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**Owners' Gender and Gross Value Added in India's
Unincorporated Non-Agricultural Enterprises
(2023–24): An Empirical Investigation**

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Abstract

Self-employment dominates and continues to increase its share in India's employment landscape whether agricultural or non-agricultural. A large part of it is necessity-driven and undertaken for survival, as opposed to entrepreneurial self-employment driven by innovation and opportunity. By incorporating gender-specific effects, this study uncovers sources of disparities in gross value-added (GVA) based on gender of the proprietor, using data from India's Unincorporated Non-Agricultural Enterprises (UNAEs) survey for 2023-24. Cross-tabulations reveal a pronounced gender gap in firm performance: female-led UNAEs are disproportionately concentrated in the lowest GVA quartile. Lower-GVA firms have less educated proprietors and operate from household premises as own account workers; features that typically characterise female proprietors. Quantile regression analysis of the log transformed GVA shows that, controlling for other covariates, compared to urban men, urban women close in by the top quartile, while rural women close the gap by nearly one-half between the 25th and 75th percentiles. The median regression model, allowing for proprietor- and firm-level factors to differ across male-and female-led enterprises, further shows that female proprietors diverge from male proprietors primarily in hiring patterns, business location, and industry choice, while education and social background have relatively uniform effects across genders. This relatively underexplored analysis of UNAEs also highlights that data limitations permit only a minimal assessment on the role of gender composition of hired workers.

Key Words: *Unincorporated non-agricultural enterprises, Gross Value Added, Gendered Performance, Quantile Regression*

JEL Codes: *J16, L26, O17*

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INTRODUCTION

Self-employment has emerged as a significant and evolving sector in the employment landscape, encompassing both, entrepreneurial self-employment driven by innovation and opportunity, as well as distress-driven self-employment undertaken due to necessity (Can, 2021). While entrepreneurial self-employment has been widely studied due to the availability of structured datasets, distress-driven self-employment particularly in unincorporated non-agricultural enterprises (UNAE) remains an underexplored area (Mukherjee. et al, 2017). These enterprises, characterized by their small-scale operations, informal nature, and limited access to financial resources, play a crucial role in employment generation, especially for vulnerable sections of the workforce.

A notable trend observed in recent years is the gradual increase in self-employment among both rural and urban women. Periodic Labour Force Survey (PLFS) reports highlight a significant shift, particularly for rural women, whose self-employment rates have surged (GoI, 2018 to 2024). There is gradual increase in self-employment rates for both rural and urban women aged above 15 years with a marginal rise for rural men and no change for urban men. What stands out is large increase in the percentage of self-employed rural women from 57.7% to 73.5% in less than a decade starting 2017-18. Although this increase is predominantly from agriculture, the share in non-agriculture is also substantial.

This overall rise in non-agricultural self-employment warrants a deeper examination of its structural drivers and implications. Traditional assumptions about opportunity-driven self-employment may not adequately capture the lived experiences of those engaging in necessity-driven enterprises, necessitating a more nuanced investigation into the determinants of self-employment patterns. Thus, within small-scale UNAE, gender disparities in entrepreneurial engagement and firm

characteristics deserve scrutiny and has been less explored (Thomas, 2026). Men and women often differ in motivations, resource access, and business strategies, influencing enterprise performance. This study seeks to unpack these aspects, assessing how gender shapes entrepreneurial opportunities and constraints in self-employment.

The analysis in this study is carried out first to examine the proprietor- and firm-level characteristics across Gross Value Added (GVA) quartiles using quantile regression. A median regression model further highlights the variations between male and female enterprise owners and referred as proprietors in this study. The gendered analysis of self-employment from a firm's perspective remains largely unexplored making this study one of the earliest systematic attempts, based on the Annual Survey of Unincorporated Sector Enterprise (ASUSE) of 2023–24 carried out by the National Sample Survey Organization of India.

REVIEW OF LITERATURE

Barriers to growth: Differences in unincorporated non-agricultural enterprises and incorporated enterprises.

Due to their unorganized nature, UNAE often lack the necessary documentation required by formal financial institutions, leaving them unable to collateralize their assets for loans (Dutta & Dhar, 2021). Consequently, many UNAEs operate as outsourced units for larger firms, perpetuating vulnerability. Many operate as subsistence ventures rather than commercial enterprises, reflecting the lack of economies of scale and necessary resources for growth (Sharma et al., 2023). Low productivity also plagues UNAEs, which suffer from inadequate capital-labour ratios and limited technological use. Both rural and urban manufacturing enterprises within the informal sector demonstrate markedly lower productivity compared to their formal sector counterparts (Mitra, 2023). This lack of efficiency translates into significantly reduced

wages for informal workers, perpetuating poverty, and inequality. Wage disparities between formal and informal sectors remain acute, with informal workers facing limited access to social security benefits (Raj & Sen, 2019; Sheikh & Chavan, 2023).

Social identity factors, especially caste, play a significant role in the operation of UNAEs. Marginalized groups such as Scheduled Tribes (STs) encounter systemic challenges accessing resources and engaging in high-productivity activities (Sahu & Kumar, 2020). Caste-based discrimination entrenches inequality, limiting the ability of these groups to gain credit, adopt technology, and reach markets. As a result, enterprises owned by marginalized communities often fail to achieve sustainable growth, perpetuating disparities (Sheikh & Chavan, 2023).

Women proprietors in UNAEs confront distinct hurdles shaped by societal attitudes and gender discrimination. Negative family and societal perceptions deter women from pursuing entrepreneurial ventures, as shown by studies on trainees from rural self-employment institutes (Kumar and Kumra, 2023). Financial inclusion initiatives have addressed some barriers but failed to eliminate gender disparities in credit access, leaving entrepreneurial women at a disadvantage (Gang et al., 2022).

A lack of access to technology and markets further stifles UNAEs. The inability to adopt innovation and establish robust marketing channels limits their competitiveness against formal sector counterparts. Research indicates that product and process innovation, necessary for productivity enhancement, remains unattainable for many UNAEs due to resource limitations (Kumar and Kumra, 2023). This problem is further pronounced for rural establishments. Rural UNAEs experience unique challenges, particularly in accessing infrastructure, markets, and government support. For rural food entrepreneurs, barriers such as product quality inconsistencies, absence of buyers, and inadequate policy frameworks hinder opportunities to expand businesses (Panghal et al., 2023).

Contrasting enterprise attributes across genders

One of the most consistent findings across studies is that female-owned firms often underperform male-owned firms in terms of survival rates, profits, and growth. For instance, a study analysing data from the 2007 US Census Bureau PUMS dataset found that female led businesses trail male-led businesses in survival rates, profits, employment, and sales over a 15-year period (Kiefer et al., 2020). Similarly, a study conducted in India revealed that women-owned firms underperform in terms of size, growth, and efficiency compared to male-owned firms (Chaudhuri et al., 2020).

However, some studies suggest that these performance gaps may narrow or disappear when controlling for factors such as firm size, industry, and proprietor characteristics. For example, a matched-sample analysis of firms in the United States found that female-owned firms have the same survival rates and growth rates as male-owned firms when heterogeneity is controlled for (Farhat & Mijid, 2018)

Female-owned firms tend to differ from male-owned firms in terms of size, industry, and ownership structure. For example, a study examining data from the World Bank's Enterprise Survey in India found that female-owned firms are smaller in size, younger, and more likely to operate in the retail and service sectors compared to male-owned firms (Anandharaman and Rangaswamy, 2024). Similarly, a study analysing German SMEs found that female-owned firms are less likely to invest and have lower average investment rates compared to male-owned firms (Pelger, 2012).

In terms of ownership structure, female-owned firms are more likely to be organized as proprietorships, while male-owned firms are more likely to be organized as corporations (Cole & Mehran, 2011). Additionally, female-owned firms are more likely to be home-based and

have fewer employees compared to male-owned firms (Farhat & Mijid, 2016).

The differences between female- and male-owned firms also vary across regions and cultural contexts. For example, a study analysing data from over 100 countries found that female headed firms are more prevalent in countries with better rule of law, gender equality, and stronger individualistic cultures (Fang et al., 2020). However, this study further shows that female-headed firms in these countries still tend to have lower productivity and labour productivity growth compared to male-headed firms. In Africa, the performance gap between female- and male-headed firms is smaller, and female-headed firms may even have a comparative advantage in certain sectors, such as services (Fang et al., 2020). In contrast, in South Asia, female-headed firms face higher distortions on production and are more likely to underperform compared to male-headed firms (Ranasinghe, 2020).

UNAE productivity in developing economies: A gendered lens

Research on gender disparities in entrepreneurial performance highlights varying outcomes across different economic contexts. On one hand Mickiewicz and Nguyen (2024) analyze longitudinal data from Vietnam to assess the productivity of female-owned businesses compared to their male counterparts. Their study reveals that female-managed enterprises demonstrate higher efficiency in resource utilization, particularly in capital and labour management. This efficiency is further enhanced in challenging institutional environments, where female proprietors adopt strategic approaches to optimize productivity. Notably, the presence of a higher share of female employees or exclusive female staffing contributes positively to business performance, reinforcing the argument that gender-based employment structures influence firm success.

On the other hand, Islam et al. (2018) employ Oaxaca-Blinder decomposition techniques to investigate the labour productivity gap

between female- and male-managed firms and find that female-managed firms exhibit approximately 11% lower labour productivity compared to male-managed counterparts, indicating a significant unconditional gap. The productivity disadvantage is partially attributed to firm age, as female-owned enterprises are generally younger, contributing to the endowment effect in productivity differences. The decomposition analysis further highlights that female-led firms are less likely to have protective measures against external risks, such as crime and power outages, and often lack essential business infrastructure, including company websites and capital investments in manufacturing. These limitations, coupled with lower labour costs, contribute to the observed disparities in productivity between male- and female-managed firms.

Sabarwal and Terrell (2008) analyse firm-level data across 26 Eastern and Central European countries, highlighting gender-based differences in business performance. They find that female-owned firms operate at smaller scales with lower sales revenues and total factor productivity, yet achieve profit margins comparable to male-led businesses. While both male and female firms face inefficiencies due to scale limitations, women's enterprises are more constrained by capital access and industry concentration. The study concludes that female proprietors would benefit significantly from scaling their operations, as their returns to scale exceed those of male proprietors.

While existing studies provide valuable insights into female proprietorship, productivity, and resource efficiency, there remains a critical gap in the Indian context. Previous research has largely focused on developing countries and transition economies in Eastern Europe, yet India's entrepreneurial landscape remains understudied, particularly in the unincorporated sector.

This study seeks to fill this gap by leveraging the latest ASUSE dataset for 2023-24 to comprehensively examine the interplay of capital,

labour, and gender-based firm structures in India followed by a rigorous analysis of gross value added and resource efficiency disparities between male- and female-owned firms in India. By incorporating sectoral differences, labour structures, and capital constraints, the research aims to provide empirical evidence on gender-based business outcomes.

DATA

The Annual Survey of Unincorporated Sector Enterprises (ASUSE) 2023-24, conducted from October 2023 to September 2024, provides comprehensive data on unincorporated non-agricultural establishments across manufacturing, trade, and services (excluding construction)¹. Covering 4,98,024 establishments (2,73,085 rural and 2,24,939 urban), ASUSE captures key economic indicators for MSMEs, household enterprises, and own account businesses in India's informal sector, offering valuable insights into their employment structure, resource efficiency, and productivity dynamics. The study considers only the enterprises recorded under proprietorship. Only male and female proprietors are taken and transgender proprietors are excluded as the sample size was very small. Other enterprises like self-help-groups, partnerships and not for profit organizations are not in the purview of the study.

Computation of Gross Value Added by Establishment

Gross Value Added (GVA) was derived using the production approach (computed as the difference between total output and total input) following the methodology specified in the documentation of ASUSE 2023-24.

Total input was obtained by aggregating expenses across all activity-specific categories (manufacturing, trading, transport,

¹ The glossary of commonly used terminologies is mentioned in Appendix A.

warehousing, postal, accommodation, information & communication, financial, real estate, business services, education, health, personal services, and other activities), together with general operating expenses, after excluding transactions that do not constitute genuine intermediate consumption, namely, the value of goods purchased purely for resale, interest payments, expenditure on land or buildings acquired for resale, and insurance premiums. Total output was similarly constructed from the corresponding receipt categories, adjusted to reflect trading margins rather than gross sales. Gross sales represent the total revenue before deductions, while trading margin - often called gross margin - shows the profitability after subtracting the cost of goods sold. The margin from real-estate resale transactions amortised evenly across the year to smooth their lumpy, infrequent occurrence. GVA was estimated separately for establishments reporting on a monthly versus an annual (audited) reference basis, and the two series were subsequently reconciled into a single monthly-equivalent measure.

Variables in the study

Male and female owned firms or whether the firm has a male or a female proprietor is the main feature to focus upon. To further have a gendered lens to the hiring pattern of the establishment, the share of female unpaid labour and female hired labour for each establishment is used. Other correlates of GVA are capital in Indian rupees, labour as the number of persons employed (the emoluments data for many firms was unavailable); age of the firm under current ownership to capture the experience of the proprietor; the highest educational level of the proprietor; the type of labour the enterprise employs and their shares; industry of operation (classified into seven categories and listed in Table B1 of Appendix B); extent of technology used; whether the enterprise is in rural or urban, and states to which they belong to; the social group to which the proprietor belongs. The enterprises either are operated by just the proprietor or have hired workers. Both own-account-establishment

and hired-worker-establishment can have unpaid workers. This effectively gives four types of establishments: (i) only working owner, (ii) working owner and unpaid worker, (iii) working owner and hired worker (iv) working owner with unpaid and hired workers.

METHODOLOGY

The data analysis is carried out in three components. The first part provides a preliminary analysis based on summary statistics of the GVA quartiles tabulated across some important covariates focusing on the gender of the proprietor of the enterprise. This is followed by a discussion on how the covariates differ across quartiles of GVA using the quantile regression model and lastly the median regression model using OLS is estimated to get further insight into the extent of difference if any of the determinants of GVA for small enterprises in India based on the gender (male versus female) of the enterprise proprietor.

Quantile Regression Model

A quantile regression is useful when one expects heteroscedasticity and a skewed distribution of the dependent variable which would be the case for the GVA. We expect that the different factors (covariates) associated with GVA to not have the same effect across the GVA distribution or particularly at the lower tail and upper tail of the GVA distribution. Thus, quantile regression method enables to capture such heterogeneous effect of each covariate (conditional on the remaining covariates), along different quantiles of the distribution of a continuous variable like GVA (Koenker, 2005 and Goldar, 2022). The q^{th} quantile of GVA is when there is q fraction of firms at lower GVA and $(1-q)$ fraction at the higher values when ranked by their GVAs. For example, 0.25th quantile indicates that 0.25 fraction or 25 percent of firms have GVA less than this firm and 75 percent have more GVA values.

The quantile regression model is represented as:

$$Y_i = X_i' \beta_q + u_i \dots (1)$$

where for firm 'i', Y_i represents the outcome variable GVA and X_i is the vector of covariates. β_q is the vector of coefficients for the q^{th} GVA quantile associated with the X covariates and u_i is the stochastic error term. For every covariate, there will be 'q' estimated coefficients, unlike a single estimate for the OLS regression. This enables to get better insight how the determinants vary across the GVA distribution which are classified on the basis of quartiles in this study.

OLS Estimation of median regression for male-female ownership differentials

To investigate whether the determinants of GVA regression model differs for the female and male proprietors, we use the gender dummy interacted model as in Wooldridge (2015) that allows for an intercept and slope difference in the regressors for male and female proprietors. This would be the median regression as per the quantile regression model (Koenker, 2005). The aim of this empirical strategy is to understand if all or only some coefficients are different between female and male proprietors. To account for proprietor's gender differences in intercept and slope coefficients, an intercept dummy and interaction dummy with other regressors is included respectively; where the dummy variable $D_i=1$ for female proprietor and 0 for male proprietor.

$$LnGVA = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} + D_i(\gamma_0 + \sum_{j=1}^k \gamma_j X_{ij}) + \epsilon_i \dots (2)$$

As the interpretation of the dummy variable goes, β coefficients are for the male proprietors and γ coefficients if statistically significant is interpreted to be different for the female proprietors compared to male proprietors; the positive (negative) coefficient implying a higher (lower) impact than for male proprietors. A statistically insignificant γ coefficient implying no difference in the determinants between male and female proprietors.

RESULTS AND DISCUSSION

Descriptive Statistics

Given the heterogeneous nature of the ASUSE dataset, a quantile-based analysis of variable composition can provide deeper insights into underlying patterns and disparities. The gross value added (GVA) is divided into quartiles and corresponding composition of the proprietor-level characteristics like gender, caste and average education level of the proprietor and enterprise characteristic like the location of the enterprise are mapped. The results are presented for several covariates of GVA for male, female and all proprietors to understand how the GVA and its correlates vary across the two genders of the proprietors. A quartile classifies the entire distribution of GVA into four categories such that each quartile has 25% of the firms. The firms are arranged in the increasing order of the GVA so that quartile 1 has least GVAs, followed by the higher quartiles with the UNAs with top 25% GVAs in 2023-24 in quartile 4.

In 2023-24, 1.14 lakh establishments were reported to be owned by female proprietors constituting about 23.1% while male owned enterprises are about 77% totaling to 3.78 lakh UNAs. We first begin with cross-tabulation of GVA quartiles and gender of the proprietor of the UNAs. Table 1 shows that 60% of the female proprietors surveyed are in the lowest GVA quartile while 60% of the male proprietors surveyed are in the third and fourth quartiles indicating that the average GVA of a female led firm is lower to that of the male-led firm. Similarly, Table 2 below shows the gender-education composition across GVA. 47% of women proprietors who are above graduate are in the lower GVA quartile while 47% of above graduate men proprietors are in the highest GVA quartile. Similarly, while 66% women whose highest education level was below secondary operate in the lowest GVA quartile, 60% men with the

same educational background operate in either the second or third GVA quartile.

Table 1: GVA composition across men and women proprietors with summary statistics

GVA Quartile	Female (%)	Male (%)	Mean GVA (Rs. per month)	Standard Deviation of GVA
1	60.1	14.4	3308.8	1600.7
2	21.8	26.0	9149.4	1750.9
3	10.6	29.3	16743.9	3032.8
4	7.5	30.3	75662.6	304690.7
All	100	100	26215.01	155081.5

Source: Authors' computation from ASUSE 2023-24

Table 2: GVA and education level for female and male proprietors (%)

	Female			Male		
Education Level/ GVA Quartile	1	2	3	1	2	3
1	66.5	57.2	47.4	18.4	12.3	11.1
2	22.4	22.5	18.6	32.7	23.6	17.2
3	8.3	12.6	13.0	30.1	30.8	23.9
4	2.8	7.8	21.1	18.8	33.3	47.8
All	100	100	100	100	100	100

Source: Authors' computation from ASUSE 2023-24

Notes: (1) Column headers for Education Level-1: Below secondary level, 2: Between Hr Sec and graduate, 3: Above graduate. (2) Row Headers for GVA quartile- 1: bottom 25% of GVA, 2: next 25-50% of GVA, 3: next 50-75% of GVA and 4: top 25% of GVA.

Table 3 shows the GVA composition for different enterprise locations, conveys that enterprises with permanent structures are more likely to be in the higher GVA quartiles, while enterprises operating within household premises are more likely to be in lower GVA quartiles.

Table 3: GVA composition across different location of the enterprise (in %)

GVA Quartiles	Within Household	Permanent Structure	Other Structure
1	52.1	9.4	14.6
2	24.6	20.4	36.5
3	14.5	27.7	36.9
4	8.9	42.6	12.0
All	100	100	100

Source: Authors' computation from ASUSE 2023-24.

Note: Refer Table 2 for definition of GVA quartiles, 1-4.

Results from Table 4 indicate that women are more likely to have the establishment within household premises. Since women already operate at lower levels of GVA, a larger portion of enterprises within household also operate in the lower GVA quartiles. On the other hand, almost 53% of men-led enterprises have permanent structures.

Table 4: Composition of enterprise location across genders (%)

Enterprise Location	Female (%)	Male (%)	All (%)
Within Household	69.3	23.7	34.2
Permanent Structure Outside	23.2	52.8	46.0
Other Structures Outside	7.5	23.5	19.8
All	100	100	100

Source: Authors' computation from ASUSE 2023-24

We next discuss the findings of the results for the mean and standard deviation of the covariates of GVA provided in Table 5, separately for male, female and all proprietors. The covariates which are categorical in nature, the mean refers to proportion of firms in that category and the discussion below converts the shares to percentage for ease of discussion. As we have already observed that the GVA of female

owned firm is concentrated in bottom 25% and expectedly the mean GVA per annum is about one-third of that for men. Given this, the capital invested on an average is half that for male owned firms. As UNAEs are unorganised enterprises, the average number of workers or the labour used is very small, with about 1.3 workers and 3.5 per enterprise for the female and male owned firms. Similarly, the gap in age of the firms, share of unpaid and hired workers is not that different between female and male owned firms but they are still always lower in most aspects that could improve GVA. Male proprietors have a higher share of unpaid female workers while the share of female workers unpaid or paid is low across both female and male proprietor firms.

The industrial composition of the UNAEs is clearly gendered as seen from Table 5. About 50% of female owned firms are in traditional manufacturing consisting of manufacturing of food products, textiles, wearing apparel, tobacco products, leather, paper products etc², followed by about 20% in trade and transport and then other services at 12% and 9% in health sector; in contrasting to males owning 50% in the trade and transport sector followed by 14% in ICT and Finance where women own about 6% enterprises. Male owned manufacturing enterprises account for about 18% with 11% for traditional and 7% for modern manufacturing where women owned enterprises is only about 2.5%. This industrial composition of the firms will also have implications of location, technology used and the employees in these UNAEs.

Location of the UNAEs on one hand indicates how informally organised the economic activity would be and on the other hand a gendered aspect of time use. About 69% of the women owned UNAE is within the household premise compared to about 24% for men while 23% of women owned UNAEs are in fixed structures outside the house

² Table B1 in the Appendix B lists the NIC codes that are grouped as "Traditional Manufacturing"

wherein male owned UNAEs dominate this category with 53% and once again the gap is large (7.5% for females versus 23.5% for males) in the other structures (these include fixed premises with no structure, mobile markets and street vendors) as well between female and male owned UNAEs. This gap is biased against women potentially due to their restricted mobility outside of their household.

The technology of the home-based establishments is highly likely to be traditional or rudimentary and this could also be true for some trade related activities reflecting in 68% of the total UNAEs use no technology. A whopping 81.4% of the female owned and about 66% of the males owned UNAEs use no technology and this is perhaps also reflective of the lower capital that may be required to run these establishments. At the other end usage of internet is the next highest technological use as per the survey questionnaire and with 15% and 26% respectively for female and male owned firms. Usage of computers with or without internet is low. There is no information on the use of electricity (or the expenditure on it for this economic activity) or any other form of mechanization of the economic activity so it would be difficult to understand for instance if women use sewing machines powered with an electric motor or it is manual; where tailoring may be a predominant economic activity for female owned establishment in the traditional manufacturing segment of the industrial sector.

Another feature of the UNAEs is that they are predominantly (79%) own account establishments and more so among the female owned (93%) compared to male owned (75%); only 5% of women UNAEs hire workers compared to about 19% for the males owned. About 83% of these proprietors have not completed their graduation and UNAEs are usually low skilled establishments. About 48% (38%) of female (male) proprietors have below secondary education while the gender gap closes a bit by about 6 percentage points for the secondary

to below graduation and this gap is the least among graduate proprietors with 16% (18%) for females (males).

The caste composition of the UNAEs proprietor shows that they are predominantly OBCs followed by Others, STs and then SCs are the lowest. This ranking of social group shares is the same for both female and male owned UNAEs but there is a slightly higher share among SCs and STs for women compared to the male and overall average shares. The regional distribution indicates that the eastern India³ has a marginally higher share of 27% followed by the southern states and are usually about one-fifths. So regionally, these firms are more or less uniformly located and the distribution of the male owned UNAEs are also similar. However, female owned UNAEs are not that uniformly distributed with southern states dominating at 30% and East following closely at 28% followed by 23% in the West and the least 18% in the Northern states. The rural-urban composition of the UNAEs is nearly similar but marginally favours urban areas for female owned ones compared to the male and overall, which slightly favours the rural.

³ Table B2 in the Appendix B lists the states and Union Territories that are grouped into Indian regions: East, West, North, and South.

Table 5: Summary Statistics of male and female proprietors in Unincorporated enterprises in India, 2023-24

	Female Proprietors		Male Proprietors		All	
Output and Basic Inputs	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
GVA of establishment (Rs. '000 Per month)	11.0	48.21	30.8	174.63	26.222	1.55
Log of GVA	8.5	1.1	9.7	1.03	9.39	1.16
Capital (Rs. Lakhs Per year)	3.5	14.28	7.2	34.64	6.31	31.17
Log of capital	11.6	1.52	12.45	1.43	12.26	1.48
Labour (workers)	1.4	1.8	2.2	5.1	2	4.6
Log of labour	0.169	0.411	0.447	0.643	0.382	0.609
Age of firm under current proprietor (years)	8.4	7.1	10.4	8.5	9.9	8.2
Proportion of unpaid women workers	0.043	0.198	0.083	0.267	0.074	0.253
Proportion of hired women workers	0.038	0.181	0.029	0.14	0.031	0.151
Type of broad industry						
Traditional manufacturing	0.49	0.5	0.114	0.318	0.201	0.401
Modern manufacturing	0.025	0.157	0.069	0.254	0.059	0.235
Trade and transport	0.198	0.398	0.502	0.5	0.431	0.495
ICT, Finance and Administrative	0.066	0.249	0.147	0.354	0.128	0.335
Professional Services	0.002	0.045	0.012	0.11	0.01	0.099
Education and Health	0.097	0.296	0.067	0.25	0.074	0.261
Other services	0.122	0.327	0.089	0.284	0.096	0.295

Table 5 Continued...

Table 5 Continued...

	Female Proprietors		Male Proprietors		All	
Output and Basic Inputs	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Location of enterprise						
Within household (HH) premises	0.693	0.461	0.237	0.425	0.342	0.474
Outside HH premises with fixed structure	0.232	0.422	0.528	0.499	0.46	0.498
Other structures	0.075	0.263	0.235	0.424	0.198	0.399
Use of technology						
No tech usage	0.814	0.39	0.658	0.474	0.694	0.461
Computer only	0.0	0.018	0.001	0.024	0.001	0.023
Internet only	0.161	0.367	0.259	0.438	0.236	0.425
Both computer and internet	0.026	0.158	0.083	0.276	0.07	0.255
Employee Type						
Employs hired + unpaid workers	0.015	0.122	0.052	0.223	0.044	0.205
Employs only hired workers	0.051	0.22	0.198	0.399	0.164	0.37
Own account worker	0.934	0.248	0.75	0.433	0.792	0.406
Highest educational level						
Below Secondary	0.476	0.499	0.386	0.487	0.407	0.491
Secondary or above but below graduate	0.368	0.482	0.436	0.496	0.42	0.494
Graduate and above	0.156	0.362	0.179	0.383	0.174	0.379

Table 5 Continued...

Table 5 Continued...

	Female Proprietors		Male Proprietors		All	
Output and Basic Inputs	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Social group of proprietors						
Scheduled Caste (SC)	0.075	0.264	0.049	0.215	0.055	0.228
Scheduled Tribe (ST)	0.148	0.355	0.108	0.31	0.117	0.322
Other Backward Classes (OBC)	0.489	0.5	0.516	0.5	0.51	0.5
Others	0.288	0.453	0.327	0.469	0.318	0.466
Region of establishment						
East	0.284	0.451	0.281	0.45	0.282	0.45
North	0.183	0.387	0.256	0.437	0.239	0.427
South	0.301	0.459	0.24	0.427	0.254	0.435
West	0.233	0.423	0.223	0.416	0.225	0.418
Sector						
Rural	0.488	0.500	0.525	0.499	0.517	0.500
Urban	0.512	0.500	0.475	0.499	0.483	0.500

Source: Authors' computation from ASUSE 2023-24.

Note: Table B2 in the Appendix B lists the states and Union Territories that are grouped into Indian regions: East, West, North, and South.

Quantile Regression Estimates

The results presented in Table 6, provide coefficient estimates (based on Equation (1) and corresponding t-statistics for the 25th, 50th, and 75th percentiles, offering insights into the differentiated effects across the conditional distribution of the dependent variable, logarithm of monthly GVA by the establishment. Even if the log transformed GVA reduces

skewness, quantile regression remains useful because it helps examine heterogeneous effects across quantiles on the transformed scale.

Proprietor's Characteristics

Beginning with the proprietor's characteristics, we observe that, relative to urban males, rural males and females exhibit consistently negative and highly significant effects across all percentiles. Rural females face the steepest disadvantages, underscoring gendered and geographical disparities. Although this gap is closed by nearly 50% when moving from 25th to the 75th percentile (-0.48 at the 25th percentile to -0.26 at the 75th percentile). Interestingly, urban females demonstrate a shift from negative (-0.098) at the 25th percentile to positive (0.111) at the 75th percentile, suggesting dynamics where urban women may outperform men in higher-performing segments.

Relative to the "not literate" base category, the variable on education level of the proprietor reveals a positive progression in economic outcomes with increasing levels of education. However-, statistical significance is observed primarily at higher education levels. For instance, coefficients for graduates and above are positive and significant across all percentiles (0.163 at the 25th percentile to 0.175 at the 75th percentile), indicating the transformative impact of higher education on the firm's performance. Intermediate education levels, such as higher secondary education, become significant only at the 50th and 75th percentiles.

When it comes to social groups of the proprietor, the coefficients for Scheduled Castes (SC), Scheduled Tribes (ST), and Other Backward Classes (OBC) are interpreted relative to "Others" (indicative of those belonging to privileged social groups) as the base category. The results reveal persistent disadvantages for SCs, with significant negative effects

increasing in magnitude at higher percentiles (-0.039 at the 25th percentile to -0.070 at the 75th percentile).

Firm Characteristics

The coefficients for logarithmic labour and logarithmic capital are directly representative of their output elasticities. These values reveal the proportional contribution of labour and capital to the creation of GVA. These are consistently positive and statistically significant across all percentiles. The coefficients also demonstrate diminishing marginal returns as evidenced by the decreasing coefficients from the 25th (0.869) to the 75th (0.825) percentile. The t-statistics confirm the robustness of these findings, underscoring the primacy of labour and capital as essential inputs in production. Furthermore, a higher coefficient for $\log(\text{labour})$ than $\log(\text{capital})$ ($0.843 > 0.172$ at the median quartile) suggests that labour contributes more to GVA than capital, underlining critical role of labour in production processes of unincorporated enterprises.

The variable for age of the firm (under the current proprietor) shows a small positive and significant effect (coefficient around 0.004) across all percentiles, suggesting that experience of the proprietor contributes modestly to economic outcomes. Conversely, the share of female workers to total workers exhibits a negative and statistically significant effect, with a stronger impact at the lower quantile (-0.667 at the 25th percentile), indicating gender disparities in establishment's performance, particularly in lower-performing segments.

Enterprises that only placed orders online experienced a positive and significant impact at the 25th and 50th percentiles (0.113 and 0.055, respectively), although the effect diminishes at the 75th percentile (0.030) and becomes insignificant. Firms that both received and placed online orders demonstrated consistently positive and significant effects

across all percentiles (0.170 at the 25th percentile, 0.137 at the 50th percentile, and 0.127 at the 75th percentile). This suggests digital market participation is associated with higher GVA, particularly for lower-end firms, potentially helping them access markets.

Relative to professional services (the base category), other industries exhibit varying impacts. Basic manufacturing consistently shows a significant negative impact, with effects decreasing in magnitude as one moves up the percentiles (-0.266 at the 25th percentile to -0.161 at the 75th percentile). This pattern might reflect structural challenges in manufacturing sectors. Advanced manufacturing has an insignificant effect at the lower percentiles but becomes marginally significant and positive at the 75th percentile (0.072), potentially indicating advantages for high-performing entities in this industry. Trade, transport, and accommodation, as well as ICT, financial, and administrative services, exhibit predominantly negative impacts compared to professional services, with the latter sector showing substantial negative coefficients (-0.437 at the 25th percentile, -0.302 at the 50th percentile, and -0.179 at the 75th percentile). These findings may highlight specific industry-level disparities in economic performance.

Table 6: Quantile regression estimates for log (GVA), 2023-24

Variables (Dependent: log of GVA)	25th Percentile		50th Percentile		75th Percentile	
	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat
Constant	7.152**	68.06	7.507**	105.08	7.893**	140.10
Proprietor's characteristics						
Region and Gender (Base: Urban Male)						
Rural Male	-0.179**	14.26	-0.173**	19.23	-0.178**	23.89
Rural Female	-0.48**	12.07	-0.346**	11.48	-0.26**	9.81
Urban Female	-0.098**	2.61	0.025	0.91	0.111**	4.84
Education level (Base: Illiterate)						
Below primary	0.025	0.35	0.014	0.26	-0.014	0.54
Primary–below secondary	0.054	0.82	0.075	1.88	0.034	1.23
Secondary–below higher secondary	0.05	0.76	0.064	1.63	0.037	1.36
Higher secondary– below graduate	0.067	1.01	0.093*	2.33	0.099**	3.63
Graduate and above	0.163*	2.45	0.159**	3.98	0.175**	6.36
Social group (Base: Others)						
Scheduled Caste (SC)	-0.054	1.4	-0.021	0.69	0.014	0.44
Scheduled Tribe (ST)	-0.039*	2.02	-0.051**	3.41	-0.07**	5.11
Other Backward Classes (OBC)	-0.01	0.78	-0.021*	2.32	-0.017	1.94
Firm Characteristics						
Log of Labour	0.869**	84.84	0.843**	112.31	0.825**	124.89
Log of Capital	0.172**	29.17	0.172**	38.43	0.161**	46.50
Age of the enterprise	0.004**	6.48	0.004**	7.21	0.004**	9.40
Share of female workers	-0.667**	20.91	-0.588**	24.05	-0.524**	33.09

Table 6 continued...

Table 6 continued...

Variables (Dependent: log of GVA)	25th Percentile		50th Percentile		75th Percentile	
	Coeff.	t-Stat	Coeff.	t-Stat	Coeff.	t-Stat
Use of technology by the enterprise (Base: Neither placed nor received orders online)						
Only received orders online	-0.035	0.8	0.021	0.92	0.025	0.8
Only placed orders online	0.113**	4.51	0.055**	2.94	0.03	1.44
Both received & placed online	0.17**	4.87	0.137**	5.47	0.127**	3.57
Broad Industry (Base: Professional services)						
Basic manufacturing	-0.266**	7.75	-0.26**	10.38	-0.161**	5.73
Advanced manufacturing	0.001	0.02	0.002	0.08	0.072*	2.46
Trade, transport, accommodation	-0.132**	4.01	-0.109**	5.11	-0.009	0.36
ICT, Fin, and admin services	-0.437**	11.63	-0.302**	12.77	-0.179**	6.28
Education, health, recreation	-0.218**	6.54	-0.176**	7.77	-0.085**	3.11
Other activities	-0.107**	3.07	-0.134**	5.78	-0.087**	3.19

Source: Authors' estimation from ASUSE 2023-24.

Note: The significance levels indicated are: * $p < 0.05$; ** $p < 0.01$

OLS estimates of median regression for male-female ownership differences

Table 7 shows the output of the regression model (equation 2). The intercept difference in entrepreneurial success indicates that female-owned businesses start at a lower baseline productivity level compared to men. This initial disparity reflects systemic disadvantages in access to financial resources, industry concentration, and labour utilization. Existing literature consistently highlights women's higher efficiency in

resource management. This can particularly be seen with capital utilization with women having an increase of 20% compared to 18% for men for a 1% increase in capital. However, results indicate that female proprietors tend to experience lower returns to labour. Nevertheless, a notable pattern emerges among establishments that employ workers; female proprietors derive higher returns to additional hired or unpaid labour compared to male proprietors. This efficiency gain offsets their initial disadvantage, leading to productivity levels on par with men-led establishments when labour structuring is optimized.

Another critical dimension in this analysis is the role of unpaid female labour in shaping the GVA. While an increase in share of female unpaid labour generally exerts a negative impact on productivity, women-led businesses with a higher share of unpaid female workers experience a comparatively lower reduction in GVA than male-led firms employing similar levels of unpaid female labour. This suggests that female proprietors may leverage unpaid labour more effectively, possibly through informal networks and community-driven economic participation. While interpreting the coefficients, from a theoretical perspective, the diminishing marginal returns framework offers a compelling explanation. Since female-led enterprises start at a lower initial GVA, additional investments in capital, labour, or organizational restructuring yield stronger marginal gains before reaching an efficiency plateau. This follows a concave production function, wherein businesses operating at lower productivity levels benefit more from incremental inputs. Conversely, male-led firms, which already function at a higher productivity threshold, exhibit limited efficiency gains from additional labour or capital. At this stage, further investments may lead to diminishing returns, or even operational inefficiencies.

Firm-level characteristics, such as business location, also play a crucial role in determining entrepreneurial success. Establishments operated by women within household premises demonstrate lower

efficiency, with productivity constraints exacerbated in traditional manufacturing sectors. Industry-wise performance further reinforces these disparities female-owned firms consistently underperform in manufacturing and ICT, while exhibiting no significant gender-based differences in other sectors. Interestingly, interaction terms within proprietor characteristics yield insignificant effects in most cases. Education, for instance, serves as an equalizing factor, higher educational attainment benefits both genders similarly, indicating that skill acquisition mitigates entrepreneurial disparities. Similarly, among marginalized social groups, gender-based differences manifest unevenly. While OBC women tend to outperform their male counterparts, ST and SC women show no statistical difference, suggesting that social identity may outweigh gender effects in these cases. Notably, urban enterprises do not exhibit significant gender-based disparities in business outcomes, reinforcing the role of sectoral constraints rather than proprietor characteristics in shaping entrepreneurial success.

Thus, female proprietors differ from male proprietors primarily in enterprise-level factors such as hiring patterns, business location, and industry selection, while personal characteristics like education and social identity have relatively uniform effects across genders. This underscores the importance of structural business factors over individual attributes in determining the trajectory of female proprietorship.

Table 7: Median Regression of GVA for Gender differences in Ownership

Variables (Dependent: log of GVA)	Female Proprietor		Male Proprietor	
	Coeff.	SE	Coeff.	SE
Constant	-0.3786***	0.1116	6.8377***	0.0377
Production function				
Log of capital	0.0192***	0.0056	0.1848***	0.0025
Log of labour	-0.0781**	0.0347	0.6014***	0.0084
Firm characteristics				
Age of the firm under the current proprietor	0.0026**	0.0011	0.0039***	0.0003
Share of hired female workers	0.0253	0.0407	-0.1697***	0.0163
Share of unpaid female workers	0.1301**	0.0463	-0.3513***	0.0118
Location of establishment (Base: Outside HH premises with fixed structure)				
Within household (HH) premises	-0.2743***	0.0175	-0.2315***	0.0073
Other location	0.0638	0.0391	0.2765***	0.0063
Employing pattern (Base: Own account worker)				
Employs hired + unpaid workers	0.3508***	0.06	0.3681***	0.0153
Employs only hired workers	0.2880***	0.0458	0.4075***	0.01
Broad industry (Base: Professional services)				
Traditional manufacturing	-0.4243***	0.0863	-0.0356*	0.0204
Modern manufacturing	-0.6907***	0.099	0.1322***	0.0233
Trade and transport	-0.0718	0.087	0.0129	0.0194
ICT, Finance and Administrative	0.0094	0.0869	-0.4471***	0.0196
Education and Health	-0.3823***	0.0859	-0.1169***	0.0201
Other activities	-0.0099	0.0885	-0.1135***	0.0207

Table 7 continued...

Table 7 continued...

Variables (Dependent: log of GVA)	Female Proprietor		Male Proprietor	
	Coeff.	SE	Coeff.	SE
Technology use (Base: No tech use)				
Computer Only	0.1504	0.2001	0.0049	0.1367
Internet Only	0.0195	0.0151	0.2256***	0.0057
Computer + Internet	0.0999**	0.031	0.3928***	0.0113
Proprietor's characteristics				
Region (Base: North)				
East	-0.0117	0.0166	0.0161*	0.007
South	0.0691***	0.0144	0.1050***	0.0063
West	-0.0777***	0.0157	-0.0939***	0.0064
Sector (Base: Rural)				
Urban	0.0145	0.0109	0.1413***	0.0047
Social group (Base: Others)				
Scheduled Caste (SC)	-0.0429	0.0403	-0.1826***	0.0141
Scheduled Tribe (ST)	-0.0096	0.021	-0.0645***	0.0097
Other Backward Classes (OBC)	0.0428**	0.0136	-0.0432***	0.0056
Educational level (Base: Below Secondary)				
Hr. Sec. and above, but not graduate	-0.0199	0.0129	0.0797***	0.0057
Graduate and above	-0.0136	0.0196	0.1629***	0.0095

Source: Authors' estimation from ASUSE 2023-24.

CONCLUSION

The Periodic Labour Force Surveys (PLFS) are a more comprehensive survey on employment which reveals that self-employment has steadily risen over the years, with notable increases among rural women—from 57.7% to 73.5%—and significant growth across all age groups (Manivannan, 2025). The age-wise employment composition of rural women, disaggregated into four-year cohorts, further indicates that self-employment has doubled or tripled over the four-period timeframe.

These trends underscore the transformative role self-employment plays in facilitating economic participation among traditionally marginalized groups, while also prompting critical questions about the structural and economic factors driving these shifts.

The GVA quartile wise summary provides additional insights into the heterogeneity of enterprise performance, particularly measured by gross value added (GVA). A stark gender disparity emerges: approximately 60% of female proprietors are concentrated in the lowest quartile, in contrast to 60% of male proprietors occupying the higher quartiles (third and fourth). This pattern is further nuanced by the interplay of variables such as education and enterprise location. Additionally, enterprises with permanent structures—more commonly owned by men—are predominantly associated with higher GVA, while a significant share of women-led ventures operating within household premises fall into the lower GVA categories. These findings highlight the multifaceted nature of self-employment, where factors such as access to capital, infrastructure, and educational attainment intersect with gender to influence economic outcomes.

Building on the quartile-wise summary, the quantile regression also highlights the heterogeneity in the determinants of enterprise outcomes. From the perspective of proprietor's characteristics, persistent disadvantages are evident for rural proprietors and women, with rural females facing the steepest penalties across the distribution. Scheduled Castes also experience consistent negative effects, which intensify at higher percentiles, pointing to entrenched social disadvantages. Interestingly, urban females demonstrate a shift from negative to positive coefficients across the distribution, suggesting that in higher-performing segments, women proprietors in urban areas may outperform their male counterparts. By incorporating a gender dummy and interacting key variables with gender, the analysis reveals that while certain variables affect both groups similarly, others have a distinctly

different impact. Specifically, the significance of interaction terms provides evidence that a unit change in some determinants leads to different outcomes in enterprise performance for men and women, thereby validating the necessity of a gendered lens in such analyses.

While this study provides valuable insights into gendered employment patterns and enterprise performance, certain data limitations restrict a more nuanced analysis. Firstly, the selection of women into specific types of employment is influenced by individual characteristics and socio-cultural backgrounds. However, the dataset lacks direct information on these determinants, making it difficult to assess their precise role in shaping employment trends. Secondly, limited data on the characteristics of hired workers have permitted only a minimal assessment of the role of their attributes including gender in explaining productivity differences. Thirdly, while expenses on capital and labour are available, there is no data on how these enterprises source their capital. Fourthly, the absence of employee-specific characteristics such as education, age, and skill levels prevents a full assessment of labour quality, which is critical for evaluating productivity. Moreover, public policies and government schemes that may support these enterprises are not documented within the dataset. Particularly, with schemes like MUDRA which are designed to assist small scale female proprietors it may be useful to analyse how women in particular who access these loans are able to improve their GVAs. This restricts the ability to analyse the impact of policy interventions on firm performance.

In summary, this study has demonstrated that self-employment in India especially among women is characterized by pronounced disparities in enterprise performance. By utilizing ASUSE data, the research delineates how demographic factors, educational background, and enterprise characteristics converge to shape the enterprise performance that are mostly different across male and female owned UNAEs. These insights are crucial for informing targeted policy

interventions that can address the structural inequities underlying self-employment and foster a more inclusive environment for entrepreneurship. Future research should continue to explore these dynamics and evaluate the long-term impacts of these disparities on the livelihood of UNAE proprietors. There is ample scope for more rigorous analysis by including the earlier years of ASUSE surveys and is being explored for further research.

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APPENDIX A: Glossary of key terms used

1. Enterprise: An institutional unit in its capacity as a producer of goods and services is known as an enterprise. An enterprise is an economic transactor with autonomy in respect of both financial and investment decision-making, as well as authority and responsibility for allocating resources to produce goods and services. (ASUSE 2023-24 report)

2. Establishment: An establishment is an enterprise, or part of an enterprise, that is situated in a single location and in which either only a single productive activity is carried out or in which the principal productive activity accounts for major part of the value added. The enterprise and the establishment are the same for single-establishment firms. (ASUSE 2023-24 report)

3. Gender: Refers to the socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender diverse people. It influences how people perceive themselves and each other, how they act and interact, and the distribution of power and resources in society. Whereas sex refers to a set of biological attributes in humans and animals (Canadian Institute of Health Research, 2023). In the context of current study gender and sex have been used interchangeably assuming females are women and males are men.

4. Gross Value Added: The Gross Value Added (GVA) of the establishment is worked out by deducting total output from total input (as calculated by summation of output and input data collected in the survey). (ASUSE 2023-24 report)

5. Hired Worker establishment: An establishment which is employing at least one hired worker on a fairly regular basis is termed as hired worker establishment. Paid apprentices, paid household members /servants /resident workers in an establishment are considered as hired workers. (ASUSE 2023-24 report)

6. Own account establishment: An establishment which is run without any hired worker employed, for the major part of the period

when operation(s) of an establishment are carried out during a reference period. (ASUSE 2023-24 report)

7. Self-Employment: Persons who operate their own farm or non-farm enterprises or are engaged independently in a profession or trade on their own-account or with one or a few partners are deemed to be self-employed in household enterprises.

8. Unincorporated Non-agricultural establishment: All establishments covered under Sections C to U of NIC-2008 are "non-agricultural establishments". However, under ASUSE, Sections C to S of NIC-2008 are considered. Non- agricultural establishments which are not incorporated are those that are neither registered under Companies Act, 1956 nor under Companies Act, 2013. (ASUSE 2023-24 report)

APPENDIX B: Tables

Table B1: Classification of broad industry using NIC codes

Sl. No.	Broad Industry	NIC Divisions
1	Traditional Manufacturing	10 to 19
2	Advanced Manufacturing	20 to 38
3	Trade, Transport & Accommodation	45 to 56
4	ICT, Financial and Admin Services	58 to 68, 77 to 82
5	Professional Services	69 to 75
6	Education, Health and Recreational activities	85 to 93
7	Other Services	94 to 96

Source: Based on two-digit National Industrial Classification, 2008 from https://www.mospi.gov.in/uploads/documents/publicDocuments/1760616645687-nic_2008_17apr09.pdf

Table B2: Grouping of States into Regions

Region	States/ Union Territories
East	Bihar, Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Assam, West Bengal, Jharkhand, Odisha, Chhattisgarh
West	Rajasthan, Madhya Pradesh, Gujarat, Dadra & Nagar Haveli, Daman & Diu, Maharashtra, Goa
North	Jammu & Kashmir, Himachal Pradesh, Punjab, Chandigarh, Uttarakhand, Haryana, Delhi, Uttar Pradesh, Ladakh
South	Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Lakshadweep, Puducherry, Andaman & Nicobar Islands, Telangana

Source: <https://www.dcmsme.gov.in/publications>

MSE Monographs

- * Monograph 36/2017
Underlying Drivers of India's Potential Growth
C.Rangarajan and D.K. Srivastava
- * Monograph 37/2018
India: The Need for Good Macro Policies (4th Dr. Raja J. Chelliah Memorial Lecture)
Ashok K. Lahiri
- * Monograph 38/2018
Finances of Tamil Nadu Government
K R Shanmugam
- * Monograph 39/2018
Growth Dynamics of Tamil Nadu Economy
K R Shanmugam
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