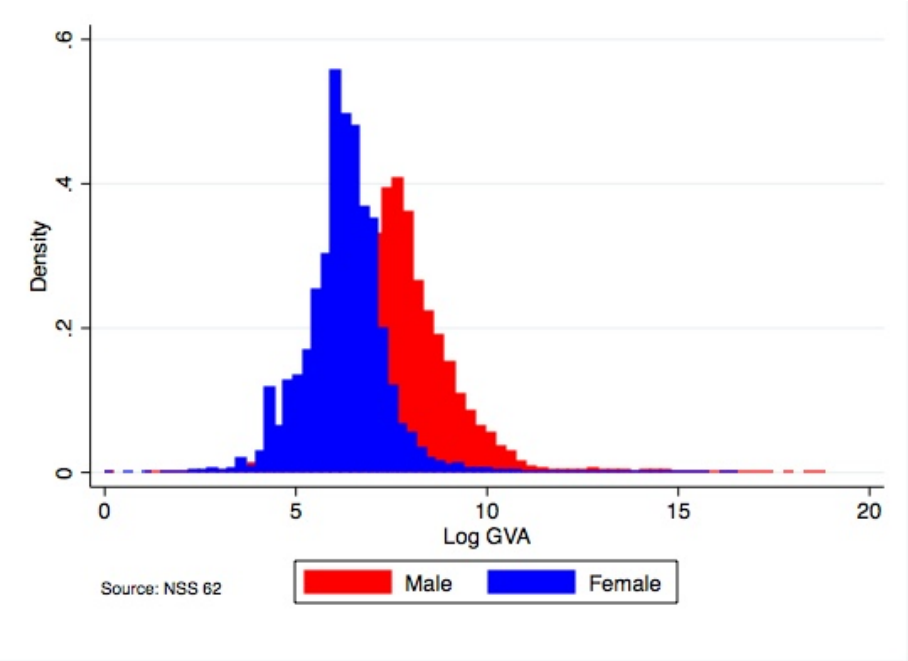

Figure 2: *Distribution of Log Assets for male (red) and female (blue) operated firms.*

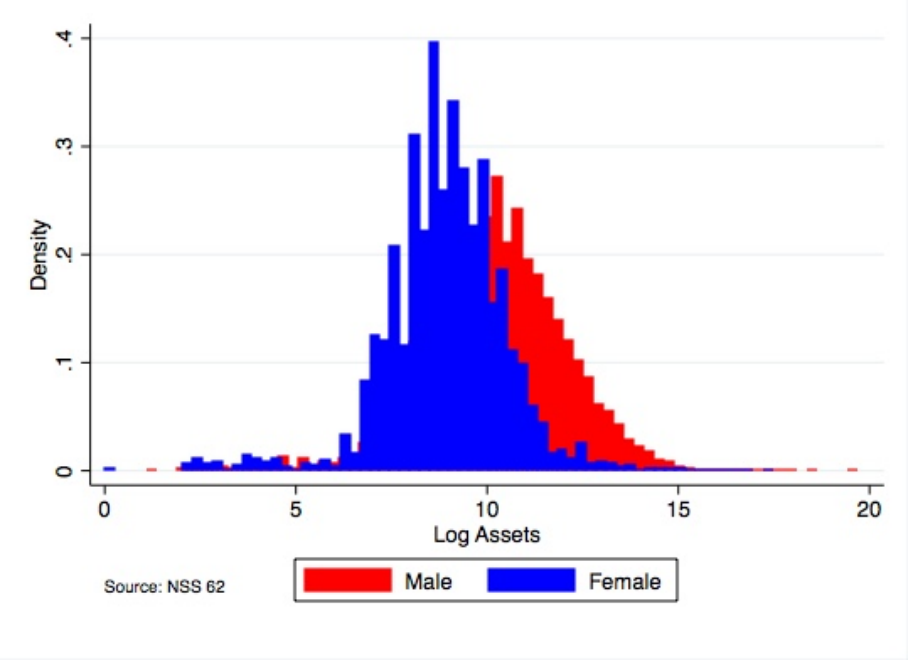

Figure 3: *Distribution of working hours for male (red) and female (blue) operated firms.*

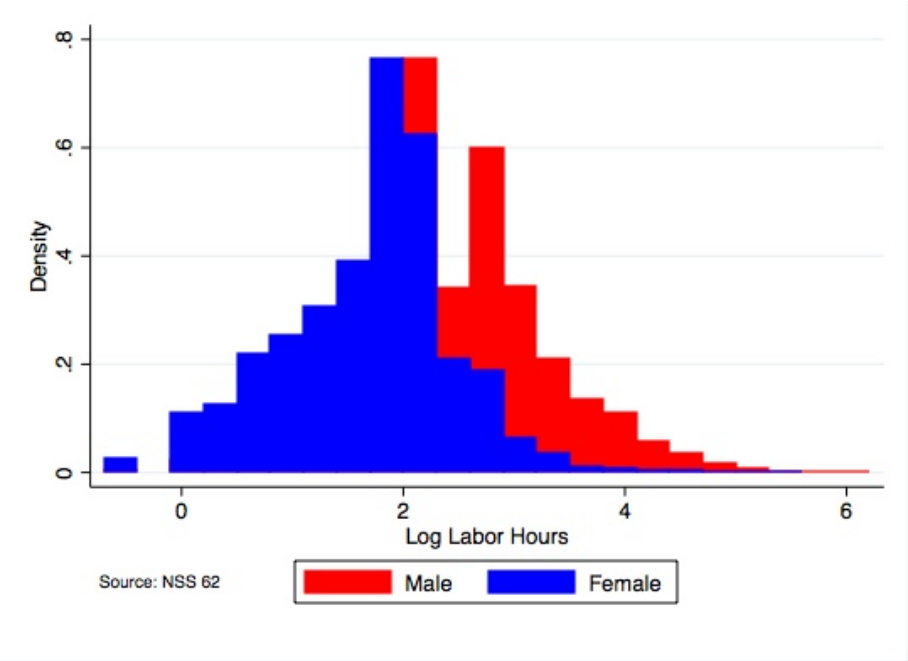

Figure 4: *Distribution of Male (left) and Female (right) owners across industries*

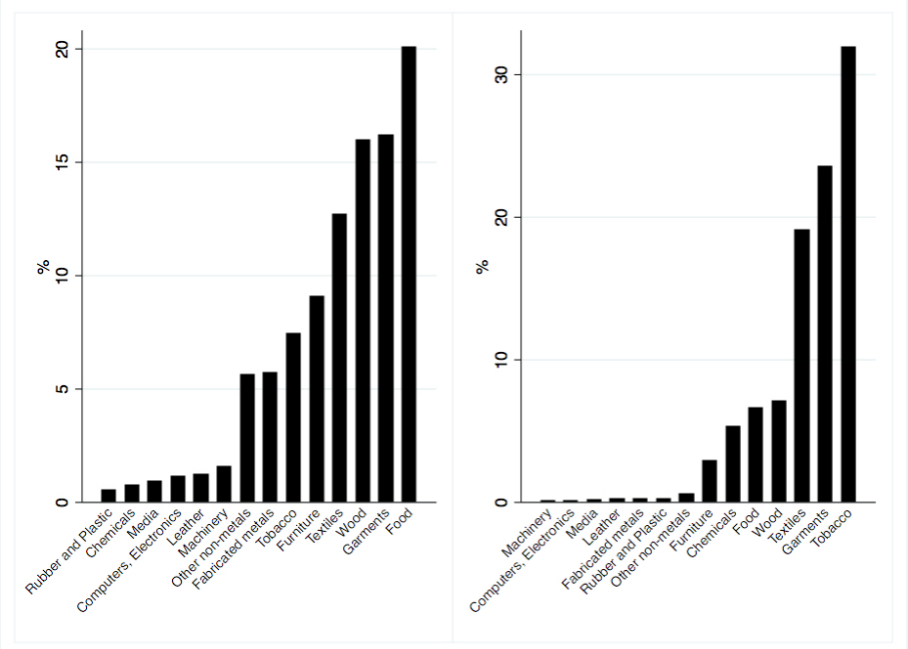

Figure 5: *Percent female owners in an industry versus GVA of male-owned firms*

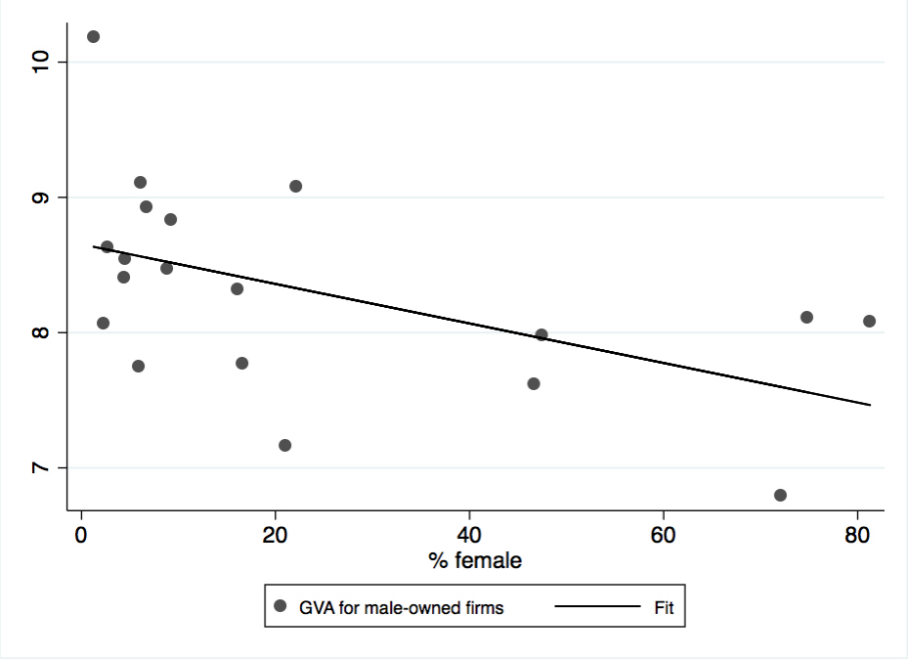

Figure 6: *Marginal Effect - State and Gender*

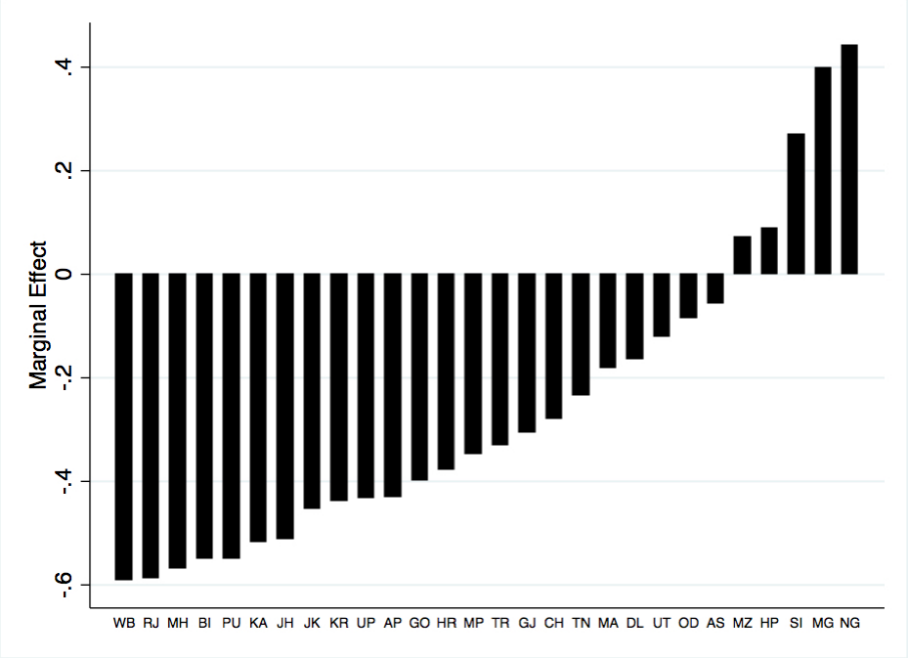

Figure 7: *Spatial Variation in State Marginal Effect*

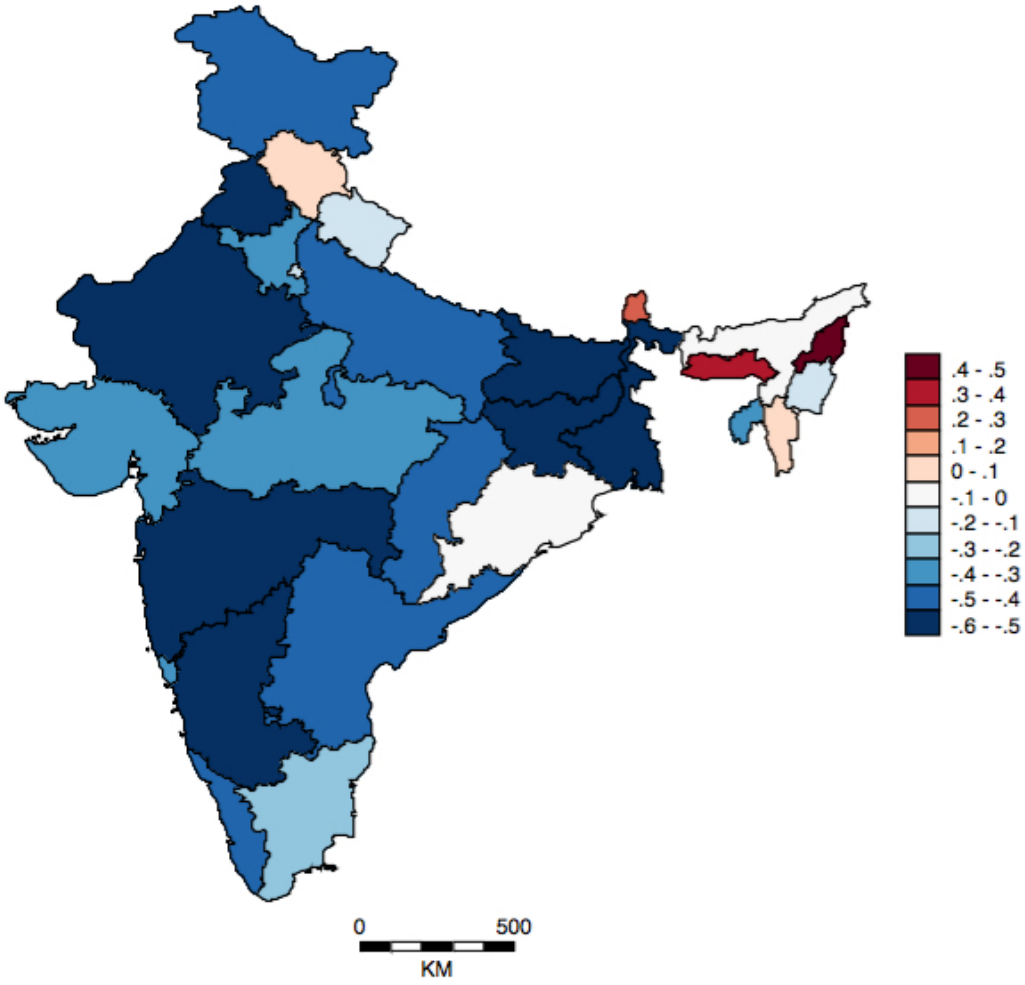

Figure 8: *State Marginal Effect versus GDI-2006 and Literacy Gap*

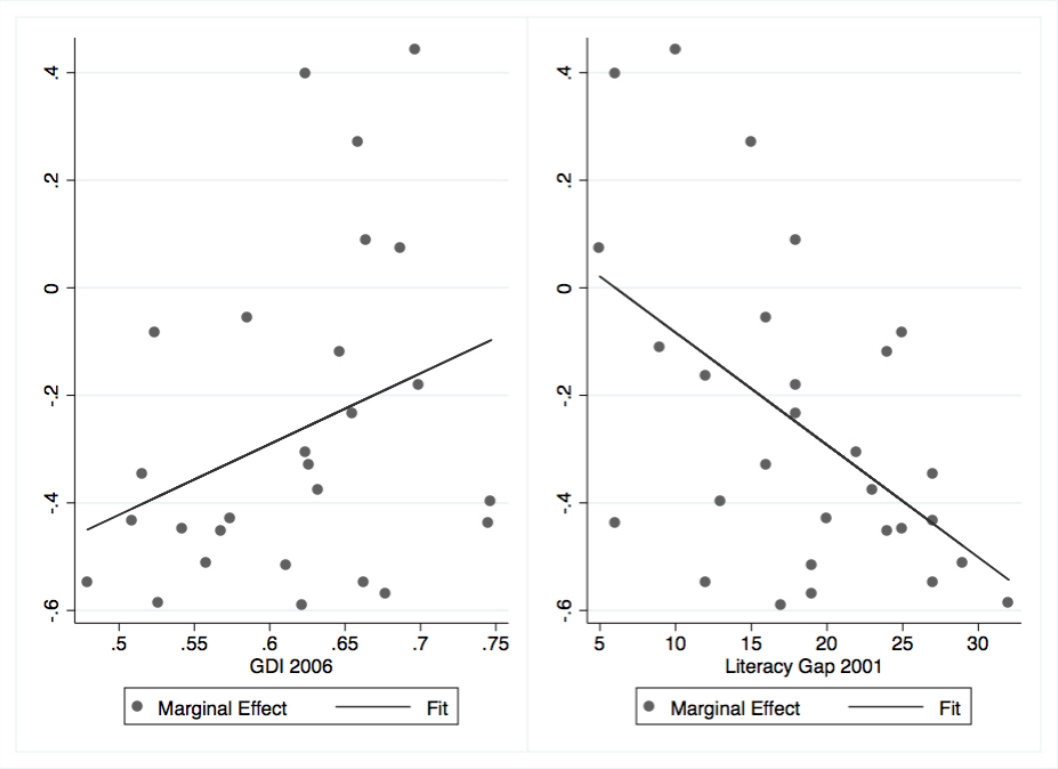

Table 1: *Descriptive Statistics for Full Sample (2005)*[a]

	ALL FIRMS			MALE			FEMALE		
	Mean	Stdev	Median	Mean	Stdev	Median	Mean	Stdev	Median
Log GVA	7.19	1.39	7.12	7.73	1.30	7.65	6.28	1.01	6.31
Log Assets	9.70	1.80	9.65	10.17	1.78	10.19	8.92	1.53	8.99
Log Labor Hours	2.21	0.89	2.08	2.51	0.83	2.48	1.70	0.75	1.79
Home-based	0.73	0.44	1.00	0.61	0.49	1.00	0.94	0.24	1.00
Urban	0.29	0.45	0.00	0.30	0.46	0.00	0.27	0.44	0.00
Paid/Unpaid	0.09	0.22	0.00	0.13	0.26	0.00	0.02	0.11	0.00
Paid Workers	0.14	0.35	0.00	0.21	0.41	0.00	0.03	0.16	0.00
No schooling	0.25	0.43	0.00	0.20	0.40	0.00	0.33	0.47	0.00
Up to primary	0.37	0.48	0.00	0.37	0.48	0.00	0.37	0.48	0.00
Up to secondary	0.32	0.47	0.00	0.35	0.48	0.00	0.26	0.44	0.00
Above secondary	0.06	0.24	0.00	0.08	0.27	0.00	0.04	0.19	0.00
Observations	81333			61774			19559		

[a] Data are from Round 62 of the NSSO (2005). All estimates in this table have been computed by using sampling weights.

Table 2: *OLS Results for Gender Dummy and Stratification by Gender: Full Sample*[a]

	Pooled	**Interaction**	
	Female Dummy	Male	Female
Female	-0.4593***	–	–
	(0.0775)		
Log Assets	0.1597***	0.1585***	-0.0264
	(0.0133)	(0.0163)	(0.0216)
Log Labor Hours	0.5843***	0.5812***	0.0114
	(0.0277)	(0.0301)	(.0381735)
Home-based	-0.2818***	-0.2451***	-0.0797
	(0.0317)	(0.0304)	(0.0601)
Urban	0.0756**	0.1515***	-0.1693***
	(0.0269)	(0.0285)	(0.0400)
Paid-Unpaid Ratio	1.0499***	0.9688***	0.4337**
	(0.0814)	(0.0801)	(0.1924)
Primary School	0.0605	0.1696***	-0.2129**
	(0.0516)	(0.0362)	(0.0926)
Secondary School	0.1451***	0.2137***	-0.1560**
	(0.0359)	(0.0334)	(0.0769)
College	0.2880***	0.3973***	-0.3250***
	(0.0459)	(0.0424)	(0.0971)
State Dummies	Y	Y	Y
Industry Dummies	Y	Y	Y

[a] The sample size for the estimation is 81333. Sampling weights have been applied for estimation, which implies a population of about 17 million firms. Standard errors, clustered by state and industry, are given in parentheses below parameter estimates. Significance levels: * p<0.1, ** p<0.05, *** p<0.01.

Table 3: *Oaxaca-Blinder Decomposition: Full Sample*[a]

	Male Owner	**Female Owner**	**Gap**
GVA predicted	7.6880	6.3688	1.3193
GVA observed	7.7302	6.2840	1.4462
		Decomposition	
	Endowments	**Returns**	**Interaction**
All Covariates	0.9875***	0.2415**	0.0902
Assets	0.1672***	0.2196	0.0312
Labor hours	0.4728***	-0.0182	-0.0085
Home-based	0.0866***	-0.0413	0.0147
Paid ratio	0.1567***	-0.0072**	-0.048**
Urban	0.0014	0.0128	0.0014
Illiterate	-0.0086**	-0.0415***	0.0163***
Primary	0	0.0331	-0.0001
Secondary	0.0108	0.0087	0.0029
College	0.003	0.0117**	0.0139**

[a] Authors' calculation using data from Round 62 of the NSSO.

Table 4: *OLS Results for Gender Dummy and Stratification by Gender: No paid workers*[a]

	Pooled	**Interaction**	
	Female Dummy	Male	Female
Female	-0.4997***	–	–
	(0.0837)		
Log Assets	0.1479***	0.1405***	-0.0159
	(0.0129)	(0.0171)	(0.0210)
Log Labor Hours	0.5590***	0.5430***	0.0357
	(0.0295)	(0.0361)	(0.0416)
Home-based	-0.3278***	-0.2926***	-0.0006
	(0.0347)	(0.0323)	(0.0702)
Urban	0.0759**	0.1773***	-0.1920***
	(0.0306)	(0.0344)	(0.0447)
Primary School	0.0611	0.1877***	-0.2404***
	(0.0525)	(0.0359)	(0.0906)
Secondary School	0.1517***	0.2343***	-0.1905**
	(0.0367)	(0.0370)	(0.0783)
College	0.1774***	0.3080***	-0.3235***
	(0.0458)	(0.0423)	(0.0958)
State Dummies	Y	Y	Y
Industry Dummies	Y	Y	Y

[a] The sample size for the estimation is 53,624. Sampling weights have been applied, which implies a population of about 14.6 million firms. Standard errors, clustered by state and industry, are given in parentheses below parameter estimates. Significance levels: * p<0.1, ** p<0.05, *** p<0.01.

Table 5: *OLS Results for Gender Dummy and Stratification by Gender: Paid workers*[a]

	Pooled	**Interaction**	
	Female Dummy	Male	Female
Female	-0.1318**	–	–
	(0.0484)		
Log Assets	0.2266***	0.2251***	-0.0379
	(0.0252)	(0.0280)	(0.0432)
Log Labor Hours	0.7881***	0.7685***	0.2027**
	(0.0290)	(0.0307)	(0.0804)
Home-based	-0.0317	-0.0103	-0.1014
	(0.0418)	(0.0437)	(0.1472)
Urban	0.0711**	0.0808**	-0.0648
	(0.0350)	(0.0349)	(0.0772)
Paid-Unpaid Ratio	0.7976***	0.8843***	-0.4900*
	(0.1229)	(.0.1300)	(0.2965)
Primary School	0.0318	-0.0310	0.4387**
	(0.0631)	(0.0538)	(0.1726)
Secondary School	0.0880	0.0274	0.3680**
	(0.0546)	(0.0445)	(0.1783)
College	0.3122***	0.2448***	0.4577**
	(0.0573)	(0.0503)	(0.1999)
State Dummies	Y	Y	Y
Industry Dummies	Y	Y	Y

[a] The sample size for the estimation is 25,807. Sampling weights have been applied, which implies a population of about 2.4 million firms. Standard errors, clustered by state and industry, are given in parentheses below parameter estimates. Significance levels: * p<0.1, ** p<0.05, *** p<0.01.

Table 6: *Oaxaca-Blinder Decomposition: Firm Type*[a]

	No Paid Workers	**Paid Workers**
Observed Gap	1.099	0.5568
Predicted Gap	0.9649	0.6514
Endowments	0.5742***	0.5791***
Returns	0.2670**	0.2412***
Interaction	0.1236	-0.1688**

[a] Authors' calculation using data from Round 62 of the NSSO.