

Analysing the Impact of Socio-Demographic Variables on the Time Spent by Females on Paid Activities Using the Time Use Survey by NSSO

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ABSTRACT

Female labour force participation is continuously declining but women in India are still experiencing time poverty due to the increased burden of unpaid work. This paper is an attempt to study the first-ever Time Use Survey conducted by NSSO and to understand the factors that affect the amount of time spent on paid activities by females in India by developing a multiple linear regression model and using the technique of OLS. The research highlights the significance of various socio-demographic variables like age, education, household size, marital status, land possessed etc. The paper also presents a detailed econometric study on the significance of such factors through diagnostic checking for normality, multicollinearity and heteroscedasticity. This research concludes that socio-demographic variables play a significant role in influencing the amount of time females spend on paid activities in India and that females should be treated as human capital, should be encouraged to complete education and unpaid work should be equitably distributed between males and females.

Keywords: paid work, unpaid work, time poverty, time use survey, female laborforce participation

1. INTRODUCTION

In the last century, the world has witnessed great strides in terms of women's economic participation. As per The Economic Times, during 1960-2016, "the Female laborforce participation rate (FLFPR) increased from 40 percent to 51 percent, on an average, for the OECD countries". In fact, OWID estimates suggests that "women labour market participation has progressed significantly over the last century for 32 out of 41 countries. On the other hand, the Indian subcontinent, home to 17 per cent of the world's women population, is in the company of 9 countries where FLFPR has plummeted. Between 1983-2012, India's FLFPR fell by almost 4 percentage points. India's current FLFPR at 20 percent is among the lowest in the world, with only parts of the Arab world performing worse than the country".

India, even in the 21st century, is struggling to provide equal opportunity to the females. According to the World Bank, "female labor force participation in India has fallen by nearly 30 percent in the last 20 years". In the World Economic Forum's Global Gender Gap Index,

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“India slipped to 112th place in 2021, simply because over 70 lakh Indian women have dropped out of work”.

Usually, economies experience a U-shaped curve in female participation rates but in India, despite of the structural changes such as decline in fertility rates and expansion of women’s education, Indian Female labor force participation rate is on a downward track.

In 2019, before the Covid-19 pandemic, female labor force participation in India was 23.5%, according to ILO estimates. According to a working paper by Ashwini Deshpande, “The pandemic has made this situation worse. Women were hit much harder by the pandemic and the looming recession. Four out of every 10 women who were working during the last year lost their jobs during the lockdown. At the same time, the COVID-19 pandemic has disproportionately increased the time women spend on family responsibilities, by nearly 30 percent in India, according to one estimate”.

The discussion on low participation of women in the labour markets should begin with a dialogue about how the onus of domestic chores and caregiving work is distributed among genders. India’s societal norms are such that women are expected to take the responsibility of family care and childcare. This stereotype is a critical barrier to women’s labor force participation.

A recent article in The Economic Times highlighted, “according to 2014 OWID data, India’s female-to-male ratio of time devoted to unpaid care work stands at 9.83, which is the third highest in the world. Therefore, 62.1 per cent of the women in 15-59 age group were involved in domestic duty participation in 2017-18”.

As per the Time Use Survey (2019) conducted by NSSO, “the participation rate of men in paid employment is high at 57.3 per cent, compared to women whose participation rate is only 18.4 per cent. Indian men also spend more time at paid work, spending on average 7 hours 39 minutes compared to the 5 hours 33 minutes spent by women. However, when it comes to unpaid work like domestic services for household members which includes cooking food, cleaning, or unpaid caregiving like looking after a dependent child or an adult, the participation of women is very high. 81.2 per cent women participate in unpaid domestic services spending an average 4 hours 59 minutes each day. The participation rate of men in domestic services is low at 26.1 per cent, and the amount of time they spend conducting this service is far lesser than women, who spend around 1 hour 37 minutes while conducting this activity”.

The statistics point out how Indian social norms mediates the rate at which female labour supply will respond to economic opportunities. Women are not in a position to disregard their domestic duties and, despite their willingness to work, they can only take up opportunities that allows them juggle between paid and unpaid work.

Studies suggest that improvements in female economic participation not only benefit women but also boost aggregate economic growth. McKinsey’s 2018 report finds that “advancing gender parity in India would have a larger economic impact than in any other region in the world— predicting \$700 billion of added GDP in 2025. This can be achieved by increasing India’s female labor force participation by just 10 percentage points, increasing the number of

paid hours worked by women, and adding more women to higher-productivity sectors. At this stage, when the Indian economy has been derailed by the COVID pandemic, women can play a central role in defining country's future growth story".

Therefore, this research paper attempts to explore the factors that affects the amount of time spent on paid activities by women in India. Section 2 presents the research gap and objective of the study. Section 3 presents a detailed literature review. Section 4 presents the data and methodology. Section 5 presents the results. Section 6 presents the conclusions.

2. RESEARCH GAP & OBJECTIVE OF THE STUDY

Existing literature has focussed on female labor force participation rate and the burden of unpaid care work but there is very limited literature on which factors govern the time spent by females on paid and unpaid activities in India. The first-ever Time Use Survey for India was conducted in the year 2019 by NSSO which presents an opportunity to bridge this research gap. So, the objective of present study is to examine the influence of various socio-demographic factors on the amount of time spent by women on the paid activities in India using the Time Use Survey (2019).

3. LITERATURE REVIEW

3.1 Defining unpaid work

As per ILO, unpaid work is defined as "non-remunerated work carried out to sustain the well-being and maintenance of other individuals in a household or the community, and it includes both direct and indirect care (i.e., routine housework)". The ILO estimates show that "time spent in unpaid work accounted for '16.4 billion hours per day, with women contributing more than three-fourths of the total' which is equivalent to 2.0 billion people working on a full-time basis without pay".

As per United Nations Statistics Division, 2018, "Women continue to bear the unequal burden of unpaid household and care work both in developed and developing countries. Such intra-household uneven distribution of unpaid work can be detrimental to women's wellbeing".

3.2 Theoretical Understanding

In the existing literature, there are "two strands that explain the gendered nature of unpaid work and its disproportionate burden on women, the economic perspective and the gender perspective. The economic perspective emphasizes the principles of rationality and comparative advantage that women have in unpaid labour relative to the paid work which can be changed with changes in various factors like educational attainment and wages.

The gender perspective is based on the sociological understanding of gender as a power relation. Accordingly, the approach emphasizes reinforcing masculine and feminine behaviour through unpaid labour. Specifically, by avoiding unpaid work men tend to display masculinity whereas performing unpaid household chores is considered integral to being an 'ideal' wife or mother" (Chauhan, 2021).

3.3 Implications of Burden of Unpaid Work on Women

As per United Nations, “the unequal distribution of unpaid care work between women and men represents an infringement of women’s rights and also a brake on their economic empowerment”. “The unpaid work impedes entry of females into the labor market and restricts women’s income and earning potential. It costs the loss of income and financial independence for women” (Kabeer, 2012)

Women typically spend disproportionately more time on unpaid care work than men. This is in addition to their paid activities, thus creating the “double burden” of work for women. Abundant literature exists that supports the claim that “the double burden of work for women not only deters their access to paid work, lowering their educational attainment and earnings, but also causes distress to their health”. (Hirway & Antonopoulos, 2009; Hirsch & Konietzko, 2013; Fendel, 2020). Similar claim has been made by Dong & An, 2015 and Chopra & Zambelli, 2017, “the inequitable gender distribution of unpaid work at home often deprives women of adequate time for self-care and leisure activities”.

“How society and policy makers address issues concerning care has important implications for the achievement of gender equality: they can either expand the capabilities and choices of women and men, or confine women to traditional roles associated with femininity and motherhood” (Razavi, 2007).

“The sustainable development goals (SDG) recognize the importance of unpaid care and domestic work through public services, infrastructure, and social protection policies as well as shared responsibility within the household (Target 5.4). Therefore, by performing these unpaid works, women subsidize the market and also reduce the burden of the State.” (Hirway, 2015).

But, much of women’s unpaid work is unrecognized by the beneficiaries- family, society and state at large. Moreover, “neo-liberal macroeconomic policies have been formulated on the same lines without recognizing, reducing, and redistributing unpaid work in the economy”. (Hirway, 2005; Elson, 2017; Folbre and Yoon, 2008)

3.4 Case of India

As per The Economic Times (2021), “structural transformation in societies play an important role in breaking the social barriers. However, in India, structural transformation led to a high share of the population working in informal sector and setting up small enterprises”. This acts as one of the main impediments to female participation in paid economic activities.

In India, women’s labour force participation is dismal and has been showing a declining trend for more than a decade. According to the World Bank data, “female labour force participation has decreased from 32% in 2005 to 21% in 2019. Simultaneously, women’s time poverty has increased manifold”, clearly suggesting that women bear disproportionate responsibilities of unpaid labour.

To highlight, the double work burden faced by women, a large number of studies have concluded that “though large section of women is engaged in back breaking work in sectors such as agriculture and construction in India, they also shoulder most of the unpaid household

work. This is true across India, irrespective of the regional variations in the social and cultural norms and economic development”. (Shimray, 2004; Luke et al., 2014; Lahiri-Dutt & Sil, 2014; Dutta, 2016; Manhas & Gupta, 2017; Irani & Vemireddy, 2020; Swaminathan et al., 2020; Rao et al., 2021)

Verick (2014) has estimated that in India, “a substantially high proportion of females report their activity status as attending to domestic duties. In 2011-12, 46.1 per cent of all urban females in India were attending to domestic duties, as against 42 per cent in 1993-94. It is interesting to note that significant proportion of women usually engaged in domestic duties reported their willingness to accept work if the work was made available at their household premises”.

As per The Diplomat (2020), “globally, while unpaid domestic work by women is valued at nearly 13 percent of the total economy, in India, women’s unpaid domestic work is estimated to be valued at almost 40 percent of its current GDP”. Time Poverty experienced by women in India is also highlighted in the TUS report by NSSO.

Finally, the unpaid labour performed by women is not accounted for in the Indian national accounting systems, and are therefore excluded from the realm of policy making which further worsens the situation by not recognizing and rewarding the unpaid work.

3.5 Factors influencing time allocation between paid and unpaid activities by females

Abundant literature exists on factors associated with an individual’s time allocation between paid and unpaid work. Some of the important ones include marital status, educational attainment, employment, age, access to infrastructure and other demographic factors.

A number of studies from Australia, Italy, United States suggest that married women do more housework than other women (Shelton & John, 1993; South & Spitze, 1994; Gupta, 1999; Baxter, 2005; Meggiolaro, 2014), while no such difference was found in case of married men (Shelton & John, 1993; South & Spitze, 1994).

As per Sullivan (2018), “the cumulative effect of increasing education is that women do less housework and men participate more in unpaid household work. Evidence from different countries suggests that women’s educational attainment has a negative relationship with the amount of time they spend on unpaid household work (Shelton, 1992; Brines, 1994; Torabi, 2020; Kolpashnikova & Koike, 2021)”.

Van der et al. (2018) finds that “unemployed women do more additional household work than unemployed men”.

Sona Mitra (2019) based on unit-level NSSO data, has found that older women are more excluded from paid work due to care responsibilities. Various studies in the existing literature suggests that the demographic factors, mainly fertility rates and family structure and composition, play crucial role in determining the status of women as unpaid workers (Aguirre et al., 2012; Grimshaw and Rubery, 2015).

As per the Time Use Survey report (2019) by NSSO, in India, “the intersections of caste and geography play an important role in determining gendered division of time and labor”. Recent

research by Mukesh Eswaran, Bharat Ramaswami, and Wilima Wadhwa (2013) finds that the “ratio of women’s paid work to that of men declines as family wealth increases. This decline is steeper as we move up the caste hierarchy in rural India. Further, while upper caste women are more likely to be educated, the effect of higher education on women’s market work is weaker for the higher castes”.

Various studies have found that access to the basic infrastructure have strong influence on the time spent for unpaid work and the failure of state to provide alternatives for care and domestic assistance increases the burden of unpaid work for women (Neff et al., 2012; Das et al., 2015).

The mindset and societal structure in India which defines women’s primary responsibility as attending to unpaid care work and household responsibilities is the major impediment in changing the working status of women in India.

4. DATA AND METHODOLOGY

For the analysis, secondary data has been used- The Time Use Survey conducted by NSSO during the period January 2019 to December 2019 to collect information on the activities that are performed by the population and the duration of time for which such activities are performed.

As per the TUS report, “This survey was spread over 9,945 First Stage Units (5,947 villages and 3,998 urban blocks). It covered 1,38,799 households (rural: 82,897 and urban: 55,902). Information on time use was collected from each member of age 6 years and above of the selected households 4,47,250 persons of age 6 years and above (rural: 2,73,195 and urban:1,74,055) were surveyed. The survey covered the whole of the Indian Union except the villages in Andaman and Nicobar Islands which are difficult to access”. Data on time use was collected through personal interview method. Information on time use was collected covering a period of 24 hours starting from 4:00 A.M. on the day before the date of interview to 4:00 A.M. on the day of interview.

Since this research paper focuses on females, the entire dataset has been filtered on the basis of gender, thus including only female respondents in the data used for analysis. In the TUS dataset, activities were divided in 18 codes and information on time use was collected accordingly. For this paper, the time spent by females of age 6 years and above only on paid activities has been calculated, thereby including only codes 13-18 in the analysis. (Refer Appendix A.1)

To do the analysis, the technique of Multiple Linear Regression using OLS is used with the help of software R.

Dependent Variable	Independent Variables
Time spent by females on paid activities	Age
	Household’s consumption expenditure (logmonthlyce)
	Household size (loghhsz)

Place of residence (sector =1 if urban, 0 otherwise)
Relation with Household Head relation_self =1 for Self (Female head) relation_spouse =1 for Spouse of the head base category- Other females of the household
Marital Status (marital_single = 1for single females, 0 otherwise)
Highest level of education Edu_middle= 1 for Up to upper primary/middle Edu_secondary =1 for Up to higher secondary Edu_high = 1 for Graduate and above Not Literate is base category
Religion (religion_nh =1 for Non-Hindus, 0 otherwise)
Social Group (socialgp_res=1 for reserved categories, 0 otherwise)
Land possessed Land_1.01to4.01= 1 for land possessed between 1.01-4.01 Land_greater=1 for Land>=4.01 Land_none = 1 for No land possessed Land possessed <1.01 is base category
Infrastructure (refer Appendix A.2)

Table 1: List of Dependent and Independent Variables

Regression Model:

Time spent by females on paid activities (Y) = $\beta_0 + \beta_1 \text{ age} + \beta_2 \text{ logmonthlyce} + \beta_3 \text{ loghhsz}$ + $\beta_4 \text{ sector} + \beta_5 \text{ relation_self} + \beta_6 \text{ relation_spouse} + \beta_7 \text{ marital_single} + \beta_8 \text{ edu_middle} + \beta_9 \text{ edu_secondary} + \beta_{10} \text{ edu_high} + \beta_{11} \text{ religion_nh} + \beta_{12} \text{ socialgp_res} + \beta_{13} \text{ land_1.01to4.01} + \beta_{14} \text{ land_greater} + \beta_{15} \text{ land_none} + \beta_{16} \text{ infra_good}$

5. RESULTS

5.1 REGRESSION ANALYSIS

MODEL INFO:				
Observations: 36898				
Dependent Variable: timespent				
Type: OLS linear regression				
MODEL FIT:				
F(16,36881) = 117.98 , p = 0.00				
R ² = 0.05				
Adj. R ² = 0.05				
Standard Errors: Robust, type = HC1				
	Est.	S.E.	t val.	p
(Intercept)	295.08	14.79	19.95	0.00
age	-0.37	0.08	-4.83	0.00
logmonthlyce	6.97	1.75	4.00	0.00
loghhsize	-9.10	2.14	-4.25	0.00
sector	37.96	2.07	18.36	0.00
relation_self	13.59	3.13	4.35	0.00
relation_spouse	-8.99	2.79	-3.22	0.00
marital_single	15.84	2.84	5.58	0.00
edu_middle	-22.29	2.05	-10.89	0.00
edu_secondary	-27.63	2.68	-10.31	0.00
edu_high	11.15	3.22	3.46	0.00
religion_nh	-21.26	2.12	-10.02	0.00
socialgp_res	20.70	2.01	10.32	0.00
land_1.01to4.01	-15.76	2.56	-6.17	0.00

land_greater	-42.50	6.96	-6.10	0.00
land_none	97.26	36.73	2.65	0.01
infra_good	10.21	1.84	5.55	0.00

Table 2: Regression results (Source: Author’s Calculations)

As can be seen in Table 2, all the explanatory variables are statistically significant in explaining the variation in time spent by females on paid activities.

Institution of marriage severely affects a female’s ability to be a part of the laborforce in a negative way. Beta coefficients for edu_middle and edu_secondary are negative but Beta coefficient for edu_high is positive and all are statistically significant implying females with high levels of education (atleast graduate) spend more time on paid activities as compared to the females with no education. Household with land possession usually expects the females to work on their own land and they are not paid anything for it and households with even greater amount of land consider working women to be a shame for the family. Higher number of family members require more unpaid care work which is expected to be done by female so they end up spending less time on paid activities.

Above analysis can be visually summarized using Regression Coefficients plot provided in Appendix A.3

5.2 DIAGNOSTIC CHECKING

The residual plot confirms linearity and the residuals are approximately normally distributed (Fig 1 and 2) and the analysis for multicollinearity is summarized in Table 3.

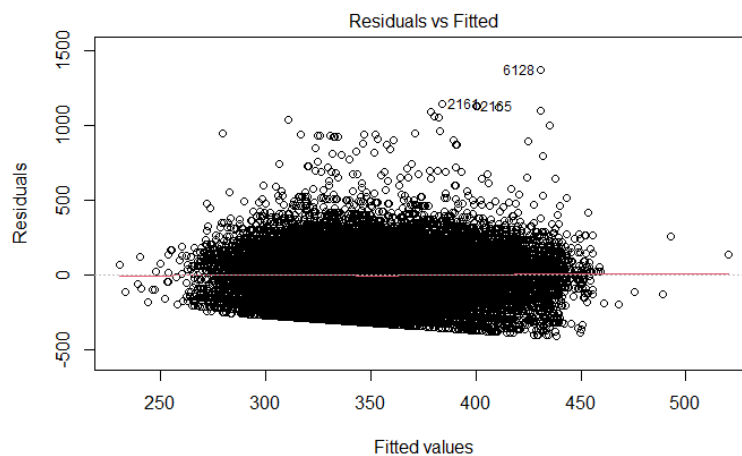


Fig 1: Residual plot confirming linearity (Source: Author’s Calculations)

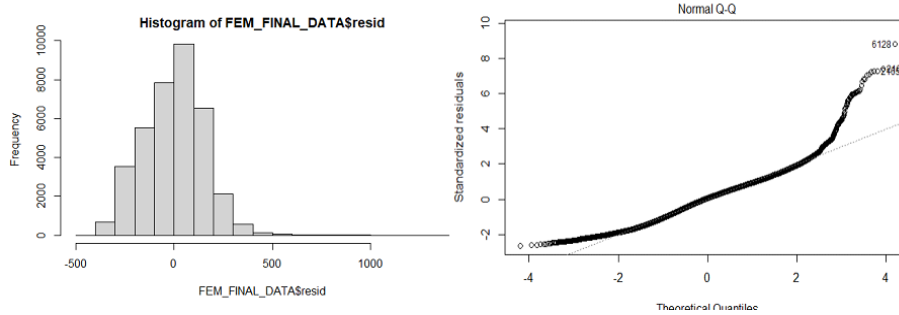


Fig 2: Graphs confirming normality (Source: Author’s Calculations)

	sector .x	age	relati on_se lf	relati on_sp ouse	marit al_sin gle	edu_ middl e	edu_ scond ary	edu_ h igh
sector.x	1	-0.06	0.05	-0.11	0.1	-0.09	0.1	0.34
age	-0.06	1	0.26	0.19	-0.08	-0.1	-0.21	-0.16
relation_self	0.05	0.26	1	-0.51	0.5	-0.02	-0.06	-0.05
relation_spouse	-0.11	0.19	-0.51	1	-0.74	0.04	-0.08	-0.13
marital_single	0.1	-0.08	0.5	-0.74	1	-0.03	0.03	0.07
edu_middle	-0.09	-0.1	-0.02	0.04	-0.03	1	-0.32	-0.28
edu_secondary	0.1	-0.21	-0.06	-0.08	0.03	-0.32	1	-0.18
edu_high	0.34	-0.16	-0.05	-0.13	0.07	-0.28	-0.18	1
religion_nh	0.06	-0.04	0.01	-0.04	0.05	0.03	0.06	0.03
socialgp_res	-0.15	0	0.02	0.04	0	0.03	-0.05	-0.21
land_1.01to4.01	-0.2	0.03	-0.1	0.06	-0.1	0.01	-0.01	-0.07
land_greater	-0.06	0.01	-0.04	0	-0.03	0	0	-0.02
land_none	0	0	0.01	0	0	0	-0.01	0
infra_good	0.35	-0.01	-0.01	-0.03	0.01	-0.07	0.12	0.25
timespent	0.15	-0.02	0.08	-0.1	0.1	-0.07	-0.03	0.11
logmonthlyce	0.33	-0.13	-0.26	0	-0.09	-0.09	0.12	0.38
loghsize	-0.07	-0.24	-0.44	0.06	-0.2	0.04	0.04	-0.03

	religion_nh	socialgp_res	land_1.01to4.01	land_greater	land_none	infra_good	timespent	logmonthlyce	loghsize
sector.x	0.06	-0.15	-0.2	-0.06	0	0.35	0.15	0.33	-0.07
age	-0.04	0	0.03	0.01	0	-0.01	-0.02	-0.13	-0.24
relation_self	0.01	0.02	-0.1	-0.04	0.01	-0.01	0.08	-0.26	-0.44
relation_spouse	-0.04	0.04	0.06	0	0	-0.03	-0.1	0	0.06
marital_single	0.05	0	-0.1	-0.03	0	0.01	0.1	-0.09	-0.2
edu_middle	0.03	0.03	0.01	0	0	-0.07	-0.07	-0.09	0.04
edu_secondary	0.06	-0.05	-0.01	0	-0.01	0.12	-0.03	0.12	0.04
edu_high	0.03	-0.21	-0.07	-0.02	0	0.25	0.11	0.38	-0.03
religion_nh	1	-0.03	-0.06	-0.03	0	-0.01	-0.04	0.08	0.04
socialgp_res	-0.03	1	-0.03	-0.03	0	-0.15	0.03	-0.21	0.03
land_1.01to4.01	-0.06	-0.03	1	-0.04	-0.01	-0.04	-0.07	0.03	0.11
land_greater	-0.03	-0.03	-0.04	1	0	0.01	-0.04	0.06	0.07
land_none	0	0	-0.01	0	1	-0.02	0.01	-0.01	0
infra_good	-0.01	-0.15	-0.04	0.01	-0.02	1	0.08	0.31	-0.03
timespent	-0.04	0.03	-0.07	-0.04	0.01	0.08	1	0.04	-0.06
logmonthlyce	0.08	-0.21	0.03	0.06	-0.01	0.31	0.04	1	0.42
loghsize	0.04	0.03	0.11	0.07	0	-0.03	-0.06	0.42	1

Table 3: Multicollinearity analysis (Source: Author's Calculations)

There is only one case of high correlation i.e., between the dummy for marital status (marital_single=1 for single, 0 otherwise) and the dummy for relation with head (relation_spouse=1 for spouse of the head, 0 otherwise). This correlation is evident from the fact that if a female is married, she is more likely to be the spouse of the head of the household rather than being the head herself. Except this case, there are no cases of high correlation. So, we can conclude that the model does not suffer from the problem of multicollinearity.

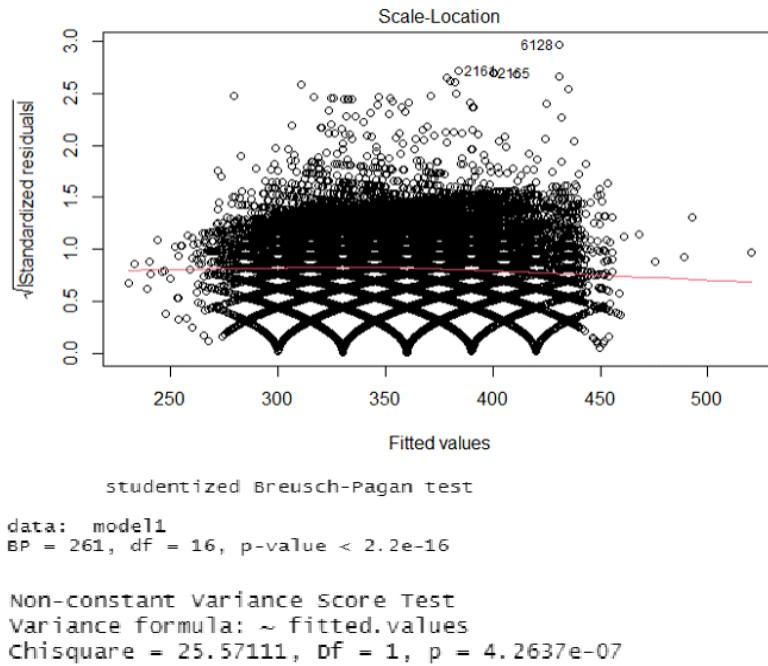


Fig 3: Graph confirming Heteroscedasticity (Source: Author' Calculations)

The graphical description of residuals in Fig 3 clearly shows that residuals are not equally spread along the range of predictors implying the presence of non-constant variance. The Breusch-Pagan test and non-constant variance score test in Figure confirm this observation as $p\text{-value} < 0.05$ implying heteroscedasticity.

To correct for heteroscedasticity, I have used the Generalized Least Squares (GLS) Method (refer Appendix A.4). The results are presented in Fig 4. The GLS model portrays the same results with respect to the significance of the explanatory variables and the direction of their impact on the dependent variable. But this model has helped us in addressing the problem of non-constant variance.

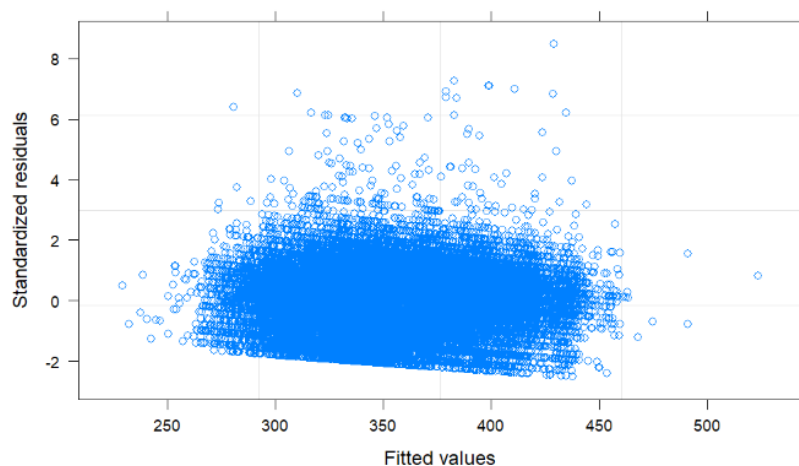


Fig 4: Graph through GLS (Source: Author's Calculations)

Fig 5 clearly shows that there is the issue of outliers and high leverage points and the lower panel confirms that some observations have a greater Cook's distance implying the outliers are influential values.

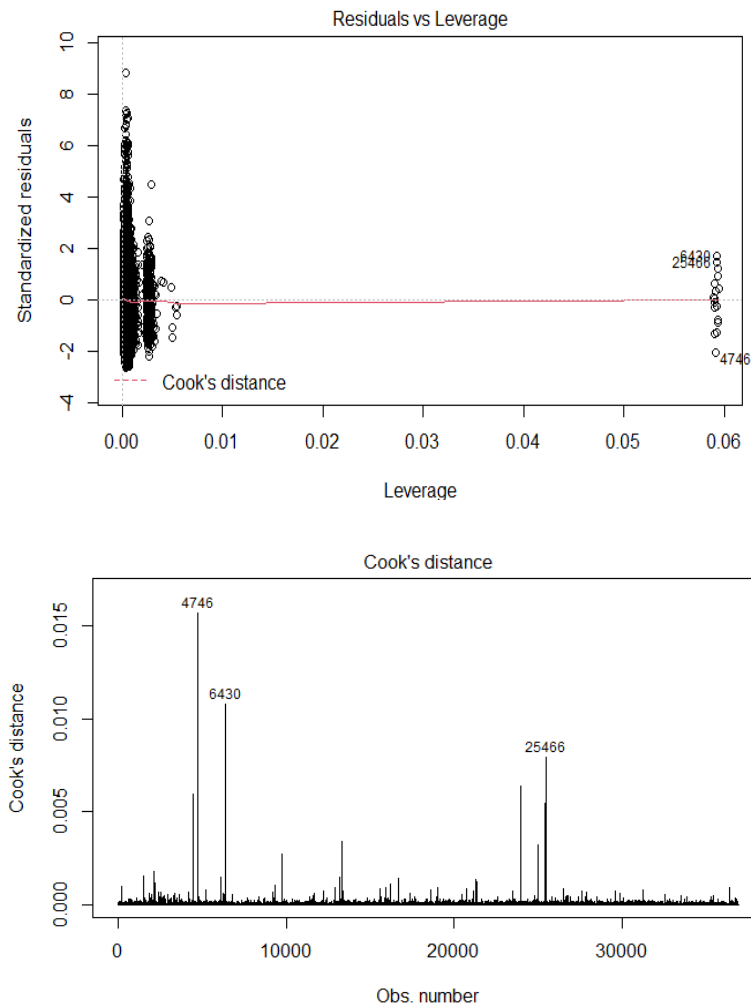


Fig 5: Leverage and Outliers (Source: Author's Calculations)

For statistically testing the influential values, threshold in the dataset under analysis would be $4/n = 0.00010$. There are no observations in the dataset that have Cook's distance greater than this threshold, even if we set the threshold at 0.5 or 1 which are widely used threshold levels (Cousineau, D. and Chartier, S., 2010), statistical testing reveals that there are no observations having distance greater than these thresholds so no outliers are statistically influencing the model. Therefore, we can say that removing the outliers would not have any significant impact on the model given the large number of observations in the dataset.

6. CONCLUSION

The econometric model thus developed clearly shows that socio-demographic variables have a significant impact on the time spent by females on paid activities in India. As per the analysis done for 2019, in Indian context, marriage and household size negatively influence the participation of females in laborforce. Females alone should not be expected to fulfill the household responsibilities of unpaid care work, instead they should be treated as human capital,

as agents of growth for the economy. Education is an important driver towards females joining the workforce but as per the data, this doesn't happen until they complete at least graduation so, they must be encouraged to complete their education and acquire necessary skills that can help them in securing well-paid jobs. Wealthy families (who possess greater amount of land) should not consider working females as an embarrassment. More equitable distribution of unpaid work between men and women should be encouraged.

In the end, I would like to add, World Bank noted that “no country can develop and achieve its full potential if half of its population is locked in non-remunerative, less productive and non-economic activities.” So, it is high time for Indian economy to utilise its full human capital and embark on the journey of growth and development.

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APPENDIX

A.1 Activity Codes as per TUS (Source: *Time Use Survey, 2019*)

Code	Activity	Code	Activity
NOT FOR PAYMENT			
01	self-development/ self-care/ self-maintenance, etc.	12	other unpaid work for production of services
02	care for children, sick, elderly, differently-abled persons in own households		FOR PAYMENT
03	production of other services (except care activities as covered in code 02) for own consumption	13	self-employment: for production of goods
04	production of goods for own consumption	14	self-employment: for production of services
05	voluntary work for production of goods in households	15	regular wage/ salary: for production of goods
06	voluntary work for production of services in households	16	regular wage/ salary: for production of services
07	voluntary work for production of goods in market/non-market units	17	casual labour: for production of goods
08	voluntary work for production of services in market/non-market units	18	casual labour: for production of services
09	unpaid trainee work for production of goods		

10	unpaid trainee work for production of services		
11	other unpaid work for production of goods		

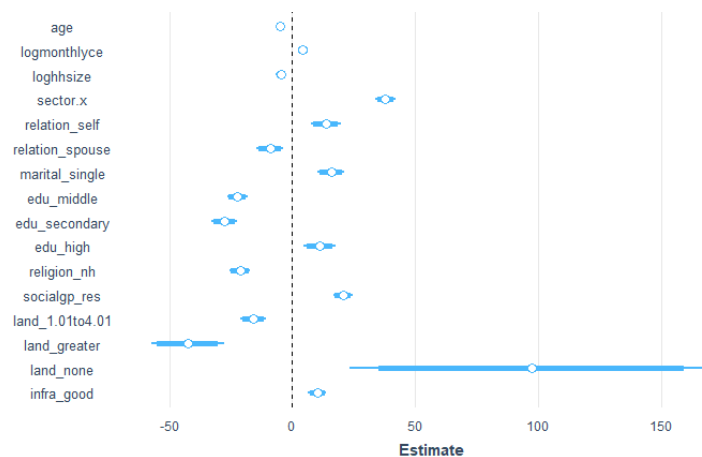
A.2 Construction of variable- Infrastructure

TUS data has been collected on five fronts:

- primary source of energy for cooking
- primary source of energy for lighting
- type of washing of clothes considering major source
- type of sweeping of floor considering major source
- type of structure of the dwelling unit

Each of these variables is a categorical variable with multiple categories. Each variable was converted into two categories- Good and Bad. And then, a single variable Infrastructure was created, which takes on value 1 if there are at least 3 “Goods”, 0 otherwise.

A.3 Regression Coefficients Plot



Source: Author’s Calculations

A.4 Results of Generalised Least Squares (GLS) Method

	Value <chr>	Std.Error <chr>	t-value <chr>	p-value <chr>
(Intercept)	298.15721	14.72601	20.246980	0.0000
age	-0.35358	0.07414	-4.768919	0.0000
logmonthlyce	6.37238	1.73309	3.676896	0.0002
loghhsz	-8.54836	2.16401	-3.950240	0.0001
sector.x	38.13555	2.03111	18.775699	0.0000
relation_self	13.82326	3.14905	4.389664	0.0000
relation_spouse	-8.66083	2.75159	-3.147567	0.0016
marital_single	15.85650	2.75174	5.762351	0.0000
edu_middle	-21.91909	2.05711	-10.655285	0.0000
edu_secondary	-27.41806	2.67053	-10.266888	0.0000
	Value <chr>	Std.Error <chr>	t-value <chr>	p-value <chr>
edu_high	11.79078	3.28420	3.590148	0.0003
religion_nh	-21.36559	2.13988	-9.984466	0.0000
socialgp_res	21.35552	1.97315	10.823062	0.0000
land_1.01to4.01	-15.50960	2.61716	-5.926115	0.0000
land_greater	-42.35521	7.30105	-5.801249	0.0000
land_none	97.37794	39.55792	2.461654	0.0138
infra_good	10.23832	1.84338	5.554117	0.0000

Source: Author's Calculations