Does Urbanization Empower Women? Evidence from India[*]

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Abstract

The paper examines the short-term implications of urbanization on women empowerment in India. India is currently experiencing rapid urbanization, and it is imperative to understand how this might affect women who continue to be marginalized in society. In theory, urbanization can affect women either positively or negatively. Women in urban areas, compared to their rural counterparts, are thought to enjoy greater social, economic, and political opportunities and freedoms. At the same time, research shows barriers to women's empowerment remain widespread in urban environments. Using satellite-based nighttime light intensity as a measure of urbanization, we leverage variations over time and across regions to assess its impact. Our findings indicate that urbanization provides limited benefits for women. While it is associated with improved mobility, there is no significant relationship between urbanization and women's labor market participation, access to information, financial autonomy, intrahousehold agency, or gender beliefs. Moreover, urbanization appears to increase the risk of intimate partner violence for women. In contrast, urbanization is linked to improved labor market participation for men, thus, suggesting that the effects of urbanization are gendered. These findings suggest that, at least in the short-term, urbanization is unlikely to be very helpful in economically empowering Indian women.

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1 Introduction

The urbanization process in Asia is proceeding at unprecedented speed and scale. Compared to other major Asian countries, the rate of urban growth in India has been fairly modest until the end of the last decade; it is now, however, starting to accelerate rapidly. According to the *World Urbanization Prospects Report 2018*, between 2018 and 2050, urban areas are expected to grow by 416 million people in India.[1] The report also projects that by 2050, 53% of India's population will be urban (currently, 34% of India's population is urban).

In this paper, we investigate the implications of urbanization and urban expansion in India on women's empowerment. Gender inequality and discrimination against women are pervasive in India. While boys and girls start secondary school at the same rate, only 0.80 girls enroll in tertiary schooling for every boy (World-Bank (2011)). Early marriage and childbearing are extremely common, and many women face highly unequal gender norms and have limited agency both within and outside their houses (Klasen and Pieters (2015); Calvi (2020); Afridi et al. (2022a)). They also spend a disproportionately higher amount of time in domestic activities and unpaid health care for family members which leaves little time for participation in paid employment (Charmes et al. (2019); Ratheesh and Anitha (2022)).[2] As per the Indian Census 2011, India's sex ratio among children aged 0 to 6 years is 1.09 boys per girl, reflective of the widespread practice of sex-selective abortion. Finally, the situation of gender violence is very concerning in India with about 1 out of 4 women reporting to have been exposed to physical intimate partner violence (IPV).[3] Against this backdrop, it is important to understand whether the process of rapid urbanization that India is currently experiencing is actually benefiting women or affecting them adversely.

In theory, urbanization can affect women positively as well as negatively. Women in urban areas, unlike their rural counterparts, are thought to enjoy greater social, economic, and political opportunities and freedoms. In an editorial, Tacoli and Satterthwaite (2013) note that "urban women are able to engage in paid employment outside the family, better access to services, lower fertility rates, and some relaxation of the rigid social values and norms that define women as subordinated to their husbands and fathers and to men generally" (p. 3). Even so, these women are likely to continue experiencing forms of gender discrimination. As noted in the UN-Habitat's *State of Women in Cities 2012-13* report, in urban environments "notable gender gaps [exist] in labour and employment, 'decent work', pay, tenure rights,

[1] https://population.un.org/wup/Publications/Files/WUP2018-Highlights.pdf

[2] India is one of the fastest growing economies of the world yet its female labor force participation rate (FLFP) has remained one of the lowest. According to the Periodic Labor Force Survey 2021-22, only around 29% of women in the age group 15 to 59 were a part of the labor force.

[3] National Family Health Survey 2019-21

access to and accumulation of assets, personal security and safety, and representation in formal structures of urban governance" (p. viii). This clearly suggests that barriers to women empowerment are widespread in urban environments and that women are often the last to benefit from the prosperity of cities. In fact, Chant (2013) remarks, "women make significant contributions to urban prosperity through a wide range of paid and unpaid labour,...[yet they] often reap limited rewards in terms of equitable access to 'decent' work, human capital acquisition, physical and financial assets, intra-urban mobility, personal safety and security, and representation in formal structures of urban governance" (p. 9-10).

Women's empowerment is not a single-dimensional phenomenon (Moghadam (1996); Kabeer (1999); Janssens (2010)). Rather it is a multidimensional and multi-scalar process and is experienced at the individual as well as the household levels. As noted in Kabeer et al. (2011) and Golla et al. (2011), it is imperative to understand that women's economic empowerment extends beyond women's economic position in terms of work, income, education, and assets to encompass other social and political dimensions. More specifically, this requires skills and resources to compete in markets, fair and equal access to economic institutions, and the ability to make and act on decisions and control resources and profits in terms of exercising power and agency. As such, in this paper, we use several economic outcomes to capture women's empowerment. These include indicators for women's participation in the labor market and employment, mobility, financial autonomy, agency within the household, access to information, and exposure to and attitudes towards IPV. We obtain data on these measures from two recent repeated cross-sections, the 2015-16 and 2019-21 waves of the National Family Health Survey (NFHS). These are widely used nationwide surveys of India and are a part of the global Demographic Health Survey (DHS) program. They provide detailed information on women's socioeconomic characteristics, decision-making power within households, financial independence, physical health, employment, IPV, etc. The two waves of the NFHS provide us with access to data on more than 1.2 million Indian women.

We measure urbanization using district-level satellite nighttime lights data. Based on the notion that light intensity per unit area corresponds to a reasonable measure of the degree of urbanization, nighttime lights is argued to be a valid marker of urbanization and urban settlements (Elvidge et al. (1997); Imhoff et al. (1997); Sutton (1997); Henderson et al. (2003); Storeygard (2016); Abay and Amare (2018); Amare et al. (2020); Chen et al. (2022) Abay et al. (2023)). As such, nighttime lights intensity of an area is likely to be indicative of its level of urbanization (with higher values of nighttime lights intensity indicating higher level of urbanization).[4]

[4]Using nighttime lights to measure urbanization in developed countries could be a little problematic since the two main driving forces for the changes in nighttime lights in these countries are urbanization (or de-

Of course, there are other (and perhaps more popular) ways to measure urbanization as well. For example, one could construct measures of urbanization using data on districts' urban population or use the census-based binary indicator of urbanization (indicating whether or not respondents live in urban areas) available in the NFHS. Each of these measures, however, has a major drawback. Construction of population-based measures of urbanization requires information on districts' urban population which is at best obtained at 10-year intervals in India. In fact, the last year for which district population data is available for India is 2011. This clearly means it is impossible to construct accurate population-based measures of urbanization that correspond to the 2015 and 2019 waves of the NFHS. The typical binary measure of urbanization is also problematic. As noted above, the binary indicators of urbanization available in the NFHS are also census-based. Since after 2011 no census was conducted in India, the indicator of urban and rural areas in the 2015 and 2019 waves of the NFHS reflects whether in 2011 the areas were considered as urban or rural. However, it is possible that an area that was classified as rural in the 2011 census may actually have become urban in 2015 or 2019 (i.e., if the census was administered in 2015 or 2019, that area's classification would have changed from rural to urban). This implies that using the census-based indicator or urbanization available in the NFHS likely would cause our covariate of interest to suffer from misclassification error (or non-classical measurement error).[5] Additionally, some recent studies have claimed that the definition of 'urban' used in India, based on which the binary indicator of urbanization is constructed, is particularly restrictive.[6]

Controlling for time-invariant unobserved heterogeneity across districts as well as for secular changes in the economic environment that have the same effect on all individuals within states in addition to individual heterogeneity, and exploiting intertemporal and interspatial variation in nighttime light intensity, we find that urbanization is associated with improved mobility for women: the estimated associations are statistically and economically significant. For example, one standard deviation (sd) increase in nighttime lights is associated with the women's likelihood to travel alone to the market by 0.11 sd, to the health facility by 0.091 sd, and to places outside their village/town by 0.086 sd. However, we find no evidence

urbanization) and energy saving policies. However, as noted in Stathakis et al. (2015), when using nighttime lights to measure urbanization in developing countries, the interpretation of nighttime light changes is much easier because the latter driving force is typically absent.

[5]In general, binary measures of urbanization are not preferred since they fail to capture the heterogeneity of urban areas. As noted by Cali and Menon (2013), Christiaensen and Todo (2014) and Abay et al. (2023), urbanization is a continuum reflecting a rural-to-urban transformation process rather than a binary phenomenon.

[6]https://wri-india.org/blog/measuring-urbanization-why-india-needs-re-think-its-methodology?trk=feed$_main - feed - card_feed - article - content$

of significant relationship between urbanization and women's labor market participation, women's intrahousehold agency, access to information, financial autonomy, and gender beliefs. Further, we find that urbanization increases the risk of intimate partner violence (IPV) for women. We also examine the effect of urbanization on men's labor market outcomes and detect positive effect of urbanization men's paid employment. This result is in sharp contrast to the effect of urbanization on women's labor market outcomes. This suggests that in addition to urbanization benefiting women very little, the effect of urbanization is likely gendered.

While endogenous selection of location due to rural-urban migration is unlikely to be driving our results since research shows rural-to-urban migration is exceedingly low in India and India's urban growth is organic in that it originates from natural population growth, absorption of neighboring villages, and designating existing villages as census towns (Sen (2017); Randolph and Gandhi (2019)),[7] we also carry out our analysis by restricting our sample to women who have not recently migrated to their current area of residence. We find that the results are similar to the baseline results suggesting that much of the effects are not driven by endogenous selection and migration of some women and their families. We also perform several robustness checks and falsification tests and show that the baseline results are robust to all of them.

We also document some interesting heterogeneity. For example, we find that the effect of urbanization on the likelihood of participating in paid employment is higher for women belonging to poor households and women of disadvantaged caste groups. In fact, for these subgroups, the effect of urbanization on paid employment is economically and statistically significant, which is in sharp contrast to the results obtained based on the full sample. This likely confirms Nanda et al. (2021) and several others' finding that urbanization in India is associated majorly with the creation of low-skilled informal jobs for women. Women from the relatively lower rungs of society are more likely to be employed in such jobs than their counterparts. Since poor women and women from disadvantaged caste groups are likely to belong to the lower rungs of society, it is possible that urbanization influences only their likelihood of participating in the labor market positively, but not that of others.

We examine several macro-channels through which the association between urbanization and women's empowerment could operate. These include literacy rate, public education infrastructure, private education infrastructure, financial infrastructure, sex ratio, crime against women, and women's participation in politics. Our analysis reveals that urbanization is associated with higher literacy rates, more public and private educational institutions,

[7]The rate of migration into cities in India has remained essentially stagnant since the 1970s — even after liberalization unleashed a wave of economic growth.

better financial infrastructure, and reduced crime against women. However, there is no significant relationship between urbanization and sex ratios or women's participation in politics. Given that sex ratios and political participation are widely regarded as indicators of societal gender norms, our findings suggest that urbanization does not substantially alter gender norms in India. This aligns with our conclusion that urbanization provides limited benefits for women.

1.1 Literature

Our study is one of the first to comprehensively analyze the link between urbanization and women's empowerment in a developing country using data from a large-scale survey. Although the study does not establish causation, it provides valuable insights into a critical issue through a detailed descriptive analysis. In the last two decades, a large empirical literature in economics has come into being that looks at the determinants of women empowerment and gender inequality in developing countries. Gender inequality manifests itself in various forms including, but not limited to disparities in health, education, labor market participation, freedom of choice, and bargaining power within marriage. This literature has attributed these disparities to several factors such as the dependence of developing countries on activities that men have a comparative advantage in (Qian (2008); Carranza (2014)), difference in property rights between men and women (Goldstein and Udry (2008); Anderson and Genicot (2015); Bhalotra et al. (2019)), lack of technological progress in home production (Dinkelman (2011); Devoto et al. (2012)), dowry system (Bloch and Rao (2002); Alfano (2017); Bhalotra et al. (2020); Sekhri and Storeygard (2014)), difference in job opportunities (Bhalotra et al. (2021)), patriarchal norms and attitudes (Jayachandran (2017); Jayachandran (2015); Afridi et al. (2022a); Dhar et al. (2022)), child marriage and early marriage (Field and Ambrus (2008); Roychowdhury and Dhamija (2021)), historical factors (Alesina et al. (2013); Guarnieri and Rainer (2021)), etc.[8] This literature, however, has not focused much on the relationship between urbanization and women empowerment despite theoretical and descriptive works in economics (e.g., Boserup (1970), Goldin (1995)) and other related disciplines (see Chant (2013) for an excellent review) suggesting that the effects of economic development and urbanization are likely to be gendered.

The dearth of studies examining the effect of urbanization on women empowerment in developing countries perhaps is because, as summarized by Chauvin et al. (2017), most of the empirical literature on urbanization and agglomeration effects in general focuses on developed countries (especially on the US), and little is known about the impact of urbanization in

[8] Jayachandran (2015) provides an excellent review of this literature.

developing countries despite the global importance of the phenomenon in these countries. Similar observation has also been made by Vakulabharanam and Motiram (2023). They note, "Global urbanization has been driven by cities in developing countries, but literature in economics has disproportionately focused on cities in the Global North." (p. 64) Chauvin et al. (2017) argue that only *some* of the stylized facts documented about cities in the US apply to cities of the developing world, and they call for more research on cities in the developing world. Some studies that do look at the effect of urbanization in developing countries in recent times include Hering and Poncet (2010), Banks (2013), Cali and Menon (2013), Combes et al. (2015), Hasan et al. (2017), Mitra (2019), Combes et al. (2020), Amare et al. (2020), Chen et al. (2022), Abay et al. (2023) and Vakulabharanam and Motiram (2023) among a few others. Of these only Banks (2013), Mitra (2019), and Vakulabharanam and Motiram (2023) focus on women. However, these studies are interested in only looking at the relationship between urbanization and female employment which is only one of the several measures of women empowerment. Further, often these focus on only one state (e.g., Mitra (2019)) or a couple of cities (e.g., Vakulabharanam and Motiram (2023)).

The rest of the paper unfolds as follows. Section 2 presents the background. Section 3 discusses the data and outlines the empirical model. Results are discussed in Section 4. The last section concludes.

2 Background

2.1 Urbanization in India

Urbanization is a socioeconomic process by which cities (or urban areas) grow. According to Tisdale (1941),

> urbanization is a process of population concentration. It proceeds in two ways: the multiplication of points of concentration and the increase in size of individual concentrations....consistent with the definition of urbanization, cities may be defined as points of concentration (p. 311).

In India, urbanization has evolved significantly in recent decades, diverging notably from the patterns observed before 1990. The shift towards a liberalized economic framework post-1991 has prompted questions about its impact on urbanization, GDP structure, employment patterns, intergovernmental relations, and financial systems. With urban India now encompassing 7,933 settlements and a population of 377.1 million as of 2011, the country boasts the world's second-largest urban system (Mathur (2021)). This growth has been fuelled

by the rise of census towns and substantial population increases in major cities.[9] Despite a previous decline, the urban population growth rate has shown a substantial recovery in recent years. There is also a notable convergence in urbanization levels across states, with 81 districts now reporting over 50% urban population as per Census 2011. Internationally, India's share of the global urban population has risen to 11.03% and is projected to reach 14% by 2050 (Mathur (2021). However, rural-urban migration remains limited.

The significance of urbanization in India is underscored by its contribution of about 65% to the GDP, highlighting its critical role in achieving ambitious economic growth targets. Several challenges remain including inadequate infrastructure, such as poor transportation networks, insufficient housing, and limited access to clean water and sanitation (UN Habitat (2020)). Rapid population growth in cities leads to overcrowding, resulting in increased pollution and strain on public services like healthcare and education (Ministry of Housing and Urban Affairs, Government of India (2017)). Informal settlements, or slums, are expanding due to a lack of affordable housing, which further exacerbates socio-economic inequalities (Chandramouli and General (2011)). These challenges often have a gender dimension, as women and girls face increased vulnerabilities, such as limited access to safe public spaces and services (Das (2019)). Additionally, the growing demand for energy and resources puts pressure on urban sustainability, requiring effective urban planning and policy reforms to address these interconnected challenges (UN Habitat (2020)). As urbanization continues to shape India's development trajectory, there is a growing emphasis on enhancing the liveability, inclusivity, and competitiveness of cities to address emerging challenges effectively.

2.2 Urbanization and Women Empowerment

It is often presumed that urbanization is associated with the generation of wealth and urban women enjoy greater social, economic, and political opportunities and freedoms than their rural counterparts. However, just as prosperity is not an inevitable outcome of urbanization—there is considerable evidence that suggests urbanization has created widespread poverty, inequality, poor living conditions, insecurity, and violence for many people in cities (Chen and Ravallion (2007); Ravallion et al. (2007); Jones and Corbridge (2008); Mathur (2013)) —, urban expansion and growth may not always result in gender equality and improve the lives of women. The barriers to women's 'empowerment' remain widespread in urban environments.

[9] As per the Census 2011, in India urban areas consist of (i) All places with a municipality, corporation, cantonment board or notified town committee etc.; (ii) All other places which satisfy the following criteria: a. Minimum population of 5000, b. At least 75% of male working population engaged in non-agricultural pursuits; and a density of population of at least 400 persons per square km.

For women, as well as men, the city's main attraction is the possibility of economic opportunities which are unavailable to them in rural areas. In particular, expanded independence due to the prevalence of better gender norms, the possibility for social mobility, and greater employment opportunities associated with city life are often viewed as a potential path to a better standard of living for women and their families (Deshingkar and Grimm (2005); IOM (2009)). Additionally, a common perception is that cities allow women to escape from the miseries of gender violence, gender discrimination, and disinheritance (IOM (2009); Tacoli and Mabala (2010); IATF (2012)). However, existing research often shows that women are disadvantaged compared with men in cities in terms of equal access to employment and shelter, health and education, transport, asset ownership, experiences of urban violence, and the ability to exercise their rights. These disadvantages are especially marked for poor urban women residing in informal settlements (slums).

Urban centers can provide access to economic resources and institutional support to help women cope with violence. Yet, women in urban areas are exposed to high levels of violence perpetrated by a partner as well as by someone who is not a partner (McIlwaine (2013); Jungari et al. (2022)). Research suggests a number of urban-specific factors can be responsible for this. These include more fragmented social relations which erode support for the most vulnerable (Walker et al. (2013)), engagement in certain specific types of occupation (McIlwaine (2013)), poor infrastructure and, limited sanitary facilities (International (2010)). For a very large number of women in urban areas, the constant threats, from verbal harassment to outright violence whenever they leave the home, thus, are an unwelcome reality. This, as noted by McIlwaine (2013), can significantly affect women's health, mobility, and their ability to work. Indeed, the use of space among women is also cross-cut by time in cities. In particular, women have much more restricted mobility (especially at night) linked with their safety and fear of violence. Issues of access to and provision of quality and affordable public transport are also crucial in determining women's movement within cities (Khosla (2009); Borker (2021)).

Life in urban areas is more expensive than in rural areas and, in many cases, is more expensive for the residents of low-income settlements since they have to pay higher prices for inadequate accommodation, water provided by private vendors, and for access to latrines, where these exist. The cost of poor health, exacerbated by lack of sanitation and living in locations with high concentrations of environmental hazards, is also high when missing a day's work means a considerable reduction in income. Poor housing conditions, distance from health services and schools, unsafe neighborhoods – both because of environmental hazards and high rates of violence and crime – and limited access to water and sanitation place an additional burden on those who undertake unpaid care work and social reproductive

activities such as child care, food preparation, cleaning and washing (Tacoli (2012); Chant (2013)). These are typically women's responsibilities, to which they often have to add paid work. The resulting time poverty[10] and emotional stress are important non-income elements of urban poverty, which are made much worse at times of economic crises when prices rise, incomes decline and public services provision is cut (Chant (2013)).

In sum, therefore, whether urbanization and urban growth really make women better off than their rural counterparts is not very clear.

3 Data and Methodology

3.1 Data

3.1.1 Outcomes

The outcome variables used in this study are obtained from the fourth and fifth rounds of NFHS of India (NFHS 2015-16, NFHS 2019-21). The NFHS is a nationally representative household demographic and health survey for India. It provides information on various topics such as population demographics, health, and nutrition for India. It is conducted by the International Institute for Population Sciences (IIPS) in Mumbai, administered under the Ministry of Health and Family Welfare (MoHFW), Government of India, and is a part of the global Demographic Health Survey (DHS) program. The NFHS 2015-16 survey was conducted between January 2015 and December 2016, and covered 601,509 households located throughout India. The NFHS 2019-21 was conducted between June 2019 and April 2021, and covered 636,669 households located throughout India. In every round, the sample was drawn using stratified random sampling (for more details on the survey methodology see IIPS and ICF, 2017, 2022). All rounds of the NFHS survey are publicly available at the DHS website.[11]

Both the NFHS rounds administered separate woman's and man's questionnaires to collect information on eligible women aged 15-49 and eligible men aged 15-54 in the sampled households. The woman's questionnaire included questions on their background characteristics, family planning, nutrition, marriage, sexual activity, employment status, domestic violence, women's mobility and autonomy, etc.[12] The man's questionnaire included questions on their background characteristics, family planning, nutrition, marriage, sexual activity, and

[10] See Gammage (2010) for a discussion on time poverty

[11] https://dhsprogram.com/Countries/Country-Main.cfm?ctry

[12] However, questions on certain topics like domestic violence and menstrual hygiene were restricted to a subset of the eligible women randomly selected from each household belonging to the state module. The state module consists a subsample of 15% of the surveyed households.

employment status, etc.[13]

We focus on a range of groups of women's outcomes as discussed below:

1. **Labor force participation**: These include four binary employment indicators: currently employed in paid work (i.e., whether or not a woman was employed in paid work when the survey was being conducted), employed in paid work in the last twelve months (i.e., whether or not a woman was employed in paid work during the twelve months preceding the survey), currently employed in unpaid work (i.e., whether or not a woman is employed in unpaid work when the survey was being conducted), and employed in unpaid work in the last twelve months (i.e., whether or not a woman was employed in unpaid work during the twelve months preceding the survey).[14] If a woman is currently employed in paid (unpaid) work, the first (third) variable takes a value one, and zero otherwise. If a woman was employed in paid (unpaid) work anytime during the twelve months preceding the survey, the second (fourth) variable takes a value one, and zero otherwise.

2. **Mobility**: This set comprises variables reflecting the ability of women to travel alone to the following places: a) market, b) health facility, and c) places outside their village/town. For all three places, there is a separate binary variable that takes a value one if a woman is allowed to travel alone and zero otherwise. Additionally, we create a mobility index that takes a value one if a woman is allowed to travel alone to at least one of the three places and zero otherwise. We also use a z-score mobility index by taking the simple average of the individual z-scores for mobility to markets, health facilities, and locations outside the village/town, based on the respective means and standard deviations.

3. **Intra-household decision-making power**: This set comprises variables based on the women's subjective evaluations of their decision-making power within the household on the following decisions: a) their health care, b) large purchases of the household, c) their visits to friends or relatives, and d) the use of husband's income. For all four decisions, there is a separate binary variable which takes a value one if the response is that the woman alone or woman and husband jointly take the decision, and zero otherwise. Additionally, we create an index of intra-household decision-making power that takes a value one if the response is woman alone or woman and husband jointly take the decision for at least one of the four decisions, and zero otherwise. We also use a z-score intra-household decision-making power index by taking the simple average of the individual z-scores for the four decisions, based on the respective means and standard deviations.

4. **Access to Information**: This set comprises variables capturing the women's access

[13]The man's questionnaire was conducted exclusively within the subsample of households chosen for the state module.

[14]Paid work indicates work for which women get payment in the form of cash or kind. Unpaid work includes domestic work, caregiving activities, etc.

to various modes of information and media such as newspapers, radio, and television. For all three modes, there is a separate binary variable that takes a value one if a woman accesses that mode (reads a newspaper, listens to the radio, or watches television) in a week and zero otherwise. Additionally, we create an index of access to media that takes a value one if a woman accesses at least one of the three modes and zero otherwise. We also use a z-score access to media index by taking the simple average of the individual z-scores for the three modes of media, based on the respective means and standard deviations. Moreover, we create another variable, access to mobile phones, which takes a value one if a woman has a mobile phone and zero otherwise.

5. **Ownership of Assets and Financial Access**: This set comprises variables capturing the ownership of a house, land, and access to money or a bank account. The variable ownership of house (land) takes a value one if a woman owns a house (land) and zero otherwise. Access to money or a bank account is a binary variable that takes a value one if a woman has access to her own money that she can decide how to use or if she has a bank or savings account that she operates herself, and zero otherwise. Additionally, we create an index of financial autonomy that takes a value one if a woman owns a house, land, or has access to money/bank account and zero otherwise. We also use a z-score index of financial autonomy by taking the simple average of the individual z-scores for the ownership of house, land, and access to money/bank, based on the respective means and standard deviations.

6. **Gender Beliefs/ Attitudes Towards IPV:** This set comprises variables reflecting the women's acceptability of IPV due to the following acts: a) travels without informing husband, b) neglects the house or the children, c) argues with the husband, d) refuses to have sex with the husband, e) does not cook food properly, f) husband suspects her of being unfaithful, and g) shows disrespect for in-laws. For all the seven acts, there is a separate binary variable that takes a value one if a woman justifies the violence and zero otherwise. Additionally, we create an index of attitudes towards IPV that takes a value one if a woman justifies violence for either of the seven acts and zero otherwise. We also use a z-score index of attitudes toward IPV by taking the simple average of the individual z-scores of the seven acts of justification, based on the respective means and standard deviations.

7. **IPV**: This set comprises four broad categories of IPV: less severe physical violence, severe physical violence, sexual violence, and emotional violence. Less severe physical violence includes acts of pushing, shaking, throwing something, twisting arm, pulling hair, slapping, punching with a partner's fist, or something else. Severe physical violence includes acts of kicking, beating, choking, burning, threatening, or attacking with any kind of weapon. Sexual violence includes forced sexual acts, forced sexual relations resulting from the fear of what the partner would do otherwise, and humiliating sexual acts. Finally, emotional

violence includes activities that cause women to face humiliation, insult, and various kinds of threats from their partners to hurt the women or their close ones. For each of the four categories of IPV, there is a binary variable that takes a value one for a woman if she reports having faced at least any one kind of the underlying acts of violence in the last twelve months and zero otherwise. We also create an additional indicator, *any violence*, which takes a value one for a woman if she reports having at least one of the four kinds of IPV and zero otherwise. We also use a z-score index of exposure to IPV by taking the simple average of the individual z-scores of the four kinds of IPV, based on the respective means and standard deviations.

3.1.2 Covariate of Interest

Our covariate of interest is urbanization. As discussed previously, we measure urbanization using district-level nighttime lights. Nighttime lights data is obtained from the Socioeconomic High-resolution Rural-Urban Geographic Platform for India (SHRUG).[15] The SHRUG is an open data platform describing multidimensional socioeconomic development across 600,000 villages and towns in India. It provides satellite nighttime lights at different geographic levels. The nighttime lights data available in the SHRUG for 2014-2021 are drawn from annual nighttime light intensity data (provided as raster surfaces) measured by the Visible Infrared Imaging Radiometer Suite (VIIRS) Day/Night Band (DNB), flown jointly by NASA and NOAA (Elvidge et al. (2017)).[16] It is measured in average cloud-free radiance values (Mayala et al. (2018); Mayala and Donohue (2022)). For further details on the nighttime lights data, please see Henderson et al. (2011) and Asher et al. (2021).

3.1.3 Demographics

We use several individual/household-level demographic variables in our regression models including a woman's current marital status (whether a woman has never been in a union, is currently married, or others), religion (Hindu, Muslim, or others), and caste group (Scheduled Caste [SC], Scheduled Tribe [ST], Other Backward Classes [OBC], or Other Caste [OC]). In addition to these, we also include birth year dummies of women. These variables are also obtained from the NFHS.

[15]The SHRUG dataset is available at http://devdatalab.org/shrug

[16]Please note that the nighttime lights data for 2010 used in the mechanism analysis is obtained from Defense Meteorological Satellite Program's Operational Linescan System (DMSP-OLS) operated by National Aeronautics and Space Administration (NASA).

3.1.4 District Characteristics

In India, districts refer to third-level administrative divisions, below the level of country and state/union territories. As per the Census of India 2011, there were 640 districts. We use a range of district-level characteristics from the district census abstract of 2011 Indian Census in our empirical analysis. This set comprises the following variables: number of government pre-primary schools, number of government primary schools, number of government middle schools, number of government secondary schools, number of government senior secondary schools, number of government arts and science degree colleges, number of government engineering colleges, number of government medicine colleges, number of government management institutes, number of government polytechnic institutions, number of government vocational training schools, number of government non-formal training center, number of primary health center doctors, number of maternity and child welfare center doctors, number of mobile health clinic doctors, power supply per day (in hours) for all users in summer (April-September), power supply per day (in hours) for all users in winter (October-March), percentage of SC/ST population, percentage of the literate population, and population density per square kilometers.[17] The SHRUG provides the aggregated data at the district level (see Asher et al. (2021) for more details). Non-missing and valid information on all the district characteristics is available for 608 districts. The NFHS 2015-16 and NFHS 2019-20 data are matched with these district-level characteristics.

3.1.5 Analytical Sample

The nighttime lights composite data are matched with the respective women's data files at the district level. Next, we match the district-level characteristics with both the NFHS rounds. We further pooled the two rounds of NFHS data to construct district-level panel data which forms our analytical sample.[18]

[17] District census abstract provides the aggregated number of schools in all the villages of a district.

[18] In theory, one could construct panel data at the NFHS cluster level. Although NFHS does not have cluster identifiers that uniquely identify clusters across the two rounds, the clusters have longitudinal and latitudinal information (GPS coordinates). Using these, clusters can potentially be matched across the two rounds. We could not take this route because of the following reasons. To preserve spatial anonymity, NFHS uses a geo-masking method whereby clusters cannot be identified by the GPS coordinates since NFHS randomly displaces clusters using a random angle and random distance within a given buffer range (2km radius for urban clusters and 10 km radius for rural clusters). So finding clusters in both rounds with identical GPS coordinates is extremely unlikely (we actually could not find any cluster across the two rounds with identical GPS coordinates). Even then, we checked if we could create a panel of clusters with 'similar' GPS coordinates. To do so, for every cluster in the first round (base clusters), we figured out the nearest cluster in the second round (nearest neighbor) so that we could match every base cluster with a cluster in the second round uniquely. We found that for only 8.73% of the base clusters, the nearest second-round clusters were within 1 km geodetic distance; for 39.62% of the base clusters, the nearest second-round clusters were within 3 km; for 52.68% of the base clusters, the nearest second-round clusters were within 10 km. This

The unit of analysis is women aged 15 to 49 years. Specifically, our analytical sample includes 646,832 women from NFHS 2015-16 and 610,611 women from NFHS 2019-20, making a total of 1,257,443 observations. The analytical sample consists of women who are usual residents of the household and have non-missing information for all the demographics and district characteristics included in the analysis. However, our analytical sample for the regression analysis varies by the outcome variables based on the non-missing data on the specific outcome variable. For example, our mobility outcomes have 204,774 observations, while IPV outcomes have 201,742 observations, and access to information has 1,257,443 observations.

3.1.6 Summary Statistics and Descriptive Analysis

The summary statistics for outcome variables, nighttime lights along with the demographics and district characteristics, are presented in Tables 1A, 1B, and 1C, respectively. Table 1A shows that the average proportion of women in the pooled sample that report being employed in paid (unpaid) jobs at the time of the survey is 20.9% (5.1%), and the proportion of women reported to be employed in paid (unpaid) jobs in the last 12 months preceding the survey is 26.9% (7.9%). In the pooled sample, around 61.8% of the women report that they have the mobility to travel alone, 88.6% report that they have some say in one or more kinds of household decision-making, 77.4% have access to some source of media (newspaper, radio, or television), 48.9% have mobile phone, 42% own a house alone or jointly, around 32.9% own land alone or jointly, and 73.9% have financial access to money or bank account, 46.8% think IPV is justifiable, and 25.5% have been exposed to one or more types of IPV in the last 12 months.

As noted previously, the nighttime lights are reported in average cloud-free radiance. We further take the natural log of the nighttime lights after adding one to the raw data. Table 1B shows that the average values of nighttime lights and log of (nightlights + 1) in the pooled sample are 16,093.44 and 6.59, respectively. Figure 1 shows the distribution of log(nightlights + 1) for the pooled sample (upper panel) as well as across the two rounds (lower panel). The district-level distribution of nightlights across the two rounds is shown in Figure 2. The map indicates a significant variation in nightlights across the districts and the two rounds of survey. The demographic variables, in Table 1B, further indicate that the average age of women is 30.22 years, the average years of completed education is around 7 years, 71% are currently married, 76% are Hindus, and 20% are from upper castes.

meant that if we wanted to create a panel of 'similar' clusters (or panel of clusters located nearest to each other), even if we were fine with treating clusters within 10 km distance as 'similar', we would have to drop close to 50% of the clusters from the data to create a balanced panel. This would likely lead to sample selection issues.

Table 1C shows that in 2011 the average number of government pre-primary schools in districts was around 346, government primary schools was around 1162, government middle schools was around 479, government secondary schools around 161, government senior secondary schools was around 59, government arts and science degree colleges was around 6, government engineering colleges was 0.6, government medicine colleges was 0.5, government management institutes was around 0.75, government polytechnic institutions was 1.39, government vocational training schools was around 4, government non-formal training centers was around 35, the strength of primary health center doctors was 63, maternity and child welfare center doctors was around 53, mobile health clinic doctors was around 10, power supply per day for all users in summer as well as winter was around 2 hours, the percentage of SC/ST population was 32%, the percentage of literate population was 62%, and population density was 516.6 per sq. km.

3.2 Methodology

Our main regression model is given by

$$y_{idst} = \beta log(nightlights_{dst-1} + 1) + \gamma x_{idst} + \lambda v_{ds}^{2011} \times t + \mu_d + \eta_{st} + \epsilon_{idst} \quad (1)$$

where y_{idst} represents outcomes of women i residing in district d within state s from survey year t;[19] $nightlights_{dst-1}$ represents total nighttime lights of district d at year $t-1$, x_{idst} includes individual/household level controls, $v_{ds}^{2011} \times t$ denotes district characteristics (including public goods) as per the 2011 census interacted with survey year, μ_d indicates district fixed effects, η_{st} denotes the state-survey year fixed effects, and ϵ_{idst} is the idiosyncratic error term. We cluster the standard errors at the district level.

Our coefficient of interest is β which captures the effect of urbanization (as proxied by nighttime lights) on different women's outcomes. In general, obtaining a consistent estimate of the effect of urbanization on women's outcomes is very challenging due to the usual problem of omitted variables, i.e., there could be unobservables that could impact women's outcomes and also be correlated with urbanization. Our specification, however, reduces this concern substantially. The inclusion of state-survey round fixed effects helps us account for time-varying state-level policies, and infrastructural and social developments. These could be correlated with both urbanization and women empowerment. District fixed effects account for all district-level time-invariant characteristics. These include economic structure that have been constant over our sample period, geographic features like soil type, proximity to rivers, latitude, longitude, altitude, and ruggedness, and historical factors like year of

[19]The survey years are 2015 and 2016 for NFHS 2015-16, and 2019, 2020 and 2021 for NFHS 2019-21

exposure to railways, location of colonial institutions and missionaries, historical political conditions of the district, etc. Districts' economic structure, geographical conditions and history could simultaneously be determining women's outcomes and urbanization. In fact, district-fixed effects are also likely to account for unobserved local social/gender norms since they are known to be very sticky at least in the short term (Afridi et al. (2022b)). Local social/gender norms are very important determinants of women's outcomes; they could potentially be correlated with urbanization as well. Finally, the inclusion of the interaction between district characteristics and survey year allows us to partial out the impact that initial economic conditions of districts can have on women's outcomes over time.

One concern for married women is that their natal home might not be in the same village or urban locality as their current place of residence (which is their husbands' home). If that is the case, state-time fixed effects, district fixed effects, and interactions between district characteristics and survey year will account for omitted factors discussed above that are relevant for women's current residence, but not that are relevant for women's natal home. This could, in theory, be problematic since omitted variables corresponding to women's natal home could be determining women's current (post-marriage) outcomes (e.g., local gender norms prevailing at the place where the women grew up could be affecting her current outcomes). We recognize this concern but feel this does not hamper our identification. This is because, while patrilocal village exogamy (where the woman moves out of her village to join her husband's family) is very common in India, as noted in Beauchamp et al. (2023), most women stay within the same district. As such, the included fixed effects and interactions between district characteristics and survey year are likely to account for unobserved attributes corresponding to women's natal home (in addition to women's husbands' home).

In addition to omitted variables, endogenous sorting of women into districts could be driving our results. While women might not be migrating across districts due to marriage, they could be migrating for economic reasons or after marriage with their husbands. Further, this migration could be rural-urban migration, i.e., migration from less urban (more rural) districts to more urban (less rural) districts. In theory, rural-urban migration could be determining urbanization. Moreover, those women migrating from rural to urban districts could have different attributes compared to those who are not and these attributes could be correlated with women's outcomes. This is a genuine point of concern. But the rapid urbanization that India is currently witnessing, like most other developing countries, is *not* driven by rural-urban migration.[20] In fact, several studies find that overall rural-urban migration is exceptionally low in India (Munshi and Rosenzweig (2016); Sen (2017); Randolph

[20] Menashe-Oren and Bocquier (2021) empirically show that over urban transition, the role of migration was negligible in low- and middle-income countries between 1985 and 2015.

and Gandhi (2019); Dutta et al. (2022)). Most migration in India is from rural to rural.[21] As noted by Sen (2017), "80 per cent of Indian urban growth is organic in that it arises from three predominant sources—(a) natural population growth; (b) absorption of neighboring villages; and (c) designating existing villages as "census towns". None of these involve spatial movements of people, and hence do not alter the social composition of constituencies.". Similar observations have also been made by Randolph and Gandhi (2019). However, even if there is a small degree of sorting into districts (or migration from rural to urban districts), this is unlikely to be very problematic for us given our model specification. In particular, our model includes a host of time-varying and time-invariant individual and household-level controls (e.g., caste groups, religion, etc.). Many of these controls are also likely to act as proxies for unobserved attributes like tastes, preferences, attitudes, etc. These controls should be able to account for the sorting of women or families into villages/neighborhoods (if any) to a large extent. Nevertheless, to assuage this concern, in addition to estimating our regression model for the full sample, following van Maarseveen (2021) and Abay et al. (2023), we estimate it by restricting our sample to those women who have lived in the area for a relatively long time. As argued by Glaeser (1996), "presumably location choice would be less of an issue for long-term residents" (p. 62). Thus, if the data showed that the effect of the degree of urbanization of the district is no different for long-term residents than those who have migrated relatively recently, this should lead us to believe that it is urbanization that drives outcomes. However, despite these efforts, we admit that concerns regarding omitted variables or endogenous location choice cannot be fully ruled out. Therefore, we do not interpret our findings as causal.

3.2.1 Addressing the Multiple Inference Problem

Since our analysis includes multiple outcome variables, the likelihood of false rejections is inherently inflated. To mitigate this issue, we adjust the p-values to account for multiple hypothesis testing. Specifically, we control the false discovery rate (FDR), which represents the expected proportion of type I errors rejections. FDR formalizes the trade-off between correct and false rejections and reduces the penalty to testing additional hypotheses. For controlling FDR, we follow the procedure proposed by Benjamini et al. (2006) and outlined in Anderson (2008). The procedure computes q-values for each hypothesis tested, where the q-value is an alternative measure akin to p-values in the context of multiple hypothesis testing. It represents the minimum FDR at which that comparison, and all the other comparisons

[21] Munshi and Rosenzweig (2016)'s explanation for India's low mobility is based on a combination of well-functioning rural insurance networks and the absence of formal insurance, which includes government safety nets and private credit.

having smaller p values, can be called significant. Benjamini et al. (2006)'s approach builds upon an earlier method for computing q-values outlined in Benjamini and Hochberg (1995) and the q values computed are referred to as 'sharpened' q values.[22] We report the sharpened q values in the main regression tables.

4 Results

4.1 Main Results

The estimates of the effect of urbanization on different measures of women's empowerment are reported in Tables 2-8. Each table consists of two horizontal panels. In panel A, we present the regression results for the full analytical sample; in panel B, we present the regression results for the sample of women who have lived in the area for at least ten years preceding the survey.

The results for women's labor market participation based on the full sample are reported in Table 2, horizontal Panel A. The coefficients of log(1+nighttime lights) (referred to as LNL hereafter) from the regression that uses 'currently employed in paid (unpaid) work as the dependent variable is 0.002 (0.006), and from the regression that uses 'employed in paid work in the last twelve months as the dependent variable is 0.005 (0.001). As evident, these coefficients are small and statistically insignificant. The analysis that uses the sample of women who have lived in the same area for at least ten years preceding the survey (horizontal Panel B) produces results similar to those obtained based on the full sample. These results suggest urbanization does not lead to changes in women's paid and unpaid employment.

Next, we turn to the implications of urbanization on women's mobility. The estimated effects of urbanization on the ability of women to travel alone to various places are reported in Table 3. The results based on the full sample clearly indicate a positive relationship between LNL and women's ability to travel alone (Panel A). Specifically, the results show that one sd increase in LNL is associated with 0.11, 0.091, 0.086, 0.099, and 0.905 sd increases the likelihood of traveling alone to market, health facility, places outside their village/town, at least one of three places, and z-score index of mobility respectively.[23] Alternatively, doubling nighttime lights (i.e., a 100% increase in nighttime lights) is associated with 0.041, 0.034,

[22] As noted by Anderson (2008), this procedure provides better power than Benjamini and Hochberg (1995) while controlling FDR at level q for independent or positively dependent p values.

[23] The effect of a one sd increase in nighttime lights is equal to $\frac{(Coefficient)*(Standard\,Deviation\,of\,nightlights)}{(Standard\,Deviation\,of\,outcome\,variable)}$. The standard deviation of LNL (SD LNL) for every regression is provided in the tables. The standard deviation of the outcome variables are available in Table 1A. Notably, we do not divide the coefficient by the standard deviation of the outcome variable for the z-score index as it is already measured in the sd units.

0.032, and 0.036 increase in the probability of traveling alone to market, health facility, places outside their village/town, and at least one of three places respectively. Similary, the coefficient of z-score index shows that doubling nighttime lights is associated with 0.071 sd units of higher mobility to the three places. The coefficient estimates of LNL based on the sample of women who have lived in the same area for at least ten years preceding the survey (Panel B) while are not always statistically significant (columns 2 and 3), they are positive, as well as economically significant, thus, suggesting that urbanization and women's mobility are positively linked.

Women's intra-household decision-making power is captured through their ability to make decisions on their health care, large household purchases, their visits to friends or relatives, the usage of their husband's income, and overall decision-making index. The results of the regressions that examine the effect of urbanization on these outcomes are reported in Table 4. Results in Panel A indicate a negative relationship between urbanization and intra-household decision-making power of women. The coefficients are large although are not statistically significant for two outcomes. Specifically, the results show that an additional sd of LNL is associated with 0.131 sd decrease in the likelihood of women making decisions regarding their own health care, with 0.121 sd decrease in the likelihood of women making decisions regarding their visits to friends or relatives, with 0.116 sd decrease in the likelihood of women making any major decision within households, and 0.111 sd decrease in the z-score index of decision making power. The estimated coefficients reported in Panel B are similar in magnitude and direction to those reported in Panel A; however, except for the coefficients reported in columns 4 and 6, all of them are statistically insignificant.

In Table 5, we examine whether urbanization has any effect on women's access to information and media from various sources such as newspapers, radio, and television, and women's access to mobile phones. The results based on the full sample (Panel A) and sub-sample (Panel B) provide evidence of economically and statistically insignificant effects of LNL on all the different measures of women's access to information/ media and mobile phones.

Table 6 reports the results of the effects of urbanization on five outcomes—women's ownership of a house, land, access to money or a bank account, binary index, and z-score index of financial autonomy. Estimates across the two panels show that women's ownership of land and house, their access to money or bank account, as well as indexes of financial autonomy increases with LNL. All the estimated coefficients, except binary index in Panel B, are economically significant. However, only the effect of LNL on access to money or a bank account is statistically significant. In terms of magnitude, the estimated coefficient of LNL based on the full sample sugggests, one sd increase in LNL is associated with 0.088 sd increase in women's likelihood to access money or bank account.

Next, we seek to understand whether urbanization changes women's gender beliefs, particularly, their attitudes toward IPV. The coefficients of LNL reported in both panels A and B of Table 7 are positive and, for some cases, they are economically significant as well (e.g., the coefficient reported in column 2 of Panel A and columns 1 and 2 in Panel B). This suggests that urbanization ironically makes women more likely to justify IPV for one or more reasons. However, most of the estimated coefficients fail to exhibit statistical significance; the only exceptions to this are coefficients reported in column 2 of panel A and columns 1 and 2 of panel B.

Next, we turn to the discussion of the results on women's exposure to IPV reported in Table 8. Evidently, all the estimated coefficients of LNL reported in Panel A are positive and economically significant. Further, most of the estimated coefficients are statistically significant as well. Specifically, results based on the full sample show that an extra sd of LNL leads to 0.14 sd increase in the likelihood of women's exposure to less severe physical violence, 0.099 sd increase in severe physical violence, 0.048 sd increase in sexual violence, 0.121 sd increase in emotional violence, 0.175 sd increase in at least one kind of IPV and 0.102 sd increase in z-score index of any violence. The results obtained based on the restricted sample (Panel B) are very similar to the full sample results. These results suggest that urbanization is associated with an increase in women's exposure to IPV. This could be due high stress levels triggered by urban environments or be driven by the so-called 'male backlash effect' arising in response to increased mobility and financial autonomy of women.

Could these results be driven by higher reporting of IPV by urban women? Unlikely because of two reasons. First, when it comes to beliefs about IPV, there is no evidence to suggest that urban women have better gender beliefs than rural women (if anything, urban women seem to be more likely to justify IPV). Further, across several key measures of empowerment as well, urban women are no different from their rural counterparts. In light of this, there is no reason to suspect that urban women are more forthcoming when it comes to reporting of IPV than rural women. Second, while in general misreporting of exposure to IPV is a concern, it is widely accepted that the IPV data in the NFHS is unlikely to contain severe measurement error. As noted by Golder (2016), "It [NFHS] follows both Indian and international guidelines, viz. WHO ethical guidance for research on domestic violence against women, 2001, for the ethical collection of data on violence" (p. 2). Specifically, the following precautions are taken by the survey. First, only one woman per household is selected (randomly) for the interviews. Second, the surveyors ensured that there is no one else in the room when the interviews were conducted. Third, the respondents are informed that their answers would be kept confidential. Fourth, women are asked the questions only toward the end of the interview so that a rapport has been built up between interviewer and

respondent before the questions are posed. Fifth, interviewers are provided with extensive training regarding the appropriate way to ask questions of such a sensitive nature. Finally, the survey avoids generic and subjective questions on domestic violence and instead employs questions about specific episodes of violence. This procedure reflects a revised version of the Conflict Tactics Scales (Straus (1979); Straus et al. (1996)), and is considered by social scientists as the gold standard for survey data collection on domestic violence (Guarnieri and Rainer (2021)).

In sum, our results suggest that the short-term effect of urbanization on women's outcomes are mixed at best: while there is clear evidence suggesting that urbanization is associated with increased mobility and (partial) improvements in the financial autonomy of women, we detect no link between urbanization and women's labor market participation, access to information, and gender beliefs. Additionally, we find that urbanization reduces women's intra-household agency and increases their exposure to IPV.

It needs to be stressed that while these results—especially the simultaneous increase in women's financial autonomy and reduction in intrahousehold agency—might appear slightly puzzling, they are not. Theoretical models suggest that the effect of increased financial autonomy on women's intrahousehold agency depends on the association between IPV and financial autonomy (Jose and Younas (2023)). If higher financial autonomy is associated with increased IPV—which seems to be the case in the present context—women's financial autonomy could increase and their intrahousehold agency could fall at the same time. Further, our results are also not inconsistent with those of existing studies that examine the link between urbanization and women's outcomes in low- and middle-income settings. For example, Mitra (2019), using district-level data from the Indian state of Odisha, finds no evidence that urbanization improves women's work participation; on the contrary, he finds that urbanization is negatively associated with women's employment in both rural and urban areas. Additionally, Banks (2013) using data from Bangladesh documents the persistence of patriarchal social norms in urban areas that forbid women (especially those who are married) from working.

Are the effects of urbanization gendered? In addition to understanding the linkage between urbanization and women empowerment, it is also useful to understand whether the effects of urbanization are gendered (i.e., whether men and women are impacted differently by urbanization). Towards that end, we examine the link between urbanization and men's labor market outcomes and compare our findings with those obtained for women.

As in the case of women, we focus on four binary indicators of men's employment: currently employed in paid work (i.e., whether or not a man was employed in paid work when

the survey was being conducted), employed in paid work in the last twelve months (i.e., whether or not a man was employed in paid work during the twelve months preceding the survey), currently employed in unpaid work (i.e., whether or not a man is employed in unpaid work when the survey was being conducted), and employed in unpaid work in the last twelve months (i.e., whether or not a man was employed in unpaid work during the twelve months preceding the survey). If a man is currently employed in paid (unpaid) work, the first (third) variable takes a value one, and zero otherwise. If a man was employed in paid (unpaid) work anytime during the twelve months preceding the survey, the second (fourth) variable takes a value one, and zero otherwise. We regress these outcome variables on LNL. Similar to equation (1), we include individual/household level controls, district characteristics interacted with year, district fixed effects, and state-year fixed effects in all regressions. The summary statistics of all the variables used to estimate these regressions are reported in Tables A1 in the Appendix.

Table 9 presents the regression results. Panels A and B show that LNL positively influences men's paid employment (current and in the last twelve months), and negatively influences men's unpaid employment. All the estimated coefficients appear to be economically and statistically significant for the restricted sample. For the full sample, all coefficients are economically significant; as far as statistical significance is concerned, one out of the four coefficient (column 2) fails to show statistical significance. In terms of the magnitude, the estimated coefficients of LNL based on the restricted sample suggest, that doubling LNL is associated with a 0.039 (0.044) increase (decrease) in the likelihood of men being currently employed in any paid (unpaid) work and 0.019 (0.061) increase (decrease) in the likelihood of being employed in paid (unpaid) work in the twelve months preceding the survey. The estimated coefficients of LNL based on the full sample suggest that the magnitudes of the effects are similar to those obtained for the restricted sample.

Clearly, these results are in sharp contrast to the corresponding results obtained for women. Recall, that the estimated effect of urbanization on women's paid and unpaid employment were economically and statistically insignificant. Overall, thus our findings provide evidence that the effect of urbanization in India is likely gendered.

4.2 Heterogeneity

We explore whether the effect of urbanization on different measures of women's empowerment differ across wealth categories (poor and non-poor), religion groups (Hindu and other religions), caste groups (disadvantaged/backward and forward), and regions (Northern In-

dian states including the BIMARU[24] states and other states). The results are reported in Tables 10 and 11.[25] For each case of heterogeneity analysis, we construct a separate binary variable that takes a value one if a woman belongs to the specific group and zero otherwise: *Poor* takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; *Minority* takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; *Disadvantaged Class* takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and *NBIMARU* takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise (see Figure 3). Each table consists of four panels. In panels A, B, C, and D, we present the regression results of the interactions between LNL and the binary variables—Poor, Minority, Disadvantaged Caste, and NBIMARU—respectively. The coefficient of the interaction between LNL and the binary variable for the specific subgroup shows the differential effect of urbanization on the comparison groups (poor, Hindu, disadvantaged caste groups, and NBIMARU states) relative to the respective reference group (non-poor, other religions, forward caste group, other states). The coefficient of LNL shows the effect of urbanization on the reference group.

The following findings stand out. First, the effect of urbanization on the likelihood of participation in paid employment is higher for men and women belonging to poor households and members of disadvantaged castes (in fact, for these subgroups, the effect of urbanization on paid employment is positive and statistically significant) (Table 10). Second, women from poor households, in addition to being more likely to participate in the labor market in relatively more urban areas, are also more likely to have access to bank accounts (Table A14) and hence financial autonomy (Table 11). Third, the (positive) effect of urbanization on women's mobility is weaker for members of disadvantaged caste groups than their counterparts (Table 11). Fourth, urbanization increases the likelihood of women justifying as well as facing any IPV more for members of disadvantaged caste groups than their counterparts (Table 11).

The most interesting of these observations is perhaps the first one: urbanization positively affects women's labor force participation of poor women and women from disadvantaged castes but does not affect that of their respective counterparts. We believe this finding suggests that urbanization in India is associated majorly with the creation of low-

[24]It is an acronym indicating a group of four extremely economically backward states including Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh.

[25]The results for the individual components and Z-score indexes of women's mobility, intra-household decision making power, access to information, financial autonomy, attitudes toward IPV, exposure to IPV are reported in Tables A11-A16

skilled informal sector jobs for women. Women from the relatively lower rungs of society are more likely to be employed in such jobs than their counterparts. Poor women and women from disadvantaged castes are more likely to belong to the lower rungs of the society. As such, urbanization may influence the likelihood of participating in the labor market of these subgroups of women positively. Indeed, a recent study by Nanda et al. (2021) finds that "considering, total urban female workforce, about 87 percent of female workers are without any social security benefits, about 77 percent do not have any written work contracts and nearly 80 percent are not eligible for paid leaves. Thus, more than two-thirds of the urban female workforce are under the category of informal workers (PLFS 2017-18)" (p. 6). Could it be that these subgroups also experience a positive shift in gender attitudes due to urbanization which in turn makes women from these subgroups more likely to participate in paid work? Unlikely. If anything, as noted previously, urbanization leads women from disadvantaged castes to have worse attitudes toward IPV than their counterparts.

4.3 Discussion of Underlying Mechanism

Our results indicate that urbanization enhances women's mobility and financial autonomy but does not affect their labor market participation, access to information, or gender beliefs. It also reduces women's household agency while increasing their risk of IPV. Meanwhile, urbanization benefits men's labor market outcomes. In this section, we examine the potential channels through which these effects might be operating, namely, educational outcomes, public education infrastructure, private education infrastructure, financial infrastructure, sex ratio, crime against women, and women's political representation. Specifically, educational outcome variables include literacy rate (in percentage), natural log of number of literate men, and natural log of number of literate women in a district. Public education infrastructure includes number of public pre-primary schools, public secondary schools, public vocational training schools in a district. Private education infrastructure includes number of private pre-primary schools, private secondary schools, private vocational training schools in a district. Financial infrastructure includes the district's accessibility to ATM and financial self-help groups. District's accessibility to ATM (financial self-help group) takes a value 1 if there is at least one village with ATM (financial self-help group) and 0 otherwise. Crime against women includes the number of reported cases of assault on a woman with the intent to outrage her modesty, number of reported cases of attempt to rape and number of reported cases of rape in a district. Moreover, we also focus on women's representation in politics as a possible mechanism. It includes the number of women candidates and the percentage of vote share received by them in a constituency of the state assembly election.

The data for educational outcomes, public education infrastructure, private education infrastructure, financial infrastructure, and sex ratio comes from the 2011 Indian Census. The Trivedi Center for Political Data (Agarwal et al. (2021)) provides the state assembly constituency level data on women's representation from 2015 to 2021. The National Crime Record Bureau Crime Against Women (NCRB CAW) provides the data on crime against women. The SHRUG has compiled the aggregated data on educational outcomes, public education infrastructure, private education infrastructure, financial infrastructure, and sex ratio at the district level. The SHRUG also provides the aggregated data on women's representation at the assembly level. The India Data Portal (see Bharti Institute of Public Policy (BIPP), Indian School of Business (ISB) (2019) for more details) provides the compiled district level data on crime against women. We use data on crime against women from 2016 to 2021. We could not include 2015 into this analysis due to unavailability of data on crime against women. We match this data with district level nighttime lights. The summary statistics of these variables along with other controls such as population density, altitude, latitude and longitude of the centre of the district, included in the regression are presented Appendix Table A2.

Our regression model to analyse the association between educational outcomes, public education infrastructure, private education infrastructure, financial infrastructure, sex ratio and nighttime lights is given by

$$y_{ds} = \beta log(nightlights_{ds2010} + 1) + \gamma x_{ds} + \mu_s + \epsilon_{ds} \tag{2}$$

where y_{ds} represents the district d level outcomes within state s in 2011, $nightlights_{ds2010}$ represents total nighttime lights of district d in 2010, x_{ds} includes population density, altitude, latitude and longitude of the centre of the district d as per the 2011 census, μ_S indicates state fixed effects, and ϵ_{st} is the idiosyncratic error term. We use the robust standard errors. The nighttime lights data for this set of analysis is obtained from Defense Meteorological Satellite Program's Operational Linescan System (DMSP-OLS) operated by National Aeronautics and Space Administration (NASA). Our analysis is restricted to 604 districts due to unavailability of altitude, latitude and longitude of the centre of the four districts (Barnala, Mansa, North Middle Andaman, and South Andaman).

In order to examine the association between crime against women and nighttime lights, we estimate the following regression model

$$y_{dt} = \beta log(nightlights_{dt-1} + 1) + \lambda v_d^{2011} \times t + \mu_d + \eta_t + \epsilon_{dt} \tag{3}$$

where y_{dt} represents the number of reported cases of assault on a woman with the intent to

outrage her modesty, number of reported cases of attempt to rape and number of reported cases of rape are measured at district level d in year t; $nightlights_{dst-1}$ represents total nighttime lights of district d in year $t-1$, $v_{ds}^{2011} \times t$ denotes the population density as per the 2011 census interacted with survey year, μ_d indicates district fixed effects, η_t denotes the year fixed effects, and ϵ_{ds} is the idiosyncratic error term. We cluster the standard errors at the district level. Our analysis is restricted to 608 districts from 2016 to 2021. We could not include 2015 in our analysis due to unavailability of data.

We use the same regression model in (3) to estimate the association between women's representation in politics and nighttime lights. However, the outcome variables i.e. the number of women candidates and percentage of vote share received by them are measured at the state constituency level from district d in year t. Our analysis is restricted to 2013 constituencies from 477 districts from 2015 to 2021.

The estimates of the associations between nighttime lights and these outcome variables are reported in Table 12. In panel A, we present the regression results of educational outcomes, public education infrastructure, private education infrastructure, financial infrastructure, and sex ratio. Panel B shows the results of crime against women and women's representation in politics. Our results indicate that nighttime lights are associated with improvements in educational outcomes, both public and private education infrastructure, and accessibility to ATMs. Additionally, there is a negative correlation between nighttime lights, sex ratio, and crimes against women. However, we find no significant association between nighttime lights and women's political representation.

These findings suggest that urbanization enhances various pathways, such as educational and financial infrastructure, reduction in sex ratio, and reduction in crimes against women, contributing to women's empowerment. However, the positive shifts in these pathways due to urbanization do not translate into improvements across all dimensions of women's empowerment. For instance, while better educational outcomes, infrastructure, and reduced crime against women may enhance women's mobility, they do not necessarily improve their labor market participation, decision-making power, access to information, or attitudes toward IPV. Similarly, improved financial infrastructure, as indicated by better access to ATMs, may explain the positive impact of urbanization on women's financial autonomy, but it does not extend to all aspects of their empowerment.

4.4 Robustness Checks

We carry out several robustness checks to assess the robustness of our results. First, we cluster standard errors at the level of district-survey round. In the baseline analysis, we

had clustered standard errors at the district level; this could have been more conservative than required, and hence we could have been getting statistically insignificant coefficients for many cases. By making the level of clustering less conservative, we can assess whether that is the case. The results are reported in Panel A of Tables A3-A10 in the Appendix. We find that on altering the level of clustering, the statistical significance of the estimated coefficients undergoes no remarkable change: barring a few exceptions, most of the estimated coefficients that were statistically insignificant previously, continue to remain so.

Second, we redo our analysis by restricting our analytical sample to only those who have stayed in their current place of residence forever (never-movers or stayers). While the size of this subsample is substantially smaller compared to the baseline sample which could lead to higher standard errors of estimated coefficients, it is worth examining how the estimated coefficients based on this subsample compare with those obtained from the baseline model since endogenous location selection is a possibility that in all honesty cannot be ruled out completely. The results are reported in Panel B of Tables A3-A10. The estimated coefficients, as evident, are not qualitatively different from the baseline results. However, many coefficients that earlier were statistically significant lose their significance (which is not unexpected).

Third, we use a binary measure of nighttime lights as an alternative to continuous measure. Specifically, this binary measure of urbanization takes a value 1 (indicating a higher degree of urbanization) if log(nightlights + 1) for a district exceeds the state's median log(nightlights + 1) value, and 0 (indicating a lower degree of urbanization) otherwise. The results using this binary treatment variable are presented in Panel C of Tables A3-A10. Our findings indicate that a higher degree of urbanization enhances women's mobility and financial autonomy, increases exposure to IPV, and reduces intrahousehold decision-making power. The impact of urbanization on other outcomes, such as men's labor market performance, remains consistent in direction. However, the precision of the coefficients diminishes, likely due to the loss of information and statistical power caused by converting the continuous treatment variable into a binary form (Royston et al. (2006)).

Fourth, the data collection period of the NFHS 2019-21 overlapped with the onset of the COVID-19 pandemic in 2020. To assess whether this overlap may have influenced the treatment effects, we replaced the survey year fixed effects with a *post-COVID* dummy variable. Specifically, *post-COVID* equals 1 if the survey was conducted in 2020 or 2021, and 0 otherwise. The results from this specification, presented in Panel D of Tables A3-A10, show that effect on women's mobility, intra household decision making power, financial autonomy, exposure to IPV, and men's labor market outcomes remain economically significant.

Finally, we carry out a falsification test. We randomize the district level ordering of

nighttime lights. We then re-run all the regression models. As a result, it randomly assigns the nighttime lights of district X to another district. Specifically, the outcome variables in district X get matched to nighttime lights of another district randomly. Using this randomly matched data, we re-estimate our results for the employment outcome variables, mobility index, autonomy index, access to information index, access to mobile phone, financial autonomy index, attitudes towards IPV index, and exposure to any IPV index. We repeat this exercise 1000 times for each outcome variable by randomizing the district level ordering of nighttime lights. Ideally, we should not be detecting the effect of nighttime lights on any outcome variable (other than by chance), i.e., the estimated coefficients should be zero or close to zero. Figures 4 and 5 show that the distribution of simulated coefficients for each of the outcome variables are centered around zero and smaller in magnitude than our coefficient in the main analysis.

5 Conclusion

We examined the short-term implications of urbanization on women empowerment in India. In theory, urbanization can affect women either positively or negatively. Women in urban areas, compared to their rural counterparts, are thought to enjoy greater social, economic, and political opportunities and freedoms. Further, gender norms prevailing in urban areas are also likely to be less regressive. At the same time, research shows barriers to women's empowerment remain widespread in urban environments. We measured urbanization using satellite-based nighttime light intensity data. Fixed effects estimation results showed that urbanization positively influences women's mobility and financial autonomy. However, urbanization has no links to women's labor market participation, access to information, and gender beliefs. Further, urbanization reduces women's intrahousehold agency and increases women's exposure to IPV. We also find that urbanization impacts men's labor market outcomes positively. Overall, these results suggest that Indian women benefit very little from urbanization and that the effects of urbanization are gendered. This could be because urban planning in India has not been gender-responsive and/or urbanization has failed to alter patriarchal gender norms.

Our study has two limitations. First, while we define urbanization based on nighttime lights following recent literature, we recognize that urbanization is a multidimensional process that can be defined in various ways. Alternative definitions, such as those from geography or sociology, may emphasize different aspects of urbanization—such as economic activities, infrastructure, or social networks—which could lead to different empirical results. This suggests that our findings might vary under different conceptualizations of urbaniza-

tion. Future research could benefit from incorporating these interdisciplinary perspectives to provide a more nuanced understanding of urbanization dynamics. Second, although we have made efforts to account for several unobserved confounders that could affect the relationship between urbanization and women's outcomes, our results should not be interpreted as causal. Future studies could aim to establish causality by leveraging natural experiments or employing other robust causal inference methods.

A plethora of research demonstrates that gender inequality is exceedingly high in India, and women are marginalized in the community. Our findings indicate that existing gender inequality might increase and Indian women might become marginalized further because of the rapid urbanization that India is currently witnessing. Policymakers should take cognizance of this possibility and consider designing and implementing interventions that could potentially tackle this. These could include urban planning that takes into account the specific needs and challenges faced by women, initiatives that ensure equal access to employment opportunities for women in urban areas, interventions that could change cultural norms that may restrict women's participation in urban life, programs that encourage community engagement and participation, especially involving women, in the planning and decision-making processes related to urban development, etc. If, by 2030, India wants to achieve the United Nation's Sustainable Development Goal (SDG) 5—which aims to achieve gender equality and empower all women and girls—collaboration among policymakers, advocacy groups, and communities is essential to ensure that all proposed policies related to urbanization are contextually relevant and address the specific challenges faced by women in the process of urbanization. Additionally, ongoing research and data collection can help refine and adapt policies based on the evolving needs of women in urban areas.

References

Abay, K. A. and Amare, M. (2018). Night light intensity and women's body weight: evidence from Nigeria. *Economics & Human Biology*, 31:238–248.

Abay, K. A., Tiberti, L., Woldemichael, A., Mezgebo, T. G., and Endale, M. (2023). Can urbanisation improve household welfare? evidence from Ethiopia. *Journal of African Economies*, 32(1):81–109.

Afridi, F., Bishnu, M., and Mahajan, K. (2022a). What determines women's labor supply? the role of home productivity and social norms. *Journal of Demographic Economics*, pages 1–33.

Afridi, F., Dhillon, A., Roy, S., and Sangwan, N. (2022b). Social networks, gender norms and women's labor supply: Experimental evidence using a job search platform.

Agarwal, A., Agrawal, N., Bhogale, S., Hangal, S., Jensenius, F. R., Kumar, M., Narayan, C., Nissa, B. U., Trivedi, P., and Verniers, G. (2021). TCPD Indian Elections Data v2.0. data retrieved on 15 June 2024, https://tcpd.ashoka.edu.in/lok-dhaba/.

Alesina, A., Giuliano, P., and Nunn, N. (2013). On the origins of gender roles: Women and the plough. *The quarterly journal of economics*, 128(2):469–530.

Alfano, M. (2017). Daughters, dowries, deliveries: The effect of marital payments on fertility choices in India. *Journal of Development Economics*, 125:89–104.

Amare, M., Arndt, C., Abay, K. A., and Benson, T. (2020). Urbanization and child nutritional outcomes. *The World Bank Economic Review*, 34(1):63–74.

Anderson, M. L. (2008). Multiple inference and gender differences in the effects of early intervention: A reevaluation of the abecedarian, perry preschool, and early training projects. *Journal of the American statistical Association*, 103(484):1481–1495.

Anderson, S. and Genicot, G. (2015). Suicide and property rights in India. *Journal of Development Economics*, 114:64–78.

Asher, S., Lunt, T., Matsuura, R., and Novosad, P. (2021). Development research at high geographic resolution: an analysis of night-lights, firms, and poverty in India using the shrug open data platform. *The World Bank Economic Review*, 35(4).

Banks, N. (2013). Female employment in Dhaka, Bangladesh: participation, perceptions and pressures. *Environment and urbanization*, 25(1):95–109.

Beauchamp, A., Calvi, R., and Fulford, S. (2023). Terms of engagement: Marriage and migration in India,.

Benjamini, Y. and Hochberg, Y. (1995). Controlling the false discovery rate: a practical and powerful approach to multiple testing. *Journal of the Royal statistical society: series B (Methodological)*, 57(1):289–300.

Benjamini, Y., Krieger, A. M., and Yekutieli, D. (2006). Adaptive linear step-up procedures that control the false discovery rate. *Biometrika*, 93(3):491–507.

Bhalotra, S., Chakravarty, A., and Gulesci, S. (2020). The price of gold: Dowry and death in India. *Journal of Development Economics*, 143:102413.

Bhalotra, S., Chakravarty, A., Mookherjee, D., and Pino, F. J. (2019). Property rights and gender bias: Evidence from land reform in West Bengal. *American Economic Journal: Applied Economics*, 11(2):205–237.

Bhalotra, S., Kambhampati, U., Rawlings, S., and Siddique, Z. (2021). Intimate partner violence: The influence of job opportunities for men and women. *The World Bank Economic Review*, 35(2):461–479.

Bharti Institute of Public Policy (BIPP), Indian School of Business (ISB) (2019). India Data Portal. data retrieved on 15 June 2024, https://indiadataportal.com/about.

Bloch, F. and Rao, V. (2002). Terror as a bargaining instrument: A case study of dowry violence in rural India. *American Economic Review*, 92(4):1029–1043.

Borker, G. (2021). *Safety first: Perceived risk of street harassment and educational choices of women*. World Bank Washington, DC, USA.

Boserup, E. (1970). *Woman's Role in Economic Development*. New York :St. Martin's Press.

Cali, M. and Menon, C. (2013). Does urbanization affect rural poverty? evidence from Indian districts. *The World Bank Economic Review*, 27(2):171–201.

Calvi, R. (2020). Why are older women missing in India? the age profile of bargaining power and poverty. *Journal of Political Economy*, 128(7):2453–2501.

Carranza, E. (2014). Soil endowments, female labor force participation, and the demographic deficit of women in India. *American Economic Journal: Applied Economics*, 6(4):197–225.

Chandramouli, C. and General, R. (2011). *Census of India 2011: Provisional Population Totals*. Office of the Registrar General Census Commissioner, India.

Chant, S. (2013). Cities through a "gender lens": a golden "urban age" for women in the global South? *Environment and urbanization*, 25(1):9–29.

Charmes, J. et al. (2019). *The Unpaid Care Work and the Labour Market: An analysis of time use data based on the latest World Compilation of Time-use Surveys*. ILO Geneva.

Chauvin, J. P., Glaeser, E., Ma, Y., and Tobio, K. (2017). What is different about urbanization in rich and poor countries? cities in Brazil, China, India and the United States. *Journal of Urban Economics*, 98:17–49.

Chen, L., Hasan, R., and Jiang, Y. (2022). Urban agglomeration and firm innovation: Evidence from Asia. *The World Bank Economic Review*, 36(2):533–558.

Chen, S. and Ravallion, M. (2007). Absolute poverty measures for the developing world, 1981–2004. *Proceedings of the National Academy of Sciences*, 104(43):16757–16762.

Christiaensen, L. and Todo, Y. (2014). Poverty reduction during the rural–urban transformation–the role of the missing middle. *World Development*, 63:43–58.

Combes, P.-P., Démurger, S., and Li, S. (2015). Migration externalities in Chinese cities. *European Economic Review*, 76:152–167.

Combes, P.-P., Démurger, S., Li, S., and Wang, J. (2020). Unequal migration and urbanisation gains in China. *Journal of Development Economics*, 142:102328.

Das, M. B. (2019). Gender dimensions of urbanization: Challenges and opportunities in india. World Bank Blog.

Deshingkar, P. and Grimm, S. (2005). *Internal migration and development: A global perspective*. United Nations.

Devoto, F., Duflo, E., Dupas, P., Parienté, W., and Pons, V. (2012). Happiness on tap: Piped water adoption in urban Morocco. *American Economic Journal: Economic Policy*, 4(4):68–99.

Dhar, D., Jain, T., and Jayachandran, S. (2022). Reshaping adolescents' gender attitudes: Evidence from a school-based experiment in India. *American economic review*, 112(3):899–927.

Dinkelman, T. (2011). The effects of rural electrification on employment: New evidence from South Africa. *American Economic Review*, 101(7):3078–3108.

Dutta, A., Gandhi, S., and Green, R. K. (2022). *Do urban regulations exacerbate rural-urban inequality? Evidence from rent control in India*. SSRN Working Paper.

Elvidge, C. D., Baugh, K., Zhizhin, M., Hsu, F. C., and Ghosh, T. (2017). VIIRS night-time lights. *International journal of remote sensing*, 38(21):5860–5879.

Elvidge, C. D., Baugh, K. E., Kihn, E. A., Kroehl, H. W., Davis, E. R., and Davis, C. W. (1997). Relation between satellite observed visible-near infrared emissions, population, economic activity and electric power consumption. *International Journal of Remote Sensing*, 18(6):1373–1379.

Field, E. and Ambrus, A. (2008). Early marriage, age of menarche, and female schooling attainment in Bangladesh. *Journal of political Economy*, 116(5):881–930.

Gammage, S. (2010). Gender, time poverty and Amartya Sen's capability approach: evidence from Guatemala. *The international handbook of gender and poverty: concepts, research, policy. Edward Elgar, Cheltenham, UK*, pages 71–76.

Glaeser, E. L. (1996). Discussion to 'spatial effects upon employment outcomes: The case of New Jersey teenagers' by o'reagan, k. and j.quigley. *New England Economic Review*, May 1996:58–64.

Golder, S. (2016). Measurement of domestic violence in NFHS surveys and some evidence.

Goldin, C. (1995). *The U-Shaped Female Labor Force Function in Economic Development and Economic History*, pages 61–90. University of Chicago Press.

Goldstein, M. and Udry, C. (2008). The profits of power: Land rights and agricultural investment in Ghana. *Journal of political Economy*, 116(6):981–1022.

Golla, A. M., Malhotra, A., Nanda, P., and Mehra, R. (2011). *Understanding and Measuring Women's Economic Empowerment*. ICRW.

Guarnieri, E. and Rainer, H. (2021). Colonialism and female empowerment: A two-sided legacy. *Journal of Development Economics*, 151:102666.

Hasan, R., Jiang, Y., and Rafols, R. M. (2017). Urban agglomeration effects in India: evidence from town-level data. *Asian Development Review*, 34(2):201–228.

Henderson, J. V., Storeygard, A., and Weil, D. N. (2011). A Bright Idea for Measuring Economic Growth. *American Economic Review*.

Henderson, M., Yeh, E. T., Gong, P., Elvidge, C., and Baugh, K. (2003). Validation of urban boundaries derived from global night-time satellite imagery. *International Journal of Remote Sensing*, 24(3):595–609.

Hering, L. and Poncet, S. (2010). Market access and individual wages: Evidence from China. *The Review of Economics and Statistics*, 92(1):145–159.

IATF (2012). *Rural Women and the Millennium Development Goals*. Inter-Agency Task Force on Rural Women, New York.

Imhoff, M. L., Lawrence, W. T., Stutzer, D. C., and Elvidge, C. D. (1997). A technique for using composite dmsp/ols "city lights" satellite data to map urban area. *Remote Sensing of Environment*, 61(3):361–370.

International, A. (2010). Insecurity and indignity: women's experiences in the slums of Nairobi, Kenya.

IOM (2009). *Rural women and migration*. International Organisation for Migration, Washington DC.

Janssens, W. (2010). Women's empowerment and the creation of social capital in Indian villages. *World Development*, 38(7):974–988.

Jayachandran, S. (2015). The roots of gender inequality in developing countries. *economics*, 7(1):63–88.

Jayachandran, S. (2017). Fertility decline and missing women. *American Economic Journal: Applied Economics*, 9(1):118–139.

Jones, G. A. and Corbridge, S. (2008). Urban bias. In Desai, V. and Potter, R., editors, *The Companion to Development Studies*, pages 286–290. Routledge, London, UK.

Jose, J. and Younas, J. (2023). Financial inclusion and women's bargaining power: evidence from India. *International Review of Applied Economics*, 37(1):76–92.

Jungari, S., Chauhan, B. G., Bomble, P., and Pardhi, A. (2022). Violence against women in urban slums of India: A review of two decades of research. *Global public health*, 17(1):115–133.

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and change*, 30(3):435–464.

Kabeer, N., Mahmud, S., and Tasneem, S. (2011). Does paid work provide a pathway to women's empowerment? empirical findings from Bangladesh. *IDS Working Paper, issue 375*.

Khosla, R. (2009). Addressing gender concerns in india's urban renewal mission (new delhi: Undp).

Klasen, S. and Pieters, J. (2015). What explains the stagnation of female labor force participation in urban India? *The World Bank Economic Review*, 29(3):449–478.

Mathur, O. P. (2013). Urban poverty in Asia. *Asian Development Bank, Metro Manila, Philippines*, pages 1–122.

Mathur, O. P. (2021). *State of the cities India*. Institue of Social Sciences.

Mayala, B. and Donohue, R. (2022). The DHS program geospatial covariate datasets manual third edition.

Mayala, B., Fish, T., Eitelberg, D., and Dontamsetti, T. (2018). The DHS program geospatial covariate datasets manual second edition the DHS program, icf 2.

McIlwaine, C. (2013). Urbanization and gender-based violence: exploring the paradoxes in the global South. *Environment and Urbanization*, 25(1):65–79.

Menashe-Oren, A. and Bocquier, P. (2021). Urbanization is no longer driven by migration in low-and middle-income countries (1985–2015). *Population and Development Review*, 47(3):639–663.

Ministry of Housing and Urban Affairs, Government of India (2017). *India Habitat III National Report*. Government of India.

Mitra, A. (2019). Women's work in response to urbanization: Evidence from Odisha. *ANTYAJAA: Indian Journal of Women and Social Change*, 4(1):92–106.

Moghadam, V. M. (1996). *Patriarchy and development: Women's positions at the end of the twentieth century*. Oxford University Press.

Munshi, K. and Rosenzweig, M. (2016). Networks and misallocation: Insurance, migration, and the rural-urban wage gap. *American Economic Review*, 106(01):46–98.

Nanda, S., Sengupta, N., Anand, S., Sharma, S., and Seth, K. (2021). Covid-19 policies and women in informal work in India-a rebuild scoping report.

Qian, N. (2008). Missing women and the price of tea in China: The effect of sex-specific earnings on sex imbalance. *The Quarterly Journal of Economics*, 123(3):1251–1285.

Randolph, G. and Gandhi, S. (2019). Migrants aren't streaming into cities, and what this means for urban India. *Hindustan Times*, 22 July, 2019.

Ratheesh, C. and Anitha, V. (2022). Gender disparity in invisible economy: Lessons from Indian Time Use Survey. *The Indian Journal of Labour Economics*, 65(2):463–481.

Ravallion, M., Chen, S., and Sangraula, P. (2007). New evidence on the urbanization of global poverty. *Population and development review*, 33(4):667–701.

Roychowdhury, P. and Dhamija, G. (2021). The causal impact of women's age at marriage on domestic violence in India. *Feminist Economics*, 27(3):188–220.

Royston, P., Altman, D. G., and Sauerbrei, W. (2006). Dichotomizing continuous predictors in multiple regression: a bad idea. *Statistics in medicine*, 25(1):127–141.

Sekhri, S. and Storeygard, A. (2014). Dowry deaths: Response to weather variability in India. *Journal of development economics*, 111:212–223.

Sen, P. (2017). The puzzle of [i]ndian urbanization. *Mint*, 12 April, 2017.

Stathakis, D., Tselios, V., and Faraslis, I. (2015). Urbanization in European regions based on night lights. *Remote Sensing Applications: Society and Environment*, 2:26–34.

Storeygard, A. (2016). Farther on down the road: transport costs, trade and urban growth in sub-Saharan Africa. *The Review of economic studies*, 83(3):1263–1295.

Straus, M. (1979). Measuring intrafamily conflict and violence: the conflict tactics scales. *Journal of Marriage and the Family*, 41:75–88.

Straus, M. A., Hamby, S. L., Boney-McCoy, S., and Sugarman, D. B. (1996). The revised conflict tactics scales (cts2) development and preliminary psychometric data. *Journal of family issues*, 17(3):283–316.

Sutton, P. (1997). Modeling population density with night-time satellite imagery and gis. *Computers, environment and urban systems*, 21(3-4):227–244.

Tacoli, C. (2012). *Urbanization, gender and urban poverty: paid work and unpaid care-work in the city*. Human Settlements Group, International Institute for Environment and Development, United Nations Population Fund.

Tacoli, C. and Mabala, R. (2010). Exploring mobility and migration in the context of rural—urban linkages: why gender and generation matter. *Environment and urbanization*, 22(2):389–395.

Tacoli, C. and Satterthwaite, D. (2013). Gender and urban change.

Tisdale, H. (1941). The process of urbanization. *Social Forces*, 20:311.

UN Habitat (2020). *World Cities Report 2020: The Value of Sustainable Urbanization*. United Nations Human Settlements Programme.

Vakulabharanam, V. and Motiram, S. (2023). Gender and work patterns in Indian cities: A socio-spatial analysis. *Feminist Economics*, 29(2):64–95.

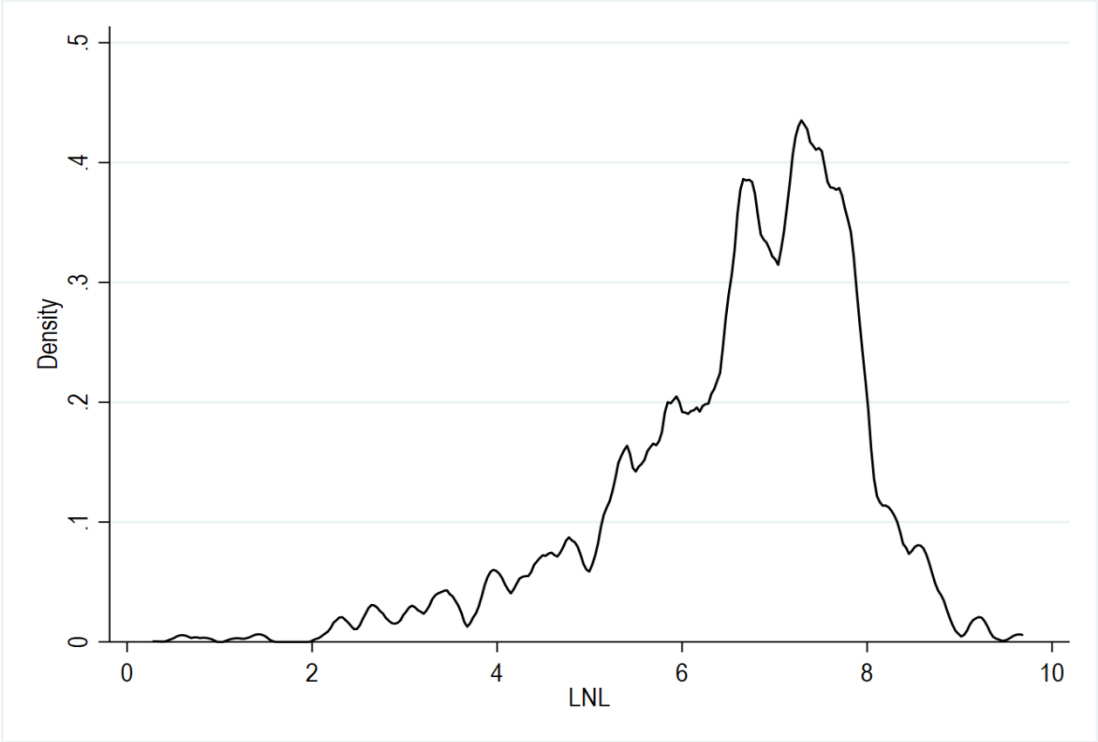
van Maarseveen, R. (2021). The urban–rural education gap: do cities indeed make us smarter? *Journal of Economic Geography*, 21(5):683–714.

Walker, J., Frediani, A. A., and Trani, J.-F. (2013). Gender, difference and urban change: implications for the promotion of well-being? *Environment and Urbanization*, 25(1):111–124.

World-Bank (2011). *World Development Indicators 2011*. World Bank, Washington D.C.

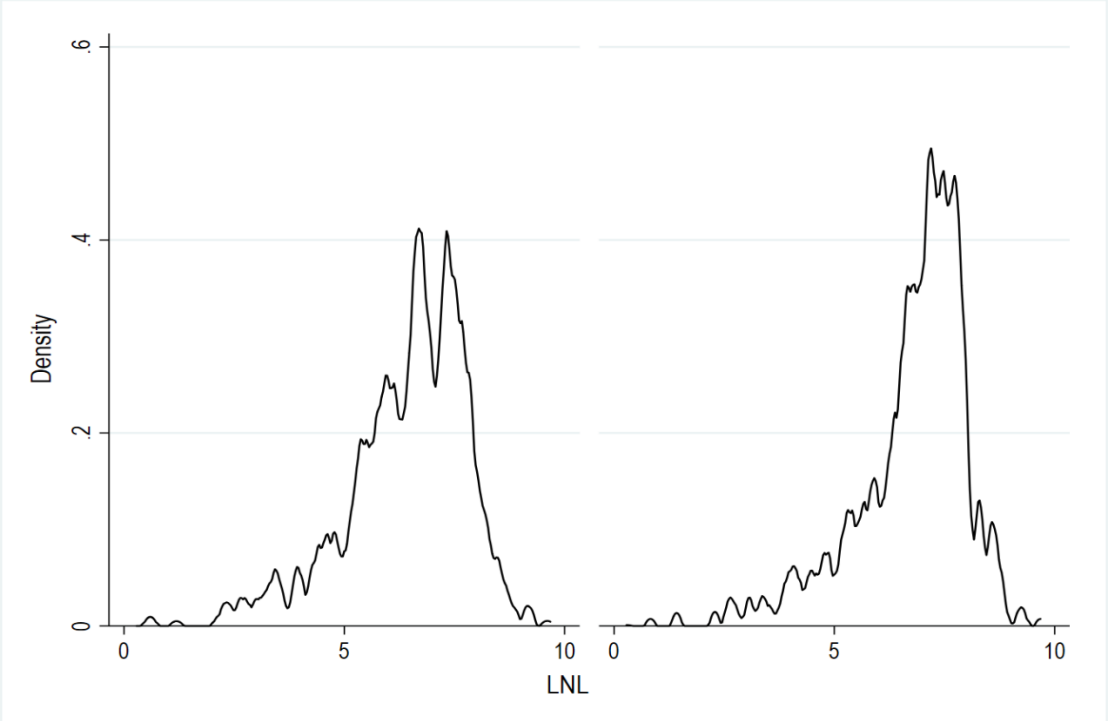
Fig 1: Kernel Density Plot of Log (1 + Nighttime lights).

a. Pooled Sample



b. NFHS (2015-16) Sample

c. NFHS (2019-21) Sample



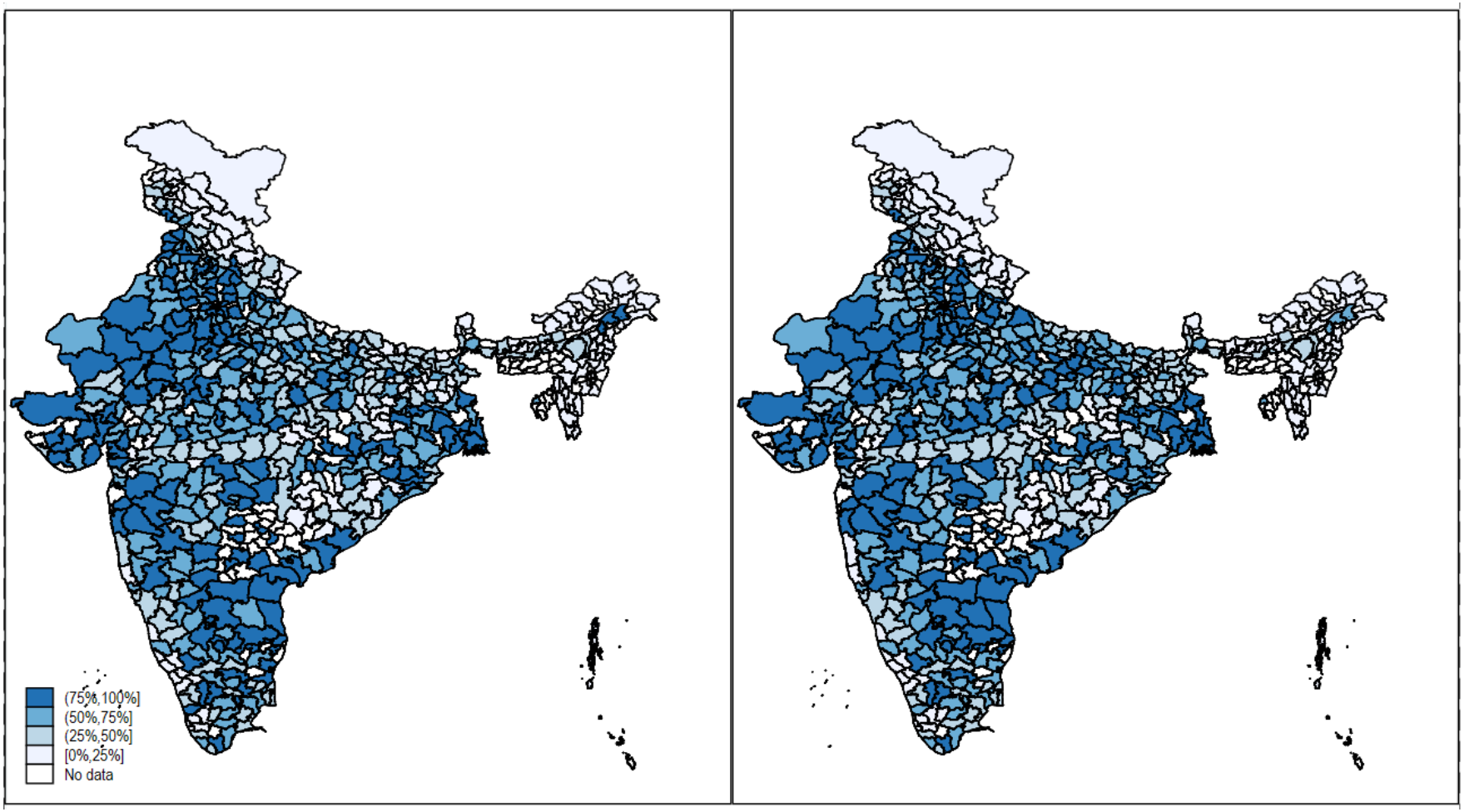
Source: By authors using data from SHRUG Nighttime Lights.

Notes: The pooled sample in (a) includes the one-year lagged nightlights data for the districts surveyed in 2014-15 and 2019-21. NFHS (2015-16) and NFHS (2019-21) samples in (b) and (c) include the one-year lagged nightlights data for the districts surveyed in 2014-15 and 2019-21, respectively. LNL indicates the log (1+nighttime lights).

Fig 2: District-Level Map of Log (1 + Nighttime lights).

a. NFHS (2015-16) Sample

b. NFHS (2019-21) Sample



Source: Compiled by authors using District Coordinates from Survey of India and Nighttime Lights from SHRUG.

Notes: The NFHS (2015-16) and NFHS (2019-21) samples in (a) and (b) include the one-year lagged nightlights data for the districts surveyed in 2014-15 and 2019-21, respectively. LNL indicates the log (1+nighttime lights).

Table 1A: Summary of Outcomes: Women's Sample Analysis

	Pooled			NFHS (2015-16)		NFHS (2019-21)	
Variables	N	Mean	SD	N	Mean	N	Mean
Labor Force Participation							
Currently employed in paid work	196364	.209	.407	108553	.199	87811	.221
Employed in paid work in the last twelve months	192714	.269	.443	106293	.263	86421	.276
Currently employed in unpaid work	163729	.051	.221	91483	.05	72246	.053
Employed in unpaid work in the last twelve months	152968	.079	.269	85175	.08	67793	.077
Mobility							
Traveling alone to market	204774	.553	.497	113116	.544	91658	.565
Traveling alone to health facility	204774	.496	.5	113116	.488	91658	.508
Traveling alone to places outside their village/town	204774	.49	.5	113116	.48	91658	.501
Binary Index: Mobility	204774	.618	.486	113116	.609	91658	.63
Z-Score Index: Mobility	204774	-.002	.904	113116	-.021	91658	.02
Intra Household Decision Making Power							
Decisions regarding own health care	144612	.784	.412	80069	.758	64543	.816
Decisions regarding large household purchases	144612	.766	.423	80069	.742	64543	.795
Decisions regarding visits to family/relatives	144612	.781	.413	80069	.754	64543	.815
Decisions regarding what to do with husband's earning	141271	.75	.433	78259	.727	63012	.779
Binary Index: Intra Household Decision Making Power	143630	.886	.318	79402	.87	64228	.905
Z-Score Index: Intra Household Decision Making Power	143630	.006	.834	79402	-.053	64228	.078
Access to Information							
Newspaper/Magazine	1257443	.35	.477	646832	.382	610611	.315
Radio	1257443	.151	.358	646832	.16	610611	.142
Television	1257443	.734	.442	646832	.75	610611	.717
Binary Index: Access to Media	1257443	.774	.418	646832	.791	610611	.756
Z-Score Index: Access to Media	1257443	-.005	.694	646832	.038	610611	-.05
Access to Mobile Phones	204774	.489	.5	113116	.45	91658	.538

Table 1A (cont..): Summary Statistics: Outcomes

	Pooled			NFHS (2015-16)		NFHS (2019-21)	
Variables	N	Mean	SD	Variables	N	Mean	SD
Financial Autonomy							
Ownership of House	204774	.42	.494	113116	.39	91658	.457
Ownership of Land	204774	.329	.47	113116	.304	91658	.36
Access to money or a bank account	204774	.739	.439	113116	.647	91658	.853
Binary Index: Financial Autonomy	204774	.848	.359	113116	.792	91658	.918
Z-Score Index: Financial Autonomy	204774	0	.713	113116	-.108	91658	.134
Attitudes towards Intimate Partner Violence (IPV)							
Justifies IPV in the following cases:							
Goes out without informing husband	202325	.215	.411	111330	.243	90995	.181
Neglects the house or the children	204199	.323	.758	113116	.386	91083	.245
Argues with the husband	202457	.242	.428	111477	.272	90980	.205
Refuses to have sex with the husband	201049	.12	.325	110561	.132	90488	.105
Doesn't cook food properly	202946	.161	.368	111861	.183	91085	.134
Suspicion of being unfaithful	202229	.211	.408	111392	.233	90837	.185
Shows disrespect for in-laws	202583	.332	.471	111608	.359	90975	.299
Binary Index: Justifies IPV for any of the above reason	201742	.468	.499	111173	.499	90569	.43
Z-Score Index: Justifies IPV	201742	.003	.717	111173	.062	90569	-.068
Exposure to Intimate Partner Violence							
Less Severe Physical Violence	115708	.214	.41	61731	.211	53977	.217
Severe Physical Violence	115708	.063	.243	61731	.062	53977	.064
Sexual Violence	115708	.051	.221	61731	.054	53977	.048
Emotional Violence	115708	.107	.309	61731	.105	53977	.11
Binary Index: Any Violence	115708	.255	.436	61731	.253	53977	.257
Z-Score Index: Any Violence	115708	.002	.732	61731	.001	53977	.003

Source: Compiled by authors using NFHS (2015-16) and NFHS (2019-21).

Notes: This table reports summary statistics of all the women's outcome variables used in the analysis, beginning with the number of observations, mean and standard deviation for the pooled sample. Subsequently, the number of observations and means are reported for the NFHS (2015-16) and NFHS (2019-21) samples separately.

Table 1B: Summary Statistics of Main Variable of Interest and Demographics

		Pooled		NFHS (2015-16)		NFHS (2019-21)	
Variables	N	Mean	SD	N	Mean	N	Mean
Nighttime Light	1257443	16093.443	17435.057	646832	14272.668	610611	18022.225
LNL: log (1+Nighttime Lights)	1257443	6.59	1.335	646832	6.424	610611	6.766
Age	1257443	30.223	9.87	646832	29.972	610611	30.489
Current Marital Status							
Never in union	1257443	.25	.433	646832	.247	610611	.253
Currently married	1257443	.71	.454	646832	.713	610611	.706
Others	1257443	.041	.198	646832	.04	610611	.041
Religion							
Hindu	1257443	.755	.43	646832	.75	610611	.76
Muslims	1257443	.131	.338	646832	.134	610611	.128
Others	1257443	.114	.317	646832	.115	610611	.112
Caste Group							
SC	1257443	.189	.392	646832	.181	610611	.198
ST	1257443	.172	.377	646832	.173	610611	.171
OBC	1257443	.393	.488	646832	.397	610611	.389
Others	1257443	.196	.397	646832	.202	610611	.189
Don't know/Missing	1257443	.05	.218	646832	.047	610611	.053

Source: Compiled by authors using NFHS (2015-16) and NFHS (2019-21).

Notes: This table reports summary statistics of main variable of interest along with other covariates used in the analysis, beginning with the number of observations, mean and standard deviation for the pooled sample. Subsequently, the number of observations and means are reported for the NFHS (2015-16) and NFHS (2019-21) samples separately.

Table 1C: Summary Statistics of District level controls

Variables	N	Mean	SD
Government Pre-Primary Schools	608	345.543	867.942
Government Primary Schools	608	1161.742	856.241
Government Middle Schools	608	478.668	331.51
Government Secondary Schools	608	160.502	152.082
Government Senior Secondary Schools	608	59.4	59.936
Government Arts and Science Colleges	608	6.396	10.471
Government Engineering Colleges	608	.602	1.877
Government Medical Colleges	608	.505	2.093
Government Management Institutions	608	.745	3.841
Government Polytechnics	608	1.385	4.928
Government Vocational Training Institutes	608	4.179	8.726
Government Non-Formal Training Institute	608	35.403	134.844
Primary Health Centre Doctor	608	62.699	52.928
Maternity and child welfare Centre Doctors	608	53.262	100.907
Mobile Health clinics Doctors	608	10.174	27.26
Power Supply in Summer (in hours)	608	2.431	2.754
Power Supply in Winter (in hours)	608	2.486	2.538
SC/ST Population (in percentage)	608	32.1	.218
Literate Population (in percentage)	608	62	10.347
Population Density per sq. km.	608	516.622	485.261

Source: Compiled by Authors using SHRUG 2.0's Population Census 2011 district census abstract.

Notes: This table reports summary statistics of district level controls used in the analysis, beginning with the number of observations, mean and standard deviation. All the variables except power supply, SC/ST population and literate population are measured in numbers.

Table 2. Effect of Urbanization on Women's Labor Market Outcomes

	[1] **Currently employed in paid work**	[2] **Employed in paid work in the last twelve months**	[3] **Currently employed in unpaid work**	[4] **Employed in unpaid work in the last twelve months**
Panel A: Full Sample				
LNL	0.002	0.005	0.006	0.001
	(0.012)	(0.015)	(0.009)	(0.013)
Observations	196,364	192,714	163,729	152,968
R-squared	0.101	0.128	0.056	0.077
SD LNL	1.323	1.314	1.334	1.328
FDR (q-values)	1	1	1	1
Panel B: Restricted Sample (Respondent living at the same place for at least 10 years)				
LNL	-0.010	-0.007	0.006	-0.002
	(0.013)	(0.017)	(0.011)	(0.015)
Observations	133,995	131,350	109,935	102,238
R-squared	0.104	0.134	0.062	0.085

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panel A focuses on the full sample. Panel B restricts the sample to the respondents living in the same place for at least 10 years. All the outcome variables are binary in nature. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km. Standard deviation of the LNL and FDR (False Discovery Rate) q-Values are reported in the last two rows of Panel A.

Table 3. Effect of Urbanization on Women's Mobility

	[1]	[2]	[3]	[4]	[5]
	Traveling alone to market	**Traveling alone to health facility**	**Traveling alone to places outside their village/town**	**Binary Index: Mobility**	**Z-Score Index: Mobility**
Panel A: Full Sample					
LNL	0.041**	0.034**	0.032*	0.036**	0.071**
	(0.017)	(0.017)	(0.018)	(0.016)	(0.032)
Observations	204,774	204,774	204,774	204,774	204,774
R-squared	0.137	0.140	0.127	0.127	0.159
SD LNL	1.337	1.337	1.337	1.337	1.337
FDR (q-values)	0.051	0.051	0.051	0.051	0.051
Panel B: Restricted Sample (Respondent living at the same place for at least 10 years)					
LNL	0.036**	0.024	0.027	0.032*	0.058*
	(0.018)	(0.018)	(0.019)	(0.017)	(0.033)
Observations	140,417	140,417	140,417	140,417	140,417
R-squared	0.125	0.135	0.119	0.115	0.150

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panel A focuses on the full sample. Panel B restricts the sample to the respondents living in the same place for at least 10 years. All the outcome variables are binary in nature except Z-score index. The binary index takes a value one if at least one of the underlying variables take a value one, and zero otherwise. The Z-score index is the simple average of the individual z-score of mobility variables based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km. Standard deviation of the LNL and FDR (False Discovery Rate) q-Values are reported in the last two rows of Panel A.

Table 4. Effect of Urbanization on Women's Intra-Household Decision Making Power.

	[1]	[2]	[3]	[4]	[5]	[6]
	Own health care	**Large household purchases**	**Visits to family/relatives**	**Husband's earning**	**Binary Index**	**Z-Score Index**
Panel A: Full Sample						
LNL	-0.041**	-0.029	-0.038*	-0.030	-0.028*	-0.084*
	(0.020)	(0.019)	(0.021)	(0.019)	(0.015)	(0.043)
Observations	144,612	144,612	144,612	141,271	143,630	143,630
R-squared	0.051	0.054	0.060	0.047	0.043	0.066
SD LNL	1.318	1.318	1.318	1.321	1.32	1.32
FDR (q-values)	0.124	0.124	0.124	0.124	0.124	0.124
Panel B: Restricted Sample (Respondent living at the same place for at least 10 years)						
LNL	-0.031	-0.030	-0.033	-0.034*	-0.023	-0.079*
	(0.021)	(0.020)	(0.022)	(0.019)	(0.015)	(0.045)
Observations	87,067	87,067	87,067	85,318	86,726	86,726
R-squared	0.049	0.048	0.055	0.047	0.041	0.062

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panel A focuses on the full sample. Panel B restricts the sample to the respondents living in the same place for at least 10 years. All the outcome variables are binary in nature except Z-score index. The binary index takes a value one if at least one of the underlying variables take a value one, and zero otherwise. The Z-score index is the simple average of the individual z-score of decision-making variables based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km. Standard deviation of the LNL and FDR (False Discovery Rate) q-Values are reported in the last two rows of Panel A.

Table 5. Effect of Urbanization on Women's Access to Information

	[1]	[2]	[3]	[4]	[5]	[6]
	Read a newspaper or magazine	**Listen to the radio**	**Watch television**	**Binary Index: Access to media**	**Z-Score Index: Access to media**	**Access to Mobile Phones**
Panel A: Full Sample						
LNL	0.006	-0.004	0.018	0.002	0.014	0.012
	(0.011)	(0.012)	(0.014)	(0.013)	(0.022)	(0.015)
Observations	1,257,443	1,257,443	1,257,443	1,257,443	1,257,443	204,774
R-squared	0.175	0.120	0.190	0.180	0.203	0.170
SD LNL	1.335	1.335	1.335	1.335	1.335	1.337
FDR (q-values)	1	1	1	1	1	1
Panel B: Restricted Sample (Respondent living at the same place for at least 10 years)						
LNL	0.007	-0.005	0.017	0.002	0.013	0.008
	(0.010)	(0.012)	(0.015)	(0.013)	(0.022)	(0.018)
Observations	867,530	867,530	867,530	867,530	867,530	140,417
R-squared	0.196	0.126	0.192	0.185	0.216	0.172

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panel A focuses on the full sample. Panel B restricts the sample to the respondents living in the same place for at least 10 years. All the outcome variables are binary in nature except Z-score index. The binary index takes a value one if at least one of the underlying variables take a value one, and zero otherwise. The Z-score index is the simple average of the individual z-score of access to information from newspaper/magazine, radio, and television based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km. Standard deviation of the LNL and FDR (False Discovery Rate) q-Values are reported in the last two rows of Panel A.

Table 6. Effect of Urbanization on Women's Financial Autonomy

	[1]	[2]	[3]	[4]	[5]
	Ownership of House	**Ownership of Land**	**Access to money or a bank account**	**Binary Index: Financial Autonomy**	**Z-Score Index: Financial Autonomy**
Panel A: Full Sample					
LNL	0.024	0.025	0.029*	0.013	0.056
	(0.028)	(0.028)	(0.015)	(0.013)	(0.039)
Observations	204,774	204,774	204,774	204,774	204,774
R-squared	0.144	0.119	0.123	0.084	0.150
SD LNL	1.337	1.337	1.337	1.337	1.337
FDR (q-values)	0.459	0.459	0.343	0.459	0.409
Panel B: Restricted Sample (Respondent living at the same place for at least 10 years)					
LNL	0.023	0.032	0.028*	0.006	0.060
	(0.029)	(0.029)	(0.016)	(0.013)	(0.041)
Observations	140,417	140,417	140,417	140,417	140,417
R-squared	0.153	0.124	0.123	0.088	0.159

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panel A focuses on the full sample. Panel B restricts the sample to the respondents living in the same place for at least 10 years. All the outcome variables are binary in nature except Z-score index. The binary index takes a value one if at least one of the underlying variables take a value one, and zero otherwise. The Z-score index is the simple average of the individual z-score of ownership of land, land, and access to money/bank account based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km. Standard deviation of the LNL and FDR (False Discovery Rate) q-Values are reported in the last two rows of Panel A.

Table 7. Effect of Urbanization on Women's Attitude Towards Intimate Partner Violence (IPV)

	[1] **Justifies IPV if wife goes out without informing husband**	[2] **Justifies IPV if wife neglects the house or the children**	[3] **Justifies IPV if wife argues with the husband**	[4] **Justifies IPV if wife refuses to have sex with the husband**	[5] **Justifies IPV if wife doesn't cook food properly**	[6] **Justifies IPV if husband suspects wife being unfaithful**	[7] **Justifies IPV if wife shows disrespectful for in-laws**	[8] **Binary Index: Justifies IPV for any of the above reason**	[9] **Z-Score Index: Justifies IPV**
Panel A: Full Sample									
LNL	0.019	0.059**	0.019	0.008	0.010	0.004	0.020	0.028	0.033
	(0.016)	(0.030)	(0.020)	(0.012)	(0.015)	(0.015)	(0.021)	(0.025)	(0.034)
Observations	202,325	204,199	202,457	201,049	202,946	202,229	202,583	201,742	201,742
R-squared	0.098	0.079	0.088	0.048	0.057	0.075	0.113	0.144	0.120
SD LNL	1.329	1.335	1.328	1.331	1.332	1.332	1.331	1.33	1.33
FDR (q-values)	0.875	0.819	0.875	1	1	1	0.875	0.875	0.875
Panel B: Restricted Sample (Respondent living at the same place for at least 10 years)									
LNL	0.027*	0.055*	0.022	0.011	0.011	0.013	0.035	0.034	0.046
	(0.016)	(0.033)	(0.021)	(0.013)	(0.015)	(0.016)	(0.023)	(0.026)	(0.034)
Observations	138,536	139,927	138,657	137,436	139,010	138,455	138,747	138,060	138,060
R-squared	0.099	0.077	0.091	0.051	0.060	0.078	0.116	0.143	0.122

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panel A focuses on the full sample. Panel B restricts the sample to the respondents living in the same place for at least 10 years. All the outcome variables are binary in nature except Z-score index. The binary index takes a value one if at least one of the underlying variables take a value one, and zero otherwise. The Z-score index is the simple average of the individual z-score of attitude variables based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km. Standard deviation of the LNL and FDR (False Discovery Rate) q-Values are reported in the last two rows of Panel A.

Table 8. Effect of Urbanization on Women's Intimate Partner Violence

	[1] **Less severe physical domestic violence**	[2] **Severe physical domestic violence**	[3] **Sexual domestic violence**	[4] **Emotional Domestic Violence**	[5] **Binary Index: Any Violence**	[6] **Z-Score Index: Any Violence**
Panel A: Full Sample						
LNL	0.043**	0.018**	0.008	0.028**	0.057***	0.076**
	(0.018)	(0.008)	(0.009)	(0.013)	(0.020)	(0.032)
Observations	115,708	115,708	115,708	115,708	115,708	115,708
R-squared	0.076	0.040	0.029	0.039	0.076	0.066
SD LNL	1.338	1.338	1.338	1.338	1.338	1.338
FDR (q-values)	0.033	0.035	0.072	0.035	0.031	0.033
Panel B: Restricted Sample (Respondent living at the same place for at least 10 years)						
LNL	0.060***	0.027**	0.015	0.036**	0.070***	0.111***
	(0.021)	(0.011)	(0.010)	(0.014)	(0.023)	(0.035)
Observations	70,643	70,643	70,643	70,643	70,643	70,643
R-squared	0.082	0.044	0.033	0.044	0.081	0.071

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panel A focuses on the full sample. Panel B restricts the sample to the respondents living in the same place for at least 10 years. All the outcome variables are binary in nature except Z-score index. The binary index takes a value one if at least one of the underlying variables take a value one, and zero otherwise. The Z-score index is the simple average of the individual z-score of exposure to IPV variables based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km. Standard deviation of the LNL and FDR (False Discovery Rate) q-Values are reported in the last two rows of Panel A.

Table 9. Effect of urbanization on Men's Labor Market Outcomes

	[1] **Currently employed in paid work**	[2] **Employed in paid work in the last twelve months**	[3] **Currently employed in unpaid work**	[4] **Employed in unpaid work in the last twelve months**
Panel A: Full Sample				
LNL	0.034**	0.014	-0.044*	-0.060**
	(0.015)	(0.010)	(0.026)	(0.028)
Observations	182,738	181,466	57,505	46,751
R-squared	0.342	0.420	0.266	0.432
SD LNL	1.319	1.313	1.403	1.429
FDR (q-values)	0.067	0.089	0.067	0.067
Panel B: Restricted Sample (Respondent living at the same place for at least 10 years)				
LNL	0.039***	0.019*	-0.044*	-0.061**
	(0.015)	(0.010)	(0.027)	(0.028)
Observations	164,657	163,481	52,588	42,641
R-squared	0.340	0.421	0.260	0.430

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panel A focuses on the full sample. Panel B restricts the sample to the respondents living in the same place for at least 10 years. All the outcome variables are binary in nature. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km. Standard deviation of the LNL and FDR (False Discovery Rate) q-Values are reported in the last two rows of Panel A.

Table 10. Heterogeneity analysis: Effect of Urbanization on Women's and Men's Labor Market Outcomes

	Women's Labor Market Outcome				Men's Labor Market Outcomes			
	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]
	Currently employed in paid work	**Employed in paid work in the last twelve months**	**Currently employed in unpaid work**	**Employed in unpaid work in the last twelve months**	**Currently employed in paid work**	**Employed in paid work in the last twelve months**	**Currently employed in unpaid work**	**Employed in unpaid work in the last twelve months**
Panel A: Wealth								
LNL*Poor	0.016***	0.021***	-0.004**	-0.005*	0.003	0.003*	-0.017***	-0.010**
	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.004)	(0.004)
LNL	-0.006	-0.006	0.009	0.004	0.032**	0.014	-0.035	-0.053*
	(0.012)	(0.015)	(0.009)	(0.013)	(0.015)	(0.010)	(0.026)	(0.028)
Poor	-0.031**	-0.030	0.053***	0.077***	0.012	0.042***	0.133***	0.129***
	(0.015)	(0.019)	(0.013)	(0.018)	(0.015)	(0.012)	(0.028)	(0.028)
Observations	196,364	192,714	163,729	152,968	182,738	181,466	57,505	46,751
R-squared	0.107	0.139	0.058	0.082	0.343	0.425	0.267	0.436
Panel B: Religion								
LNL*Minority	-0.003	-0.003	-0.007***	-0.011***	0.008***	0.009***	-0.018***	-0.014**
	(0.003)	(0.004)	(0.002)	(0.003)	(0.002)	(0.002)	(0.005)	(0.006)
LNL	0.003	0.006	0.008	0.004	0.031**	0.011	-0.038	-0.055**
	(0.012)	(0.015)	(0.009)	(0.013)	(0.015)	(0.010)	(0.026)	(0.028)
Minority	0.012	0.005	0.040***	0.066***	-0.066***	-0.070***	0.109***	0.087**
	(0.021)	(0.024)	(0.014)	(0.020)	(0.016)	(0.015)	(0.031)	(0.039)
Observations	196,364	192,714	163,729	152,968	182,738	181,466	57,505	46,751
R-squared	0.101	0.128	0.056	0.078	0.342	0.420	0.266	0.432
Panel C: Caste								
LNL*DisadvCaste	0.018***	0.021***	0.002	0.002	0.007***	0.009***	-0.003	-0.000
	(0.003)	(0.003)	(0.001)	(0.002)	(0.003)	(0.002)	(0.004)	(0.004)
LNL	-0.012	-0.012	0.005	-0.001	0.028*	0.008	-0.042	-0.060**
	(0.012)	(0.015)	(0.009)	(0.013)	(0.015)	(0.010)	(0.026)	(0.028)
DisadvCaste	-0.066***	-0.075***	-0.016*	-0.023*	-0.011	-0.028*	-0.024	-0.033
	(0.020)	(0.024)	(0.010)	(0.014)	(0.019)	(0.017)	(0.026)	(0.028)
Observations	196,364	192,714	163,729	152,968	182,738	181,466	57,505	46,751
R-squared	0.101	0.129	0.056	0.077	0.342	0.420	0.266	0.432
Panel D: Region								
LNL*NBIMARU	0.008	0.015	0.011	0.019	0.044	0.006	0.070	0.053
	(0.023)	(0.030)	(0.018)	(0.025)	(0.027)	(0.020)	(0.048)	(0.051)
LNL	-0.002	-0.002	0.001	-0.009	0.013	0.012	-0.080**	-0.086**
	(0.018)	(0.022)	(0.014)	(0.018)	(0.018)	(0.012)	(0.033)	(0.033)
NBIMARU	0.244	0.397*	0.065	0.060	-0.325*	-0.131	-0.212	-0.334
	(0.183)	(0.220)	(0.133)	(0.211)	(0.190)	(0.133)	(0.339)	(0.357)
Observations	196,364	192,714	163,729	152,968	182,738	181,466	57,505	46,751
R-squared	0.101	0.128	0.056	0.077	0.342	0.420	0.266	0.432

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panels A, B, C, and D focus on the heterogeneity analysis by wealth, religion, caste group, and region, respectively. Poor takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; Minority takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; Disadvantaged Class takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and NBIMARU takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise. All the outcome variables are binary in nature. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table 11. Heterogeneity analysis: Effect of Urbanization on Women's Mobility, Intra-Household Decision Making Power, Access to Information, Financial Autonomy, Attitudes towards IPV, and Exposure to IPV.

	[1]	[2]	[3]	[4]	[5]	[6]	[7]
	Binary Index: Mobility	**Binary Index: Intra Household Decision Making Power**	**Binary Index: Access to any of the media sources**	**Access to Mobile Phones**	**Binary Index: Financial Autonomy**	**Binary Index: Justifies IPV for any of the above reason**	**Binary Index: Any Violence**
Panel A: Wealth							
LNL*Poor	-0.003	0.001	-0.003	0.010***	0.009***	0.005	0.003
	(0.002)	(0.002)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)
LNL	0.037**	-0.030**	-0.001	0.004	0.007	0.026	0.057***
	(0.017)	(0.015)	(0.012)	(0.014)	(0.013)	(0.025)	(0.020)
Poor	-0.006	-0.031***	-0.265***	-0.302***	-0.117***	0.045**	0.071***
	(0.016)	(0.012)	(0.026)	(0.021)	(0.016)	(0.020)	(0.019)
Observations	204,774	143,630	1,257,443	204,774	204,774	201,742	115,708
R-squared	0.128	0.043	0.260	0.209	0.089	0.148	0.083
Panel B: Religion							
LNL*Minority	-0.004	0.001	0.004	0.005	-0.004*	0.000	0.005
	(0.003)	(0.002)	(0.004)	(0.005)	(0.002)	(0.004)	(0.004)
LNL	0.038**	-0.028*	0.001	0.011	0.014	0.028	0.055***
	(0.016)	(0.015)	(0.013)	(0.015)	(0.013)	(0.025)	(0.020)
Minority	0.040*	0.006	-0.014	0.013	0.037**	-0.007	-0.047*
	(0.021)	(0.016)	(0.027)	(0.031)	(0.015)	(0.024)	(0.026)
Observations	204,774	143,630	1,257,443	204,774	204,774	201,742	115,708
R-squared	0.128	0.043	0.180	0.170	0.085	0.144	0.076
Panel C: Caste Group							
LNL*DisadvCaste	-0.009***	-0.003	-0.013***	-0.038***	-0.002	0.006*	0.014***
	(0.003)	(0.002)	(0.003)	(0.004)	(0.002)	(0.004)	(0.003)
LNL	0.043***	-0.026*	0.012	0.042***	0.014	0.023	0.046**
	(0.017)	(0.015)	(0.013)	(0.016)	(0.013)	(0.025)	(0.020)
DisadvCaste	0.059**	0.034*	0.071***	0.163***	0.011	-0.023	-0.050**
	(0.024)	(0.019)	(0.023)	(0.031)	(0.016)	(0.025)	(0.024)
Observations	204,774	143,630	1,257,443	204,774	204,774	201,742	115,708
R-squared	0.128	0.043	0.180	0.171	0.085	0.144	0.076
Panel D: Region							
LNL*NBIMARU	-0.029	-0.030	0.041	-0.018	-0.008	-0.055	0.006
	(0.031)	(0.028)	(0.025)	(0.028)	(0.025)	(0.051)	(0.040)
LNL	0.050**	-0.014	-0.017	0.021	0.016	0.054	0.054**
	(0.024)	(0.017)	(0.015)	(0.020)	(0.016)	(0.033)	(0.025)
NBIMARU	0.299	-0.256	-0.148	0.119	0.190	1.761***	0.283
	(0.261)	(0.229)	(0.190)	(0.258)	(0.203)	(0.428)	(0.293)
Observations	204,774	143,630	1,257,443	204,774	204,774	201,742	115,708
R-squared	0.128	0.043	0.180	0.170	0.085	0.144	0.076

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panels A, B, C, and D focus on the heterogeneity analysis by wealth, religion, caste group, and region, respectively. Here we have reported all the Binary variables only and Access to Mobile phone. The binary index takes a value one if at least one of the underlying variables take a value one, and zero otherwise. Poor takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; Minority takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; Disadvantaged Class takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and NBIMARU takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise. All the outcome variables are binary in nature. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table 12. Effect of urbanization on educational outcomes, public education infrastructure, private education infrastructure, financial infrastructure, sex ratio, and crime against women.

Panel A - Data Source: Population Census 2011

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
	Educational Outcomes			**Public Education Infrastructure**			**Private Education Infrastructure**			**Financial Infrastructure**		**Sex Ratio**
	Literacy Rate	Log(Male Literate Population)	Log(Female Literate Population)	Pre-Primary School	Senior Secondary School	Vocational Training Institute	Pre-Primary School	Senior Secondary School	Vocational Training Institute	ATM	Self Help Groups	Number of women per 100 men
LNL	7.358***	0.481***	0.522***	58.927**	16.313***	1.198**	52.277***	13.981***	2.224***	0.100***	0.006	-1.410***
	(0.636)	(0.056)	(0.056)	(24.961)	(3.976)	(0.527)	(15.794)	(3.705)	(0.534)	(0.035)	(0.007)	(0.380)
Obs	604	604	604	604	604	604	604	604	604	604	604	604
R^2	0.649	0.816	0.815	0.848	0.535	0.494	0.508	0.455	0.297	0.363	0.220	0.566

Panel B- Data Source: National Crime Record Bureau for Crime Against Women and Trivedi Center for Political Data for Women's Political Representation

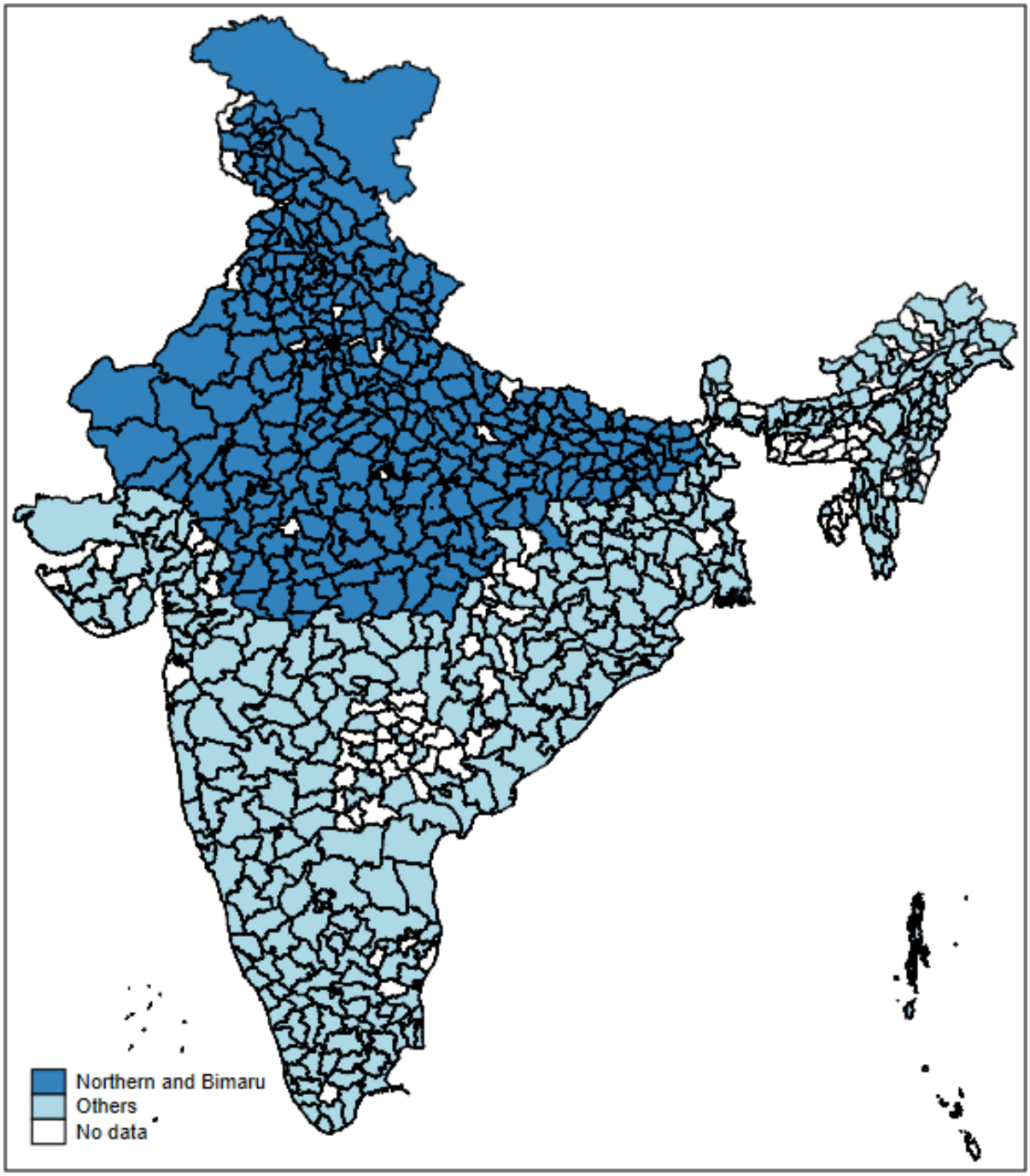
	[1]	[2]	[3]	[4]	[5]
	Crime Against Women			**Women's Political Representation**	
	Alleged Rape	Alleged Attempt to Commit Rape	Alleged Assault with Intent Modesty	Women Candidates	Vote Share
LNL	-15.802***	-3.237*	-15.943**	-0.185	2.540
	(3.356)	(1.777)	(7.075)	(0.189)	(3.033)
Obs	3,588	3,588	3,588	2,440	2,440
R^2	0.837	0.771	0.880	0.237	0.266

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: In Panel A, the source of the data for the outcome variables is 2011 Indian Census. The educational outcome variables include literacy rate (in percentage), natural log of number of literate men, and natural log of number of literate women in a district. Public education infrastructure includes number of public pre-primary schools, public secondary schools, public vocational training schools in a district. Private education infrastructure includes number of private pre-primary schools, private secondary schools, private vocational training schools in a district. Financial infrastructure includes the district's accessibility to ATM (=1 if yes and 0 otherwise) and financial self-help groups (=1 if yes and 0 otherwise). Sex ratio measures the number of women per 100 men. LNL indicates the log (1+nighttime lights) where nightlights data is used for 2010. In addition to this, population density, altitude, latitude and longitude of the center of the district are included as the additional controls. Robust standard errors are used. In Panel B, the source of the data for the outcome variables focusing on crime against women is National Crime Record Bureau. We use data on crime against women from 2016 to 2021. The three outcome variables under this head are the number of reported

cases of assault on a woman with the intent to outrage her modesty, reported cases of attempt to rape and reported cases of rape in a district. LNL indicates the log (1+nighttime lights) where nightlights data is used from 2015 to 2020. In addition to this, population density is interacted with time (2016 to 2021) and district fixed effects are also included. Standard errors are clustered at the district level. The source of the data for the outcome variables focusing on women's political representation is Trivedi Center for Political Data. We use data on women's political representation from 2015 to 2021. The two outcome variables under this head are the number of women candidates and the percentage of vote share received by them in one constituency of the state assembly election. LNL indicates the log (1+nighttime lights) where nightlights data is used from 2014 to 2020. In addition to this, population density is interacted with time (2015 to 2021) and district fixed effects are also included. Standard errors are clustered at the district level.

Fig A1: District-Level Map showing districts used for region-based heterogeneity analysis.



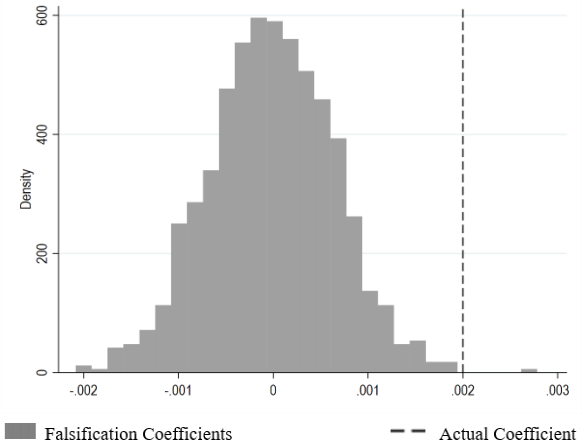
Source: Compiled by authors using District Coordinates from Survey of India.

Note: Northern and BIMARU states include Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, and Jharkhand. The remaining states are included in the category of other states.

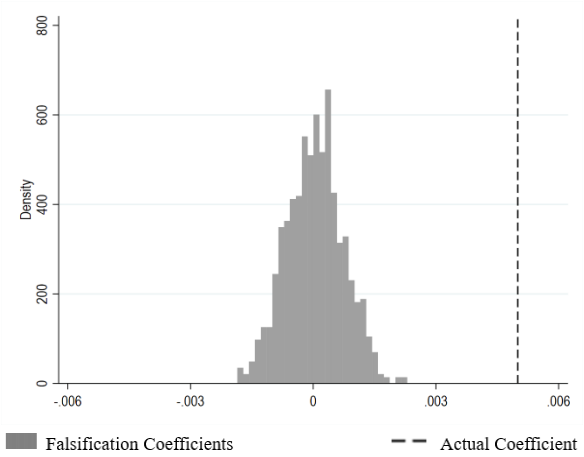
Fig A2. Falsification Test

Panel A2A: Women's (A2A1- A2A4) and Men's (A2A5- A2A8) Labor Market Outcomes

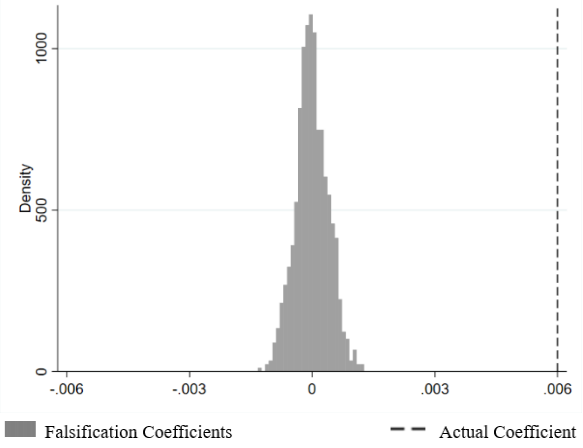
A2A1: Currently employed in paid work



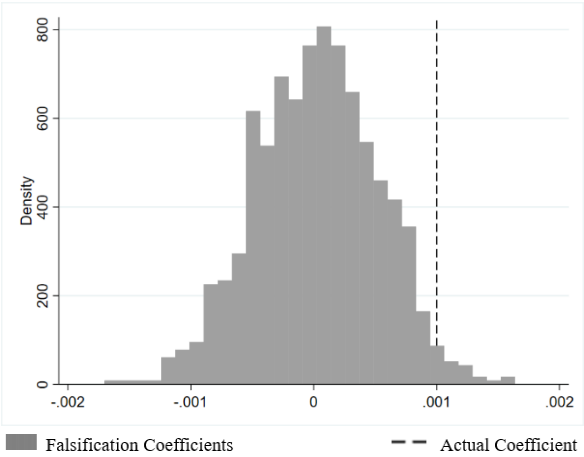
A2A2: Employed in paid work in the last twelve months



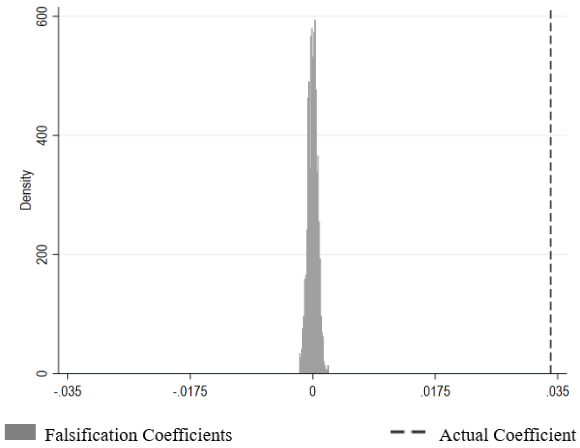
A2A3: Currently employed in unpaid work



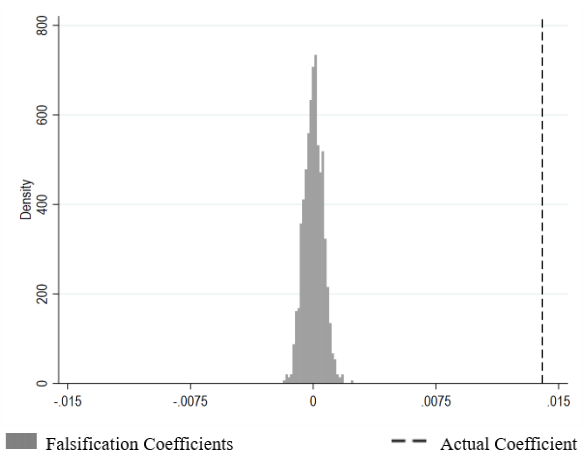
A2A4: Employed in unpaid work in the last twelve months



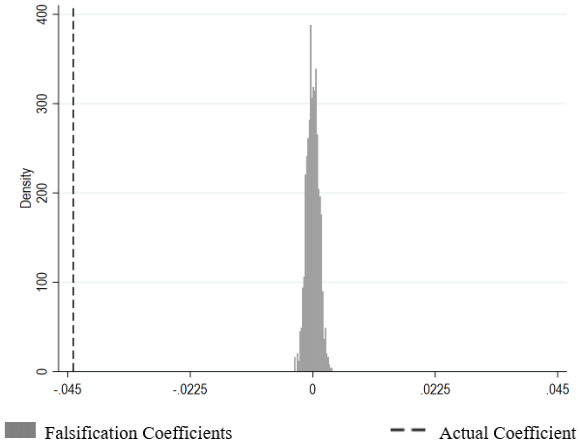
A2A5: Currently employed in paid work



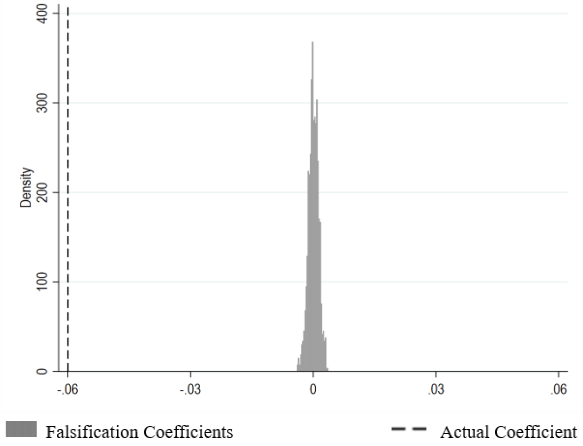
A2A6: Employed in paid work in the last twelve months



A2A7: Currently employed in unpaid work

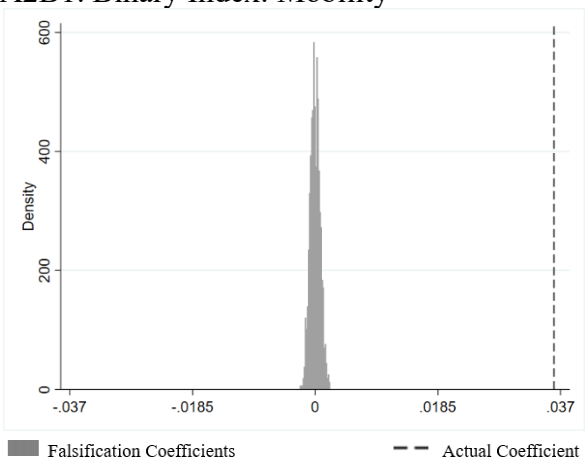


A2A8: Employed in unpaid work in the last twelve months

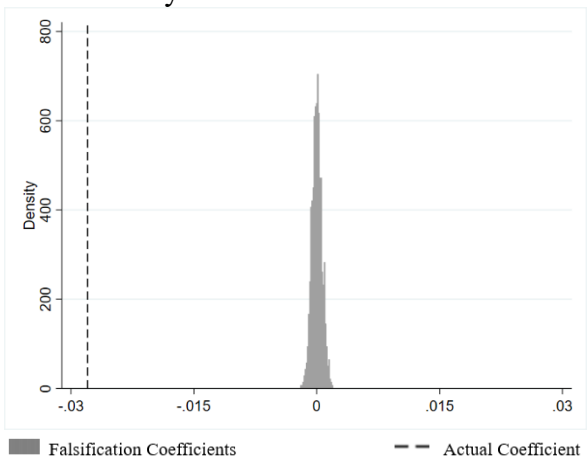


Panel A2B: Women's Mobility, Intra-Household Decision Making Power, Access to Information, Access to Mobile Phones, Financial Autonomy, Attitudes towards IPV, and Exposure to IPV.

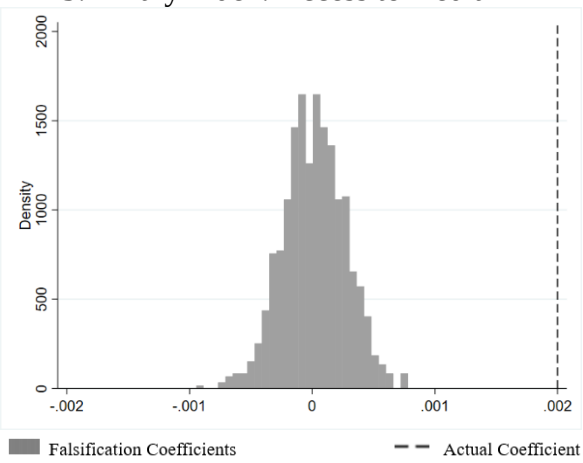
A2B1: Binary Index: Mobility



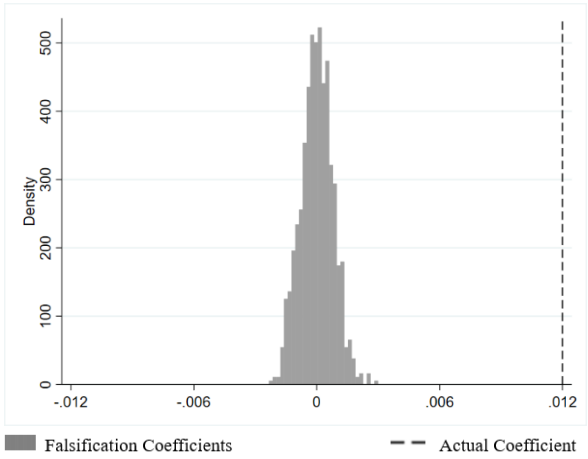
A2B2: Binary Index: Intra HH DM Power



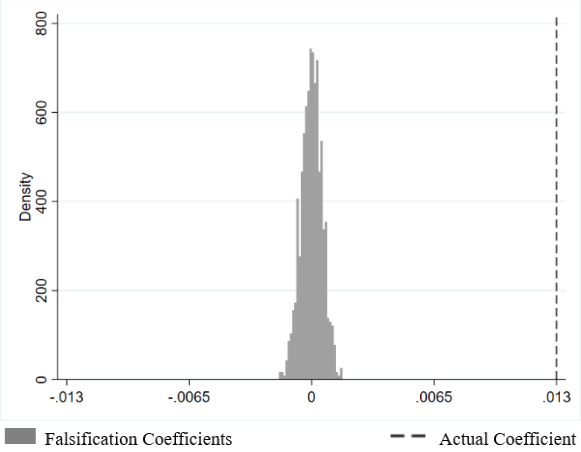
A2B3: Binary Index: Access to media



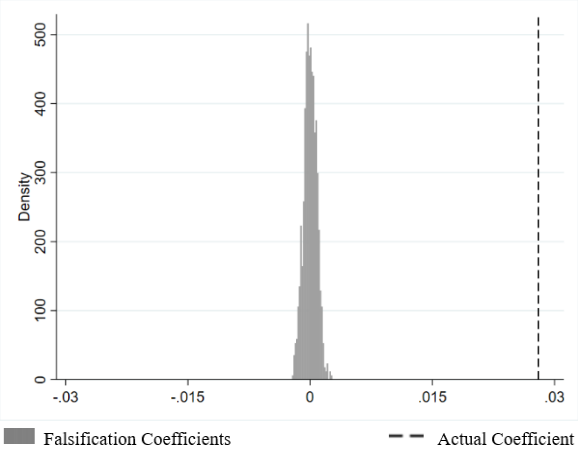
A2B4: Access to Mobile Phones



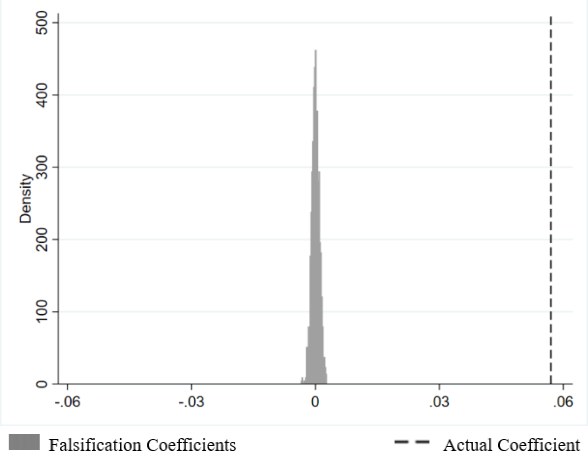
A2B5: Binary Index: Financial Autonomy



A2B6: Binary Index: Justifies IPV



A2B7: Binary Index: Any Violence



Note: LNL has been reshuffled and coefficient against reshuffled LNL has been recorded 1000 times, using the histogram has been plotted. In the figure, actual significant coefficient has also been reported.

Table A1: Summary Statistics: Men's Sample Analysis

Panel A: Outcomes							
		Pooled			**NFHS (2015-16)**		**NFHS (2019-21)**
Variables	N	Mean	SD	Variables	N	Mean	SD
Currently employed in paid work	182738	0.737	0.44	99251	0.74	83487	0.732
Employed in paid work in the last twelve months	181466	0.801	0.399	98504	0.802	82962	0.8
Currently employed in unpaid work	57505	0.164	0.37	31710	0.188	25795	0.134
Employed in unpaid work in the last twelve months	46751	0.228	0.42	26213	0.256	20538	0.194
Panel B: Main Variables of Interest and Demographics							
Nighttime Light	182738	16364.3	17698.2	99251	14715.1	83487	18324.9
LNL: log (1+Nighttime Lights)	182738	6.614	1.319	99251	6.463	83487	6.793
Age	182738	31.913	11.167	99251	31.708	83487	32.156
Current Marital Status							
Never in union	182738	0.363	0.481	99251	0.36	83487	0.366
Currently married	182738	0.622	0.485	99251	0.626	83487	0.619
Others	182738	0.015	0.122	99251	0.015	83487	0.015
Religion	.	.	.	.	.	.	.
Hindu	182738	0.758	0.428	99251	0.751	83487	0.766
Muslims	182738	0.133	0.34	99251	0.142	83487	0.123
Others	182738	0.108	0.311	99251	0.107	83487	0.11
Caste	.	.	.	.	.	.	.
SC	182738	0.189	0.391	99251	0.181	83487	0.198
ST	182738	0.168	0.374	99251	0.167	83487	0.169
OBC	182738	0.39	0.488	99251	0.39	83487	0.391
Others	182738	0.199	0.399	99251	0.204	83487	0.194
Don't know/Missing	182738	0.054	0.225	99251	0.058	83487	0.048

Source: Compiled by authors using NFHS (2015-16) and NFHS (2019-21).

Notes: This table reports summary statistics of men's outcome variables, main variable of interest along with other covariates used in the analysis, beginning with the number of observations, mean and standard deviation for the pooled sample. Subsequently, the number of observations and means are reported for the NFHS (2015-16) and NFHS (2019-21) samples separately.

Table A2: Summary Statistics: Mechanism Analysis

Panel A: Data Source: Population Census 2011			
Variable	N	Mean	SD
Educational Outcomes			
Literacy Rate (in Percentage)	604	61.97	10.339
Log (Male Literate Population)	604	13.037	1.054
Log (Female Literate Population)	604	12.73	1.072
Public Education Infrastructure			
Pre-Primary School	604	347.449	870.497
Senior Secondary School	604	59.621	60.066
Vocational Training Institute	604	4.2	8.751
Private Education Infrastructure			
Pre-Primary School	604	193.045	215.518
Senior Secondary School	604	30.321	43.053
Vocational Training Institute	604	3.897	6.603
Financial Infrastructure			
ATM	604	0.887	0.316
Self Help Groups	604	0.993	0.081
Sex Ratio			
Number of women per 100 men	604	94.704	5.891
Variable of Interest			
Nighttime Lights	604	6.378	6.33
LNL: log (1 + Nighttime Lights)	604	1.667	0.84
Controls			
Population Density Per Sq. Km.	604	518.605	486.075
Latitude	604	23.435	5.768
Longitude	604	80.949	6.201
Altitude	604	410.939	547.647
Panel B: Data Source: National Crime Record Bureau for Crime Against Women			
Variable	N	Mean	SD
Outcomes			
Alleged Rape	3588	48.055	55.18
Alleged Attempt to Commit Rape	3588	6.616	19.264
Alleged Assault with Intent Modesty	3588	127.992	159.018
Variables of Interest			
Nighttime Lights	3588	1388.77	1490.06
LNL: log (1 + Nighttime Lights)	3588	6.635	1.344
Control			
Population Density Per Sq. Km.	3588	517.996	487.115
Panel C: Trivedi Center for Political Data for Women's Political Representation			
Variable	N	Mean	SD
Outcomes			
Women Candidates	2440	1.705	0.976
Vote Share	2440	16.368	22.234
Variables of Interest			
Nighttime Lights	2440	24365.6	25315.6
LNL: log (1 + Nighttime Lights)	2440	7.177	1.045
Control			
Population Density Per Sq. Km.	2440	815.955	687.602

Notes: In Panel A, the source of the data for the outcome variables is 2011 Indian Census. The educational outcome variables include literacy rate (in percentage), natural log of number of literate men, and natural log of number of literate women in a district. Public education infrastructure includes number of public pre-primary schools, public secondary schools, public vocational training schools in a district. Private education infrastructure includes number of private pre-primary schools, private secondary schools, private vocational training schools in a district. Financial infrastructure includes the district's

accessibility to ATM (=1 if yes and 0 otherwise) and financial self-help groups (=1 if yes and 0 otherwise). Sex ratio measures the number of women per 100 men. LNL indicates the log (1+nighttime lights) where nightlights data is used for 2010. In addition to this, population density, altitude, latitude and longitude of the center of the district are included as the additional controls. Robust standard errors are used. In Panel B, the source of the data for the outcome variables focusing on crime against women is National Crime Record Bureau. We use data on crime against women from 2016 to 2021. The three outcome variables under this head are the number of reported cases of assault on a woman with the intent to outrage her modesty, reported cases of attempt to rape and reported cases of rape in a district. LNL indicates the log (1+nighttime lights) where nightlights data is used from 2015 to 2020. In addition to this, population density is interacted with time (2016 to 2021) and district fixed effects are also included. Standard errors are clustered at the district level. The source of the data for the outcome variables focusing on women's political representation is Trivedi Center for Political Data. We use data on women's political representation from 2015 to 2021. The two outcome variables under this head are the number of women candidates and the percentage of vote share received by them in one constituency of the state assembly election. LNL indicates the log (1+nighttime lights) where nightlights data is used from 2014 to 2020. In addition to this, population density is interacted with time (2015 to 2021) and district fixed effects are also included. Standard errors are clustered at the district level.

Table A3. Robustness checks: Effect of Urbanization on Women's Labor Market Outcomes.

	[1]	[2]	[3]	[4]
	Currently employed in paid work	**Employed in paid work in the last twelve months**	**Currently employed in unpaid work**	**Employed in unpaid work in the last twelve months**
Panel A: Clustering at the District-Survey Year				
LNL	0.005	0.009	0.007	0.002
	(0.009)	(0.011)	(0.007)	(0.009)
Observations	196,364	192,714	163,729	152,968
R-squared	0.110	0.144	0.062	0.087
Panel B: Never Movers				
LNL	-0.001	0.013	0.015	0.008
	(0.020)	(0.025)	(0.015)	(0.018)
Observations	41,152	40,324	35,541	33,681
R-squared	0.113	0.134	0.067	0.094
Panel C: Binary measure of Urbanization				
LNL > Median LNL	-0.006	-0.009	0.002	-0.000
	(0.009)	(0.011)	(0.007)	(0.009)
Observations	196,364	192,714	163,729	152,968
R-squared	0.101	0.128	0.056	0.077
Panel D: COVID Years				
LNL	0.002	0.005	0.006	0.001
	(0.012)	(0.015)	(0.009)	(0.013)
Observations	196,364	192,714	163,729	152,968
R-squared	0.101	0.128	0.056	0.077

*** p<0.01 (significant at 1%), ** p<0.05 (significant at 5%), * p<0.1 (significant at 10%)

In Panel A, we cluster the standard errors at the district-survey year level instead of district level. Panel B restricts the sample to the respondents who have never moved from their current place of residence. Panel C uses the binary measure of urbanization. This binary measure of urbanization takes a value 1 if log (nightlights + 1) of a district is more than the state's median value of log(nightlights + 1) and 0 otherwise. In Panel D, we use the state-COVID year fixed effects instead of state-interview year fixed effects. Specifically, COVID year is defined as 1 if survey year is 2020 or 2021, and 0 otherwise. LNL indicates the log (1+nighttime lights). All specifications control for individual/household characteristics, district characteristics interacted with interview year, and district fixed effects. Panels A, B, and C include state-interview year fixed effects. Standard errors in parentheses are clustered at the district level in panels A, B and C. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A4. Robustness checks: Effect of Urbanization on Women's Mobility

	[1]	[2]	[3]	[4]	[5]
	Traveling alone to market	**Traveling alone to health facility**	**Traveling alone to places outside their village/town**	**Binary Index: Mobility**	**Z-Score Index: Mobility**
Panel A: Clustering at the District-Survey Year					
LNL	0.041***	0.034***	0.032**	0.036***	0.071***
	(0.012)	(0.012)	(0.013)	(0.012)	(0.023)
Observations	204,774	204,774	204,774	204,774	204,774
R-squared	0.137	0.140	0.127	0.127	0.159
Panel B: Never Movers					
LNL	0.016	0.009	0.037	0.037	0.042
	(0.028)	(0.030)	(0.032)	(0.028)	(0.055)
Observations	42,734	42,734	42,734	42,734	42,734
R-squared	0.154	0.159	0.137	0.139	0.177
Panel C: Binary measure of Urbanization					
LNL	0.018*	0.018	0.021*	0.021*	0.038*
	(0.011)	(0.013)	(0.012)	(0.012)	(0.022)
Observations	204,774	204,774	204,774	204,774	204,774
R-squared	0.137	0.139	0.127	0.127	0.159
Panel D: COVID Years					
LNL	0.041**	0.034**	0.032*	0.036**	0.071**
	(0.017)	(0.017)	(0.018)	(0.016)	(0.032)
Observations	204,774	204,774	204,774	204,774	204,774
R-squared	0.137	0.140	0.127	0.127	0.159

*** p<0.01 (significant at 1%), ** p<0.05 (significant at 5%), * p<0.1 (significant at 10%)

In Panel A, we cluster the standard errors at the district-survey year level instead of district level. Panel B restricts the sample to the respondents who have never moved from their current place of residence. Panel C uses the binary measure of urbanization. This binary measure of urbanization takes a value 1 if log (nightlights + 1) of a district is more than the state's median value of log(nightlights + 1) and 0 otherwise. In Panel D, we use the state-COVID year fixed effects instead of state-interview year fixed effects. Specifically, COVID year is defined as 1 if survey year is 2020 or 2021, and 0 otherwise. LNL indicates the log (1+nighttime lights). All specifications control for individual/household characteristics, district characteristics interacted with interview year, and district fixed effects. Panels A, B, and C include state-interview year fixed effects. Standard errors in parentheses are clustered at the district level in panels A, B and C. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A5. Robustness checks: Effect of Urbanization on Women's Intra-Household Decision Making Power.

	[1]	[2]	[3]	[4]	[5]	[6]
	Own health care	**Large household purchases**	**Visits to family/relatives**	**Husband's earning**	**Binary Index**	**Z-Score Index**
Panel A: Clustering at the District-Survey Year						
LNL	-0.041***	-0.029**	-0.038**	-0.030**	-0.028***	-0.084***
	(0.014)	(0.014)	(0.015)	(0.013)	(0.010)	(0.031)
Observations	144,612	144,612	144,612	141,271	143,630	143,630
R-squared	0.051	0.054	0.060	0.047	0.043	0.066
Panel B: Never Movers						
LNL	-0.098**	-0.207***	-0.158***	-0.152***	-0.105**	-0.365***
	(0.048)	(0.048)	(0.047)	(0.055)	(0.041)	(0.101)
Observations	7,476	7,476	7,476	7,327	7,449	7,449
R-squared	0.185	0.192	0.201	0.188	0.188	0.217
Panel C: Binary measure of Urbanization						
LNL	-0.026**	-0.022*	-0.031**	-0.032***	-0.019**	-0.066**
	(0.012)	(0.013)	(0.013)	(0.011)	(0.009)	(0.027)
Observations	144,612	144,612	144,612	141,271	143,630	143,630
R-squared	0.051	0.054	0.060	0.047	0.043	0.066
Panel D: COVID Years						
LNL	-0.041**	-0.029	-0.038*	-0.030	-0.028*	-0.084*
	(0.020)	(0.019)	(0.021)	(0.019)	(0.015)	(0.043)
Observations	144,612	144,612	144,612	141,271	143,630	143,630
R-squared	0.051	0.054	0.060	0.047	0.043	0.066

*** p<0.01 (significant at 1%), ** p<0.05 (significant at 5%), * p<0.1 (significant at 10%)

In Panel A, we cluster the standard errors at the district-survey year level instead of district level. Panel B restricts the sample to the respondents who have never moved from their current place of residence. Panel C uses the binary measure of urbanization. This binary measure of urbanization takes a value 1 if log (nightlights + 1) of a district is more than the state's median value of log (nightlights + 1) and 0 otherwise. In Panel D, we use the state-COVID year fixed effects instead of state-interview year fixed effects. Specifically, COVID year is defined as 1 if survey year is 2020 or 2021, and 0 otherwise. LNL indicates the log (1+nighttime lights). All specifications control for individual/household characteristics, district characteristics interacted with interview year, and district fixed effects. Panels A, B, and C include state-interview year fixed effects. Standard errors in parentheses are clustered at the district level in panels A, B and C. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A6. Robustness checks: Effect of Urbanization on Women's Access to Information.

	[1] Read a newspaper or magazine	[2] Listen to the radio	[3] Watch television	[4] Binary Index: Access to media	[5] Z-Score Index: Access to media	[6] Access to Mobile Phones
Panel A: Clustering at the District-Survey Year						
LNL	0.006	-0.004	0.018*	0.002	0.014	0.012
	(0.008)	(0.009)	(0.010)	(0.009)	(0.015)	(0.011)
Observations	1,257,443	1,257,443	1,257,443	1,257,443	1,257,443	204,774
R-squared	0.175	0.120	0.190	0.180	0.203	0.170
Panel B: Never Movers						
LNL	0.032**	-0.002	0.012	-0.009	0.030	0.005
	(0.015)	(0.015)	(0.020)	(0.016)	(0.029)	(0.029)
Observations	261,822	261,822	261,822	261,822	261,822	42,734
R-squared	0.155	0.162	0.157	0.141	0.184	0.249
Panel C: Binary measure of Urbanization						
LNL	0.010	-0.007	0.005	0.003	0.005	0.015
	(0.007)	(0.009)	(0.010)	(0.008)	(0.016)	(0.010)
Observations	1,257,443	1,257,443	1,257,443	1,257,443	1,257,443	204,774
R-squared	0.175	0.120	0.190	0.180	0.203	0.170
Panel D: COVID Years						
LNL	0.006	-0.004	0.018	0.002	0.014	0.012
	(0.011)	(0.012)	(0.014)	(0.013)	(0.022)	(0.015)
Observations	1,257,443	1,257,443	1,257,443	1,257,443	1,257,443	204,774
R-squared	0.175	0.120	0.190	0.180	0.203	0.170

*** p<0.01 (significant at 1%), ** p<0.05 (significant at 5%), * p<0.1 (significant at 10%)

In Panel A, we cluster the standard errors at the district-survey year level instead of district level. Panel B restricts the sample to the respondents who have never moved from their current place of residence. Panel C uses the binary measure of urbanization. This binary measure of urbanization takes a value 1 if log (nightlights + 1) of a district is more than the state's median value of log (nightlights + 1) and 0 otherwise. In Panel D, we use the state-COVID year fixed effects instead of state-interview year fixed effects. Specifically, COVID year is defined as 1 if survey year is 2020 or 2021, and 0 otherwise. LNL indicates the log (1+nighttime lights). All specifications control for individual/household characteristics, district characteristics interacted with interview year, and district fixed effects. Panels A, B, and C include state-interview year fixed effects. Standard errors in parentheses are clustered at the district level in panels A, B and C. Individual/household characteristics include current marital status, religion, social group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A7. Robustness checks: Effect of Urbanization on Women's Financial Autonomy

	[1]	[2]	[3]	[4]	[5]
	Ownership of House	**Ownership of Land**	**Access to money or a bank account**	**Binary Index: Financial Autonomy**	**Z-Score Index: Financial Autonomy**
Panel A: Clustering at the District-Survey Year					
LNL	0.024	0.025	0.029***	0.013	0.056**
	(0.020)	(0.020)	(0.011)	(0.009)	(0.028)
Observations	204,774	204,774	204,774	204,774	204,774
R-squared	0.144	0.119	0.123	0.084	0.150
Panel B: Never Movers					
LNL	0.010	0.026	0.038*	0.036*	0.054
	(0.033)	(0.033)	(0.023)	(0.021)	(0.047)
Observations	42,734	42,734	42,734	42,734	42,734
R-squared	0.184	0.158	0.136	0.112	0.184
Panel C: Binary measure of Urbanization					
LNL	0.051***	0.042**	0.021*	0.023***	0.080***
	(0.017)	(0.017)	(0.011)	(0.009)	(0.024)
Observations	204,774	204,774	204,774	204,774	204,774
R-squared	0.144	0.119	0.123	0.085	0.150
Panel D: COVID Years					
LNL	0.024	0.025	0.029*	0.013	0.056
	(0.028)	(0.028)	(0.015)	(0.013)	(0.039)
Observations	204,774	204,774	204,774	204,774	204,774
R-squared	0.144	0.119	0.123	0.084	0.150

*** p<0.01 (significant at 1%), ** p<0.05 (significant at 5%), * p<0.1 (significant at 10%)

In Panel A, we cluster the standard errors at the district-survey year level instead of district level. Panel B restricts the sample to the respondents who have never moved from their current place of residence. Panel C uses the binary measure of urbanization. This binary measure of urbanization takes a value 1 if log (nightlights + 1) of a district is more than the state's median value of log (nightlights + 1) and 0 otherwise. In Panel D, we use the state-COVID year fixed effects instead of state-interview year fixed effects. Specifically, COVID year is defined as 1 if survey year is 2020 or 2021, and 0 otherwise. LNL indicates the log (1+nighttime lights). All specifications control for individual/household characteristics, district characteristics interacted with interview year, and district fixed effects. Panels A, B, and C include state-interview year fixed effects. Standard errors in parentheses are clustered at the district level in panels A, B and C. Individual/household characteristics include current marital status, religion, social group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A8. Robustness checks: Effect of Urbanization on Women's Attitudes towards Intimate Partner Violence (IPV)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
	Justifies IPV if wife goes out without informing husband	**Justifies IPV if wife neglects the house or the children**	**Justifies IPV if wife argues with the husband**	**Justifies IPV if wife refuses to have sex with the husband**	**Justifies IPV if wife doesn't cook food properly**	**Justifies IPV if husband suspects wife being unfaithful**	**Justifies IPV if wife shows disrespectful for in-laws**	**Binary Index: Justifies IPV**	**Z-Score Index: Justifies IPV**
Panel A: Clustering at the District-Survey Year									
LNL	0.019*	0.059***	0.019	0.008	0.010	0.004	0.020	0.028	0.033
	(0.011)	(0.022)	(0.014)	(0.009)	(0.011)	(0.011)	(0.015)	(0.018)	(0.024)
Observations	202,325	204,199	202,457	201,049	202,946	202,229	202,583	201,742	201,742
R-squared	0.098	0.079	0.088	0.048	0.057	0.075	0.113	0.144	0.120
Panel B: Never Movers									
LNL	0.013	0.104*	0.028	0.001	0.001	0.004	0.052	0.060*	0.043
	(0.023)	(0.062)	(0.026)	(0.020)	(0.025)	(0.022)	(0.032)	(0.035)	(0.048)
Observations	41,781	42,450	41,842	41,094	42,034	41,768	41,907	41,475	41,475
R-squared	0.131	0.090	0.125	0.081	0.085	0.109	0.151	0.175	0.161
Panel C: Binary measure of Urbanization									
LNL	-0.004	0.003	0.015	0.000	0.004	-0.021*	0.003	0.002	-0.001
	(0.012)	(0.025)	(0.016)	(0.009)	(0.011)	(0.011)	(0.015)	(0.018)	(0.025)
Observations	202,325	204,199	202,457	201,049	202,946	202,229	202,583	201,742	201,742
R-squared	0.098	0.079	0.088	0.048	0.057	0.075	0.113	0.144	0.120
Panel D: COVID Years									
LNL	0.019	0.059**	0.019	0.008	0.010	0.004	0.020	0.028	0.033
	(0.016)	(0.030)	(0.020)	(0.012)	(0.015)	(0.015)	(0.021)	(0.025)	(0.034)
Observations	202,325	204,199	202,457	201,049	202,946	202,229	202,583	201,742	201,742
R-squared	0.098	0.079	0.088	0.048	0.057	0.075	0.113	0.144	0.120

*** p<0.01 (significant at 1%), ** p<0.05 (significant at 5%), * p<0.1 (significant at 10%)

In Panel A, we cluster the standard errors at the district-survey year level instead of district level. Panel B restricts the sample to the respondents who have never moved from their current place of residence. Panel C uses the binary measure of urbanization. This binary measure of urbanization takes a value 1 if log (nightlights + 1) of a district is more than the state's median value of log (nightlights + 1) and 0 otherwise. In Panel D, we use the state-COVID year fixed effects instead of state-interview year fixed effects. Specifically, COVID year is defined as 1 if survey year is 2020 or 2021, and 0 otherwise. LNL indicates the log (1+nighttime lights). All specifications control for individual/household characteristics, district characteristics interacted with interview year, and district fixed effects. Panels A, B, and C include state-interview year fixed effects. Standard errors in parentheses are clustered at the district level in panels A, B and C. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A9. Robustness checks: Effect of Urbanization on Women's Intimate Partner Violence

	[1] **Less severe physical domestic violence**	[2] **Severe physical domestic violence**	[3] **Sexual domestic violence**	[4] **Emotional Domestic Violence**	[5] **Binary Index: Any Violence**	[6] **Z-Score Index: Any Violence**
Panel A: Clustering at the District-Survey Year						
LNL	0.043***	0.018***	0.008	0.028***	0.057***	0.076***
	(0.013)	(0.006)	(0.007)	(0.009)	(0.014)	(0.023)
Observations	115,708	115,708	115,708	115,708	115,708	115,708
R-squared	0.076	0.040	0.029	0.039	0.076	0.066
Panel B: Never Movers						
LNL	0.032	0.050	0.033	0.035	0.036	0.137
	(0.060)	(0.036)	(0.029)	(0.043)	(0.065)	(0.110)
Observations	6,079	6,079	6,079	6,079	6,079	6,079
R-squared	0.213	0.179	0.167	0.205	0.209	0.226
Panel C: Binary measure of Urbanization						
LNL	0.008	0.000	0.006	0.010	0.022*	0.021
	(0.011)	(0.005)	(0.005)	(0.007)	(0.012)	(0.018)
Observations	115,708	115,708	115,708	115,708	115,708	115,708
R-squared	0.076	0.040	0.029	0.039	0.076	0.066
Panel D: COVID Years						
LNL	0.043**	0.018**	0.008	0.028**	0.057***	0.076**
	(0.018)	(0.008)	(0.009)	(0.013)	(0.020)	(0.032)
Observations	115,708	115,708	115,708	115,708	115,708	115,708
R-squared	0.076	0.040	0.029	0.039	0.076	0.066

*** p<0.01 (significant at 1%), ** p<0.05 (significant at 5%), * p<0.1 (significant at 10%)

In Panel A, we cluster the standard errors at the district-survey year level instead of district level. Panel B restricts the sample to the respondents who have never moved from their current place of residence. Panel C uses the binary measure of urbanization. This binary measure of urbanization takes a value 1 if log (nightlights + 1) of a district is more than the state's median value of log (nightlights + 1) and 0 otherwise. In Panel D, we use the state-COVID year fixed effects instead of state-interview year fixed effects. Specifically, COVID year is defined as 1 if survey year is 2020 or 2021, and 0 otherwise. LNL indicates the log (1+nighttime lights). All specifications control for individual/household characteristics, district characteristics interacted with interview year, and district fixed effects. Panels A, B, and C include state-interview year fixed effects. Standard errors in parentheses are clustered at the district level in panels A, B and C. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A10. Robustness checks: Effect of Urbanization on Men's Labor Market Outcomes

	[1]	[2]	[3]	[4]
	Currently employed in paid work	**Employed in paid work in the last twelve months**	**Currently employed in unpaid work**	**Employed in unpaid work in the last twelve months**
Panel A: Clustering at the District-Survey Year				
LNL	0.044***	0.021**	-0.020	-0.045
	(0.015)	(0.011)	(0.025)	(0.027)
Observations	177,085	175,997	54,921	44,443
R-squared	0.342	0.421	0.259	0.429
Panel B: Never Movers				
LNL	0.044***	0.020*	-0.040	-0.061*
	(0.016)	(0.012)	(0.029)	(0.031)
Observations	131,302	130,408	42,830	34,621
R-squared	0.341	0.422	0.239	0.419
Panel C: Binary measure of Urbanization				
LNL	0.011	0.008	-0.016	-0.017
	(0.011)	(0.007)	(0.017)	(0.017)
Observations	182,738	181,466	57,505	46,751
R-squared	0.342	0.420	0.266	0.432
Panel D: COVID Years				
LNL	0.033***	0.015*	-0.043**	-0.057***
	(0.011)	(0.008)	(0.019)	(0.020)
Observations	182,738	181,466	57,505	46,751
R-squared	0.347	0.432	0.269	0.441

*** p<0.01 (significant at 1%), ** p<0.05 (significant at 5%), * p<0.1 (significant at 10%)

In Panel A, we cluster the standard errors at the district-survey year level instead of district level. Panel B restricts the sample to the respondents who have never moved from their current place of residence. Panel C uses the binary measure of urbanization. This binary measure of urbanization takes a value 1 if log (nightlights + 1) of a district is more than the state's median value of log (nightlights + 1) and 0 otherwise. In Panel D, we use the state-COVID year fixed effects instead of state-interview year fixed effects. Specifically, COVID year is defined as 1 if survey year is 2020 or 2021, and 0 otherwise. LNL indicates the log (1+nighttime lights). All specifications control for individual/household characteristics, district characteristics interacted with interview year, and district fixed effects. Panels A, B, and C include state-interview year fixed effects. Standard errors in parentheses are clustered at the district level in panels A, B and C. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A11. Heterogeneity analysis: Effect of Urbanization on other components of Women's Mobility

	[1]	[2]	[3]	[4]
	Traveling alone to market	**Traveling alone to health facility**	**Traveling alone to places outside their village/town**	**Z-Score Index: Mobility**
Panel A: Wealth				
LNL*Poor	-0.004*	-0.002	-0.003	-0.006
	(0.003)	(0.003)	(0.002)	(0.005)
LNL	0.043**	0.034**	0.034*	0.074**
	(0.017)	(0.017)	(0.018)	(0.032)
Poor	-0.016	-0.024	0.008	-0.022
	(0.017)	(0.018)	(0.016)	(0.031)
Observations	204,774	204,774	204,774	204,774
R-squared	0.138	0.140	0.127	0.160
Panel B: Religion				
LNL*Minority	-0.005	-0.004	-0.008***	-0.012**
	(0.003)	(0.003)	(0.003)	(0.006)
LNL	0.043**	0.035**	0.035**	0.075**
	(0.017)	(0.017)	(0.018)	(0.032)
Minority	0.042**	0.034	0.071***	0.098**
	(0.020)	(0.022)	(0.021)	(0.039)
Observations	204,774	204,774	204,774	204,774
R-squared	0.137	0.140	0.127	0.159
Panel C: Caste				
LNL*DisadvCaste	-0.010***	-0.008**	-0.007*	-0.016**
	(0.004)	(0.004)	(0.004)	(0.007)
LNL	0.049***	0.040**	0.038**	0.084***
	(0.017)	(0.017)	(0.018)	(0.032)
DisadvCaste	0.053**	0.036	0.037	0.084*
	(0.025)	(0.026)	(0.025)	(0.047)
Observations	204,774	204,774	204,774	204,774
R-squared	0.137	0.140	0.127	0.159
Panel D: Region				
LNL*NBIMARU	0.003	0.002	-0.042	-0.024
	(0.031)	(0.032)	(0.034)	(0.060)
LNL	0.040	0.032	0.052**	0.083*
	(0.025)	(0.025)	(0.023)	(0.046)
NBIMARU	0.335	0.200	0.494*	0.687
	(0.275)	(0.275)	(0.278)	(0.509)
Observations	204,774	204,774	204,774	204,774
R-squared	0.137	0.140	0.127	0.159

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panels A, B, C, and D focus on the heterogeneity analysis by wealth, religion, caste group, and region, respectively. Poor takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; Minority takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; Disadvantaged Class takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and NBIMARU takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise. All the outcome variables are binary in nature except Z-score index. The Z-score index is the simple average of the individual z-score of mobility variables based on their respective means and standard deviations LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A12. Heterogeneity analysis: Effect of Urbanization on other components of Women's Intra-Households Decision Making

	[1] Decisions regarding own health care	[2] Decisions regarding large household purchases	[3] Decisions regarding visits to family/relatives	[4] Decisions regarding what to do with husband's earning	[5] Z-Score Index: Intra Household Decision Making Power
Panel A: Wealth					
LNL*Poor	0.005**	0.004	0.001	0.002	0.007
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)
LNL	-0.044**	-0.032	-0.039*	-0.031*	-0.089**
	(0.020)	(0.020)	(0.021)	(0.019)	(0.044)
Poor	-0.047***	-0.045***	-0.031**	-0.029*	-0.094***
	(0.014)	(0.015)	(0.014)	(0.015)	(0.029)
Observations	144,612	144,612	144,612	141,271	143,630
R-squared	0.051	0.054	0.060	0.047	0.066
Panel B: Religion					
LNL*Minority	0.004	-0.001	-0.000	0.003	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)
LNL	-0.042**	-0.029	-0.038*	-0.031*	-0.085*
	(0.020)	(0.019)	(0.021)	(0.019)	(0.043)
Minority	-0.006	0.015	0.009	-0.001	0.010
	(0.018)	(0.021)	(0.022)	(0.020)	(0.042)
Observations	144,612	144,612	144,612	141,271	143,630
R-squared	0.051	0.054	0.060	0.047	0.066
Panel C: Caste					
LNL*DisadvCaste	-0.004	-0.001	-0.001	-0.002	-0.005
	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)
LNL	-0.038*	-0.029	-0.037*	-0.029	-0.080*
	(0.020)	(0.020)	(0.022)	(0.019)	(0.044)
DisadvCaste	0.043*	0.019	0.022	0.012	0.057
	(0.023)	(0.025)	(0.022)	(0.024)	(0.051)
Observations	144,612	144,612	144,612	141,271	143,630
R-squared	0.051	0.054	0.060	0.047	0.066
Panel D: Region					
LNL*NBIMARU	-0.024	-0.025	-0.047	-0.044	-0.086
	(0.038)	(0.037)	(0.040)	(0.035)	(0.082)
LNL	-0.030	-0.017	-0.015	-0.009	-0.043
	(0.023)	(0.022)	(0.022)	(0.021)	(0.048)
NBIMARU	-0.074	-0.055	-0.138	0.055	-0.111
	(0.286)	(0.292)	(0.301)	(0.298)	(0.644)
Observations	144,612	144,612	144,612	141,271	143,630
R-squared	0.051	0.054	0.060	0.047	0.066

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panels A, B, C, and D focus on the heterogeneity analysis by wealth, religion, caste group, and region, respectively. Poor takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; Minority takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; Disadvantaged Class takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and NBIMARU takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise. All the outcome variables are binary in nature except Z-score index. The Z-score index is the simple average of the individual z-score of decision-making variables based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A13. Heterogeneity analysis: Effect of Urbanization on other components of Women's Access to Information

	[1] Read a newspaper or magazine	[2] Listen to the radio	[3] Watch television	[4] Z-Score Index: Access to media
Panel A: Wealth				
LNL*Poor	-0.006**	-0.004***	0.001	-0.007
	(0.003)	(0.001)	(0.004)	(0.005)
LNL	0.005	-0.002	0.012	0.011
	(0.010)	(0.012)	(0.014)	(0.020)
Poor	-0.222***	-0.024**	-0.311***	-0.413***
	(0.021)	(0.010)	(0.027)	(0.030)
Observations	1,257,443	1,257,443	1,257,443	1,257,443
R-squared	0.229	0.124	0.273	0.280
Panel B: Religion				
LNL*Minority	-0.002	0.004*	0.007	0.008
	(0.003)	(0.002)	(0.004)	(0.006)
LNL	0.007	-0.005	0.016	0.012
	(0.011)	(0.012)	(0.014)	(0.021)
Minority	0.053***	-0.029**	-0.037	-0.018
	(0.019)	(0.015)	(0.029)	(0.037)
Observations	1,257,443	1,257,443	1,257,443	1,257,443
R-squared	0.175	0.120	0.190	0.203
Panel C: Caste				
LNL*DisadvCaste	-0.029***	-0.006***	-0.013***	-0.036***
	(0.003)	(0.002)	(0.003)	(0.005)
LNL	0.028**	0.001	0.028*	0.041*
	(0.011)	(0.012)	(0.015)	(0.022)
DisadvCaste	0.099***	0.006	0.067***	0.126***
	(0.022)	(0.013)	(0.024)	(0.036)
Observations	1,257,443	1,257,443	1,257,443	1,257,443
R-squared	0.176	0.120	0.190	0.203
Panel D: Region				
LNL*NBIMARU	0.016	-0.035	0.050*	0.016
	(0.020)	(0.022)	(0.027)	(0.041)
LNL	-0.002	0.013	-0.006	0.006
	(0.013)	(0.015)	(0.017)	(0.026)
NBIMARU	-0.191	1.115***	-0.300	0.676*
	(0.198)	(0.206)	(0.221)	(0.373)
Observations	1,257,443	1,257,443	1,257,443	1,257,443
R-squared	0.175	0.120	0.190	0.203

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panels A, B, C, and D focus on the heterogeneity analysis by wealth, religion, caste group, and region, respectively. Poor takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; Minority takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; Disadvantaged Class takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and NBIMARU takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise. . All the outcome variables are binary in nature except Z-score index. The Z-score index is the simple average of the individual z-score of access to information from newspaper/magazine, radio, and television based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A14. Heterogeneity analysis: Effect of Urbanization on other components of Women's Financial Autonomy

	[1] Ownership of House	[2] Ownership of Land	[3] Access to money or a bank account	[4] Z-Score Index: Financial Autonomy
Panel A: Wealth				
LNL*Poor	-0.004	-0.002	0.021***	0.012***
	(0.003)	(0.003)	(0.003)	(0.004)
LNL	0.026	0.027	0.016	0.049
	(0.028)	(0.028)	(0.015)	(0.039)
Poor	0.028	0.017	-0.239***	-0.151***
	(0.019)	(0.018)	(0.019)	(0.027)
Observations	204,774	204,774	204,774	204,774
R-squared	0.144	0.119	0.132	0.151
Panel B: Religion				
LNL*Minority	-0.009***	-0.009**	0.002	-0.011**
	(0.003)	(0.004)	(0.003)	(0.005)
LNL	0.027	0.029	0.029*	0.060
	(0.028)	(0.028)	(0.015)	(0.039)
Minority	0.066***	0.067***	0.002	0.094***
	(0.023)	(0.025)	(0.020)	(0.034)
Observations	204,774	204,774	204,774	204,774
R-squared	0.144	0.119	0.123	0.150
Panel C: Caste				
LNL*DisadvCaste	0.000	-0.005	-0.006**	-0.008
	(0.004)	(0.004)	(0.003)	(0.005)
LNL	0.023	0.029	0.034**	0.062
	(0.028)	(0.028)	(0.015)	(0.039)
DisadvCaste	0.006	0.024	0.025	0.040
	(0.026)	(0.027)	(0.021)	(0.038)
Observations	204,774	204,774	204,774	204,774
R-squared	0.144	0.119	0.123	0.150
Panel D: Region				
LNL*NBIMARU	-0.023	0.025	-0.026	-0.017
	(0.055)	(0.055)	(0.029)	(0.077)
LNL	0.035	0.014	0.041**	0.065
	(0.032)	(0.032)	(0.017)	(0.043)
NBIMARU	0.831*	0.624	0.068	1.056
	(0.480)	(0.469)	(0.253)	(0.657)
Observations	204,774	204,774	204,774	204,774
R-squared	0.144	0.119	0.123	0.150

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panels A, B, C, and D focus on the heterogeneity analysis by wealth, religion, caste group, and region, respectively. Poor takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; Minority takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; Disadvantaged Class takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and NBIMARU takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise. All the outcome variables are binary in nature except Z-score index. The Z-score index is the simple average of the individual z-score of ownership of land, land, and access to money/bank account based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A15A. Heterogeneity analysis: Effect of Urbanization on other components of Women's Attitude towards Intimate Partner Violence (IPV)

	[1] **IPV is justified if wife goes out without informing husband**	[2] **IPV is justified if wife neglects the house or the children**	[3] **IPV is justified if wife argues with the husband**	[4] **IPV is justified if wife refuses to have sex with the husband**
Panel A: Wealth				
LNL*Poor	0.004*	-0.013**	0.009***	0.002
	(0.002)	(0.006)	(0.002)	(0.002)
LNL	0.017	0.067**	0.015	0.007
	(0.016)	(0.030)	(0.020)	(0.012)
Poor	0.029**	0.156***	0.005	0.020*
	(0.014)	(0.040)	(0.013)	(0.011)
Observations	202,325	204,199	202,457	201,049
R-squared	0.101	0.080	0.092	0.050
Panel B: Religion				
LNL*Minority	0.001	-0.005	0.002	0.001
	(0.003)	(0.005)	(0.003)	(0.002)
LNL	0.019	0.061**	0.019	0.008
	(0.016)	(0.030)	(0.020)	(0.012)
Minority	-0.003	0.050	-0.014	-0.006
	(0.016)	(0.034)	(0.018)	(0.013)
Observations	202,325	204,199	202,457	201,049
R-squared	0.098	0.079	0.088	0.048
Panel C: Caste				
LNL*DisadvCaste	0.002	0.001	0.002	-0.001
	(0.003)	(0.005)	(0.003)	(0.002)
LNL	0.017	0.057*	0.018	0.009
	(0.016)	(0.030)	(0.020)	(0.013)
DisadvCaste	-0.005	-0.006	0.002	0.014
	(0.022)	(0.038)	(0.022)	(0.016)
Observations	202,325	204,199	202,457	201,049
R-squared	0.098	0.079	0.088	0.048
Panel D: Region				
LNL*NBIMARU	-0.015	-0.080	-0.033	0.009
	(0.032)	(0.054)	(0.039)	(0.024)
LNL	0.026	0.097**	0.035	0.004
	(0.020)	(0.044)	(0.024)	(0.015)
NBIMARU	1.158***	1.637***	1.441***	0.648***
	(0.297)	(0.424)	(0.328)	(0.195)
Observations	202,325	204,199	202,457	201,049
R-squared	0.098	0.079	0.088	0.048

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panels A, B, C, and D focus on the heterogeneity analysis by wealth, religion, caste group, and region, respectively. Poor takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; Minority takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; Disadvantaged Class takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and NBIMARU takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise. All the outcome variables are binary in nature. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A15B. Heterogeneity analysis: Effect of Urbanization on other components of Women's Attitude towards Intimate Partner Violence (IPV)

	[5]	[6]	[7]	[8]
	IPV is justified if wife doesn't cook food properly	**IPV is justified if husband suspects wife being unfaithful**	**IPV is justified if wife shows disrespectful for in-laws**	**Z-Score Index: Justifies IPV**
Panel A: Wealth				
LNL*Poor	0.006***	0.004**	0.006**	0.009**
	(0.002)	(0.002)	(0.003)	(0.004)
LNL	0.007	0.002	0.017	0.029
	(0.015)	(0.015)	(0.021)	(0.033)
Poor	0.010	0.018	0.017	0.065**
	(0.012)	(0.014)	(0.018)	(0.026)
Observations	202,946	202,229	202,583	201,742
R-squared	0.060	0.077	0.116	0.125
Panel B: Religion				
LNL*Minority	0.001	0.000	0.004	0.001
	(0.002)	(0.003)	(0.004)	(0.005)
LNL	0.010	0.004	0.019	0.033
	(0.015)	(0.015)	(0.021)	(0.034)
Minority	-0.003	-0.008	-0.027	-0.006
	(0.016)	(0.018)	(0.024)	(0.032)
Observations	202,946	202,229	202,583	201,742
R-squared	0.057	0.075	0.113	0.120
Panel C: Caste				
LNL*DisadvCaste	0.005*	0.001	0.004	0.005
	(0.003)	(0.003)	(0.003)	(0.006)
LNL	0.007	0.003	0.017	0.029
	(0.016)	(0.016)	(0.021)	(0.034)
DisadvCaste	-0.021	0.008	-0.006	-0.004
	(0.018)	(0.018)	(0.023)	(0.038)
Observations	202,946	202,229	202,583	201,742
R-squared	0.057	0.075	0.113	0.120
Panel D: Region				
LNL*NBIMARU	-0.007	-0.011	-0.043	-0.046
	(0.030)	(0.030)	(0.042)	(0.067)
LNL	0.014	0.010	0.040	0.055
	(0.019)	(0.020)	(0.029)	(0.041)
NBIMARU	0.622**	1.281***	1.340***	2.572***
	(0.259)	(0.284)	(0.352)	(0.587)
Observations	202,946	202,229	202,583	201,742
R-squared	0.057	0.075	0.113	0.120

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panels A, B, C, and D focus on the heterogeneity analysis by wealth, religion, caste group, and region, respectively. Poor takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; Minority takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; Disadvantaged Class takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and NBIMARU takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise. All the outcome variables are binary in nature except Z-score index. The Z-score index is the simple average of the individual z-score of attitude variables based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.

Table A16. Heterogeneity analysis: Effect of Urbanization on other components of Women's Intimate Partner Violence

	[1] Less severe physical domestic violence	[2] Severe physical domestic violence	[3] Sexual domestic violence	[4] Emotional Domestic Violence	[5] Z-Score Index: Any Violence
Panel A: Wealth					
LNL*Poor	0.002	0.004**	0.001	0.002	0.008
	(0.003)	(0.002)	(0.001)	(0.002)	(0.005)
LNL	0.044**	0.017**	0.008	0.028**	0.075**
	(0.018)	(0.008)	(0.009)	(0.012)	(0.032)
Poor	0.068***	0.012	0.015*	0.029**	0.096***
	(0.017)	(0.010)	(0.008)	(0.013)	(0.031)
Observations	115,708	115,708	115,708	115,708	115,708
R-squared	0.083	0.044	0.030	0.042	0.073
Panel B: Religion					
LNL*Minority	0.006*	0.002	0.001	0.001	0.007
	(0.003)	(0.002)	(0.002)	(0.002)	(0.006)
LNL	0.041**	0.017**	0.008	0.027**	0.074**
	(0.019)	(0.009)	(0.009)	(0.013)	(0.032)
Minority	-0.053**	-0.014	-0.001	-0.016	-0.062
	(0.023)	(0.013)	(0.011)	(0.015)	(0.041)
Observations	115,708	115,708	115,708	115,708	115,708
R-squared	0.076	0.040	0.029	0.039	0.066
Panel C: Caste					
LNL*DisadvCaste	0.015***	0.003**	0.000	0.004*	0.016***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.006)
LNL	0.032*	0.016*	0.008	0.024*	0.064**
	(0.018)	(0.009)	(0.009)	(0.013)	(0.032)
DisadvCaste	-0.053**	-0.003	0.007	-0.005	-0.031
	(0.021)	(0.012)	(0.013)	(0.017)	(0.042)
Observations	115,708	115,708	115,708	115,708	115,708
R-squared	0.076	0.040	0.029	0.039	0.067
Panel D: Region					
LNL*NBIMARU	-0.018	-0.001	-0.003	0.041*	0.017
	(0.036)	(0.016)	(0.019)	(0.024)	(0.063)
LNL	0.052**	0.018*	0.009	0.009	0.069*
	(0.022)	(0.011)	(0.010)	(0.016)	(0.040)
NBIMARU	0.231	0.174	0.246*	0.172	0.739
	(0.261)	(0.120)	(0.138)	(0.184)	(0.474)
Observations	115,708	115,708	115,708	115,708	115,708
R-squared	0.076	0.040	0.029	0.039	0.066

*** p<0.01-significant at 1%, ** p<0.05-significant at 5%, * p<0.1-significant at 10%

Notes: Panels A, B, C, and D focus on the heterogeneity analysis by wealth, religion, caste group, and region, respectively. Poor takes value one if a woman belongs to the poor or poorest wealth quintile and zero otherwise; Minority takes a value one if a woman belongs to a religion other than Hindu and zero otherwise; Disadvantaged Class takes a value one if a woman belongs to SC, ST, or OBC and zero otherwise; and NBIMARU takes a value one if a woman belongs to Bihar, Chandigarh, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Jharkhand, Madhya Pradesh, Punjab, Rajasthan, Uttarakhand, or Uttar Pradesh and zero otherwise. All the outcome variables are binary in nature except Z-score index. The Z-score index is the simple average of the individual z-score of exposure to IPV variables based on their respective means and standard deviations. LNL indicates the log (1+nighttime lights). All specifications include individual/household characteristics, district characteristics interacted with survey year, district fixed effects, and state-survey year fixed effects. Standard errors in parentheses are clustered at the district level. Individual/household characteristics include current marital status, religion, caste group and birth year dummies of women. District level characteristics include number of government pre-primary schools, primary schools, middle schools, secondary schools, senior secondary schools, arts and science degree colleges, engineering colleges, medicine colleges, management institutes, polytechnic institutions, vocational training schools, non-formal training center, number of primary health center doctors, maternity and child welfare center doctors, health clinic doctors, power supply per day in summer (in hours), power supply per day in winter (in hours), percentage of SC/ST population, literate population, and population density per sq. km.