

Why do men rape? Understanding the determinants of rapes in India

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Abstract: The study examines the determinants of rapes in India using state-level data for the time period 2001-2015. The panel model analysis indicates that there is no impact of education and economic growth, pointing towards a larger role of social and cultural factors in this context. The effect of deterrence variables (such as, the number of police stations) is non-existent, indicating possibly towards the incompetency of the police force. Social attitude towards women emerged as the most robust predictor of the extent of rapes in India. We argue that the fundamental problem lies in the misogyny deep-rooted in the Indian society.

Keywords: rape; India; women; sexual violence; gender inequality; panel analysis

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1. Introduction

On the night of 16th December 2012, a 23-year-old paramedical student known as 'Nirbhaya' was brutally gang-raped in Delhi (The Hindu, May 8, 2017). She was then savagely beaten and left bleeding by the roadside. Nirbhaya died after a few days from the injuries inflicted upon her. The horrific incident, which is often referred to as a 'watershed moment', attracted widespread attention both locally and internationally as well as galvanised thousands of people across the country who staged protests demanding stricter laws against rape (CNN, December 16, 2015) and

The National Crime Records Bureau (NCRB) started collecting data on rapes only from 1971 onwards whereas data on other crimes are available from 1953. The reason behind this anomaly is unknown although legal provisions for rape existed in the Indian Penal Code prior to 1971 (The Times of India, January 6, 2008). Between 1971 and 2015, rape cases increased by a staggering 1293.3% significantly leaving behind other heinous crimes such as murder (98.5%). Kidnapping and Abduction-which also primarily involves women as victim-has increased by 762.2% whereas Burglary and Dacoity (an act of violent robbery committed by an armed gang) cases have declined over time by 31.2% and 64.2% respectively¹. Though some critics opine that this massive upsurge in rape figures reflects an increase in crime-reporting rather than an increase in the crime rate there exists no concrete proof in favour of this argument.

Since independence, successive Indian governments have adopted several measures to safeguard the interests of women. Article 14 in the Indian Constitution (which came into effect from 26th January, 1950) guarantees equality to Indian women². The National Commission for Women was set up as a statutory body in 1992 to review the constitutional and legal safeguards of women and to recommend remedial legislative measures. As specified on it's website, the commission also advises the government on all policy matters affecting women. The Indian Penal Code Sections 375 and 376 outline the legal definition of rape and punishment for rapists respectively. Following the 2012 case, the Indian government brought amendments to broaden the definitions of rape and introduced stricter punishments for rape crimes and proposed to set up around 1800 fast track courts to fasten the delivery of justice to

rape and other sexual violence victims. But there are reasons to doubt the effectiveness of these courts to mitigate the problem of rape. Firstly, Kothari and Ravi examine the performance of the 10 fast-track rape courts in the southern state of Karnataka and report an abysmal conviction rate of only 16.8%³. Secondly, concerns have been raised on how these courts still rely on outdated forms of medical evidence such as the archaic two-finger test and prior sexual history of the complainant, despite the Supreme Court terming the latter as discriminatory against women⁴. Thirdly, as pointed out by a BBC report on 9th January 2013, funding these courts have been a major problem. The central government has delegated the funding of these courts to the state governments in 2011 who, finding it expensive to run, sometimes do away with them. Fourthly, the Indian judicial system is severely undermanned with 18 judges per million people and 22 million legal cases pending (The Indian Express, August 4, 2016; The Economist, May 19th, 2016). Unsurprisingly this understaffed system makes the fast track courts deal with cases outside of sexual violence against women and somewhat defeats the purpose of their existence. For instance, New Delhi, which has the highest incidence of rapes than any other Indian city, has a backlog of 3,487 cases in its fast-track courts with some cases languishing for more than three years (The Washington Post, August 15, 2016). Meanwhile, over the period 2012-2016, incidence of rape crimes has continued to increase at a rate (56.3%) which is higher than that recorded in the previous ten years 2002-2012 (52.2%)⁵. Some authors argue that violence against women is a deep-rooted social problem and policy response in the form of broadening the legal definition of rape, enhancing punishment, increasing the number of courts and police stations would not be sufficient. The emphasis should be on prevention⁶.

Subsequently, we ask: what are the probable determinants of rapes in India? There is a vast gamut of literature which explores the determinants of domestic violence in India (see Section 2). Comparatively speaking, the literature on rape in India is scant⁷. The existing works on the issue of rape mainly comprise of blogs, newspaper articles and specific case studies. To the best of our knowledge, there exists virtually no study which attempts to quantify the effect of different factors contributing to the occurrence of rapes in India.

The general crime literature argues that factors which determine criminal activities are diverse, relating to economic, educational, social, political and legal aspects.

a) **Economic factors:** Corman and Mocan said that individuals engage in criminal activities depending upon the expected payoffs of the activities, the return to legal labour market activities and costs associated with crimes such as conviction and punishment⁸. Fleisher shows that low income leads to higher rates of crime⁹. Several studies such as Krohn argue that violent crimes tend to decrease with increasing economic development¹⁰.

b) **Education:** The early economic models treated crime and work as substitutes and deduced that increasing availability of jobs and higher wages decrease the level of criminal activities¹¹. Lochner argues that higher levels of education increase the probability of higher earnings consequently raising the opportunity costs of crime. Therefore, more intelligent and more educated adults should commit fewer street (unskilled) crimes¹². Many other studies obtain similar findings¹³. Dutta and Hussain say that education may have a “civilisational effect” by improving moral stance thereby leading to a reduction in unlawful activities¹⁴.

c) **Deterrence factors:** Becker’s seminal work, on the economics of crime, emphasises the relationship between crime and punishment through a model of the decision to commit crime¹⁵. Ehrlich also shows the effectiveness of law enforcement in reducing crime and the resulting social losses¹⁶. An increase in law enforcement activities increases either the probability of punishment or severity of punishment and thus may act as a strong deterrence factor for the criminals. Using a panel dataset on North Carolina counties, Cornwell and Trumbull demonstrate that criminal justice strategies are helpful in deterring crime¹⁷.

d) **Social attitude/ Valuing of Women in Indian society:** Many studies and newspaper articles (see, for example, The Times of India, September 9, 2016 and ED Times, May 18, 2016, among others) have blamed the lack of dignity of women in Indian society as one of the central causes for such high occurrence of rapes¹⁸. We therefore aim to test these assertions using quantitative analysis.

e) Gender of the Head of Government: A few studies have shown that having women representatives at the head of the local government helps deter crimes against women. See Section 2 for a detailed discussion on each of the aforementioned factors in the context of India.

Therefore, this paper seeks to examine the determinants of rapes in 28 Indian states and Delhi (capital of India) for the time period 2001-2015 by considering educational, economic, social, political and institutional factors. The existing theoretical literature asserts that the rape crisis (or, the violence against women in general) currently facing India is a consequence of the deep-rooted social evils (see Section 2) and this problem cannot be eradicated with mere improvement in economic indicators and legal reforms. Consequently, we aim to test the following hypotheses through our econometric analysis:

- i) There is no significant effect of economic and legal or deterrence factors on incidence of rapes;
- ii) The social factors (or, factors capturing social attitude) are primarily responsible for the high occurrence of rapes in India.

The paper employs the official government statistics on rape, compiled by the National Crime Records Bureau, in the analysis. We acknowledge the fact that rape statistics are grossly under-estimated in India because marital rape is still not considered to be a crime under the Indian laws. We therefore would like to caution the reader that the effects of explanatory variables captured by this study may be slightly affected by downward bias (i.e., estimates may be slightly lower than the true parameter). In absence of any other source of state-level time series marital rape data, we work with the NCRB data as it is the most comprehensive dataset available on the rape crimes in India.

2. Review of the Literature

According to the Indian Penal Code Section 375, a man is said to commit “rape” if he—

(a) penetrates his penis, to any extent, into the vagina, mouth, urethra or anus of a woman or makes her to do so with him or any other person; or (b) inserts, to any extent, any object or a part of the body, not being the penis, into the vagina, the urethra or anus of a woman or makes her to do so with him or any other person; or (c) manipulates any part of the body of a woman so as to cause penetration into the vagina, urethra, anus or any part of body of such woman or makes her to do so with him or any other person; or (d) applies his mouth to the vagina, anus, urethra of a woman or makes her to do so with him or any other person, under the circumstances falling under any of the following seven descriptions:—

Firstly, against her will; secondly, without her consent. thirdly, with her consent, when her consent has been obtained by putting her or any person in whom she is interested, in fear of death or of hurt; fourthly, with her consent, when the man knows that he is not her husband and that her consent is given because she believes that he is another man to whom she is or believes herself to be lawfully married; fifthly, with her consent when, at the time of giving such consent, by reason of unsoundness of mind or intoxication or the administration by him personally or through another of any stupefying or unwholesome substance, she is unable to understand the nature and consequences of that to which she gives consent; sixthly, with or without her consent, when she is under eighteen years of age; and seventhly, when she is unable to communicate consent.

Exception 1: A medical procedure or intervention shall not constitute rape.

Exception 2: Sexual intercourse or sexual acts by a man with his own wife, the wife not being under fifteen years of age, is not rape¹⁹.

It should be noted that sexual violence is a continuum that stretches from sexual harassment through to rape. Though not always the case, the acts of sexual violence often escalate along the continuum where perpetrators often start with acts such as ‘*Eve teasing*’, get emboldened in the process by factors such

as, but not limited to, social acceptance of such acts and lack of fear for law, and escalate towards more serious crimes such as rape²⁰.

Therefore, in order to choose explanatory variables for our econometric model, we do not only focus on existing literature on rape but also on the broader literature on sexual violence and domestic violence. Wherever there is a dearth of studies in the Indian context, we rely solely on the international studies in order to comprehend the existing evidence on the empirical relationship between rape and its potential determinants.

Valuing of Women in Indian society (social attitude)

There is a consensus in the literature that the root of the problem of sexual crimes against women in India lies in the country's long history of patriarchal hierarchy. It was not uncommon to find women to be considered as the 'The Inferior Sex' even in the developed countries a few centuries back but as these nations progressed on the economic and social fronts, the exploitation against women gradually declined. However, India's case is unique. Livne vividly captures the historical evolution of the patriarchal hierarchy in India²¹. For thousands of years (since the Vedic period, 1500-800 BCE), the Indian woman has been playing a dichotomous role. On one hand, she is revered as the goddess of power and wealth (object of worship) and on the other she was required to be serve as the submissive wife and a beacon of chastity (object of control). The post-Vedic period witnessed the arrival of a Hindu funeral ritual known as 'Sati' in which the woman had to kill herself by sacrificing herself in the deceased husband's funeral pyre. This act was considered as the proof of the wife's devotion towards her husband.

The advent of "Indian nationalism" during the British rule (19th century-early 20th century) separated the cultural domain into two spheres-the material and the spiritual²². While the Indians accepted the science, technology and modern methods of statecraft from the advanced Western world the Indian nationalists argued that the East is superior to the West in the spiritual domain. The argument followed that as long as India retained the spiritual distinctiveness of its culture, it would be able to maintain its unique identity amidst the changing material world. Thus, emerged a new form of patriarchy where

women were allowed to take up formal education but the maintenance of spiritual virtue inside the home rested on her alone. Regardless of her educational qualifications, the “new woman” was required to develop feminine virtues such as self-sacrifice, chastity, submission and devotion. She, as the symbol of Indian culture, has to be always confined at home in order to be protected from western influence. Livne argues that this new patriarchy is still present in India which is the underlying reason behind tension between those trying to change the status quo and those who resist any change by invoking cultural and historical tradition²³. Chattoraj gives an overview of the problem of rape with illustrative examples from the Indian context and concludes that the general attitude of society must change in favour of dignity of women which would necessitate greater female literacy and improvement of the economic conditions of the downtrodden masses²⁴. Soondas, in his blog, also blames the hierarchical nature of the Indian society for the high occurrence of rapes in India (The Times of India, December 19, 2012). Similar sentiments are echoed in numerous other newspaper reports such as those by Sharmal and Arora who write that patriarchy has seeped deep into the Indian society (Times of India, September 9, 2016; ED Times, May 18, 2016). This is evident from the fact that marital rape is still not considered a crime in India. Even many women in India refuse to believe that marital rape exists showing the absence of the concept called ‘consent’ in the general Indian psyche.

The role of social factors is also observed in the case of other countries where the problem of rape is widespread. A 2009 study reviews the sexual violence literature for South Africa and observes that the over-arching ideology of patriarchy in South Africa is largely responsible²⁵. A 2011 study analyses sexual violence in the Democratic Republic of Congo (DRC) using a household survey data on 3436 women and reports that the main drivers of the rape epidemic in Congo are the lack of law and order and broader social acceptance of sexual violence²⁶.

Thus, it can be claimed that sexual violence or rape is more likely to occur in societies that foster beliefs of perceived male superiority and social and cultural inferiority of women. Given the deep-rooted patriarchy present in the Indian society, we include variables that intend to capture the social aspects of rape.

Though culture is an important determinant of occurrence of rapes, as suggested by few studies, we need to look at, as well as beyond to comprehend the complete picture²⁷.

Legal and deterrence factors

The early literature on rape, including the seminal works of Brownmiller and Clark and Lewis, has unanimously stressed the importance of stereotypes and myths (false beliefs about rape and rape victims) in creating a climate which downplays the severity of rapes and which is hostile to rape victims²⁸. Burt discusses that some of the examples of these 'rape myths' are "only bad girls get raped"; "any healthy woman can resist a rapist if she really wants to"; "women ask for it"; and, "women 'cry rape' only when they've been jilted or have something to cover up"²⁹.

The more patriarchal a society is, the more will be the tendency to evaluate crimes such as rapes through the prisms of rape myths. This tendency then spills over to the law-enforcement institutions as these consist of people who come from that very society.

There exists a large body of articles which highlight the apathy of the Indian police towards rape victims and regard the system as part of the rape problem (The New York Times, January 22, 2013; Huffington Post, July 26, 2016). Narrain, and Simon-Kumar link the high occurrence of rape crimes with the inefficiency of the police system in the country³⁰. Lapsia examines the 2012 Delhi incident and cites government inadequacies and normalisation of gender injustice as the causes behind the growing violence against Indian women³¹. In the context of the gang-rape and death of a 16 year old girl in Kolkata, Martinson, in her Guardian article on 2nd January 2014 , highlights the political corruption and inefficiency of the police force in the country whereby the investigating officers harassed the grieving family of the victim by insisting on cremating the dead girl hurriedly because the rape offenders were supposedly linked to the ruling political party of West Bengal. Several other studies such as Sharma and Gupta, and that by Dalal and Lindqvist also blame insufficient legal intervention for the current plight of the average Indian woman³². Moreover, the police force in the country is still highly male-dominated with only about 7% of all employees being women. (The Indian Express, March 28, 2017).

As discussed earlier, India has taken several regulatory measures, such as toughening the punishment terms, broadening the legal definition of rape, setting up of institutions such as National Commission for women and fast track courts. Moreover, the number of police stations per 100 square km. have increased in every state of India over time³³. Thus, quantitatively speaking, it can be argued that the India has undoubtedly responded to the problem of rape crimes. Therefore, it would be interesting to test empirically whether deterrence factors affect the occurrence of rapes in India.

Economic factors

There can be confusion in the mind of the readers surrounding the definition of economic factors as the literature uses diverse variables to capture the economic aspect of rape (such as unemployment rates, poverty and size of the economy concerned). It could be argued that all these measures are highly correlated because as a country experiences economic growth unemployment rates tend to fall thereby leading to a reduction in poverty levels. In other words, all these economic variables tend to move together. At the state-level, data on State Domestic Product is available for each year under consideration by this study and therefore we will use the same as the proxy for economic factor in our economic analysis. Also, it should be noted that there is another strand of literature which looks at individual data to capture the economic aspect of rape³⁴. Given the scope of the paper, we focus only on aggregate level studies.

Some scholars posit the disadvantaged male hypothesis whereby a male resort to rape if he has no other means of securing copulations³⁵. One of the implications of this hypothesis is that men with lower socio-economic status would commit more rapes relative to their counterpart with higher status because the former are relatively incapable of attracting the opposite sex. Thus, deprived of mates, their frustration is vented through forceful sexual activities. However, the overall empirical evidence is mixed. Some studies indeed report that rapes are committed disproportionately by men with lower socio-economic status³⁶. Vaughan in a 2010 study collected data on 255 rape offences in the USA and found that there were more low-status than high-status men in the sample³⁷. On the other hand, a 2014 study on European

countries state that the overall findings on the relationship between rape and economic factors are inconclusive³⁸. Another study estimates the effect of unemployment rates on crime rates in USA using a state-level panel covering the period 1971–1997 and reports a non-robust effect of economic factors on rape³⁹. Some of these studies generally lend support to another hypothesis known as the opportunistic rapist hypothesis whereby men engage in sexual violence, irrespective of socio-economic status, because the opportunity costs of such activities are very low. That is why frequency of rapes increases substantially during war times because of the decreased likelihood of detection and punishment. A 2012 study examines the link among crime, deterrence and unemployment in Greece over the period 1991–1998 and conclude that rising unemployment increases property crimes but not violent crimes, including rape⁴⁰. The empirical relationship between economic factors and rape seem to be fragile as the findings vary from country to country and thus the result of any particular set of international studies cannot be assumed to generally apply in all cases. Therefore, this study will examine the relationship for India.

Education

Theoretically speaking, there are strong reasons to believe that education should have a negative effect on any crime. Firstly, schooling increases the returns to legitimate work, thereby raising the opportunity costs of criminal behaviour. In other words, punishment for violent crimes (including rape) involves incarceration. By raising wage rates, schooling makes this ‘lost time’ more costly⁴¹. Secondly, education affects the psychic rewards from crime and also alters preferences of individuals (for instance, makes them more risk averse and increases the probability of moral behaviour), which in turn affects the decisions to engage in criminal activities. However, the empirical evidence is inconclusive. A study on prison inmates in the USA report that 1-year increase in average years of schooling increases rape which is counter-intuitive. The authors initially hypothesised this finding by assuming that more educated women are more likely to report rape. They examined reporting rates from the National Criminal Victimization Survey and failed to find evidence of such differential reporting⁴². Many other studies also report that the effect of educational attainment is statistically insignificant⁴³.

As far as India is concerned, there does exist a considerably large literature reflecting on this relationship between rape and education but mostly the focus has been on domestic violence. Overall, the evidence

is mixed. Whereas some report a negative effect of education on sexual violence, others report counter-intuitive findings. Babu and Kar examine domestic violence against women by conducting a population-based study covering both married women (n = 1718) and men (n = 1715) from three states of Eastern India. The interviewees were selected through a systematic multistage sampling strategy. The study finds that urban residence, older age, lower education and lower family income are associated with occurrence of domestic violence⁴⁴. A study focused on Southern India examine the prevalence of physical and sexual violence among 1,974 married women from 40 low-income communities .and report that women with elementary or middle school education are more likely to report abuse than those with no formal education⁴⁵. A 2006 study on Northern India published in the American Journal of Public Health also report similar findings as far as sexual violence is concerned ⁴⁶.

Gender of Head of Government

There is a significant under-representation of women in Indian politics. Women accounted for only 10% of the membership of national legislatures in 2009. During the time period, 1985–2007, only 5.5 percent of state legislators, on average, were women⁴⁷. There are a few studies on India which argue that increasing the number of women holding political offices tend to decrease crimes against women⁴⁸. Some argue that such political representation gives voice to the disadvantaged groups (women in this context) within the criminal justice system⁴⁹. A 2014 study on India shows that gender of the chief political decisionmaker affects violent crime rates in India⁵⁰. Consequently, we will investigate whether rapes are lower in states where there is a female Chief Minister (Head of State Government).

3. Methodology and Data

This section presents the econometric model employed by the study. The explanatory variables have been selected after a thorough perusal of the related literature.

The econometric model employed by the study can be presented as follows.

$$\text{Rape}_{it} = \beta_0 + \beta_1 \text{SDP}_{it} + \beta_2 \text{Enrol}_{it} + \beta_3 \text{Conviction}_{it} + \beta_4 \text{Police}_{it} + \beta_5 \text{Social}_{it} + \beta_6 \text{FemaleCM}_{it} + e_{it} \quad (1)$$

where, in state 'i' at time 't',

'Rape' denotes number of rapes per lakh female population, 'SDP' (a proxy for 'economic factors') is per capita Net State Domestic Product in INR 2004 constant prices, 'Enrol', a dummy for 'education' factors, is gross enrolment ratio in higher education (18-23 years), 'Conviction' and 'Police' capture the 'legal and deterrence factors' which can be defined as conviction rate for rape crimes and number of police stations per 100 square km respectively, 'FemaleCM' is a dummy variable which takes the value of 1 if the state has a female Chief Minister and 0 otherwise and 'Social' captures the social attitude towards women. Three variables have been used as proxy for 'Social' which are:

a) **'Foeticide'**: female child foeticide per lakh female population. This variable captures the selective abortion of female foetuses happening all over India. Since 1991, 80% of districts in India have recorded a declining sex ratio⁵¹. This brutal practice is primarily driven by the prospect of having to pay a dowry to the future bridegroom of a daughter⁵². Traditionally in the Indian society, a son has always been considered to be an asset who supposedly provides security to his parents in their old age whereas a daughter is viewed as a social and economic burden. One of the theories on rape say that cultural norms, that approve of violence against women, increase the likelihood of rape⁵³. Therefore, we hypothesise that the higher the occurrence of foeticide in a state, the worse is the social status of the women there and the higher is the occurrence of rapes.

b) **'Dowrydeath'**: The second proxy is the number of dowry deaths per lakh female population. Dowry is the money or assets that the bride brings to her husband or his family after marriage. It is not a 'gift'

or a ‘reciprocal gesture’; rather parents of the bride are compelled to transfer a significant amount of their wealth to the groom’s family and has become a major factor in marriage negotiations⁵⁴. The low status of women in the society is a major factor behind the existence of the dowry system.

c) ‘**Cruelty**’: The final proxy for social attitude is the number of cases registered under Indian Penal Code Section 498A (cases of cruelty by husband or his relatives per lakh female population) which aims to capture the suffering and hardship faced by the Indian women in their in-laws’ homes.

Each of the social attitude proxies enter the estimating equation separately. The purpose of this is two-fold: firstly, including these variables together in the model can potentially lead to the problem of high multicollinearity, and secondly, this way, we also examine whether our econometric findings are robust to different model specifications.

In Section 4, we estimate the following three models:

$$\text{Rape}_{it} = \beta_0 + \beta_1 \text{SDP}_{it} + \beta_2 \text{Enrol}_{it} + \beta_3 \text{Conviction}_{it} + \beta_4 \text{Police}_{it} + \beta_5 \text{Foeticide}_{it} + \beta_6 \text{FemaleCM}_{it} + e_{it}$$

(2)

$$\text{Rape}_{it} = \beta_0 + \beta_1 \text{SDP}_{it} + \beta_2 \text{Enrol}_{it} + \beta_3 \text{Conviction}_{it} + \beta_4 \text{Police}_{it} + \beta_5 \text{Dowrydeath}_{it} + \beta_6 \text{FemaleCM}_{it} + e_{it}$$

(3)

$$\text{Rape}_{it} = \beta_0 + \beta_1 \text{SDP}_{it} + \beta_2 \text{Enrol}_{it} + \beta_3 \text{Conviction}_{it} + \beta_4 \text{Police}_{it} + \beta_5 \text{Cruelty}_{it} + \beta_6 \text{FemaleCM}_{it} + e_{it}$$

(4)

One limitation of our state-level analysis is the omission of any measure that could capture the potential role of caste. There is ample evidence of caste-based sexual violence in India where women belonging to Dalit and tribal communities are subjected to rape by men from ‘upper’ castes⁵⁵. It would have been therefore interesting to disaggregate the dependent variable into different caste groups and rerun the model for each group. However, it was not possible to conduct this exercise because of unavailability of state-level rape data sorted by caste. In individual-level studies, it is possible to account for this measure by asking the respondent to report their caste in the survey questionnaire.

We express the dependent variable as well as the ‘Social’ variables as percentage of the respective state’s size of female population and not the entire population because sex ratios (number of females per 1000 of males) are widely dispersed across Indian states. For instance, in 2011, as reported by the Census of India, Kerala had 1084 females for every 1000 males and, on the other hand, the sex ratios were 868 and 879 in Delhi and Haryana respectively. The primary cause of the low sex ratios in some of the Indian states is due to the violent treatments meted out to the girl child, referred to as female foeticide, at the time of the birth.

The examination has been conducted over the time period 2001-2015 for all the 28 Indian states and the capital city of Delhi (union territory) which covers 99.7% of the Indian population as per the 2011 Census of India data. All the variables have been expressed in their natural logarithms except ‘FemaleCM’, ‘Foeticide’ and ‘Dowrydeath’ since ‘FemaleCM’ is a dummy variable and the values of the last 2 variables mostly range between 0 and 1. The complete list of states can be found in Table A1 in the Appendix. Telengana, the youngest state of India, was formed in 2014 and has been clubbed with its parent state Andhra Pradesh for the purpose of consistency. We also incorporate a lagged dependent variable ‘L.Rape’ in our model to control for any potential autocorrelation bias. Data on ‘Rape’, ‘Dowrydeath’, ‘Foeticide’, ‘Conviction’ and ‘Police’ have been obtained from yearly publications of National Crime Records Bureau (Ministry of Home Affairs, Government of India) which is the principal source of crime data for India⁵⁶. Data on ‘SDP’, ‘FemaleCM’ and ‘Enrol’ come from the Handbook of Statistics on Indian Economy published by the Reserve Bank of India in 2016⁵⁷, worldstatesmen.org website (<http://worldstatesmen.org/>) and the Ministry of Human Resource Development (Government of India, various issues) database respectively⁵⁸.

4. Results

Table 1 presents state-wise selected statistics on each variable considered by this study. Going by the absolute number of rape crimes committed in 2015, Madhya Pradesh (4391), Maharashtra (4144) and Uttar Pradesh (3025) top the list. Accordingly, MP and UP were also two of the worst performers among all states on ‘economic’, ‘education’ and ‘deterrence’ fronts. For instance, MP and UP has some of the

lowest educational attainments (ranked 19th and 20th respectively out of 29 states in 'Enrol', Column VI), lower SDP per capita than most (ranked 25th and 28th respectively, see Column IV) and fewest police stations per 100 square km (ranked 22nd and 29th respectively, Column IX). However, that is not true for Maharashtra which is one of the most developed states in India, with the 5th highest mean enrolment ratio and 3rd highest per capita income. Moreover, it should be noted that all the aforesaid states are also the largest states in India and once we control for the population size, the apparent association between rape crimes and economic, education and deterrence variables become even less obvious.

Insert Table 1 here

According to the average number of rapes committed over 2001-15 (Column II), only MP features in the top 5 list. UP and Maharashtra registered some of the lowest rape per lakh female population figures. The city state of Delhi is an interesting case. It comes out to be one of the best-performing states in terms of its achievement in terms of educational (ranked 1st), economic development (ranked 2nd) and number of police stations (7th). At the same time, it features as one of the top 3 states as far as mean occurrence of rapes is concerned.

Some authors share the notion that North (not the north-eastern states) and Central India is more unsafe for women compared to South India as the society in the former region is more patriarchal and violent than that in the latter which gets reflected in the sexual violence figures (The World Street Journal, January 3, 2013). But the rape data does not seem to lend any concrete support to this view. If we rank the states as per mean rape per lakh female population, only 3 Northern and Central states (Delhi, Madhya Pradesh and Chhattisgarh) feature in the top 10. Similarly, an examination of the annual average growth rates in numbers of rape reveal that 4 states from the North (Delhi, Uttarakhand, Rajasthan and Punjab) make in to the top 10.

We start our econometric analysis by estimating Equation 2 using the Pooled Ordinary Least Squares (OLS) method. Next, we re-estimate the model using the Fixed Effects Approach as the Hausman Test ruled in favour of the Fixed Effects model as opposed to the Random Effects model. Moreover, using

a Fixed Effects model controls for any potential time-invariant state-specific characteristics. If the problem of autocorrelation is detected, we estimate the model using Feasible Generalised Least Squares (FGLS) method because this estimation procedure allows estimation in the presence of first-order autocorrelation within panels or cross-sectional correlation across panels⁵⁹. Another issue which could potentially bias the findings is the problem of endogeneity or reverse causality. For instance, as discussed earlier, an improvement in law and order situation may lead to a decrease in crimes such as rapes. However, it is also possible that a rise in the rate of rapes compels the government to tighten the law and order situation in the state owing to the pressure exerted by the civilian movements, as evidenced after the 2012 Nirbhaya incident. In that case, there will be a reverse causality flowing from our dependent variable ('Rape') towards the law and order variables, namely, 'Conviction' and 'Police' thereby making these variables endogenous. However, the Durbin-Wu-Hausman test of endogeneity confirmed that 'Conviction' and 'Police' are not endogenous (test results presented in Tables 2 and 3). In other words, in the case of Indian states, there is no evidence that a surge in the number of rapes leads to an improvement in deterrence conditions. Therefore, there was no need to re-estimate the model using Instrumental Variables Approach.

Table 2 below present the estimation results of the equation with 'Foeticide' as the social variable.

Insert Table 2 here

Overall, the econometric model seems to explain slightly above 70% of the variation in the dependent variable. Regardless of the estimation method, the social factor seems to be the most robust determinant of the extent of rapes in the Indian states. As per the Pooled OLS and FGLS estimates, if foeticide (per lakh female population) goes up by 1, the number of rapes (per lakh female population) goes up by around 100.1% which indicates that the effect of social factors is quite substantial. Though the FEM estimates indicate a lower impact (coefficient on 'Foeticide'=0.249) we do not infer from the FEM results because of the autocorrelation bias, as confirmed by the Wooldridge test.

Hypothetically speaking, as education level increases, overall morality of a society gets uplifted, women are more empowered as their ability to earn independent income goes up and subsequently crimes against women drop. However, the effect of education seems to be statistically insignificant in the Indian context. We do not find any effect of economic growth on the number of rapes. Though the Indian economy has grown rapidly since the liberalisation of the early 1990s the incidence of rapes has also exhibited an upward trend over time. During the same period, India has also experienced a rise in income inequality, indicating that the benefits of growth have only been enjoyed by a small proportion of the populace until now⁶⁰. Thus, this lack of effect of the economic growth on social evils like rape can probably be attributed to the unequal distribution of the fruits of growth. The theory of “relative deprivation”, one of the leading sociological paradigms on crime, states that inequality leads to social tensions as the economically disadvantaged feel dispossessed when compared with wealthier people and this feeling of disadvantage and unfairness leads the poor to seek compensation and satisfaction by all means, including committing crimes against both poor and rich⁶¹. A 2002 World Bank study establishes empirically that an increase in inequality increases crime rates⁶². Baron and Straus also find income inequality to be one of the prime drivers of rape⁶³.

The coefficient on ‘FemaleCM’ is negative and significant which indicates that states experience fewer rapes when they have a woman as the head of the government. The deterrence variable, the number of police stations per 100 square km, seems to have absolutely no negative impact on the crime rate. If anything, FGLS regression results hint towards a weak positive correlation between number of police stations and the incidence of rapes which is counter-intuitive. Harris says that India has a police force *‘that is corrupt, easily susceptible to political interference, heavily male and woefully understaffed’* (The New York Times, January 22, 2013). A similar sentiment echoes in the Human Rights Watch August 2009 report. According to many, rape victims see police as part of this rape problem. A Reuters report also records the archaic and insensitiveness of the police system. The article says that an investigation conducted by India's Tehelka magazine along with NDTV news channel in 2012 found that more than 50% of the police officers interviewed had prejudices-blaming the victim's clothes or the fact that she was out at night, suggesting that she was "asking for it" (Reuters, January 16, 2013).

Police reforms have been proposed for decades, but the politicians have little incentive to pursue those reforms as that would make the police force less susceptible to political interference. Ironically, Delhi- the place with the worst figures for rapes in India-also had the most police stations per 100 square km (12) compared to all other Indian states which somewhat justifies the positive correlation indicated by the FGLS estimates. Besides the inefficiency and hostility embedded in the system, understaffing is also a serious problem. The average number of police stations per 100 square km in India was less than 1 (0.92) in 2015 which is appalling⁶⁴.

There is some evidence that an increase in conviction rate decreases the number of rape crimes however the effect is fragile and seems to be sensitive to different model specifications and estimation methods (see Table 3). Low conviction rates seem to be responsible for this lack of robustness. NCRB suggests that the average conviction rates for rape were 29.4% in 2015 whereas, that for other heinous crimes such as murder and infanticide were 46.5% and 52.2% respectively⁶⁵. There are many theories explaining why the conviction rates are so low in India. On an average, a rape case takes four to five years to come to conclusion which affects the conviction rate (The Hindustan Times, August 24, 2016). Failure of the legal system is also responsible for low conviction rates. Criminal lawyer K.K. Manan blamed aimless probing and inefficient Forensic Science Laboratory reports which lead to a delay in the extraction of medical evidence, which, in turn, hinders the conviction process (India Today, December 30, 2012). Furthermore, reluctance of victims to give statements in courts due to security reasons, which again points towards the incompetence of the police and social stigma further add to the problem.

4.1 Robustness Check: Estimation with other social variables

We re-estimate our model (Equation 1) with ‘Dowrydeath’ (Column I) and ‘Cruelty’ (Column II) as alternate social variables by employing the FGLS method.

Insert Table 3 here

Both the social indicators ('Dowrydeath' and 'Cruelty') came out positive and statistically significant. For instance, if dowry deaths go up by 1, rapes per lakh female population increase by 4.6%. Whereas, rape prevalence increased 4.3% for every 1% increase in cruelty on a woman by husband or his relatives (per lakh female population). Overall, the findings seem to be consistent across the different model specifications. As found earlier, the effect of conviction rate is fragile. There is no statistically significant effect of education and economic factor on the rape problem in India. Our finding, that social status of women in the society, is the most robust predictor of rapes in India is upheld.

5. Discussion of the econometric results

Overall, the econometric analysis conducted in Section 4 fails to reject both the hypotheses presented at the outset that: i) there is no significant effect of economic and legal or deterrence factors on incidence of rapes; and ii) the social factors (i.e., factors capturing social attitude) are primarily responsible for the high occurrence of rapes in India.

Since the Nirbhaya incident of 2012, tougher laws have been imposed and the number of angry civil movements against rape has dramatically increased but it can be claimed that there has been no significant improvement in the situation, with the number of rapes going up with each passing year. This probably indicates that India is not adequately addressing the fundamental reason behind this rape epidemic-the social factors like gender inequality. The misogyny is so deeply ingrained in the society that 57% of the Indian boys (15-19 years) think that wife-beating is justified⁶⁶. According to the Global Gender Gap Report 2016 published by the World Economic Forum, India is one of the worst countries for women. The country achieved abysmal ranks of 136th, 113th and 142nd out of 144 countries according to the Economic, Education and Health criteria respectively. There is a large literature which documents the positive relationship between attitude towards women and violence against women. In a cross-cultural study, Levinson notes that male dominance with regards to decision-making in the family is

one of the strongest predictors of societies that are highly violent towards women⁶⁷. Societies which adhere to rigid gender roles and culturally accept manhood being linked to dominance and aggression are more prone to demonstrate high levels of rape⁶⁸. Costin and Schwarz report that victim-blaming beliefs about rape were positively related to beliefs that restrict women's rights and support male domination⁶⁹. A 2003 study examine the attitudes of men and women towards violence against women in four countries namely India, USA, Kuwait and Japan. The study finds that Indian participants had the second-least positive attitude towards sexual assault victims and were less sympathetic towards the victims as compared to their American and Japanese counterparts⁷⁰. This attitude is clearly reflected in the statements of several Indian political leaders, including members of Parliament and State legislatures. Maneka Gandhi, the current Minister for Women and Child Development, believes that the rape problem of India is exaggerated by the media (The Guardian, November 23, 2016). Arun Jaitley, the current Finance Minister in the Indian Government, referred to the Delhi gangrape 2012 incident as “one small incident” and lamented how that has costed India billions of dollars in terms of lower tourism (The Times of India, August 22, 2014)! There are other countless examples of apathy and victim blaming remarks from politicians, such as, former Chief Minister of Uttar Pradesh, Mulayam Singh Yadav, referring to rapes as ‘mistakes’ and further defending the rape offenders by saying that “*boys will be boys*”; former Prime Minister of India, Manmohan Singh’s “*theek hai*” (it is okay) in response to the Delhi gangrape case; the Chief Minister of West Bengal, Mamata Banerjee’s comment that “*rapes are happening because men and women are interacting too freely*” and M. L. Khattar (current Chief Minister of Haryana) blaming women for rise in rapes (The Indian Express, April 11, 2014; Scroll.in, October 22, 2014))⁷¹. Other examples of victim blaming remarks include some politicians declaring that most of the rapes are fabricated and that skirts as part of school uniforms should be banned, citing it as a cause for increase in sexual harassment cases (OpenDemocracy, March 5, 2015)). There seems to be a latent bias against women ingrained even in the judicial system. As reported by The Washington Post in a 2012 article, a 1996 survey of Indian judges revealed that 68% of the respondents believed that provocative clothing invites rape. The Justice J.S. Verma Committee, set up by the Government of India after the Nirbhaya case in 2012, correctly notes that the gender equality guaranteed by the Indian Constitution has not yet become a reality for Indian women.

Furthermore, recorded rape cases are only the tip of the iceberg as majority of the rape cases are not even registered in India. There are many reasons behind the underreporting which are as follows:

a) **Treatment meted out by the police:** Often, dishonest police officers do not want to record cases. Even if the case is registered and an investigation starts, the female victims are often interrogated by male investigating officers; as a result, the victims feel embarrassed to disclose the truth⁷².

b) **Examination of rape victims:** In India, the primary method of testing whether a woman has been raped or not remains the archaic “two-finger rape test” which is another form of sexual assault and degradation of the victims⁷³.

c) **Fear of Stigma:** Victim or her family often chooses not to file a police complaint because publicity of such incidents may lead to i) social exclusion, ii) failure to find a suitable groom, if the victim is unmarried, iii) loss of family ‘honour’ and iv) allegation that the victim herself was being promiscuous (“*she invited it*”). All these factors lead to underreporting of the crime and emboldens the rape offenders.

6. Conclusion and Policy Recommendations

The study examines the determinants of rapes in India using state-level data for the time period 2001-2015. The panel model results indicate that there is no impact of education and economic growth on the incidence of rape crimes. The implication of this finding is twofold: firstly, it points towards the bigger role of social and cultural factors in this context, and secondly, with faster economic growth, India has also experienced rising income inequality which has probably offset the capability of economic development to eliminate social evils like rape. The effect of deterrence variables such as conviction rate is fragile and sensitive to different model specifications and estimation methods. Other deterrence variable employed by the study, namely, number of police stations per 100 square km, also does not seem to impact the rape rates, indicating towards the incompetency of the police force in India. The states, with female head of the state (Chief Minister), seem to experience fewer rapes per lakh female population.

Social attitude towards women (represented by multiple measures such as dowry deaths, female foeticide and domestic violence) emerged as the most robust predictor of rape prevalence in India. Consequently, we argue that the quantitative analysis conducted by the study demonstrates that the fundamental problem lies in the misogyny deep-rooted in the collective psyche of Indian society. Unless this problem is addressed, the situation will not improve, as far as sexual violence against women is concerned. Readers should however exercise caution while interpreting the econometric results as the results are correlational and therefore causality should not be presumed. Nonetheless, the findings have some important implications for future rape reduction policies in India.

6.1 Future policy recommendations

i) Community-based programmes by state or local governments

Since the brutal gangrape which took place in Delhi in 2012, the Indian government has imposed tougher laws and there has been massive public outcry demanding harsher punishment for the offenders, but rapes have only continued to increase with each passing year. That is because the lawmakers in the country have, so far, been only treating the symptoms by ignoring the root causes. We are not downplaying the role of factors relating to law and order and police reforms (such as appointing more female police officers to record victims' statements and opening of crisis centres like those in the USA and UK to assist victims during cross-examination by the police); the point that we want to make is that these measures will not be sufficient to decrease the rate of occurrence of rapes.

The Justice J.S. Verma Committee, in its 2013 report, highlights a similar point and argues that education, for correcting the gender bias and eliminating the prejudices inherent in the society, must begin at birth in homes, in formal education and social interactions. Moreover, community-based programmes should be arranged by the state governments or municipalities which should aim at changing the attitude of people towards rape victims.

ii) Further encouragement towards NGOs to play a complementary role at the grassroots level

Chattoraj notes that many NGOs organise neighbourhood dramas and street shows to draw public attention towards the necessity of identifying prospective sex offenders⁷⁴. Such activities should be further encouraged by the state governments as well as the central government. Sex education programmes should be initiated in all schools to create awareness from a very young age.

iii) Banning regressive institutions like the Khaps

Finally, regressive institutions like Khap Panchayats (unelected village councils) should be banned. These councils, often acting as quasi-judicial institutions, are the worst manifestation of patriarchy in the Indian society which use rape as a tool for 'punishment'. Some examples of their rulings are: a) a Khap Panchayat in Baghpat (North India) ruled that two sisters would be raped and paraded naked with their faces blackened, as punishment for their brother's relationship with a married woman (The Huffington Post, August 15, 2016.); b) in another instance, a woman was gangraped by 13 men on the orders of the panchayat in West Bengal's Birbhum district (India Times, July 11, 2014.).

To finish, we would like to stress the fact that development is not synonymous with only increasing GDP figures. Despite rapid economic growth over the past two decades, India's quest for becoming a 'superpower' will remain unaccomplished until it learns one of the rudiments of a developed society i.e. to treat its women with dignity and respect.

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Appendix

Table 1: Selected Statistics on Key Variables

| State/Variable | Rape | | SDP (INR) | | Enrol(%) | Conviction(%) | Police | | Foeticide | Dowrydeath | Cruelty |
|-------------------|-------|------------------------|-----------|-----------------------|----------|---------------|-----------------------|------|-----------|------------|---------|
| | Mean* | Average annual growth* | Mean | Average annual growth | Mean | Mean | Average annual Growth | Mean | Mean | Mean | Mean |
| Andhra Pradesh | 3.12 | 5.74% | 34122.08 | 6.18% | 20.63 | 14.29 | 0.70% | 0.59 | 0.01 | 1.25 | 26.12 |
| Arunachal Pradesh | 8.4 | 6.81% | 31376.34 | 4.63% | 16.37 | 46.13 | 3.40% | 0.09 | 0 | 0.03 | 3.45 |
| Assam | 9.94 | 3.41% | 19517.64 | 3.69% | 10.81 | 24.09 | 3.35% | 0.35 | 0.001 | 0.84 | 30.7 |
| Bihar | 2.45 | 0.23% | 10478.74 | 6.38% | 9.93 | 22.99 | 2.55% | 0.87 | 0.002 | 2.55 | 5.62 |
| Chhatisgarh | 9.22 | 2.46% | 23466.13 | 5.39 | 11.14 | 27.89 | 0.92% | 0.28 | 0.09 | 0.83 | 7.03 |
| Goa | 4.93 | 21.65% | 92046.54 | 4.05% | 21.04 | 28.01 | 0.58% | 0.68 | 0.01 | 0.17 | 1.67 |
| Gujarat | 1.54 | 6.21% | 47952.72 | 8.79% | 14.73 | 17.57 | 2.33% | 0.26 | 0.02 | 0.14 | 18.95 |
| Haryana | 5.66 | 6.96% | 51067.28 | 6.31% | 19.53 | 26.99 | 2.17% | 0.53 | 0.09 | 2.37 | 22.33 |
| Himachal Pradesh | 5.29 | 5.29% | 43161.85 | 5.91% | 21.19 | 23.1 | 2.16% | 0.17 | 0.07 | 0.12 | 8.53 |
| Jammu & Kashmir | 4.57 | 3.37% | 25157.9 | 3.08% | 16.41 | 7.08 | 1.83% | 0.18 | 0.01 | 0.19 | 3.62 |
| Jharkhand | 5.65 | 4.16% | 22104.74 | 6.52% | 10.32 | 29.95 | 3.81% | 0.46 | 0.01 | 1.92 | 6.06 |
| Karnataka | 1.88 | 7.33% | 36897.73 | 6.26% | 18.67 | 16.99 | 1.27% | 0.44 | 0.02 | 0.88 | 9.11 |
| Kerala | 4.26 | 7.42% | 44506.13 | 6.78% | 17.57 | 18.12 | 1.05% | 1.18 | 0.003 | 0.14 | 22.59 |
| Madhya Pradesh | 9.95 | 1.75% | 19988.71 | 4.81% | 14.63 | 24.76 | 0.90% | 0.31 | 0.09 | 2.25 | 11.28 |
| Maharashtra | 3.63 | 8.18% | 51475.47 | 6.76% | 20.92 | 16.41 | 1.39% | 0.32 | 0.02 | 0.66 | 13.39 |
| Manipur | 3.2 | 12.84% | 19983.38 | 2.84 | 21.86 | 19.71 | 3.58% | 0.33 | 0 | 0.02 | 1.8 |
| Meghalaya | 7.36 | 10.46% | 27215.88 | 3.57 | 15.91 | 34.86 | 3.53% | 0.15 | 0 | 0.1 | 1.41 |
| Mizoram | 15.24 | 9.08% | 35270.38 | 6.88 | 18.3 | 83.32 | 0.84% | 0.17 | 0 | 0.06 | 0.82 |
| Nagaland | 2 | 7.78% | 40188.41 | 4.62 | 11.65 | 81.37 | 5.13% | 0.29 | 0 | 0.01 | 0.12 |
| Odisha | 5.86 | 7.37% | 21614.11 | 5.68 | 12.7 | 21.53 | 2.26% | 0.32 | 0.003 | 1.94 | 8.29 |
| Punjab | 4.33 | 7.82% | 41289.74 | 4.19 | 16.52 | 33.24 | 3.20% | 0.61 | 0.15 | 1 | 9.04 |
| Rajasthan | 5.52 | 8.33% | 23873.48 | 6.06 | 12.77 | 30.85 | 1.52% | 0.22 | 0.07 | 1.37 | 30.54 |
| Sikkim | 6.92 | 35.42% | 47991.31 | 10.81 | 21.11 | 52.97 | 0.58% | 0.39 | 0.12 | 0.07 | 1.35 |
| Tamil Nadu | 1.77 | 1.44% | 44986.13 | 7.48 | 26.89 | 24.23 | 0.67% | 1.02 | 0 | 0.53 | 4.96 |
| Tripura | 10.57 | 5.27% | 33606.48 | 6.97 | 10.87 | 23.76 | 3.33% | 0.59 | 0 | 1.56 | 32.72 |
| Uttar Pradesh | 2.07 | 4.51% | 15993.02 | 4.3 | 14.1 | 51.69 | 0.40% | 0.61 | 0.01 | 2.27 | 7.66 |
| Uttarakhand | 3.02 | 9.96% | 39911.42 | 9.04 | 23.66 | 48.53 | 3.47% | 0.22 | 0.002 | 1.5 | 7.54 |
| West Bengal | 3.92 | 4.12% | 28868.07 | 5.17 | 12.01 | 13.95 | 0.42% | 0.54 | 0.001 | 1.04 | 29.53 |
| Delhi | 10.09 | 13.67% | 90531.18 | 6.57 | 37.46 | 32.51 | 3.12% | 10.2 | 0.08 | 1.73 | 20.34 |

Source: Authors' own calculations based on data compiled from NCRB and Reserve Bank of India.

Note: *Mean and average annual growth rate have been calculated over the time period 2001-15.

Table 2: Regression results with ‘Foeticide’

| Independent Variable | Pooled OLS | FEM | FGLS |
|--|-------------------|--------------|-------------|
| Constant | 1.497*** | 2.793 | 1.497*** |
| L.Rape | 0.146*** | 0.054*** | 0.146*** |
| SDP | -0.062 | -0.223 | -0.062 |
| Enrol | -0.014 | 0.058 | -0.014 |
| Conviction | -0.071* | 0.068 | -0.071** |
| Police | 0.028 | -0.020 | 0.028* |
| Foeticide | 1.001*** | 0.249*** | 1.001*** |
| FemaleCM | -0.156** | -0.012 | -0.156** |
| R ² | 0.738 | | |
| Mean VIF | 1.80 | | |
| Wooldridge test H0: No first-order autocorrelation | | P-value=0.00 | |
| Durbin-Wu-Hausman test H0: Regressors are exogenous | | P-value=0.45 | |

Note: The dependent variable is Number of rapes per lakh female population (Rape_{it}). *, **, *** denote statistical significance at 10%, 5% and 1% respectively. Heteroskedasticity-robust standard errors have been used. All regressions include time trend. The mean variance inflation factor (VIF) value is 1.80, considerably lower than 10, confirming the absence of any multicollinearity problem.

Table 3: FGLS Regression results with ‘Dowrydeath’ and ‘Cruelty’

| Independent Variable | Equation 3 (I) | Equation 4 (II) |
|---|---------------------------|----------------------------|
| Constant | 0.792 | 1.005** |
| L.Rape | 0.147*** | 0.145*** |
| SDP | 0.006 | -0.017 |
| Enrol | -0.023 | -0.045 |
| Conviction | -0.059* | -0.002 |
| Police | 0.022 | 0.025** |
| Dowrydeath | 0.046** | |
| Cruelty | | 0.043** |
| FemaleCM | -0.165** | -0.177*** |
| Durbin-Wu-Hausman test H ₀ : Regressors are exogenous | P-value= 0.47 | P-value= 0.29 |

Note: The dependent variable is Number of rapes per lakh female population ($Rape_{it}$). *, **, *** denote statistical significance at 10%, 5% and 1% respectively. All regressions include a time trend. The Durbin-Wu-Hausman test results were obtained for each estimating equation using IV GMM approach, where ‘Conviction’ and ‘Police’ were instrumented using first and second year lags of ‘Conviction’ and ‘Police’. Since the test indicated that the regressors were not endogenous we do not report the IV GMM results in the paper and instead could infer on the basis of the current results.

Table A1: List of Indian States

| | |
|-------------------|---------------|
| Andhra Pradesh | Maharashtra |
| Arunachal Pradesh | Manipur |
| Assam | Meghalaya |
| Bihar | Mizoram |
| Chhattisgarh | Nagaland |
| Goa | Odisha |
| Gujarat | Punjab |
| Haryana | Rajasthan |
| Himachal Pradesh | Sikkim |
| Jammu & Kashmir | Tamil Nadu |
| Jharkhand | Tripura |
| Karnataka | Uttarakhand |
| Kerala | Uttar Pradesh |
| Madhya Pradesh | West Bengal |
| Delhi | |

Note: The remaining union territories could not be included because of data limitations.

Notes

¹ National Crime Records Bureau, various publications, 1971; 2015.

² Ahamad and Mishra, "Legal status and rights", 39.

³ Kothari and Ravi, "The Myth of Justice", 3.

⁴ Ibid., 4.

⁵ National Crime Records Bureau, various publications, 2002; 2012; 2016

⁶ Sharma, "Violence against women", 8.

⁷ Lapsia, "Impact of "Nirbhaya" Case", 9-10.

⁸ Corman and Mocan, "Analysis of Crime", 584.

⁹ Fleisher, "The Effects of Income".

¹⁰ Krohn, "A Durkheimian Analysis", 654.

¹¹ Witte and Tauchen, "Work and Crime", 1.

¹² Lochner, "Education, Work, and Crime".

¹³ Freeman, "Crime and Employment", 236-37; Freeman, "American Men and Crimes", 25; Lochner and Moretti, "Effect of Education", 155; Buonanno and Leonida, "Non-market effects of Education", 11.

¹⁴ Dutta and Husain, "Determinants of crime rates", 10.

¹⁵ Becker, "Crime and Punishment", 207-09.

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- ¹⁶ Ehrlich, "Participation in Illegitimate Activities", 521.
- ¹⁷ Cornwell and Trumbull, "Economic Model of Crime", 360.
- ¹⁸ Chattoraj, "Sex related offenses", 88; Lapsia, "Impact of the "Nirbhaya" Case", 8-9;
- ¹⁹ National Crime Investigation Bureau, "Indian Penal Code", 192-93.
- ²⁰ Sigsworth, "Anyone can be rapist", 12.
- ²¹ Livne, "Violence Against Women", 5-6.
- ²² Chatterjee, "Nation and its Fragments", 6-9.
- ²³ Livne, "Violence Against Women", 6.
- ²⁴ Chattoraj, "Sex related offenses", 93-96.
- ²⁵ Sigsworth, "Anyone can be rapist", 12-15.
- ²⁶ [Peterman](#) et al., "Determinants of Sexual Violence", 1.
- ²⁷ Kalra and Bhugra, "Sexual violence against women", 1.
- ²⁸ Brownmiller, "Against Our Will", Chapters 9 and 10; Clark and Lewis, "Price of coercive sexuality", 135-45.
- ²⁹ Burt, "Myths and Supports for Rape", 1.
- ³⁰ Narrain, "Violation of bodily integrity", 17-20; Simon-Kumar, "Sexual violence in India", 452.
- ³¹ Lapsia, "Impact of "Nirbhaya" Case", 11 & 44.
- ³² Sharma. And Gupta, "Gender Based Violence", 114; Dalal and Lindqvist, "Correlates of domestic violence", 265.
- ³³ NCRB, various issues.
- ³⁴ [Peterman](#) et al., "Determinants of Sexual Violence",
- ³⁵ McKibbin et al., "Why do men rape?", 89; [Lalumière](#) et al., "Mate deprivation hypothesis", 299.
- ³⁶ Thornhill and Thornhill, "Human rape", 137.
- ³⁷ Vaughan, "socioeconomic status and victim-offender relationship", 121.
- ³⁸ Caruso, "Unemployment and rape", 5.
- ³⁹ Raphael and Winter-Ebmer, "Effect of Unemployment on Crime", 259.
- ⁴⁰ Saridakis and Spengler, "Crime, deterrence and unemployment", 167.
- ⁴¹ Lochner and Moretti, "Effect of education", 1.
- ⁴² Ibid, 19, 25.
- ⁴³ Tauchen et al., "Criminal Deterrence", 15; Witte and Tauchen, "Work and Crime", 1.
- ⁴⁴ Babu and Kar, "Domestic violence against women", 1.
- ⁴⁵ Solomon et al., "Domestic Violence and Forced Sex", 7.
- ⁴⁶ Koenig et al., "Domestic violence in North India", 1.
- ⁴⁷ Iyer et al., "Power of political voice", 169.
- ⁴⁸ Mani, "Women in Politics", 2.
- ⁴⁹ Iyer et al., "Power of political voice", 165-66.
- ⁵⁰ Amaral et al., "Crime and social conflict", 46.
- ⁵¹ Gupta, "Female foeticide in India", Para 4.
- ⁵² Ahmad, "Female Foeticide", 13.
- ⁵³ Baron and Straus, "Four theories of rape".
- ⁵⁴ Srinivasan and Lee, "Dowry system in Northern India", 1108.
- ⁵⁵ Human Rights Watch, "End Caste-Based Rape"; Amnesty International, "Rape of Dalit woman".
- ⁵⁶ National Crime Records Bureau, Database accessed at: <http://ncrb.gov.in/>
- ⁵⁷ Reserve Bank of India, Database accessed at: <https://rbi.org.in/Scripts/AnnualPublications.aspx?head=Handbook%20of%20Statistics%20on%20Indian%20Economy>
- ⁵⁸ Ministry of Human Resource Development, Database accessed at: <http://mhrd.gov.in/statist>
- ⁵⁹ Beck and Katz, "Time-Series Cross-Section Data", 634.
- ⁶⁰ OECD, "Divided We Stand", 49.
- ⁶¹ Rufrancos et al., "Income Inequality and Crime", 1.
- ⁶² Fajnzylber et al., "Inequality and Violent Crime", 1.
- ⁶³ Baron and Straus, "Four Theories of Rape", 467.
- ⁶⁴ Bureau of Police Research & Development, "Data on Police Organisations", 4.
- ⁶⁵ NCRB, "Crime in India".
- ⁶⁶ UNICEF, "Progress for Children", 32.
- ⁶⁷ Levinson, "Violence in cross-cultural perspective".
- ⁶⁸ Heise, "Violence Against Women", 270-71.
- ⁶⁹ Costin and Schwarz, "Beliefs about rape", 46.
- ⁷⁰ Nayak et al., "Attitudes Toward Violence", 339.
- ⁷¹ Sethi, "Nirbhaya Case", 20.
- ⁷² Chattoraj, "Sex related offenses", 90.

⁷³ Neuman, “Issue of Sexual Violence”, 39.

⁷⁴ Chatteraj, “Sex related offenses”, 94.