EXPLORING BARRIERS TO SCALE FOR WOMEN ENTREPRENEURS IN INDIA

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Executive Summary

India continues to lag behind its counterparts across several measures of gender equality, specifically in terms of economic outcomes. In an economy characterized by informality and labor market frictions, entrepreneurship has received much attention as an alternative route to not just greater equality, but also growth. However, much of the existing literature focuses on the issue of creating new business. While the issue of entry is important, the question of scale remains less explored. This is striking because data shows that women perform worse than male entrepreneurs across various firm performance measures including profitability and asset ownership.

In this paper, we provide suggestive evidence that informal women entrepreneurs face additional barriers to scale as compared to their male counterparts. Further, we demonstrate that differences in industry choice or firm location cannot alone explain these differences. First, we model the decisions that entrepreneurs face at the point of entry and scale. Next, we evaluate demand-side, supply-side and institutional constraints to identify specific barriers to scale that women entrepreneurs might face. We use a combination of evidence from the literature, quantitative analysis (using nationally representative enterprise-level data on unorganized firms) and qualitative interviews to inform our diagnostics. From this analysis, we find three factors that might explain the differential barriers to scale women entrepreneurs face – i) absence of market linkages, ii) lack of information and iii) lack of access to social networks. Not only are these mechanisms interlinked to one another, but in fact, are deeply affected by underlying social norms.

Based on these diagnostics we evaluate a variety of policy recommendations on technical, political and administrative dimensions, before narrowing down to two recommended policies. First, we propose group-based entrepreneurship activities - specifically, marketing cooperatives - to create economies of scale, leverage collective bargaining, enable easier access to markets, and also reinforce stronger networks. Second, we propose mobile phone-based information campaigns to inform women entrepreneurs about the resources available to them, while fostering a sense of community that might influence both networks and norms. A caveat to keep in mind is that not all entrepreneurs can, or are willing to, scale their business. Further, policymakers must assess tradeoffs in terms of stakeholder coordination, costs, time and resources while making implementation decisions. To this end, we propose different interventions for each policy solution that vary from low-touch to increasingly intensive, giving the government the opportunity to test, develop, and iterate on its policy design and implementation plans before scaling up.

Introduction

Recent data on the World Economic Forum's Global Gender Gap Report, measuring gaps across health, education, economic activity and political participation, ranked India 108 out of 144 countries. Particularly worrying is that India's rank fell to 139 out of 144 countries on economic participation.[1] Given the alarmingly low female employment rates, entrepreneurship has received considerable attention as another means of bridging the gender gaps in economic activity. In fact, **research shows that gender gaps in entrepreneurship in India are directly correlated with losses in economic productivity**, with long-run income losses estimated at over 10 percent.[2]

Policy initiatives in India are concentrated in facilitating the entry of female entrepreneurs, given the presence of microfinance organizations and livelihood promotion initiatives. Current policy assumes these enterprises will organically scale up. However, this is not the case – women-owned firms remain smaller, less profitable than their male counterparts. Evidence indicates that gaps in scale have consequences for labor force participation as well. In India, **while fewer women-owned firms hire workers, when they do, they hire more employees than male-owned firms and are more likely to use computers and manage accounts**.[3] Research also shows that the gender of the firm owner is strongly correlated with the gender of that firm's employees providing further evidence that female entrepreneurship can lead to economic gains.[4] We then ask the question, do females face additional barriers to scale and if yes, how can policy address them?

In the Indian context, an important caveat to keep in mind is that not all women entrepreneurs might want to scale up. Borrowing from Schoar's language, we classify subsistence entrepreneurs as those that operate micro-enterprises and do not have a willingness to expand beyond providing employment to themselves or their immediate family.[5] In contrast to this, transformational entrepreneurs are those that exhibit a willingness to scale, and acts as drivers of economic growth

[1] World Economic Forum. "The Global Gender Gap Report." World Economic Forum, 2017.
[2] Cuberes, D., and M. Teignier. *Gender Gaps in the Labor Market and Aggregate Productivity*. Department of Economics, University of Sheffield, 2012. http://eprints.whiterose.ac.uk/74398/1/serps_2012017.pdf. This paper uses an occupational choice model to quantify the resource misallocation from gender discrimination in the labor force and quantifies the cost of this misallocation to total economic productivity for each country.
[3] Daymard, Arnaud. "Determinants of Female Entrepreneurship in India." *OECD Economic Department Working Papers*, no. 1191 (2015): 0_1–38. https://doi.org/10.1787/5js4rfh5qtbq-en.
[4] Ghani, Ejaz. *Will Market Competition Trump Gender Discrimination in India?* Policy Research Working Paper 7814. Washington, D.C.: World Bank Group, Macroeconomics and Fiscal Management Global Practice Group, 2016.
[5] Credit for focusing the SYPA on this idea goes to Mr. Adarsh Kumar at the World Bank South Asia office with whom the author conducted an expert interview.

by contributing to productivity and employment.[6] When considering the issue of scale, we must keep in mind that identifying female entrepreneurs with high-growth potential is critical. With this in mind, we attempt to look beyond simply differences in rates of entrepreneurship among male and female business owners (i.e., the extensive margin), but instead, focus on **examining and addressing differences in scale and a wider range of firm performance measures** (i.e., the intensive margin). This paper will proceed as follows:

- First, we document gender gaps among existing enterprises. Next, we provide suggestive evidence that women business owners face higher barriers to scale.
- Then, we outline a model to analyze the problem, following which we diagnose potential barriers to scale in light of this framework.
- Lastly, we propose policy solutions and recommend multiple pathways for implementation.

Problem Motivation

We restrict our analysis to informal entrepreneurship. While there might be several barriers to scale that are common across formal and informal enterprises, we acknowledge that there are likely additional barriers to making the jump between formal and informal entrepreneurship.[7] Further, the argument could be made that in the long-term, there might be greater welfare gains from a subset of the entrepreneurs in the informal sector finding wage employment (those that are forced into subsistence business due to lack of job opportunities).[8] While we acknowledge these issues, they are outside the scope of this paper. Given that over 95 percent of entrepreneurship in India is concentrated in the informal sector, with millions of female entrepreneurs actively operating in this sector, we focus on identifying and diagnosing barriers to scale which are important to these enterprises, at least in the short and medium term.[9]

Data

Quantitative Data

To identify the scope of the problem, we first analyze data using a nationally representative sample of informal enterprises in both the manufacturing and services sector collected by the government.

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[6] Schoar, Antoinette. "The Divide between Subsistence and Transformational Entrepreneurship." *Innovation Policy and the Economy* 10, no. 1 (2010): 57–81. https://doi.org/10.1086/605853.

[7] de Mel, Suresh, David McKenzie, and Christopher Woodruff. 2013. "The Demand for, and Consequences of, Formalization among Informal Firms in Sri Lanka." *American Economic Journal: Applied Economics*, 5(2): 122-50.

[8] Lofstrom, Magnus. "Does Self-Employment Increase the Economic Well-Being of Low-Skilled Workers?" *IDEAS Working Paper Series from REPEC*, 2009.

[9] Daymard, Arnaud. "Determinants of Female Entrepreneurship in India." *OECD Economic Department Working Papers*, no. 1191 (2015): 0_1–38. https://doi.org/10.1787/5js4rfh5qtbq-en.

We consider data from the 62nd round for manufacturing (2005-2006) and 63rd round for service enterprises (2006-07) which provides information on enterprise characteristics, firm performance and importantly, owner characteristics (gender, education).[10] While these datasets date back a few years, they currently provide the most nationally representative dataset with owner and enterprise characteristics. Consistent with the literature, informal manufacturing firms are defined as those having less than 20 workers while informal service firms are identified as those with 5 or less workers.[11] To identify clear trends in ownership by gender, we restrict the sample to only proprietarily owned firms, which represent over 90 percent of all firms. With this definition, our data includes a sample of 77,530 manufacturing firms that represent 16.6 million firms, after applying the appropriate weights. Similarly, our dataset on service enterprises includes a sample of 165,493 firms which represent 14.3 million firms.

Qualitative Research

Focus Groups

In addition to quantitative analysis, we also conducted focus groups and in-depth qualitative interviews with female entrepreneurs in January 2018. Focus groups were conducted with roughly 30 entrepreneurs across multiple states in India, and carried out in-depth interviews with a subset of 7 of these entrepreneurs. The questions were designed to not just understand the practical constraints of operating a business, but also examine the motivations, goals and struggles of these entrepreneurs (see Appendix 7 for a detailed questionnaire).

Expert Interviews

In addition to qualitative interviews, we conducted expert interviews with officials at the World Bank, Mann Deshi Foundation and WEConnect International. The purpose was to better understand the policy space in India around female entrepreneurship and gain insight from implementers that work directly with entrepreneurs on the ground.

Snapshot of entrepreneurship

Among manufacturing enterprises, we see that 73 percent of firms are home-based and on average, hire about 0.4 workers and report annual gross value-added (revenues – expenses) of 10.5 lakh rupees (roughly 17,500 USD). Of service firms, roughly 30 percent are home-based, and on

[10] National Sample Survey Office (NSSO), Ministry of Statistics and Programme Implementation.
[11] Ghani, Ejaz, William Kerr, and Stephen O'Connell. "Local Industrial Structures and Female Entrepreneurship in India." *Journal of Economic Geography* 13 (May 2013): 929–64. https://doi.org/10.1093/jeg/lbt004.

average, these firms hire 0.2 workers and report annual gross value-amounting to roughly 5 lakh rupees, equivalent to 8000 USD (see Appendix 1 & 2 for details).

Gender gaps exist on the entry margin, but seem to be reducing

Along the entry margin, female entrepreneurship rates continue to lag

We observe clear differences in the rates of entrepreneurship by gender. In absolute numbers, there are more female entrepreneurs concentrated in the services sector. However, 40 percent of all informal manufacturing firms are owned by women. In contrast, only 9 percent of service enterprises are owned by women (See Appendix 1 & 2 for details)

However, women seem to be catching up, especially in the manufacturing sector

Figure 1 shows that in the last three years, the growth of new female manufacturing enterprises has kept pace with male enterprise growth. Unfortunately, this data is not available for service enterprises. This is consistent with the emphasis we have observed on self-employment opportunities among low-income women, which we discuss in detail later.

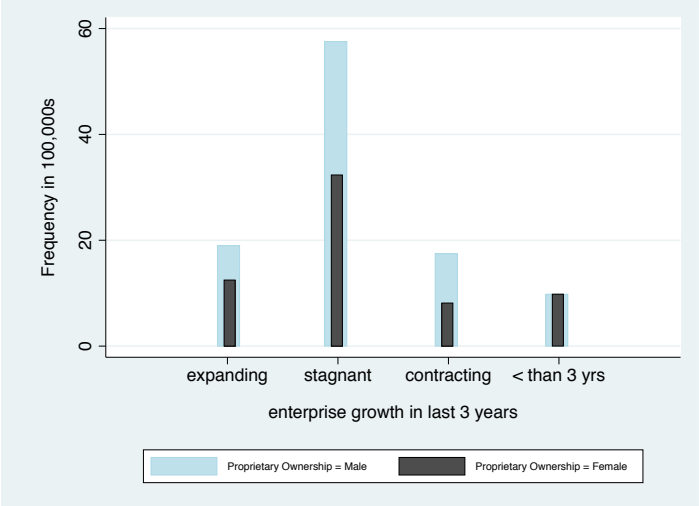


Figure 1. Enterprise Growth in Manufacturing Enterprises in Last Three Years

Conditional on entry, large growth and performance gaps persist

Most new entrants in female entrepreneurship are self-employed

We see that 94 percent of women-owned manufacturing enterprises are home-based, as compared to 60 percent of male-owned enterprises. Similarly, for service enterprises, 57 percent of women-owned enterprises are home-based as compared to 26 percent of male-owned enterprises. Among new entrants (less than 3 years old) in the manufacturing sector (see Figure 1), we see that of the

male-owned new entrants, 32 percent are firms with hired workers. Contrasting this to the female-owned new entrants, a dismal 3 percent of firms have hired workers – clearly the share of self-employed women is driving this catch-up. This is further corroborated in the literature which shows that the female-owned business without hired workers grew from 29 percent in 2001 to 43 percent in 2005, while the percentage of women-owned enterprises with workers has stagnated.[12]

Females lag behind male-owned firms on a variety of firm performance measures

First, we demonstrate differences in firm performance by gender of owner across business metrics including Gross Value Added and Asset Ownership in Figures 2 and 3. From the skewed distributions in the graphs below, it is evident that large performance gaps exist.

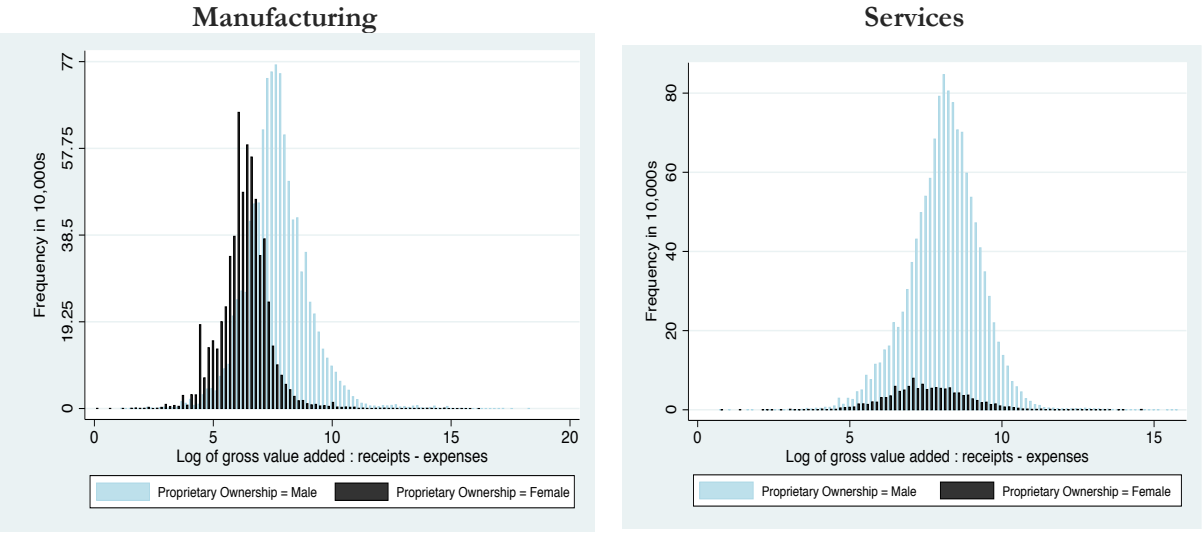


Figure 2. Gross Value Added by Industry and Owner Gender

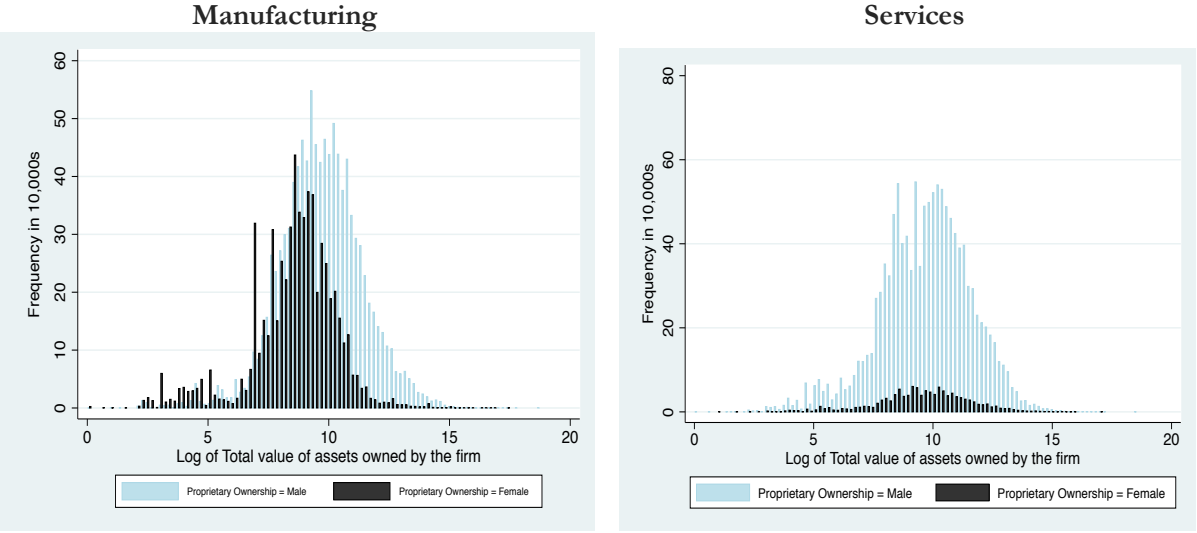


Figure 3. Asset Ownership by Industry and Owner Gender

[12] Daymard, Arnaud. "Determinants of Female Entrepreneurship in India." *OECD Economic Department Working Papers*, no. 1191 (2015): 0_1–38. https://doi.org/10.1787/5js4rfh5qtbq-en.

Thus, despite increases in absolute numbers, scale remains an important factor in the gender gaps in entrepreneurship, particularly in terms of profitability. Next, we show differences in the number of employees for both sectors.

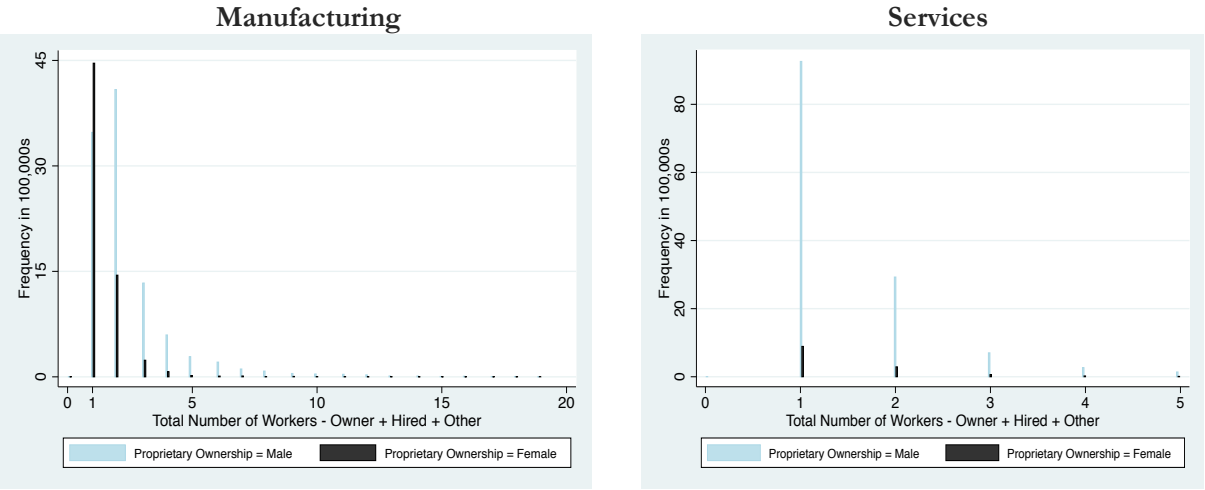


Figure 4. Number of Workers by Industry and Owner Gender

From the graph, we see a huge spike in single-worker firms with a declining trend as number of employees increase. We can infer that much of this spike is driven by self-women. This might be indicative that in addition to making the decision to start a business, an entrepreneur likely faces additional fixed costs when making the decision to hire workers.

Industry or geographical choices alone do not explain these differences

The argument could be made that women-owned business might be located in less accessible regions or operate in less productive industries.

TABLE 1a: Differences in Firm Performance by Owner Gender for Manufacturing Firms

	All Firms		Self-employed firms		Firms with hired workers	
	Gross Value Added	Asset	Gross Value Added	Asset	Gross Value Added	Asset
Owned by Female	-0.918***	-0.409***	-0.749***	-0.336***	-0.184**	0.232**
	(0.0281)	(0.0392)	(0.0277)	(0.0406)	(0.0782)	(0.0977)
Industry-District Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	77,049	77,067	53,545	53,683	23,504	23,384
R-squared	0.776	0.720	0.741	0.715	0.752	0.718

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 1b. Differences in Firm Performance by Owner Gender for Services Firms

	All Firms		Self-employed firms		Firms with hired workers	
	Gross Value Added	Asset	Gross Value Added	Asset	Gross Value Added	Asset
Owned by Female	-0.299***	0.0373	-0.312***	0.0305	-0.0586*	0.148**
	(0.0173)	(0.0268)	(0.0179)	(0.0293)	(0.0323)	(0.0579)
Industry-District Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	164,332	157,623	134,781	127,485	30,379	30,138
R-squared	0.430	0.387	0.420	0.359	0.549	0.447

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

However, the data shows that female entrepreneurs perform worse than their male counterparts even after controlling for industry and district variation (see Table 1).[13] We see that while women owned firms perform worse than male-owned firms on profitability measures, the gaps are lower for firms that hire workers as compared to the self-employed firms. From these tables, we can see that differences in female-owned firm performance are not a function of industry or location choice alone. However, economists might still argue that this is not evidence of differential barriers – this gap in performance might still be the most efficient outcome.[14] It might simply be the case that women are worse entrepreneurs than men. To answer this question, we must explore if women face differential barriers than men while engaging in entrepreneurship.

Suggestive evidence of differential barriers to scale

To examine whether women face higher barriers to entrepreneurship, ideally, we would explore differences in marginal product between male and female-owned firms. In the absence of firm distortions, we would expect marginal product to be equal across firms. If marginal products were not equalized, we could potentially allocate capital from low-productivity firms to high-productivity firms, which eventually leads to convergence. Hsieh and Klenow use total firm revenue productivity (TFPR) to measure these distortions which they prove are proportional to marginal products of labor and capital.[15,] Unfortunately, our data does not provide robust measures

[13] The detailed version of this table will be presented in Appendix Table 3. This includes regressions with and without fixed effects.

[14] De Mel et al. "Are Women More Credit Constrained? Experimental Evidence on Gender and Microenterprise Returns." *American Economic Journal: Applied Economics* 1, no. 3 (2009): 1–32.

[15] TFPR is measured using a Cobb Douglas Production Function as $(PY/K^{\propto}L^{1-\propto})$, where PY represents aggregate revenue, K is capital, L is labor and $\propto$ represents capital's share of revenue.

of capital for the entire sample of firms. Therefore, as a proxy for TFPR we use a per-worker measure of gross value added (i.e. gross value added divided by total number of workers). Consistent with Hsieh and Klenow, we would expect this per-worker gross value-added measure to equalize across male and female-owned firms after controlling for differences in industry and geography.[16] Below, we plot the distribution of per-worker gross value added for male and female-owned firms in both the manufacturing and service sectors.

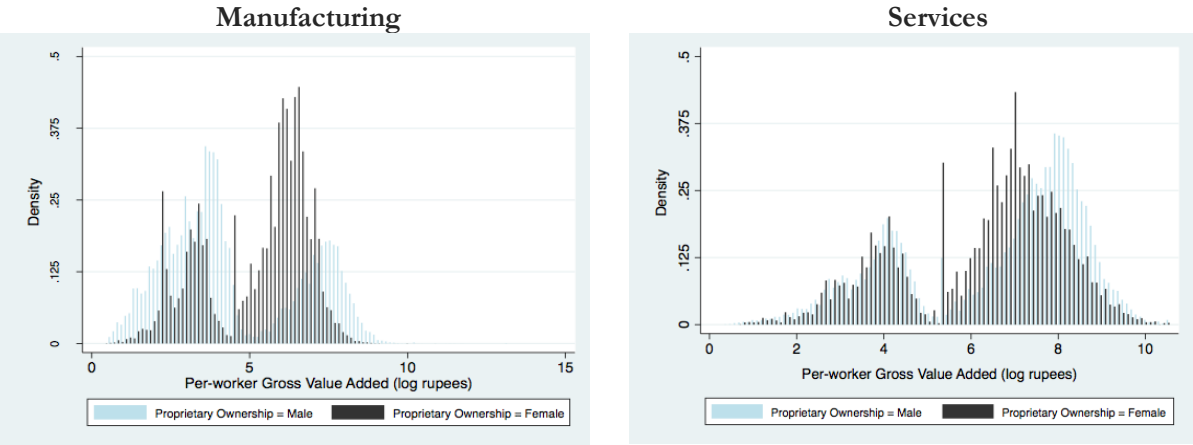


Figure 5. Differences in per-worker gross value added

We see that the distributions for female firms are skewed to the higher end. For instance, while the median per-worker gross-value added for female-owned manufacturing firms is 5.8 log rupees, the figure is only 3.9 log rupees for male-owned firms (See Appendix 4 & 6, note the positive coefficient on female ownership). From this data, we provide suggestive evidence **that women entrepreneurs face higher barriers to scale than male entrepreneurs in both informal manufacturing and service sectors.** Before we delve into the diagnosing why these barriers to scale exist, we first provide some institutional context in the next section.

Institutional Context

Stakeholder Mapping [17]

To understand the policy environment within which we are operating, we first map the key actors and interactions that inhabit the ecosystem targeting women entrepreneurs.[18] As can be seen from the figure below, this is a complex space with multiple actors engaged in overlapping initiatives.

[16] Hsieh, Chang-Tai. "Misallocation and Manufacturing TFP in China and India." *The Quarterly Journal of Economics* 124, no. 4 (2009): 1403–1448. https://doi.org/10.1162/qjec.2009.124.4.1403.

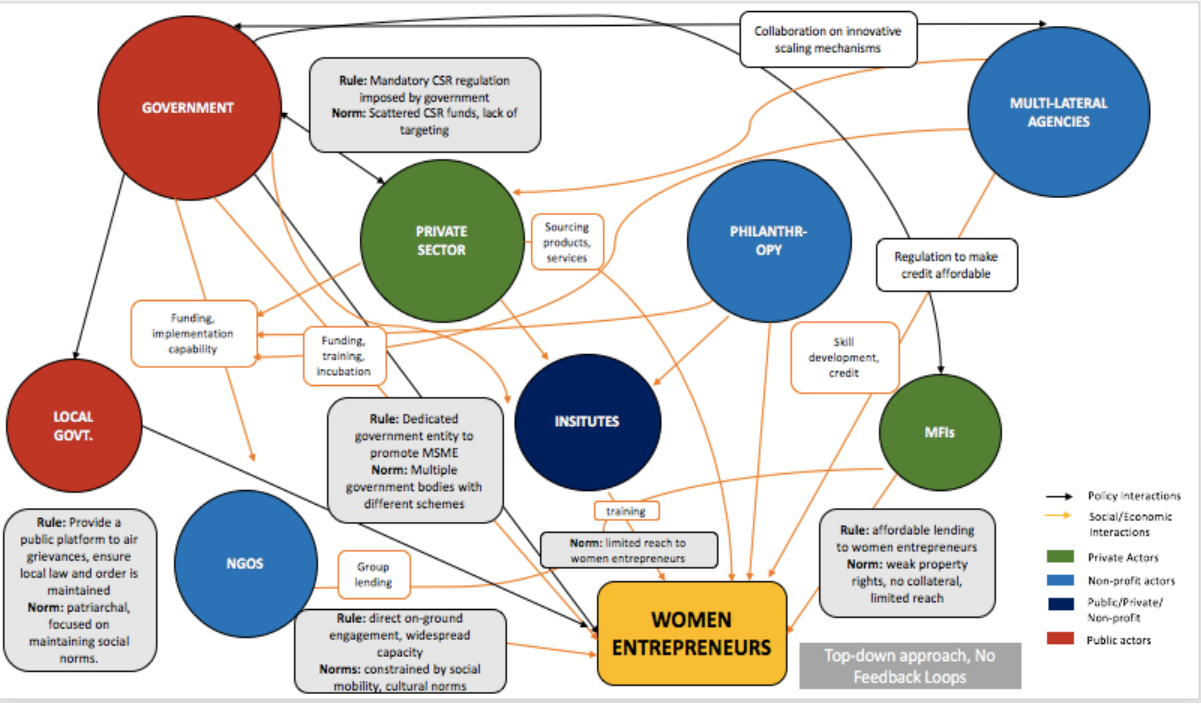
[17] In addition to expert interviews at the World Bank, Mann Deshi Foundation and WEConnect International, the content of the stakeholder mapping also relies on a preliminary, informal IMAGO document prepared by Namrata Saraogi and Shreya Pandey on 'Enterprise Development in Rural India'.

[18] Ostrom, Elinor Ostrom. *Understanding Institutional Diversity*. Princeton Paperbacks. Princeton: Princeton University Press, 2005, Chapter 2. This framework of institutional mapping is adapted from material used in Ryan Sheely's 'Institutions and Development' Class at Harvard Kennedy School.

The **key actors** we identify include:

- Public actors (highlighted in red)
  - Government: This subsumes both national and state government actors and include a variety of entities including relevant ministries of MSME, development banks including the Small Industries Development Bank of India (SIDBI), councils of industries, as well as our client, the Ministry of MSME (at the national level)
  - Local governance institutions (formal and informal): Local political supportability will be critical to implementation. Often, these are the purview of local community organizations, particularly informal village councils in rural areas.
- Private actors (highlighted in green)
  - Private sector: The private sector directly or indirectly engages with informal female entrepreneurs, be it through corporate social responsibility (CSR) initiatives for large corporates like the TATA group, Mahindra, etc., lending through private banks, incubation and financial support through social entrepreneurship or direct for-profit relations.
  - Microfinance Institutions (MFIs): MFIs directly provide credit to low-income women entrepreneurs, with a specific mandate for financial inclusion

Figure 6. Institutional Mapping of Actors, Interactions and Institutions



- Not-for-profit actors (highlighted in blue)
  - Multilateral agencies: often provide support in the form of funding towards credit provision or training programs with active involvement from the World Bank, UNDP, etc.

- Philanthropy: Several philanthropy groups support programs for women entrepreneurs, be it Dasra or the Swades Foundation – however, influence varies by mandate and funding.

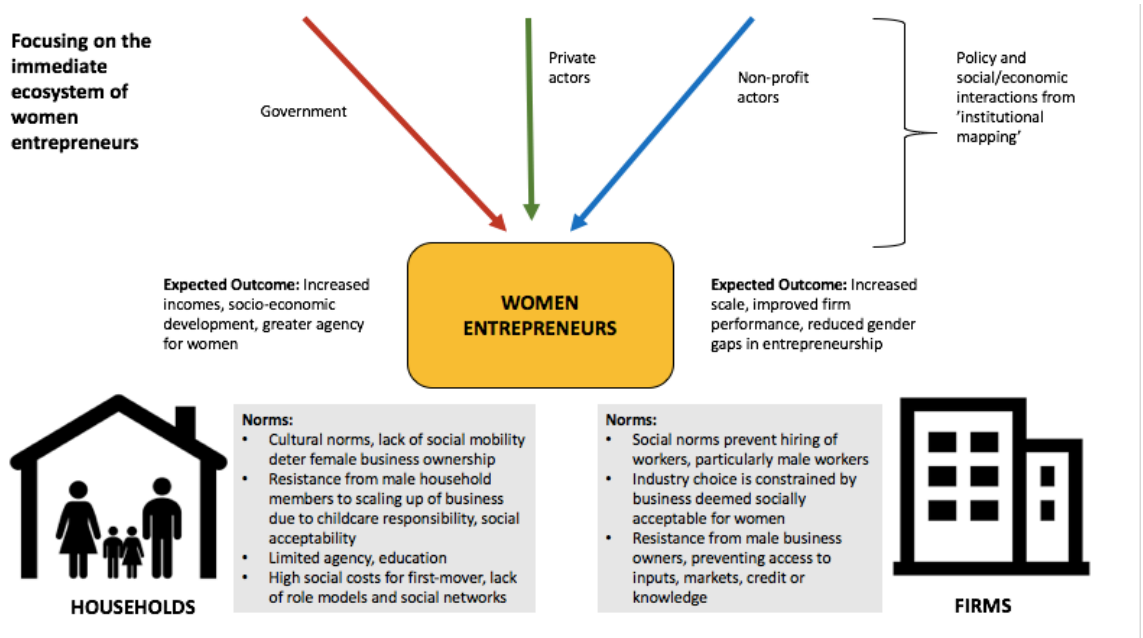
➢ NGOs: are probably the pivotal implementation actor, with extensive on-ground presence. However, they remain constrained by funding and relationships with the government.

➢ Lastly, we have the institutes (in indigo) which could be private, public or not-for-profit that provide direct training or indirect support through incubation, mentorship, etc.

Interactions: Social and economic interactions are highlighted in orange. From Figure 6, we can see that there are multiple initiatives across multiple stakeholders, typically focused on credit and business training initiatives that **treat the female entrepreneur as a beneficiary of the interventions**. This is clearly evident in the direction of the arrows, particularly through the **absence of any feedback loops** from women entrepreneurs. We provide an overview of the major government programs in the next section (see 'Review of Status Quo).

Administrative institutions: The boxes in grey highlight the administrative institutions shaping implementation, framed as the rule (what is expected to be done) and the norm (what actually occurs).[19] For instance, NGOs, despite extensive resources and experience remain constrained by norms on social mobility of women. We delve further into how norms influence the immediate ecosystem of women entrepreneurs in Figure 7.

Figure 7. Ecosystem of Women Entrepreneurs



[19] Ibid

While scale might improve business performance, women might not be able to leave their homes due to limited social mobility which affects their agency (see Expected Outcome on household side). This limited social mobility might also affect the ability to hire more workers (see Expected Outcome on firm side). While improvements in scale of female entrepreneurship might lead to the 'Expected Outcomes' we remain cognizant of the fact that not only is the achievement of these constrained by social norms, but also, these social norms interact with the constraints as well.

The Status Quo

The policy landscape is filled with a plethora of programs scattered across ministries, each with different policy mandates. **Most of these programs offer some combination of credit and skill development.** Below we provide an overview of the major policies:

Table 2. Review of major government programs focused on credit/training

Scheme	Ministry	Overview
Pradhan Mantri Mudra Yojana (PMMY)	Ministry of Finance	Smaller loan amounts are insufficient to meet scaling up needs (focused on entry of self-employed). Larger loan amounts require business registration i.e. target formal firms. Under its credit provision scheme MUDRA, the government offers: i) Shishu, with loans upto INR 50,000 (roughly USD 800) which target self-employed individuals ii) Kishor, with loans size of between 800 – 8000 USD iii) Tarun with loan size ranging between 8000-15,000 USD. [20]
Trade Related Entrepreneurship Assistance and Development (TREAD)	Ministry of MSME	This scheme is targeted towards creating self-employment i.e. focused on entry margin and not on the self-employed women being able to hire workers or scale. This scheme offers grants to support credit as well as training through entrepreneurship development institutes[21]
National Rural Livelihoods Mission (NRLM)	Ministry of Rural Development	Designed to promote entry of new entrepreneurs into self-employment through self-help groups focused on training, market linkages with private companies, access to credit. [22]
Stand-up India Scheme	Ministry of Finance	Provides credit to first-time entrepreneurs only. Offers loans starting from 15,000 USD with the goal of providing credit to at least one woman per bank branch. [23] Not available to entrepreneurs for scaling existing business.

[20] Ministry of Micro, Small and Medium Enterprises, India. "MSME Schemes." Government of India, August 2015. http://www.msme.nic.in/WriteReadData/eBook/MSMESchemesNew.pdf.
[21] Ibid
[22] Ibid
[23] Ibid

As evidenced from the table above, policy initiatives relating to entrepreneurship target either i) the entry margin for informal entrepreneurs through microfinance organizations or self-help groups and ii) the formal MSME space. Thus, there is a 'missing middle' in the entrepreneurship policy space, particularly with regards to women. This is reminiscent of the 'valley of death' seen in the small business innovation cycle, with credit available in the initial research stage and the later commercialization stage, but often lacking in the middle.[24] Further, credit and training interventions alone are ineffective in addressing barriers to scale, as we discuss later.

The Ministry of MSME has also **adopted a cluster development strategy**, under what is called the Micro & Small Enterprises – Cluster Development Program (MSE-CDP). A cluster is defined as a group of enterprises in an area that share similarities in marketing, production and other challenges. The government then funds part of the cost of setting up the required infrastructure for group entrepreneurship, with larger grants allocated to women-dominated clusters. [25] The MSE-CDP has undergone multiple iterations and renaming over the years, with limited success. Beyond this flagship approach, over 205 cluster development schemes have been implemented, a majority of which cater to providing direct or indirect financial support to clusters.[26]

Further, **evaluations of this program have not shown tangible results** primarily due to implementation challenges. A review in 2009 by the government states that cluster development is essential to the growth of MSMEs but highlights a number of shortcomings including lack of intermediary agents connecting the ministry to the clusters as well as lack of data, monitoring and evaluation.[27] In another review in 2012, the Planning Commission highlighted lack of data and performance evaluation as well as professional representation from clusters as binding constraints to cluster development.[28] Again, this is indicative of a top-down approach which has been ineffective in helping entrepreneurs scale up, yet continues to persist over time. A small-scale survey of 154 MSME's across the country found that less than half of the entrepreneurs were even aware of these government programs.[29] This is consistent with findings from qualitative fieldwork.

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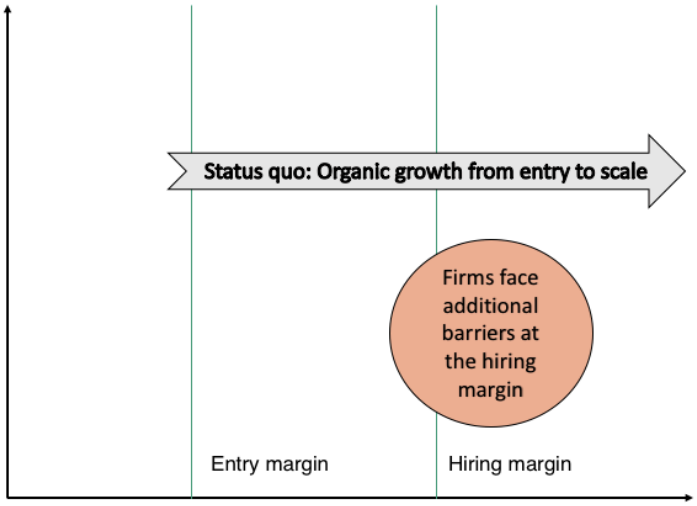
[24] Ford, George S., et al. *A Valley of Death in the Innovation Sequence: An Economic Investigation*. SSRN Scholarly Paper, ID 1093006, Social Science Research Network, 1 Sept. 2007. *papers.ssrn.com*, https://papers.ssrn.com/abstract=1093006.
[25] CDP. Ministry of MSME. http://www.dcmsme.gov.in/mse-cdprog.htm
[26] Foundation for MSME Clusters. *Financing Sustainable Production among MSME Clusters – Experiential Learnings and Policy Recommendations*. FMC, 2016, http://fmc.org.in/wp-content/uploads/2012/10/Policy-Paper-SCP-Scheme.pdf.
[27] Anil Chandy Ittyerah. *Evaluation Study of Micro & Small Enterprises Cluster Development Program*. Indian Institute of Public Administration, Jan. 2009, http://www.dcmsme.gov.in/schemes/evaluation_study(MSME)_cluster.pdf.
[28] Planning Commision. *Improving the Productivity & Competitiveness of Industrial Clusters : A Holistic Strategy for India*. Government of India, 2012, http://planningcommission.gov.in/reports/genrep/rep_tech2509.pdf.
[29] Foundation for MSME Clusters. *Financing Sustainable Production among MSME Clusters – Experiential Learnings and Policy Recommendations*. FMC, 2016, http://fmc.org.in/wp-content/uploads/2012/10/Policy-Paper-SCP-Scheme.pdf.

From the above policies, we can see that current policy initiatives assume that informal, subsistence firms will organically scale if support is provided at the entry margin and the business grows. However, we have already provided evidence that **the theory of change under the status quo breaks down** as seen in Figure 8. From our analysis, we see firms face differential barriers to scale at the hiring margin, i.e. the organic growth from entry to scale does not occur. Even more concerning is that these barriers are harder to scale for women entrepreneurs as seen in Figure 5 (or Appendix Table 4 & 6). Therefore, we need policy that specifically targets the hiring margin, helping women breach the differential barriers they face in scaling up. Next, we present a conceptual model to ground our policy analysis.

Figure 8. Theory of Change under Status Quo



Conceptual Framework

The Model

We adopt a simplified version of Banerjee and Newman's occupational choice model to frame the decision-making process for entrepreneurs.[30] Consider an unemployed individual - if the individual chooses to expend effort, she is faced with two options, namely, wage employment or entrepreneurship. Next, for those that choose entrepreneurship, they make the choice to either be "self-employed" or hire workers to run their business. Self-employment refers to the form of entrepreneurship in which the individual is the sole claimant of returns i.e. those firms who hire no workers. In Figure 4, we see a significant spike at number of employees for self-employed firms, indicating some discrete costs of scaling up beyond self- employment. In order to rationalize this empirical pattern, we incorporate not only the fixed cost of entering into entrepreneurship but also the additional cost of hiring workers. To simplify the model, we only consider proprietary enterprises. We also assume imperfect financial markets where agents must post collateral in order to borrow for business purposes. Given this context, we set up some parameters for the model:

[30] Banerjee, Abhijit Vinayak. "Occupational Choice and the Process of Development." *Journal of Political Economy* 101, no. 2 (1993): 274–298. https://doi.org/10.1086/261876.

- First, consider the costs of starting a business. The costs for setting up a business under self-employment is C_E (which we term "entry costs") and the additional cost for setting up a business that hires workers is C_H (which we term "hiring costs", incurred conditional on entry).
- Next, profit (π) of a firm is a function of individual and market factors. When considering individual level factors, we model profit as a function of wealth (w_i) and entrepreneurial ability (a_i). Profit monotonically increases with wealth and ability. Market-level factors, broadly defined, include both demand-side factors (D) such as consumers' information about products and supply-side factors (S) such as wages, interest rate, credit, final goods transport costs, etc. It could also incorporate institutional factors such as corruption.
- Lastly, there is an outside option of wage employment. Any individual can choose to enter the labor market and earn a wage (V).

Under these conditions, we model the choices when individuals consider entrepreneurship.[31]

Decision between self-employment and wage employment

An individual would be indifferent between self-employment and wage employment when:

$$\pi_{self-employed}(w_i, a_i, D, S) - C_E = V$$

This equilibrium level of wealth is defined as $\widehat{w_E}$ which defines the point at which an individual decides to enter into self-employment

Decision to hire workers

An individual would be indifferent between choosing to hire more workers and remaining self-employed when:

$$\pi_{hiring}(w_i, a_i, \tilde{D}, \tilde{S}) - C_H = \pi_{self-employed}(w_i, a_i, D, S)$$

This equilibrium level of wealth is defined as $\widehat{w}_H$ which defines the point at which an individual decides to scale by hiring workers.

Qualitative Support of the Model

As a preliminary step, we provide qualitative support of the model by demonstrating that firm outcomes improve with ability (in this case, using formal education as a proxy). We can see that firm owners with some education show better firm performance outcomes than those without.

[31] Ibid

This provides empirical support of our model. Next, we explore the demand, supply and institutional factors, particularly focused on the hiring margin.[32]

Table 3. Relationship between firm outcomes and ability (education) of firm owner

	Manufacturing Firms			Service Firms		
VARIABLES	**(1) Gross Value Added**	**(2) Profit**	**(3) Assets Owned**	**(1) Gross Value Added**	**(2) Profit**	**(3) Assets Owned**
Does the owner have any formal education?	0.172***	0.154***	0.186***	0.295***	0.283***	0.430***
	(0.022)	(0.022)	(0.038)	(0.013)	(0.013)	(0.023)
Industry-District Weights	Yes	Yes	Yes	Yes	Yes	Yes
Observations	77,049	76,341	77,067	165,160	164,332	157,623
R-squared	0.735	0.723	0.717	0.441	0.425	0.393

All values are in log rupees. Appropriate sample weights are applied
Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.01

Diagnostics: Identifying barriers to scale

We use a mix of quantitative and qualitative evidence, supplemented with evidence from the literature to diagnose which constraints might explain the differential barriers to scale.

Demand-side Factors

Consumers lack information about products or firms

Evidence in the literature: Couture et al. argue that consumers in China, particularly those in lesser connected areas, often lack information to businesses located further away. They test the potential for e-commerce to bridge this demand constraint, providing consumers with a low-cost and easy-to-use way of accessing new products and services. This translates into gains for both the consumer and seller (including entrepreneurs) that benefit from access to new markets. They find that when logistical and educational barriers are overcome, e-commerce leads to improved incomes for sellers, with stronger gains seen in villages that were previously disconnected.[33] However, in India, e-commerce markets remain relatively less developed. Alternatives have been explored by

[32] Ibid
[33] Victor Couture, Benjamin Faber, Yizhen Gu, Lizhi Liu. "E-Commerce Integration and Economic Development: Evidence from China," January 2018.

organizations on the ground including roadshows, connections with larger private companies, etc. – however, these programs are scattered and often do not provide a reliable source of demand.[34]

Qualitative evidence:

In rural areas particularly, even when entrepreneurs were able to bring their products to urban markets, they were still unable to find markets for their products. Several of them mentioned that they were constrained by local demand i.e. from their immediate community and would only produce to meet this demand. They were unable to leverage economies to scale, and this in turn, resulted in them not wanting to scale up.

> "We got into a group of 10 entrepreneurs to manufacture disposable plates, invested in the machinery and even paid for transportation to send our products to urban markets. However, we were unable to sell our products at prices that helped us recover our costs, and sometimes we simply could not find buyers. In the end, we had to use our savings to repay our debts, and shut down our business" – *Self-employed female entrepreneur in rural Gujarat*

Supply Side Factors

Industry Choice

Evidence in the literature: Industry choice might also explain the persistent gender gap, with women-owned business concentrated in sectors with lower productivity. Basole finds evidence that women entrepreneurship in India is concentrated in a few industries, which typically tend to be less productive. Further, women tend to be concentrated in retail and service sectors.[35] This might also be a product of cultural norms, with women unable to work in certain industries even if they might be high-return in nature.

Quantitative evidence: We compare the top industry choices among male and female entrepreneurs in both the manufacturing and services sector and find some interesting patterns. We see that while women are concentrated in sectors like tailoring, handicrafts, and beauty services, men occupy industries like flour milling, manufacturing of wood products, transportation and restaurants. In fact, Ghani finds that on average, women are concentrated in low-wage industries in the manufacturing sector, although the gap seems to be reducing over time. These gaps are not

[34] From expert interviews with Mann Deshi Foundation and WEConnect International.
[35] Basole, Amit. "A Gender Penalty for Firm Performance in India's Informal Manufacturing Sector," 2016.

as stark in the services industry.[36] However, gender gaps in entrepreneurship persist even after controlling for industry choice – this holds true for both self-employed entrepreneurs as well as those that hire workers. We provide a snapshot of this in Table 1 which show negative, significant coefficients on firm profitability measures for female-owned enterprises.

Qualitative evidence: Individual interviews with entrepreneurs revealed that while the motivation to start a business might be greater economic independence, choice of industry remained constrained by social norms. An overwhelming share of the interviewees mentioned that while their husband's and families might be supportive of their business when it does well, often this support was conditional on them fulfilling certain household tasks that were considered the sole responsibility of the women (childcare, household chores). Therefore, women either chose professions that were home-based or allowed them greater flexibility in terms of time. Some women also expressed that they considered certain industries, say construction or carpentry, solely male industries and would never consider them even if they received training or other support.

> "In an ideal world, I would love to open my own salon. I trained in beauty services and the potential to make money is much larger. However, I now run my own tailoring business simply because it allows me to work after my children have gone to bed and I have completed all my household responsibilities. My family didn't want me to spend time away from home so this is the only way I could run my own business." – *Tailor in Mumbai*

Labor Constraints

Evidence in the literature: Basole finds that in informal Indian manufacturing enterprises, differences in performance persist between male and female-owned enterprises, even after controlling for owner and firm characteristics. However, these differences in performance disappear when examining the sub-sample of women who are able to hire wage employees. Basole offers insight that facilitating the scaling up of female-owned enterprises might help address the gender gap in entrepreneurship.[37] However, in the Indian context, the decision to hire labor is one that is often closely linked to existing social norms. We show in Figure 4 that all entrepreneurs face a fixed cost when making the decision to hire workers, and it is likely that these costs are higher for female entrepreneurs as we see from qualitative research.

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[36] Ghani, Ejaz. *Will Market Competition Trump Gender Discrimination in India?* Policy Research Working Paper 7814. Washington, D.C.: World Bank Group, Macroeconomics and Fiscal Management Global Practice Group, 2016.

[37] Basole, Amit. "A Gender Penalty for Firm Performance in India's Informal Manufacturing Sector," 2016.

Qualitative evidence:

> "From our work on the ground, we see that men in the families become more supportive of the woman expanding her business once her business is doing well. While they might be initially reluctant to have her employing workers from the community, this reluctance does not hold when the household receives an additional source of income," – *NGO worker in Maharashtra*

From the above statement, it is clear that the issue of scale and the barriers to hiring that women face are intimately linked. While women might be able to break social norms and hire workers if the business is doing well, this profitability is often conditional on being able to achieve economies of scale, as we showed earlier. We acknowledge that the issues of labor constraints are hard to separate from those of social norms or lack of labor market opportunities for women.

Credit constraints

Evidence in the literature: Multiple studies have proved that when informal firms receive access to credit, profitability improves. However, intra-household bargaining power is a factor to consider when exploring barriers to credit access among female entrepreneurs. De Mel et al. propose that returns to capital are simply lower for women-owned business i.e. when provided access to business grants, male entrepreneurs make better business decisions than female entrepreneurs.[38] However, exploring these mechanisms, Fields et al. show that women appear to be investing the money in their husband's enterprises, leading to differential returns. They find that when women are the sole entrepreneurs in households, returns to capital are equivalent.[39] Therefore, traditional solutions like providing liquidity alone might not help address barriers to scale.

Quantitative evidence:

Figure 9 compares credit patterns among male and female entrepreneurs. We see that not only do fewer women entrepreneurs have loans but also the loan amounts are smaller. When asked if the firm faced a shortage of capital, only 29 percent of female-owned firms answered in the affirmative as compared to 50 percent of male-owned firms. However, this might be a function of scale, social norms or even industry choice, and unfortunately cannot be disentangled given the data available.

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[38] Mel, Suresh de, David McKenzie, and Christopher Woodruff. "Are Women More Credit Constrained? Experimental Evidence on Gender and Microenterprise Returns." *American Economic Journal: Applied Economics* 1, no. 3 (2009): 1–32.

[39] Bernhardt, Arielle, Erica Field, Rohini Pande, and Natalia Rigol. "Household Matters: Revisiting the Returns to Capital Among Female Micro-Entrepreneurs." SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, April 1, 2017. https://papers.ssrn.com/abstract=2957520.

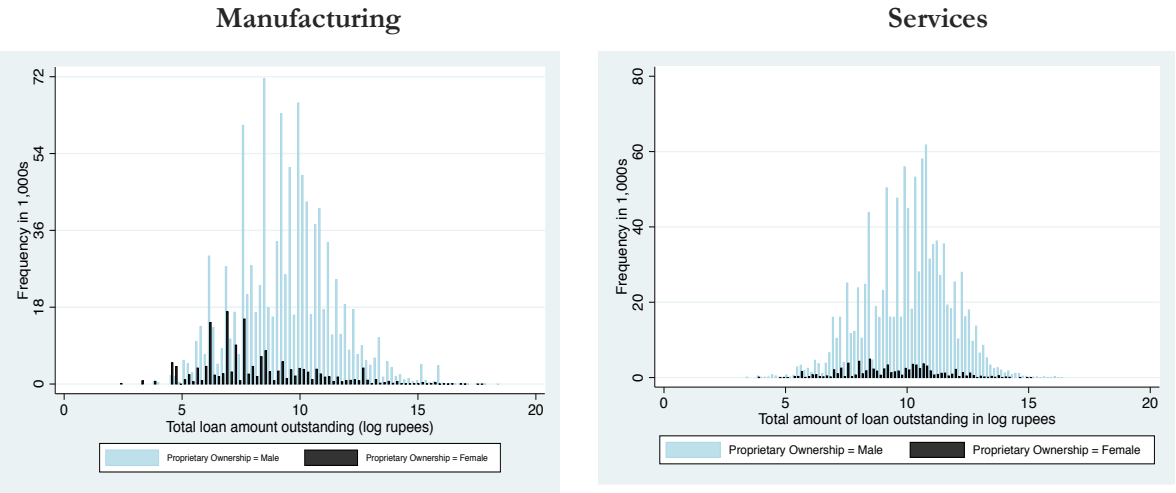

Figure 9. Loan Amount Outstanding by Industry and Owner Gender

Studies by the IFC have shown that many banks require male members to act as a guarantor for loans to women. Some women also perceive banks as unfriendly due to lack of female officers. These examples provide evidence that norms and the institutional context affect access to credit.[40]

Qualitative evidence: Several women accessed credit through self-help groups or microfinance institutions. However, the loan amounts they requested were not particularly large, and insufficient to facilitate scale. In the focus groups, most entrepreneurs said that while they usually used the loan amount for their business, if needed, they would sometimes spend the money on their child's education, medical emergencies or ceremonial events. Some entrepreneurs running larger firms mentioned lack of awareness of the many credit schemes provided by the government, preventing them from accessing larger pools of credit. It remains unclear how much of this is due to absence of strong networks, lower financial literacy or even, social norms.

"While I was able to benefit from the credit I received through self-help groups, I'm still not confident enough to go to the bank to apply individually for a loan. Apparently, there are programs to help entrepreneurs like me but I have no information about them. I have expanded my business very slowly using my savings from the business" – *Vegetable vendor in Gujarat*

Lack of skills or managerial knowledge

Evidence in the literature: One proposed solution to addressing gender gaps in entrepreneurship has been the spread of business training or skills development programs aimed at improving

[40] International Finance Corporation. "Improving Access to Finance for Women-Owned Businesses in India." World Bank Group, 2017.

business decision-making or entrepreneurial abilities among women. However, research has demonstrated that while training programs might facilitate new entrepreneurship, they are not very successful in improving performance of existing female-owned enterprises.[41]

Qualitative evidence: Almost every female entrepreneur reported attending some form of training. Among the self-employed women, the most common training attended was to learn either sewing skills or manufacturing of food products. Interestingly, only one entrepreneur interviewed in the focus groups was working in a business she had received formal skills training in. This might indicate a need for a more tailored approach in the delivery of training programs. Further, entrepreneurs that hired workers stated that business training skills were important to them, while for self-employed women this was not a priority. Business training needs were largely driven by having to pay wages, maintain accounts, so on and so forth.

Lack of networks

Evidence in the literature: Examining factors that prevent women from scaling up their business, one potential explanation is offered by a lack of incumbent female entrepreneurs in the immediate vicinity.[42] This plays out through two different methods – either network effects or role model effects. Network effects can manifest as either sales factors such as access to markets or knowledge factors such as information sharing. Observing network effects, Pande et al. find that women who receive trainings with a friend are more likely to take out business loans, and also report increased business activity and improved incomes.[43] Ghani et al. also find that rates of female entrepreneurship are expected to be higher in industry-districts that have incumbent female entrepreneurs.[44] From both these studies, we see that network effects might help bridge the gender gap between entrepreneurship among men and women, either due to increased confidence, support from their social network, and potentially, through shifting norms.

Quantitative evidence: To test whether women and men face differential network effects, we run a regression examining firm profitability against the number of firms of one's own gender in a given industry-district as well as the total number of firms in a given industry district, after controlling for differences in geography and industry.

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[41] De Mel, Suresh, David Mckenzie, and Christopher Woodruff. "Business Training and Female Enterprise Start-up, Growth, and Dynamics: Experimental Evidence from Sri Lanka." *The Journal of Development Economics* 106 (2014): 199
[42] Ghani, Ejaz. "Spatial Determinants of Entrepreneurship in India." [Boston], 2011.
[43] Field, Erica, Seema Jayachandran, Rohini Pande, and Natalia Rigol. "Friendship at Work: Can Peer Effects Catalyze Female Entrepreneurship?" *NBER Working Paper Series*, 2015, n/a. https://doi.org/10.3386/w21093.
[44] Ghani, Ejaz. "Spatial Determinants of Entrepreneurship in India." [Boston], 2011.

Table 3a: Profitability of Firms Controlling for Network Effects - Manufacturing

	Female-owned Firms			Male-owned Firms		
VARIABLES	Gross Value Added	Profit	Asset Owned	Gross Value Added	Profit	Asset Owned
Number of male firms in industry district				4.187***	4.175***	5.223***
				(0.00903)	(0.00912)	(0.0115)
Number of female firms in industry district	3.901***	3.871***	5.171***			
	(0.0154)	(0.0157)	(0.0197)			
Total firms in industry district	0.003**	0.004**	0.004*	-0.009***	-0.009***	-0.005***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18,912	18,629	18,956	58,137	57,712	58,111
R-squared	0.811	0.805	0.821	0.818	0.815	0.813

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.01

Table 3b: Profitability of Firms Controlling for Network Effects - Service

	Female-owned Firms			Male-owned Firms		
VARIABLES	Gross Value Added	Profit	Asset Owned	Gross Value Added	Profit	Asset Owned
Number of male firms in industry district				6.248***	6.248***	8.033***
				(0.006)	(0.005)	(0.008)
Number of female firms in industry district	6.590***	6.582***	8.692***			
	(0.011)	(0.011)	(0.016)			
Total firms in industry district	0.000	0.001***	0.000	0.001***	0.001	0.000*
	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,591	155,052	15,471	154,255	15,160	147,880
R-squared	0.972	0.890	0.971	0.890	0.958	0.888

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Not surprisingly, we find that in the manufacturing sector particularly, the number of male firms in a given industry-district has a much higher effect on the profitability of male-owned firms, than the number of female-owned firms on the profitability of female-owned firms, perhaps indicating that networks might be stronger among men. In contrast to this, network effects are not that different in the services industry, and number of firms in an industry-district is not associated with increases in firm performance. However, this analysis looks at one cross-section in time, and network effects might intensify over time.

Qualitative evidence: Multiple women cited other women entrepreneurs as inspiration for starting their own business. Among self-employed women in particular, network effects were strong either due to membership in self-help groups or previous attempt to practice group entrepreneurship. For those operating at some scale, a common theme was the role of women networks in dealing with suppliers, who often tend to be male. These entrepreneurs said that they often felt excluded from traditional entrepreneur-supplier relationships because these were predominantly dominated by men. However, recent attempts to create women networks were viewed optimistically.

> "I know how hard I struggled to set up my business, I had no role models or mentors and was constantly battling against the odds. Now that I am successful, I want to help all the women in my community. I have all their mobile phone numbers and am constantly calling or texting them to provide information on buyers or traders, or even to provide employment to the women who want to become empowered." – *Musical instrument manufacturer in Maharashtra*

Institutional Factors

Social Norms

Evidence in the literature: Given socio-cultural norms in India, there might be the possibility that restriction of social mobility for women might explain the high prevalence of self-employment and home-based business. The effect of norms on entrepreneurial activity can be extremely complex often being deeply embedded in other constraints. For instance, Fields et al. find that training improves business activity among upper caste Hindu women (who often face more restrictions on mobility than lower caste Hindu women) although similar effects were absent among Muslim women, who face much stronger restrictions.[45] This lends to the fact that while training and similar

[45] Field, Erica, Seema Jayachandran, and Rohini Pande. "Do Traditional Institutions Constrain Female Entrepreneurship? A Field Experiment on Business Training in India." *The American Economic Review* 100, no. 2 (2010): 125–29.

interventions might be able to influence norms, there are differential effects across complicated social structures.

Qualitative evidence: Most of the female entrepreneurs interviewed were first-time entrepreneurs, indicating some progress on the entry margin. However, for many of these entrepreneurs, family support (and to some degree, even permission) was critical to being able to run a business. Household responsibilities were consistently reinforced as an additional barrier that women entrepreneurs have to face. In some of the focus group settings, entrepreneur networks were able to transcend caste boundaries, which NGO workers cited as a factor of group entrepreneurship. This provides interesting insight into the interaction of economic and social factors indicating that entrepreneurship might also lead to bridging of networks.

Given the range of factors we analyzed, we present our key findings of the barriers to scale below:

Key Findings:

- Current policy initiatives focused on credit and training might prove effective on the entry margin; literature shows mixed evidence on improving scale.
- Information and market linkages are pressing constraints. Social networks could mobilize female entrepreneurship, facilitating sharing of information and economies of scale
- Social norms remain a binding constraint; stronger networks could influence these norms.

Stage I: Policy Recommendations

In the previous section, we identified that entrepreneurs face differential barriers to scale including lack of access to information, markets as well as networks. Below we analyze a range of policy options that might address these constraints.

Recommended Option 1: Group Entrepreneurship

We have already provided evidence of literature that demonstrates increased business activity when training is received with peers.[46] Further, given that the government already runs cluster development programs and works with self-help groups to provide credits, we hypothesize that there will be political supportability for interventions focused on group activity.[47] We acknowledge

[46] Ibid

[47] Ministry of Micro, Small and Medium Enterprises, India. "MSME Schemes." Government of India, August 2015. http://www.msme.nic.in/WriteReadData/eBook/MSMESchemesNew.pdf.

that for group entrepreneurship activities to be successful, there needs to be a tipping point (or enough female business activity) for network effects to kick in, if not, group interventions will be ineffective. As seen earlier, existing cluster development strategies have not proven to be very effective particularly due to lack of implementation capability. One way to navigate this would be leverage existing in-community organizations like NGOs or cooperatives to act as the facilitator between the Ministry and the clusters. In addition, these organizations might also represent the voices of the entrepreneurs at the policy levels, again a more bottom-up approach.

Hansen et al. analyze different models in which existing informal lending structures can be leveraged to drive group entrepreneurship in rural Kenya. In the 'Individual Ownership' model, the farmer borrows from the informal lending group to improve business – when this farmer is successful, other members of the group are inspired and follow suit. However, network effects are weak and hence market linkages are unlikely to evolve. In the 'Shared Ownership' model the group borrows collectively and either profits or technology are shared creating incentives to pool resources to access markets. In the 'Third Party Ownership' model, external capital is provided by a larger cooperative, and while profits and technology are shared within the group of farmers, the cooperative also signs a profit-sharing agreement with the groups and therefore has a stake in facilitating access to markets.[48] Thus, there are a variety of group entrepreneurship structures that can be adapted to the case of female entrepreneurship in India, which we discuss later.

Recommended Option 2: Mobile phone-based information

Access to information was a consistent barrier cited among both self-employed and larger-scale entrepreneurs, particularly with regards to government programs. An advantage of information campaigns is that they can be used to target multiple constraints - be it financial literacy, lack of awareness about government programs or expanding social networks. Research in other fields in the Indian context for smallholder farmers has demonstrated the potential for information and communication technologies, particularly mobile phone-based voice advice, to bridge informational asymmetries.[49] A similar intervention that provided business literacy tools to small businesses via mobile phones found that while overall listening was low, those who were engaged with the system saw improved firm performance in terms of sales and business savings.[50]

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[48] *Leveraging Informal Lending Mechanisms to Facilitate Technology Transfer and Microenterprise in Developing Countries - ScienceDirect*. https://www.sciencedirect.com/science/article/pii/S0160791X14000712. Accessed 24 Feb. 2018.

[49] Cole, Shawn. "The Value of Advice: Evidence from Mobile Phone-Based Agricultural Extension." *IDEAS Working Paper Series from RePEc*, 2012.

[50] Cole, Shawn; Schoar, Antoinette. "Rules of Thumb: Providing Timely Financial Management Advice at Scale in India." AEA RCT Registry, May 2, 2017.

When considering political factors, one consideration to keep in mind is potential opposition from informal governance structures given patriarchal norms that often discourage mobile ownership among women due to reputational concerns.[51] However, given potential economic gains, we might be able to circumvent this issue. Mobile phone-based information campaigns also require low investment costs and are likely to be viewed by political factions as a low-risk, high-visibility option.[52] However, if implemented with other stakeholders, we might face coordination problems limiting the effectiveness of the solution.

Alternate Option: Mentorship Programs

Another hypothesis is that exposure to female role models that have successfully scaled could potentially inspire other entrepreneurs to follow suit. In a developed country context, researchers exposed entrepreneurs to role models and found overall improvements in entrepreneurial attitudes. While this study controlled for potential confounding factors, given that it is not experimental in nature, it is hard to identify causality.[53] Another randomized evaluation targeted Danish students providing e-training through role models and found evidence on changes in desirability of becoming an entrepreneur but no influence on knowledge about entrepreneurship.[54] For precisely these reasons, we are skeptical about the technical correctness of this solution.

Further, mentorship programs often put the onus on existing successful entrepreneurs who might not be willing to mentor other entrepreneurs, either due to worries of competition or due to social norms. Additionally, mentorship alone might not be enough to encourage women to deviate from social norms. We acknowledge that in many group entrepreneurship settings such as self-help groups, there might be existing successful entrepreneurs whose experience could serve as a complement to the policy measures discussed above. For instance, we could potentially leverage the mobile phone-based helpline to encourage women to share experiences within their communities or push inspirational stories to other entrepreneurs, which are again discussed later.

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[51] Ibid

[52] Cole, Shawn. "The Value of Advice: Evidence from Mobile Phone-Based Agricultural Extension." *IDEAS Working Paper Series from RePEc*, 2012.

[53] Fellnhofer, Katharina, and Kaisu Puumalainen. "Can Role Models Boost Entrepreneurial Attitudes?" *International Journal of Entrepreneurship and Innovation Management* 21, no. 3 (2017): 274–90. https://doi.org/10.1504/IJEIM.2017.083476.

[54] Moberg, Kare. "Entrepreneurial Role Models and Online-Based Entrepreneurship Education." Innovation Growth Lab, 2017.

Alternate Option: E-Commerce

In the absence of market linkages, e-commerce has proven an exciting alternative to directly connect entrepreneurs to their buyers, or to improve ease of procuring raw materials.[55] Particularly for women, who often lack mobility, this alternative allows them to scale business without disrupting social norms. However, experiments evaluating the potential of e-commerce to create gains for entrepreneurs have identified infrastructure for logistics, and education of both the entrepreneur and consumer, as critical factors for success.[56] In India, internet applications face several barriers to take-up, the most important one being literacy. Second, the required logistics infrastructure for e-commerce to succeed in many parts of the country does not exist. Therefore, we hypothesize that this solution unlikely to work, at least in the short and medium-run.[57] Further, e-commerce innovations might disrupt existing programs which will need to be carefully evaluated in the future, particularly in light of potential opposition from local government.

We summarize our recommendations in the table below along with the reasoning for our choices:

Table 4: Recommended Policy Options

Policy Option	Technical Correctness	Political Supportability	Administrative Feasibility
Mobile phone-based information campaigns	Low-cost, high-reach conditional on adoption.	Low risk investment given limited investment and high upside if used	Limited implementation for tech, trust and usage might require NGO partners
Group Entrepreneurship	Pooling of resources and knowledge can facilitate greater access, accountability and economies of scale	Leverages off previous cluster development strategies by the govt.	Partner with on-ground NGOs to implement, multi-stakeholder coordination issues

Having made these recommendations, we recognize that this deviates considerably from existing interventions. Therefore, before we scale-up, we propose a detailed plan for piloting and implementation to ensure effectiveness and scalability.

[55] Victor Couture, Benjamin Faber, Yizhen Gu, Lizhi Liu. "E-Commerce Integration and Economic Development: Evidence from China," January 2018.
[56] Ibid
[57] Victor Couture, Benjamin Faber, Yizhen Gu, Lizhi Liu. "E-Commerce Integration and Economic Development: Evidence from China," January 2018.

Stage II: Implementation

We recognize that policy design cannot operate in isolation and we must take into consideration implementation constraints. We identify two major constraints. First, not all entrepreneurs can and/or want to scale i.e. not all self-employed women are transformational entrepreneurs. Second, the policy options we mention above could be implemented alone or in cooperation with other stakeholders. In the following sections, we delve into these tradeoffs and provide different iterations for implementation that account for these considerations.

Screening Matters

Qualitative fieldwork reveals that among small, informal firms there exist only a subset of entrepreneurs that can and want to scale. Schoar makes the critical distinction between entrepreneur type, arguing that subsistence entrepreneurs are rarely likely to transition into transformational entrepreneurs. Based on this distinction, we could potentially identify a subset of female entrepreneurs that have both the aptitude and willingness to scale up their enterprises.[58] One such experiment in Africa used a business plan competition to attract what might be considered 'growth-oriented' entrepreneurs. They find that entrepreneurs that received access to grants improved firm performance and increased employment opportunities for others.[59] Similar research also finds that financial literacy, schooling and performance on certain cognitive tests (numerical and verbal reasoning) can be used to screen for high-potential entrepreneurs.[60] Further, non-cognitive factors like willingness, entrepreneurial drive, could also potentially play a role.

However, we must recognize that there are tradeoffs in incorporating a screening mechanism into our policy implementation. Not only is there an additional cost of implementing screening, this would involve greater on-ground resources to ensure effectiveness. On the other hand, impact of the policy might be diluted if we do not make the distinction between subsistence and transformational entrepreneurs. With these considerations in mind, we propose different implementation approaches for each of the policy options.

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[58] Schoar, Antoinette. "The Divide between Subsistence and Transformational Entrepreneurship." *Innovation Policy and the Economy* 10, no. 1 (2010): 57–81. https://doi.org/10.1086/605853.

[59] McKenzie, David. "Identifying and Spurring High-Growth Entrepreneurship: Experimental Evidence from a Business Plan Competition †." *American Economic Review* 107, no. 8 (2017): 2278–2307. https://doi.org/10.1257/aer.20151404.

[60] Woodruff, Christopher, and Marcel Fafchamps. "Identifying Gazelles." World Bank, Washington, DC, 2016. http://hdl.handle.net/10986/24221.

Models for Implementation

As discussed above, there are clear tradeoffs to consider when making implementation decisions. For instance, if we choose to screen for transformational entrepreneurs our program is likely to be more effective. However, screening is costlier and requires greater implementation capability. Similarly, it is probably easiest for the government to implement policies on their own. However, while the government has ample resources it might not have the on-ground reach of NGOs or the efficiency of the private sector. If the government partners with other stakeholders, it must take into account that there might be principal-agent failures, lack of coordination, lack of transparency, etc. that might hinder implementation. With this in mind, we present a range of implementation models from low-touch (i.e. with no screening or with single stakeholders) to more complex models (with screening and/or multi-stakeholder coordination). While the former might be easier and more cost-effective to implement, the latter, if successful, might demonstrate better results.

Policy Option 1: Mobile phone-based information campaigns

We propose three different iterations of a mobile phone-based intervention to determine which is the most effective in terms of impact, cost and scalability. This includes:

Helpline Only	Helpline + Community Sharing	Helpline + Community Sharing + Screening
Helpline that provides voice-based information to entrepreneurs	Helpline that provides voice-based information to entrepreneurs + Leverages NGO community networks to share information	Helpline that provides voice-based information + Leverages NGO community networks to share information + Screening transformational entrepreneurs

Intervention Design

A mobile phone-based helpline that uses an interactive voice response (IVR) system to communicate information to female entrepreneurs. The helpline can be used to 1) send information on government schemes 2) include a toll-free number to call into for questions and 3) connect buyers to female entrepreneurs. An advantage of voice-based systems is that it requires low levels of literacy and can be adapted to local languages. Since all information is communicated

via mobile phones we anticipate cost-effectiveness – for instance, the rate of calling is less than 1 cent /minute.[61] Below we present the different potential models of the intervention:

- **Helpline Only:** A mobile phone-based system that entrepreneurs can register on to receive messages and also ask questions. No in-person interventions will be done. However, there might be insufficient trust or take-up due to the top-down nature.
- **Helpline + Community Sharing**: In addition to receiving information, the platform could allow entrepreneurs to share information with others in their community, facilitated by NGOs that can also help build trust in the technology and encourage adoption. This could also facilitate mentorship opportunities within communities.
- **Helpline + Community Sharing + Screening:** In addition to the previous interventions, the voice-based platform could be programmed to monitor both quality and frequency of entrepreneur engagement to screen for the transformational entrepreneurs. Alternatively, entrepreneurs could be administered a survey at the time of registration (manual or automated) to assess cognitive skills and potentially gauge interest in scaling. [62]

Stakeholder Identification

We believe problem framing will be an effective way in creating support for policy adoption and implementation across stakeholders that are varied in power and interest.[63] We suggest focusing on creating coalitions across the government ("the insider with power") and NGOs or the private sector ("the outsider with interest").[64] Potential stakeholders would include:

- **The Ministry of MSME** (at the federal and state levels) will be responsible for funding and facilitating the helpline. We can appeal to their "material interest" i.e. emphasize the potential for economic growth from increasing scale of female-owned micro business.[65]
- A technology partner like **Awaaz.de or Gram Vaani** that specialize in designing large-scale voice-based mobile phone helplines that provide information to low-income populations.[66] Here, we could appeal to material interests given the government would directly pay for their services and also to "normative values". For instance, consider the mission of Awaaz.de which is to achieve "last-mile connectivity for social impact". [67]

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[61] Ibid
[62] Adapted from Cole and Fernando (2013)'s experiment using IVR technology in agricultural information
[63] Bryson, John M. "What to Do When Stakeholders Matter: Stakeholder Identification and Analysis Techniques." *Public Management Review* 6, no. 1 (2004): 21–53. https://doi.org/10.1080/14719030410001675722. This approach to coalition building is adapted from Ryan Sheely's class 'Institutions and Development' at Harvard Kennedy school.
[64] Ibid.
[65] Ibid.
[66] Gram Vaani. http://www.gramvaani.org/
[67] Awaaz.de. https://awaaz.de/

- For the iterations requiring NGO facilitation, we could partner with the **Mann Deshi Foundation** which already operates a toll-free helpline for female entrepreneurs for asking questions. Again, their mission is to "economically empower rural women" due to which we can expect support. They have reached over 400,000 women through their empowerment programs across the country. In fact, the Mann Deshi Foundation also includes a Mann Deshi Bank which provides access to credit for women through self-help groups, indicating the presence of pre-existing social networks.[68] We anticipate that adoption will be harder in rural areas and hence focus our pilots here, but could potentially partner with organizations that work with entrepreneurs in more urban in the next phase (e.g. ICICI Foundation).[69]

The support and power of the government, combined with the reach and relationships of NGOs on the ground would likely be effective in overcoming opposition from local governance institutions.[70] Further, we could appeal to the material interests of local governance institutions by highlighting opportunities to promote local economic development through increased business activity to gain their support. Lastly, it is in the interest of these institutions to remain in good stead with the national and state governments on whom they often rely for legitimacy and support.[71]

Phase 1: Piloting

As a first step, we will draw on **design thinking principles** to perform rapid, low-cost prototyping to ensure that our implementation models are effective. These methods include:

User-centered Design: We can implement a variety of qualitative methods to glean information on user needs and gain contextual understanding. One way to do this would be through ethnographic research which involves the designers of the technology immersing themselves in the entrepreneurs' daily lives to understand their information needs.[72] Other ways to incorporate user needs into policy design and delivery is to conduct periodic focus groups with different entrepreneurs to elicit whether the information platform is able to meet their needs. Lastly, we could collect periodic feedback from within the platform itself by allowing users to respond to content or fill out automated surveys (these are features already provided by our technology

[68] Mann Deshi Foundation. http://manndeshifoundation.org/
[69] ICICI Foundation http://www.icicifoundation.org/
[70] Bryson, John M. "What to Do When Stakeholders Matter: Stakeholder Identification and Analysis Techniques." *Public Management Review* 6, no. 1 (2004): 21–53. https://doi.org/10.1080/14719030410001675722. This approach to coalition building is adapted from Ryan Sheely's class 'Institutions and Development' at Harvard Kennedy school.
[71] Ibid.
[72] Liedtka, Jeanne. "Perspective: Linking Design Thinking with Innovation Outcomes through Cognitive Bias Reduction." *Journal of Product Innovation Management*, vol. 32, no. 6, Nov. 2015, pp. 925–38. *Wiley Online Library*, doi:10.1111/jpim.12163.

partner).[73] We could engage with NGO workers to determine which functionalities are most effective for them in the platform allowing for a more demand-driven, bottom-up approach.

A/B Testing**:** allows us to run quick randomized experiments with small groups of entrepreneurs to test which iterations of the voice-based platform are most effective.[74] These might include:

- Randomizing content of the information provided on government schemes, local traders, cluster development programs, business training, etc.
- Randomizing content delivery mechanisms including stories from successful entrepreneurs, character-based storytelling, general announcements, training modules, etc.
- Randomizing screening mechanisms such as cognitive tests, evaluating usage of entrepreneurs on the platform to assess non-cognitive skills, algorithms that combine the two methods, etc.
- Targeted messages based on entrepreneur industry, location could also be tested for impact.[75]

Phase 2: Monitoring and Evaluation

We anticipate that the process pilots will help us determine the best way to deliver the interventions to the entrepreneurs. However, this does not necessarily mean that the interventions will impact the medium or long-term outcomes we hope to influence. To test this, we recommend larger-scale impact evaluations. Ideally, we propose a randomized evaluation (potentially with three treatment arms: Treatment 1- Helpline Only, Treatment 2 – Helpline + Community Networks, Treatment 3 – Helpline + Community Networks + Screening). We recommend follow-ups in 2 and 5 years to determine how the impact evolves over time. The table below presents a framework of the short-term as well as longer-term outcomes we can measure to assess impact.

Table 5. Monitoring and Evaluation Framework

Intervention	Binding constraints	Outcomes
Helpline	Lack of information	Short-run: Number of minutes spent on the platform, questions asked, types of information accessed Medium/long-run: Business performance (sales, gross value added, number of employees), Female

[73] Awaaz.de https://awaaz.de/

[74] Liedtka, Jeanne. "Perspective: Linking Design Thinking with Innovation Outcomes through Cognitive Bias Reduction." *Journal of Product Innovation Management*, vol. 32, no. 6, Nov. 2015, pp. 925–38. *Wiley Online Library*, doi:10.1111/jpim.12163.

[75] Some iterations of these tests are based on the author's own experiences with A/B testing for ICT-based solutions.

		empowerment (greater decision-making ability in household, improved incomes)
Helpline + Community Networks	Lack of information Lack of networks Social Norms	Short-run: Number of minutes spent on the platform, questions asked and types of information accessed, frequency of community meetings, frequency of accessing information shared by group members on the platform. Medium/long-run: Business performance (sales, gross value added, number of employees), empowerment (stronger networks, greater decision-making ability in household, increased mobility, improved incomes)
Helpline + Community Networks + Screening	Lack of information Lack of networks Social Norms	Short-run: Number of minutes spent on the platform, questions asked and types of information accessed, frequency of community meetings, frequency of accessing information shared by group members. Medium/long-run: Improved business performance (sales, gross value added, number of employees, credit amount), greater female empowerment (stronger networks of female entrepreneurs, greater decision-making ability, increased mobility, improved incomes)

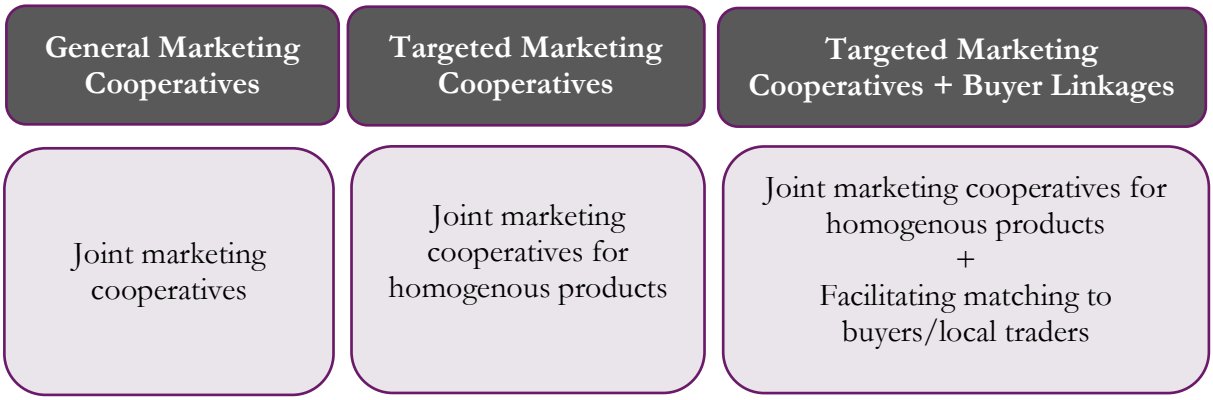
The platform also provides long-term administrative data on both frequency of engagement of the entrepreneurs, as well as their information needs. As this information is aggregated, it can be used to push big data techniques that include predictive algorithms or information targeting based on entrepreneur characteristics. Further, this data will contribute to the sparse data on entrepreneurship in India. NGOs could also aggregate information to better design other interventions and to better represent their voice at a policymaking stage, creating stronger feedback loops by enabling greater transparency and accountability.

Policy Option 2: Group entrepreneurship

We believe that group entrepreneurship can facilitate 1) stronger network effects and 2) stronger market linkages through economies of scale and collective action. We recommend against production cooperatives (collective investment in production technology) because of moral hazard problems. This might be because of deviations in the individual optimal production and the group optimal. Instead, we recommend marketing cooperatives where a group of entrepreneurs practice

joint sales. Through marketing cooperatives, entrepreneurs can meet larger demand volumes, effectively negotiate prices, gain access to buyers, improve quality of production and ultimately, have a greater say in the marketplace.[76] For instance, qualitative fieldwork revealed that individual women entrepreneurs were often scared to go speak with the local trader (typically male) alone, which made sales difficult. Here, marketing cooperatives would be particularly effective.

However, marketing cooperatives require management – whether in assigning who produces how much, maintaining quality standards or distributing returns among entrepreneurs. This management role can be taken up by the entrepreneurs themselves or an external stakeholder like an NGO could potentially come in. While the former would give entrepreneurs more agency, lack of sustained leadership might cause the cooperative to break down. Or, while a simple marketing cooperative might be easier to coordinate, cooperatives selling homogenous products or screening for transformational entrepreneurs might be more effective in leveraging economies of scale. Again, the latter might require either stronger leadership or external management for organization.[77] We propose three different iterations that incorporate these tradeoffs below:



Intervention

We believe that the government can work with NGOs on the ground to facilitate creation of marketing cooperatives. These cooperatives could be newly formed or leverage off existing group entrepreneurship structures such as self-help groups or NGO outreach initiatives. While we recognize that this might lower entrepreneurial agency in forming cooperatives, we estimate that

[76] United States Department of Agriculture and Rural Development. *Understanding Cooperatives: Agricultural Marketing Cooperatives*. Cooperative Information Report 45, Section 15, May 1998, https://www.rd.usda.gov/files/CIR45-15.pdf.
[77] Shah, Tushaar. *Catalysing Co-Operation: Design of Self-Governing Organisations*. Sage Publications, 1996.

NGOs on-the-ground have the convening power that individual entrepreneurs currently lack.[78] Below we present details on the intervention designs for each of the three models proposed:

- **General marketing cooperatives:** This would involve a low-touch model where entrepreneurs could form groups to practice joint sales, irrespective of what they produce. Here, the NGO would be responsible for coordinating with the entrepreneurs, maintaining quality standards or helping entrepreneurs reach newer markets.[79]
- **Targeted marketing cooperatives:** Previous literature has demonstrated that cooperatives perform much better when selling homogenous products – not only is it easier to access markets but also entrepreneurs are more likely to cooperate when motivations are similar.[80] NGOs would have to take on an even greater coordination role here – right from identifying who would participate, aggregating market demand, determining pricing and distributing profits. A secondary concern in this process might be whether to screen for transformational entrepreneurs i.e. to group entrepreneurs with similar motivation.[81] For instance, entrepreneurs could be asked to participate in a cognitive test when signing up. Again, there are time and cost trade-offs in implementing these screening processes, as discussed earlier.
- **Targeted marketing cooperatives + Buyer Linkages:** Lastly, creating of joint cooperatives might be insufficient to address market access barriers in some regions. To circumvent this, the government and other stakeholders could provide an additional layer of support in the form of facilitating buyer linkages. This might be through trade shows or exhibitions where entrepreneurs can sell their products to private companies and/or individuals. Another avenue could be exploring a helpline that matches buyers with entrepreneurs, exhibiting complementarities with the previously mentioned information-based interventions.

Stakeholder Identification

To enable ease of piloting, we would partner with similar stakeholders including the **Ministry of MSME** and the **Mann Deshi Foundation**. The latter still makes sense because it already works with self-help groups and has been experimenting with efforts to facilitate market linkages including through road shows and a radio channel.[82] Consistent with the previous section, we could again use problem framing to appeal to the NGO's mission since a lot of these programs

[78] Ibid
[79] United States Department of Agriculture and Rural Development. *Understanding Cooperatives: Agricultural Marketing Cooperatives*. Cooperative Information Report 45, Section 15, May 1998, https://www.rd.usda.gov/files/CIR45-15.pdf.
[80] Shah, Tushaar. *Catalysing Co-Operation: Design of Self-Governing Organisations*. Sage Publications, 1996.
[81] Ibid
[82] Mann Deshi Foundation. http://manndeshifoundation.org/

are embedded within Mann Deshi's existing interventions. While the Government already runs programs that facilitates cluster access to trade fairs, we recommend shifting the onus of implementation to NGOs to ensure a more bottom-up approach.[83] The role of the government would then be to support the NGOs and grassroots organizations.

Phase 1: Piloting

Given the nature of the intervention, the costs and analysis time frame are likely going to be higher given the resources need to organize and manage cooperatives. However, we can still implement rapid testing to determine the best models for delivery. We can use:

User-centered design: Ethnographic research and qualitative interviewing will be key in designing the structure of the cooperatives. For instance, it will be important to understand how entrepreneurs perceive external support from NGOs.[84] Further, contextual understanding and frequent iteration will be key in ensuring that elite capture, corruption, etc. can be avoided in the designing of the cooperatives.[85] Care should be taken to understand the NGO perspective as well – is the NGO able to meet the needs of the entrepreneurs? What kind of support from the government would be most beneficial to NGOs?

Tracking Administrative Data: A key feature in tracking and monitoring cooperative performance would be to develop data systems that allow all stakeholders to monitor performance. One way to do this might be to collect information at the time of creation of the cooperative. Communication of the data to all stakeholders involved, including entrepreneurs is critical to ensuring this multi-stakeholder partnership holds. Follow-up data should include information on how frequently the cooperative meets, how frequently joint sales is practiced, the network of local traders and intermediaries that the cooperative deals with, revenue earned, allocation of revenue to cooperative members and so forth. This administrative data will prove critical in making decisions on scale up.

A/B Testing: Lastly, rapid low-cost randomized experiments could assess organizational design and management elements through the following mechanisms:

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[83] Ministry of Micro, Small and Medium Enterprises, India. "MSME Schemes." Government of India, August 2015. http://www.msme.nic.in/WriteReadData/eBook/MSMESchemesNew.pdf.

[84] Liedtka, Jeanne. "Perspective: Linking Design Thinking with Innovation Outcomes through Cognitive Bias Reduction." *Journal of Product Innovation Management*, vol. 32, no. 6, Nov. 2015, pp. 925–38. *Wiley Online Library*, doi:10.1111/jpim.12163.

[85] Shah, Tushaar. *Catalysing Co-Operation: Design of Self-Governing Organisations*. Sage Publications, 1996.

- Randomizing frequency of communication with cooperative members (monthly meetings vs weekly meetings, in-person meetings or mobile phone-based communication)
- Randomizing nature of buyer linkages (trade fairs, use of mobile phone-based information helpline, government radio channel, outreach to local traders, etc.)
- Randomizing screening mechanisms (similar to previous intervention – testing for cognitive skills, interviewing for ability and/or motivation)

Phase 2: Monitoring and Evaluation

Consistent with the monitoring and evaluation plan for Policy 1, we recommend a Randomized Control Trial with three treatment groups – General Marketing, Targeted Marketing and Targeted Marketing + Buyer Linkages – and a control group. Again, we would recommend follow-ups in 2 and 5 years, and present a framework to track outcomes below:

Table 6. Monitoring and Evaluation Framework

Intervention	Binding constraints	Outcomes
General Marketing Cooperatives	Access to Markets Lack of Networks	Short-run: Frequency of cooperatives meeting, participation, sales and/or revenue information Medium/long-run: Business performance (sales, gross value added, number of employees), greater female empowerment (stronger networks, improved incomes)
Targeted Marketing Cooperatives	Access to markets Lack of networks Social Norms	Short-run: Frequency of cooperatives meeting, participation, sales and/or revenue information, effectiveness of screening mechanisms Medium/long-run: Business performance (sales, gross value added, number of employees), greater female empowerment (stronger networks, greater decision-making ability, improved incomes)
Targeted Marketing Cooperatives	Access to markets Lack of networks Social Norms	Short-run: Frequency of cooperatives meeting, participation, sales and/or revenue information, effectiveness of screening mechanisms, number of trade shows attended, new buyers accessed Medium/long-run: Business performance (sales, gross value added, number of employees), greater female empowerment (stronger networks of female

		entrepreneurs, greater decision-making ability in household, increased mobility, improved incomes)

Implementation: Summary

In the policy analysis sections, we recommend information campaigns and group entrepreneurship as broad policy solutions and provide specific interventions that go from low-touch to high-touch and can be tested before scaling up. Note that we specifically do not provide costing estimates for the pilots because these figures will depend on the findings from the rapid piloting that we recommend in the first phase. While there might be upfront technology costs for example, these can be easily distributed as the program scales. We recommend conducting a costing exercise once Phase 1 has been completed. Second, the government can also explore various options for monetizing these experiments. For example, the government could explore various options to mitigate costs, including partnerships with the private sector or asking entrepreneurs to pay for the calling fees while the government fronts the technology cost. In conclusion, we summarize our broad policy recommendations as well as specific iterations that can be piloted below.

Policy Recommendation: Information Campaign			
Intervention	Voice-based mobile phone helpline	Voice-based mobile phone helpline with community networks	Voice-based mobile phone helpline with community networks and screening
Stakeholder	Ministry of MSME, Awaaz.de/Gram Vaani	Ministry of MSME, Awaaz.de/Gram Vaani, Mann Deshi Foundation	Ministry of MSME, Awaaz.de/Gram Vaani, Mann Deshi Foundation

Policy Recommendation: Group Entrepreneurship		
Intervention	Leverage SHGs to create shared profit entrepreneur groups	Leverage NGO/private company to create market linkages among shared-profit groups
Stakeholder	Ministry of MSME, Mann Deshi Foundation	

Finally, our implementation plan leaves ample room for iteration and innovation. Further, careful monitoring and evaluation processes will allow all stakeholders to remain committed to using these interventions to bridge gender gaps to entrepreneurship in India. In this paper, we provide evidence of the barriers to scale that female entrepreneurs face while scaling up and offer potential policy solutions to address these, while also considering implementation challenges. Going forward, we call for greater research exploring the issues of scale and how these affect the gender gaps in entrepreneurship. Further, we believe there is a greater need for stakeholder cooperation in developing, testing and implementing innovative policy solutions that address these constraints.

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Appendices

Appendix 1: Summary Statistics for Unorganized Services

Variable	All Firms	Male	Female	T-test
Male Proprietary Owner	0.912 (0.283)			
Female Proprietary Owner	0.088 (0.283)			
Urban	0.420 (0.493)	0.410 (0.492)	0.514 (0.500)	0.104*** (0.013)
Self-employed Firms	0.861 (0.346)	0.859 (0.348)	0.879 (0.326)	0.020*** (0.005)
Firms with hired workers	0.139 (0.346)	0.141 (0.348)	0.121 (0.326)	-0.020*** (0.005)
Home-based	0.297 (0.457)	0.271 (0.445)	0.559 (0.497)	0.288*** (0.012)
Number of workers (total)	1.582 (1.382)	1.580 (1.370)	1.606 (1.493)	0.026 (0.021)
Number of hired workers	0.333 (1.254)	0.333 (1.242)	0.339 (1.366)	0.007 (0.016)
Loan (Yes/No)	0.085 (0.280)	0.087 (0.282)	0.066 (0.247)	-0.022*** (0.004)
Loan amount (log rupees)	10.154 (1.789)	10.192 (1.770)	9.626 (1.959)	-0.566*** (0.116)
Gross value added (log rupees)	8.133 (1.227)	8.182 (1.198)	7.623 (1.395)	-0.559*** (0.028)
Assets owned (log rupees)	9.727 (1.956)	9.736 (1.954)	9.628 (1.980)	-0.108*** (0.034)
N	14.8 million	13.5 million	1.3 million	

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix 2: Summary statistics for Unorganized Manufacturing				
	All	**Male**	**Female**	**T-test**
Male Proprietary Owner	0.623			
	(0.485)			
Female Proprietary Owner	0.377			
	(0.485)			
Urban	0.286	0.294	0.273	-0.021
	(0.452)	(0.455)	(0.445)	0.011
Self-employed Firms	0.864	0.795	0.977	0.182
	(0.343)	(0.403)	(0.149)	0.004
Firms with 1-6 workers	0.102	0.154	0.017	-0.137
	(0.303)	(0.361)	(0.128)	0.004
Firms with more than 6 workers	0.034	0.051	0.006	-0.044
	(0.181)	(0.219)	(0.078)	0.003
Home-based	0.736	0.611	0.943	0.332
	(0.441)	(0.488)	(0.232)	0.007
Total Number of Workers	1.997	2.355	1.404	-0.951
	(1.649)	(1.880)	(0.898)	0.029
Total Number of Hired Workers	0.410	0.613	0.073	-0.540
	(1.433)	(1.713)	(0.641)	0.020
Loan (Yes/No)	0.074	0.103	0.026	-0.077
	(0.261)	(0.304)	(0.159)	0.004
Loan amount (log rupees)	9.228	9.405	8.068	-1.337
	(2.065)	(1.987)	(2.185)	0.190
Gross value added (log rupees)	7.160	7.688	6.280	-1.409
	(1.360)	(1.269)	(1.005)	0.050
Assets owned (log rupees)	9.238	9.677	8.512	-1.165
	(1.838)	(1.724)	(1.789)	0.074
N	16.6 million	10.4 million	620k	

Robust standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Appendix 3: Differences in Total Firm Productivity by Gender: Manufacturing												
	No FE			District FE			Industry FE			Industry-district FE		
VARIABLES	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**
All Firms												
Owned by	1.393***	1.120***	1.306***	1.384***	0.982***	1.282***	0.952***	0.503***	0.895***	0.918***	0.409***	0.853***
Female	(0.0480)	(0.0684)	(0.0494)	(0.0273)	(0.0375)	(0.0275)	(0.0270)	(0.0404)	(0.0267)	(0.0281)	(0.0392)	(0.0265)
Observations	77,049	77,067	76,341	77,049	77,067	76,341	77,049	77,067	76,341	77,049	77,067	76,341
R-squared	0.258	0.096	0.261	0.472	0.344	0.471	0.480	0.379	0.466	0.776	0.720	0.766
Restricting to firms without hired workers												
Owned by	1.072***	0.872***	1.078***	1.067***	0.737***	1.070***	0.791***	0.425***	0.793***	0.749***	0.336***	0.749***
Female	(0.0475)	(0.0693)	(0.0495)	(0.0267)	(0.0393)	(0.0278)	(0.0275)	(0.0434)	(0.0281)	(0.0277)	(0.0406)	(0.0279)
Observations	53,545	53,683	53,188	53,545	53,683	53,188	53,545	53,683	53,188	53,545	53,683	53,188
R-squared	0.254	0.072	0.251	0.469	0.363	0.465	0.423	0.352	0.420	0.741	0.715	0.738
Restricting to only firms without hired workers												
Owned by	0.319***	0.0932	0.342***	0.260***	0.220*	0.271***	-0.155**	0.227**	0.189***	-0.184**	0.232**	0.214***
Female	(0.107)	(0.172)	(0.103)	(0.0811)	(0.125)	(0.0756)	(0.0720)	(0.0936)	(0.0665)	(0.0782)	(0.0977)	(0.0680)
Observations	23,504	23,384	23,153	23,504	23,384	23,153	23,504	23,384	23,153	23,504	23,384	23,153
R-squared	0.005	0.000	0.006	0.312	0.194	0.295	0.279	0.307	0.241	0.752	0.718	0.737

Robust standard errors in parentheses, *** p<0.01 **p<0.05 *p<0.1. GVA is Gross Valued Added. All numbers are in log rupees.

Appendix 4: Differences in Per-Worker Firm Productivity by Gender: Manufacturing												
	No FE			District FE			Industry FE			Industry-district FE		
VARIABLES	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**
All Firms												
Owned by	0.768***	1.492***	0.785***	0.746***	1.561***	0.766***	0.842***	1.666***	0.860***	0.634***	1.417***	0.649***
Female	(0.0817)	(0.110)	(0.0827)	(0.0533)	-0.0727	-0.0541	(0.0544)	-0.0753	-0.0547	-0.0582	-0.0864	-0.0588
Observations	77,049	77,067	76,341	77,049	77067	76341	77,049	77067	76341	77049	77067	76341
R-squared	0.035	0.064	0.035	0.188	0.222	0.187	0.250	0.285	0.251	0.577	0.584	0.575
Restricting to only firms without hired workers												
Owned by	0.364***	0.942***	0.361***	0.238***	0.882***	0.237***	0.614***	1.345***	0.621***	0.330***	0.987***	0.330***
Female	(0.0863)	(0.116)	(0.0873)	(0.0545)	(0.0729)	(0.0551)	(0.0592)	(0.0806)	(0.0594)	(0.0593)	(0.0859)	(0.0595)
Observations	53,545	53,683	53,188	53,545	53,683	53,188	53,545	53,683	53,188	53,545	53,683	53,188
R-squared	0.009	0.030	0.009	0.220	0.247	0.219	0.255	0.288	0.256	0.601	0.604	0.600
Restricting to firms with hired workers												
Owned by	-0.117	-0.117	-0.121	0.192***	-0.0396	0.189***	0.151***	-0.0257	0.157***	-0.0902	0.0704	-0.0931
Female	(0.0788)	(0.0788)	(0.0777)	(0.0734)	(0.103)	(0.0730)	(0.0556)	(0.0850)	(0.0553)	(0.0748)	(0.111)	(0.0758)
Observations	23,504	23,504	23,153	23,504	23,384	23,153	23,504	23,384	23,153	23,504	23,384	23,153
R-squared	0.001	0.001	0.001	0.194	0.189	0.194	0.348	0.342	0.340	0.691	0.703	0.689

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. GVA is Gross Value Added. All figures are in log rupees

Appendix 5: Differences in Total Firm Productivity by Gender: Services												
	No FE			District FE			Industry FE			Industry-district FE		
VARIABLES	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**
All Firms												
Owned by	0.553***	0.110***	0.568***	0.609***	0.190***	0.610***	0.276***	0.0136	0.280***	0.301***	0.0272	0.306***
Female	(0.0267)	(0.0333)	(0.0256)	(0.0199)	(0.0290)	(0.0197)	(0.0230)	(0.0308)	(0.0234)	(0.0174)	(0.0264)	(0.0174)
Observations	170,645	163,042	169,728	170,645	163,042	169,728	170,645	163,042	169,728	170,645	163,042	169,728
R-squared	0.018	0.000	0.019	0.222	0.135	0.231	0.343	0.307	0.323	0.455	0.397	0.437
Restricting to firms without hired workers												
Owned by	0.605***	0.0972***	0.618***	0.627***	0.165***	0.631***	0.292***	0.00469	0.302***	0.312***	0.0289	0.325***
Female	(0.0237)	(0.0342)	(0.0235)	(0.0202)	(0.0308)	(0.0204)	(0.0241)	(0.0343)	(0.0250)	(0.0179)	(0.0293)	(0.0183)
Observations	134,893	127,595	134,348	134,893	127,595	134,348	134,893	127,595	134,348	134,893	127,595	134,348
R-squared	0.028	0.000	0.028	0.246	0.144	0.250	0.303	0.256	0.295	0.420	0.359	0.413
Restricting to only firms without hired workers												
Owned by	0.0454	0.0734	-0.0174	0.106***	0.112**	0.145***	0.0376	0.165***	0.0228	-0.0500	0.115**	-0.0557
Female	(0.0688)	(0.0613)	(0.0687)	(0.0396)	(0.0537)	(0.0424)	(0.0495)	(0.0544)	(0.0506)	(0.0332)	(0.0534)	(0.0357)
Observations	35,752	35,447	35,380	35,752	35,447	35,380	35,752	35,447	35,380	35,752	35,447	35,380
R-squared	0.000	0.000	0.000	0.290	0.104	0.283	0.286	0.287	0.256	0.509	0.429	0.469

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. GVA is Gross Value Added. All figures in log rupees.

Appendix 6: Differences in Per-Worker Firm Productivity by Gender: Services												
	No FE			District FE			Industry FE			Industry-district FE		
VARIABLES	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**	**GVA**	**Asset**	**Profit**
All Firms												
Owned by	0.519***	-0.104**	0.530***	0.481***	-0.0515	0.490***	-0.0483	0.222***	-0.0562*	-0.0585*	0.254***	0.0669**
Female	(0.0340)	(0.0528)	(0.0345)	(0.0308)	(0.0431)	(0.0303)	(0.0330)	(0.0446)	-0.0334	(0.0301)	(0.0421)	(0.0304)
Observations	170,643	163,040	169,726	170,643	163,040	169,726	170,643	163,040	169726	170,643	163,040	169,726
R-squared	0.004	0.000	0.004	0.096	0.085	0.098	0.301	0.259	0.299	0.384	0.344	0.382
Restricting to only firms without hired workers												
Owned by	0.642***	0.173***	0.651***	0.643***	0.188***	0.644***	0.103***	0.183***	0.109***	0.111***	0.229***	-0.120***
Female	(0.0312)	(0.0509)	(0.0315)	(0.0301)	(0.0430)	(0.0302)	(0.0342)	(0.0459)	(0.0346)	(0.0314)	(0.0436)	(0.0315)
Observations	134,891	127,593	134,346	134,891	127,593	134,346	134,891	127,593	134,346	134,891	127,593	134,346
R-squared	0.009	0.000	0.009	0.151	0.129	0.154	0.315	0.283	0.313	0.399	0.368	0.398
Restricting to firms with hired workers												
Owned by	0.177***	0.223***	0.0153	0.217***	0.191***	0.00322	0.0251	0.0849*	0.157***	0.212***	0.0880*	-0.0931
Female	(0.0557)	(0.0669)	(0.0374)	(0.0505)	(0.0600)	(0.0349)	(0.0386)	(0.0489)	(0.0553)	(0.0512)	(0.0484)	(0.0758)
Observations	35,752	35,447	35,380	35,752	35,447	35,380	35,752	35,447	23,153	35,380	35,447	23,153
R-squared	0.001	0.001	0.311	0.094	0.098	0.446	0.312	0.346	0.340	0.090	0.468	0.689

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. GVA is Gross Value Added. All figures are in log rupees

Appendix 7: Focus Group Discussion

Once oral consent is administered, these will be the broad themes discussed in the focus group and a subset of these questions will be posed in the individual interviews.

Entrepreneur Characteristics

- How much decision-making capability would you say you have in your enterprise? How would you describe your decision-making ability in terms of different business decisions – inputs, labor, sales, etc.
- Are you the only entrepreneur in your household?
- What are your care responsibilities? Is your business home-based? If yes, have you consider expanding your business? Why or why not?

Enterprise Characteristics

- How do you access markets, both to buy inputs and sell outputs?
- Do you face issues in terms of location or infrastructure that affect your operations? (Examples might include power cuts, property rights issues)
- Why did you choose this particular industry to operate in?
- How long have you been running this business?
- Has the business grown since you started, if yes, please describe the growth trajectory?

External support

- Have you received any external support in the form of training, credit (or otherwise) from the government?
- If yes, what programs/support have you received?
- Are there programs/services you would like the government to provide that are not already accessible to you?
- Have you received any support from your friends and family?

Desire/Ability to Scale

- Size of operation in terms of number of workers
- Desire/ability to expand your business (either in terms of capital or hiring more workers)? What are the major constraints you faced while trying to expand?
- Is there a desire to scale operations? If no, why not?
- For those able to scale, what were the major successful factors behind achieving scale and what are current constraining factors?

- For those unable to scale, what has been major barriers to scale?
- If they have scaled, what advice would they give to other women enterprises?

Access to Credit

- Questions around financial institution access (presence of microfinance institutions, bank account, etc.)
- Question about credit access (seeking external financing, access, reasons for denial, quantity/frequency of borrowing)
- External programs/support that have improved access to finance
- What are your major sources for borrowing money (both formal and informal)?
- Reasons for borrowing money
- Intra-household allocation of credit

Skill Development/Training

- How comfortable are you making business decisions?
- Have they received training from external actors on making business decisions? If yes, from whom?
- Whom do you consult with while making business decisions?

Social Networks

- Network effects:
    - Supply side (sales network): market size, who are your buyers, how did you get connected with your buyers? Do you practice joint purchase and sale with other entrepreneurs, in particular women entrepreneurs?
    - Knowledge transfer: seeking advice, do you share business strategies with peers?
- Role Models: are you inspired by successful entrepreneurs in your immediate community?
- Are there many female entrepreneurs in your immediate community? Do you interact with them?

Norms

- What inspired you to start your own business/ what was the motivation for starting your own business?
- Were you the first female entrepreneur in your household? Were you encouraged by your family members to start your own household?
- Do you think there are specific barriers to scale that you face as women that perhaps, male entrepreneurs might not?