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# Female Earnings and Household Contribution in India's Urban Informal Sector: A Study of Working Women in India

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## ABSTRACT

India's female labour force participation remains low even as women's educational attainment has risen, a contrast that has attracted considerable policy attention (IMF 2015; Sinha and Mehrotra 2019). This paper examines the determinants of female contribution to household earnings, using data from the Periodic Labour Force Survey (PLFS). Using a weighted least squares (WLS) regression, the study models the female share of total household earnings as a function of the household participation rate, education, husband's income, and the female's age among other variables. The results indicate that a woman's contribution to household earnings is adversely influenced by the rate of household participation. Conversely, the effect of the female's increasing education level is modest and positive. The relationship between the employment status of the spouse and contribution by the female is negative. The findings suggest that household-level constraints, including household structures and spousal economic characteristics play a larger role than individual attributes alone in shaping self-employed and casual women's economic participation. The findings imply that policies aimed at raising female labour force participation should focus on reducing socio-cultural constraints on casual and self-employed women's paid work.

## INTRODUCTION

With a real GDP expansion of 7.1% for the 2025 fiscal cycle, India remains a leading driver of global economic progress. Essential to this trajectory is its working-age demographic that stands among the most substantial worldwide. Around 68.7% of India's population is between the ages of 15 and 64, and this is expected to reach 70% by 2030 (Desai and Kulkarni n.d.). This expansion in the workforce is also reflected in the Periodic Labour Force Survey (PLFS) which shows India's unemployment in 2025 hitting an eight-year low of 3.1%. One possible reason for this increase in workforce is the rising female employment as seen from the Female Labour Force Participation (FLFP) statistics which rose from 23% in 2017-18 to 42% in 2023-24 (*Akashvani News* 2025). However, these headlines are not without structural imbalances in the workforce.

For example, there is a stark disparity in the rise of Labour Force Participation Rates (LFPR) for women over 15 years between urban and rural areas. An evaluation of labour metrics from 2022 to 2025 reveals that the rural LFPR shifted from 37.5% to 45.9%, whereas urban environments saw a minor rise from 24.7% to 27.7%. This demonstrates that the rural expansion outpaced urban growth by nearly a two-to-one margin, illustrating that surges in female employment are impelled by India's agrarian and village economies. On the other hand, the rising rate of education in urban towns and cities, results in the labour force dropping with increasing education and then rising again. Women who are more educated tend to marry spouses with higher levels of education (Chatterjee, Desai, and Vanneman 2018). As household wealth rises, married women often drop out of unskilled labour as their employment is no longer needed to support the family (Verick 2017; Klasen and Pieters 2015). In other words, female contribution to the household budget in urban areas typically increases only when necessary.

Nonetheless, female contribution to household income has been shown to be beneficial. According to Thomas (1990) maternal income significantly increases expenditure on nutrient-dense foods and health. Female controlled income is usually associated with an increased proportion of the budget allocated to children's clothing, education and nutrition. (Lundberg et al. 1997), (Bhupal and Sam 2014). When women contribute economically to the household, their greater intra-household bargaining power tends to redirect household spending towards basic needs, children's welfare, and longer-term investments. (Nordman and Sharma 2016), (Doss 2013). The hypothesised U-shaped trend of female labour force participation (FLFP) is therefore relevant because women's withdrawal from paid work as household earnings rise may reduce their share of total household earnings. Consequently, their ability to positively influence household expenditure and living standards are reduced.

Therefore, it is important to look not only at FLFP rates but also at female contribution to household earnings. In India, the recovery in FLFP is largely concentrated in the informal sector (UNFPA 2025).

This paper therefore attempts to examine the factors that limit or encourage female contribution to household earnings in the urban informal sector by considering the following questions:

a) What household, spousal, and individual socioeconomic factors are significantly correlated with the percentage contribution of women to household earnings in India’s urban informal sector?
b) How do the direction and strength of these correlations vary across spousal, household and individual socioeconomic factors?

The study uses data sourced from the National Sample Survey Office (NSSO 2025) and employs a Weighted Least Squares (WLS) regression model. Female percentage contribution is used as the dependent variable to represent female contribution to household income. Household size, children and dependents; Male income and education ; female age, education,working hours and occupation are taken to represent household,spousal and socio-economic factors respectively.

## LITERATURE REVIEW

Ghouse (2025) examines the correlation between female education and female socio-economic empowerment. It analyzes the PLFS and several other primary data sources. The data indicates a positive shift in education as a result of government initiatives such as *Beti Bachao*. Consequently, health indicators such as nutrition, decision-making and economic empowerment are positively impacted. In addition, the study finds that the female literacy in India has risen from 65.46% in 2011 to 70.3% in 2024, underscoring state-wise disparities, with Kerala at the top and Bihar at the bottom. Thus, the study concludes that female education has a multiplier effect on socio-economic empowerment.

On the other hand, Negi (2023) examines whether higher education levels correlate with income inequality in India. The study uses national data sets to analyse the correlation between the AYS (Average Years of Schooling) Index and the Gini Index. The study suggests a relationship between educational attainment and income inequality. However, the quality of education is also influenced by considerations such as regional differences in the instructional standard and localised labour market differences. Therefore, Negi concludes that while there is a correlation between income inequality and education in India, it is also affected by other factors and suggests that policies should aim to address these differences while increasing the education level in India. The two studies suggest that education affects women's economic agency, which evidences a greater focus on education as a predictor for female contribution to household earnings.

Zhao (2015) evaluates the intersection of spousal human capital and female earnings, tracing how a husband's educational attainment correlates with a married woman's productivity over a ten-year span. Utilizing cross-sectional data from the Current Population Survey (CPS), the study employs an Ordinary Least Squares (OLS) framework to isolate these changes. The model finds that the benefit of the male's education on this spouse's earnings is significant, with an estimated effect of 1.5–4%. One suggested reason for this effect is "positive assortative mating" (Zhao, 2015), where individuals with a higher level of education tend to prefer spouses at an equal level. Further to this, Dubey et al. (2024) demonstrate that the income effects of education do not occur in isolation, but are instead impacted by broader socio-economic variables, such as household poverty and the local environment.

Finally, Awan et al. (2015) analyze the determinants of financial contributions by females employed informally within the urban labour market. They make use of stratified survey based data from Dera Ghazi Khan district of Pakistan. Applying Ordinary Least Squares (OLS) estimations, they model "Women's Support for Family" which was defined by "ratio of woman's monthly income for household to the total household income" as a function of many socio - economic variables. Further, female education has a positive correlation with WSF with every additional year of education increasing female contribution by INR 0.0126. The study also suggests that as the number of economically active individuals in a household increases, female contribution to household budget decreases showing a strong statistically significant correlation of -10%. Variables that were largely insignificant included the age and age squared of women as well as young children (under six years). Awan et al conclude that financial

contributions by females working in the informal sector to the household's budget increase primarily in response to household poverty, meaning that spousal employment status and the number of dependents strongly correlate with the female's share of total earnings.

The paper contributes to the discussion on female economic activity in the following ways.

1) While existing Indian literature primarily centers on labor force participation rates or absolute earnings, this study focuses specifically on the relative contribution of females to household earnings, centering the results around statistical correlations rather than causal effects.
2) This study models the female percentage contribution as a continuous variable rather than a binary outcome (e.g., whether a wife earns more than her husband), which is more accommodating to the joint family structures also present in urban India.
3) By utilizing the nationally representative recent PLFS microdata, this research provides large-scale empirical evidence specifically focused on self-employed and casual female workers in the urban informal sector, filling a gap where prior studies have relied on smaller, localized, or international samples.

## DATA SOURCE AND METHODOLOGY

Data for this study were taken from the PLFS report 2025, sourced from the NSSO ("Periodic Labour Force Survey (PLFS) Annual Report," 2025). The PLFS is India's national unemployment survey and provides representation for the entire country. Additionally, its large sample size and consistency in reliability over the years makes it ideal for the study. Operating on a multi-stage stratified design, the PLFS provides quarterly metrics for urban regions as well as annual tracking for both rural and urban sectors. The analytical sample for this study isolates working female respondents located within urban First Stage Units (FSUs). At least one woman was engaged in informal economic activity in each household present in the study. As the dataset was taken from the PLFS report, the study excludes forms of work that are not separately captured in the survey such as hybrid and mobile labour.

### Informal Sector Determination

In this study the informal sector was categorised on the basis of the ILO definition : "as any remunerative work (both self-employment and wage employment) that is not registered, regulated, or protected by existing legal or regulatory frameworks" (International Labour Organization, 2015). This was done since the PLFS survey does not present sector identification as a survey question.

The data taken from the PLFS survey were filtered to retain the variables required for the survey.
The categories used are as follows: "enterprise registration, contract status, provident fund/employees' state insurance, and nature of employment" (National Statistical Office 2026) . Following standard PLFS definitions, enterprise registration is used to identify unincorporated proprietary or partnership operations. The absence of written job contracts and social security provisions (such as a provident fund) serves to

identify informal employment structures, and is used as a second check to confirm informality. Males and Females enrolled in educational institutions were excluded from the study. Also excluded from the study are regular wage workers since they fall into the category of both formal and informal sector. To remove uncertainty and avoid accidental incorporation of formal sector workers, the study focuses strictly on more precarious segments of urban informal employment, specifically self employment and casual labour.

The attributes that were not directly presented as survey questions were computed using individual responses. A Python script was used to parse the downloaded PLFS microdata based on official guidelines. The sequential operations used to generate the variables are detailed in Table 1

***Table 1:*** *Steps for variable determination*

| Variables | Steps |
|---|---|
| Female Percentage Contribution | Step 1: Total earnings of household per month summed*<br>Step 2: Female earnings divided by total household earnings per month |
| Number of Children | Step 1: Female's own children identified<br>Step 2: If ages between 6 and 15, count is incremented |
| Number of Infants and Toddlers | Step 1: Female's own children identified<br>Step 2: If ages between 5 and 0, count is incremented |
| Household Size | Step 1: Identify each household by its head, who is listed first (serial number 1) within each household.<br>Step 2: Count the members from one head of household (serial 1) up to the next head of household; this count is the household size. |
| Adults present in the Household | If age > 18, for any individual in the household, count is incremented |
| Female's Work Hours | Work hours in a week divided by 7 |

**(Earnings defined as per the PLFS)*

## Gender-Based Limitations in the PLFS

As this study is primarily about women and women's participation in the labour force, it is important to address potential systemic undercounting (Desai and Durga 2025) in the source data. Economic activities in the PLFS survey are determined based on principal and subsidiary activities. These classifications can also influence the employment indicators used to inform government policy decisions. In the informal sector where employment is not formally contracted, female economic work can be irregular or part-time. In the PLFS, if a woman spends a larger period of time performing a non-economic activity such as "attended domestic duties only" her principal status will be the same. This deprioritises her economic activity and contribution to household budget which could be significant in policy decisions that often focus primarily on the principal status. This study, therefore, equally prioritises a woman's primary and secondary status when developing a model. The status of "attended domestic duties and was also engaged

in free collection of goods (vegetables, roots, firewood, cattle feed, etc.), sewing, tailoring and weaving for household use" (PLFS Status Code 93) is primarily defined as a non-economic activity. However, as they replace household expenditures, it can be argued that they directly contribute to the household budget. This can be seen to increase rates of female participation in the labour force. As this impact is minimal in urban areas, it is not taken into account in this study.

## METHODOLOGY

When making estimates of factors that affect women's contribution to household earnings, many alternative methods have been used previously. Roy *et al.* (2017) used a logit model to measure the contribution of women to their household income, their impact on the decision making process, and the impact of income on decision making. Factors affecting the workforce in Malaysia by women who were married were evaluated by Ismail and Sulaiman (2014) using a logistic binomial model. However, in 2007, Khan & Khan (2007) used an OLS model to analyse the contribution of informally employed women in Pakistan. As previously cited, Awan et al (2015) also used an OLS model to establish the factors affecting female contribution to the household budget. The dependent variable of the study, female percentage contribution to household earnings, is a continuous ratio, a linear model such as an OLS model is more appropriate, whereas logit and Tobit models are better suited to binary or censored outcomes. The regression utilises the official household-level multipliers (MULT) as frequency weights to ensure national-level population representativeness. Therefore, the present study uses a Weighted Least Squares (WLS) model to account for the complex multi-stage stratified sampling design of the PLFS survey while keeping to a linear model. As the WLS model appears most closely aligned with the approach adopted in similar studies, it was taken for the study.

Given that cluster-robust standard errors were not computed, the model aligns well with the paper's aim of estimating weighted associations rather than definitive causal analysis. Statistical inference from the resulting parameters should be interpreted with appropriate caution as specified in the econometric analysis sections.

A WLS model can be given by the algebraic form in Equation 1.

$$min\,\beta \sum_{i=1}^{n} w_i \left( y_i - \beta_0 - \sum_{j=1}^{k-1} \beta_j x_{ij} \right)^2$$

*Equation 1 : Minimisation of the Weighted Least Squares Error*

To find the coefficients of the predictive terms and therefore determine their effect on the dependent variable the weighted sum of squared residuals is taken.

The Weighted Linear Regression model computes the coefficients using Equation 2.

$$\beta = \frac{X^T W y}{X^T W X}$$

*Equation 2 : Predicted coefficients of the Minimisation*

Where:

**β** is the vector of estimated coefficients

**X** is the independent variable matrix

**W** is the diagonal matrix of weights

**y** is the vector of dependent variable results

The function is therefore modelled as given in Equation 3.

$$FPC = f(FGE, FAS, FGL, FMS, FOC, FWH, ADP, HHS, HSE, HGL, HMC, NIT, NOC, RHP)$$

*Equation 3: Function predicting the FPC*

Where,

$$f(x) = \beta_0 + \sum_{j=1}^{k-1} \beta_j x_j$$

The abbreviations, definitions and other details are captured in Table 2

*Table 2: Definitions and Abbreviations*

| Abbreviations/ Variable | Definitions | Details |
|---|---|---|
| FPC | Female Percentage Contribution (monthly) | Ratio of female's monthly earnings to total household earnings |
| FGE | Female's Age | Age in Years |
| FAS | Female's Age Squared | Square of Age |
| FGL | Female's General Education Level | The general education level as defined by the PLFS |
| FMS | Female's Marital Status | Married - 1, Otherwise - 0 |

| Abbreviations/ Variable | Definitions | Details |
|---|---|---|
| FOC | Female's Occupation | Hairdressers, Beauticians and Related Workers (514) and Garment and Related Trades Workers (753) as per NCO definitions - 1, Other - 0 |
| FWH | Female's Work Hours | Average Hours worked per day |
| ADP | Adults Present in Household | Total number of adults present in the household (Long term residence) |
| HHS | Household Size | Total number of people present in the household (Long term residence) |
| HSE | Husband's Status of Employment | 1 - Employed, 0 - Other |
| HGL | Husband's General Education level | The general education level as defined by the PLFS |
| HMC | Husband's Monthly Contribution | Husbands' earnings per month |
| NIT | Number of Infants and Toddlers | Number of children aged 0 - 5 belonging to female |
| NOC | Number of Children | Number of children school aged belonging to female (6 - 15) |
| RHP | Rate of Household Participation | Ratio of earning household members to household size |

*Female Percentage Contribution (FPC) is calculated as the ratio of the female's monthly earnings to total household earnings from the PLFS data. This continuous ratio serves as an appropriate measure because it captures a woman's relative financial leverage within joint family structures.*

*The Rate of Household Participation (RHP) has a direct mathematical relationship with FPC. As more members earn, the total household income pool expands, which mechanically reduces the individual percentage share of the female earner; this structural baseline should be considered when interpreting its regression coefficient.*

## RESULTS

Results are divided into two sections. The first discusses the descriptive statistics to understand the distribution of key variables amongst the Indian female population. The second discusses the results of the WLS regression and its trends.

## Descriptive Statistics

Descriptive statistics for the key variables analysed in this study is given in Table 3. The husband's general education level (HGL) ranges from 0 (min) to 13 (max) and has a mean value of 4.38. With a standard deviation of 4.40, the distribution of HGL is positively skewed (0.36) and platykurtic (-1.33).

*Table 3: Descriptive Statistics for Key Variables*

| Index | HGL | HMC | HSE | HHS | RHP | ADP | NIT | NOC | FGL | FGE | FAS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean | 4.38 | 10954.00 | 0.54 | 4.63 | 0.50 | 3.32 | 0.10 | 0.42 | 7.16 | 41.07 | 1791.00 |
| Median | 5.00 | 6495.00 | 1.00 | 4.00 | 0.50 | 3.00 | 0.00 | 0.00 | 7.00 | 40.00 | 1600.00 |
| Std | 4.40 | 17393.00 | 0.50 | 1.87 | 0.22 | 1.33 | 0.36 | 0.79 | 3.56 | 10.23 | 873.00 |
| Skew | 0.36 | 5.07 | -0.17 | 1.54 | 0.69 | 1.27 | 4.18 | 2.02 | -0.37 | 0.22 | 0.87 |
| Kurt | -1.33 | 57.30 | -1.97 | 5.69 | 0.05 | 2.94 | 19.32 | 3.89 | -0.63 | -0.20 | 0.89 |
| Max | 13.00 | 400000.00 | 1.00 | 25.00 | 1.00 | 17.00 | 4.00 | 6.00 | 13.00 | 79.00 | 6241.00 |
| Min | 0.00 | 0.00 | 0.00 | 2.00 | 0.06 | 1.00 | 0.00 | 0.00 | 1.00 | 15.00 | 225.00 |

The household size (HHS) varies between 2 and 25 with a mean of 4.63 members and a standard deviation of 1.87. Reflecting typical urban family compositions, the household size (HHS) distribution exhibits a positive skew of 1.54, while the number of adults in the household (ADP) centers on a mean of 3.32 members within a range of 1 to 17. The number of infants and toddlers (NIT) varies from 0 to 4 with a mean of 0.10 (SD = 0.36). The NIT distribution is positively skewed (4.18) and leptokurtic (19.32) which suggests extreme outliers

Finally, the average age of women (FGE) is 41.07 years (SD = 10.23), with a range spanning from 15 to 79 years. Women's age follows a platykurtic distribution with a kurtosis value of -0.20 and is mildly skewed to the right (0.22). Similarly, the squared transformation of women's age (FAS) exhibits a platykurtic distribution, with an excess kurtosis value of 0.89.

Table 4 gives the Variance Inflation Factor (VIF) values. The VIF values for the current study show that there is no perfect pairwise correlation between variables. Those for female age (FGE) and age squared (FAS) suggest high multicollinearity. This is expected as the age squared term is created directly from the age term to account for a non-linear trend. This means that these localised inflated values do not undermine the stability of the remaining predictors. Therefore, multicollinearity most likely does not present a problem to the study.

*Table 4: Variance Inflation Factor (VIF) Values*

| Variable | VIF Values |
|---|---|
| const | 233.26 |
| Female's General Education Level | 1.44 |
| Female's Age | 51.60 |
| Female's Age Squared | 49.65 |
| Female's Marital Status | 1.30 |
| Husbands Monthly Income | 1.70 |
| Husband's General Education Level | 2.94 |
| Husband's Status of Employment | 3.72 |
| Number of Children | 1.97 |
| Number of Infants and Toddlers | 1.29 |
| Household Size | 4.43 |
| Adults Present in Household | 4.17 |
| Rate of Household Participation | 1.85 |
| Female's Work Hours | 1.25 |
| Female's Occupation | 1.09 |

## Econometric Analysis

Table 5 and Table 6 give the details of the WLS regression results. As seen from Table 6, the F-statistic is 2876, and its significance is at the 1% level which suggests that the model rejects the null hypothesis. Although covariance estimates are non robust and do not fully account for the PLFS clustering and stratification, the R-squared value of 0.746 and adjusted R-squared value of 0.745 suggest that the model is a good fit for the data given that the data are microdata. These statistics indicate the proportion of variance explained by the model but do not establish that the model is free from specification bias or that the identified relationships are causal.

Table 7 gives the Standardised Beta Values. The point estimates and standardized beta coefficients are unaffected by the variance estimation method and are taken as the primary measure of the practical strength of individual predictors. Given an underestimation of standard errors, traditional significance thresholds (1%, 5%, and 10%) are interpreted as indicators of population-weighted associations rather than definitive causal significance.

The intercept, which represents the predicted value of the dependent variable when all predictors are zero, is positive and statistically significant.

*Table 5: WLS Regression Results (part a)*

**WLS Regression Results**

| | | | |
|---|---|---|---|
| Dep. Variable: | Female Percentage Contribution | R-squared: | 0.746 |
| Model: | WLS | Adj. R-squared: | 0.745 |
| Method: | Least Squares | F-statistic: | 2876 |
| No. Observations: | 13755 | Prob (F-statistics): | 0 |
| Df Residuals: | 13740 | Log-Likelihood: | -62632 |
| Df Model: | 14 | AIC: | 1.25E+05 |
| Covariance Type: | nonrobust | BIC: | 1.25E+05 |

*Table 6: WLS Regression results (part b)*

| Index | coef | std err | t | P>\|t\| | [0.025 | 0.975] |
|---|---|---|---|---|---|---|
| const | 126.3307 | 2.061 | 61.293 | 0.000 | 122.291 | 130.371 |
| Female's General Education Level | 0.2558 | 0.047 | 5.438 | 0.000 | 0.164 | 0.348 |
| Female's Age | 0.2642 | 0.095 | 2.792 | 0.005 | 0.079 | 0.450 |
| Female's Age Squared | -0.0018 | 0.001 | -1.667 | 0.096 | -0.004 | 0.000 |
| Female's Marital Status | -0.7085 | 0.375 | -1.888 | 0.059 | -1.444 | 0.027 |
| Husbands Monthly Income | -8.77E-05 | 0.000 | -10.452 | 0.000 | 0.000 | 0.000 |
| Husband's General Education Level | -0.9143 | 0.057 | -16.104 | 0.000 | -1.026 | -0.803 |
| Husband's Status of Employment | -19.7989 | 0.533 | -37.130 | 0.000 | -20.844 | -18.754 |
| Number of Children | -4.8404 | 0.250 | -19.375 | 0.000 | -5.330 | -4.351 |
| Number of Infants and Toddlers | -3.9367 | 0.418 | -9.416 | 0.000 | -4.756 | -3.117 |
| Household Size | -7.0662 | 0.170 | -41.586 | 0.000 | -7.399 | -6.733 |
| Adults Present in Household | -2.8263 | 0.236 | -11.960 | 0.000 | -3.289 | -2.363 |
| Rate of Household Participation | -79.1006 | 0.847 | -93.436 | 0.000 | -80.760 | -77.441 |
| Female's Work Hours | 2.3826 | 0.065 | 36.571 | 0.000 | 2.255 | 2.510 |
| Female's Occupation | -3.4218 | 0.432 | -7.919 | 0.000 | -4.269 | -2.575 |

*Table 7: Standardised Beta Values*

| Variable | Beta Value |
|---|---|
| Female's General Education Level | 0.028 |
| Female's Age | 0.082 |
| Female's Age Squared | -0.048 |
| Female's Marital Status | -0.008 |
| Husbands Monthly Income | -0.046 |
| Husband's General Education Level | -0.122 |

| Variable | Beta Value |
|---|---|
| Husband's Status of Employment | -0.299 |
| Number of Children | -0.116 |
| Number of Infant and Toddlers | -0.043 |
| Household Size | -0.400 |
| Adults Present in Household | -0.114 |
| Rate of Household Participation | -0.531 |
| Female's Work Hours | 0.175 |
| Female's Occupation | -0.034 |

## DISCUSSION

While there are studies outside India that look at female contribution to household earnings, Indian literature is scarce. The study therefore references dummy variables such as FLFP which theoretically suggest similar trends with the key independent variable to stand in for female contribution to household earnings. This is to check the accuracy of the correlation and suggest reasons for the sign and size of the WLS coefficients.

The female general education level indicates a significant positive correlation at the 1% level with female contribution to the household earnings. The model suggests that an increase in general education level (as defined by the PLFS) by 1 level is associated with an increase of 0.2558 percentage points in female percentage contribution to total household earnings. The coefficient has a standardised beta score of 0.028 which suggests that education has less impact in comparison to other variables. Empirical work by Chen et al. (2022) establishes that educational benchmarks surpassing middle school generate an upward trend in wage returns, with the ceiling being significantly higher for female workers. The model may indicate the behavior established by Chen et al. (2022), suggesting that female earnings shares are positively shaped by educational advancement.

While the husband's education is also significant at the 1% level, it shows a negative association. As the husband's general education level increases by a year, female contribution to the household Earnings decreases by 0.9143 percentage points. In comparison to the female education variable, the husband's education level indicates a more substantial relative impact on the dependent variable, with a standardised beta score of negative 0.122. This negative association contrasts with the "cross-productivity gains" documented by Zhao (2015), which could indicate that within India's urban informal employment framework, increased spousal education could operate as a household income effect that reduces the financial necessity of a woman's relative earnings contribution as suggested by the household income dynamics identified by Chatterjee, Desai, and Vanneman (2018).

Similar to the trend observed for the husband's education level, negative trends were also found for the husband's employment status (HSE) and monthly earnings (HMC). HMC and HSE have a significant negative association with female contribution to household income. As the husband's Earnings increase

by INR 1.00, female contribution to household earnings falls by 0.0000877 percentage points. To put into perspective, an increase of INR 10,000 in the husband's earnings lowers female percentage share by 0.88 percentage points. HSE indicates a more significant impact with a standardised beta coefficient of negative 0.299. HMC, on the other hand, has a standardised beta coefficient of negative 0.046 which suggests a much lower impact. The greater impact of HSE aligns with the behavioral framework of Fluchtmann et al. (2024), which demonstrates that when a male spouse is actively employed, women have a greater inclination to take on primary domestic care responsibilities and re-enter the labor market primarily through secondary earnings. The effect of HMC is in line with the significant negative relationship between men's earnings and the employment of married women in India found by Agarwal et al (2026). Consequently the literature could indicate that its lesser effect may be explained by the decreased need for contribution from a married couple in a joint family household. As noted in the limitations, the model does not account for the distribution of household structures.

Children are differentiated based on the age range. School-aged children (NOC) indicate a greater negative impact than the number of infants and toddlers (NIT). The coefficients for both variables are significant at the level of 1%. However, school-aged children have a coefficient of 4.8404 while infants have a coefficient of 3.9367. NOC also has a higher standardised beta coefficient of negative 0.116. Existing literature suggests that Women are more likely to have the primary caregiving responsibility as a result of traditional roles and cultural norms which is in line with the negative trend. In specific, Das and Zumbyte (2017) and Gupta (2019), establish a consensus that younger children exert a more pronounced negative impact on the FLFP. In contrast, this WLS model finds that NOC displays a stronger negative association with FPC than NIT. Although the two variables female contribution and FLFP have a correlation, they also differ in nature. A possible explanation is the exclusion of non-working women in the study. Literature (Kahn and García-Manglano 2014) shows active female earners experience a reduction in their relative earnings share due to caregiving demands of school-aged children, which reduces as children grow older. The greater negative impact of NIT on FLFP (Das and Zumbyte 2017) , suggests that in the study, the divergence could occur because mothers of infants are more likely to drop out of the workforce entirely rather than work for a lower income share, leaving active earners with school-aged children to drive the negative coefficient observed in this study. (Kahn, García-Manglano, and Bianchi 2014)

The ADP, or the adults present in the household, suggest a significant negative relationship. When the number of adults present in the household increases by one, the dependent variable decreases by 2.8263. The coefficient also has a high impact on the dependent variable with a standardised beta coefficient of negative 0.114.

Similarly, the household size mirrors this trend indicating a significant negative coefficient as well. For an increase of 1 member, the y coefficient (female contribution to household earnings) falls by 7.0662. The standardised beta coefficient is negative 0.400. Studies such as Das and Zumbyte (2017) find the correlation between household size and FLFP to be insignificant. A possible explanation for this discrepancy lies in the construction of the variables under study. Larger ADP values can mechanically

compress a single worker's percentage share as the aggregate income pool expands, provided that the additional adult members are actively contributing to household earnings.

Beyond this structural baseline, these comparable negative parameters can be interpreted by the findings of Rahman et al. (2025), which suggests multi-generational residential structures that correspond with larger household sizes reinforce traditional gender divisions. Such arrangements also diminish the immediate financial pressure for women to generate market income, thereby reducing the relative share of female earnings within the household. A more nuanced construction of the variable would separate male and female ADP. This would allow the model to indicate how gender-dominated household compositions differ in their correlations with the female earnings contribution. .

The household participation rate is statistically significant at the 1% level and has the largest estimated association with the dependent variable, female percentage contribution. It has a coefficient of negative 79.1006 which means that for an increase in the household participation rate by 1, female contribution to household earnings falls by 79.1 percentage points. Since RHP is a ratio of the number contributors to household size, a higher RHP implies more earners sharing total contribution, which mathematically reduces every member's share, including the female's own share. It has a standardised beta coefficient negative 0.531 which further indicates that it has the greatest impact out of all the coefficients. As household wealth increases, the proportion of female market engagement relative to male economic work experiences a structural decline (Eswaran, Ramaswami, and Wadhwa 2013), driven heavily by domestic norms that prioritize home production for married women. Therefore the negative correlation aligns with the findings by Eswaran et al (2013) As discussed earlier, the mathematical reduction in FPC reduces the ability of the regression to ascertain the impact of the effect suggested by Eswaran et al (2013).
Female's age is significant at the 1% level and Female's age squared is significant at the 10% level respectively. They suggest little impact with standardised beta values of 0.082 (Female's age) and negative 0.048 (Female's age squared).

Similarly, Female's marital status is significant at the 10% level and suggests little impact with a standardised beta value of negative 0.008. Female's occupation is negatively associated and significant at the 1% level but suggests a lesser impact with a standardised beta coefficient of negative 0.034. Female work hours, however, are significant at the 1% level and are positively associated with female percentage contribution to total household earnings. It has a coefficient of 2.3826 which suggests that for an increase of one hour, female contribution to household earnings increases by 2.38 percentage points. It indicates a relatively stronger impact with a standardised beta coefficient of 0.175.

## CONCLUSION

The regression results suggest that the rate of household participation shows the strongest association with female contribution to household earnings.

The variables that indicate a significant statistical relationship with female contribution are as follows: *husband's education level, husband's status of employment, number of children, household size, and female work hours.*

The observed trends suggest that the relationship between the female contribution to household earnings and its key determinants closely aligns with previous literature using identical explanatory and proxy dependent variables. However, for the variables NOC, NIT, HHS, the study suggests that the correlations differ from previous literature.

As the rate of household participation suggests the strongest overall correlation with female contribution to household earnings, it is possible that socio-cultural expectations discussed by previous literature (Eswaran, Ramaswami, and Wadhwa 2013) are the main factor constraining a woman's ability to contribute to household earnings as of 2025. Greater focus should be given to policy measures aimed at reducing these socio-cultural expectations. Examples of policies could include paid childcare leave for both male and female parents, and education campaigns to destigmatize female participation (Dev and Sahay 2025).

## LIMITATIONS

The study uses a WLS model assuming linear relationships. The variables age and age squared have been used to account for the non-linear relationship between age and female contribution to household earnings. Other relationships appear broadly linear, but perfect linearity cannot be assumed. Furthermore, because the model utilizes cross-sectional PLFS data, these patterns represent statistical correlations rather than definitive causal links.

Initially, the variable poverty status was considered as part of the WLS. A commonly used lower-middle-income poverty line, as set by the World Bank, is $3 per day (PPP). However, because Purchasing Power Parity information is not available in the PLFS, this study does not include poverty status in its analysis. Additionally, because the dependent variable is constructed as an income share, variables capturing spousal income levels share a partly mechanical relationship with the outcome.
As the PLFS data do not capture the distribution of households by structure, the analysis does not distinguish between joint and nuclear household structures, which may affect a woman's motivation to participate in the labour force and therefore her percentage contribution to household income.

Regular wage workers/salaried employees are excluded from this study as they can also be formally employed. As a result, the findings are representative of mainly self-employed and casual female workers in urban informal employment rather than the entire informal landscape.

## FUTURE RESEARCH

For variables where the correlation with female contribution to household earnings differs from its correlation with the proxy variable used, further analysis should be done to check the accuracy of the trend.

The largest influence on female contribution to total household earnings is the rate of household participation. Further analysis on the data should consider the effect of cultural and religious expectations of women as the primary unpaid household worker and how it differs across different socio-economic groups.

Deeper analysis should be done to investigate how these factors differ across regions in India and households at different earnings levels. The PLFS is a cross-sectional survey and a longitudinal study can be conducted to study these trends over time.Future research using data that records the segregation of households into nuclear and joint could examine how household structure shapes women's labour supply and contribution to household earnings, with an emphasis on how socio-cultural expectations differ across these structures.

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## APPENDIX

**Appendix A:** correlation matrix between the variables (Table 8)

*Table 8: Correlation matrix to check for multicollinearity in the WLS regression.*

| Item | FGL | FGE | FAS | FMs | HMC | HGL | HSE | NOC | NIT | HHS | ADP | RHP | FWH | FOC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FGL** | 1 | | | | | | | | | | | | | |
| **FGE** | -0.2638 | 1 | | | | | | | | | | | | |
| **FAS** | -0.2655 | 0.9874 | 1 | | | | | | | | | | | |
| **FMs** | -0.1174 | 0.3262 | 0.2811 | 1 | | | | | | | | | | |
| **HMC** | 0.0451 | 0.0874 | 0.0607 | 0.1174 | 1 | | | | | | | | | |
| **HGL** | 0.0275 | 0.1516 | 0.1265 | 0.1855 | 0.5917 | 1 | | | | | | | | |
| **HSE** | -0.2546 | 0.1152 | 0.0758 | 0.2028 | 0.5766 | 0.7451 | 1 | | | | | | | |
| **NOC** | -0.0554 | -0.1695 | -0.1984 | 0.1251 | 0.2171 | 0.3164 | 0.3891 | 1 | | | | | | |
| **NIT** | 0.0397 | -0.2528 | -0.2368 | 0.0609 | 0.0944 | 0.1742 | 0.1872 | 0.1752 | 1 | | | | | |
| **HHS** | -0.1779 | 0.1556 | 0.1396 | 0.1669 | -0.0671 | -0.1109 | -0.0487 | 0.1252 | 0.0366 | 1 | | | | |
| **ADP** | -0.1559 | 0.3323 | 0.3281 | 0.0809 | -0.1164 | -0.1852 | -0.1649 | -0.3190 | -0.1970 | 0.7365 | 1 | | | |
| **RHP** | -0.0991 | 0.0489 | 0.0651 | -0.0939 | 0.2098 | 0.2437 | 0.3272 | -0.1608 | -0.0653 | -0.5116 | -0.2411 | 1 | | |
| **FWH** | 0.1547 | -0.1116 | -0.1113 | -0.0983 | -0.2266 | -0.3671 | -0.3957 | -0.1607 | -0.1144 | 0.0740 | 0.1038 | -0.2032 | 1 | |
| **FOC** | 0.0836 | -0.0425 | -0.0552 | 0.0664 | 0.1236 | 0.2362 | 0.1955 | 0.1132 | 0.0475 | -0.0872 | -0.1175 | 0.0690 | -0.1385 | 1 |

**Appendix B:** Additional statistics data for WLS regression (Table 9);
Table 9 is in addition to Table 5 and Table 6

*Table 9: Additional Statistics for WLS regression (Part C)*

| | | | |
|---|---|---|---|
| Omnibus: | 2277.22 | Durbin-Watson: | 1.928 |
| Prob(Omnibus): | 0 | Jarque-Bera (JB): | 31170.01 |
| Skew: | 0.367 | Prob(JB): | 0 |
| Kurtosis: | 10.338 | Cond. No. | 3.56E+05 |

**Appendix C: Graphical representations**

Figure 1 and Figure 2 are graphical representations of Table 6 (Coeff) and Table 7 (Standardized Beta Values). The same conclusion as given earlier in the discussion section is evident in both

Figure 1 and Figure 2. The rate of household participation has the strongest overall correlation with female contribution to household earnings

*Figure 1: Graphical representation of the Regression results*

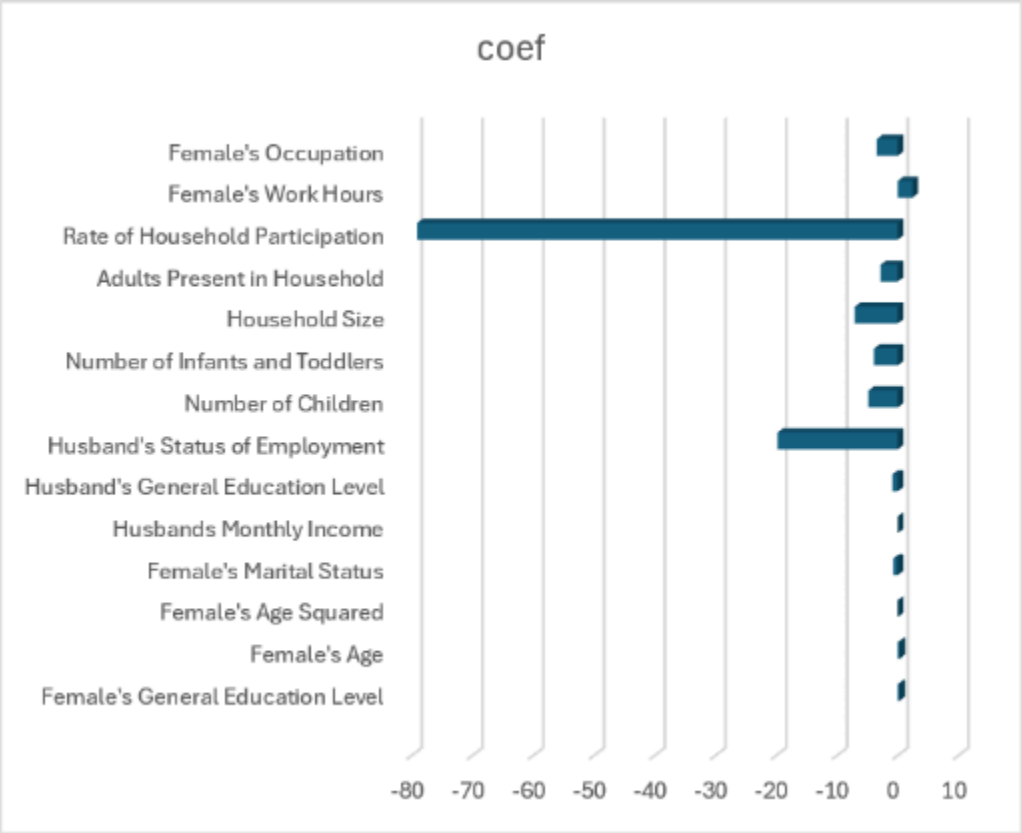


*Figure 2: Graphical representation of Standardized Beta Values*

