Final report

Gender, social change, and urbanisation in North India

Milan Vaishnav

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Gender, Social Change, and Urbanization in North India

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Project #IND-19069

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Much of the research carried out under this project will appear in a forthcoming special issue of the journal, *Urbanisation.* We thank Aromar Ravi, Rekha Raghunathan and colleagues at the Indian Institute for Human Settlements (IIHS) for their continued collaboration.

As always, all errors are entirely our own.

Milan Vaishnav
March 3, 2021
Washington, D.C.

Chapter 1: Gender, Social Change, and Urbanization in North India

Devesh Kapur, Neelanjan Sircar, and Milan Vaishnav

India's urban future

In the year 2020, over half of the world lives in urban areas. In the next four decades, the global urban population is expected to grow by 2.7 billion, while the world's rural population is expected to shrink further.

Nowhere is this transition more apparent than in India, which is expected to see its urban population rise from 338 million (as per official census data) in 2010 to 875 million in 2050. The projected increase of 497 million between 2010 and 2050—roughly a million a month—will be the largest rural-to-urban transformation in the world, with China a distant second (341 million). One study examining the fastest growing cities in the world between 2019-2035 (as measured by size of their economies), found that all ten of the cities projected to grow fastest in this period were located in India (Wood 2018).

India's urbanization is "messy and hidden" (Ellis and Roberts 2016). It is "messy" in that, as per India's 2011 Census, 65.5 million Indians lived in urban slums and about one-eighth of the total urban population lived below the national poverty line in 2011. The "hidden" aspect of India's urbanization is reflected in how it is commonly measured. India's official definition of urbanization is unique in that it is based on the intersection of three parameters—size, density and economic activity—whose exacting criteria almost certainly underestimate how urbanized India really is.

Furthermore, even when settlements meet these stringent census criteria, they may still not be statutorily classified as urban. In 2001, 32.1 million people in 2713 settlements—so-called "census towns"—met the Census' urban test but were not classified as such in statutory terms. In 2011, the number stood at 23.2 million across 2069 settlements.

Thus, while India's urban population stood at 31 percent according to the 2011 Census, one globally applicable alternative measure of urban concentration—the Agglomeration Index formulated by Uchida and Nelson (2010)—reports that 43 percent of India's population lives within an hour of at least a Class I town (>100,000 population) while 52 percent live within an hour of at least a Class II town (>50,000 population). Given that their analysis was based on 2001 data, the numbers are likely to be considerably higher today.

Another effort (Denis and Marius-Gnanou 2011) geo-spatially matched locations of contiguous (defined as less than 200 metres apart) built-up areas from satellite imagery with settlements from the Census and found that 45 percent of India's population lived in agglomerations of more than 5,000; 37 percent in agglomerations of more than 10000; and 27 percent in towns of more than 10000. For Bihar, the proportion of the state's population living in urban areas was

almost three times higher (31 percent) using this definition compared to the Census benchmark (10 percent).

India's urbanization is more about morphing places than moving people, a fact perhaps best captured by the rapid growth of its metropolitan suburbs. As an increasing number of smaller settlements are changing their occupational character to non-farm activities, they get re-classified as urban. This has led to a high concentration of economic activity in metropolitan cities. According to a 2012 estimate, 54 metropolitan areas (spread across 65 administrative districts) accounted for 40 percent of India's overall GDP. By 2025, 69 metropolitan areas could account for roughly half of India's national income (Brar et al. 2014).

Given the sheer demographic magnitude of urbanization unfolding in India, understanding the multiple political, economic and social implications of this massive structural shift underway, is vital for the country's future.

Theoretical motivations

While the degree and rate of urbanization in India is contested, there are also multiple questions concerning the country's urban future, ranging from the drivers and pace of this urbanization, settlement type and economic foundations. However, the question of the impacts of urbanization on social identities, attitudes, and hierarchies has not been as deeply explored.

Urbanization is as much a social process—transforming behavior, culture and social institutions over time—as it is an economic and spatial process. Urbanization transforms core societal organizations such as the family, the nature and density of social interactions, the nature of work and diversity of occupations, and individual freedoms and personal autonomy. Cities are sites of social change that offer possibilities for social mobility by disrupting the social stratifications of rural societies (Kapur 2017).

At their core, cities are also about labor markets. Certain initial factors or locational advantages contribute to the rise of specific industries. These industries employ workers from their catchment areas. The resultant growth attracts more labor, which migrates to these areas for jobs. Over time, depending on the availability of infrastructure and the pool of labor, new and diverse industries may come up. This diverse group of workers and activities in close proximity generates spillovers, spurring economic growth. This cycle can be self-reinforcing: economic growth fuels labor demand which drives further economic growth, creating a self-enforcing dynamic until congestion, land and housing prices, the decline of industries concentrated in that urban area and demographic changes, taper (or even reverse) further growth.

Given this, what does India's rapid urbanization mean for social hierarchies and social cleavages in the country? Will some hierarchies be amplified, others attenuated or transformed? And, in particular, how will urbanization affect half of India's population—women—and in what ways? The focus of this report is on how gender, urbanization, and social change interconnect. While the project is motivated by a concern with India's low (and, according to some measures,

declining) female labor force participation (FLFP), it also focuses on the larger ecosystem within which labor markets function. In so doing, it brings to light new, gender-disaggregated data on labor markets, social attitudes, empowerment and individual agency, and asset ownership and use (see Raman 2020 for a discussion of how the lack of gender-disaggregated data in India hampers policymaking efforts).

As India urbanizes, its dismally low (and declining) FLFP is more than a mere academic puzzle. There is a large and growing body of work that persuasively argues that the gender gap in work is actively hampering India's efforts to reach its economic potential. For starters, India's economic future is premised on the fact that it will be able to generate a sufficiently skilled workforce to sustain and enhance economic growth. India seeks to reap the benefits of a "demographic dividend," a period over which a very large share of the population will be of working age due to recently increasing life expectancies and lower fertility rates. However, this potential dividend will be squandered if half of the country's population is not productively employed. The Government of India's 2017-2018 Economic Survey, its flagship publication on the health of the Indian economy, singled out India's gender gap in the labor force as a factor that "adversely affects the growth potential of the Indian economy."

Some studies have tried to quantify the loss to India's economic health on account of India's gender gap in the labor force. According to estimates published by the McKinsey Institute (2015), India could add as much as $2.9 trillion to its annual gross domestic product (GDP) by the year 2025 if it fully eliminated the gender employment gap. This would translate into 68 million new women entering the workforce over this period.

The issue of women's engagement with the Indian economy is an issue of increasing salience for Indian policymakers, as they grapple with the twin challenges of "jobless growth" and gender inequality.

Indeed, the importance of these issues for India's development has been acknowledged by Prime Minister Narendra Modi, dating back to his inaugural Independence Day speech in 2014, when he spoke of the severe gender inequalities plaguing the country. Subsequently, Modi explicitly addressed the female labor force dilemma India confronts, stating that "financially empowered women are a bulwark against societal evils" and that providing them with economic opportunities should be a key priority for government.

These concerns also preoccupy India's state leaders. For instance, Bihar chief minister Nitish Kumar, whose alcohol prohibition policy was explicitly aimed at addressing a widespread demand by women, has been explicit that "Bihar's development is not possible without women empowerment."

There is now an emerging literature that has sought to understand and explain India's low FLFP. Broadly, the findings focus on four sets of factors located at the individual level, household level, neighborhood characteristics and the urban physical environment, and the dynamics of the larger economy (Figure 1).

Figure 1. Variables affecting FLFP

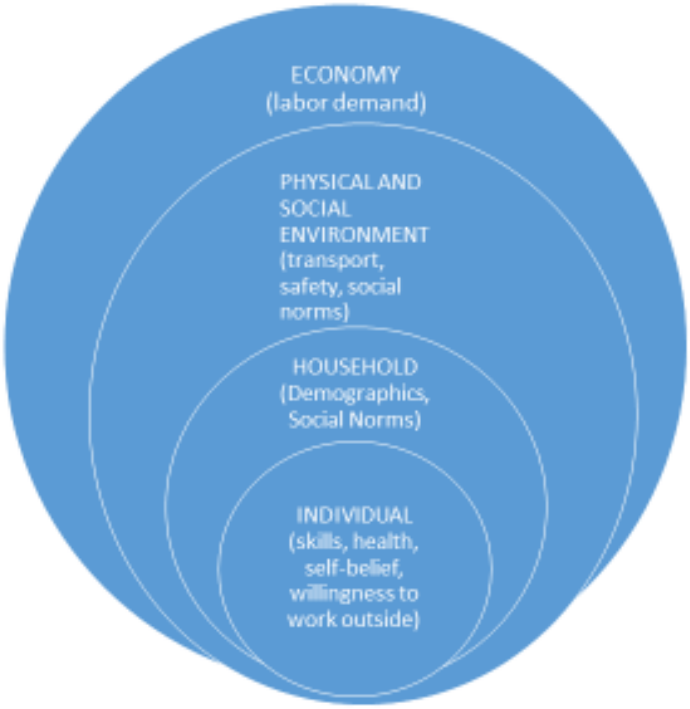


Figure 1 is a schematic representation of the locus of binding constraints on FLFP. Much of the political economy literature has focused on the role of social norms as a barrier to female participation in the workforce. This literature has grappled with, among other things, how social norms might influence women's entry into the labor force and their ability (and willingness) to continue working.

While social norms are certainly an important determinant of women's labor market behavior, it is unclear whether these social norms are located within the household (such as a father or husband or in-laws who proscribe a woman from working outside the household) or social norms in society at large. For instance, research has found links between FLFP and women's empowerment and agency, both inside and outside of the household. Samad and Zhang (2019) find that the increase in female empowerment documented in the nationally representative India Human Development Survey (IHDS) is largely driven by increases in female education and employment. Similarly, Luke and Munshi (2011) suggest that employment is a significant factor in household bargaining, especially for low-caste women.

However, it is worth considering whether a drop of over 10 percentage points in female labor force participation in the past couple of decades can be explained by conservative social norms alone. Is it the case that these patriarchal social norms are even more pernicious than they were twenty years ago despite the much greater access to information (TV, smartphones), bank accounts (through the government's flagship Pradhan Mantri Jan Dhan Yojana scheme) and

means of communication (mobile phones)? Might structural changes in the economy or public safety or even personal choice explain outcomes in female labor force participation in India?

In addition, there is the possibility that women may not want to work not because they lack the agency to work, but precisely because they may have the agency to decide *not to work*. The urban environment, such as safety and the availability of public transport, can be further determinants. Above all, there is the presumption that women are not working *despite* the availability of jobs, rather than their absence. India's jobless growth—and the absence of jobs that have the flexibility for working mothers—might well serve as a more binding constraint, especially in north India, the subject of this report.

The initial motivation for this report on gender and urbanization in north India was to analyze India's decreasing female labor force participation. However, we soon realized that a comprehensive study of women in the labor force required a nuanced understanding of several complex issues, such as social norms, intra-household inequalities, patterns of mobility, social and political preferences, and structural changes like urbanization and shifting labor markets and occupational changes. Rather than isolating one or two of these factors, our intellectual approach is to understand how these factors act in equilibrium—that is, how these factors are interconnected and how they inform the problem as a connected whole.

To be sure, we also surmise that social norms—stemming from gendered division of labor and responsibilities at home as well social attitudes at the individual, household and societal levels—significantly dampen female labor force participation. In our view, these have not changed dramatically in recent years. If anything, there have been improvements, manifest most visibly in access to education. With social constraints in tow, we show that women espouse preferences for part-time work near the home—conditions that characterize the agricultural labor market but not the urban labor market. As India urbanizes, labor market opportunities matching those criteria are in shorter supply, causing women to leave the labor market or discouraging them from entering in the first place. Similarly, we provide a nuanced explanation of women's mobility and permissions, showing substantial variation in who can move outside the home, where they can go, and from whom they must obtain permission. We also show that marriage inequalities can affect gender preferences in surprising ways. Thus, the key explanations about gender inequality that emerge from our study are rooted in the interaction of multiple factors with each other.

Case selection

According to the 2011 Census, the "Hindi belt" — the region in India in which majority of the population speaks the Hindi language as its mother tongue — had a population of a little over 562 million, account for nearly half of the country's inhabitants. At the same time, only 24 percent of the Hindi belt lives in urban areas, well below the all-India average of 31 percent, according to the 2011 Census.

While, the Hindi belt as a whole remains a laggard in terms of urbanization, and economic development more generally, there is significant variation in economic dynamism across the region. Most importantly, with respect to the focus of this study, the Hindi belt possesses the lowest rates of FLFP. The Hindi belt is, thus, a particularly interesting region in which to understand the complicated interplay between urbanization, economic growth, and gender inequalities.

In this study, we examine four urban clusters: Dhanbad, Indore, Patna, and Varanasi. While these four urban clusters plausibly differ along many dimensions, our basis of case selection was urban age. Both Patna and Varanasi are once bustling cities that have lost much of their industrial past. As ancient cities on the banks of the Ganges river, their histories extending over multiple millennia provide both rich resources to draw from as well as make the prospects for rapid improvements in their weak infrastructure more daunting.

On the other hand, Dhanbad and Indore saw rapid economic rise in the 20th century, particularly after India's independence, although their core economic activities—finance and trading in Indore, and mining and steel in Dhanbad—are very different. These differences have contributed to radically different urban growth rates, with Indore being the fastest growing urban area in the sample in recent years and Dhanbad the slowest. The differences between these urban clusters of study allow us to unpack variations in gender inequalities across different economic conditions.

It is also important to note that these urban clusters have formed around so-called "tier-2" cities in India—reasonably large urban agglomerations with rural areas—with populations of approximately 1 to 2 million in the core city according to the 2011 Indian Census. India's tier-2 cities are important as they are large enough cities to draw labor from surrounding areas, but they are not major destinations for migrants all across India like the "megacities" of Ahmedabad, Bengaluru, Chennai, Delhi, Hyderabad, Kolkata, Mumbai, and Pune. These cities are therefore natural locations to assess the impacts of (often haphazard) urbanization without major selection effects on the population due to high in-migration.

Sampling urban clusters

In order to study preferences to enter the labor force for women, the principal investigators have undertaken surveys of intra-household inequalities by gender and female labor force participation in the urban clusters of Dhanbad, Indore, Patna, and Varanasi. In each urban cluster, we aimed to sample approximately 3000-3500 households.

An urban cluster consists of a core major (census-defined) city and surrounding areas that constitute the periphery of the city. In this study, we define an urban cluster as all locations within two hours travel distance—by driving time, according to standard Google transportation algorithms—of the center point of the major census-defined city. Our previous experience, as detailed above, has shown that administrative and census definitions of urban and rural space can be highly inconsistent and prone to political manipulation. Furthermore, those living in reasonable proximity to a city cannot often be easily classified as residing in an urban or rural

space. It is common (as our data will show) for families to engage in "mixed" economic strategies with certain household members tending to agriculture while others are engaged in labor or business in the city.

Our definition of an urban cluster captures the core city, small urban areas in the periphery, as well as peri-urban villages that are plausibly economically dependent upon the city. The most peripheral of areas display significant agricultural activity. As such, we imagine that our definition of an urban cluster captures a complete "rural to urban gradient" around the city.

We used the polling booth area as the basis for our sample collection. Each polling booth area contains an average of 1000 voters and 200-400 households. The Election Commission of India (ECI) publishes electoral rolls which reveal the geographic boundaries polling booth areas. In order to generate polling booth areas consistent with an urban cluster, we used an iterative process. We sampled polling booths at random from a large area surrounding the core city and then mapped the polling booth areas. Those areas that did not meet the inclusion criteria (not within 2 hours of the center point) were dropped. We repeated the same randomization and inclusion procedure until we reached a target number of polling booth areas.

The outcome of this procedure was a set of polling booth areas located within our urban cluster boundaries. Because polling booth areas are defined by (voting) population size and not area, the distribution of sampled polling booths hews closely to the distribution of population density across the cluster.

Sampling households and respondents

In order to understand intra-household inequalities, we sought to interview the (typically male) primary wage earner (PWE) and a randomly-selected working age female (aged 18-59) in each household.[1] We were particularly focused on making sure that we sampled a working-age female for each household in our sample, even if we could not reach the PWE. In order to do so, we used the following protocol:

1. In each household, enumerate working-age females from youngest to oldest.
2. Use a Kish table to sample the female respondent. If the sampled person is not available, use a Kish table for the replacement.
3. If a female is not selected in step 2, then drop the household.
4. If the household is kept, then sample the PWE in the household

This protocol meant that we sampled a number of household in which we only spoke to a working-age female but could not reach the PWE. In total, we reached a total of 13,770

[1] We note that in India an individual may be of working age from 15 years of age, but we did not interview any person under the age of 18 due to ethical reasons.

households across our 4 sites of study (all with a working-age female). Of those households, we reached a male PWE in 12,579 households (91%).

Sample particulars

Table 1 provides some basic sample characteristics for the data used in this report.

Table 1: Sample demographics

	Dhanbad	Indore	Patna	Varanasi
Hindu (%)	82	88	93	91
Muslim (%)	16	11	7	9
Scheduled Caste (%)	19	19	24	32
Scheduled Tribe (%)	9	12	3	4
Other Backward Class (%)	54	54	42	50
Average Household Size	4.9	4.8	5.3	5.9
Average Age (Female Respondent)	35	36	36	36
Average Age (Male PWE)	43	40	44	44
Employed Female Respondent (%)	14	21	23	19
Employed Male PWE (%)	94	84	93	96
Both Female and Male PWE (Number of HH)	3237	2854	3041	3447
Total Sample (Number of HH)	3540	3228	3495	3507

Survey instrument

The survey features three separate questionnaires in addition to a module on time use. Each of the three questionnaires—household, male primary respondent, and female primary respondent—is further subdivided into separate modules.

The household questionnaire was administered to either the male or female primary respondent, depending on their availability. Because the aim was to ensure the most accurate representation of the household's demographics and characteristics, other household members who may have been present were allowed to help complete the common household questionnaire. The household questionnaire captured basic information on: membership and composition of the household, background socio-economic characteristics, migration and remittances, ownership of common household assets, experience with economic shocks and

associated coping mechanisms, availability to basic public services, and access to government welfare benefits.

The male and female primary respondent questionnaires were nearly identical with a few notable exceptions. The male and female instruments were administrated to a male primary respondent between the ages of 18-60 (ideally the primary wage earner) and a female primary respondent in the same age range. Enumerators sought to interview the male or female respondent on their own to avoid the risk of social desirability bias or coercion. The female instrument contained twelve modules on:

- formal and vocational education
- employment
- workplace conditions (for those working outside of the home)
- intra-household decision making
- safety and physical mobility
- perceptions on women's employment
- family background (related to education, employment, and language)
- childcare
- financial access, savings, and credit behavior
- voting practices
- information and social media use
- political attitudes and polarization

The male instrument mirrored the female instrument with three exceptions. First, the male instrument contained an additional block of questions about the female primary respondent's employment status. Second, it replicated the module on intra-household decision making but adapted the framing of the questions such that men were asked about the female primary respondent. Third, the male instrument did not contain a separate childcare module.

The final questionnaire contained a time use survey that was administered to both male and female primary respondents. For logistical reasons and to limit the length of the survey, the module asked about respondents' activities during a 24-hour period (yesterday or the last typical day) by using meals as key milestones throughout the day. Then, respondents were asked to enumerate their activities in between those milestones.

Background on cities

History

The four cities in our sample are each located in four different states. Two of them—Patna and Varanasi—are two of the world's oldest continuously inhabited cities, stretching over nearly three millennia. Patna's principal economic ballast comes from its status as the capital of the state of Bihar, with government jobs the principal well-paying formal sector jobs (and, hence, acutely coveted).

In the case of Varanasi, its pilgrimage status had made it a major tourist destination for both domestic and foreign tourists, and the attendant service sector jobs are its major economic drivers. It has one large public sector manufacturing (Diesel Locomotive Works) and rich traditional artisan and crafts industries, but some of them (e.g. the Banarsi sari) have seen declining fortunes.

Indore is a relatively younger city dating to the 16th century. It was part of the princely Holkar state and, after its merger into the Indian Union, it was briefly the summer capital of the state of Madhya Bharat. Following the reorganization of Indian states in 1956 and the emergence of the state of Madhya Pradesh, the state capital moved to Bhopal and Indore emerged as the state's commercial capital.

The youngest city in the sample is Dhanbad whose history is less than a century old. Its rise was largely due to the discovery of rich deposits of coal in the proximity of the city. Two coal public sector units (PSUs)—Eastern Coalfields and Bharat Coking Coal—are the city's largest employers. As is often the case with mining and minerals, there is evidence that they have ushered in a local "resource curse." Dhanbad has long been plagued with a "coal mafia" and the related gang wars and violence (memorably captured in the film "Gangs of a Wasseypur," a locality in the city) has undoubtedly stymied the city's growth.

Another noteworthy feature of three of these cities is a substantial higher education infrastructure. Indore has seen the establishment of a large number of higher education institutions in recent years (including a new Indian Institute of Technology [IIT] and Indian Institute of Management [IIM]), and the large supply of human capital has likely contributed to the city's greater economic dynamism. The presence of Banaras Hindu University in Varanasi, a large well-regarded federal university with a major medical center and an IIT, provides the city with its largest employer. While Patna University was once a major center of learning in the state, it has fallen on hard times since at least the 1970s and is today more a symbol of the city's absence of dynamism rather than a possible engine of growth. Dhanbad is the only one of the four cities without a substantial higher education infrastructure.

Economic dynamism

In the absence of direct economic measures, the report uses three variables—population, built up land area, and night lights—to measure the relative economic dynamism of the four cities. The data are all sourced from satellite imagery. For instance, the population numbers are from the Gridded Population of the World v4 dataset, although we also refer to official Census data.[2]

[2] We very are grateful to Dawson Verley for his help in compiling this data.

Population

In 2001, Patna was the largest of the four cities (with a population of around 1.7 million people living in the urban agglomeration of Patna), due in part to its long history and its status as the capital of Bihar (Table 2). Indore, with 1.5 million people, was the second largest city in our sample. In the two decades since, Indore has enjoyed the highest growth and, as of 2011, was the most populous city in the sample with a population 2.2 million compared to Patna's 2 million. Although Patna's population has also grown, it is likely that, in the aftermath of the bifurcation of Bihar in 2000, the state had few industrial clusters left (which were all located in the new state of Jharkhand). This, together with the state's continued rapid population growth (the highest in India), and improvements in the state's economy—especially after 2010—have led to the city's expansion.

Table 2: Census population of sample cities, 2001-2011

Urban agglomeration	2001	2011
Patna	1,697,976	2,049,156
Varanasi	1,203,961	1,432,280
Indore	1,506,062	2,170,295
Dhanbad	1,065,327	1,196,214

Source: Census of India, 2001 and 2011

Like Patna, Varanasi is one of India's oldest cities, but grew less rapidly in this period; it added just over 200,000 inhabitants to its population in the decade between 2001 and 2011. Unlike Patna, which is more than four times larger than the next biggest city in Bihar (Gaya), Varanasi is the sixth largest city in the state of Uttar Pradesh (after Lucknow, Kanpur, Ghaziabad, Agra, and Meerut). While Uttar Pradesh's economy has been anemic, its population growth rate is one of India's highest, which is likely the principal driver of Varanasi's population growth. However, since 2015, the city has emerged as the Prime Minister's constituency, and concomitant new investments have given the city new momentum.

Dhanbad is the second largest city in the state of Jharkhand, sandwiched between the industrial city of Jamshedpur and the state capital, Ranchi. This might be a reason why it has had the lowest population growth among the four cities in our sample.

One gets a different impression of the four cities in our sample if one refers to population estimates derived from census data calculated through 1 km. grid cells, as captured by satellite imagery. This dataset, compiled by NASA, distributes population data from census and

administrative units to 30 arc-second (approximately 1 km.) grid cells.[3] According to this data, both the levels and growth of urbanization are notably higher. As of 2010, Patna had the largest population (4.6 million), more than twice as large as Indore. And, by 2020, that gap had not closed much despite higher growth in the latter.

Table 3: Gridded population, 2000-2020
(x1000)

Year	Dhanbad	Patna	Indore	Varanasi
2000	2,309	3,717	1,616	3,285
2005	2,446	4,139	1,863	3,559
2010	2,591	4,609	2,147	3,856
2015	2,745	5,133	2,475	4,177
2020	2,908	5,716	2,853	4,526
Growth (%) 2000-2020	20.6	35	43.4	27.4

Source: NASA, Gridded Population of the World (GPW) v4.

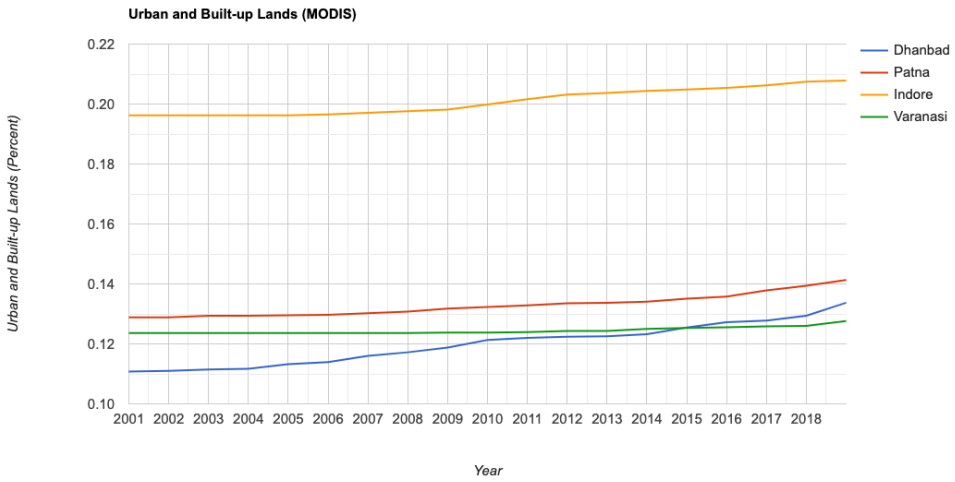
Land

One sees a somewhat different picture using data on built-up land-area (Figure 3).[4] Here we see the maximum expansion in the case of Dhanbad (albeit from a low base), with Varanasi stagnating. Indore, which already had the largest land footprint has further expanded while Patna has seen an uptick in more recent years.

[3] According to source documentation, population input data are collected at the most detailed spatial resolution available from the results of the 2010 round of censuses, which occurred between 2005 and 2014. For India, this would be the 2011 Census. Furthermore, the input data are extrapolated to produce population estimates for each modeled year. For more information, visit: https://sedac.ciesin.columbia.edu/data/set/gpw-v4-population-density-rev11/docs.

[4] More information on the built-up land measure can be found here: https://lpdaac.usgs.gov/products/mcd12q1v006/.

Figure 2: Built-up land, 2001-2018



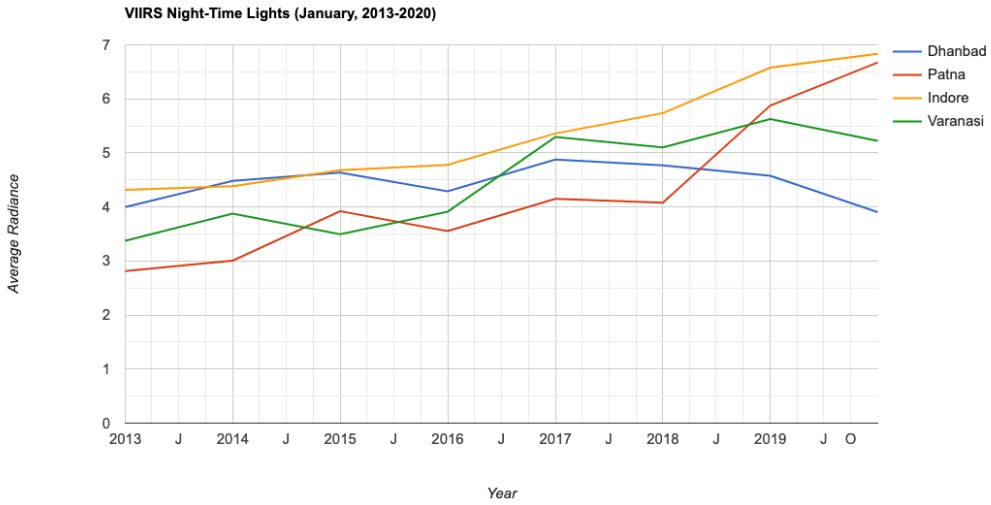
Source: NASA, MODIS Land Cover Type (MCD12Q1) v6.

Night lights

Another indicator of economic dynamism is the intensity of night-light data.[5] Figure 3 plots data for the average radiance in the month of January from 2013-2020. The dominance of Indore over the period is clear. Patna which was had the lowest radiance in 2013 has sharply improved, especially in the last two years. Dhanbad on the other had has almost no change in this period in contrast to the other three cities.

[5] Background on the night lights data is here: https://eogdata.mines.edu/download_dnb_composites.html.

Figure 3: Night lights data, 2013-2019



Source: Earth Observation Group, VIIRS Day/Night Band Nighttime Lights v1

Outline of report

This report contains four substantive chapters.

Chapter 2 examines the predictors of women's employment outside of the home. Previous research has shown that many women in India must negotiate difficult trade-offs between working outside of the home and managing onerous responsibilities inside the home. This chapter employs a survey experiment to disentangle the relative impact of proximity of a suitable job, a negative income shock, and extra assistance in the home on willingness to enter the labor force

Chapter 3 focuses on the issue of women's agency within the household. In particular, it look at a range of household decisions that provide variation across decision types and domains of decision-making. The key question the chapter grapples with is whether employment—defined in multiple ways—is associated with the extent to which women are successfully able to shape those decisions.

Chapter 4 looks at women's agency outside, rather than inside, of the household. This chapter examines women's mobility as function of household factors, specifically a woman's relationship to the household head and its urban/rural location. The chapter assesses mobility with respect to a range of destinations outside the home in order to capture the heterogeneity across examples.
Chapter 5 takes as its starting point the robust debate over the "true" level of female labor force participation in India. In recent years, a diverse array of scholars have argued that official government statistics—based on large-scale sample surveys—do not capture the full picture of

women's employment. This chapter delves into this issue by comparing three sources of data on women's labor market behavior—a household roster, a detailed survey instrument, and a time-use survey. Leveraging this granular data, the chapter examines shortcomings stemming from concerns about data validity and data accuracy. Data validity refers to the relationship between theoretical concepts and collected information. Data accuracy is about the correctness or avoidance of errors in the data and the chapter explores two principal sources of error: measurement error and reporting error.

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Chapter 2: Why Is Female Labor Force Participation So Low in India?

Deepaboli Chatterjee and Neelanjan Sircar

Introduction

According to the International Labour Organisation, female labor force participation in India dropped from 35 percent in 1990 to 27 percent in 2014. The gender gap in labor force participation in 2014 was 53 percentage points, and urban female labor force participation in India has all but stagnated for the last two decades.

This has occurred in a context of rising per capita income, which accelerated in India from the 1990s onward, as well as a significant reduction in fertility rates. Indeed, standard economic theory predicts that as countries move from lower income to middle income, like India, women leave the workforce as there is less need to engage in the most arduous forms of labor, like agriculture and brick kilns, for a little bit of extra money. As incomes rise sufficiently, it is argued that women are offered white collar jobs and enter back into the labor force, as in the West.

But India's numbers are far worse than what standard theories might predict. A recent World Bank report found that India is ranked 121st out of 131 countries in the female labor force participation rate, and worse than all of its neighbors. In fact, Sri Lanka's female labor force participation stabilized around 35 percent decades ago, and Bangladesh consistently demonstrates well over 35 percent female labor force participation – and, according to the latest estimates, Pakistan's female labor force participation rate is now slightly higher than that of India.

In the coming years, India will face enormous challenges in generating a sufficiently skilled work- force to sustain and enhance economic growth. India seeks to reap the benefits of a "demographic dividend," a period over which a very large share of the population will be of working age due to recently increasing life expectancies and lower fertility rates. This increased labor force has the ability to provide a big push to economic well-being and development in India, but lagging educational and health outcomes threaten to prevent the labor force from acquiring sufficient skills to unlock these potential gains (Chandrasekhar, Ghosh and Roychowdhury, 2006). More to the point, without serious intervention, the continued education gaps between men and women and poor integration of women into the skilled labor force will likely attenuate the positive impacts of India's demographic dividend (Desai, 2010).

The challenges of integrating women into the labor force will only become more apparent as India continues to urbanize. From 2001-2011, the urban population growth rate was 2.4 times that of the rural population growth rate in India, significantly higher than any other decadal urban-rural population growth ratio in India's history. We only expect this process to accelerate. India is expected to see its urban population rise from 338 million in 2010 to 875 million in 2050, with the increase of 497 million between 2010 and 2050 the largest projected growth in urban population in world history.

In order to grapple with nuances of women's engagement in the labor market in India, we argue for a re-thinking of the core models that undergird the study of female labor force participation. The standard literature poses a false binary between working and not working, but this characterization does is not amenable to work near the home, like agriculture or types of part-time work, which makes up the bulk of women's labor in India. Our intervention is to understand a woman's choice to work outside the home as a strategic decision that balances expectations at home with a possible wage outside the home. If the expectations for time at home are sufficiently high then any desire to enter the labor force will necessarily entail work that is either part-time and near the home, whereas full-time work outside the home is untenable. We argue, therefore, a woman's desire to enter the labor force is often "non-monotonic." It is eminently possible that a woman prefers to have part-time work to not working at all, but would rather leave the labor force instead of working full-time. Our core insight is that because a lot of women state a preference for part-time work, travelling time to work (and back) – as it forces a decision between full-time work and not working at all – generates the conditions for a larger number of women to leave the labor market.

In this paper, we analyze preferences among women who are currently unemployed to enter the labor force through a survey experiment in the vicinity of the Indian cities of Dhanbad, Indore, Patna and Varanasi. Our results are striking – women are 12 to 23 percentage points less likely to express a preference to take up a suitable job if they have to travel one hour to work. The magnitude of these effects are far greater than the impact of the primary wage earner of the household losing his/her job or other family members coming to assist the woman in household duties. This suggests that the impact of distance concerns for women on preferences to enter the labor market may be more severe than is commonly assumed, even more than income effects and lack of assistance at home – the major economic explanations for why women choose to leave the labor force.

While India's performance on integrating women into the labor force is particularly poor, a careful analysis of preferences to enter the labor force is helpful for general theory in two ways. First, it takes complicated factors in the decision to enter labor force seriously – from incomes to social stigma to patriarchal norms to difficulty of movement. By modeling the complexity of the choice, and the relative contribution of various factors in obstructing entry into the labor force, one can ascertain a deeper understanding of how much social and political factors affect labor markets. Second, this paper contributes to an increasingly vibrant literature on the role of personal networks and mobility in engendering positive social, political and economic outcomes (Borker, 2018; Kruks-Wisner, 2018; Prillaman, 2019; Vyborny et al., 2019), especially in South Asia.

Section 2 reviews major theories of female labor force participation and develops a simple model and key hypotheses. Section 3 describes the study design. Section 4 presents data to characterize women's work and their willingness to work, and section 5 describes the results of a survey experiment to distinguish between the relative impact on women of traveling great

distances, lack of assistance at home and income in choosing to opt out of the labor force. Section 6 concludes the paper.

Female Labor Force Participation

At the outset, it is important to note that our understanding of female labor force participation (FLFP) must necessarily encompass a broad swathe of economic activities and opportunities. Labor force participation may be "formal" or "informal," given that most labor in a country like India is engaged in informal sectors. Labor force participation may also include entrepreneurship activities, from operating stores and food stalls to trading. Given our focus on urbanization, entrepreneurship will take on an increasingly large role in our understanding of "economic opportunity" for women. Nonetheless, it is important to make a distinction between FLFP in the home and outside the home. The opportunity to engage in economic activity outside the home increases the marginal value of employment, and it is also more likely to break discriminatory gender norms that coerce women to stay at home. The ability and opportunity to work outside the home will, thus, be an important outcome in our analyses. It should, however, be noted that women are often engaged in "money-saving" activities from tending to a family store to providing other labor assistance for family members without pay (Deshpande and Kabeer, 2019). These do not show up as labor force participation, even though they are de facto money-generating for the family.

Declining FLFP during periods of economic growth is not in and itself a surprising phenomenon, as it has been noted in a number of contexts (Goldin, 1995). From an economic perspective, a woman's decision to participate in the labor force is broadly viewed as a consequence of evaluating two tradeoffs. First, as aggregate household income increases the marginal benefit of entering the labor force is thought to decrease; that is, if there is sufficient money in the household, there are weaker incentives to get a job. Second, the incentive to join the labor force decreases as the opportunity costs (psychic or financial) of leaving home increase; that is, if it is particularly difficult to carry out necessary tasks at home while working, an individual should be less likely to work a job outside the home.

The foundational work of Goldin (1995) posits a "U-shaped" FLFP rate as a function of economic development, owing to the interaction between the income tradeoff and social status. Under this theory, when countries are poor, women with low human capital must enter the informal sector in "low status" jobs due to financial pressures. When household incomes rise, women choose to leave the labor force to avoid low status work. Once the human capital of women rises, they re-enter the labor force in high status jobs. Thus, existing economic theory offers a reasonable explanation as to why FLFP might initially drop as the Indian economy grows. Indeed, some recent studies find empirical support for an "income effect" in decreasing FLFP and a U-shaped FLFP curve in India (Mammen and Paxson, 2000; Klasen and Pieters, 2015)[6]. The channeling of women

[6] We note here that a number of factors, such as the age at which women engage child-rearing and exit/re-enter the workforce, may factor into these phenomena as well. However, this remains understudied.

into low status jobs is also consistent with evidence that FLFP in India is highest in areas were women's human capital is low, and where gender inequality in human capital is the greatest (Sundaram and Vanneman, 2008).

A second source of impact on FLFP is the changing nature of the relative benefits/costs of working outside of home vis-à-vis staying at home (outside the labor force). Declining FLFP may result from structural changes in the marriage market. For instance, Klasen and Pieters (2015) argue that increasing education gaps between husband and wife due to less education-selective marriages than the past has resulted in reduced FLFP. At the same time, decisions about a woman's age of marriage, and the attributes of the marriage entered into, are likely a function of the labor force participation of single women (Jensen, 2012). Another source of variation is the perceived increase in short-term or circular migration among males. As men leave home for work, women may have an increased pressure to stay at home and may choose to opt out of the labor market. Furthermore, as countries develop, families become much more "nuclear" in nature and there are fewer family members to help in household duties. This changing nature of help with household duties is what we call the "assistance effect."

The Crucial Role of Proximity

But these existing economic theories may not alone be sufficient to explain FLFP; the sheer magnitude of the drop in FLFP and gap in participation between men and women in a country like India makes it a laggard among countries with similar levels of economic development. This suggests that there are serious rigidities in the existing labor market, from outright discrimination against women to social stigmas of working in particular jobs and other social barriers to female entry into the labor force (e.g., safety) that demand study.
Of particular concern is the extent to which women are incorporated into the urban labor market. As the rural-urban wage gap widens, there are increasing economic incentives to enter the urban labor market (and decreasing incentives to participate in the rural labor market) – what economists refer to as "own-wage elasticity." In order to gain purchase on these issues, one must first characterize local labor markets and the interplay between the urban and rural markets. In other countries, an urban transition typically negatively impacts FLFP. In plain language, this means that as rural incomes rise, women prefer not to do the backbreaking work of agricultural labor. Yet, typically women do not immediately enter back into the urban labor market.

These urban biases are likely to be driven by a number of factors, including the difficulty of travel to and within urban contexts, the lack of safety in certain urban areas, and social stigmas associated with certain occupations that particularly prevalent in the urban labor market, e.g., construction or manufacturing. Of course, India will continue to have to address pernicious patriarchal norms that prevent women from entering the labor force. As our data will show, despite these patriarchal norms, women themselves are quite willing to work (and the men in

the household are supportive of it).[7] While safe and efficient transport and social stigma remain barriers to movement for women in India, similar observations can be made about a number of developing country contexts with substantially greater FLFP. Rather, we focus on the social and structural factors that comprise a "suitable job" for women.

We focus on the pressures to take care of household duties, which generate incentives for part-time work near the home. This is not just about the time spent carrying out such duties, but the expectation that certain women in the house (e.g., mothers) must carry out such duties. In rural India, agricultural work is typically near the home, so there is a natural source for female employment – and it is still the largest source of employment for women today (Afridi, Dinkelman and Mahajan, 2016). Even in non-farm work, rural India has demonstrated the capacity to employ women. For instance, more women than men availed of the opportunities provided by the National Rural Employment Guarantee Scheme (NREGS) – often small infrastructural work near the village. There are some common reasons for this pattern. First, women often say that they prefer work near the home so they can tend to household duties when necessary. Second, a number of women may see more productive gains in certain household tasks like educating their children in a low wage environment (Afridi, Dinkelman and Mahajan, 2016). Finally, it may be very difficult to travel great distances from the home safely for work, and there is often a social stigma placed on women who spend a lot of time outside of the home. Intellectually, it is important to grapple with these various explanations when we seek to understand low mobility outside the home.

Fundamentally, this is not only an economic problem; it is also a political problem – as gender inequality in the household, and society in general, manifests itself in terms of policy that is less than optimal for women (Khan, 2019). The role of mobility in engendering better outcomes on a host of political and educational outcomes has been the topic of a number of recent studies (Borker, 2018; Kruks-Wisner, 2018; Prillaman, 2019; Vyborny et al., 2019). For the reasons described above, it seems natural to extend this framework for the challenges of female labor force participation. In this article, we will show that there is a particularly strong relationship between the distance one must travel away from home and the willingness to work. The challenges that this relationship poses for labor force participation need to be addressed in policy work.

Model

We envision a world in women face a tradeoff between working in a directly income-generating activity and staying at home to do a fixed amount of work. The fewer hours the individual has at her disposal to complete work at home, the more burdensome it is for her. However, she may be willing to move away from duties at home if she is compensated adequately in the income-generating activity.

[7] This is also the core finding in recent work analyzing the National Sample Survey (NSS) with respect to FLFP (Fletcher, Pande and Moore, 2017).

Let individual i have the opportunity to work for hourly wage w with a fixed amount of work C at home. We note that amount of work at home C, while it may not be directly income-generating, may be money-saving or otherwise impact the consumption and income levels of the household (Deshpande and Kabeer, 2019). A number of models of intra-household decision-making vis-à- vis gender (Chiappori and Ekeland, 2011) incorporate notions of aggregate family welfare into individual decisions of females and intra-household allocation. This term implicitly makes the same assumption.

Let us further imagine that individual i spends a minimum of k > 0 hours at home, but can allocate n hours between time at home and in the income generating activity. We let $x \in [0, n]$ be the number of hours allocated to directly income-generating activities with wage w. We also let the aggregate amount of effort needed for housework to be inversely proportional to the number of hours at home, $n + k - x$. Our simplified model assesses the tradeoff between entering the directly income-generating labor market and the extra costs (in terms of effort) from having fewer hours at home. In particular, we consider a simplified utility function, Ui, of the form:

$$U_i(x) = wx - \frac{C}{n+k-x} \tag{2.1}$$

The first derivative is given by:

$$U_i'(x) = w - \frac{C}{(n+k-x)^2} \tag{2.2}$$

Evidently, individual i will opt for a full-time job if the wage (vis-à-vis work at home C) is sufficiently high and if there are enough hours n to potentially commit to a direct income-generating activity. This occurs when the following condition is met:

$$w \geq \frac{C}{k^2} \tag{2.3}$$

Alternatively, if the amount of work at home is too onerous and if there aren't sufficiently many hours to devote to working on a directly income-generating activity, then individual i opts not to enter the labor market altogether. This occurs when the following condition is met:

$$w \leq \frac{C}{(n+k)^2} \tag{2.4}$$

When both of the above conditions fail, namely when $(C (n + k)^2 < w < C$, individuals may choose to work "part-time," i.e., choose a level for x such that x < n. Intuitively, the number of hours to work part-time is a function of the number of hours one can plausibly work in a directly income- generating activity (n) and the relative scales of wage (w) and work at home (C). To see this, note the first order condition is given by:

$$x = n + k - \sqrt{\frac{C}{w}} \tag{2.5}$$

Note now, that although individual i prefers to work x hours given the opportunity to work part-time, she will opt out of the labor market rather than work full time if only given those two choices when:

$$\frac{C}{(n+k)^2} < w < \frac{C}{(n+k)k} \tag{2.6}$$

Similarly, she will opt for full-time work if only given these two choices, even though she prefers part-time work, when:

$$\frac{C}{(n+k)k} \leq w < \frac{C}{k^2} \tag{2.7}$$

This shows conclusively that when condition (2.6) is met, then individuals may prefer part-time work but choose to leave the labor force if only given a decision between no work and working full-time.

A More Complete Utility Function

Above, we described how a simplified utility function encapsulating the tradeoffs between n, C, and w can capture important dynamics of the decision to enter the labor market, whether part-time or full-time. We now consider a more complete utility function that accounts for income in the household, others helping in the household, the distance to work (our key parameter of interest), and a more complicated benefit-cost relationship to work in the home.

Let I denote existing household income. Consistent with the model of maximizing over total household income instead of individual income, we consider an aggregate household income from joining the labor force of $\alpha \log(I) + \frac{w}{I^\alpha} x$ (a first order Taylor approximation to $\log(I^\alpha + wx)$, an increasing concave function, expanded around zero) where $\alpha \geq 0$ is a parameter that denotes how much existing household income affects the labor market decision.

We let h > 1 be a measure of household assistance, and let $\frac{1}{h^{\beta}}$ ' denote how much the household work, C, is decreased as a function of incoming help where β ≥ 0 is a parameter denoting how much this help matters in determining household work.

Finally, we consider distance d which structures the employment decision in two ways. First, it adds an additional cost due to travel, X, increasing as a function of d. Second, it necessarily decreases number of hours you spend at home by (a function of) d. We let the impact of distance on perceived hours to do housework as γd, where γ ≥ 0 denotes how much distance to work exacerbates effort for work in the household.

We also note that in line with Afridi, Dinkelman and Mahajan (2016), we allow individuals to reap positive benefits b for each hour spent in the home. Taking these considerations into account, the individual i maximizes the utility function, Ui(x):

$$U_i(x) = \alpha \log(I) + \frac{w}{I^{\alpha}}x + b(n-x) - \frac{C}{h^{\beta}(n+k-(x+\gamma d))} - X(d) \tag{2.8}$$

The first derivative is given by:

$$U_i'(x) = \left(\frac{w}{I^{\alpha}} - b\right) - \frac{C}{h^{\beta}(n+k-(x+\gamma d))^2} \tag{2.9}$$

To keep things tractable, we assume k > γd. A person always chooses to enter full-time work if:

$$w \geq I^{\alpha}\left(\frac{C}{h^{\beta}(k-\gamma d)^2} + b\right) \tag{2.10}$$

Comparing to the simple model in (2.3), and assuming α, β, γ > 0, this inequality shows that if the individual comes from a household with greater household income I, must travel a larger distance d, or receives greater benefit from household work, the individual must be compensated with a higher wage. By contrast, greater help in the household, h, implies that i is willing to take a lower wage to enter the labor market full time.

Similarly, the individual will always opt out of the labor market if[8]

$$w \leq I^{\alpha}\left(\frac{C}{h^{\beta}(n+k-\gamma d)^2} + b\right) \tag{2.11}$$

Comparing this to the simple model in (2.4), we see that higher household income, greater benefits from doing household work and less help in the household all make it more likely to opt out of the labor market altogether. Most importantly, greater distance makes opting out far

[8] This condition is derived by taking condition by taking limit as $x \to 0$, which is why *d* shows up in the equation.

more likely.

Finally, when $I^{\alpha}\left(\frac{C}{h^{\beta}(n+k-\gamma d)^2}+b\right) < w < I^{\alpha}\left(\frac{C}{h^{\beta}(k-\gamma d)^2}+b\right)$ the first order condition is given by:

$$x = n + k - \sqrt{\frac{CI^{\alpha}}{h^{\beta}(w - bI^{\alpha})}} - \gamma d \tag{2.12}$$

Naturally, the individual is willing to commit fewer hours to work if the distance d is greater and thus overall earnings drop. As above, we can write down a condition in which the person opts to leave the labor market if only offered full-time job and no part-time job. For clarity of exposition, we set X(d) = b = 0. The condition is then given by:

$$\frac{C}{(n+k-\gamma d)^2} < \frac{h^{\beta}w}{I^{\alpha}} < \frac{C}{(n+k-\gamma d)(k-\gamma d)} \tag{2.13}$$

When we consider the fact most women who may plausibly enter the labor market in this context come from poorer households (as described in some detail below), and that household duties are as much about expectation as they are about time, we do not expect labor force decisions to be as strongly impacted by I and h. On the other hand, both the upper and lower bounds (2.13) are quite sensitive to travel – as time for travel directly impacts the ability to do household tasks. This implies travel time, in and of itself, should be impactful for willingness to enter the labor market – either full-time or part-time – as it frees up more hours for work and thus greater earnings.

From the above discussion and this model, we discern three important hypotheses. First, we hypothesize that many women will prefer part-time work and opt out of labor market if such work is unavailable, especially in a context of relatively lower wages. Second, we hypothesize that women in India are responsive to all three of the factors modeled here: household income, assistance at home, and distance to work. Third, given that travel distance plausibly has the strongest impact on opting in/out of the labor market (2.13), we hypothesize that the distance effect will be larger in magnitude than household income or household assistance effects. Thus, we can state the following three hypotheses:

H1. A significant proportion of those who opt out of the labor market prefer part-time work.

H2. Women are responsive to income, distance, and assistance at home in making labor force decisions, and responsiveness to these factors is measured by the parameters α, γ, λ, so we hypothesize $\alpha, \gamma, \lambda > 0$.

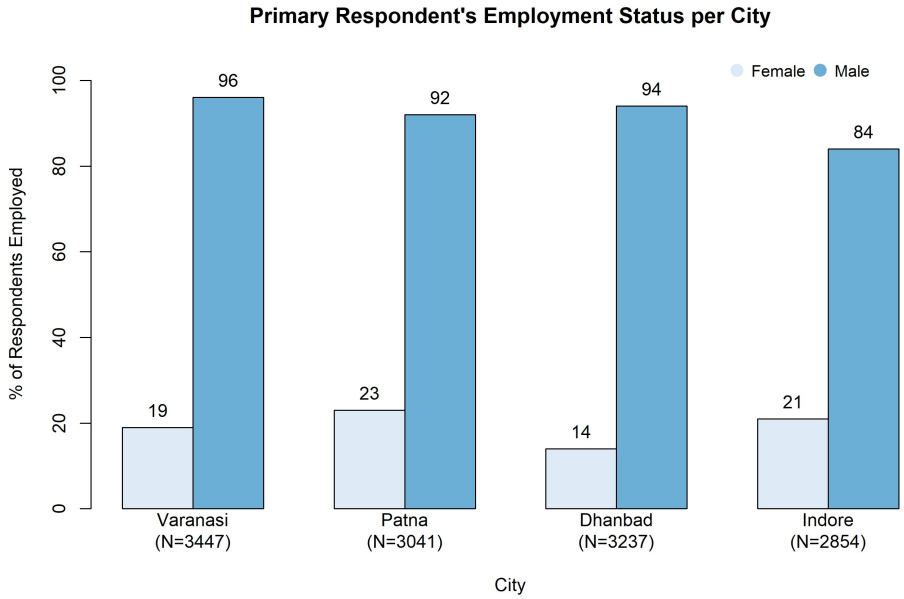
H3. This impact of distance is greatest on labor market decisions, so

$$\left|\frac{\partial U'}{\partial d}\right| > \left|\frac{\partial U'}{\partial h}\right| \;\&\; \left|\frac{\partial U'}{\partial d}\right| > \left|\frac{\partial U'}{\partial I}\right|.$$

Structural Phenomena in the Labor Market

In this section, we provide some aggregate statistics from our data. These data are drawn from household roster data, but rather than calculating the statistics from the roster, we rely on responses from our main respondents for two reasons: (1) people do not always reliably record employment information for other household members; and (2) the randomization protocol means that the male/female comparison is between the primary wage-earning male and a randomly selected working-age female. The differences between these two individuals elucidate intra-household decisions about labor choices.

Figure 1. Female Working Age vs. Primary Wage Earner Comparison



In figure 1, we display this comparison. Female labor force participation is uniformly low in our data, with a particularly low level in and around Dhanbad. To understand this variation, it is useful to break down the working population by type of work (industry), which we can again classify from the household roster data. The classification is shown in figure 2.

Figure 2. Industry of Working Population by Gender

Category	Dhanbad	Indore	Patna	Varanasi
Commerce	8.49	11.96	8.51	9.51
Service	12.03	13.20	6.08	7.45
Skilled Labour	3.77	3.71	1.67	14.90
Semi-Skilled & Unskilled Labour	20.05	7.84	5.17	6.50
Managerial, Administrative, & Clerical	1.42	3.51	1.06	0.63
Lower Professional	14.62	6.39	7.90	6.97
Higher Professional	0.24	0	0.30	0.32
Agriculture	39.39	53.40	69.30	53.72

(a) Females (%)

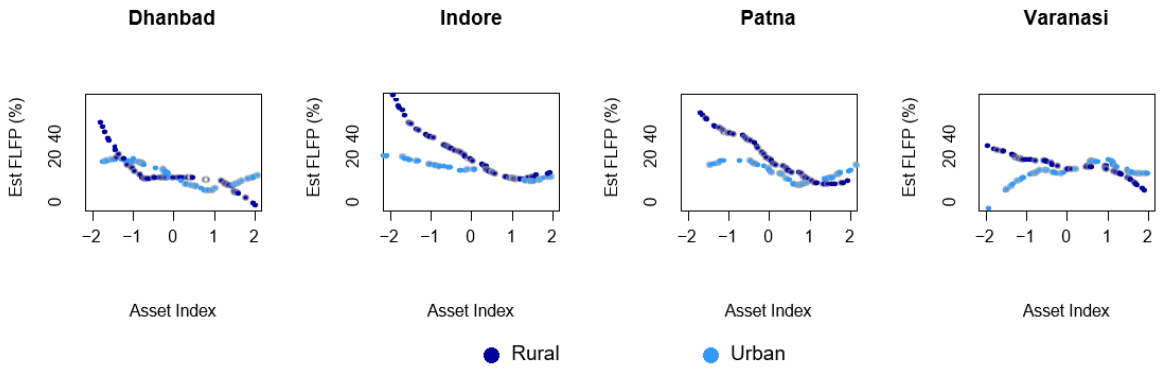
Category	Dhanbad	Indore	Patna	Varanasi
Commerce	14.98	20.40	14.40	18.38
Service	3.07	4.61	3.86	4.20
Skilled Labour	15.41	13.04	11.42	18.95
Semi-Skilled & Unskilled Labour	44.78	19.11	22.34	23.73
Managerial, Administrative, & Clerical	5.30	2.80	2.99	2.81
Lower Professional	5.43	2.97	3.72	2.99
Higher Professional	0.72	1.21	1.19	0.51
Agriculture	10.30	35.86	40.08	27.29

(b) Male Primary Wage Earners (%)

While there is significant variation in the industrial composition of each of our study locations, women are consistently far more employed agriculture as compared to male primary wage earners. Indeed, agriculture is a key driver of female labor force participation outside the home, and the lack of these opportunities in Dhanbad account for some of the low FLFP rates we see in that study location. At the same time, the lack of agricultural opportunities necessarily pushes working women into industries they are typically less numerous. We see a much higher per- centage of women in semi-skilled labor and in lower professional (e.g., technician) categories as compared to the other study locations. A final key point from looking at the data is that while a majority of working women are engaged in agriculture in three cities (and a near majority in Dhanbad), the significantly lower percentage of male primary wage earners in these industries suggests households that are mixed in terms of occupational specification (not purely agricultural and non-agricultural). It also speaks to the structural challenges faced by women in entering the urban non-agricultural labor market – not only do women face restrictions due to poor infrastructure and safety in cities but household allocation of labor is likely to be an obstruction to women entering non-agricultural jobs. This complicated structure of work is one of the real benefits of our sampling approach in moving away from urban/rural binaries in sampling.

In order to understand the role of rural-urban transitions in structuring the labor market for women, we used official administrative classifications of urban and rural localities across our sample. We then plotted, using LOESS curves, the likelihood that a woman enters the labor force as a function of the asset index (see methods note) in each study location. This is shown in figure 3.

Figure 3. Urban/Rural FLFP by Asset Wealth Across Cities



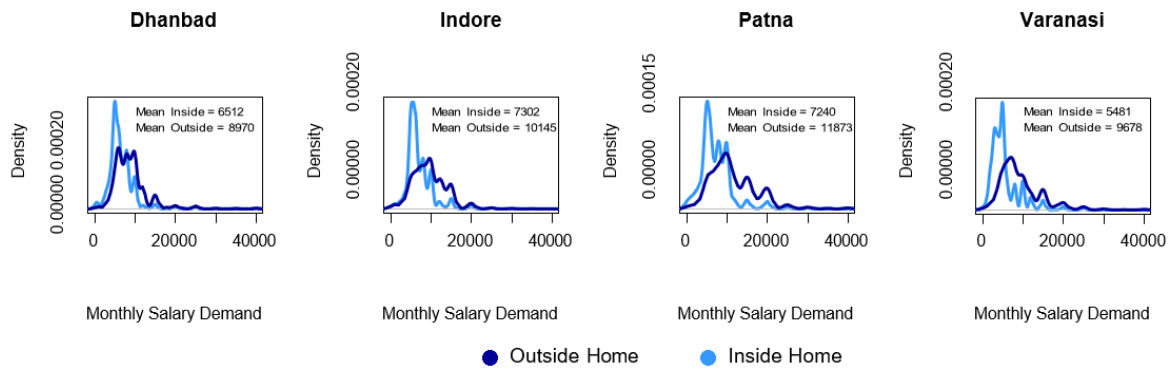
There are several key points with respect to urban-rural transitions that one can glean from figure 3. First, as we suggested above, rural areas consistently show higher levels of labor force participation for the poorest households (the one possible exception in Dhanbad, with overall low levels of agricultural work). Yet, as the wealth grows, the female labor force participation rate in rural areas converges to that of urban areas. This suggests the dearth of any opportunity for women beyond agricultural work, which women (or households) opt out of when incomes are higher consistent with the model above. In fact, for the richest households in 3 cities (Dhanbad, Patna, Varanasi) the wealthiest households actually display slightly higher female labor force participation. This suggests that women with sufficient wealth (and human capital) have greater opportunity for skilled, white collar work in urban contexts – even if the overall levels remain quite low.

Labor Market Decisions

The approach in section 2 was based around how women make decisions to enter or opt out of the labor market. We explicitly included "household concerns" into the decision-making process by basing the decision on aggregate household income and work that is to be done in the household (irrespective of entering the labor market). Our key insight was that it is the tradeoff between income to be gained from working and work in the household often created for part-time work. In the event that part-time work is not available, individuals will often opt out of the labor market.

We argued above that perhaps the strongest factor in decisions to enter the labor was the decision to go outside the home. One way to assess whether women perceive working outside to home to entail an economic cost, beyond the cost of travel, is to ascertain how much more money they would demand in wage to offset having to leave home. If indeed, the difference are more than standard costs, then there is evidence that the reduced time at home is seen as costly. In order to see whether traveling outside of the home matters, we asked unemployed women in our sample to tell us how much salary they would demand per month if engaged in a direct income-generating activity within the home versus outside the home. Figure 4 plots the kernel density curves for monthly salary demands within and outside the home across our locations of study.

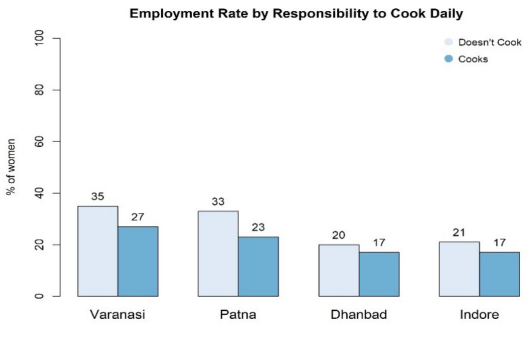
Figure 4. Minimum Income Demanded to Work Inside/Outside the Home Across Cities



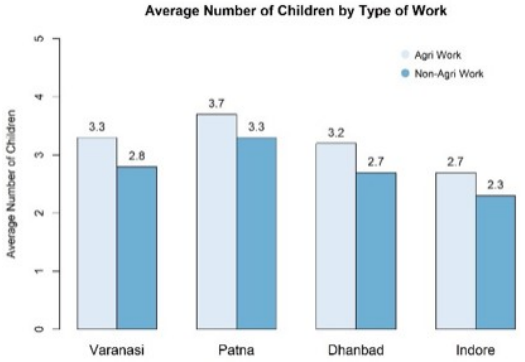
In figure 4, it is noticeable that the average differences in minimum salary range from about Rs. 2500 per month (Dhanbad) to Rs. 4500 per month (Patna). It also worth noting that an average salary of Rs. 9000 or above is well beyond low skilled salary rates in these cities. The gap in demanded salary inside and outside of the home suggests that there are perceived costs beyond those associated with transport and food for working outside the home. Our model suggests that this cost is due to the reduced ability to tend to household tasks.

Indeed, there is a discernible relationship in our data between household duties and labor market outcomes. In figure 5(a), we display labor force participation of the female respondent in our sites of study by whether or not the respondent must cook daily, suggesting higher opting out among women in charge of certain daily tasks. In figure 5(b), we see that those engaged in agricultural occupations have more children on average than those in non-agricultural occupations across our sites of study, consistent with our discussion of the agricultural labor force above

Figure 5. Household Duties and Female Labor Force Decisions



(a) Cooking and FLFP



(b) Agricultural Labor and Number of Children

If our model is right, then we should find a disproportionate number of women willing to enter labor market preferring to part-time work instead of full-time work. Once again, we asked un-employed women whether they would be willing to do a "suitable job" and what kind of contract they would prefer for their jobs. Figure 6 shows that the vast majority of women

affirmatively would like to work, and among them, a significantly higher percentage prefer part-time work. This is consistent with our first hypothesis.

Figure 6. Willingness to Work and Preferred Type of Contract (%)

Category	Dhanbad	Indore	Patna	Varanasi
Regular Full-Time	41	28	38	33
Regular Part-Time	59	65	57	62
Occasional/Casual	0	7	5	5
Stating a Preference for Work	58	52	60	66

In order to check the assumptions of the model, we also asked our unemployed female respondents to explain the reasons for a job and contract that they found suitable. We allowed a large number of answers. Here we segregate two types of answers: (1) those based on earnings and quality of fit which is consistent purely with individual preferences or financial needs; and (2) those based on need to attend to household concerns and proximity consistent with our model of tradeoffs. Respondents were allowed to give multiple reasons. In figure 7, we displayed the percentage of respondents giving each response.

Figure 7: Reasons Given for Suitable Job and Contract (%)

Response	Dhanbad	Indore	Patna	Varanasi
Can Take Care of Things at Home with this Job	33	14	23	21
This Job is Available Nearby	5	16	11	14
Family Supports and Approves of this Job	6	7	10	14
Contribute Financially to Household Income	21	11	23	19
Decent Pay	11	9	6	2
Qualified for this Job	7	8	7	12

In figure 7, we segregated 6 responses into these two categories. We viewed the respondent as giving reasons around concerns of household work if she answered that her reason for a job preference was that: (1) they could take care of things at home; (2) that the job was available nearly; or (3) the family approves of the job. We viewed the respondent as giving financial or individual reasons if she answered that her reason for a job preference was that: (1) it contributed financially to the household; (2) it had decent pay; or (3) she is qualified for the job. Across all of our sites of study, the top reason given was that the respondent would be able to take care of things at home. Furthermore, in each site, the set of concerns consistent with our model were reported more often than those of individual preferences or financial needs. Finally, it is worth noting that in 3 our locations of study, Indore, Patna, and Varanasi, proximity to home was given as the third most popular choice – adding some face validity to our claims.

Disentangling Key Drivers of Preferences

As described in the model in section 2.3, income in the household, assistance from others in household duties, and distance to possible work are all likely determinants of labor force participation for women. But how much? In order to disentangle these effects, we came up with possible manipulations (hypothetical scenarios) that would affect a woman's willingness to do a "suitable job." We decided upon following scenarios upon a base case of the respondent being offered a job in her mohalla (neighborhood). The manipulations are as follows:

- **Income Shock.** The primary wage earner (PWE) permanently loses his/her job
- **Positive Help.** Family members move in to assist with household duties.
- **Distance Effect.** The respondent must travel one hour away for work

The survey experiment was administered to all unemployed respondents. Respondents were randomly select to receive one of 8 possible versions, corresponding to permutations of the 3 manipulations. All randomizations were directly implemented through Open Data Kit (ODK), the program used to conduct the survey. The versions are shown in figure 5.

Figure 8: Eight Possible Scenarios

Versions	PWE	Help	Physical proximity to job opportunity
1	*-*	*-*	*in the neighbourhood*
2	*-*	*-*	*1 hour away*
3	*-*	*Someone comes to help*	*in the neighbourhood*
4	*-*	*Someone comes to help*	*1 hour away*
5	*has to leave work for some reason*	*-*	*in the neighbourhood*
6	*has to leave work for some reason*	*-*	*1 hour away*
7	*has to leave work for some reason*	*Someone comes to help*	*in the neighbourhood*
8	*has to leave work for some reason*	*Someone comes to help*	*1 hour away*

Our core specification simply includes a dummy variable each time the relevant manipulation is included. (We also look at interactions, but they make little difference to the analysis). We denote the manipulations on income, assistance, and distance as D_{inc}, D_{help}, D_{dist}. Let y be an indicator of whether the respondent is willing to take up the job under the given scenario. We estimate:

$$E(y = 1) = \beta 0 + \beta_{inc} * D_{inc} + \beta_{help} * D_{help} + \beta_{dist} * D_{dist} \qquad (5.1)$$

We note here that this regression model directly connects to the model in section 2.3. In particular β_{inc} approximates Δp_L^{inc}, β_{help} approximates Δp_L^{help}, and β_{dist} approximates Δp_L^{dist}. As discussed,

Table 1. Estimation of Survey Experiment Effects

	Dhanbad	Indore	Patna	Varanasi
Distance	-0.233***	-0.146***	-0.163***	-0.123***
	(0.018)	(0.020)	(0.020)	(0.020)
Help	-0.031	0.003	0.022	-0.077***
	(0.018)	(0.020)	(0.020)	(0.020)
Income	-0.047***	0.010	-0.024	-0.012
	(0.018)	(0.020)	(0.020)	(0.020)
Constant	0.478***	0.455***	0.490***	0.520***
	(0.018)	(0.020)	(0.020)	(0.021)
N	2674	2344	2295	2464

* $p < .05$, ** $p < .01$, *** $p < .001$ (two-sided). Data are for all unemployed women in the samples from Patna and Varanasi. The data presented are simple OLS estimates

these quantities implicitly define whether individuals are sensitive to each of these factors (the parameter sα, γ, λ in the model). Table 1 displays the regression results from the specification in (5.1).

Several points are worth nothing from these results. First, consistent with H3, the magnitude of the effect of distance is by far the largest of all the manipulations – with a suitable job 1 hour away causing a 12 to 23 percentage point drop in willingness to enter the labor force. However, unlike hypothesized in H2, the income and assistance effects are not systematically significant. And someone peculiarly the effect assistance is significant in Varanasi, but it seems to be going in the wrong direction; however, it is not significant elsewhere. The income effect is only significant in Dhanbad and nowhere else. As we argued in section 2.2, the structure of labor market decisions is likely to be most sensitive to distance traveled, and poorer households coupled with gendered expectations may attenuate the impact of household income and household assistance on labor market preferences.

These survey experiment results strongly affirm the role of mobility and distance in structuring labor force outcomes. The impact distance is independent of assistance in the household, suggesting a strong role of attending to household duties in structuring labor market outcomes.

Discussion & Policy Implications

The goal of this chapter is to first and foremost analyze India's decreasing female labor force participation. In doing so, we have attempted to take a holistic approach, incorporating social norms, income, household assistance, and movement, in structuring labor market decisions. To provide one example of how our approach differs from other scholarly approaches, let us consider how the role of social norms have been studied in understanding rates of female labor force participation. There is an abundant political economy literature on impact of social norms on women entering the labor force (Jayachandran, 2020) – with focuses on, for instance, attitudes and opportunities for women's financial independence (Field et al., 2016) and misperceptions about the safety of women interacting with other men (Dean and Jayachandran, 2019). But it was worth considering whether we believe we can genuinely explain a drop of over 10 percentage points in female labor force participation in past couple of decades can be pinned on social norms. Do we believe that these patriarchal social norms have become even more pernicious than they were 20 years ago? Or do we believe that differences in norms about financial autonomy or safety can for instance explain the wide variation of female labor force participation across South Asia?

To be sure, we also surmise that social norms, namely the responsibilities at home, significantly dampen female labor force participation. But that is not what has changed over time. With social constraints in tow, we show that women espouse preferences for part-time work near the home? conditions that characterize the agricultural labor market but not the urban labor market. As India urbanizes, labor market opportunities fitting those criteria are in shorter supply, causing women to leave or unwilling to enter the labor market.

This has major policy implications for boosting female labor force participation. While one may hope for transformative changes in economic structure which dramatically boosts wages for women, this does not seem to be on the horizon for India. It is worth noting, however, that due to a textile boom neighboring Bangladesh is one of the few countries in the world where women have higher average wages than men. A prudent road seems to be investing in safe, efficient transport for women in urban spaces. Patriarchal social norms are likely to be slow to diminish in most Indian contexts. In the interim, our research suggests less onerous travel in urban spaces is likely to generate greater incentives of female entry into the labor market.

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Chapter 3. Working Women Enjoy Greater Decision-Making Power at Home: Evidence from North India

Megan Maxwell and Milan Vaishnav

Introduction

There is an emerging consensus in public policy circles that women's empowerment is, as former IMF Managing Director Christine Lagarde puts it, "macro-critical," or vital to a country's long-term health (Lagarde and Solberg, 2018). For instance, boosting women's share of the labour force can have striking, positive impacts on a country's economic growth rate (McKinsey Global Institute, 2015). Reducing gender inequality in society can also serve as an essential step toward tackling rising income inequality in many parts of the world (Gonzales, Jain-Chandra, Kochhar, Newiak, and Zeinullayev, 2015). And there is evidence that suggests that selecting women leaders—in the boardroom and at the ballot box—can have salutary impacts on economic outcomes (Duflo, 2012; Sahay, Cihak, N'Diaye, Barajas, Kyobe, Mitra, Mooi, and Yousefi, 2017).

But economic empowerment can also have wider impacts on the degree of human agency women enjoy. In our context, human agency is a person's "ability to define goals and act on them, to make decisions that matter to them, and to participate in the economy and public life" (Chang, Diaz-Martin, Gopalan, Guarnieri, Jayachandran, and Walsh, 2020). This definition builds on Kabeer's (1999) pioneering conceptualisation, which argues that three interconnected concepts comprise agency: the ability for people to set goals that align with their values; the belief that they can achieve these goals; and the ability to act towards achieving these goals. This article aims to evaluate whether women who work in north India enjoy greater human agency than those who do not work. In a comprehensive review of experimental studies on the subject, Chang et al. (2020) identify four direct indicators of women's agency: "power within" or internal belief in one's self; household decision-making; freedom of movement; and freedom from violence. This article focuses on the second manifestation—women's ability to participate meaningfully in important household decisions—and the variation that exists across cities as well as individual and household-level characteristics.

Existing literature

Cross-country data suggests that, in many developing countries, a significant share of women do not have the final say on critical household purchases or decisions impacting the family (Hanmer and Klugman, 2016). According to the 2015-16 India National Family Health Survey (NFHS), approximately two-thirds of married women (between the ages of 15-49) in India participate in three household decisions (either alone or jointly with their husband): (1) woman's own health care; (2) major household purchases; and (3) visits to the woman's family or relatives. 16 per cent of married women in this age range report not participating in *any* of the three decision categories (International Institute for Population Sciences and ICF, 2017).

Compared to data collected in the previous round of the NFHS (2005-6), women's participation in household decision-making has seen significant improvements over a decade-long period.

However, to what extent does employment explain variation in decision-making agency amongst women? There are multiple reasons why work might be associated with greater women's agency. For starters, increased labour market opportunities can lead to expanded opportunities for women (World Bank, 1995). Second, there is some empirical evidence to suggest that employment boosts women's intra-household bargaining power (Chiappori, 1988, 1992; Heath and Jayachandran, 2018). Third, when women work outside the home specifically (a subset of the category of those who work), they are more likely to be involved in household decisions, and the head of the household is less likely to be the sole decision-maker (Antman, 2014).

Given the intuitive connection between work and women's decision-making agency, it is noteworthy that the empirical evidence on this score is mixed (Donald, Koolwal, Annan, Falb, and Goldstein, 2017). For instance, several studies have found that access to employment is insufficient for increasing women's decision-making power inside their home (Chang et al., 2020; Jensen, 2012; Kotsadam and Villanger, 2019).

In her longitudinal study of Mexican households, Majlesi (2016) finds that a 1 per cent increase in demand for female labour in the manufacturing sector translates into 0.14 more decision made by wives within households. However, there is variation across decision domains. Increasing demand for women's labour leads to greater agency in decision-making on major expenditures, contraception, and children's health and medicine (but not children's education or household food consumption).

Experimental evidence drawn from Uttar Pradesh, India (one of our study sites) finds that while employment allows women to make more independent decisions, it does not increase their agency in joint household decisions (McKelway, 2019). In other words, while women enjoy greater independence than before, this does not necessarily translate into greater bargaining power within the household.
It is possible that the type of work is a critical determinant of women's decision-making agency. Using data from rural Bangladesh, Anderson and Eswaran (2009) argue that women only exhibit significantly greater autonomy when they engage in an independent income-generating activity. In the authors' words, it is not employment per se that is beneficial to women's autonomy; it is specifically employment outside of farms typically overseen by their husbands (women whose work is linked to their husband's farm income have no more autonomy than those whose activities are restricted to traditional housework).

In a recent study on the ancillary benefits of participation in India's flagship rural workfare scheme, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Tagat (2020) finds that program participation increases women's decision-making power within the household, particularly when it comes to decisions on food consumption, children's health, and female labour supply.

Our approach

To examine women's agency, we rely on a special survey module on intra-household decision-making that is part of a broader survey on urbanisation and social change. While this module asks both men and women questions about decision-making practices, we focus exclusively on women's responses to questions in the following domains: household cooking duties, children's education, and the purchase of expensive household appliances. Within each of these three domains, in turn, the survey asks about three types of decisions: 1) Who makes decisions in this domain?; 2) Who has the most say?; and 3) Who has the most say on finances related to that issue? The list of survey questions utilised was adapted and condensed from standard decision-making modules included in Demographic and Health Surveys (DHS) carried out around the world (see Table 1).

Table 1. Household decision index (HHDI) component questions

Cooking	**1.** Who decides what is cooked on a daily basis? **2.** Who has the most say in deciding what is cooked on a daily basis? **3.** Who has the most say in deciding how much money is spent on cooking for the family?
Child education	**1.** Who decides about whether to send child to school and which one? **2.** Who had the most say in deciding whether to send child to school and which one? **3.** Who has the most say in deciding how much money is spent on child's education?
Appliances	**1.** Who decides about big household purchases like TV, Fridge, Washing Machine, etc.? **2.** Who has the most say in deciding about big household purchases like TV, Fridge, Washing Machine, etc.? **3.** Who has the most say in deciding how much money is spent on big household purchases like TV, Fridge, Washing Machine, etc.?

For the question of "who decides," respondents are asked to identify an individual member of the household, although multiple responses are possible. For the matter of "who has the most say," respondents are given the additional option of selecting that it is a "collective decision." Female respondents were only asked about decisions related to their children's schooling if they have school-age children, so the sample size for these questions is naturally smaller.
Table 2 provides basic information on women's participation in household decisions across the sample, disaggregated by city. There are two clear patterns that emerge.

Table 2. Women's decision-making, by city, decision domain, and decision type

	Total	**Dhanbad**	**Indore**	**Patna**	**Varanasi**
Decides	56%	51%	57%	58%	57%

Cooking	*Most Say*	41%	38%	41%	47%	41%
	Budget	21%	12%	24%	22%	25%
Child Education	*Decides*	20%	18%	19%	26%	19%
	Most Say	22%	28%	17%	27%	17%
	Budget	16%	11%	15%	17%	15%
Appliances	*Decides*	6%	6%	5%	6%	5%
	Most Say	8%	16%	4%	9%	4%
	Budget	6%	6%	6%	7%	6%

First, there is significant variation in decision-making agency across decision domains. For instance, women report much higher levels of agency when it comes to cooking: 56 per cent of women report that they decide what is cooked daily, and 41 per cent report they have the most say. These numbers drop significantly for decisions relating to the education of the children (20 per cent decide and 22 per cent have the most say), and even further for expensive household purchases (just 6 per cent decide, and 8 per cent have the most say).

Second, there is systematic variation across decision types: in each decision domain, women report the least amount of agency when it comes to budgetary issues. For cooking, just 21 per cent of women report having the most say over how much money is spent on cooking for the family--a share that is significantly at odds with their agency over what is cooked daily. The same pattern holds true for spending decisions regarding children's school. For appliance purchases, the overall level of agency is markedly depressed across all three decision types.

In terms of defining work, the survey asks about employment in a variety of ways. We rely on the employment module embedded within the female respondent survey to generate our measures of work. This module asks women whether, in the last one year, women have: a) worked for pay or for goods; b) worked in any of the household's non-farm business; or c) worked on the agricultural land owned or cultivated by the household (Table 3).
In our baseline definition of work, we consider women respondents to be working if they respond "yes" to any of these three types of work. Further below, we also analyse sub-categories of work separately to explore variation across different employment definitions.

Table 3. Definition of work categories

Work1	**1.** In the last 1 year, (besides work on the household farm or in any of the household's businesses) did you work for pay or goods? This could include a job you hold, whether home-based or outside, or agricultural labour, construction work, factory work, clerical work, etc. Your wage may be regular or casual or based on piece-rated work. **2.** Now, did you do any work in any of the household non-farm businesses in the last 1 year?

	3. In the last 1 year, did you work on the agricultural land owned/ cultivated by the household?
Work2	**1.** In the last 1 year, (besides work on the household farm or in any of the household's businesses) did you work for pay or goods? This could include a job you hold, whether home-based or outside, or agricultural labour, construction work, factory work, clerical work, etc. Your wage may be regular or casual or based on piece-rated work.
Work3	**1.** Now, did you do any work in any of the household non-farm businesses in the last 1 year?
Work4	**1.** In the last 1 year, did you work on the agricultural land owned/ cultivated by the household?

Table 4 provides descriptive statistics on the employment status of our female respondents. All told, we have data on the employment status of 12,803 women in our dataset. Of this group, 3,160 women (25 per cent) report being engaged in some type of work over the past one year. In both Indore and Varanasi, roughly 28 per cent of women respondents are working, according to our three-fold definition. In Patna, the share is 25 per cent, and it is the lowest in Dhanbad, where only 17 per cent of women report engaging in work.

Table 4. Working women, by work category

		Dhanbad	Indore	Patna	Varanasi	Total
Work1	Yes	525	977	688	970	3160
	Total N	3140	3444	2796	3423	12803
	Share	*17%*	28%	25%	28%	25%
Work2	Yes	266	265	421	261	1213
	Total N	3140	3439	2796	3423	12798
	Share	8%	8%	15%	8%	9%
Work3	Yes	76	108	85	107	376
	Total N	3140	3444	2796	3423	12803
	Share	2%	3%	3%	3%	3%
Work4	Yes	228	646	294	642	1810
	Total N	3140	3444	2796	3423	12803
	Share	7%	19%	11%	19%	14%

9 per cent of women across cities report working for pay/goods, 3 per cent report working on a non-farm business, while 14 per cent report engaging in some form of agricultural work. The rate of non-farm business employment is very low across cities (ranging between 2-3 per cent), but there is significant city-wise variation for the other two forms of employment.

Regarding work for pay/goods, as many as 15 per cent of female respondents in Patna fall into this category while just 8 per cent do across the other three cities. 19 per cent of women in Indore and Varanasi report working in agriculture (accounting for the fact that the two cities have the highest share of overall work), while just 11 and 7 per cent of women in Patna and Dhanbad report working on the farm, respectively.

Work and agency

We now turn to the relationship between work and decision-making agency. For each decision domain (food, education, and appliance purchases) and decision type (decides, has the most say, determines budget), we compare responses of women who work (in any of the three work categories we collect information on) and those who do not. The results are displayed in Table 5.

Table 5. Work and decision-making agency, by decision domain and decision type

		% Not Working and Makes Decision	% Working and Makes Decision
Cooking	Decides	53%	65%
	Most Say	39%	48%
	Budget	18%	30%
Child education	Decides	19%	24%
	Most Say	22%	24%
	Budget	13%	19%
Appliances	Decides	5%	8%
	Most Say	8%	10%
	Budget	5%	10%

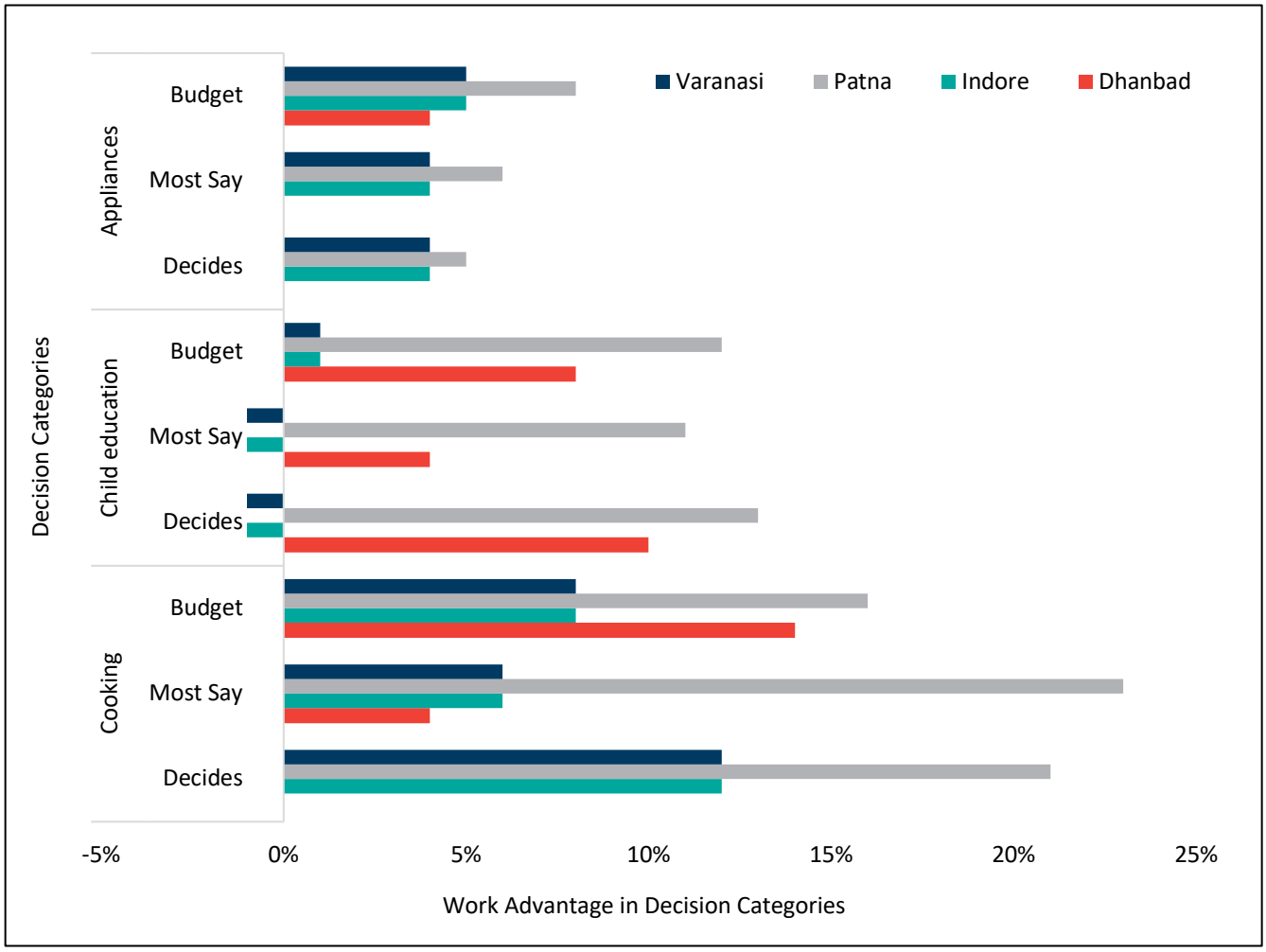
As the table indicates, there is a distinct agency advantage to working women across the board. The magnitude of the work advantage is most pronounced in the cooking domain--an area where women are already more likely to self-identify as having the most influence compared to the other domains--but is relatively muted in the other two. In the aggregate, working women are 12 per cent more likely to decide on cooking, but just 3 per cent more likely to decide about

appliances. The limited agency women enjoy over expensive appliance purchases reinforces a pattern we see in budget questions across domains; women, regardless of work status, are not likely to have the deciding say on spending matters.

Working women's advantage regarding who has the most say and on spending is greatest for cooking relative to the other two decision domains. It is worth noting, however, that agency over budgetary issues (while low overall) does markedly improve if a woman is engaged in work, across decision domains.

How does the work advantage hold up once we disaggregate by city? Figure 1 contains disaggregated data on the work advantage by city. Several interesting patterns emerge.

Figure 1. Work advantage, by decision domain, decision type, and city



First, the work advantage is positive across most decision domains, types, and cities. Out of 36 possible decision categories (nine discrete decisions by four cities), we observe a work

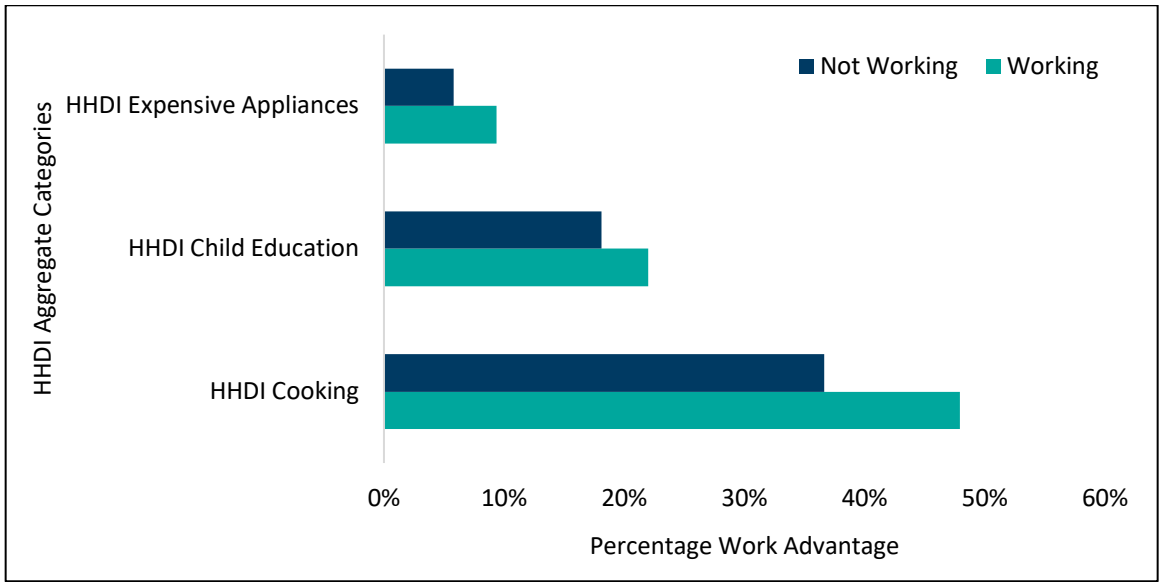
advantage in 29 of them. In Dhanbad, there was no work advantage in the following categories: who decides about cooking and appliance purchases, and who has the most say in appliance purchases.

Second, in two cities--Indore and Varanasi--working women exhibit a modest *disadvantage* when it comes to deciding/having the most say around kids' education. For both cities and decision types, non-working women exhibit marginally more agency--an unexpected finding. Third, working women in Dhanbad report no advantage when it comes to deciding cooking matters. This is surprising because the work advantage is strong across the cooking domain for the other cities (and even within Dhanbad on other cooking decision types).

Fourth, Patna stands out for reporting the greatest returns to work across all categories. In absolute terms, working women report higher levels of agency in every decision category across the four cities (with the lone exception of working women in Dhanbad on the matter of having the most say over appliance purchases). Furthermore, the magnitude of the work advantage in Patna is larger for every decision category; it is in the double digits for every decision related to cooking and kids' education.

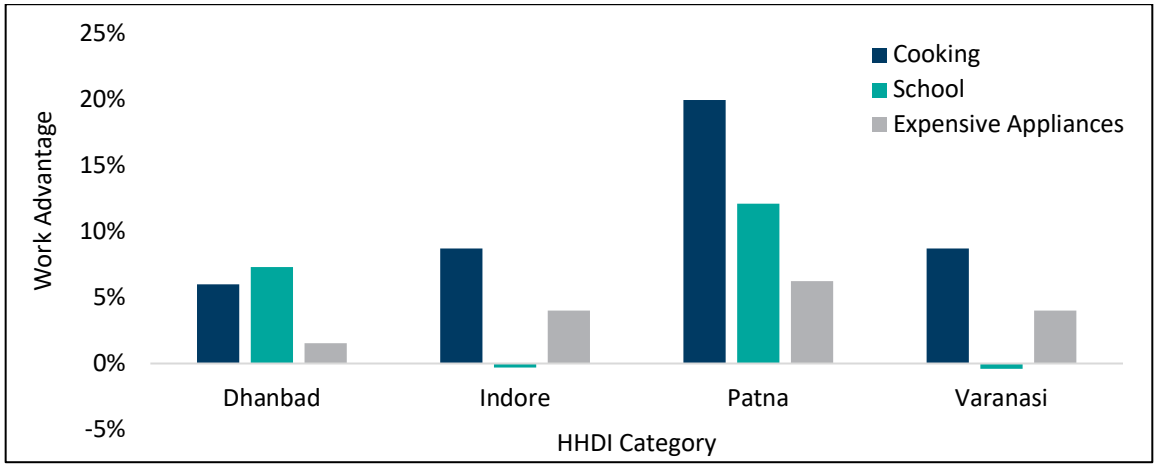
To summarise across decision types, we construct a simple additive decision index for each decision domain and compare mean levels for women who work and those who do not. Figure 2 demonstrates what has become obvious in our exploration thus far: working women enjoy a significant agency advantage, albeit one that is most pronounced for cooking, following by education and household purchases.

Figure 2. Work advantage, by decision domain and decision type



We can look at this decision-making index separately for each city and domain combination as well (Figure 3). The work advantage is present for all decision domains across cities, save for the matter of children's education in Indore and Varanasi. In these two cities, working and non-working women essentially exhibit identical levels of agency (the difference is negligible). As demonstrated above, the magnitude of the work advantage is strongest for Patna and is typically larger for cooking issues across the board.

Figure 3. Work advantage, by city and decision domain



Individual and household-level correlates

How does decision-making agency vary with certain individual and household-level factors? We explore a core set of correlates in Table 6, namely: marital status, primary wage earner status, urbanity, and number of children. With regards to marital status, widows enjoy the greatest overall agency across our three decision domains. This is perhaps not surprising given that their husbands or partners are not in the picture. But their agency is still constrained by others in the household, judging by the mean decision-making scores. Married women enjoy relatively more agency over cooking issues but considerably less agency on school and appliance decisions.

Table 6. Decision-making, by work status and other demographic factors

		Working			Not Working		
		Cooking	Child Education	Appliances	Cooking	Child Education	Appliances
Marital Status	Single	0.10	N/A	0.01	0.07	N/A	0.00
	Married	0.49	0.21	0.09	0.40	0.18	0.06
	Widowed	0.65	0.54	0.48	0.52	0.37	0.32
	Divorced	N/A	N/A	N/A	0.09	0.33	0.05
	Separated	0.00	N/A	0.00	0.18	0.43	0.04

Primary Wage Earner	Yes	0.68	0.57	0.34	0.41	0.29	0.12
	No	0.47	0.20	0.08	0.37	0.18	0.06
Rural/Urban	Rural	0.48	0.21	0.08	0.36	0.19	0.06
	Urban	0.50	0.26	0.14	0.37	0.16	0.06
Number of Children	0	0.34	N/A	0.04	0.24	N/A	0.03
	1	0.43	0.23	0.09	0.33	0.16	0.05
	2	0.50	0.24	0.09	0.39	0.18	0.06
	3	0.51	0.20	0.10	0.44	0.20	0.07
	4	0.53	0.23	0.11	0.45	0.17	0.07
	5	0.51	0.23	0.08	0.45	0.20	0.07
	6	0.49	0.19	0.07	0.43	0.14	0.07
	7	0.57	0.20	0.13	0.50	0.17	0.10
	8+	0.46	0.20	0.19	0.41	0.10	0.07

When it comes to female primary wage earners, while their numbers are relatively few, they do exhibit a marked agency advantage across all three domains. Indeed, women primary wage earners enjoy fifty per cent more agency on cooking, three times as much agency on school, and more than four times as much agency on expensive appliances.

What is surprising is that rural/urban status matters very little, at least when looking at descriptive statistics. Urban women who work possess higher levels of agency and that agency is largest for cooking and smallest for appliance purchases. However, urban women do not—in the absence of controlling for other confounding factors—experience significantly higher levels of decision-making agency than their rural counterparts.

Women without children exhibit markedly less agency than those with children. In fact, childless women have the lowest agency scores for both cooking and appliances. Agency scores on all three domains (remember that women are only asked questions about decision-making around education if they have children) increase as the number of children in the household goes up, though not in a linear fashion. For cooking, decision-making agency increases sharply with each additional child before levelling off around four children. A similar pattern can be detected for schooling decisions and appliance purchases. Women with seven or more kids do exhibit even higher agency scores across the board, but the overall sample sizes are small (233 women reported having seven children).

We also consider two additional variables in Table 7: education and religion/caste. A look at the education of our respondents throws up some interesting patterns. If anything, women with more education enjoy *less* decision-making power when it comes to cooking and appliances. This is true for both working and non-working women. Working women with no formal education report the highest degree of agency (0.51) on matters of cooking while those with post-secondary report the least (0.35) followed by women with post-graduate degrees (0.42). This pattern is repeated for non-working women, though the magnitudes are slightly smaller.

With regards to child education, for both working and non-working women, those with a post-graduate degree report the most agency, although the differences for non-working women are slight. On appliances, the overall levels of agency are depressed across the board, with modestly higher agency for women with the lowest two levels of education compared to those with secondary education or more.

Table 7. Decision-making, by work status, education, and religion/caste

		Working			Not Working		
		Cooking	Child Education	Appliances	Cooking	Child Education	Appliances
Education	None	0.51	0.24	0.10	0.41	0.18	0.07
	Primary	0.49	0.23	0.11	0.41	0.19	0.07
	Secondary	0.43	0.25	0.08	0.30	0.19	0.05
	Post-Secondary	0.35	0.30	0.09	0.22	0.15	0.04
	Post-Graduate	0.42	0.31	0.05	0.24	0.20	0.05
	NA	0.47	0.17	0.08	0.38	0.18	0.04
Religion and Caste	Hindu General	0.51	0.27	0.08	0.37	0.14	0.05
	Hindu OBC	0.48	0.21	0.10	0.36	0.18	0.06
	Hindu SC	0.49	0.21	0.08	0.38	0.19	0.05
	Hindu ST	0.48	0.29	0.12	0.34	0.21	0.09
	Muslim	0.42	0.27	0.13	0.37	0.19	0.08
	Other	0.41	0.23	0.03	0.27	0.35	0.04

Across religion/caste identities, working women enjoy higher levels of agency. But the differences across specific identity groups for working/non-working women are smaller than what one might expect.

For working women, General Caste Hindus enjoy the highest degree of agency over cooking while Muslims and "Others" possess the lowest. This pattern does not hold for the other two decision domains. In the realm of children's education, Hindu Scheduled Tribes (STs) report the highest agency with General Caste Hindus and Muslims close behind. For appliance purchases, agency levels are depressed throughout though highest for Muslims (0.13) and STs (0.12).

Among non-working women, Hindu General Castes do not enjoy a clear advantage. Dalits/Scheduled Castes (SCs) report the highest agency over cooking while STs have the highest agency for education and appliance purchases.

In sum, in almost every category for which we have a meaningful sample size across measures of marital status, PWE, rural/urban, number of children, education, and religion/caste, working women exhibit higher levels of agency than non-working women. However, this overlooks internal variation within the working/non-working binary.

Variation across work type

We now explore whether the work advantage we observed for our aggregate, catchall definition of work applies for other, narrower definitions (Table 8).

Table 8. Work advantage, by city and work category

		Dhanbad	Indore	Patna	Varanasi
Work1: Any	Cooking	0.06	0.09	0.20	0.09
	Child education	0.07	0.00	0.12	0.00
	Appliances	0.02	0.04	0.06	0.04
Work2: For Pay or Goods	Cooking	0.07	0.09	0.17	0.09
	School	0.10	0.06	0.09	0.06
	Appliances	0.06	0.07	0.07	0.07
Work3: Household, Nonfarm	Cooking	0.05	0.11	0.17	0.11
	Child education	0.06	0.02	0.10	0.02
	Appliances	-0.02	0.04	0.03	0.04
Work4: Household Farm	Cooking	0.05	0.05	0.19	0.05
	Child education	0.03	-0.04	0.10	-0.04
	Appliances	-0.02	0.01	0.03	0.01

For each of our four definitions of work (aggregate; work for pay/goods; work on non-farm business; agricultural work), we look at the women's work advantage for each of our four cities across three domains. This creates 48 possible cells; the agency advantage accruing to work women is positive in 42 of them. Again, Patna shows remarkable consistency: women's work advantage is much more pronounced in this city than in any of our other three cities, irrespective of the definition of "work" we employ. The work advantage regarding schooling decisions is noticeably small (or negative) in both Indore and Varanasi--especially for agricultural workers. Indeed, agricultural workers exhibit the weakest signs of positive returns to agency. Not surprisingly, women who work for salary and pay (presumably, this includes many who work outside of the home) appear to have the greatest work advantage. This lends credence to the notion that work that is independent of the home is connected to the greatest levels of women's agency.

Multivariate analysis

The analyses thus far have been descriptive in nature. In this section, we discuss the results of a multivariate regression model in which we integrate individual and household demographic characteristics along with our multiple definitions of work and household decision-making domains.

We run a series of Ordinary Least Squares (OLS) regression models using our three decision-making indices—cooking, education, and appliances—as outcome variables. Our primary variable of interest is the work variable, measured in four different ways, as above. As controls, we consider respondents' age, educational attainment, marital status, and number of children. We also include controls for important household characteristics: urban/rural status, assets, and a combined religion-caste identity measure. In all models, we also include city-level fixed effects so that the regressions control for unobserved, time-invariant city-level variation. Table 9 contains the results of our baseline specification using our aggregate definition of work (*Work1*) on the righthand side. Recall, this is a binary indicator of whether a primary female respondent is working according to any of our three definitions.

Across all three models (cooking, schooling, and appliance purchases), the coefficient on *Work1* is positive and significant at the 99 per cent confidence level. Women who are engaged in *any* type of work exhibit greater agency across all three domains, although the magnitude of the association is twice as large for the cooking index as for the appliance index. Working is linked to a 7 per cent increase in the value of the cooking decision-making index but just a 3 per cent increase in the appliance purchase index. The effect on the index capturing agency over educational decisions is situated in between the two extremes (4 per cent), though closer in size to the appliance model.

Table 9. OLS Regression on Work1 by HHDI category

	HHDI Model		
	Cooking	School	Appliances
Work1 (yes)	0.07 ***	0.04 ***	0.03 ***
	- 0.01	-0.01	-0.01
Age: 30-39	0.08 ***	-0.02 *	0.02 ***
	-0.01	-0.01	-0.01
Age: 40-49	0.13 ***	-0.05 ***	0.04 ***
	-0.01	-0.01	-0.01
Age: 50+	0.12 ***	-0.07 ***	0.03 ***
	-0.01	-0.02	-0.01
Highest Education: Primary School	-0.06 **	0.04	-0.01
	-0.03	-0.03	-0.02
Highest Education: Secondary School	-0.05 ***	0.01	0.01
	-0.02	-0.02	-0.01
Highest Education: Post-Secondary School	0.02 **	0.01	0.01

	-0.01		-0.01		-0.01	
Highest Education: Post-Graduate	0.01		0.01		-0.00	
	-0.01		-0.01		-0.01	
Urban Dweller	0.05	***	-0.03	***	0.00	
	-0.01		-0.01		-0.01	
Married (yes)	-0.07	***	-0.26	***	-0.27	***
	-0.02		-0.03		-0.01	
1 Child	0.09	***			0.02	*
	-0.02				-0.01	
2 Children	0.11	***	0.03	**	0.02	**
	-0.02		-0.01		-0.01	
3 Children	0.13	***	0.04	***	0.02	**
	-0.02		-0.02		-0.01	
4 Children	0.12	***	0.04	**	0.02	**
	-0.02		-0.02		-0.01	
5 Children	0.10	***	0.06	***	0.01	
	-0.02		-0.02		-0.01	
6 Children	0.08	***	0.01		-0.00	
	-0.02		-0.02		-0.01	
7 Children	0.14	***	0.04		0.03	*
	-0.03		-0.03		-0.02	
8+ Children	0.04		0.00		0.04	*
	-0.03		-0.04		-0.02	
Assets	-0.02	***	0.01	**	0.01	***
	-0.01		-0.01		0.00	
Religion: Hindu (OBC)	0.00		0.03	**	0.02	**
	-0.01		-0.01		-0.01	
Religion: Hindu (SC)	0.02		0.03	**	0.01	*
	-0.01		-0.01		-0.01	
Religion: Hindu (ST)	0.00		0.08	***	0.05	***
	-0.02		-0.02		-0.01	
Religion: Muslim	0.02		0.05	***	0.03	***
	-0.02		-0.02		-0.01	
Religion: Other	-0.05		0.13	**	-0.03	
	-0.05		-0.05		-0.03	
N	11,438		8,217		11,438	

*p < .1; **p < .05; ***p < .01

Note: All three models employ city fixed effects.

As Table 9 indicates, several of the control variables reach statistical significance, although the effects are not necessarily consistent across models and outcome variables. With respect to age, older women enjoy greater agency with regards to cooking and appliance purchases but less agency on schooling decisions. Furthermore, the effects are not always linear. For instance, women between the ages of 40 and 49 are more likely to exercise agency on appliance purchases than either women older or younger than them.

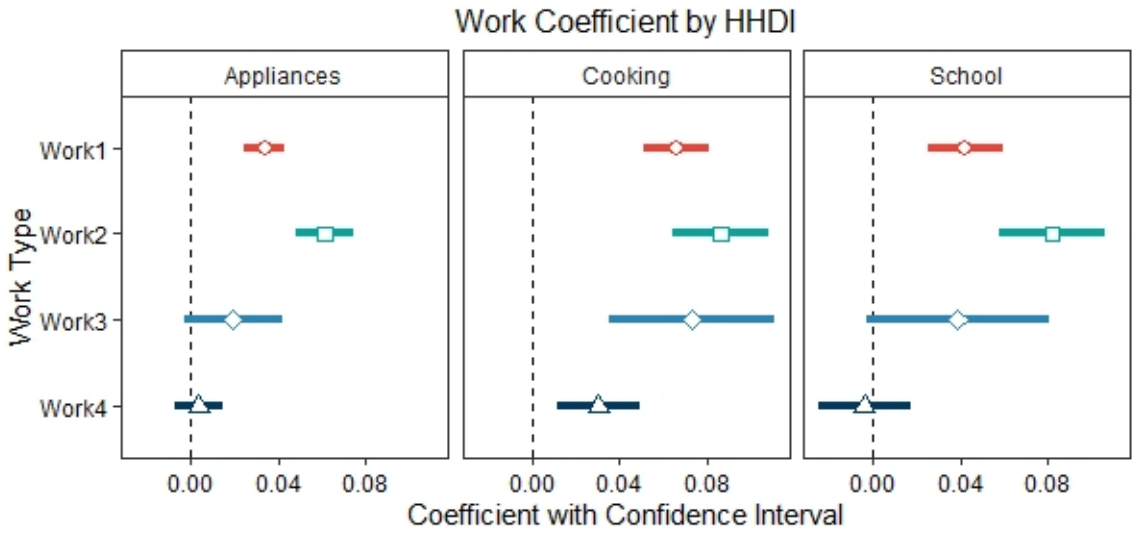
There is modest evidence of a U-shape relationship between education and the cooking index, but the education variables are not significant for the models of schooling or appliances. Being married is negatively associated with agency across all three models, but urban/rural status shows only mixed results. There is no clear pattern when it comes to number of children; in the three models, there is some evidence that having children is linked with higher agency but having more children is not always advantageous from an agency perspective.

While there is no clear relationship between a household's asset index and individual agency (the coefficient is negative and significant when it comes to cooking, but positive and significant for schooling and appliances), in two of three models, women who are General Caste Hindus (the reference category in the regressions) tend to exhibit the lowest agency—at least with respect to schooling and appliances. This is consistent with the descriptive evidence presented above.

Next, we re-run these models for each of our definitions of work. While we do not present the full regression results here due to space constraints, Figure 4 contains coefficient plots for our work variables across each of our three decision domains. These OLS regressions include the full complement of control variable specified above as well as city fixed effects. The plots are instructive insofar as they convey a consistency across models.

First, the coefficient on the work variable (however specified) is typically positive and significant, with a few exceptions. Second, the coefficient on the *Work2* (work for pay/goods) variable is consistently the largest, followed by *Work1* (the aggregate work variable), *Work3* (work on non-farm business), and *Work4* (agricultural work). Work for pay/goods (*Work2*) is associated with a 6 to 9 per cent increase in the decision-making index, depending on the decision domain in question. Third, the size and significance of the coefficient on the non-farm business (*Work3*) and agricultural work (*Work4*) variables are regularly smaller in magnitude and significance. While the non-farm work variable is positive and significant across models, its significance is notably greater for the cooking model, compared to the other two. Agricultural labour, on the other hand, is only significantly associated with greater agency on cooking decisions. In the other two models, the coefficient on the *work4* variable is both small and statistically insignificant.

Figure 4:. Coefficient plots for work variables on HHDI



In sum, even after controlling for a host of individual and household-level variables, work remains significantly associated with greater levels of agency. However, the type of work clearly matters. When one disaggregates work, it appears that work for pay or goods (what some refer to as "traditional employment") is the most connected to enhanced agency while agricultural labour offers the least payoffs from an agency perspective.

Position of women inside the household

Thus far, we have ignored the specific identity of the woman in the household and her relative positioning within the home. Before concluding, we explore one other source of heterogeneity: a woman's relational position within the household. Nearly 50 per cent of women in our sample are wives of the head of household, 17 per cent identify as the daughter-in-law, 10 per cent identify as daughter, and less than 1 per cent are the mothers of the household hold (Table 10). For 24 per cent of the sample, their precise position in the household is unclear and their position is listed as N/A as a result.

Table 10. Women's relational position in the household

	Share of Sample	Total Sample
Daughter	10%	1269
Daughter-in-Law	17%	2113
Wife	49%	6237
Mother of HHH	1%	71

NA	24%	3113

When it comes to decision-making agency (descriptive statistics not shown here), wives exhibit higher agency for cooking and schooling, but mothers report more agency on appliance purchases. Given that the latter comprise such a marginal share of respondents, one needs to interpret this association with caution. Compared to either daughters or daughters-in-law, wives do report nearly four times more agency when it comes to appliance purchases. It is worth noting that there is no reported difference in agency for daughters and daughters-in-law across our three decision domains; their scores are nearly identical.

When it comes to types of work, some interesting patterns emerge (Table 11). We focus on daughters, daughters-in-law, and wives since we have reasonable sample sizes of all three categories.

First, there is a clear work advantage across different definitions of work. In other words, the work advantage is not restricted to any one category of work. In only two instances--both having to do with the daughter-in-law--do we see non-working women enjoy more agency to working women (these are related to schooling decisions and involve women employed in household non-farm/farm work).

Table 11. Household decision index, by relation and work category

	Work for Pay or Goods			**Household Nonfarm**			**Household Farm**		
	Cooking	School	Appliances	Cooking	School	Appliances	Cooking	School	Appliances
Daughter									
Working	0.44	0.25	0.13	0.57	0.18	0.13	0.51	0.17	0.05
Not	0.34	0.15	0.03	0.34	0.16	0.03	0.33	0.16	0.03
Daughter-in-Law									
Working	0.49	0.31	0.10	0.48	0.14	0.04	0.43	0.10	0.04
Not	0.34	0.14	0.03	0.35	0.16	0.03	0.34	0.17	0.03
Wife									
Working	0.52	0.27	0.11	0.52	0.28	0.11	0.53	0.23	0.08
Not	0.43	0.20	0.07	0.44	0.20	0.07	0.43	0.20	0.07

Second, the work advantage is most clearly visible for women working for pay/goods. With just one exception, the work advantage for women in this work category is the most pronounced (the one exception is for daughters and cooking, where the advantage is smaller than for daughters working in household businesses).

Conclusion

The analyses contained in this article, by design, cannot establish a clear, causal relationship between female economic empowerment and a greater say in household decision-making and, by extension, greater agency. However, they do reveal a strong association between women participating in the labour force and household decision-making agency. This association is robust across cities, work categories, decision domains, and decision types, although there is widespread variation in the strength of this correlation. This suggests that work and greater agency within the household do proceed hand-in-hand to a certain extent. However, it is worth pointing out that the payoff to work is greatest for women who work for pay or goods in more traditional employer-employee relationships. While the agency advantage exists for other categories of work, it is less pronounced and, for certain decision domains, statistically small or insignificant.

Based on the available data from our survey, we believe that a gendered comparison of household decision-making conditional on labour force participation may yield further insight into the status of women in north India. There are several issues worthy of further scrutiny.

First, working women's influence on financial decision-making in each of the three decision domains examined here is severely curtailed when compared to other decision types. Why is a woman's ability to make financial decisions that impact other family members still limited—regardless of employment status?

This leads to a second question: whether males in the households are more likely to be making these financial decisions, which is a potential area for further study. If it is found that, regardless of work, men are likely to make the final decision on the budget across domains, it implies that women's labour force participation has a more positive effect on household purchasing power rather than women's agency within the household.

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Chapter 4. The Work of Women's Mobility: Studying Movement in North India

Vidisha Mehta and Harish Sai

The Mobility Paradox

Over the past two decades, India has continuously experienced structural and social changes that have promoted gender equality in many respects. The subcontinent, for instance, has witnessed a high growth rate and declining fertility levels.[9] Primary school enrolment for girls has reached parity with that of boys.[10] The fraction of women attending an educational institution has almost doubled. Yet, women's freedom of movement remains extremely low.[11]

The tenuous state of women's mobility in India is highlighted in the National Family Health Survey (NFHS). In the latest round of the NFHS (2015-16), only 41% of women in India reported that they were allowed to go alone to three places – the market, the health facility, and places outside the village or community.[12] Conversely, 6% of the women were not permitted to visit any of these three places.[13] More concerning, however, is the definition of "freedom of movement". According to the survey, women are considered to have the freedom of movement "if they are usually *allowed* to go alone to all three of the following places: to the market, to the health facility, and to places outside the village or community".[14] As is evident, this definition of freedom is premised on permission, assessing women's acquiescence more than their autonomy. Furthermore, this definition does not explicate the use of the word "allowed," which implores various questions, such as who permits women to visit these places and what is the degree of permission required? In this report, through a more detailed study of women's mobility, we attempt to probe these questions.

For this study, we work with primary data collected in three urban clusters in the Hindi Belt.[15] We dissect women's mobility across two categories: relation to the household head and

[9] Fertility Rate, Total (Births per Woman) - India, World Bank, accessed August 09, 2020, https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=IN.
[10] School Enrollment, Primary (\% Net) - India, World Bank, accessed August 09, 2020, https://data.worldbank.org/indicator/SE.PRM.NENR?locations=IN.
[11] Ibid.
[12] National Family Health Survey (NFHS - 4), *Ministry of Health and Family Welfare* (2016): 513
[13] Ibid.
[14] Ibid. 513; emphasis ours.
[15] The Hindi Belt is a linguistic region in the Indian subcontinent, which broadly encompasses the following states: Bihar, Haryana, Chhattisgarh, Delhi, Jharkhand, Himachal Pradesh, Madhya Pradesh, Rajasthan, Uttar Pradesh and Uttarakhand.

location of the household.[16] In order to undertake this task, we use descriptive statistics as well as the Bayesian inference technique. We find that, across all cities, spouses and daughters of the household head are more mobile than daughters-in-law. As for the effect of location: women from urban areas are more mobile than those in rural areas. We also find that women are most mobile in Dhanbad, and when visiting the market.

This report is divided into six sections. The first two sections motivate the questions we seek to examine and briefly delineate the structure of the data. Next, we outline the method employed to carry out this analysis. We then take a closer look at the descriptive statistics and the Bayesian regressions. The final section discusses the relationship between female employment and mobility.

Motivating Mobility

We define mobility as the degree of freedom a woman has in being able to leave the house to visit the market, go outside the neighborhood and visit relatives *without* the permission of a member of the household. There are two major alterations we have made to the NFHS definition. First, we replace the location health facility with relatives' homes, since women are likely, and should freely be able, to visit their natal homes.[17] Second, we examine a "degree of freedom," implying that there exist nuances when thinking about permission and movement in conjunction.

As mentioned at the outset of the report, India faces low rates of mobility — 41% were allowed to go alone to all three places: market, places outside the village or community and health center, while 6% were not allowed to go to any.[18] This low mobility is accompanied by significant regional variation. Women in states located in North or Central India have a relatively lower mobility. In Rajasthan, Chhattisgarh, Uttar Pradesh, Bihar and Jharkhand, only one-third of the women are allowed to visit all three places alone.[19] On the other hand, in most of the states in South India, women's freedom to visit all three of the mentioned places is close to 50%.[20] Thus, while women's mobility across the subcontinent is of concern, it is significantly worse in Northern India

[16] It is imperative to establish a woman's relation to the household head when studying power asymmetry between genders within a household. In our sample, though, the household head is most often a man, presumably because of the patriarchal norms that govern Indian society. However, we don't wish to circumscribe women into categories that only view them in relation to men. We understand the structural implications and problems with such an approach, but we adopt it since it enables us to gauge the biases that exist when thinking about gender and power in the household, and family structures.
[17] We discuss why we have chosen these three locations later in this paper.
[18] Ministry of Health and Family Welfare (2016): 513.
[19] Ibid.: 539.
[20] Ibid.

Shireen J. Jejeebhoy and Zeba A. Sathar, in "Women's Autonomy in India and Pakistan," argue that low rates of mobility in Northern India are a consequence of the "hierarchical relations in which the patriarch or his relatives have authority over family members."[21] As a result, women are usually dependent on other members of the household for approval to leave the house. This impedes their social interactions and potential employment opportunities. Hence, mobility in the Indian context is inextricably linked to the structure of the household. However, while many studies[22] have drawn this link, they do not discuss how "constraints of physical mobility" vary depending on the position a woman occupies in the household. We seek to understand this variation through a careful look at kinship structures in the household, i.e. the woman's relation to the household held.

Aside from complex intra-household gender dynamics, the Hindi belt proves to be a fascinating territory to study women's mobility. The region admits significant variation in levels of urbanization – areas in this region range from urban, peri-urban to rural. The rural-urban distinction presents fundamentally different economic and social contexts for women to move around.[23] Thus, it is equally important to highlight the urban-rural dichotomy in mobility, especially since previous studies have concentrated on rural mobility.[24]

Kinship structures and area setting of the household, affect mobility in ways that will be enumerated later in this report. Their effect on mobility, more ubiquitously, has important consequences on various aspects of a woman's autonomy. Wei Chang et al., in their report titled "What Works to Enhance Women's Agency," argue that "without freedom of movement, women and girls are unable to participate in social, political, and economic institutions and are accordingly constrained along multiple dimensions."[25] Furthermore, they state: "an adult's ability to move without a guardian or go outside without permission is one of the most fundamental expressions of one's ability to make and act on one's own decisions."[26] This includes decisions related to socialising and employment, among others. Hence, mobility is of utmost consequence for women's autonomy, empowerment, and economic agency. Therefore, beyond studying mobility, we also probe its link to employment, to gauge if in fact the former has an impact on the latter.

Before we begin our analysis, it is important to articulate how our study occupies a unique space amidst extant literature. Current work assessing women's mobility examines women as a larger community. As a result, there isn't a holistic understanding how mobility restrictions

[21] Shireen J. Jejeebhoy and Zeba A. Sathar, "Women's Autonomy in India and Pakistan," Population and Development Review 27(4) (2001): 690.
[22] Farooq and Kayani, 2013; Gupta and Yesudian, 2006; Mason, 1997; Dyson and Moore, 1983.
[23] Uteng, Tanu Priya. *Gender and Mobility in the Developing World*. Background Paper. World Bank (2011).
[24] Gupta and Yesudian,2006; Sathar and Kazi, 2000; Jeejeebhoy and Sathar, 2001.
[25] Wei Chang, et al. "What works to enhance women's agency: Cross-cutting lessons from experimental and quasi-experimental studies" (2020), JPAL Working Paper;39.
[26] Ibid.

vary across the life course of a woman or location. In order to bring in this nuance, we analytically separate the constraints that affect mobility in two groups: internal, which includes restrictions arising from household structure; external, which refers to restrictions arising from the location of the household and surrounding infrastructure. Keeping this framing in mind, in this paper, we broadly ask four questions:

- How mobile are women in the Hindi Belt?
- How does the position of the woman in the household structure affect mobility?
- How is mobility affected by the area in which their house is located?
- What is the effect mobility has on employment?

Through these questions, our study makes three contributions to the overall literature. First, it measures daily mobility in urban as well as rural areas, enabling a comparative analysis of the two spaces. Second, the paper contributes to understanding the way the household structures affect women's mobility in both these different areas. Finally, it analyses a link between mobility and work.

Surveying the Data

This report works with primary data collected in three urban clusters in the Hindi Belt: Dhanbad, Patna and Varanasi.

Our analysis is concerned with the female questionnaire of the survey. Within this questionnaire, we work with the permissions subsection, which lies within the intra-household decision-making module. It asks women if they have to seek permission from a family member before visiting six distinct locations: market, beauty parlour, place of worship, relative's house, outside the neighbourhood, short distance (using bus or train). The questions asked to the respondents and the answer options provided to them have been tabulated below:

Questions:	Options:		
Do you ever go to the following places?	Yes (Code: 1)	No (Code: 0)	
If yes, do you need permission to go?	Yes (Code: 1)	No (Code: 0)	No, Need to Inform (Code: 2)
If not, why do you not go to these places?	Not Interested (Code: 1)	Not Allowed (Code: 2)	Other

The first and third questions define the framework of our argument. To understand mobility more comprehensively, however, we primarily focus on the second question in the analysis.

For the hierarchical regression, the binary variable we use to measure mobility is coded as: 1 – those who don't need permission or merely need to inform (hyper mobile); 0 – those who do need permission or do not visit. We recognize that we are reducing a multidimensional variable, to a binary variable for analytical purposes in the regression. However, through a detailed description of these variables later in this paper, we ensure to preserve the nuances of the data that get lost in the binary re-coding.

Although the data provides information on six locations, our analysis works mainly with three: markets, relative's homes and outside the neighbourhood. Using these three locations, we make claims about a respondent's movement on a regular basis for a definite purpose. Markets, for instance, enable comparison between urban and rural areas because it needs to be frequented for basic necessities, regardless of economic or cultural factors. Local markets are likely to be located close to the respondent's home. Next, we inspect the ability to visit a relative's house since it can be located either within or outside the neighborhood, making it a versatile distance measure. The mobility to a relative's house also indicates the respondent's ability to visit her natal home. Finally, to gauge a respondent's mobility outside her own neighbourhood, we explore the third location: outside the neighbourhood. Going outside the neighborhood may also require travelling longer distances, often using public transport. Thus, it is indicative of women's access to facilities that may not be located within the neighborhood.

However, to fortify a holistic understanding of mobility that goes beyond these three emphasised locations, we also create an index, which averages the mobility to all six locations: market, beauty parlour, place of worship, relative's house, outside the neighbourhood, short distance (by bus or train). The re-coding is enumerated in the table below:

Mobility Index:	
If yes, do you need permission to go?	
Answer Options	Re-coded
Yes	Code: 3
No, Need to Inform	Code: 2
No	Code: 1

All those who did not even visit these places were given the value 0. Thus, as is evident, the greater the mobility, the greater the number assigned to the respondent, with 3 being the maximum. We then normalize this index to ensure it has a range from 0 - 1.

We study the mobility data in concert with some key variables, the first of which is the respondent's relationship to the household head. The common questionnaire of our survey captures each family member's relation to the head of the household. We first identify the female respondent from all the family members, and then capture and categorise their relation to the household head in five categories: daughter, daughter-in-law, spouse, mother, other.

Another variable we analyse with mobility is employment or work. The questions we use to code this variable are explained in the following table:

Work Variable		
Questions Used	Answer Options	Recoding
In the last year, did you work for pay or goods?	Yes	Code: 1
	No	-
Did you do any work in any of the household non-farm businesses in the last 1 year?	Yes	Code: 1
	No	-
In the last 1 year, did you work on the agricultural land owned/cultivated by the household?	Yes	Code: 1
	No	-
Were you employed or engaged in any income-generating activity before you got married?	Yes	Code: 0
	No	Code: 0

All those who are currently unemployed are categorised as 0, while those who are employed in any sector are characterised as 1. Thus, we create a binary variable for employment.

Methodology

The analysis makes use of descriptive statistics and the Bayesian inference technique, using a multilevel or hierarchical regression model.[27] The outcome of interest is a binary variable indicating whether or not a woman requires permission to visit the three locations pertinent to our analysis.[28]

[27] Andrew Gelman, Jennifer Hill. "Data analysis using regression and multilevel/hierarchical models." *Cambridge University Press.*, 2007.: 8.

[28] 1 implies full mobility – i.e. do not need permission to and 0 implies that a woman does not go to the
places in question or requires permission.

We consider three group level coefficients for the bivariate model. The first variable of interest is relation to the household head. In this variable, we consider all possible relations to the head of the household – spouse, daughter, daughter-in-law, mother and other – but focus most on the first three.

The second coefficient is a binary variable indicating the type of approach road leading up to the respondent's household. This is an important metric for two reasons. First, infrastructure, such as approach road affects the ability of a person to access various locations as well as different forms of transportation. Second, the type of approach road may be indicative of the household's wealth -richer households in urban areas are more likely to have a paved approach road.

The final indicator is also a binary variable classifying the area of the household into either rural or urban. This allows us to systematically compare mobility in the two regions. We then extend this model to test the effect of mobility on employment. We then use OLS regression models to dissect employment by sector and wage structure to understand their individual relationship with mobility.

Where do Women Go?

Women's mobility is circumscribed by factors that are internal, such as household structure, and external, such as the location of the household. This section first presents the results from the descriptive analysis and then those of the bivariate regression. As a coda, we establish the relationship between mobility and employment.

Descriptive Statistics

Figure 1 shows the distribution of the respondents' relations to the household head. Greater than half the respondents in all cities are spouses of the head of household. 6.7%, 9.93% and 9.7% of the respondents are daughters-in-law of the household head in Dhanbad, Patna and Varanasi respectively. The low percentage of daughters may be attributed to the fact that daughters, post marriage, are most likely not to live in their natal homes. Table 4 (Appendix) presents the distribution of respondents across urban and rural areas which indicates that a large proportion of the sample lives in rural areas across all 3 cities.

Table 4 depicts the share of women in all three cities that visit the three locations pertinent to our study — markets, relative's houses and outside the neighborhood. Table 2 probes the idea of "permissions" further. Table 3 describes the permissions variable after the binary re-coding. These figures present four key findings:

1. Mobility is severely constrained in northern India.

As Table 3 indicates, more than 50% of the women state that they require permission to visit any location.[29] On average, 68% percent of women require permission when visiting the market and going outside the neighborhood and 75% state they require explicit permission in order to visit relatives.

2. Daughters-in-law are the least mobile and spouses have the highest mobility.

Table 1 indicates that spouses, across all three cities, visit all locations at high rates. Over 60% spouses go outside their neighborhoods in both Patna and Dhanbad and over 75% spouses go to visit their relatives in Patna, Dhanbad and Varanasi. More than 50% of the spouses visit the market in all three cities.

Fewer daughters-in-law report visiting the market or going outside the neighborhood as compared to other relations. However, daughters-in-law report visiting relatives at a rate that is comparable to that of daughters. This is most evident in Varanasi, where 73% of daughters and daughters-in-law go to their relative's houses.

A higher share of daughters and spouses stated that they only needed to inform a family member, whereas a higher share of daughters-in-law stated that they explicitly needed to take permission, especially in Patna and Varanasi (Table 2). The proportion of spouses who said they required permission is the lowest.

Rows 4, 8 and 12 of Table 2 show the proportion of women who stated that they are not allowed to visit a given location. From this proportion, it is mainly daughters-in-law who report that they are not allowed to go to a specific location. In fact, the proportion of daughters-in-law who do not visit the market is more than twice that of spouses in Dhanbad and Varanasi. Thus, once again, daughters-in-law's mobility is most curbed. Table 3 also indicates similar trends. Across all three cities, on average, daughters-in-law are the least mobile when it comes to the ability to visit the market or go outside the neighborhood.

3. The degree of mobility varies by city and location.

Tables 2 and 3 indicate that women in Varanasi require permission at the highest rate and women in Dhanbad require explicit permission at the lowest rate. Further, visiting relatives necessitates women taking explicit permission to the highest degree. Women face the least restrictions when going to the market.

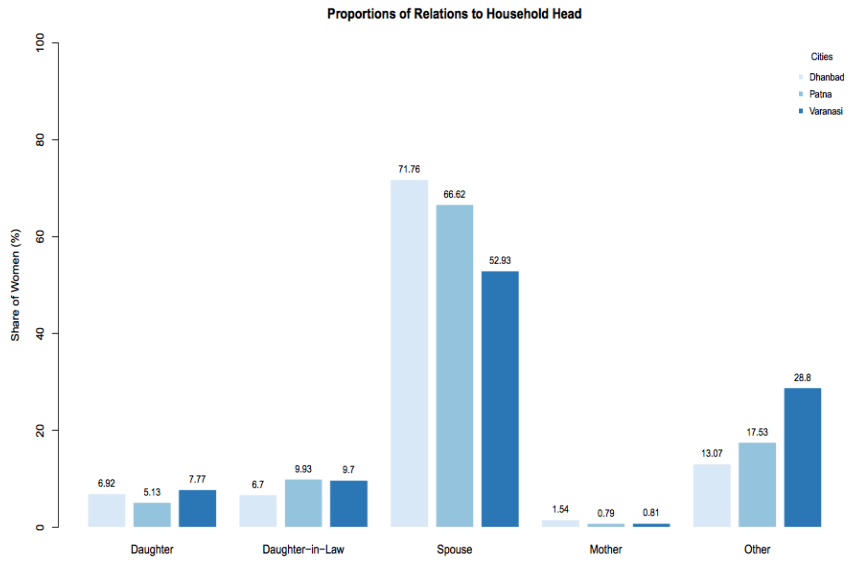
4. The degree of mobility varies with urban and rural location and on average, urban women are more mobile.

[29] As mentioned above, those who do not explicitly need permission are coded as 1. Respondents that
do not go to a certain location or explicitly need permission are coded a 0 or least mobile.

Table 5 (Appendix), indicates the mobility of women by urban and rural location of residence. It shows that urban women are, on average, more mobile.[30] It is evident that a greater percentage of daughters-in-law are required to ask for permission across both urban and rural areas, as compared to daughters or spouses.

But, the most striking result is that the city tends to affect the variation in mobility in urban and rural areas. Patna shows the lowest urban-rural variation in the share of women who say they require permission to leave the house. The variation is greatest in Varanasi, where women who require permission in rural areas is 10 percentage points higher than those living in an urban setting.

Figure 1. Proportion of relations to the household head



[30] Since the table depicts the percentage of daughters, spouses and daughters-in-law that require
permission, a lower percentage indicates higher mobility.

Table 1: Share of relations who visit a given location

City	Visit Market			Go Outside Neighborhood			Visit Relatives		
	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse
Dhanbad	66.52	29.03	63.58	65.0	47.0	61.52	79.02	79.26	84.03
Patna	57.05	35.1	64.61	64.74	56.75	64.61	71.79	64.24	80.36
Varanasi	63.7	19.29	51.79	41.85	19.29	44.62	72.96	72.7	77.45

Table 2: Share of women who need permission to visit a given location by Relation [a]

Visit Market	Dhanbad			Patna			Varanasi		
	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse
Need Permission	42.95	30.16	26.2	35.96	60.38	27.35	28.9	31.6	30.9
Need to Inform	37.58	44.44	39.88	40.45	23.58	36.59	46.9	46.4	46.1
Do not need Permission	19.4	25.3	33.9	23.59	16.0	36.05	24.08	21.8	22.9
Not allowed to visit	2.68	6.91	1.60	19.4	21.94	17.23	13.4	22.06	9.82

Go Outside Neighborhood	Dhanbad			Patna			Varanasi		
	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse
Need Permission	35.61	41.17	25.89	45.54	56.75	34.45	31.93	35.01	29.4
Need to Inform	42.47	43.14	38.91	45.54	28.82	32.09	53.92	53.62	57.14
Do not need Permission	21.91	15.6	35.1	8.9	14.41	33.4	14.1	11.3	13.3
Not allowed to visit	7.69	3.48	4.59	9.09	18.95	13.52	5.10	16.91	7.29

Visit Relatives	Dhanbad			Patna			Varanasi		
	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse
Need Permission	68.93	66.86	61.12	60.71	76.29	52.83	73.74	76.1	74.56
Need to Inform	22.6	29.65	26.18	30.36	19.07	29.42	20.95	18.7	20.37
Do not need Permission	8.4	3.4	12.7	8.9	4.6	17.7	5.3	5.1	5.5
Not allowed to visit	4.26	4.44	8.4	13.64	28.7	12.88	12.33	27.17	5.07

a. The first 3 rows in each section of the table indicate the share of women -who needed permission, only needed to inform or did not need permission - of the women who answered the question. Not allowed to visit indicates the share of women who did not answer the question but who stated the reason they do not visit a location is because they are not allowed.

Table 3: Share of women who require permission to visit a location: After Binary Re-coding [a]

City	Visit Market			Go Outside Neighborhood			Visit Relatives		
	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse	Daughter	Daughter-in-law	Spouse
Dhanbad	62.05	79.72	53.08	58.04	72.35	54.41	75.45	73.73	67.33
Patna	63.46	86.09	53.06	64.74	84.11	57.65	71.79	84.77	62.09
Varanasi	62.22	91.99	61.68	69.26	88.13	68.86	79.63	89.32	79.02

a. This table represents the share of women who said that they require permission to visit a given location after re-coding the variable. If someone answered "no, I do not need permission" or "no, I only need to inform, " the variable was coded as 1 (hyper mobile). If someone answered "yes, I do need permission," or does not visit the location, the variable is coded 0.

We now describe the results of the bivariate model. In each model, only one predictor is considered-either an internal or external factor. Figures 2-4 the results, with one graph for each city and location combination.

It is important to note that in no city or location is the probability of mobility greater than 0.5. This suggests very limited overall mobility in the region.

Location:

Panel 1 indicates variations in mobility by both city and location. On average, freedom of movement of women to all locations - market, outside neighborhood and relative's house - is the highest in Dhanbad, followed by Patna. Freedom of movement is the lowest in Varanasi.

Within each city, women can most freely go to the market, followed by outside the neighborhood. Women face the most restrictions in mobility when wanting to visit a relative.

This confirms our findings in the previous section.

Rural-Urban:

As in the descriptive statistics, the variation in urban and rural mobility differs by city. Dhanbad and Patna register the least variation in mobility between urban and rural areas, and Varanasi registers the greatest variation. On average, urban women in Patna and Varanasi are more mobile than their rural counterparts. Urban women in Varanasi are 15% percent more likely to go outside the neighborhood and 10% percent more likely to visit relatives without permission than their rural counterparts. These numbers stand at 0% and 4% for Patna. Rural women in Dhanbad appear to be more mobile as compared to their urban counterparts.

Infrastructure:

The infrastructure surrounding a women's house also affects her mobility.[31] In Varanasi, freedom of movement to all locations is higher when the respondents' house is on a paved road. In Dhanbad, higher freedom of movement to the market and outside the neighborhood is associated with a paved or pucca road, whereas movement to a relative's house is typically higher with an unpaved road. In Patna, higher mobility outside the neighborhood and to the market is associated with an unpaved approach road.

Household Structure:

[31] Infrastructure is characterized in terms of the approach road to the respondent's household: kuccha or an unpaved road and pucca or a paved road.

The household structure is a salient factor in the Indian context because there are a large number of joint families, or families where the adult son lives with his parents. [32]As a result, restrictions on female mobility can manifest itself through household structure.

The results suggest a consistent trend wherein women's mobility varies by relation. Affirming our results from the previous section: across all cities and locations, daughters-in-law have the lowest mobility whereas spouses have the highest mobility. Spouses are almost twice as likely to visit the market, 20% more likely to go outside the neighborhood and 11% more likely to visit relatives without permission as compared to daughters-in-law. The mobility of daughters remains between that of the daughters-in-law and spouses.

To summarize our results, we find clear evidence that daughters-in-law are most curbed in their ability to move freely. Our analysis also makes it clear that both the final destination and urban-rural location are important determinants of women's mobility. These trends also vary by city: women in Dhanbad are the least restricted, whereas those in Varanasi are restricted the most.

The low degree of mobility of daughters-in-laws can be explained by two hypotheses. First, the presence of in-laws restricts mobility[33]. In patriarchal households, the senior male, or in limited cases the spouse of the household head, exert control over household decisions, including people's movement outside the house.[34] In order to illustrate this point further, we looked at the question in our survey that asked women whose permission they require before leaving the house. In Patna and Dhanbad, many of the daughters-in-law listed that they require permission from a senior male or senior female in the household, which strengthens the idea that women are required to take permission in the presence of in-laws.[35]

Age may also be a limiting factor as it represents the life cycle position of women in their families. It is an indicator of whether the woman has joined a household as a new bride or has already established herself as an older daughter-in-law or mother-in-law with married children.[36] This is consistent with the result that the spouse of the head of household tends to be more mobile. One reason may be that in the more conservative settings, older women are more trusted to move about on their own than are young brides.[37]

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[32] Alice Evans, "Why Do Most Indian Men Live With Their Parents?". September 2, 2020. https://www.draliceevans.com/post/why-do-most-indian-men-still-live-with-their-parents.
[33] Sathar, Zeba Ayesha, and Shahnaz Kazi. "Women's Autonomy in the Context of Rural Pakistan." *The Pakistan Development Review* 39, no. 2 (2000): 89–110. ISSN: 0030-9729.: 105.
[34] Mason, 1997; Jeejeebhoy and Sathar, 2000; Evans 2020.
[35] One question that may arise is that the higher mobility of spouses of the head of household may capture the effect of nuclear families. However, a majority of the sample lived in joint families. Thus, the analysis captures the effect of the presence of in-laws.
[36] Jeejeebhoy and Sathar, 2001; Mason,1997.
[37] Mason, Karen Oppenheim. "How Family Position Influences Married Women's Autonomy and Power In Five Asian Countries." *Women and Families: Evolution of the Status of Women as Factor and Consequence of Changes in Family Dynamics*, 1997, 18. ISSN: 353-370.: 364.

Our analysis does not provide us with an answer to why mobility might vary by city. But, it is clear that city level characteristics do matter in determining women's mobility.[38] Access to transport may be a function of household location,[39] and is presumably higher in urban areas with paved approach roads.

The variation within cities suggests that mobility is a result of the distance to a destination. Markets are usually closely located to the household, often, within the neighborhood. Moreover, visiting a market is a necessity. This is perhaps the reason why we see higher freedom of movement to markets as compared to any other location. Moving outside the neighborhood could entail travelling longer distances and taking public transport. Thus a fear of safety restricts women's mobility outside the neighborhood. Visiting relatives might also require travelling distances by train or bus and often staying a few nights. This lends evidence to the idea that further the destination, the more restricted women's mobility. However, there may be something inherent in the nature of visiting relatives' houses that curbs the mobility of women across all relations to a similar extent.

[38] Demographic characteristics of the city may play an important role. Women in poorer households are forced to work outside the home due to economic necessity. As a result, literature suggests that OBC's have the highest mobility. Our data suggests that Dhanbad has a higher proportion of respondents who identify as OBC's as compared to Varanasi and Patna. Thus, the higher mobility in Dhanbad may be a result of this disproportionate population. .

[39] Uteng, 2011.: 4.

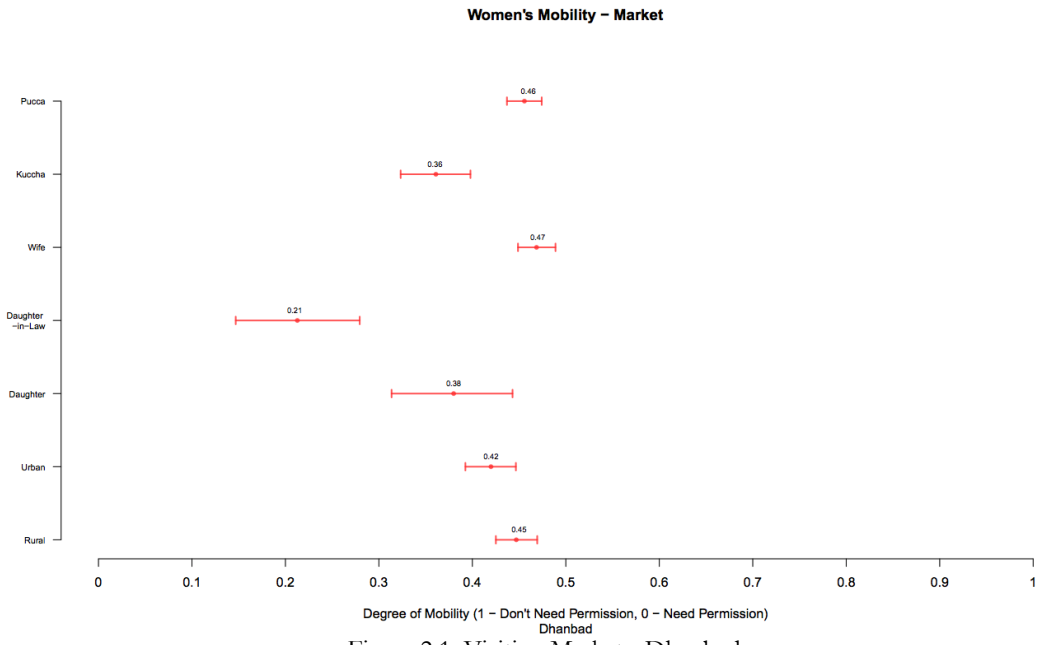


Figure 2.1: Visiting Market - Dhanbad

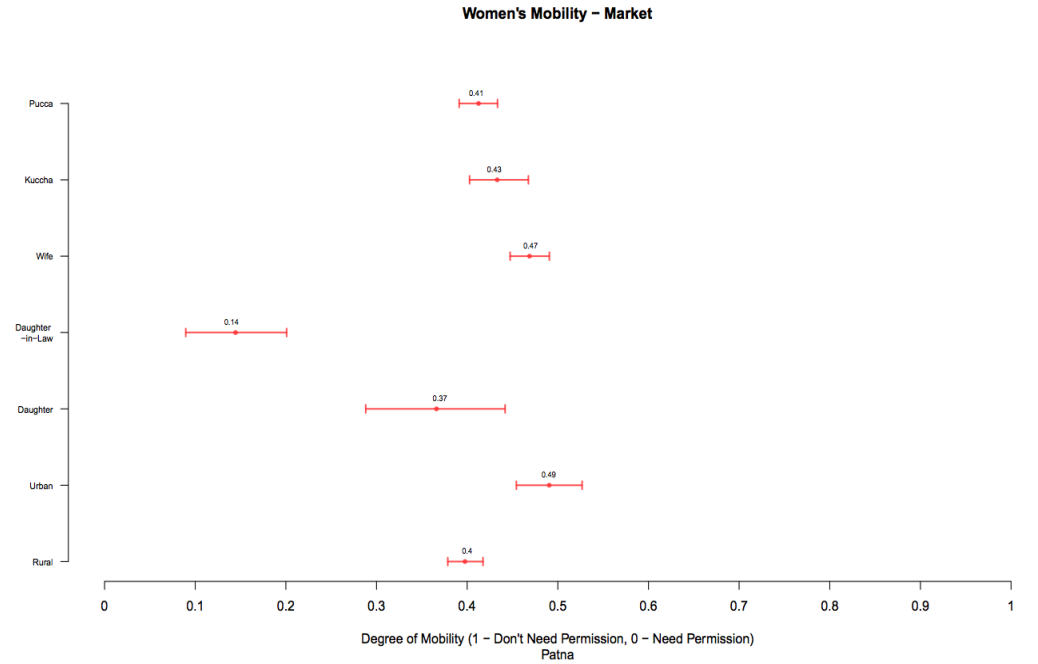


Figure 2.2: Visiting Market - Patna

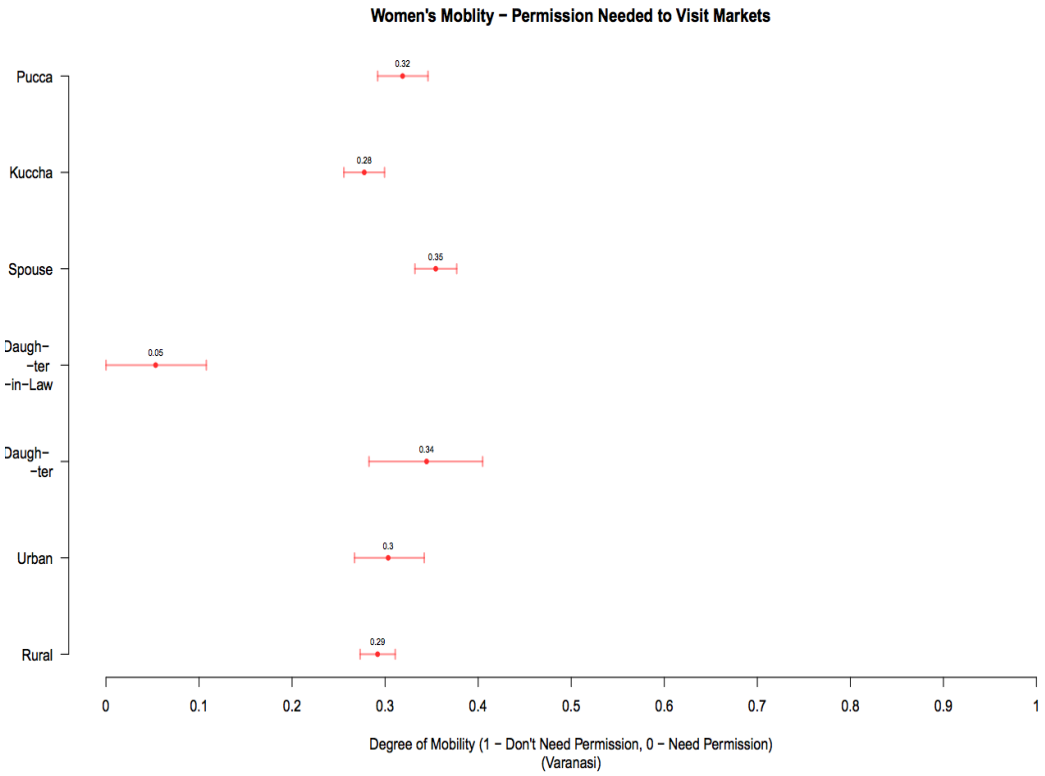


Figure 2.3: Visiting Market - Varanasi

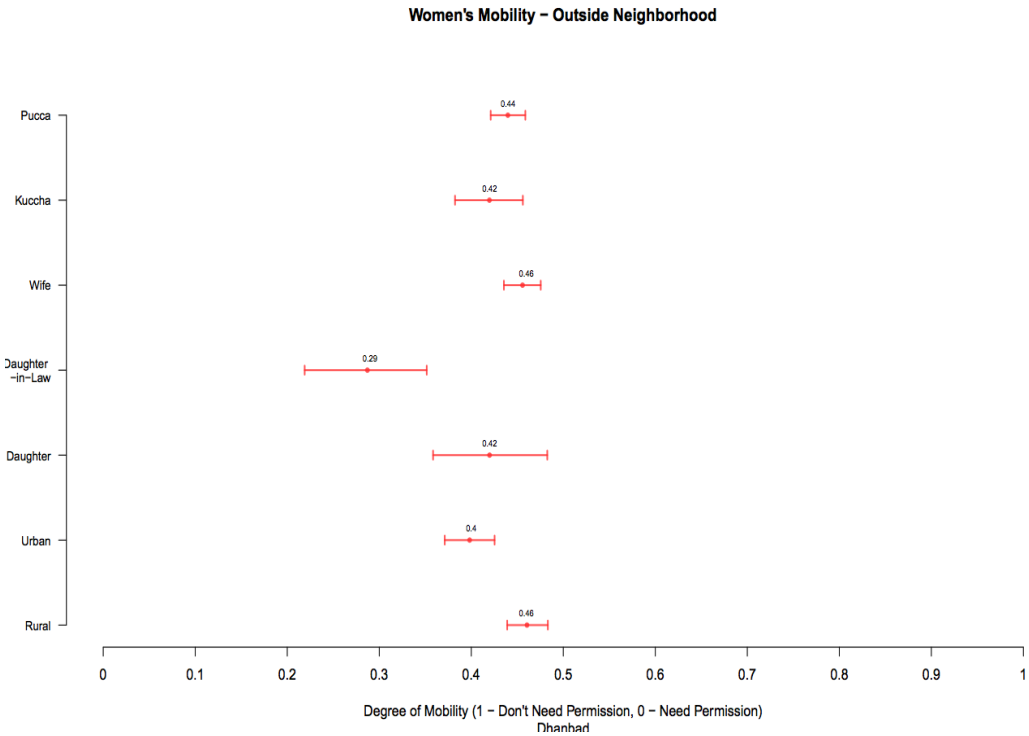


Figure 3.1: Going Outside the Neighbourhood - Dhanbad

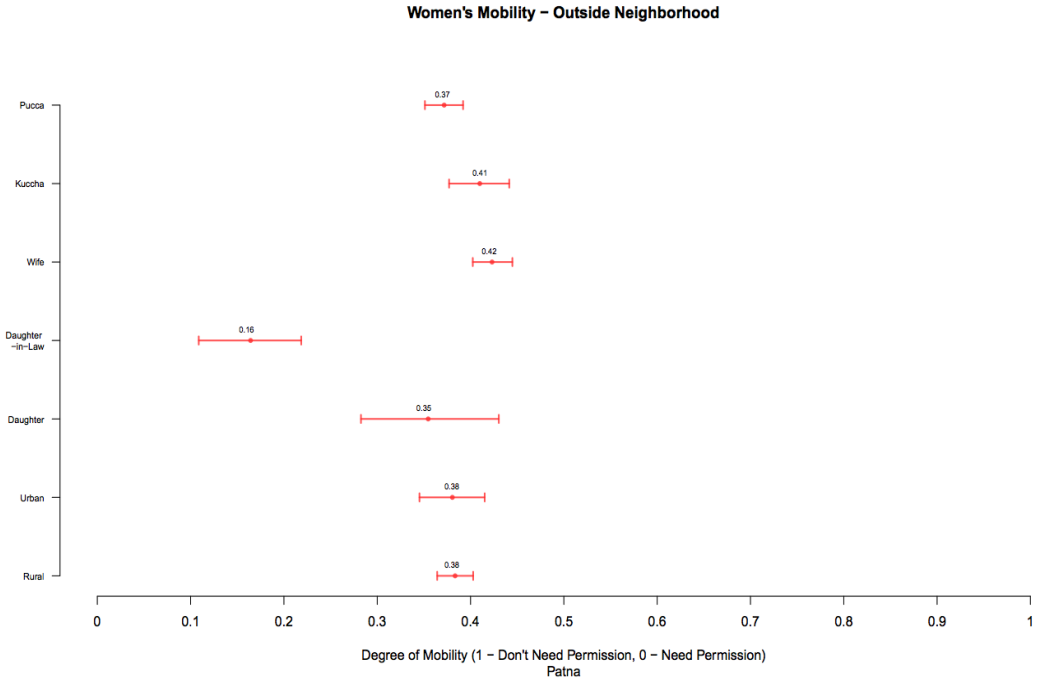


Figure 3.2: Going Outside the Neighbourhood - Patna

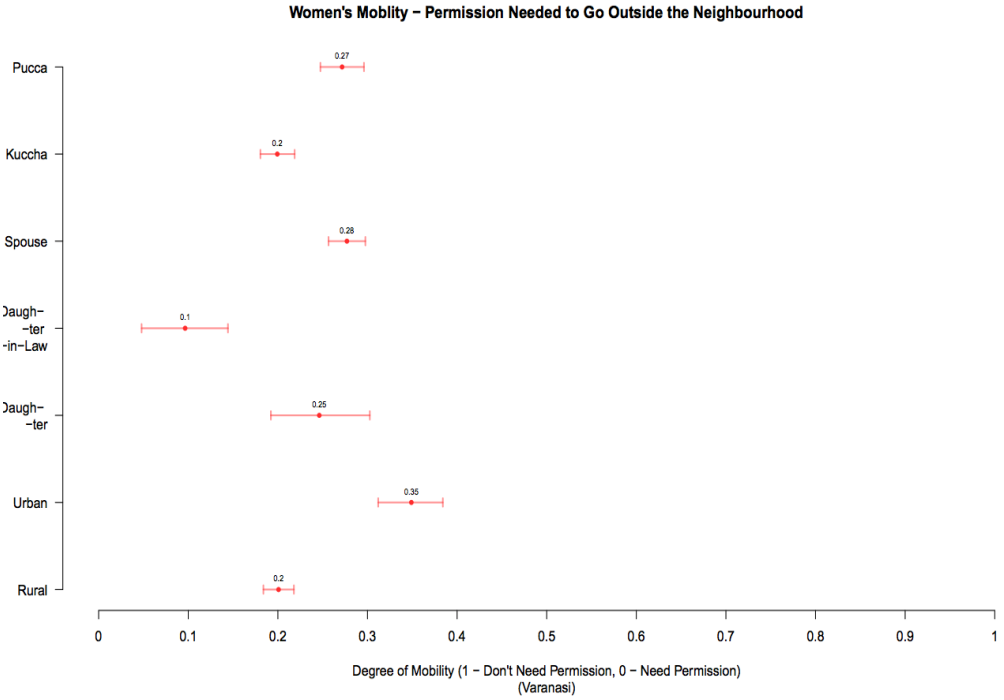


Figure 3.3: Going Outside the Neighbourhood - Varanasi

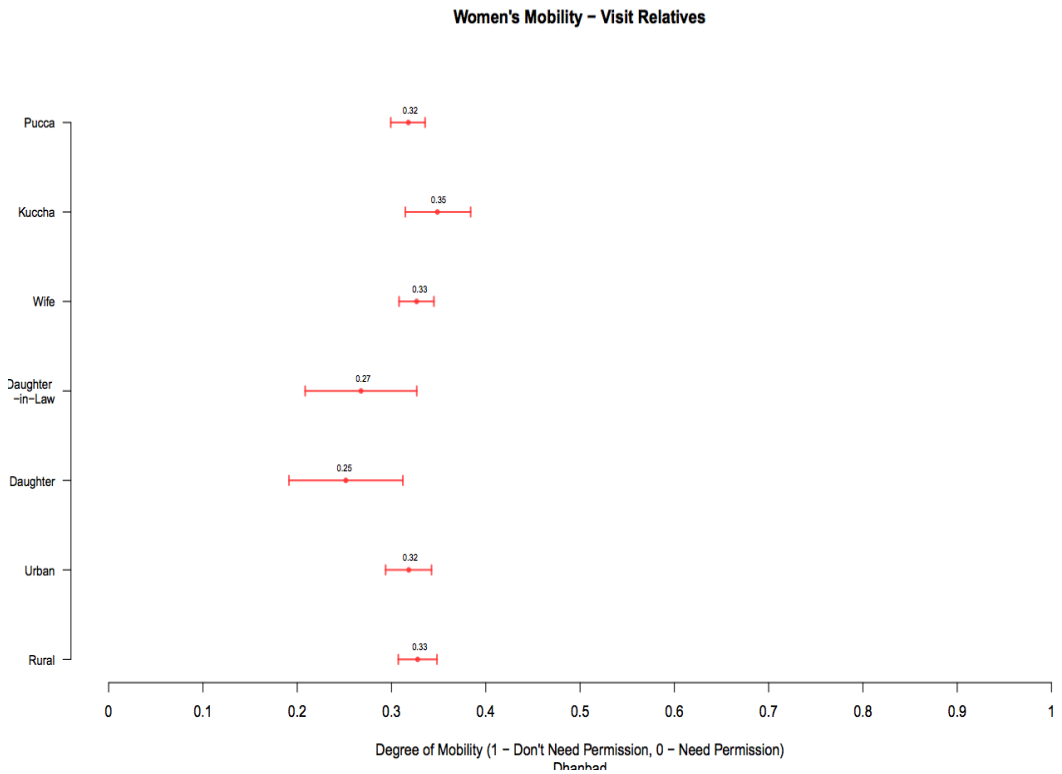


Figure 4.1: Visit Relatives - Dhanbad

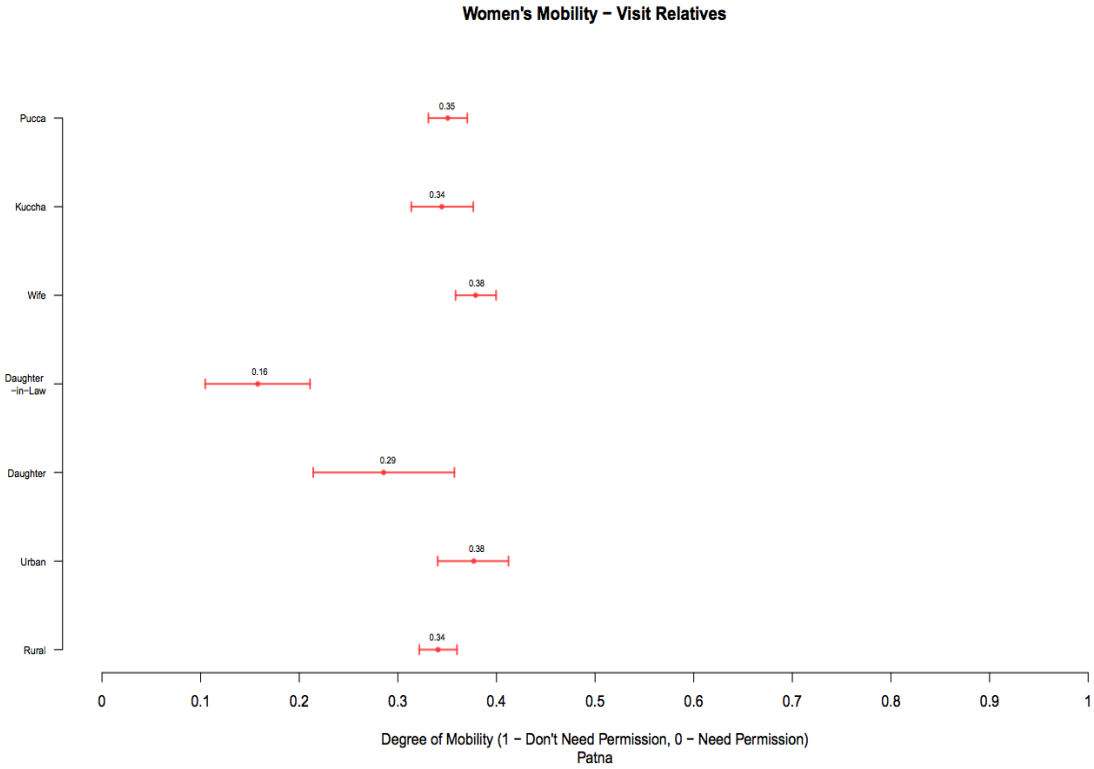


Figure 4.2: Visit Relatives - Patna

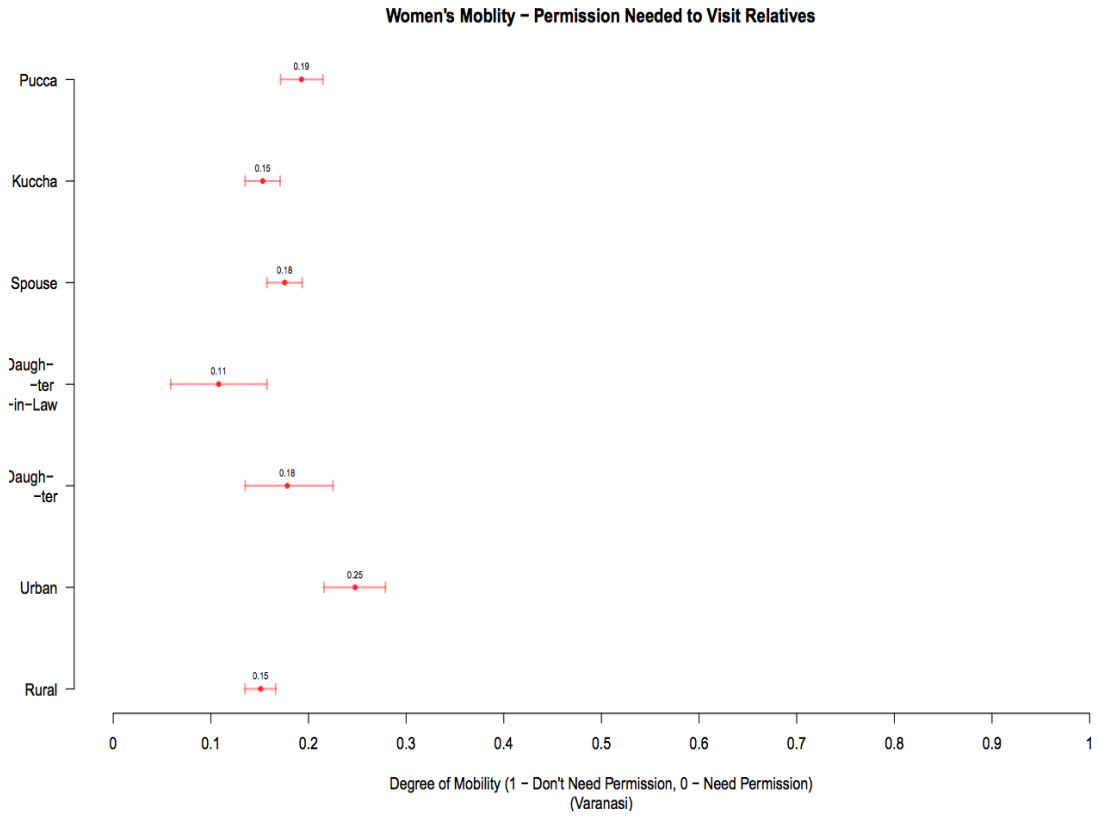


Figure 4.3: Visit Relatives - Varanasi

Working Women: Mobility and Employment

This paper has established that mobility is severely constrained across North India. However, the ability of women to move about freely, without permission from members of the household, is proposed to be an important determinant in fueling women's participation in the labour force. Ashwini Deshpande and Naila Kabeer, in their paper "(In)Visibility, Care and Cultural Barriers: The Size and Shape of Women's Work in India", highlight "strict controls over women's mobility in the public domain" as one for key barriers for women's ability to work.[40] Thus, greater mobility for women has a direct link to the country's labour force and, consequently, the economy.[41] However, while employment can bring women out of their homes for the express purpose of work, it does not necessarily result in women spending more time outside of their homes when they are not working.[42]

[40] Ashwini Deshpande and Naila Kabeer, "(In)visibility, care and cultural barriers: the size and shape of women's work in India," LSE Research Online Documents on Economics (2019): 3.
[41] Ibid.
[42] Chen et al., 2020: 42.

In this section, we probe the effect of mobility on employment. We are not making causal claims as to the direction of the relationship between mobility and employment. Rather, we are concerned with understanding the correlation between employment and mobility. To capture the macro trends, we use the mobility index as defined earlier in the paper.

It is important to qualify that our mobility measures examine movement to specific locations that are not associated with employment. This provides unbiased results when checking the correlation between the two variables.

Our analysis finds that employment and mobility are positively correlated. As is explicit in Figure 5 and 6, women who are more mobile have a higher probability of working across all three cities. Mobile women are 18% percent more likely to be employed in Patna and 10 % in Varanasi and Dhanbad (Figure 5).

This relationship, however, engenders three related questions. First, is work linked with mobility to a particular location? Second, how does mobility affect employment given complex kinship structures? Finally, are mobile women more likely to take up certain kinds of employment more than others?

We use a multilevel model to test the first of these three questions to gauge the link between employment and mobility across different locations. Figure 7 suggests that women who do not require permission and are, consequently, more mobile have a higher probability of employment. The ability to visit the market, go outside the neighborhood, or visit a relative's home without permission increases the likelihood of working by approximately 10 percentage points. This increase is the highest when compared to the other three locations.

Next, we explore the effect of kinship structures and mobility on employment. Figure 8 uses a multilevel model to describe the probability of employment given the mobility status of a woman and her position in the household. We find that across all relations, mobile women are more likely to work. The likelihood of employment increases by 11%, 7% and 3% for spouses, daughters-in-law and daughters respectively when they are mobile as opposed to when they are not. It is germane to point out that those who are not mobile across all these three relations are almost equally likely to work, with a probability of approximately 20%.

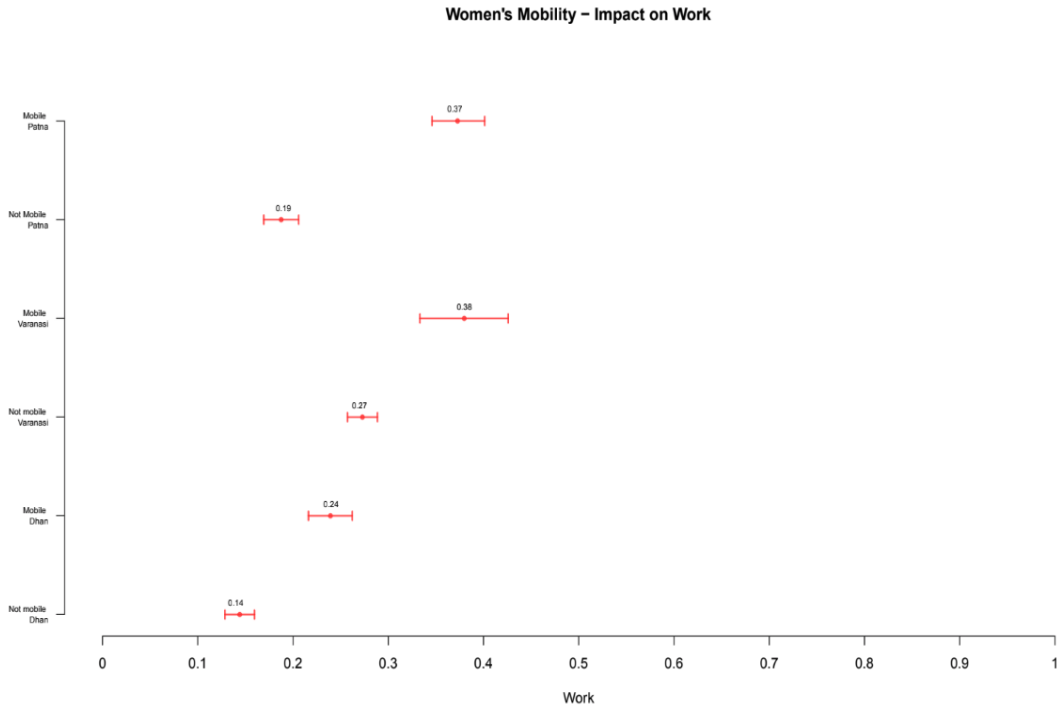
Finally, using an OLS regression, we examine the kind of employment mobile women tend to take up. We find that the likelihood of employment in non-agricultural work (Figure 9) or salaried work (Figure 10) increases as the degree of mobility increases.[43] Women who are less mobile have a greater likelihood of working in the agricultural sector and in household businesses. This result is intuitive since women working within these sectors are not required to move outside the household space.

[43] A woman engaged in agricultural work is coded as 1 and those in non-agricultural work are coded as 0. Similarly, women engaged in salaried work are coded as 1 and women engaged in business are coded as 0.

Thus, mobility and work are fundamentally linked. Increasing women's mobility is an important tool to increase their labour force participation, especially in salaried employment. However, increasing labor force participation can also serve as a tool to bring women out of the home.

Conversely, lack of labor force participation may increase the restrictions women face. If women's economic independence is heavily constrained, as a result of poor labour market prospects, women may be better off living with in-laws. As a result, women have less autonomy and are less likely to seek non-familial employment. As women age, they become economically dependent upon sons. This solidifies family ties over generations.[44]

Figure 5. Impact of women's mobility on employment



[44] Evans, 2020.

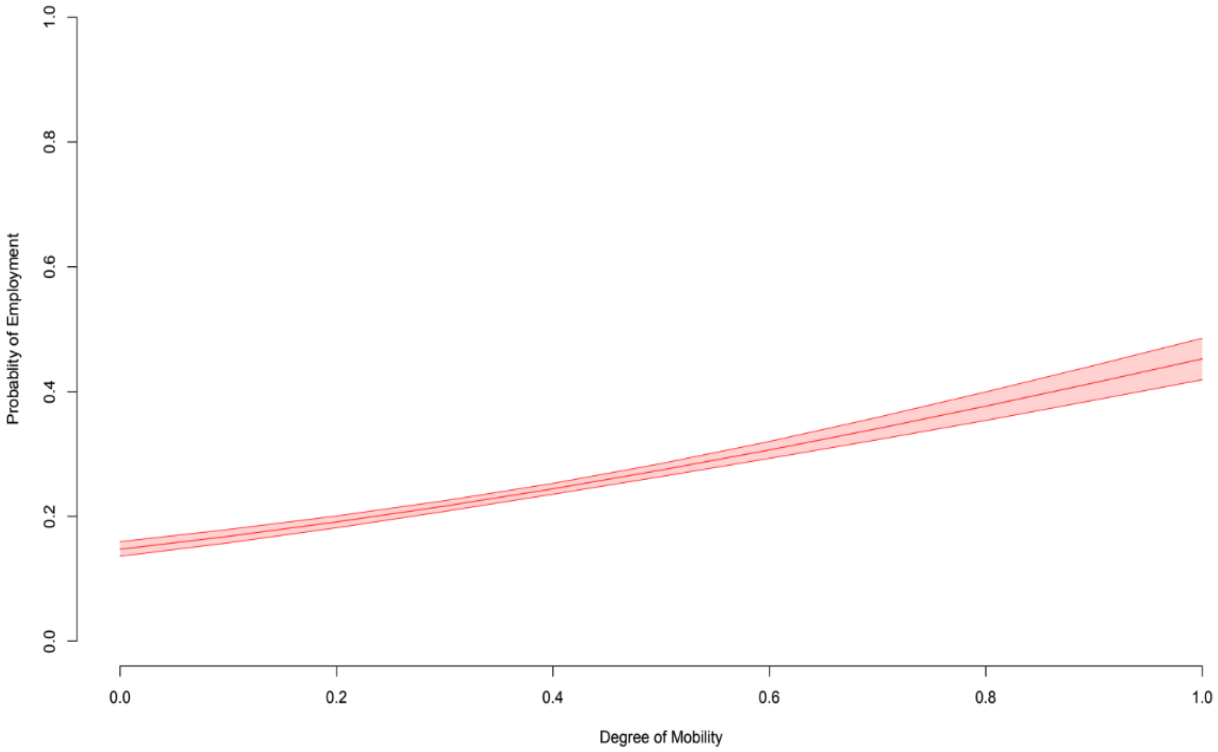


Figure 6: Probability of Employment given Mobility

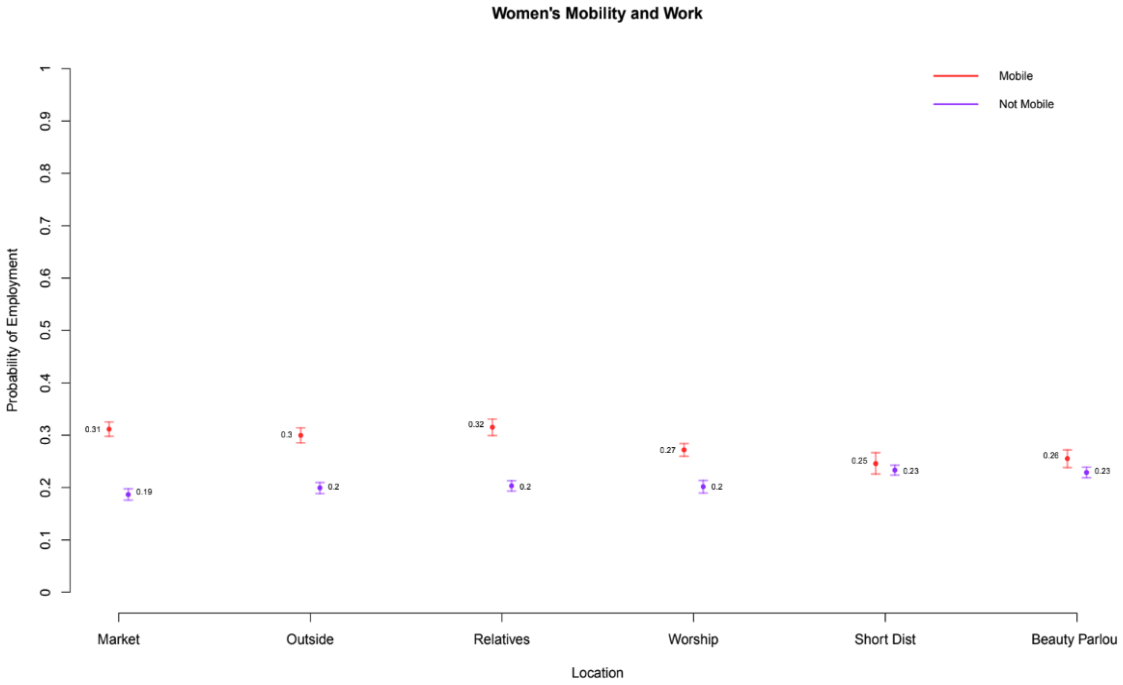


Figure 7: Women's Employment given Mobility, by Location

Figure 8: Women's Employment given Mobility, by Relation

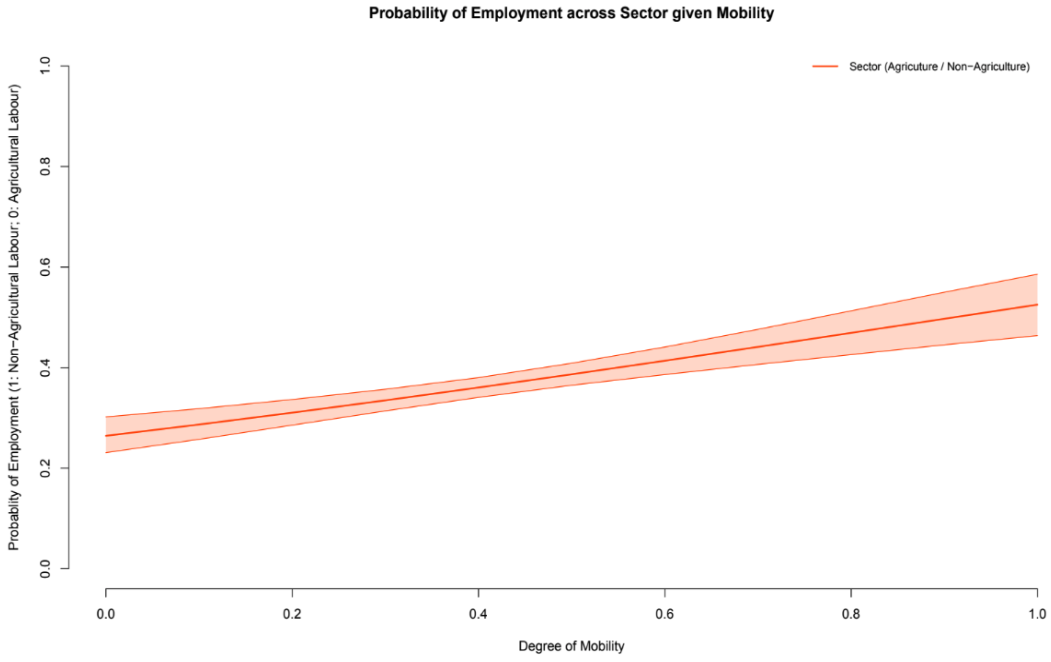


Figure 9: Women's Employment Given Mobility (Sector)

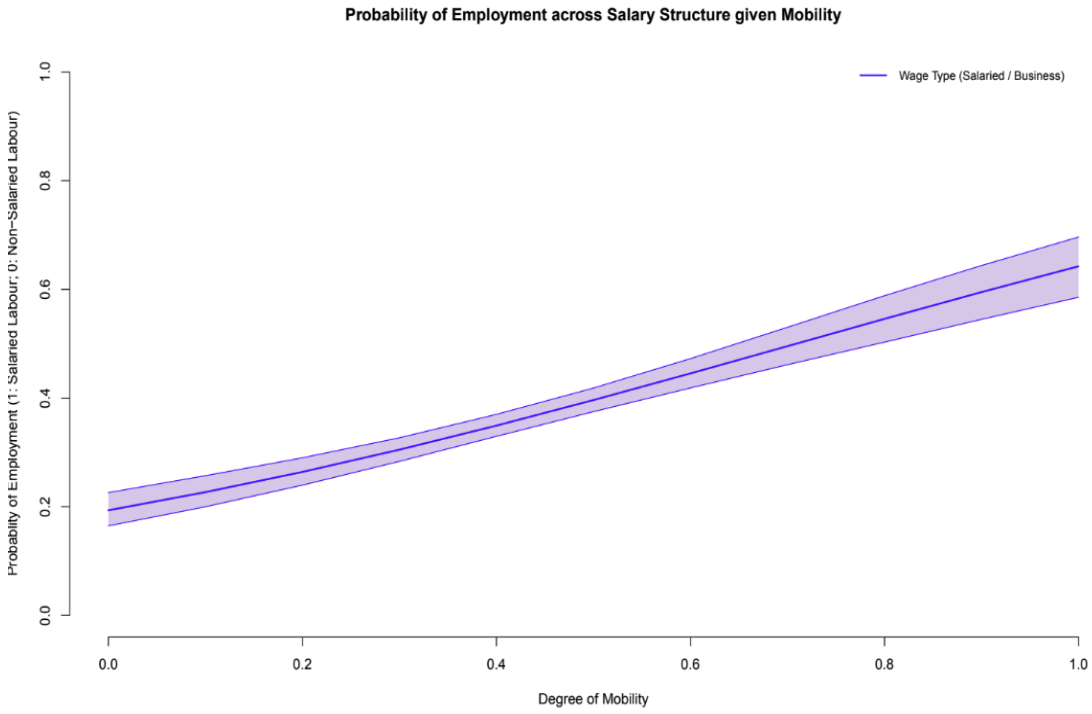


Figure 10: Women's Employment Given Mobility (Wage Structure)

Moving Forward

In this paper, we analyse women's mobility using descriptive statistics and Bayesian inference techniques in three North Indian cities: Patna, Dhanbad and Varanasi. Primarily, we find that the kinship structures and physical surroundings of a household are very powerful in explaining variation in women's autonomy and mobility.

Most significant of these factors is the woman's position in the household. Daughters-in-law are the least mobile, whereas spouses of the head of household or other senior females have the highest degree of mobility. The joint family structure and presence of in-laws limits female mobility in the North Indian context.

We find evidence that urban women are, on average, more mobile. However, what is striking is the variation in mobility across cities. Women in Dhanbad, for instance, are the most mobile and women in Varanasi are considerably less mobile. This indicates that city level factors may be affecting physical mobility. Our analysis also brings to the forefront the idea that distance travelled may also affect a woman's ability to freely move about. Women had the highest freedom of movement when they were visiting the market, which is probably located close to their homes, and lowest while visiting relatives, who might even live in different cities or states.

Aside from the variation in mobility across household structure and location, our study enumerates the value of being able to move without any restrictions. Probing the link between mobility and employment, we test if, in fact, greater mobility leads to better levels of participation in the labour force as existing literature contends. We establish that mobility is positively correlated with work. In other words: the greater the mobility, the more likely a woman is to work. Examining different sectors of employment, we find that mobility increases the likelihood of working in salaried, wage labour most significantly.

Through a focused look at household relations and location, we have only begun to scratch the surface of the potential determinants of women's mobility in a complex setting like India. Various questions, such as those related to street safety, public transport, among others, still remain answered. However, it is clear that lifting restrictions on movement increases the chances of women entering the labour force which has significant implications for their autonomy, and the Indian economy.

Appendix

Table 4: Percentage of Female Respondents in Urban and Rural Areas

Relation	Dhanbad		Patna		Varanasi	
	Rural	Urban	Rural	Urban	Rural	Urban
Daughter	54.1	45.9	66.03	33.97	81.3	18.6
Daughter-in-law	65.4	35.6	82.78	17.22	81.6	18.3
Spouse	61.3	38.7	78.68	21.32	82.0	18.0

Table 5: Share of women who need permission to visit a given location - Urban and Rural [51]

Visit Market	Dhanbad		Patna		Varanasi	
	Rural	Urban	Rural	Urban	Rural	Urban
Daughter	45.0	40.0	39.2	36.3	29.2	31.0
Daughter-in-law	22.5	33.0	62.5	53.85	34.29	21.66
Spouse	25.4	27.3	28.22	24.52	33.4	20.4
Go Outside Neighborhood	Dhanbad		Patna		Varanasi	
	Rural	Urban	Rural	Urban	Rural	Urban
Daughter	36.9	33.0	45.0	46.0	35.0	26.0
Daughter-in-law	31.8	58.2	56.52	57.0	37.3	28.9
Spouse	21.7	32.4	34.49	35.8	33.8	15.3
Visit Relatives	Dhanbad		Patna		Varanasi	
	Rural	Urban	Rural	Urban	Rural	Urban
Daughter	64.2	74.0	60.81	66.2	78.35	57.0
Daughter-in-law	68.9	62	77.97	72.72	76.6	63.2
Spouse	61.9	59.7	53.6	52.3	76.6	63.70

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Chapter 5. What is Women's Work? Reflections from Unique North Indian Data

Devesh Kapur, Milan Vaishnav, and Dawson Verley

Introduction

One of the quintessential stylised facts about India's political economy is the low—and declining—rate of female labour force participation (FLFP) in the country.

Across countries, there is a well-known "U-shaped" relationship between per capita income and female labour force participation (Goldin 1995). At very low levels of per capita income, women actively participate in the labour force in large numbers. But as incomes increase, women often withdraw from the labour force due to personal preferences, social and household pressures or inadequate employment opportunities, stemming in part from the structural transformation from an overwhelmingly rural to a more urban society. As incomes and education continue to increase further, typically so does women's labour force participation, as opportunities and norms "catch-up" with the larger structural changes.

India currently finds itself near the bottom of this U-shaped curve. What is striking, however, is how few women work in India even compared to countries with a similar level of per capita income. Between 1990 and 2014, female participation in the labour force dropped from an already low 29 percent in 2004-5 to 22 per cent in 2011-12 and to 17 percent in 2017-18, representing one of the worst gender gaps in the world.

However, within India, there is a raging debate regarding the actual severity of the female employment challenge. While there is little doubt that women's economic empowerment (proxied by female labour force participation) leaves much to be desired, there are disagreements over the "true" rate of women's participation in the workforce.

Critiques of the stylised facts that are commonly bandied about emanate from diverse quarters. For instance, Bhalla and Kaur (2011) have pointed out that certain categories of women's work—especially self-employment in family farms or family firms (e.g. shops)—are missed in national surveys, since the National Sample Survey (NSS) does not collect information on incomes from self-employment. Furthermore, they also argued that female labour force participation rate had been declining because women were attending school in greater numbers and staying there for longer durations.

More recently, Desai (2020) has highlighted weaknesses in survey techniques employed by national sample surveys conducted by the Government of India, which likely underestimate the extent of women's work by undercounting casual and domestic forms of work.

The objective of this chapter, therefore, is to unpack what we mean when we refer to "work." We argue that data on women's labour force participation (FLFP) in India is hampered by shortcomings in data *validity* and data *accuracy*. Validity refers to the relationship between

theoretical concepts and collected information while accuracy refers to the correctness or avoidance of errors in datasets (Herrera and Kapur 2017). The latter, in turn, can be afflicted by at least two types of error: *measurement error* and *reporting error*. We investigate both sources of error leveraging our extensive data collection across north India. In particular, our survey collects data on labour market behavior in at least three separate ways, through:

- an enumeration of the household roster (completed by either the male or female primary respondent);
- a detailed questionnaire completed by the female primary respondent;
- and a discrete time-use survey, also completed by the female primary respondent.

By comparing across these three modules, we can estimate the degree of measurement and reporting error that characterises data on female labour force participation.

Thinking about data validity

The core idea embedded in "work" is effort. But, according to most national statistics regimes, the measurement of "work" has been quite different and has evolved over time. International standards embodied in the System of National Accounts (SNA) initially measured work only of the "gainfully occupied population," which was defined as "any occupation for which the person engaged therein is remunerated directly or indirectly, in cash or in kind" (ILO 2013). Persons were considered to be economically active only if they contributed (or sought to contribute) to the production of goods and services within this limited SNA framework. This definition of the economically active population was introduced for the first time in 1982 to establish a direct link between employment activity and production statistics, which did not exist previously.

Two developments in the last decade modified the measurement of work.[45] The first was the international commitment to achieving the Sustainable Development Goals (SDGs) by 2030. Among these, SDG 5.4 contains a commitment to, "recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate." The key indicator developed to measure this goal was the, "proportion of time spent on unpaid domestic and care work, by sex, age and location."[46]

More recently in 2013, the International Labour Office (ILO) presented a new definition of work that emphasised the comprehensive measurement of participation in all work activities, including paid and unpaid work, defining "work" as "any activity performed by persons of any sex and age to produce goods or provide services for use by others or own use." The new ILO

[45] For a useful discussion of the evolution of the measurement of work, see Hirway (2020).
[46] United Nations, "SDG Indicators: Metadata repository," https://unstats.un.org/sdgs/metadata?Text=&Goal=5&Target=5.4.

definition formally recognised unpaid domestic services and unpaid care as “work” for the very first time (ILO 2013).

One popular way of measuring the full gamut of a person’s work activities over a full day is through time use surveys, we present data from a recent National Statistics Office (NSO) time use survey (Table 1). According to the NSO data, men spend 23.8 percent of a full day working while women spend 23.2 percent. The gender difference, therefore, is minor. Women work as hard as men, it is just that the activities they work on are different.

Table 1. Percentage share of total time in different activities in a day per person

	NSO Survey	
	Male	Female
Employment and related activities	21.3	4.3
Production of goods for own final use	0.3	0.3
Unpaid domestic services for household members (including caregiving)	2.2	18.6
Learning	7.0	6.1
Social activities and Leisure	19.6	20.5
Self-care and maintenance	49.4	50.0

Note: NSO data is for all person of age 6 years and above.

Considering alternate definitions of work

These gender-based differences in the nature of work become apparent when one reviews responses to the employment-related questions on our household survey instrument, which is completed either by the male or female primary respondent. For each household, the primary respondent is asked to provide information on the primary and secondary activities of all individuals in the home.

For primary and secondary activity, we consider an individual to be working if they are engaged in any of five discrete activities: 1) work in a household enterprise/self-employed/own account; 2) work as an employer 3) work as a helper in a household enterprise/unpaid family worker; 4) work as a regular salaried/wage employee; and 5) work as a casual wage labourer.

Table 2 presents pooled responses to this question, disaggregated by gender. Because we are using data on all eligible individuals within the household—as opposed to simply our primary respondents—the sample sizes are greater than 50,000. Using a definition of work based on primary activity, 73 percent of men and just 12 percent of women are engaged in work. If we

extend this definition to primary and secondary activities, the percentage hardly budges for men (it moves from 73 to 74 percent) but slightly increases for women, from 12 to 15 percent.

Table 2. Labour Force Participation Rates by Gender (Household Roster)

	Labour Force Participation Rate (%)				
	Not Including Domestic Work		Including Domestic Work		
Gender	Primary Activity	Primary + Secondary Activities	Primary Activity	Primary + Secondary Activities	N
Male	73	74	75	76	22796
Female	12	15	82	83	21137

If, however, the definition of work is further extended to include primary activities plus "domestic duties", the picture changes dramatically for women. For men, including domestic duties in our definition has a marginal impact on the share who are working (75 percent fit this definition). For women, on the other hand, the share jumps to 82 percent. The picture changes little if we also incorporate secondary activities.

This illustrates the extent to which domestic work consumes the lives of a large majority of women in our sample. And it echoes recent time use data released by the Government of India that finds that even though in a typical day women spent 11 percent more time working than men, they spend 84 percent of their working hours on unpaid activities, while men spend 80 percent of their working hours on paid work.[47]

Next, we subdivide the data by rural and urban households in each of our four cities (Dhanbad, Indore, Patna, and Varanasi). Table 3 provides the labour force participation rates for all eight sub-samples.

Table 3. Labour Force Participation Rates by Gender, City and Rural-Urban (Household Roster)

	Labour Force Participation Rate (%)	
	Not Including Domestic Work	Including Domestic Work

[47] According to time use data collected and analysed by the Government of India (2020), the share of total time devoted to work-related activities in a given day was 22.9 percent for males and 25.4 percent for females. Half of respondents' (both male and female) days were spent on "self-care and maintenance" for both males and females. The remaining time was spent on learning, socialising, and leisure.

Gender	City	Rurality	Primary Activity	Primary + Secondary Activities	Primary Activity	Primary + Secondary Activities	N
Male	Dhanbad	Rural	75	75	76	76	3447
Male	Dhanbad	Urban	73	73	74	74	2232
Male	Indore	Rural	79	79	82	82	2510
Male	Indore	Urban	71	71	74	74	2563
Male	Patna	Rural	73	74	75	76	3570
Male	Patna	Urban	66	67	68	69	1167
Male	Varanasi	Rural	72	73	75	75	5793
Male	Varanasi	Urban	75	76	77	77	1345
Female	Dhanbad	Rural	7	11	84	84	3242
Female	Dhanbad	Urban	8	11	81	82	2097
Female	Indore	Rural	22	24	87	88	2373
Female	Indore	Urban	11	14	81	81	2379
Female	Patna	Rural	16	20	85	86	3211
Female	Patna	Urban	9	11	81	83	1069
Female	Varanasi	Rural	11	14	81	81	5358
Female	Varanasi	Urban	12	14	77	78	1266

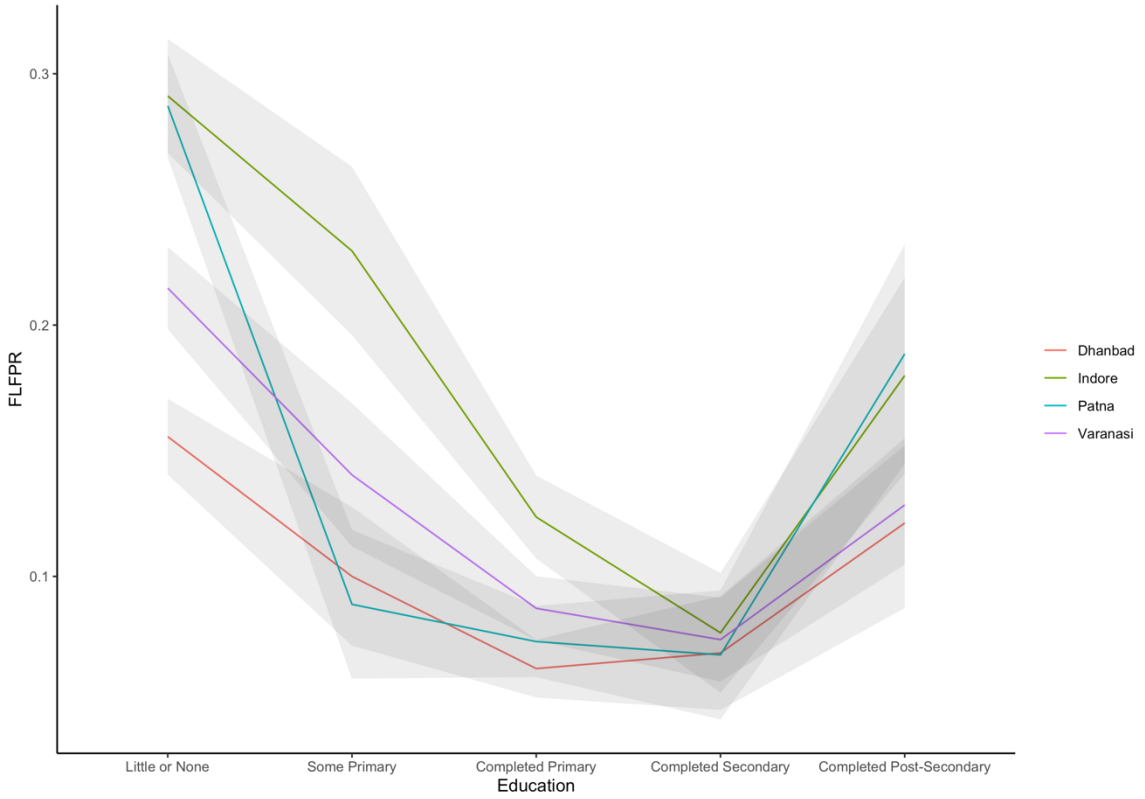
Across all cities, women's labour force participation is low, though there is some variation across cities. Labour force participation rates are highest in Indore followed by Patna. Twenty-two percent of women in rural Indore report work as their primary activity while 16 percent of women in rural Patna do the same. Both cities exhibit a sizeable urban-rural gap: 10 percent in Indore and 7 percent in Patna, with urban FLFP even lower than the very modest rural numbers.

On the other hand, Dhanbad and Varanasi trail even further behind and the former, in particular, exhibits very low female labour participation rates: just 7 percent of rural women and 8 percent of urban women report working, based on their primary activity. The numbers increase only modestly (to 11 percent) when secondary activities are included. Interestingly, Dhanbad and Varanasi also exhibit very little signs of a gap between urban and rural households, perhaps because the numbers are so low to begin with.

However, in all cases, labour participation rates increase massively once we consider domestic activities, as discussed above. Across cities, nearly 80 percent or more of women in our sample households could be classified as "working" once their domestic duties are taken into account, with shares ranging from 88 percent in rural Indore to 77 percent in urban Varanasi.

Education and FLFP exhibit the classic U-shaped relationship that has been widely documented in other studies. Figure 1 plots this U-shaped relationship across the four cities. In each case, FLFP is highest among women with little or no education and those with a post-secondary education. Conversely, it is lowest among women who have completed primary or secondary education.

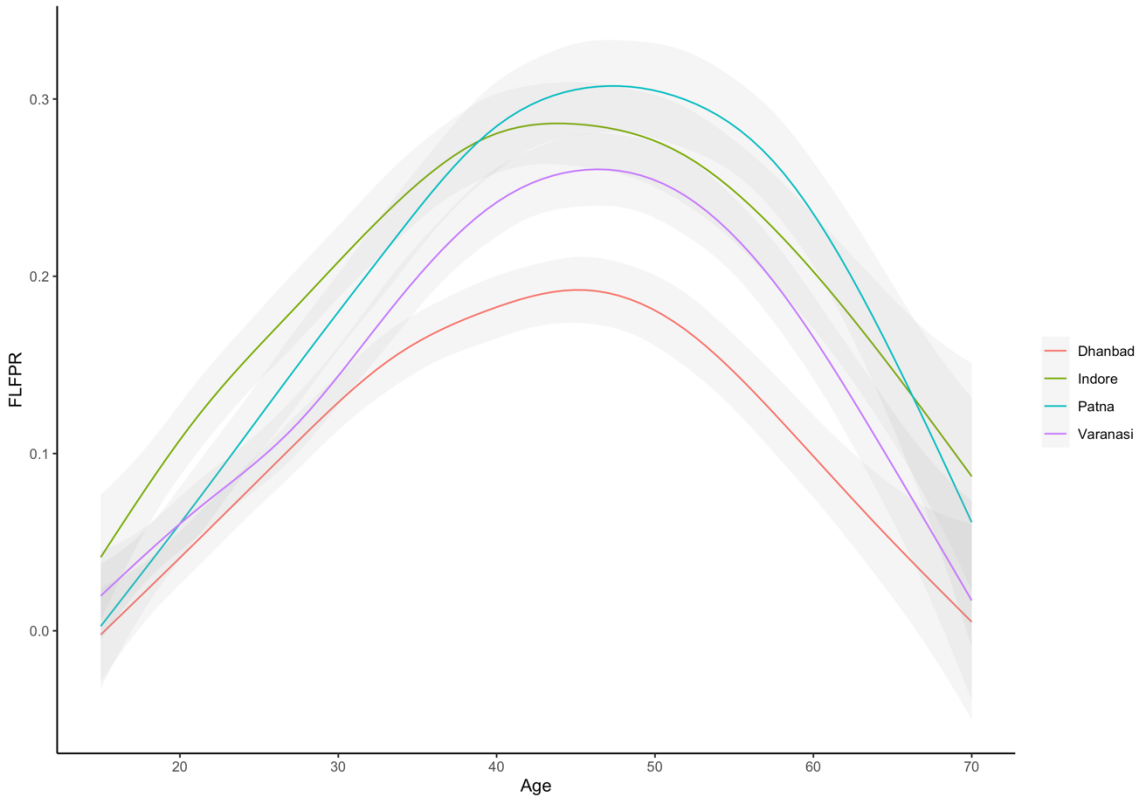
Figure 1. Education and FLFP, by City



We also see a clear inverted-U shape relationship between age and FLFP. Women in our sample are much less likely to be involved in work as their primary/secondary activity at the extremes of the age distribution. At lower ages, women are in the peak child-bearing age. Peak fertility in India is in the age group 25-29, followed by the age group 20-24 and 30-24.[48] Women in their 40s appear to the most likely demographic participating in the labour force (Figure 2).

[48] Census of India, Sample Registration System (SRS) Statistical Report 2018. https://censusindia.gov.in/vital_statistics/SRS_Report_2018/2._Figures_at_a_glance_2018.pdf

Figure 2. Age and FLFP, by City



A simple logistic regression, using primary and secondary activity as the dependent variable, adds additional context (Table 4).

This regression controls for several factors: age, education, urban/rural state, city, caste, religion, and an index of household assets. There are four main takeaways from the regression results.

First, Dhanbad (the reference category) registers the lowest FLFP while Indore registers the highest, even after controlling for numerous confounders. Second, once city-level differences are accounted for, there is no significant difference between women's propensity to work in urban versus rural areas. Third, the regression results confirm the U-shaped relationship between education and work; those with no schooling (the reference category) and those who have completed post-secondary school are the two categories of women most likely to be employed. Fourth, when it comes to identity markers, Hindu women and women from lower or disadvantaged caste groups are more likely to work than women from religious minorities or General caste women.

Table 4. Correlates of Female Labour Force Participation

Term	Estimate	SE	Statistic	p-value
(Intercept)	-2.92	0.12	-23.42	0.00
Age	0.01	0.00	7.61	0.00
City: Indore	0.72	0.06	11.67	0.00
City: Patna	0.61	0.06	9.53	0.00
City: Varanasi	0.32	0.06	5.22	0.00
Education: Some Primary	-0.29	0.07	-3.94	0.00
Education: Completed Primary	-0.48	0.06	-7.81	0.00
Education: Completed Secondary	-0.61	0.10	-6.36	0.00
Education: Completed Post-Secondary	0.09	0.09	1.06	0.29
In School	-2.55	0.23	-11.10	0.00
Assets	-0.29	0.03	-10.14	0.00
Rural	0.04	0.05	0.72	0.47
Religion: Muslim	-0.22	0.08	-2.80	0.01
Religion: Other	0.64	0.20	3.11	0.00
Caste: ST	1.11	0.09	11.82	0.00
Caste: SC	0.78	0.08	10.19	0.00
Caste: OBC	0.54	0.07	7.63	0.00
Caste: Other / Don't Know	0.75	0.15	5.10	0.00

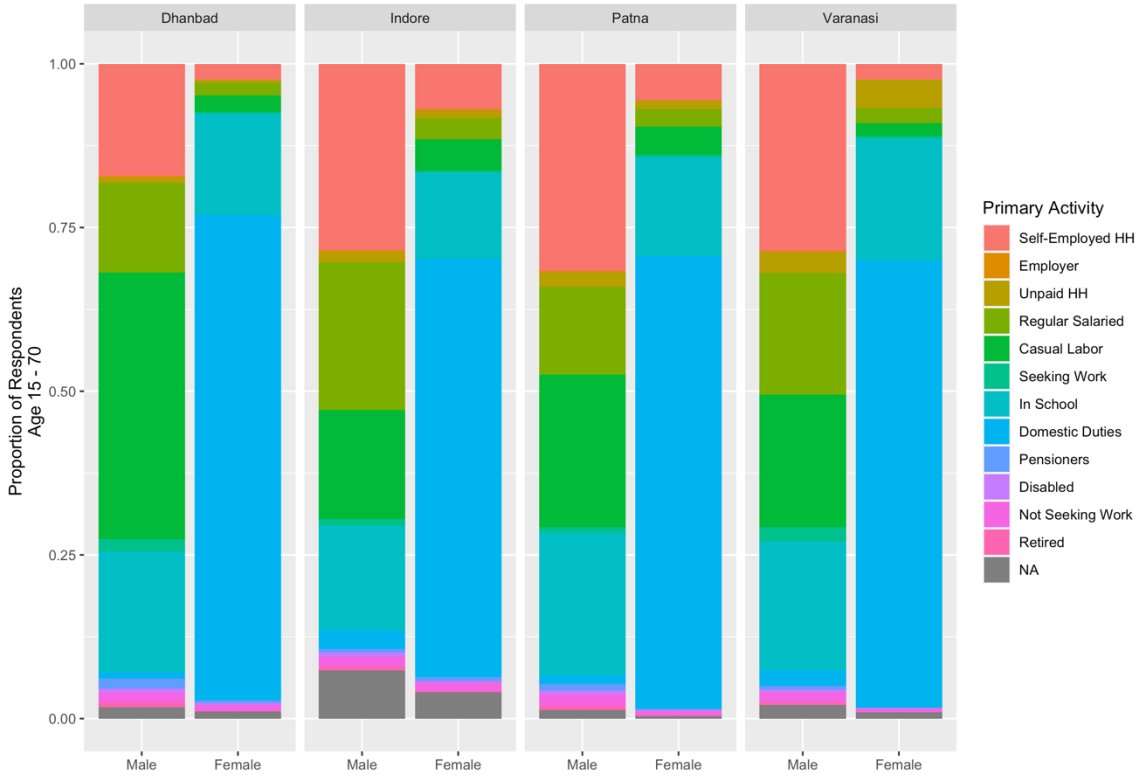
Nature of work

Next, we turn to the nature of work that men and women are engaged in. Here, we exploit information from the primary activities listed on the household roster (as above). We display the breakdown of women's activities, disaggregated by the 13 primary activity codes enumerated in our survey (Figure 3)

Expectedly there is significant gender-based variation in primary activity. The vast majority of women in our sample report "domestic duties" as their primary activity. This pattern is consistent across our four cities.

Men, on the other hand, very rarely declare such duties their primary activity. For men, the categories of "self-employed/household enterprise" and "casual labour" collectively account for as much as 50 percent of all enumerated primary activities. One other interesting thing to note is that, across all cities, very few women (less than one percent) report being unemployed but seeking work. Thus, the official unemployment rate for women in the country is extremely low, despite such low female labour force participation rates.

Figure 3. Primary Activities, by Gender and City



There is also important city-wise and activity-wise variation in primary activities, easier to discern when viewing the data in tabular form (Table 5).

Table 5. Distribution of Primary Activities, by Gender and City

	Frequency of Activity (%)							
	Men				Women			
Primary Activity	Dhanbad	Indore	Patna	Varanasi	Dhanbad	Indore	Patna	Varanasi
Self-Employed	17.7	28.8	34.2	28.7	2.5	6.7	6.0	2.4
Employer	0.2	0.3	0.2	0.2	0	0.2	0	0
Unpaid Household Work	0.9	1.6	2.6	3.1	0.4	1.0	1.4	4.3

Regular Salaried Work	12.9	21.9	12.0	18.6	1.8	3.1	2.5	2.2
Casual Labour	41.3	17.4	21.4	20.5	2.6	5.0	4.2	2.0
Seeking Work	1.9	1.1	0.8	2.1	0.2	0.2	0.3	0.3
In School	18.0	16.3	21.7	19.7	15.2	13.1	14.8	18.7
Domestic Duties	1.0	2.7	1.6	2.2	74.5	64.8	69.5	68.2
Pensioners	1.6	0.5	1.0	0.6	0.3	0.7	0.2	0.1
Disabled	0.6	0.6	0.7	0.4	0.3	0.1	0.3	0.1
Not Seeking Work	1.5	1.4	1.8	1.6	1.0	1.0	0.7	0.5
Retired	0.8	0.6	0.6	0.3	0.1	0.2	0	0
Other	1.7	7.0	1.4	2.1	1.0	3.7	0.3	1.1

For starters, it is evident from the data that the share of women listed as self-employed or working in a household enterprise as a paid worker is relatively meager across the board, but is miniscule in Dhanbad and Varanasi (2 percent) compared to either Patna or Indore (6 and 7 percent, respectively). Furthermore, casual labour—which accounts for a large share of men's primary activities—is relatively rare for women: between 2 and 5 percent of female household members engage in casual work, according to data drawn from the household roster. Salaried work, as expected, is also sparse—2 to 3 percent across all cities.

In contrast to these small numbers, the share of women reporting that they are in school is substantially higher—between 13 (in Indore) and 19 (in Varanasi) percent of women fall into this category. Finally, domestic duties accounts for the lion's share of primary activities, with the difference between Indore (64 percent) and Dhanbad (74 percent), perceptible (10 percent), but not massive. Patna and Varanasi find themselves somewhere in the middle.

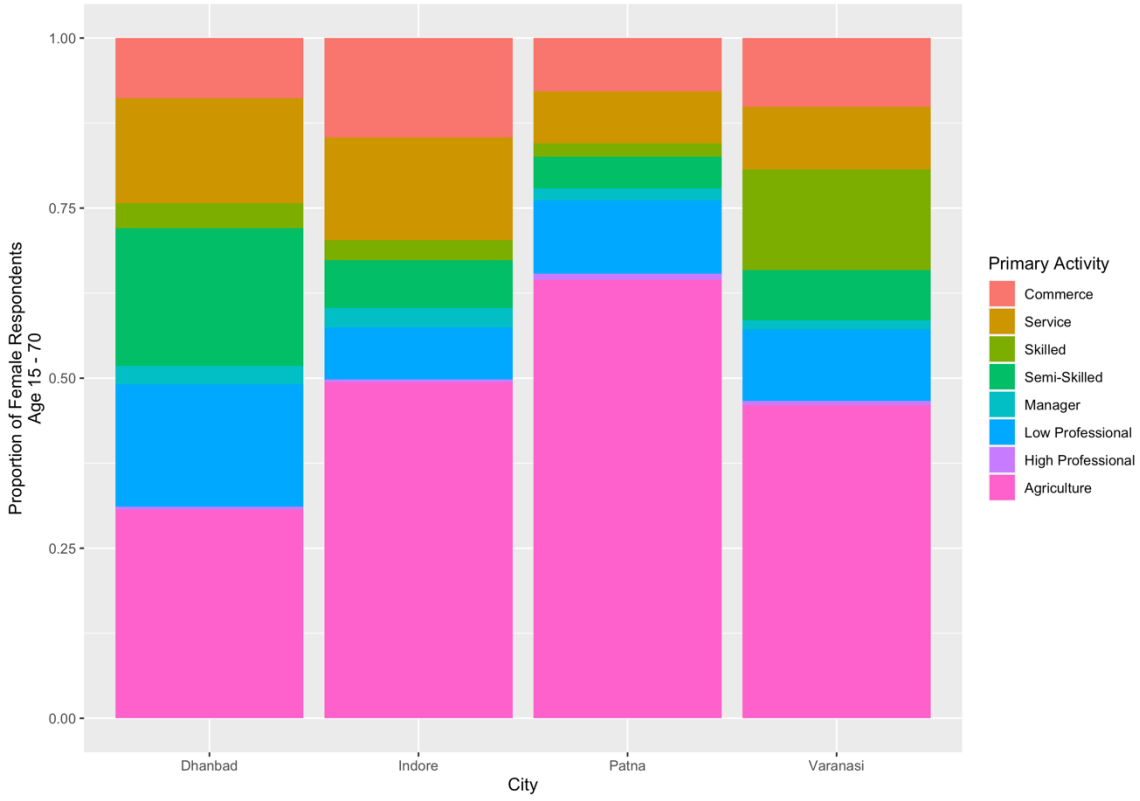
Employment occupations

Among the women who do work that goes beyond domestic duties, where do they work? In this section, we briefly examine the types of jobs in which women are working, again drawing on information from the household roster. The occupational breakdown of women's work (Figure 4) is illuminating.

There is now broad agreement among economists that the decline of FLFP largely reflects the decline in women's labour in agriculture, partly due to the fall of agriculture's share of Indian GDP and partly the growing mechanisation of agriculture that has led to a much greater decline

in women's than men's labour on Indian farms (Afridi, Bishnu, and Mahajan 2020). This decline in women's employment in rural India has not been accompanied by a concomitant growth in job opportunities for women in urban areas. Figure 4 shows that a plurality of women in all four cities report being engaged in agricultural work, though there is striking variation. 64 percent of working women in Patna are employed in agriculture compared to just 31 percent in Dhanbad. In Indore and Varanasi, the share is around half.

Figure 4. Female Employment Occupations, by City



Second, almost no women in our entire sample are employed as higher professionals or managers. While this group is often missed in surveys such as ours, we believe that this is reflective of the reality of the relative paucity of white-collar jobs in these cities and the virtual absence of women in the relatively limited number of such jobs that do exist. Three percent of women in Dhanbad and Indore report working as managers, while just two and one percent one percent of women in Patna and Varanasi, respectively, fall under this heading.

Table 6. Occupational Categories, by Gender and City

	Frequency of Occupation Category (% of active labour force)	
	Men	Women

Primary Activity	Dhanbad	Indore	Patna	Varanasi	Dhanbad	Indore	Patna	Varanasi
Commerce	14.6	19.0	14.2	18.8	9.1	13.1	7.9	10.0
Service	3.3	4.2	4.4	4.7	15.6	12.6	6.9	9.0
Skilled	16.1	12.5	11.8	22.0	3.0	2.4	1.7	15.2
Semi-Skilled	45.5	19.4	22.1	24.3	19.9	7.4	4.1	7.8
Manager	4.9	3.0	3.1	2.8	2.8	3.1	1.5	1.5
Low Professional	5.2	3.2	4.3	3.2	16.9	7.2	10.7	9.4
High Professional	1.0	1.6	1.5	0.7	0.5	0.5	1.0	0.7
Agriculture	9.4	37.1	38.6	23.6	32.2	53.7	66.2	46.3

Third, for other occupational categories, no clear pattern emerges across cities (Table 6). 18 percent of women in Dhanbad work as lower professionals, considerably higher than in the other three cities surveyed. In fact, the share of women in Dhanbad working as lower professionals is more than twice the share of similarly employed women in Indore (8 percent). Similarly, 20 percent of women in Dhanbad report worked as semi-skilled labourers—nearly three times the share seen in Indore and Varanasi and four times that of Patna.

While the number of women working as skilled labourers is low, it is significantly higher in Varanasi (15 percent compared to 2-4 percent in other cities). On the other hand, in Indore and Dhanbad, 15 percent of women are classified as service-sector works – considerably higher than in either Patna (8 percent) or Varanasi (9 percent). Finally, Indore also stands out by having a larger share of women working in commerce at 15 percent, compared to 8-10 percent in other cities, perhaps reflecting its greater economic dynamism.

Measurement error

Now, we turn to interrogating the first type of error we discussed above: measurement error. To do so, we compare definitions of "work" across three separate parts of the survey: the *household roster*, the *female primary respondent survey*, and the *time use survey*. While the household roster is completed by any adult in the household—typically either the male or female primary respondent—the latter two must be completed by the female primary respondent. In the next section, we examine a second potential source of error—reporting error—based on the identity of the survey taker who fills out the household roster.

The time use survey asks respondents to account for all activities they engage in throughout a 24-hour period, using meals times to divide the day. Respondents were asked what activities they engaged in after waking up from sleep until breakfast; from breakfast to lunch; from lunch to dinner; and from dinner to sleep. For our purposes, we are explicitly focused on work-related

activities. According to our classification, these activities fall into one of six categories: employed agricultural work, household agricultural work, employed labour at home, employed labour outside the home, working in a household business at home, and working in a household business outside of the home.

Table 7 displays the breakdown of types of work based on the time use survey. The leading work category, based on women's self-reported disaggregation of their day, is household agricultural work (7 percent), following by employment outside of the home (6 percent). 4 percent of women report being employed in agricultural work while another 4 percent report being employed at home. Just 1 percent of respondents report being engaged in a household business, either at home or outside of the home.

Table 7. FLFP, by Time Use Category

Time Use Category	Frequency
Employed Agricultural Work	3.9%
Employed at Home	4.1%
Employed Outside Home	5.6%
Household Agricultural Work	7.4%
Household Business at Home	1.2%
Household Business Outside Home	0.7%

The time use survey can be further disaggregated by city and rural/urban status (Table 8). This reveals several interesting patterns.

First, even in rural areas, there is considerable variation in the share of women employed in agriculture, either on their own land as family labour or on another farm as hired labour. More women work in household agricultural work, as part of the household production labour. This ranges from 15 percent of women in rural Varanasi to 11 percent in rural Indore and 9 percent in rural Patna but just 4 percent in Dhanbad. Somewhat fewer women work as agricultural workers: 10 percent of women in rural Patna, 7 percent in rural Indore, 4 percent in rural Varanasi and just 1 percent in rural Dhanbad.

Table 8. FLFP by Time Use Category by City, Rurality

City	Rurality	Employed Agricultural Work	Employed at Home	Employed Outside Home	Household Agricultural Work	Household Business at Home	Household Business Outside Home
Dhanbad	Rural	1.0%	2.1%	4.5%	3.9%	0.7%	0.3%
Dhanbad	Urban	0.6%	2.9%	6.3%	2.3%	1.0%	0.2%
Indore	Rural	7.3%	5.9%	9.1%	11.2%	1.2%	0.5%

Indore	Urban	1.1%	4.8%	8.1%	1.3%	1.4%	1.4%
Patna	Rural	10.3%	2.9%	4.2%	9.3%	0.9%	0.7%
Patna	Urban	1.4%	4.0%	5.3%	0.9%	1.9%	0.9%
Varanasi	Rural	4.3%	4.8%	4.1%	14.8%	1.5%	0.7%
Varanasi	Urban	0.7%	6.4%	6.6%	3.0%	1.6%	1.5%

Second, the share of women employed at home is marginally higher in Varanasi and Indore—both rural and urban—than in either Patna or Dhanbad. Work outside the home is also higher in Indore, although here urban Varanasi (7 percent) diverges from rural Varanasi (4 percent).

Third, and not surprising given the aforementioned findings from the survey, very few women are employed in a household business (either at or outside home), according to the time use survey. Across the board, the rates of employment in a household business at home are 2 percent or below, and they are 1 percent or below for household business outside the home.

It is worth pointing out that women tend to report working in just one employment category, conditional on them reporting being employed at all in the time use survey.

We can now compare results across our three measurements of work: from the roster (primary and secondary activity), the female primary respondent survey, and the time use survey (Table 9).

Table 9. Labour Force Participation Rates Across Survey Instruments

	Labour Force Participation Rates		
Gender	HH Roster	Self-reported	Time Use
Male	95.8%	82.2%	91.3%
Female	18.5%	22.2%	20.0%

Expectedly, the discrepancy between men and women's labour participation rate is striking across all measures. The gap is more than 75 percent if one goes by the roster, based on primary or primary and secondary activities. The gap is only slightly smaller for the female primary respondent survey (82 percent for men versus 22 percent for women) while it is nearly just as high for the time use survey. While women are slightly more likely to report being engaged in work on the female primary respondent and time use surveys, the differences – while noticeable – are not stark. In the most extreme case, 18.5 percent of women are listed as engaged in work as a primary activity on the roster while 22.2 percent report working when self-reporting in the female-only survey.

Interestingly, one sees a slightly different pattern for men. According to the roster and time use data, 96 and 91 percent of men, respectively, report working. This is considerably higher than the share who report working (82 percent) based on responses from the male primary respondent survey.

Table 10 displays this data for men and women across our four cities. Irrespective of the city or data source, the male labour force rate very rarely dips below 90 percent. The only exception is Patna where slightly less than 90 percent of men reporting working, according to both the male primary respondent survey and the time use survey (data on employment from the male respondent survey is unavailable in Indore due to data collection issues).

Table 10. Labour Force Participation Rates Across Survey Instruments, by City

		Labour Force Participation Rates		
Gender	City	HH Roster	Self-reported	Time Use
Male	Dhanbad	96%	91%	92%
Male	Indore	94%	N/A	92%
Male	Patna	95%	89%	88%
Male	Varanasi	98%	93%	92%
Female	Dhanbad	13%	17%	12%
Female	Indore	21%	18%	21%
Female	Patna	22%	25%	23%
Female	Varanasi	19%	28%	24%

When it comes to women, there is some variation, primarily across cities. While 13 percent of women in Dhanbad report working as their primary activity based on roster data, that share is 22 percent in Patna, according to the female primary respondent survey. Dhanbad lags behind the other cities according to the other two data sources— the female instrument and time-use survey.

Across the three metrics of work, there is no clear pattern in terms of FLFP. For Dhanbad, Patna, and Varanasi, FLFP is highest on the self-reported survey. In Indore, however, it is higher (21 percent) on the roster and time use survey and lowest on the women's instrument.

Having said that, the three sources of data—while demonstrating differences in levels of work—are reasonably correlated with one another (Table 11). When one disregards domestic work, the other types of work (irrespective of how they are captured) exhibit a correlation of 0.56 or higher.

Table 11. Correlations Between Survey Instruments

	HH Roster	Self-reported	Time Use
HH Roster	1	0.65	0.57
Self-reported	0.65	1	0.60
Time Use	0.57	0.60	1

Reporting effects

From measurement error, we now turn our attention to reporting error. Here, we focus on the identity of the household member completing the roster – from which our data on primary and secondary activity is collected. Previous work on survey methodology suggests that proxy reporting tends to reduce observed labour force participation, and moreover, that female proxies tend to report lower female labour force participation than male proxies (Bardasi et al. 2011).

To evaluate the impact of the gender identity of the respondent on reported FLFP, we compare FLFP rates when women and men serve as primary respondents on the roster portion of the survey. Regression analysis indicates that the gender of the household roster respondent does indeed matter for reported FLFP. Average marginal effects are reported in Table 12.

Table 12. Selected Average Marginal Effects (AMEs)

Factor	AME	SE	z-score	p-value	CI: Lower	CI: Upper
Female Respondent	2.60%	0.80%	3.41	0.00	1.10%	4.10%
Self-Reported LFP	-0.50%	0.60%	-0.74	0.46	-1.70%	0.80%

Contrary to Bardasi et al. (2011), we find that when a woman fills out the household roster, women's participation in the workforce is more likely to show up on the roster inventory. In particular, the labour force participation rate reported by female proxy respondents is approximately 2.6 percent higher than the female labour force participation rate reported by male proxy respondents. Furthermore, this effect holds even after controlling for baseline FLFP, using responses from the individual and time use surveys. We also control for age, education, rural/urban status, and include city dummies. Interestingly, whether the female respondent herself fills out the roster data does not seem to matter. However, while the evidence presented in Bardasi et al. (2011) is experimental, this analysis is purely correlational.

Conclusion

The preceding analysis triangulates across three sources of data on female labour force participation—a household roster, survey instrument, and time use survey—to unpack women's engagement with the workforce in north India. While the three data sources are correlated to a degree, there are important nuances.

The household roster data finds that just 15 percent of women in households surveyed are currently engaged in work. However, this definition overlooks domestic duties, a critical component of women's routine, everyday work burden. Once those tasks are factored in, 83 percent of women are engaged in work, according to this broader definition. However, male participation in "work" hardly budges once one incorporates domestic duties, suggesting that very few men are engaged in domestic duties as their primary activity.

Across all cities, women's participation in the labour force is low, although the extent does vary across cities. FLFP is highest in Indore and lowest in Dhanbad and, across our four cities, rural employment is typically larger than urban work.

Multivariate regression analysis confirms this difference in labour force rates across cities, but also finds that the city-wise variation trumps urban/rural differences. It also reaffirms the traditional U-shaped relationship between education and work and finds that Hindu women—especially from lower castes—are more likely to participate in the labour market.

In terms of sectors, a plurality of women in all four cities report working agricultural labour although the variation is large across cities. Twice as many working women in Patna are employed in agriculture compared to women in Dhanbad.

The paper also sheds light on two forms of error in measuring FLFP: measurement error and reporting error. Interestingly, the measurement error for women is not as large as for men. The survey completed by the female primary respondent demonstrates the highest level of employment followed by the time use survey and the household roster. There is a gap of almost four percentage points between the primary respondent survey and the roster, for instance. There is some variation across cities, suggesting that the direct survey measure does not always turn up the highest FLFP.

Finally, we do detect interesting reporting error, largely having to do with the identity of the household member who fills out the roster. Here, FLFP rates are significantly higher when a woman fills out the household roster than when a men completes this task. What is more intriguing is that the identity of the woman does not matter; there is no differences if the woman is the primary survey respondent or some other woman in the household. The crucial factor is that the person responding to the roster is a woman.

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