Gender Norms, Crime against Women and Female Employment

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ABSTRACT

Existing studies argue that crime against women (CAW) lowers female labour force participation (FLFP) by increasing women's expected cost of working. This increase in expected cost is a consequence of physical harm and mental trauma associated with the crime. The present paper argues that family control over females' employment may be the primary reason behind the negative effect of CAW on FLFP and the increase in expected cost may be playing a relatively minor role in many situations. The study tests this argument by examining the impact of CAW on FLFP across caste and marital status in India.

Keywords: gender norms, crime against women, female employment, patriarchy, caste, marital status

JEL Code: B54, J16, J21

1. Introduction

Gender disparities in employment are a key development challenge in the world. Though the disparities are found in both developed and developing countries, the challenge faced by developing countries is greater (Klasen, 2019; Olivetti & Petrongolo, 2016). Female labour force participation (FLFP) is often lower in developing countries. Higher FLFP in these countries is likely to result from high poverty rather than gender equality. Gender norms are the most important reason for the lower FLFP across nations (Klasen, 2019; Klasen & Pieters, 2015; Sarkar et al., 2019). The improvement in economic conditions need not increase FLFP in these countries.

India is one of the developing countries which has not only experienced a lower FLFP but also a declining participation rate since 2004 (Dubey et al., 2017; Klasen & Pieters, 2015; I. Singh et al., 2022). Several studies have sought to understand the determinants of the declining FLFP in India (Afridi et al., 2018; Baruah & Singh, 2020; Kapsos et al., 2014; Klasen & Pieters, 2015; Sarkar et al., 2019). One of the factors that received considerable attention in recent years is the impact of violence against women on female employment. Since the violence against women in itself is an outcome of a patriarchal society, one may expect an association between the two. Studies have examined the causal relationship between violence against women on FLFP (Biswas, 2017; Chakraborty et al., 2018; Mishra et al., 2021). The findings suggest a two-way relationship between violence against women and FLFP. While violence against women adversely affects FLFP, higher female employment increases the likelihood of violence against them.

Notwithstanding the effect of female employment on crime against them, the studies found a negative effect of CAW on FLFP. CAW affects female employment by lowering the probability of a woman entering the labour market (Chakraborty et al., 2018; Mishra et al., 2021), and impacting the victim's career growth with many finding it difficult to maintain

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employment after the incidence (McLaughlin et al., 2017; Moe & Bell, 2004). Mishra et al. (2021) found a significant negative effect of crime on FLFP in India. Women were less likely to work if the workplace was away from their homes. In contrast, the study found no positive effect of crime on male employment. Chakraborty et al. (2018) used the perceived fear of violence to examine the linkage between CAW and FLFP. The study found the fear to have a detrimental effect on female employment. The effect is stronger for women who practice purdah (the practice of covering their face with cloth in presence of men or outsiders) and the victims of domestic violence. The study explains the finding as a higher cost of stigma among these women due to more conservative norms in those households.

Although the above-mentioned studies provide important insights into the issue, their explanation ignores the role of families in determining employment status of women. They do consider patriarchal norms to be the reason for the causal relationship. Nevertheless, they implicitly assume internalization of the norms by women to explain the results (the next section discusses the issue in detail). They argue that women withdraw from the labour force due to the higher expected cost of being in workforce. This addition in the expected cost is the result of physical injury and mental trauma owing to the crime. However, this explanation requires women to have decision-making power which is contrary to the existing understanding of gender relations in developing countries. The present study examines this issue to provide an explanation which is consistent with our present understanding of society.

We argue that CAW may influence female employment through two mechanisms. First, CAW increases women's expected cost of working as suggested by others. Second, CAW imposes a cost on the family as gender norms attach family prestige and social standing to women's sexuality (Bidner & Eswaran, 2015; Chakravarti, 1993). Since women's decision to participate in the labour force depends on their family's approval, an increase in CAW lowers the likelihood of FLFP. We call the former the direct effect and the latter the indirect effect of

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CAW. The present study tests the possibility of the indirect effect being dominant by examining the effect of CAW on FLFP across caste and marital status in India.

The paper is divided into seven sections. The second section elaborates on the mechanisms through which CAW may influence female employment by taking the case of gender norms and CAW in India. The third section discusses the data and methodology used in the study. The fourth section discusses general trends of CAW in India. The fifth section examines the impact of CAW on FLFP in India. The sixth section analyses the impact of CAW across marital status and caste groups. The last section discusses the results and concludes the study.

2. Gender Norms, Crime Against Women and Female Employment

As previously argued, the existing studies have looked at the causal relationship between CAW and female employment from a single viewpoint. They argue that CAW exerts a cost on female victims by causing physical harm and mental trauma (Chakraborty et al., 2018; Mishra et al., 2021). Since travelling for work increases women's likelihood of falling victim to a crime, a higher CAW means a higher expected cost of working and a lower likelihood of joining the labour force. It is the direct effect of CAW.

However, there is a possibility of an indirect effect of CAW. CAW affects not only the female victims but also their families. Patriarchal norms work by controlling female sexuality and associating it with her purity which is further linked to family prestige (Chakravarti, 1993; Field et al., 2010). News of the sexual assault on a woman is perceived as a dishonour to the family. It can be interpreted as a cost to the family. Hence, the rise in CAW increases the expected cost of the family too. The family responds to the increased expected cost by tightening control over the work status of the woman. The control not only restricts women's mobility but also prevents them from gaining training and developing knowledge-sharing networks to compete in the labour market (Field et al., 2010, 2016). However, such a control

need not be absolute as the family also benefits from female employment. Women engaged in paid work means higher family earnings or less work for other members. Figure 1 presents the two mechanisms through which CAW can influence FLFP.

While both mechanisms suggest the same implications of CAW on FLFP, their strength may vary. The direct effect may be more important if a society has relatively weaker gender norms with less tendency to control female sexuality. In a society with a stronger and more rigid patriarchal structure, the indirect mechanism may be better at explaining the decline in FLFP with the rise in CAW. We shall test the argument by examining the effect of CAW across marital status and caste groups in India.

The empirical analysis is based on the assumption that the direct effect is the same across social groups (after controlling for individual, household, and area differences). However, the indirect effect may vary as the stringency of gender norms varies across social groups. CAW should have a stronger effect among sections having stringent gender norms. Hence, a heterogenous effect of CAW across caste groups and marital status would suggest that the negative effect of the crime on FLFP may partly be the result of gender norms exerting their influence through the family.

Studies showed that caste is an important determinant of agency and autonomy among women (A. Singh et al., 2022). Deprived caste groups have relatively egalitarian gender norms. In contrast, the privileged castes subject their women to stringent norms translating into their subjugation. Studies cite two reasons for this behaviour (Chakravarti, 1993). First, control of female sexuality to uphold patrilineal succession. Second, to ensure the purity of caste. Marriage is an institution through which purity in caste is maintained. There are endogamy rules whereby women are almost forbidden to interact with men from other caste groups, and defying these rules meant punishments for women. The privileged castes have the most incentives to safeguard endogamy. Hence, they are more likely to enforce stringent restrictions

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on the autonomy and agency of women (Bidner & Eswaran, 2015; Field et al., 2010; Jayachandran, 2015). In a similar vein, restrictions on women in the labour market are relatively stringent among the privileged caste groups. Participation in paid employment by women, especially married women, is deemed a low-status activity by the privileged castes.

While the increase in FLFP among these categories can be attributed to their vulnerability, being a paid worker in itself, may weaken the grip of gender norms (Eswaran et al., 2013). Field, Jayachandran, and Pande (2010) found the possibility of such an effect in a field experiment. The experiment results showed an increase in entrepreneurial activities among the privileged caste women after the training. The study argued that gender norms prevented women from privileged castes from amassing adequate skills to become entrepreneurs. Since the training filled this gap, the women from these castes experienced an increase in entrepreneurial activities.

Thus, the heterogeneous impact of CAW across caste groups may separate the influence of physical harm from gender norms. Nonetheless, it still leaves the possibility that the negative impact of CAW on FLFP is a result of trauma owed to women's internalization of gender norms. Studies have shown that women also subscribe to gender stereotyping (see Nayak et al., 2003). The effect of internalization may be separated from the role of family if a group of women experience a weakening of family control without any change in internalization. Examining the impact of CAW across marital status is one such possibility. Never-married, married, widow, divorcee and separated may experience different levels of family control. However, marital status may not affect women's internalization of gender norms.

Reed (2020) found an increase in days of work among women widows in the age group 52 years and less. The increase in workforce participation was observed among widows who resided with their in-laws or became head of the household. Workforce participation of widowed women declined if one of their adult children became head of the household. It

suggests that the social standing of the in-laws may be less affected if the widow becomes a victim of such a crime. Instead, they may prefer widows to earn independently to ease the family's financial burden. However, adult children may be concerned with the negative effects of crime against their mothers. Similarly, divorced and separated are more likely to participate in the labour force (Chattopadhyay et al., 2022).

Although widowed, divorced and separated women may not entirely elude gender norms, the control of family on their labour force participation may be considerably less. Consequently, CAW can only have a direct effect on their labour force participation. In addition, the mobility of never-married women may be less controlled than currently married. Gupta & Negi (2021) found differences in the treatment of daughters and daughters-in-law within a household. Daughters were more likely to be in paid employment and spend more time in self-care, socializing, learning, and leisure.

Thus, comparing the effect of CAW on FLFP across caste groups and marital status may help us understand the relative strength of the direct and indirect mechanism in India. Although the vulnerable caste groups may have higher participation in the labour force owing to their vulnerable positions; nonetheless, physical harm and mental trauma caused by CAW should impact women's decisions in each group in the same way (after controlling for other variables). Similarly, CAW should discourage widows and divorced women from entering in labour force too if internalization is the reason behind the observed effect. A heterogeneous effect of CAW suggests that the indirect effect is more likely to be the reason.

3. Data and Methodology

Data Collection

The study uses data on crime at the district level for the year 2019 provided by the National Crime Records Bureau (NCRB), the Government of India. NCRB provides total crimes and

not the crime rate at the district level. Therefore, the rate of crime against women was estimated by creating population estimates at the district level for the corresponding year using data from the Census of India 2001 and 2011.

The crime rate at the district level was merged with the unit-level data of the Periodic Labour Force Survey (PLFS) 2019-20 by matching the districts in the two data sets. It gives us information at the individual level with the same crime rate for each individual in a district. PLFS 2019-20 is the most recent survey before the pandemic. We used the PLFS data from the first visit which was completed before the pandemic. The study used conviction rate and pendency percentage as the explanatory variables of FLFP. Since the data on these variables was not available at the district level, we used the data at the state level.

The merging of the two data sets required minor adjustments. In a few cases, the districts in the crime data did not match the districts in PLFS due to the creation of new districts. A bigger district was often divided into two smaller districts. However, the PLFS was using the old classifications. In a few cases, a district was divided into more than one police district. We solved the problem by using the PLFS classification and combining the crime data to represent the corresponding district. Another issue we faced was the creation of new districts after the Census of India 2011. In such cases, we visited the official website of the district administration and collected population data from those.

Econometric Model

We use Probit model to estimate the effect of CAW on FLFPR. However, there is a possibility of the two-way causation between FLFP and CAW. Women have to go out of their homes and travel for work. Hence, an increase in female workforce participation increases the risk of CAW (Amaral et al., 2015). An increase in female workforce participation may increase the likelihood of spousal violence as well (Biswas, 2017). Thus, the model requires controlling for

endogeneity bias. Therefore, the paper estimates equation (1) using Instrumental Variable (IV) Probit model to examine the effect of CAW on FLFP.

$$P(FLFP_{ikjds} = 1) = \gamma_0 + \gamma_1 CAW_d + \delta_{ij}X_{ij} + \vartheta_k H_k + \rho_s Z_s + \varepsilon_i \tag{1}$$

Here, $FLFP_{ikjds}$ is a dummy variable representing the labour force participation of a working-age (15-59 years) woman. It takes value one if woman i from household k, social group j, district d and state s is in the labour force. CAW_d is the rate of crime against women in district d. X_{ij} is a vector of the individual-specific control variables such as formal years of schooling and age. H_k represent household-specific control variables like monthly per capita income, religion and area. Z_s are the state-specific control variables. We have included conviction rate and pendency percentage of IPC crimes in a state as the state-level controls in the regression. The detail of all variables included in the model along with their mean and standard deviation is given in Table A1 in the appendix. The paper uses maximum likelihood estimator (MLE) for estimating the model as it allows estimation of marginal effect of CAW.

However, analysing impact of CAW on FLFPR encounters two difficulties. First, CAW are often underreported. Second, it includes crime committed by family members. Although the issues cannot be resolved completely, we attempted to minimize their impact by taking specific crimes which are unlikely to be underreported or involve family members. For example, crimes such as murder & rape and acid attack are less likely to be underreported. Acid attack is less likely to involve a family member.

Selection of Instrumental Variable

We have used the rate of cybercrimes at district level in 2019 as an instrument. Instrumental variable provides unbiased estimates provided it is not a weak instrument (Stock et al., 2012) and does not violate the exclusion restriction (Bellemare et al., 2017). An instrument is weak if it is weakly correlated with the endogenous variable. The exclusion restriction requires that

the instrument should not affect the dependent variable directly. However, it may affect the outcome variable indirectly through its effect on endogenous variable.

Stock et al. (2012) shows that the first stage F-statistics of two-step method can be used to identify the weak instrument. The paper suggests that F-statistics should be more than 10 for rejecting the hypothesis of weak instrument. Following Stock et al. (2012), we used the first stage F-statistics of two-step method developed by Newey (1987). F-statistics is found to be more than 10 for 25 of 28 regressions used in the paper. First stage F-statistics are reported along with the results of each regression.

To examine that the instrumental variable does not violate the exclusion restriction, we have applied a simple falsification test used by Di Falco et al. (2011) and Di Falco & Veronesi (2013). The test is based on the logic that for the instrument to be valid, it should have significant effect on instrumented variable but not the outcome variable. Therefore, to test the validity of instrumental variable, we have regressed rate of crime against women and labour force participation rate on rate of cybercrimes. The results of the regression are given in Table A9 and A10 in appendix. The results shows that the rate of cybercrimes have significant effect on rate of crime against women. However, the coefficient of rate of cybercrimes is insignificant when the dependent variable is labour force participation rate. Wald test of exogeneity is used to check the endogeneity of the instrumented variable. The Wald test of exogeneity is reported in each table along with the regression results.

4. Crime Against Women in India

India witnessed a steady increase in CAW (Figure 2). The rate of crime against women (CAW) increased from 29 in 2001 to 78.6 in 2020. It is an increase of 171 percent within the first two decades of 21st century. The increase in CAW was much higher after 2011. There was a 34 percent increase in CAW between 2001 and 2011. In comparison, CAW recorded an increase

of 102 percent in the next nine years (from 2011 to 2020). If we ignore 2020 being an abnormal year due to the pandemic, the increase in CAW was still much higher at 60.4 percent between 2011 and 2019. It is almost twice the increase witnessed in the first decade.
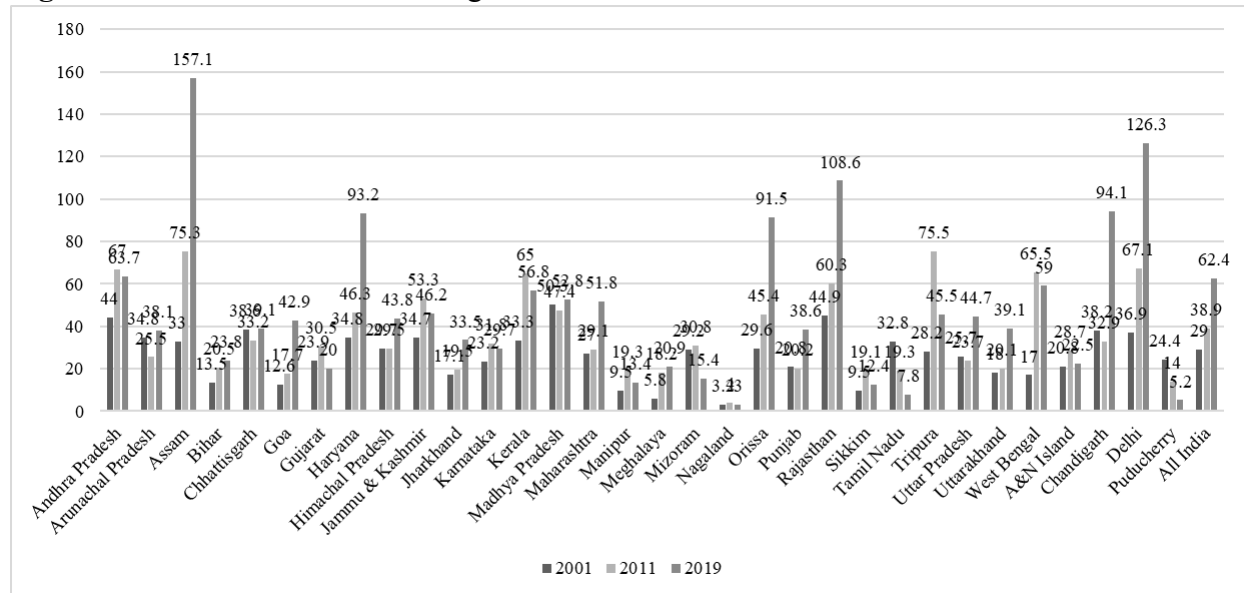
Figure 2. Crime against women (rate) in India
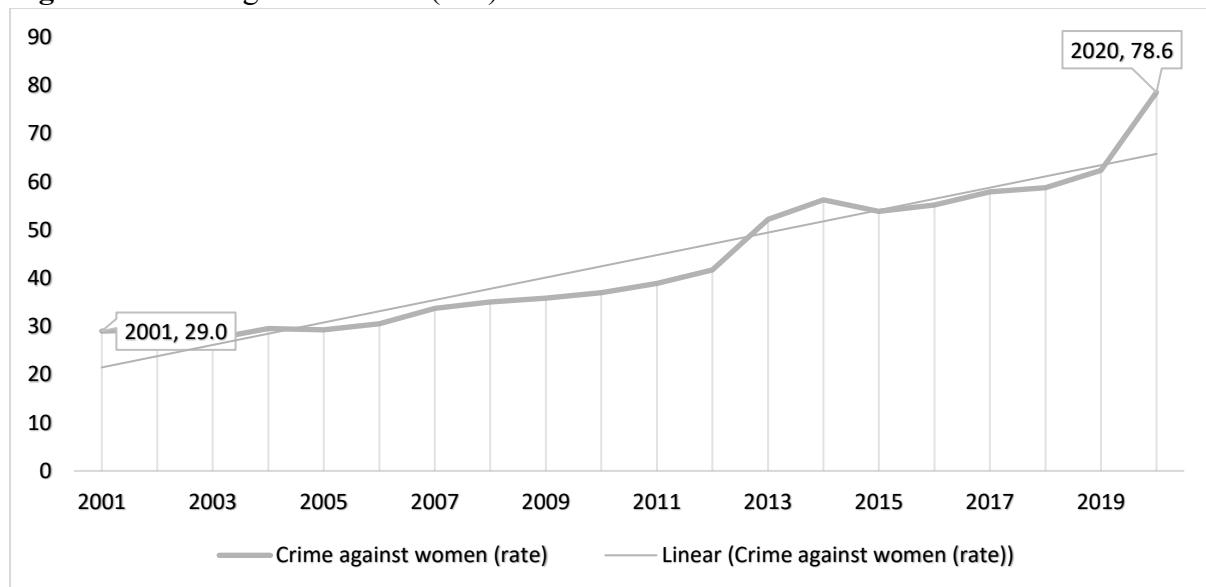
Note: Rate of crime against women represents the number of crimes per 100 thousand women population.
Source: National Crime Records Bureau, India.

However, neither CAW nor the change in it was uniform across Indian states (we have used the word "state" in the paper to mean states and union territories). States vary significantly in terms of CAW with no clear relationship with development level (Figure 3). In comparison to CAW of 29 in India in 2001, the rate was merely 3.2 in Nagaland followed by Meghalaya Sikkim and Manipur. Among the major states, Bihar, West Bengal and Jharkhand with CAW of 13.5, 17 and 17.1 had much lower CAW, whereas Andhra Pradesh, Rajasthan and Madhya Pradesh witnessed a rate of 50.3, 44.9 and 44, respectively.

In 2019, when CAW in India was 62.4, the rate varied from 3 for Nagaland to 157.1 for Assam. Among the large states, Tamil Nadu had the lowest rate with 7.8 crimes per 100 thousand women. Tamil Nadu was followed by Gujarat with 20 crimes per 100 thousand women. Rajasthan, Haryana, Odisha and Andhra Pradesh were among the large states having CAW more than all India in 2019. Nagaland consistently came on the top with the lowest CAW in

all years. Rajasthan and Andhra Pradesh were the states which consistently ranked low in terms of CAW. While CAW varies across states, the high- and low-income states on both sides of the spectrum suggest no clear relationship with the development level.

Figure 3. State-wise rate of crime against women in India

Note: Rate of crime against women represents the number of crimes per 100 thousand women population.
Source: National Crime Records Bureau, India.

Figure 4. State-wise change in rate of crime against women in India (percentage points)
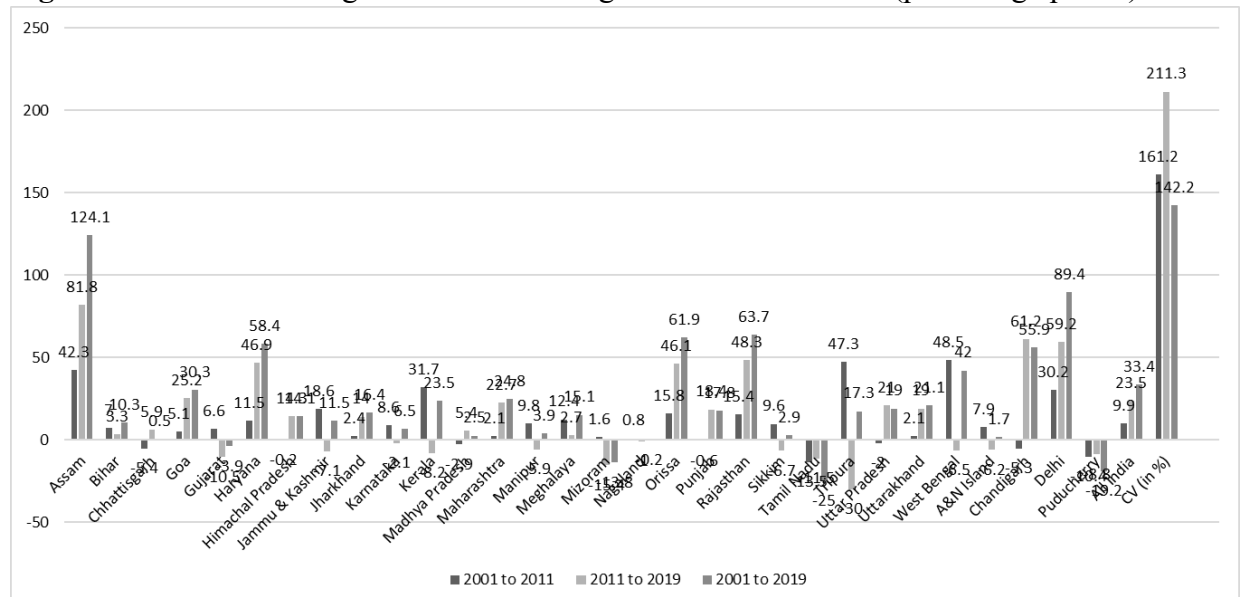
Note: Rate of crime against women represents the number of crimes per 100 thousand women population.
Source: National Crime Records Bureau, India.

The coefficient of variation (CV) of CAW increased from 43.5 percent in 2001 to 74.3 percent in 2019, suggesting a divergence among states. An increase in the deviations was visible in a

change in CAW too (Figure 4). Tamil Nadu and Gujarat witnessed a decline in CAW between 2001 and 2019. In comparison, Assam, Rajasthan, Odisha and Haryana experienced the largest rise in the rate of CAW. Assam topped the list with a 376 percent increase in CAW between 2001 and 2019. Nonetheless, the change in CAW did not show a clear pattern. Several states which showed a decline in CAW in the first decade witnessed a trend reversal after 2011. Madhya Pradesh and Uttar Pradesh are two examples of it. Similarly, some states, such as Tripura, Gujarat, Kerala and Jammu & Kashmir, had experienced positive growth in CAW in the first decade and negative thereafter. Despite the states showing no clear trend, the states doing worse in controlling CAW continue to do so in most cases. This is the reason that CAW showed a strong positive correlation between the two periods. CAW in 2011 and 2019 had a correlation coefficient of 0.725.

We can draw three conclusions from the examination of trends and patterns in CAW. There is an increase in CAW in most states but a few states did witness a decline in the rate. There are large variations in CAW across states with no clear relationship with development level. The pattern of CAW is largely consistent over time.

5. Crime Against Women and Female Labour Force Participation

The summary results of regression of FLFP on CAW (all crimes) along with relevant test statistics are presented in Table 1. The detailed results with all control variables and the test statistics are given in Table A2 of the appendix.

Table 1. Summary results of impact of crime against women on female labour force participation across age-groups

Explanatory Variables	Dependent variable: Female labour force participation (15-59 years)			
	All	15-25 years	26-40 years	41-59 years
CAW (all crimes)	-0.006** (0.002)	0.0004 (0.004)	-0.013*** (0.004)	-0.01** (0.004)
Marginal effect at mean	-.00208	.00010	-.00506	-.00368
Constant	0.123* (0.065)	-3.431*** (0.144)	1.252*** (0.116)	2.707*** (0.142)
Number of observations	132668	41994	50147	40527

Log pseudolikelihood	-448858.04	-134028.9	-171849.4	-138631.9
Wald chi square	11842.22	4406.74	4942.85	3947.11
Wald test of exogeneity	7.2	1.15	0.00	3.82
First stage F-statistics	1395.82	442.18	541.59	418.66

Note: The figures in parentheses are robust standard errors; *$p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$. The estimates are based on Probit model and the cybercrimes (rate) cases is used as an instrumental variable.

Source: Author's estimation based on data from Periodic labour force survey 2019-20, National Crime Records Bureau, India and Census of India 2001, 2011

The IV-Probit model is estimated for all individuals of working age (15-59 years). The same regression equation is then estimated for the three age groups,15-25 years, 26-40 years and 41-59 years. Wald test of exogeneity indicates CAW to be endogenously determined. First stage F-statistics is above 10 suggesting that the instrument variable is not weak.

The results shows that CAW lowers the likelihood of women entering into labour force. The coefficient is significant at five percent. The marginal effect at mean shows a -0.208 percent decline in likelihood of a woman entering into labour force with a unit increase in CAW. This finding is in line with results of the existing studies. The negative effect of CAW is highest for the age group 26-40 years (0.506 percent) followed by the 41-59 years (0.368 percent). However, the coefficient of CAW is positive and insignificant for age group 15-25 years.

The insignificant effect of CAW for the younger age group is a little puzzling if the physical and mental trauma is the major reason for the reluctance to participate in the labour force. It raises the possibility that the CAW may be influencing FLFP by acting through gender norms enforced by the family. Women, in the older cohort, are much more likely to be married than the younger cohort. The average age of never married women is 19 years (Figure 5). Since married women are more constrained by gender norms, their employment is more likely to be affected by an increase in CAW if its influence on FLFP is exerted through gender norms. The next section examines this possibility by estimating the econometric model for all caste groups and marital status and analysing them.

Figure 5. Average age (in years) of women in working age across caste groups and marital status
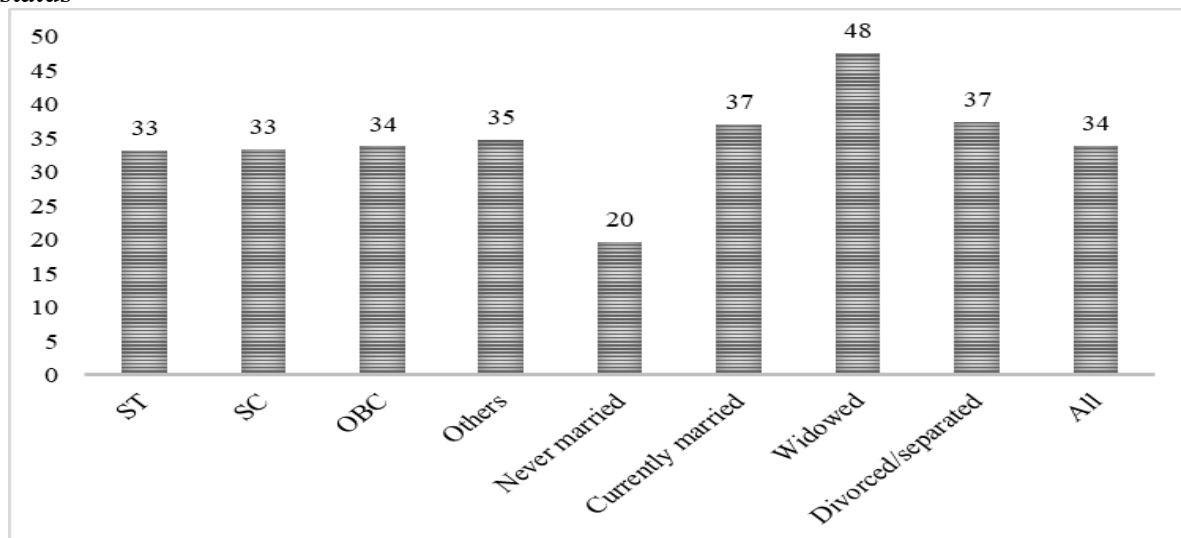
Source: PLFS 2019-20

6. Gender Norms and Heterogenous Effect of Crime Against Women

Tables 2 and 3 provides summary results of the IV-Probit across the caste groups and marital status, respectively. Detailed results along with control variables for caste groups are provided in Table A3, Table A4 and Table A5 in the appendix. Detailed results for marital status are presented in Table A6, Table A7 and Table A8 of the appendix.

The regression results suggest a heterogenous effect of CAW across caste groups and marital status. The coefficient of CAW is negative and significant for women belonging to affluent caste group (Others) but is insignificant for women from deprived groups namely, scheduled tribes (ST), scheduled caste (SC) and other backward castes (OBC) (the word, 'backward', in OBC is a term used by the Government of India to denote economic vulnerability because of belonging to a deprived caste group). CAW shows a negative and significant effect on employment decisions of women in Others category whether we consider all crimes against women, murder & rape, or acid attack (we have used acid attack to mean acid attack and attempt to acid attack). Marginal effect estimates show that a unit increase in all crimes against women lowers the likelihood of a woman in Others category entering into labour market by

0.432 percent. In case of murder & rape and acid attack, their probability of entering into labour force declines by 565 percent and 1654 percent, respectively (this large percentage decline is due to smaller number of crimes). In contrast, CAW does not show a significant effect on employment decisions of ST, SC and OBC.

As discussed earlier, studies have shown that castes in this category are more stringent in applying gender norms (A. Singh et al., 2022). In comparison, SC, ST and OBC have relatively egalitarian norms. A negative and significant effect of CAW on FLFP for Others and the absence of the same effect among ST, SC and OBC supports the argument that the indirect effect of CAW is stronger than its direct effect.

The regression results across marital status show that CAW has negative and significant coefficients for currently-married women for all types of crimes indicating a negative effect of CAW on their labour force participation. A unit increase in all crimes against women lowers the probability of a currently-married woman to enter into labour force by 2.144 percent. Murder & rape and acid attacks are associated with nearly 530 and 172 percent decline in chances of a currently-married woman being in the labour force.

Table 2. Summary results of impact of crime against women on female labour force participation across caste groups

Explanatory Variables	Dependent variable: Female labour force participation (15-59 years)											
	All crimes				Murder & rape				Acid attack & attempt to acid attack			
	ST	SC	OBC	Others	ST	SC	OBC	Others	ST	SC	OBC	Others
CAW	0.0002 (0.007)	0.009 (0.006)	-0.001 (0.004)	-0.013*** (0.004)	-0.331 (13.796)	10.29 (7.501)	-2.829 (8.517)	-17.659*** (4.773)	-1.33 (52.214)	56.328 (37.902)	-6.182 (19.892)	-56.139*** (14.098)
Marginal effect at mean	-.00011	.00327	-.00050	-.00432	-.12991	3.68395	-.96046	-5.65136	-.52208	23.81571	-2.13263	-16.54404
Constant	0.123* (0.065)	-3.431*** (0.144)	1.252*** (0.116)	2.707*** (0.142)	0.800 (1.022)	0.097 (0.147)	0.707*** (0.105)	-1.231*** (0.118)	0.783*** (0.254)	0.63* (0.375)	0.696*** (0.106)	-1.786*** (0.16)
Number of observations	18877	23411	52197	38179	18877	23411	52197	38179	18877	23411	52197	38179
Log pseudolikelihood	-59032.0	-78682.6	-168418.4	-135962.9	35689.2	55558.1	132108.4	81578.05	68676.4	70173.2	172497.3	110468.7
Wald chi square	1835.37	2334.6	4898.68	2455.49	1837.96	2363.95	4911.32	2846.6	1837.55	2889.18	4894.14	3161.39
Wald test of exogeneity	10.04	5.18	1.55	4.07	0.00	0.41	0.46	15.87	0.01	2.11	0.05	9.64
First stage F-statistics	595.99	173.19	569.5	408.2	96.37	26.53	45.03	78.60	83.91	42.44	43.70	72.83

Note: The figures in parentheses are robust standard errors; *$p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$. The estimates are based on Probit model and the cybercrimes (rate) cases is used as an instrumental variable.

Source: Author's estimation based on data from Periodic labour force survey 2019-20, National Crime Records Bureau, India and Census of India 2001, 2011

Table 3. Summary results of impact of crime against women on female labour force participation across marital status

Explanatory Variables	Dependent variable: Female labour force participation (15-59 years)											
	All crimes				Murder & rape				Acid attack & attempt to acid attack			
	Never married	Currently married	Widowed	Divorced/ Separated	Never married	Currently married	Widowed	Divorced/ Separated	Never married	Currently married	Widowed	Divorced/ Separated
CAW	0.003 (0.005)	-0.009*** (0.003)	-0.014 (0.009)	0.06* (0.033)	5.274 (7.595)	-14.859*** (4.464)	-19.551 (12.884)	31.911** (15.146)	13.866 (19.886)	-49.439*** (14.718)	-51.11 (31.336)	-119.361*** (43.416)
Marginal effect at mean	.00087	-.00325	-.00537	.02144	1.4377	-5.29737	-8.29227	12.25951	3.79926	-17.17378	-21.0092	-55.77104
Constant	-2.714*** (0.151)	0.853*** (0.079)	2.492*** (0.267)	2.964*** (0.825)	-3.07*** (0.23)	0.891*** (0.079)	2.305*** (0.27)	2.73*** (0.938)	-2.895*** (0.161)	0.61*** (0.09)	2.065*** (0.356)	2.092* (1.139)
Number of observations	32228	92378	7223	831	32228	92378	7223	831	32228	92378	7223	831
Log pseudolikelihood	-103311.8	-314994.7	-24718.4	-2786.9	76412.1	205057.8	15586.8	1852.1	105489.6	284029.1	22076.4	2633.5
Wald chi square	3690.42	7047.68	821.01	95.79	3715.21	7579.15	946.32	124.36	3710.63	7826.43	915.71	151.02
Wald test of exogeneity	3.2	3.41	0.91	3.65	0.53	14.85	2.71	2.01	0.53	7.05	1.4	3.68
First stage F-statistics	465.44	1058.3	98.77	11.47	50.4	99.9	9.41	4.88	84.77	223.07	21.74	6.53

Note: The figures in parentheses are robust standard errors; *$p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$. The estimates are based on Probit model and the cybercrimes (rate) cases is used as an instrumental variable.

Source: Author's estimation based on data from Periodic labour force survey 2019-20, National Crime Records Bureau, India and Census of India 2001, 2011

The coefficients of CAW are significant for divorced & separated too. However, the coefficient is negative just for acid attack. In which case, the marginal effect suggests 558 percent decline in a divorced & separated woman to enter into labour force. In case of all crimes and murder & rape, the coefficients are positive. Negative and significant effect of acid attack on divorced & separated women may be a consequence of their high vulnerability. It is to be noted that the divorced & separated women are relatively young with an average age of 37 years same as that of currently-married women (Figure 5). Thus, the negative effect could be attributed to the expected cost of physical harm caused by such attack. Nonetheless, the coefficients of CAW are insignificant for never married and widowed for all types of crimes.

The heterogeneous effect of CAW across marital status is unexpected if CAW works through the expected cost of harm (physical harm or trauma). Because in such a situation, the effect of CAW should be negative and significant for each marital status. It is especially true for never married women. While one may attribute insignificant or non-negative effect of CAW among widow and divorced & separated to their economic vulnerability (though our model controls for household income, their economic vulnerability is a possible reason), the same cannot be said about never married women. Only possible for these results is that gender norms are less stringent among never married women or parents apply gender norms less strictly than in-laws (see Gupta & Negi, 2021). These results may be a consequence of weakening of gender norms with modernization. However, the same norms seem to be still applicable for the currently-married women. Thus, the findings of our regression analysis support the argument that CAW exerts its influence on FLFP through the family.

7. Discussion and Conclusions

The present study examines the mechanism through which CAW affect FLFP. The existing studies argue that physical injury and mental trauma caused by the crime is a cost borne by the

victim. This cost adds to women's expected cost of engaging in employment. The increase in expected cost with a rise in CAW leads to women withdrawing employment. It is the direct effect of CAW on FLFP. The major flaw of this argument is that it requires women to have decision-making power. However, this explanation is contrary to our understanding of patriarchy. The present study argues for the second mechanism. It reasons that CAW hurts the perceived social standing of the family. Therefore, the family increased its control over females' employment decisions with the rise in CAW. We call it the indirect effect. We test presence of the indirect effect by examining the effect of CAW across caste groups and marital status.

The results discussed in the previous sections confirm the heterogenous effect of CAW across the groups. Two important findings come through in the analysis. First, a rise in CAW lowers the chances of a female participating in the labour force if the woman belongs to a group with stringent gender norms with the family exerting considerable control over her employment decision. Second, the effect of CAW on FLFP turns insignificant if the gender norms are relatively lenient within the group or if it is in the family's interest not to control a woman's employment. The former holds for the deprived caste groups who have less restrictive gender norms. The latter was observed in the case of widows, divorced and separated women. The existing studies have found higher workforce participation among widows, divorced and separated women, especially if they stay with their in-laws or are heads of their households (Reed, 2020). It is because the in-laws prefer women to earn for themselves instead of depending on them for their necessities. Hence, the economic considerations of the in-laws enable women to be free from gender norms restricting their labour force participation. In addition, the results found no effect of CAW on FLFP of never married. It is because the families apply gender norms more stringently on daughters-in-law than on daughters.

These findings favour the indirect effect as the main reason behind the lowering of FLFP with a rise in CAW in India. In other words, the decline in FLFP is not a consequence of an increase in the expected cost of working for women due to physical injury and mental trauma. If it were the reason, the negative effect should have been found among all groups. Hence, the causal relationship between the two is likely to be an outcome of an increase in the family's perceived cost to its social status owing to patriarchal norms. Gender norms require control of female sexuality to uphold her purity. CAW being linked to female sexuality is perceived to lower the victim's purity. Since gender norms are relatively stringent among the privileged caste groups, they witnessed a decline in FLFP. However, the resultant decline is less likely to be a consequence of the internalization of norms by women and more likely to be their families controlling their participation as the effect of CAW disappears for those women whose mobility is less constrained by their families.

The findings of the study are significant for three reasons. First, the indirect effect is compatible with the existing understanding of gender norms, unlike the direct effect which requires women to have decision-making power. Second, the findings show that the effect of CAW is likely to be much smaller in absence of family's control over female mobility (at least in India). Third, the findings suggest that increasing FLFP will require the policy to focus on changing gender norms in addition to controlling CAW. While a decline in CAW is warranted, it may not be effective against falling FLFP. The insignificant effect of CAW among widows, divorced and separated highlights the importance of changing the traditional gender hierarchy within the family. The insights from the previous studies suggest that the family enforces gender norms through husband or adult sons. Breaking this linkage will be an important step towards creating an equal society.

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Appendix

Table A1. Definitions and summary statistics of variables used in Probit models

Variables	Definition	Mean	Standard Deviation
Female Labour force participation (FLFP)	Female (15-59 years) is working or actively seeking work in principal or subsidiary status. (=1 if yes, =0 otherwise)	0.31	0.47
CAW (all crimes)	Total number of crimes registered in the district per 10 thousand females in the district in a year	5.74	4.45
CAW (murder & rape)	Cases of murder & rape registered in the district per 10 thousand females in the district in a year	0.0048	0.0148
CAW (acid attack & attempt to acid attack)	Cases of acid attack & attempt to acid attack registered in the district per 10 thousand females in the district in a year	0.0025	0.0063
Conviction Rate	Number of convictions as a percentage of number of cases in which trial was completed during the year for crime against women	25.41	20.05
Pendency percentage	The cases pending trial at the end of year as a percentage of total cases for trial in a year (including the cases from previous years) for crime against women	88.68	6.30
Age	Age of the person in years	33.86	12.25
Years of schooling	Number of formal years of schooling received by a person	7.82	5.19
Technical education (Reference category: No technical education)			
Technical education	Individual has received technical education (=1 if yes, = 0 otherwise)	0.03	0.16
Caste (Reference category: Others)			
ST	Individual belongs to Scheduled Tribes (ST) category (=1 if yes, =0 otherwise)	0.14	0.35
SC	Individual belongs to Scheduled Castes (SC) category (=1 if yes, =0 otherwise)	0.18	0.38
OBC	Individual belongs to Other Backward Castes (OBC) category (=1 if yes, =0 otherwise)	0.39	0.49
Religion (Reference category: Hinduism)			
Islam	Individual belongs to religion Islam (=1 if yes, =0 otherwise)	0.14	0.34
Christianity	Individual belongs to religion Christianity (=1 if yes, =0 otherwise)	0.08	0.26
Sikhism	Individual belongs to religion Sikhism (=1 if yes, =0 otherwise)	0.02	0.14
Jainism	Individual belongs to religion Jainism (=1 if yes, =0 otherwise)	0.00	0.05
Buddhism	Individual belongs to religion Buddhism (=1 if yes, =0 otherwise)	0.01	0.10
Zoroastrianism	Individual belongs to religion Zoroastrianism (=1 if yes, =0 otherwise)	0.00	0.02
Others	Individual belongs to religion Others (=1 if yes, =0 otherwise)	0.01	0.09
Marital status (Reference category: Never married)			
Currently married	Individual is currently married. (=1 if yes, =0 otherwise)	0.70	0.46

Widowed	Individual is widowed. (=1 if yes, =0 otherwise)	0.05	0.23
Divorced/ separated	Individual is divorced/separated. (=1 if yes, =0 otherwise)	0.01	0.08
MPCE	Monthly per person household consumption expenditure in thousand rupees.	2.46	2.16
Household size	Number of family members in the house	4.96	2.07
Sector (Reference category: Rural)			
Urban	Individual resided in urban areas at the time of the survey. (=1 if yes, =0 otherwise)	0.45	0.50

Table A2. Impact of crime against women on female labour force participation (15-59 years) across area and age-group

Explanatory Variables	All	15-25 years	26-40 years	41-59 years
Crime against women (rate)	-0.006** (0.002)	0.0004 (0.004)	-0.013*** (0.004)	-0.01** (0.004)
Conviction Rate	-0.003*** (0.000)	-0.004*** (0.000)	-0.005*** (0.000)	-0.001** (0.000)
Pendency percentage	-0.012*** (0.001)	-0.006*** (0.001)	-0.016*** (0.001)	-0.013*** (0.001)
Age	0.02*** (0.000)	0.179*** (0.003)	0.032*** (0.001)	-0.022*** (0.001)
Years of formal schooling	0.001 (0.001)	-0.02*** (0.002)	-0.001 (0.001)	-0.005*** (0.002)
Technical education	0.983*** (0.024)	0.759*** (0.042)	0.797*** (0.034)	1.088*** (0.061)
ST	0.408*** (0.014)	0.341*** (0.029)	0.391*** (0.023)	0.466*** (0.026)
SC	0.1*** (0.012)	0.009 (0.025)	0.074*** (0.019)	0.206*** (0.021)
OBC	0.094*** (0.01)	0.04* (0.021)	0.072*** (0.016)	0.19*** (0.017)
Islam	-0.281*** (0.012)	-0.13*** (0.024)	-0.375*** (0.019)	-0.385*** (0.023)
Christianity	0.026 (0.018)	-0.007 (0.035)	-0.043 (0.03)	-0.041 (0.031)
Sikhism	-0.367*** (0.029)	-0.309*** (0.066)	-0.398*** (0.044)	-0.534*** (0.051)
Jainism	-0.276*** (0.089)	0.004 (0.198)	-0.29** (0.125)	-0.43*** (0.143)
Buddhism	0.237*** (0.036)	0.013 (0.08)	0.316*** (0.057)	0.203*** (0.066)
Zoroastrianism	-0.096 (0.233)	-0.672 (0.481)	-0.624 (0.438)	0.455 (0.371)
Others	0.038 (0.043)	0.153* (0.083)	0.038 (0.068)	-0.267*** (0.08)
Currently married	0.036*** (0.012)	-0.539*** (0.022)	-0.898*** (0.026)	-0.459*** (0.063)
Widowed	0.379*** (0.021)	0.266 (0.21)	0.024 (0.045)	-0.089 (0.065)
Divorced/separated	0.777*** (0.047)	0.187 (0.146)	-0.137** (0.068)	0.29*** (0.099)
Monthly per capita household expenditure (in '000 Rs)	0.002 (0.002)	-0.016*** (0.005)	0.014*** (0.004)	0.004 (0.004)

Household size	-0.029*** (0.002)	-0.03*** (0.004)	-0.023*** (0.003)	-0.026*** (0.004)
Urban	-0.346*** (0.008)	-0.154*** (0.017)	-0.405*** (0.013)	-0.543*** (0.015)
Constant	0.123* (0.065)	-3.431*** (0.144)	1.252*** (0.116)	2.707*** (0.142)
Number of observations	132668	41994	50147	40527
Log pseudolikelihood	-448858.04	-134028.9	-171849.4	-138631.9
Wald chi square	11842.22***	4406.74***	4942.85***	3947.11***
Wald test of exogeneity	7.2***	1.15	0.00	3.82*
First stage F-statistics (using Newey's two step estimator)	1395.82	442.18	541.59	418.66

Note: Same as Table 1.

Source: Same as Table 1.

Table A3. Impact of crime against women on female labour force participation (15-59 years) across caste groups

Explanatory Variables	**ST**	**SC**	**OBC**	**Others**
Crime against women (rate)	0.0002 (0.007)	0.009 (0.006)	-0.001 (0.004)	-0.013*** (0.004)
Conviction Rate	-0.001* (0.001)	-0.003*** (0.001)	-0.003*** (0.000)	-0.003*** (0.000)
Pendency percentage	-0.018*** (0.002)	-0.012*** (0.002)	-0.017*** (0.001)	0.002 (0.001)
Age	0.027*** (0.001)	0.023*** (0.001)	0.019*** (0.001)	0.015*** (0.001)
Years of formal schooling	0.009*** (0.003)	-0.007*** (0.002)	-0.007*** (0.001)	0.018*** (0.002)
Technical education (Reference category: No technical education)				
Technical education	0.989*** (0.098)	0.976*** (0.064)	0.886*** (0.038)	1.018*** (0.037)
Religion (Reference category: Hinduism)				
Islam	-0.08 (0.065)	-0.466*** (0.093)	-0.391*** (0.018)	-0.126*** (0.019)
Christianity	-0.101*** (0.033)	0.05 (0.066)	0.203*** (0.044)	0.111** (0.045)
Sikhism	-0.744** (0.35)	-0.341*** (0.046)	-0.377*** (0.067)	-0.208*** (0.048)
Jainism	0.381 (0.68)	-0.872* (0.507)	-0.345 (0.247)	-0.282*** (0.096)
Buddhism	0.096* (0.057)	0.35*** (0.051)	0.684*** (0.229)	0.021 (0.195)
Zoroastrianism		-0.573 (0.793)	0.274 (0.345)	-0.141 (0.358)
Others	-0.082 (0.061)	0.071 (0.148)	0.093 (0.093)	0.107 (0.098)
Marital status (Reference category: Never married)				
Currently married	0.028 (0.028)	0.106*** (0.028)	0.083*** (0.019)	-0.073*** (0.023)
Widowed	0.345*** (0.056)	0.495*** (0.048)	0.406*** (0.034)	0.29*** (0.04)
Divorced/separated	0.879*** (0.111)	0.822*** (0.114)	0.659*** (0.078)	0.828*** (0.092)

Monthly per person household expenditure (in '000 Rs)	-0.035** (0.014)	-0.01 (0.008)	0.002 (0.003)	0.013*** (0.003)
Household size	-0.017*** (0.006)	-0.042*** (0.005)	-0.037*** (0.003)	-0.021*** (0.004)
Sector (Reference category: Rural)				
Urban	-0.334*** (0.027)	-0.3*** (0.021)	-0.367*** (0.013)	-0.356*** (0.015)
Constant	0.781*** (0.174)	0.071 (0.149)	0.700*** (0.105)	-1.083*** (0.126)
Number of observations	18877	23411	52197	38179
Log pseudolikelihood	-59032.029	-78682.623	-168418.4	-135962.87
Wald chi square	1835.37	2334.6***	4898.68***	2455.49***
Wald test of exogeneity	10.04***	5.18**	1.55	4.07**
First stage F-statistics (using Newey's two step estimator)	595.99	173.19	569.5	408.2

Note: Same as Table 1.

Source: Same as Table 1.

Table A4. Impact of rape & murder cases on female labour force participation (15-59 years) across caste groups

Explanatory Variables	ST	SC	OBC	Others
Rape & murder (rate)	-0.331 (13.796)	10.29 (7.501)	-2.829 (8.517)	-17.659*** (4.773)
Conviction Rate	-0.001 (0.003)	-0.003*** (0.001)	-0.003*** (0.001)	-0.001** (0.001)
Pendency percentage	-0.019* (0.01)	-0.012*** (0.002)	-0.017*** (0.001)	0.005*** (0.001)
Age	0.027*** (0.001)	0.022*** (0.001)	0.019*** (0.001)	0.014*** (0.001)
Years of formal schooling	0.009** (0.004)	-0.008*** (0.002)	-0.006*** (0.002)	0.017*** (0.002)
Technical education (Reference category: No technical education)				
Technical education	0.986*** (0.101)	0.982*** (0.065)	0.886*** (0.038)	0.97*** (0.045)
Religion (Reference category: Hinduism)				
Islam	-0.082 (0.11)	-0.466*** (0.093)	-0.392*** (0.018)	-0.131*** (0.019)
Christianity	-0.097 (0.115)	0.071 (0.068)	0.204*** (0.044)	0.112*** (0.043)
Sikhism	-0.736** (0.35)	-0.316*** (0.055)	-0.387*** (0.074)	-0.229*** (0.046)
Jainism	0.369 (0.672)	-0.859* (0.51)	-0.344 (0.246)	-0.26*** (0.091)
Buddhism	0.101 (0.166)	0.297*** (0.063)	0.69*** (0.224)	1.071*** (0.358)
Zoroastrianism		-0.521 (0.813)	0.28 (0.345)	-0.217 (0.34)
Others	-0.08 (0.077)	0.056 (0.146)	0.091 (0.095)	0.161 (0.097)
Marital status (Reference category: Never married)				
Currently married	0.028 (0.031)	0.111*** (0.028)	0.082*** (0.019)	-0.07*** (0.022)
Widowed	0.346*** (0.056)	0.496*** (0.048)	0.403*** (0.034)	0.271*** (0.039)
Divorced/separated	0.878*** (0.111)	0.82*** (0.115)	0.658*** (0.078)	0.767*** (0.092)

Monthly per person household expenditure (in '000 Rs)	-0.035** (0.015)	-0.008 (0.008)	0.002 (0.003)	0.01*** (0.003)
Household size	-0.017*** (0.006)	-0.042*** (0.005)	-0.037*** (0.003)	-0.021*** (0.004)
Sector (Reference category: Rural)				
Urban	-0.335*** (0.034)	-0.288*** (0.021)	-0.367*** (0.014)	-0.386*** (0.015)
Constant	0.800 (1.022)	0.097 (0.147)	0.707*** (0.105)	-1.231*** (0.118)
Number of observations	18877	23411	52197	38179
Log pseudolikelihood	35689.155	55558.14	132108.42	81578.046
Wald chi square	1837.96***	2363.95***	4911.32***	2846.6***
Wald test of exogeneity	0.00	0.41	0.46	15.87***
First stage F-statistics (using Newey's two step estimator)	96.37	26.53	45.03	78.60

Note: Same as Table 1.

Source: Same as Table 1.

Table A5. Impact of acid attack or attempt to acid attack cases on female labour force participation (15-59 years) across caste groups

Explanatory Variables	ST	SC	OBC	Others
Acid attack or attempt to acid attack (rate)	-1.33 (52.214)	56.328 (37.902)	-6.182 (19.892)	-56.139*** (14.098)
Conviction Rate	-0.001 (0.002)	-0.002*** (0.001)	-0.003*** (0.00)	-0.003*** (0.000)
Pendency percentage	-0.018*** (0.002)	-0.018*** (0.004)	-0.017*** (0.001)	0.012*** (0.003)
Age	0.027*** (0.001)	0.021*** (0.003)	0.019*** (0.001)	0.013*** (0.001)
Years of formal schooling	0.009*** (0.003)	-0.007*** (0.002)	-0.007*** (0.002)	0.017*** (0.002)
Technical education (Reference category: No technical education)				
Technical education	0.988*** (0.099)	0.943*** (0.095)	0.887*** (0.038)	0.901*** (0.069)
Religion (Reference category: Hinduism)				
Islam	-0.081 (0.094)	-0.446*** (0.098)	-0.387*** (0.023)	-0.13*** (0.019)
Christianity	-0.1*** (0.035)	0.084 (0.064)	0.204*** (0.044)	0.047 (0.048)
Sikhism	-0.737** (0.359)	-0.469*** (0.071)	-0.356*** (0.09)	-0.034 (0.06)
Jainism	0.376 (0.672)	-0.979* (0.508)	-0.348 (0.247)	-0.313*** (0.09)
Buddhism	0.096 (0.085)	0.491*** (0.093)	0.675*** (0.231)	-0.23 (0.192)
Zoroastrianism		-0.256 (0.782)	0.281 (0.339)	-0.293 (0.331)
Others	-0.082 (0.072)	0.259 (0.194)	0.087 (0.099)	-0.087 (0.109)
Marital status (Reference category: Never married)				
Currently married	0.028 (0.029)	0.102*** (0.028)	0.082*** (0.019)	-0.047* (0.024)
Widowed	0.345*** (0.056)	0.477*** (0.061)	0.405*** (0.034)	0.294*** (0.039)
Divorced/separated	0.879*** (0.111)	0.796*** (0.126)	0.656*** (0.078)	0.791*** (0.094)

Monthly per person household expenditure (in '000 Rs)	-0.035** (0.014)	-0.026** (0.013)	0.003 (0.004)	0.016*** (0.003)
Household size	-0.017** (0.007)	-0.037*** (0.008)	-0.037*** (0.003)	-0.028*** (0.004)
Sector (Reference category: Rural)				
Urban	-0.333*** (0.042)	-0.319*** (0.019)	-0.364*** (0.015)	-0.275*** (0.034)
Constant	0.783*** (0.254)	0.63* (0.375)	0.696*** (0.106)	-1.786*** (0.16)
Number of observations	18877	23411	52197	38179
Log pseudolikelihood	68676.364	70173.198	172497.25	110468.65
Wald chi square	1837.55***	2889.18***	4894.14***	3161.39
Wald test of exogeneity	0.01	2.11	0.05	9.64***
First stage F-statistics (using Newey's two step estimator)	83.91	42.44	43.70	72.83

Note: Same as Table 1.

Source: Same as Table 1.

Table A6. Impact of crime against women on female labour force participation (15-59 years) across marital status

Explanatory Variables	Never married	Currently married	Widowed	Divorced/ Separated
Crime against women (rate)	0.003 (0.005)	-0.009*** (0.003)	-0.014 (0.009)	0.06* (0.033)
Conviction Rate	-0.003*** (0.00)	-0.004*** (0.00)	0.001 (0.001)	0.00 (0.003)
Pendency percentage	-0.002 (0.001)	-0.016*** (0.001)	-0.002 (0.003)	-0.03*** (0.007)
Age	0.089*** (0.002)	0.014*** (0.00)	-0.037*** (0.002)	0.005 (0.005)
Years of formal schooling	0.047*** (0.003)	-0.009*** (0.001)	0.002 (0.004)	0.008 (0.01)
Technical education (Reference category: No technical education)				
Technical education	0.800*** (0.042)	0.932*** (0.03)	0.969*** (0.216)	0.334 (0.274)
Caste (Reference category: Others)				
ST	0.258*** (0.033)	0.437*** (0.017)	0.547*** (0.062)	0.481** (0.214)
SC	0.027 (0.029)	0.092*** (0.014)	0.331*** (0.049)	-0.011 (0.154)
OBC	0.014 (0.023)	0.111*** (0.012)	0.222*** (0.042)	-0.074 (0.133)
Religion (Reference category: Hinduism)				
Islam	-0.022 (0.027)	-0.359*** (0.015)	-0.454*** (0.053)	-0.302** (0.142)
Christianity	0.202*** (0.036)	-0.056** (0.022)	0.036 (0.076)	-0.028 (0.2)
Sikhism	-0.146*** (0.066)	-0.438*** (0.034)	-0.439*** (0.114)	-0.366 (0.419)
Jainism	0.066 (0.177)	-0.378*** (0.105)	-0.289 (0.339)	0.874 (0.619)
Buddhism	0.089 (0.082)	0.279*** (0.044)	0.311* (0.16)	
Zoroastrianism	-0.274 (0.581)	0.074 (0.266)		-0.464 (0.721)
Others	0.144*** (0.082)	-0.027 (0.055)	-0.347** (0.166)	0.54 (0.596)

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Monthly per person household expenditure (in '000 Rs)	-0.004 (0.004)	0.008*** (0.003)	-0.013* (0.007)	-0.001 (0.027)
Household size	-0.022*** (0.005)	-0.02*** (0.002)	-0.098*** (0.009)	-0.128*** (0.025)
Sector (Reference category: Rural)				
Urban	-0.048*** (0.019)	-0.469*** (0.01)	-0.306*** (0.033)	-0.1 (0.105)
Constant	-2.714*** (0.151)	0.853*** (0.079)	2.492*** (0.267)	2.964*** (0.825)
Number of observations	32228	92378	7223	831
Log pseudolikelihood	-103311.8	-314994.7	-24718.39	-2786.86
Wald chi square	3690.42***	7047.68***	821.01***	95.79***
Wald test of exogeneity	3.2*	3.41*	0.91	3.65*
F-Statistic (first stage)	465.44***	1058.3***	98.77***	11.47***

Note: Same as Table 1.

Source: Same as Table 1.

Table A7. Impact of incidence of rape & murder on female labour force participation (15-59 years) across marital status

Explanatory Variables	Never married	Currently married	Widowed	Divorced/ Separated
Rape & murder (rate)	5.274 (7.595)	-14.859*** (4.464)	-19.551 (12.884)	31.911** (15.146)
Conviction Rate	-0.003*** (0.001)	-0.004*** (0.00)	0.001 (0.001)	0.001 (0.003)
Pendency percentage	-0.001 (0.002)	-0.016*** (0.001)	-0.002 (0.003)	-0.024*** (0.009)
Age	0.089*** (0.002)	0.014*** (0.00)	-0.034*** (0.004)	0.003 (0.005)
Years of formal schooling	0.047*** (0.003)	-0.007*** (0.001)	0.005 (0.004)	0.003 (0.01)
Technical education (Reference category: No technical education)				
Technical education	0.798*** (0.042)	0.903*** (0.033)	0.895*** (0.213)	0.325 (0.265)
Caste (Reference category: Others)				
ST	0.25*** (0.033)	0.426*** (0.019)	0.564*** (0.062)	0.283 (0.213)
SC	0.034 (0.032)	0.07*** (0.017)	0.305*** (0.058)	-0.049 (0.149)
OBC	0.021 (0.027)	0.09*** (0.015)	0.192*** (0.055)	-0.158 (0.121)
Religion (Reference category: Hinduism)				
Islam	-0.02 (0.027)	-0.354*** (0.015)	-0.444*** (0.056)	-0.295** (0.145)
Christianity	0.178*** (0.043)	-0.008 (0.023)	0.088 (0.077)	-0.29 (0.229)
Sikhism	-0.118 (0.082)	-0.476*** (0.036)	-0.479*** (0.11)	-0.263 (0.373)
Jainism	0.063 (0.177)	-0.381*** (0.102)	-0.293 (0.325)	0.597 (0.526)
Buddhism	0.037 (0.108)	0.416*** (0.057)	0.405** (0.159)	
Zoroastrianism	-0.259 (0.579)	0.067 (0.258)		-0.485 (0.828)
Others	0.13 (0.082)	-0.009 (0.054)	-0.297* (0.167)	0.669 (0.564)

Monthly per person household expenditure (in '000 Rs)	-0.004 (0.004)	0.006** (0.003)	-0.013* (0.007)	-0.011 (0.028)
Household size	-0.022*** (0.005)	-0.021*** (0.002)	-0.091*** (0.012)	-0.12*** (0.028)
Sector (Reference category: Rural)				
Urban	-0.042** (0.021)	-0.477*** (0.01)	-0.317*** (0.033)	0.025 (0.111)
Constant	-3.07*** (0.23)	0.891*** (0.079)	2.305*** (0.27)	2.73*** (0.938)
Number of observations	32228	92378	7223	831
Log pseudolikelihood	76412.1	205057.76	15586.84	1852.08
Wald chi square	3715.21***	7579.15***	946.32***	124.36***
Wald test of exogeneity	0.53	14.85***	2.71*	2.01
F-Statistic (first stage)	50.4	99.9	9.41	4.88

Note: Same as Table 1.

Source: Same as Table 1.

Table A8. Impact of incidence of acid attack or attempt to acid attack on female labour force participation (15-59 years) across marital status

Explanatory Variables	Never married	Currently married	Widowed	Divorced/ Separated
Acid attack or attempt to acid attack (rate)	13.866 (19.886)	-49.439*** (14.718)	-51.11 (31.336)	-119.361*** (43.416)
Conviction Rate	-0.003*** (0.00)	-0.004*** (0.00)	0.00 (0.001)	-0.005** (0.002)
Pendency percentage	-0.003 (0.002)	-0.012*** (0.002)	0.003 (0.004)	-0.007 (0.014)
Age	0.089*** (0.002)	0.013*** (0.001)	-0.036*** (0.003)	-0.005 (0.006)
Years of formal schooling	0.047*** (0.003)	-0.009*** (0.001)	0.003 (0.004)	0.00 (0.01)
Technical education (Reference category: No technical education)				
Technical education	0.795*** (0.042)	0.873*** (0.043)	0.941*** (0.211)	0.263 (0.228)
Caste (Reference category: Others)				
ST	0.28*** (0.049)	0.337*** (0.043)	0.438*** (0.113)	-0.011 (0.26)
SC	0.026 (0.028)	0.084*** (0.015)	0.293*** (0.064)	-0.178 (0.144)
OBC	0.028 (0.034)	0.044 (0.027)	0.141* (0.08)	-0.38*** (0.124)
Religion (Reference category: Hinduism)				
Islam	-0.025 (0.027)	-0.332*** (0.02)	-0.436*** (0.059)	-0.194 (0.162)
Christianity	0.21*** (0.041)	-0.082*** (0.024)	0.021 (0.076)	0.093 (0.192)
Sikhism	-0.18** (0.074)	-0.308*** (0.051)	-0.308** (0.133)	-0.411 (0.312)
Jainism	0.059 (0.177)	-0.422*** (0.102)	-0.333 (0.351)	0.164 (0.346)
Buddhism	0.114 (0.091)	0.166*** (0.059)	0.196 (0.177)	
Zoroastrianism	-0.239 (0.577)	-0.016 (0.253)		1.26 (1.968)

Others	0.166* (0.091)	-0.106* (0.06)	-0.399** (0.161)	0.586 (0.473)
Monthly per person household expenditure (in '000 Rs)	-0.005 (0.004)	0.012*** (0.003)	-0.011 (0.008)	0.006 (0.021)
Household size	-0.022*** (0.005)	-0.023*** (0.002)	-0.096*** (0.01)	-0.111*** (0.032)
Sector (Reference category: Rural)				
Urban	-0.057** (0.023)	-0.419*** (0.024)	-0.268*** (0.047)	0.12 (0.118)
Constant	-2.895*** (0.161)	0.61*** (0.09)	2.065*** (0.356)	2.092* (1.139)
Number of observations	32228	92378	7223	831
Log pseudolikelihood	105489.63	284029.1	22076.41	2633.54
Wald chi square	3710.63***	7826.43***	915.71***	151.02***
Wald test of exogeneity	0.53	7.05***	1.4	3.68*
F-Statistic (first stage)	84.77	223.07	21.74	6.53

Note: Same as Table 1.

Source: Same as Table 1.

Table A9. Falsification test- Regression of outcome variable (labour force participation rate) on instrumental variable

Explanatory Variables	Dependent variable- Labour force participation rate (15-59 years)				
	All	ST	SC	OBC	Others
Cybercrimes (rate)	-0.012 (0.02)	-0.068 (0.081)	0.079 (0.057)	0.026 (0.047)	-0.008 (0.025)
Constant	0.15*** (0.002)	0.266*** (0.007)	0.176*** (0.006)	0.137*** (0.004)	0.093*** (0.005)
Number of observations	268976	38437	47445	105432	77662
LR chi-square	0.36	0.69	1.93	0.3	0.11
Log likelihood	-184532	-25798.6	-32412.6	-72447.6	-53617.8
Pseudo R2	0.000	0.000	0.000	0.000	0.000

Note: The figures in parentheses are standard errors; *$p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$. The estimates are based on Probit model.

Source: Author's estimation based on data from Periodic labour force survey 2019-20, National Crime Records Bureau, India and Census of India 2001, 2011

Table A10. Falsification test- Regression of instrumented variable (rate of crime against women) on instrumental variable

Explanatory Variables	Dependent variable- Crime against women (rate)				
	All	ST	SC	OBC	Others
Cybercrimes (rate)	13.599*** (0.067)	18.669*** (0.22)	12.917*** (0.182)	17.725*** (0.133)	11.581*** (0.103)
Constant	5.391*** (0.008)	3.909*** (0.018)	5.537*** (0.019)	5.087*** (0.011)	6.351*** (0.019)
Number of observations	268976	38437	47445	105432	77662
F-statistics	41124.18	7200.49	5053.21	17641.61	12765.62
Adjusted R square	0.1326	0.1578	0.0962	0.1433	0.1412

Note: The figures in parentheses are standard errors; *$p \leq 0.1$, ** $p \leq 0.05$, *** $p \leq 0.01$. The estimates are based on ordinary least square regression.

Source: Author's estimation based on data from Periodic labour force survey 2019-20, National Crime Records Bureau, India and Census of India 2001, 2011