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Doing More, Getting Less: Women's Work and Waning Productivity in India

By

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Abstract

This paper explores the trends in female labour force participation (FLFPR) in India in relation to economic growth and structural transformation from 1983–84 to 2023–24. It opts for a decomposition shift-share analysis to examine the differences in productivity for the female labour force compared to the whole labour force. The findings indicate that, despite an expansion in the female labour force in the third phase (2011-12 to 2023-24), the productivity gains for women have been significantly lower, and the female labour force has also incurred dynamic losses. Moreover, the paper uses a probit model with margins to estimate the magnitude of changes in supply-side factors influencing women's participation. Key findings affirm that marriage has a negative effect, and the presence of a working mother-in-law has a positive association of around 30 percentage points. In rural areas, there has been a notable rise in self-employment among women in recent years. Overall, the results point to the persistent barriers women face in benefiting equally from structural transformation, including social norms and limited access to progressive employment opportunities.

Keywords: Labour force participation, economic development, structural change, productivity, employment patterns, probit analysis, shift-share analysis, demographic factors, social factors, gender inequality.

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1. Introduction

India's female labour force participation rates (FLFPR) have been fluctuating in recent years. Starting in the early 2000s, India began to experience a steady economic growth rate, owing to liberalisation in 1992 and increasing globalisation; around the same time, FLFPR paradoxically started declining, reaching an all-time low of 22.5 percent in 2017-18. Astonishingly, FLFPR increased substantially since 2017-18 and was 38.5 percent in 2023-24. Despite extensive literature (Afridi et al., 2016, 2019; Deshpande & Kabeer, 2019; Deshpande & Singh, 2021; Kapsos et al., 2014; Klasen et al., 2012; Klasen & Pieters, 2015; Sarkar et al., 2019) exploring the reasons for this decline during a period of growth, research on the recent rapid changes in India's FLFPR is still developing (Bhalla et al., 2024; Deshpande, 2023; Mondal et al., 2023; Pattnayak et al., 2024). This period of changing female labour market dynamics coincides with India's steady growth rate of 6.4 percent since 1992 (World Bank, 2025a) and moderate structural transformation with some productivity growth (McMillan et al., 2017).

Understanding these fluctuations is crucial, especially in the context of India's development challenges and potential inequalities. Economic growth is generally understood as a society's increased capacity to produce goods and services, driven partly by accumulating factors of production and partly by increases in productivity. Structural transformation, where labour and capital move from lower-productivity traditional sectors (like agriculture) to higher-productivity modern sectors (like industry and services), is a key mechanism for long-run economic growth and productivity increases. However, for developing countries like India, achieving economic convergence remains an exception, and challenges related to structural transformation and fundamental factors like institutions and human capital persist. In the case of India, while globalisation allowed for a boost in productivity in the economy by bringing in jobs in the high-productivity services sector, it also contributed to "premature de-industrialisation" which may not be conducive to long-term productivity growth (Iversen et al., 2018; Mcmillan & Rodrik, 2011; Rodrik, 2013, 2015, 2017) as jobs in the high-productivity services sector are simply incapable of absorbing India's large unskilled

workforce. The lack of a manufacturing sector in the country may have adverse consequences for structural transfers in the country's female labour force.

The relationship between FLFPR and economic development has often been described by the 'feminisation U-hypothesis', which posits a decline in female participation during industrialisation, followed by a rise with the expansion of service sector jobs (Goldin, 1994; Sinha, 1967). However, empirical evidence for this hypothesis is not consistently robust, particularly in the case of India, where state-level analysis (Lahoti & Swaminathan, 2013) has found only feeble support. Confounding demand and supply-side factors unique to specific economies seem to influence women's participation, leading to varied outcomes across countries despite similar economic development or education levels. In India, for instance, education does not have a positive association with labour force participation as it does in East Asian economies (Chen & Ge, 2018; Klasen, 2019; Klasen & Pieters, 2015) and even at higher levels, education has often been valued more for its returns in the marriage market than for labour market participation, reflecting persistent cultural norms that limit women's opportunities. Furthermore, societal norms and the limited availability of 'appropriate jobs,' often confined to specific service sector roles, also restrict women's entry into the workforce, alongside significant care-work responsibilities.

Given this complex landscape, this paper aims to delve deeper into India's labour force dynamics. This paper seeks to examine differences in productivity growth between the whole and female labour force between 1983-84 and 2023-24. It also aims to analyse how the probability of participating in the workforce differs between women and men. To estimate the differences in probability, this research uses a probit model with margins to estimate how the magnitude of supply-side indicators, specifically individual and household characteristics, has changed over time to affect women's participation in the workforce. And finally, it aims to understand how changes in the productivity of India's female labour force are linked to the nature of employment women have entered into recent years.

The second section of this paper is the theoretical framework, which is split into three parts. The first part lays out the relevant theoretical background for the contribution of productivity and structural transformation in economic growth. The second part delves into

the relationship between FLFPR and structural transformation. The last part discusses the theoretical background behind the supply-side factors, such as human capital levels and socio-cultural norms that influence women's participation in the workforce.

The third section of this thesis delves into contextualising the case of India. This first part lays out how, despite similarities in development trajectories and proximity, India's neighbour's performance in FLFPR differs from India's. The second part discusses the economic growth and policy transitions in India between 1983 and 2023 to help frame the background for the conclusion drawn in the shift-share analysis. The last section presents descriptive statistics around the composition of India's FLFPR to help contextualise the issue at hand for analysis later on. It covers the FLFPR for all years for urban and rural areas, disaggregation by sectors and employment type and LFPR for different education levels.

The fourth section discusses the data sources used in the study- primarily the Employment and Unemployment Survey (EUS), the Periodic Labour Force Survey (PLFS) and GDP data. It also delves into issues of data comparability for the survey data and discusses the sources and considerations for the GDP data used in the analysis. The fifth section relays the methodology for both methods used in the paper. The sixth section presents the results and discusses the decomposition shift share results and marginal effects of the probit model. The final section addresses the research statement and scope of the research and offers insight into further implications of the findings.

2. Theoretical Framework

2.1 Structural Change and Productivity Growth

Crafts (Crafts, 2003) defines economic growth as a society's increasing ability to produce goods and services; this growth in productive potential results in part from the accumulation of more factors of production and in part from increases in productivity. An increase in productivity refers to an increase in output per unit of factor input, which is derived through advances in technology, organisational efficiency, and so on.

Long-run economic growth hinges on increases in the real GDP per person, and according to development economics, this is achieved through substantial changes in the structure of the economy and the composition of its outputs. This reasoning is based on the dual economy model (Lewis, 1954; Ranis & Fei, 1961), where an economy is sharply distinguished between a traditional (agriculture) and a modern (industry) sector, and to increase productivity, labour and capital have to move from the former to the latter. The argument hinges on the idea that accumulation, innovation and productivity growth take place in the modern sector while the traditional sector remains technologically backwards and stagnant (McMillan et al., 2017). Hence, the degree of economy-wide growth is determined by the rate at which resources, principally labour, move from the traditional to the modern sector.

Where the dual-economy model focuses on the flow of capital between sectors, growth in macroeconomics is derived from Solow's (1956) neoclassical growth model, which assumes structural similarity across sectors and, instead, sees growth as driven by savings, capital accumulation, and technological innovation. Thus, Solow's model sees growth as a result of growth within modern sectors. Together, these approaches are complementary in that they suggest that rapid growth and convergence with wealthier nations should be the norm rather than the exception, considering developing countries should be able to benefit from both sectoral shifts and high returns to capital accumulation (McMillan et al., 2017). However, economic convergence for developing countries continues to be the exception.

McMillan et al., 2017, using these two models, gave two broad categorisations of developmental challenges- the 'structural transformation' challenge, which questions the hurdles for resource allocation to modern economic sectors that operate at higher economic productivity and the 'fundamentals' challenge. The fundamentals encompass both- the deeper institutional and policy-related factors, such as governance quality, education systems, legal frameworks, and macroeconomic stability (Acemoglu et al., 2001; Glaeser et al., 2004), and, the level of human capital (education, skills and training) - shape a country's capacity to foster productivity growth over the long term.

Furthermore, Iversen et al. (2018) notes that the deepening of globalisation since the 1980s has widened the possibilities of structural change. With the introduction of 'container

shipping', as well as the revolutionization of information and communication technology, developing countries gain access to global markets and no longer need to conform to traditional patterns of structural change to boost aggregate productivity. This enabled countries like China and Bangladesh to boost manufacturing productivity, India and Costa Rica to enhance productivity in the service sector, and nations like Thailand and Vietnam to increase agricultural output and efficiency (Iversen et al., 2018). The downside of globalisation, Iversen et al. (2018) note, is that it allows economies to surpass the manufacturing sector, which is a sector that holds the key to convergence (Rodrik, 2013). Therefore, economies are experiencing stalled industrialisation or premature de-industrialisation, which is not conducive to long-term growth in productivity.

Iversen et al. (2018) argue that to Kuznets, structural change was merely a feature of economic growth, and rather it was technological change that served as a driver of economic growth. They argue that while an economy can choose to industrialise its agricultural or services sector, it is the manufacturing sector that produces machines; hence, without the industrialisation of an economy, the possibilities of productivity growth are limited. Another argument to support the centrality of manufacturing to growth is especially relevant for countries like India, Nigeria and Zambia, which have a large endowment of unskilled labour who still live in rural areas (Rodrik, 2017). In the case of India, though structural change has made a positive contribution to growth since the 1990s, this has largely been a result of the expansion of finance, insurance, and other business services (which are typically high-productivity sectors), while manufacturing shrank in the early 2000s. The majority of India's population, like Nigeria and Zambia, is still largely unskilled and will be unable to leapfrog to high-skilled jobs in the services sector. Without the expansion of its manufacturing sector that can accommodate its large unskilled workforce, achieving aggregate productivity growth in the long run will be difficult (Rodrik, 2017). The following section addresses the relevance of structural transformation, specifically for the female labour force.

2.2 Structural Transformation and Gendered Labour Outcomes

The relationship between female labour force participation rates and economic development has been famously explained by the ‘feminisation U-hypothesis’ which was first postulated by Sinha (1967), and then it was Goldin (1994) who modelled and tested it. The hypothesis posits that when the income levels of an economy are low, and most of the labour is tied up in agriculture, women are able to engage in the workforce, paid or unpaid, usually by working in their families’ farms combined with child-rearing responsibilities. This could explain why Sub-Saharan Africa’s female labour force participation rates (65 percent) are higher than the global average (49 percent) (World Bank, 2025b), despite having very low GDP per capita (Borrowman & Klasen, 2020a; Gaddis & Klasen, 2014). As countries move along the structural transformation pathway and start industrialising, more and usually better-paying jobs become available. This increase in the household’s income allows for better investments in education, though these changes to investment in education in the intermediate phase are slower for women than men (Deshpande et al., 2019). Klasen et al. (2012) note that considering more investments into men’s education, men’s incomes rise faster and therefore there is a reduction in women’s incentive to work. Finally, it is at an advanced stage of development, with the economy generating more jobs in the services sector, coupled with lower fertility, women with secondary and tertiary education re-enter the workforce, causing their participation rates to rise.

Despite its constant relevance in the debate around economic development and its relationship with women’s labour force participation, the hypothesis has not been supported by robust empirical evidence (Gaddis & Klasen, 2014; Klasen, 2018). In the case of India, Lahoti & Swaminathan (2013) conducted a state-level analysis and found feeble evidence to support the feminisation of U-hypothesis. (Gaddis & Klasen, 2014) found that empirical support for the hypothesis relies heavily on the source of GDP data used, and in their findings, it was feeble when a dynamic instead of static panel method was used. The argument in support of the feminisation U hypothesis hinges on structural change being a driving force behind fluctuations in women’s labour source participation. However, Deshpande et al. (2019) and Klasen (2018) counter that specific unique demand and supply side factors in different economies seem to confound the impact of economic development

on women's participation in the workforce, and increased investments into women's education alone are not enough to raise participation rates in an economy again.

Subsequently, these confounding factors led to divergence in outcomes across economies, with some Latin American and East Asian countries seeing a uniform rise in participation rates with rises in education. In contrast, countries like India (as seen in Figure 5) and Indonesia show a U-shaped relationship between women's participation rates and education levels (Klasen, 2019). Additionally, evidence from India (Afridi et al., 2016, 2019; Klasen et al., 2012; Klasen & Pieters, 2015) suggests that education is often valued more for its returns in the marriage market than for enhancing women's labour market participation, reflecting persistent gender norms and limited instrumental use of female education for employment.

Furthermore, Goldin's (1994) hypothesis about women returning to the workforce also hinges on a decline in fertility rates; however, Deshpande et al. (2019), argue that decisions around marriage in countries like India, Bangladesh and Jordan influence women's probability to participate rather than fertility rates. Basu & Desai, (2016) posit that the weak influence of the lower fertility rate driving women's participation rates argument could be explained by the emergence of an 'aspirational revolution', wherein mothers choose to abstain from working to invest more into child quality.

Moreover, the type and number of employment opportunities, alongside the confluence of social norms, also affect participation rates. Klasen (2019) suggest that women, even those with secondary and tertiary education, tend to be restricted to 'appropriate jobs', usually white collar jobs (namely public sector services jobs such as nurses, teachers, etc.). And, Klasen (2018), notes that considering that the expansion of such employment is limited and tied to demographic factors, their impact on drawing women from education and paid work from marriage in care work can also be limited. Additionally, in the case of South Asia, the conventional divide between paid employment and care work often fails to capture the full spectrum of women's labour, as many are engaged in unpaid economic activities such as working on family farms or rearing livestock—highlighting a third category of work that blurs the line between domestic and financial contributions (Deshpande & Singh, 2021).

Furthermore, economic analysis of the labour market to locate gender differences, (Figart, 1997) notes, controls for differences in education, experience, skills, size of the firm, and other likely influences on income and the residual is taken to denote the degree of gender discrimination; and a reduction in the residual is taken as a reduction in gender-based discrimination in the market. This approach, however, tends to overlook that the lack of residual in such models, with the presence of explanatory variables, just goes to show that differences in explanatory variables should then become the basis of understanding how these variables impact gender inequality in labour market outcomes (Kabeer, 2021)

Additionally, jobs and skills where women are over-represented are often viewed as being worth less. Hartmann & Treiman (1981) were the first to point out that in the US, low wages and female intensity in an occupation were correlated, and Phillips & Taylor (1980) suggest that the definition of skills in the workplace was less about the technical demands of the job and more about the identity (race and gender) of the person carrying out a job.

Consequently, women find it hard to break into male-dominated fields of employment, and the behaviour of occupational and sectoral segregation differs among developing countries, depending on the country's social norms (Borrowman & Klasen, 2020). Gunatilaka & Vithanagama (2021) found that in the case of Sri Lanka, though the expectation was there for female participation to rise in male-dominated fields, as a result of increasing female-led households in the aftermath of the Sri Lankan civil war, this did not come to pass. Lakshman et al. (2021) show that the ability of widowed or separated women to enter the workforce was limited, and Kandanearachchi & Ratnayake (2017) found an increased incidence of gender-based violence in households and workplaces after the conflict. Contrastingly, different social norms can also have a positive impact on female labour force participation. For instance, Klasen (2019) found socialist regimes, on account of their relatively gender-equal stance, which often is supported by legislation and policies that promote compatibility of child-rearing with employment, to have a 7 percent significantly higher record of women's participation.

2.3 Unpacking Female Labour Supply: The Role of Norms and Kinship

The above sections elucidate how India's poor FLFPR performance is a result of a lack of demand for jobs that suit women but is also, a consequence of social and cultural norms. This section will delve into previous research that addresses the mechanism through which social and cultural norms affect women's participation in the workforce. Around 70 percent of the survey respondents (NSSO), for all four years in this study, were married, and as such, marriage is a salient feature of Indian society. In India, 'patrilineal virilocality' is the norm. Patrilineal virilocality, which Menon (2022) states, is the phenomenon where a "woman has no rights in her natal home (the home into which she was born) and leaves it forever after marriage, moving to her husband's home, with limited rights as a wife)(Menon, 2022)." Thus, the decision to work for women,(Sudarshan & Bhattacharya, 2009) found, is a household decision rather than an individual one. Their survey of women in Delhi from 2006 found that a large majority of women did not work prior to marriage, and a majority of women who were working before marriage, stopped working thereafter or at least after they conceived a child. Though to say that marriage only bars women from working would also be a falsehood, considering, in the same survey, they found that despite married women having the lowest FLFPR (19 percent) of the working women in their survey, 61 percent actually started working after marriage. Thus, they (Sudarshan, 2013; Sudarshan & Bhattacharya, 2009)suggest that the spouse's consent and encouragement appear to be critical in the decision to participate in the workforce. However, when we factor in that the average age of marriage for women in India is 22.1 years (Sheikh, 2019); joining the workforce for the women could have always been in the cards. Hence, the influence from the spouse would be more consent than encouragement.

Considering working for women is a decision taken by the households, rather than it being an individual choice, the attitude of other family members also factors in. Deshpande & Kabeer (2024) note that the presence of other working women in the family, especially in an elder generation, leads to the creation of virtuous cycles, where the presence of a working mother or mother-in-law increases the probability of other women in the family working.

Furthermore, when it comes to care-work responsibilities, women in India bear the lion's share of the burden. Though women in all countries tend to perform more care work than men, the burden of care-work responsibilities in India is extreme. Figure 1 shows the care work divisions for the G-20 countries based on an ILO report on care work (ILO, 2018), and in India's case, 90.5 percent of the onus of care work is on women. Additionally, care work responsibilities, which are absolutely necessary for the development and maintenance of human capabilities (Folbre, 2006, 2021), tend to be more extensive in India's case, as compared to other industrialised nations, because the proliferation of labour-saving consumer durables is much lower in India (Deshpande & Kabeer, 2024). Despite such gaps and the higher burden of care work on women, unlike OECD countries (Hegewisch & Gornick, 2011), evidence of a 'motherhood penalty' in India is absent, and it is mainly the 'marriage effect' that is found (Afridi et al., 2016, 2019; Bhalla et al., 2024; Deshpande & Kabeer, 2024; Gupta, 2023; Mondal et al., 2023; Sudarshan, 2013; Sudarshan & Bhattacharya, 2009). However, this alone cannot discount that child-care responsibilities may have a negative effect on women's participation in the workforce (Basu & Desai, 2016). Afridi et al. (2016, 2019) show that given the complete absence of husbands' time at home, while norm being women are responsible for home production explains a significant proportion of women's low labour force participation even at higher levels of education.

The probability of women's participation in the workforce also relies on the social and cultural groups they belong to. Religion, for instance, seems to play a determining role in the probability of women's participation in the labour force. Muslim women in India tend to have lower participation rates than Hindu (majority religion) women, and this could be attributed to Islam having relatively stricter control over women's mobility than other religions (Neff et al., 2012; Srivastava & Srivastava, 2010). Sahnewaz & Sahnewaz Sanu (2018) findings indicated that "Muslim women are among the educationally disfranchised, economically vulnerable, socially isolated and politically marginalised in the country", and their initial disadvantaged status widens further in all levels of education, which has drastic consequences for their probability of participating in the workforce.

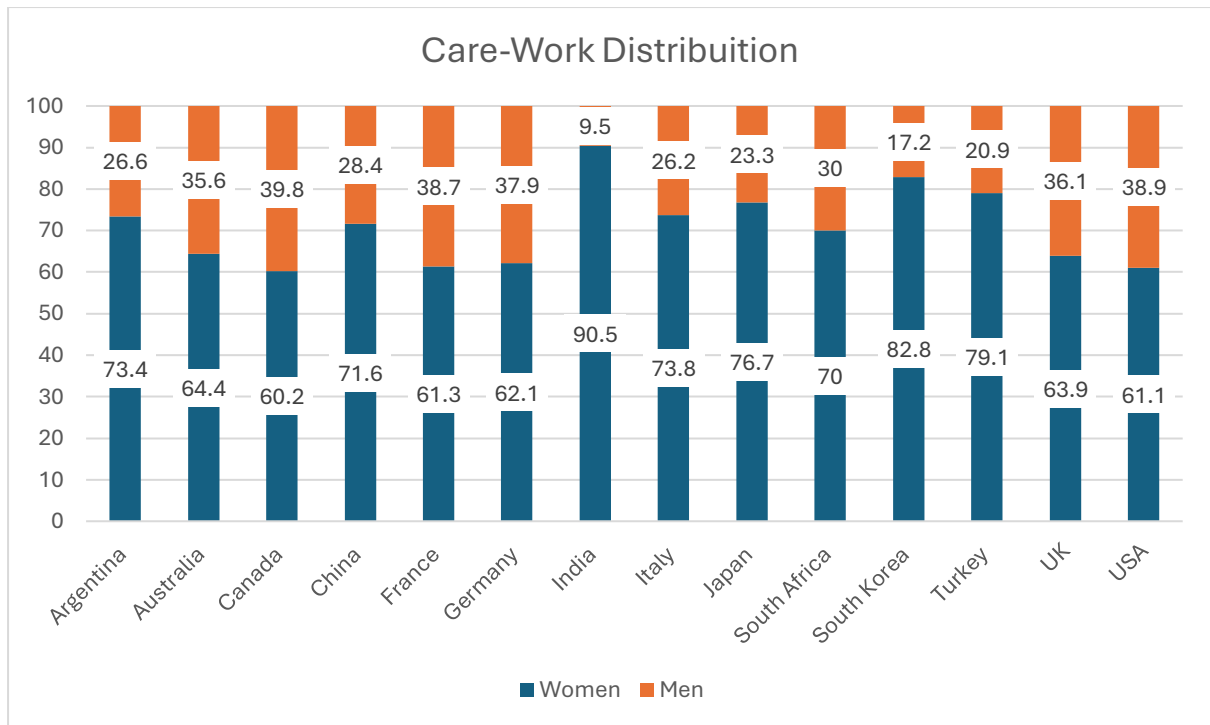


Figure 1 Care work Distribution for G20 Countries

Contrastingly, the outcomes for women from other marginalised groups, such as Scheduled Caste, Scheduled Tribes and Other Backward Classes (OBC), are quite different. Women from these groups have historically had the highest labour force participation rates and this has been attributed to the tendency of these groups to also be much poorer and subject to less cultural restriction (Alvi, 2023; Bhalla et al., 2024; Costagliola, 2021; Deshpande & Kabeer, 2024; Gupta, 2023). Unlike other social groups, women in these social classifications are expected to work. Also, lower-caste women could be better placed to benefit from expanded education opportunities. Munshi & Rosenzweig' (2006) study shows that when the language of instruction in schools was changed to English from the local language (Marathi), the catch-up for lower caste girls was much faster than for lower caste boys. They reason that people in lower caste often rely on caste networks to find jobs, and these networks favour boys, and they were more likely to be locked into their caste identities- so learning English was seen as a betrayal of the same identities. But, since these networks do not offer the same benefits to girls, they were more favourable to learn. Jensen (2012), similarly, found that since girls are seen as something that will not stay with the family, the

restrictions on them opting for learning opportunities are not as unwelcome as it is for boys who are meant to stay with the family (Duflo, 2012).

3. Context

The following section will provide further context in the Indian case for FLFPR. The first segment discusses how changes in India's FLFPR compare with those of its contemporary countries. The second segment gives an overview of the significant shifts in economic growth and policy that help explain the changes in productivity in the shift-share decomposition analysis. The final segment provides descriptive statistics that help contextualise the level and constitution of FLFPR in India.

3.1 Gaps in FLFPR: India and its neighbours

In 2017-18, India recorded one of its lowest female labour force participation rates at 22.9 percent (PLFS 2017-18); though the participation rates have since increased to 38.5 percent in 2023-24 (PLFS 2023-24). Though the sudden increase of almost 16 percentage points in just six years is concerning in itself, the focus of this section is on what it is about Indian society that keeps female participation in the labour force low. Before getting into how particular variables influence women's participation in the workforce, it is first essential to understand how India's contemporaries differ. India shares not only its borders with its neighbours, but also cultural norms- depending on region and China, given the magnitude of both India and China, remains one of the best avenues of comparison.

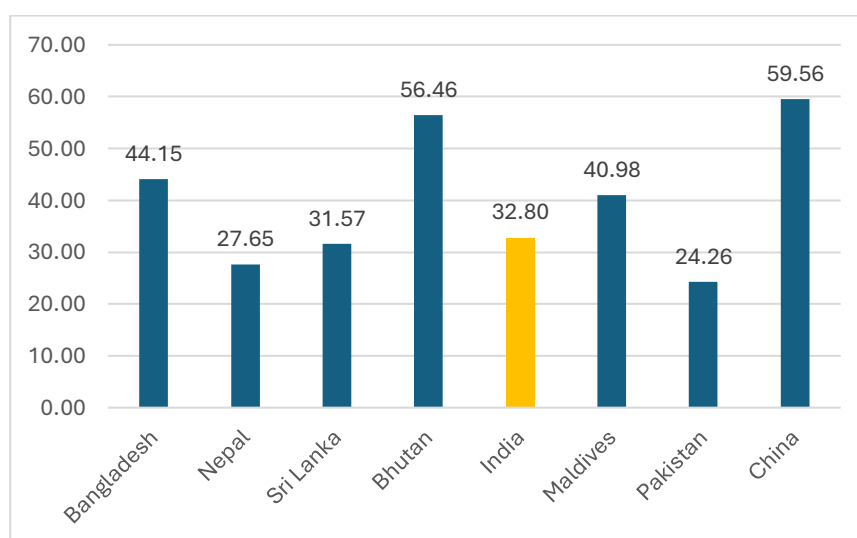


Figure 2 FLFPR (2023-24) for India and its Neighbours (Source: World Bank 2025)

Figure 2 displays female labour force participation rates for middle and lower-middle-income countries that border India. The only countries that have a lower female labour force participation rate than India are Pakistan, Nepal¹ and Sri Lanka. China, in comparison, has the highest participation rates for women and is even higher than the global average (World Bank, 2025b). Despite the large gap in FLFPR, Azam & Han (2020) and Costagliola (2021) did not find the differential remains being explained by characteristic differences. Instead, considering the feminisation, U-hypothesis predicts that FLFPR will fall as an economy starts industrialising and then rise once the economy starts producing jobs in the services sector, India and China's trajectories present contrarian paths.

Despite major expansions in the country's manufacturing sector, contrary to the predictions of the feminisation U-hypothesis, women participate in the manufacturing sector, and FLFPR remains high for the economy (Klasen, 2019). On the other hand, in India, where the economy has leapfrogged over manufacturing (Rodrik, 2015), into servicing, despite the expectations of a rise in FLFPR as jobs in services expand, FLFPR in urban India does not witness an increase comparable to the growth in the sector (Costagliola, 2021). Additionally, Chen et al. (2014) findings that in China, FLFPR is more affected by individual differences in urban areas, whereas in rural areas, household and family characteristics drive the difference. Furthermore, Azam finds that unlike India, which sees a U-shaped relationship between FLFPR and education (figure), education is positively associated with FLFPR in China. Finally, (Azam & Han, 2020) suggests that differences in outcomes of the female labour force between India and China could be a result of differences in social norms and, more importantly, a lack of demand for middle-educated workers.

Klasen (2019) notes that for South Asia, household conditions have relatively more influence as compared to other developing regions and increased access to education alongside economic growth has allowed women, who were working to ensure their family's survival, to retreat from the workforce. Furthermore, employment growth in popular white-collar jobs has not kept up with the rising number of educated women and other sectors of the

¹ Though the World Bank puts FLFPR for Nepal at 27.65 percent, alternate sources (Alaref et al., 2024) put FLFPR for Nepal over 80 percent.

workforce are stigmatised for educated women. This effect, however, is much more substantial in India than it is in Sri Lanka and Bangladesh, where women with some education have at least found work in the growing textile and garment sectors. India's lack of an export-oriented manufacturing sector is a hurdle for the opportunities and participation of the female labour force (Klasen, 2018, 2019).

3.2 India's Growth Transition: 1983-84 to 2023-24

The beginning of the 1980s, as noted by (Kohli, 2006; Rodrik et al., 2004), saw India break away from a period of stagnated growth that has been termed the 'Hindu Rate of Growth'. The boost in economic growth during the 1980s can be traced to improvements in productivity and the rate of investment. Kohli (2006) notes that during this period, there was a policy shift towards a "growth first" model of development, which saw the integration of some policies that were recommended by the Washington Consensus. This shift of policy in itself was not enough to avoid a Balance of Payments (BoP) crisis in 1991 that arose when revenues generated by growth, which were growing, albeit slowly, were inadequate to satisfy the burgeoning weight of public spending.

In response to the BoP crisis, the Indian government, pressured by the IMF, chose to liberalise the economy in 1991 as per the IMF's 'structural adjustment' prescriptions. Following these reforms, there was also significant internal deregulation of industry in an effort to tame the deficit through "delicensing of the private sector, removal of MRTP restrictions, tax concessions to business, and some further efforts to tame India's well entrenched and activist labour" (Kohli, 2008). These reforms also saw India's economy opening itself up to the global economy in a manner that was radical in its past but moderate compared to other economies.

The second period (1999-2011) of study is a time when India saw record growth, and Nagaraj (2013) even goes as far as to brand the period between 2003-04 to 2007-08 as India's 'dream run' of economic growth, where growth averaged around 9% per annum. This boom was fundamentally a private corporate debt-led growth. It was financed by a

significant increase in domestic savings, boosted by an unprecedented influx of foreign private capital. The growth coincided with an exceptional phase in the world economy, marked by a sharp upturn in world trade and easy global monetary conditions that boosted capital inflows that India was primed to take advantage of, with a population of highly educated people (who were a small proportion of the whole country, but high in magnitude given India's large population). (Ashad & Mitra, 2017) argue that though the Indian labour market has rigid regulations that impede hiring and firing workers, which impedes the re-assignment of labour, these regulations do not extend to the services sector, especially high-value-added services that depend on global rather than local infrastructure.

In this period, the bulk of the incremental output came from a few narrowly defined industries and services, with the automotive industry, telecoms, and business services being the key drivers. This generated a demand for infrastructure that boosted the expansion of construction and commercial real estate. Registered manufacturing also received a significant share of incremental fixed investment, and software exports and telecom services grew rapidly.

While the 2000s were a 'dream run' for economic growth in India, owing to increased investments and exports, which in turn boosted consumption and imports, the following decade has fallen short of those results. Amirapu & Subramanian (2015) attribute this downturn to certain structural and cyclical factors, which are rooted in the 2008 Global Financial Crisis (GFC). Though the Indian economy did not suffer immediate effects because of the GFC, the erosion of globalisation within the world economy since then has left its mark on the country's economy. Naturally, investment in the economy collapsed during the crisis, and though there was some recovery till 2010, since then, investments have fallen even further. Amirapu & Subramanian (2015) link the decline to a homegrown Balance Sheet crisis, specifically a Twin Balance Sheet (TBS) problem involving banks and infrastructure companies. Projects initiated during the mid-2000s boom went sour after the GFC due to changed economic conditions, leading to an unserviceable debt burden for firms that translated into rising Non-Performing Assets (NPAs) for banks, restricting their ability to lend. The sources indicate that this TBS problem was not adequately resolved for many years, prolonging the drag on investment. Furthermore, domestic policy shocks, such as

demonetisation in 2016 and the implementation of Goods and Services Tax (GST) in 2017, are also cited as factors that precipitated the downturn, particularly affecting the informal sector (Goel, 2024; Nataraj, 2017; Subramanian, 2019). Subsequently, experts also argue that the GDP and growth figures that have been reported by government sources since 2011-12, owing to methodological changes in the calculation, might be overstating the performance of the economy (the manner of over-estimation has been explored further in the Data section of this study) (Subramanian, 2019).

3.3 Contextualising the constitution of India's Female Labour Force

Figure 3 displays the total FLFPR, as well as the FLFPR for urban and rural women. While the FLFPR for urban women remained relatively unchanged till 2011, the decrease in total FLFPR was driven by a reduction in rural women's participation in the workforce. This reduction was seen as par for the course (Goldin, 1994; Kapsos et al., 2014), with women retreating from the agricultural workforce as household incomes were rising and they no longer needed to work to ensure their families' survival. However, between 2011-12 and 2023-24, both urban, but especially rural, FLFPR has seen a significant increase, with rural FLFPR rising to levels beyond what they even were in 1983-84.

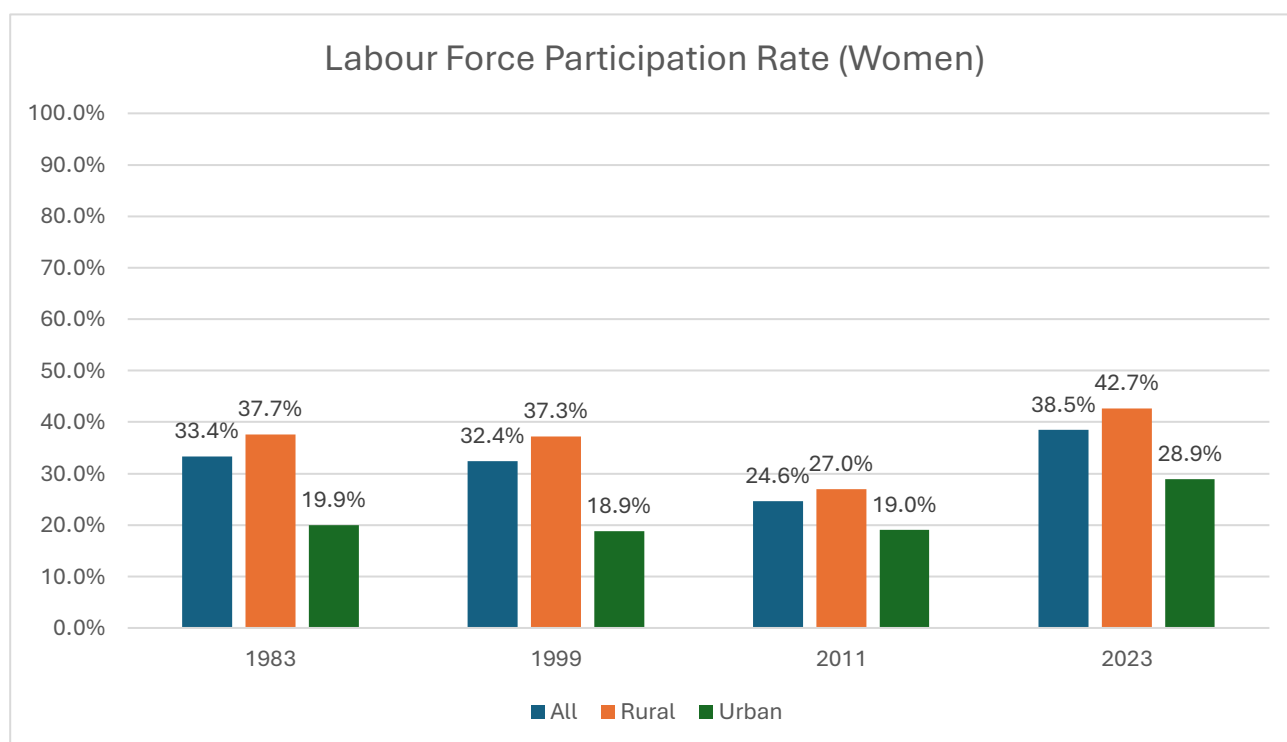


Figure 3 FLFPR for India (1983-2023-24)

Figures 4 and 5 display the sector-wise distribution of the female and male labour forces for rural and urban areas, respectively. In the case of the rural area, while the proportion of men working in agriculture has drastically declined from 74.3 percent in 1983-84 to 45.4 percent in 2023-24, the decrease has not been near as drastic for the female labour force where there has only been a decrease of less than 10 percentage points and 73.6 percent of the women are still in agriculture. Regarding expansions in the secondary (manufacturing and industrial) sector, the starting point, in terms of proportions of the workforce, was similar for men and women in 1983 at 11.7 and 9.8 percent, respectively. However, most of the manufacturing jobs that were created in rural areas mostly went to men, with their proportion increasing to 28.4 percent. While for women, there was an increase to 15 percent in 2011-12, but since then, it has fallen to 12.3 percent in 2023-24. There was a significant reduction in the rural FLFPR between 1999-00 and 2011-12, as seen in Figure 3, and this was majorly agricultural labour, which might have allowed the proportion of workers in manufacturing to increase. Regarding jobs in the tertiary sector, both men and women's proportion of employment in services in rural areas has doubled between 1983-84 and 2023-24.

In the case of urban areas, most men and women work in the tertiary sector, and the proportions are pretty similar. However, women saw a larger margin of increase between 1983-84 and 2023-24, with their proportion rising by almost 19 percentage points, while men's proportion in the tertiary sector only grew by 3.5 percentage points. The proportion of women in the primary sector, which has declined by more than 12 percentage points, is larger than it ever was for men, where the proportion declined by 4.7 percentage points. What is interesting is that though the FLFPR for urban women was constant till 2011-12, their proportion of the labour force in the secondary sector remained around 30 percent, but this share saw a decline to 25 percent by 2023-24, with a slight increase in primary and significant growth in women's employment in the services sector.

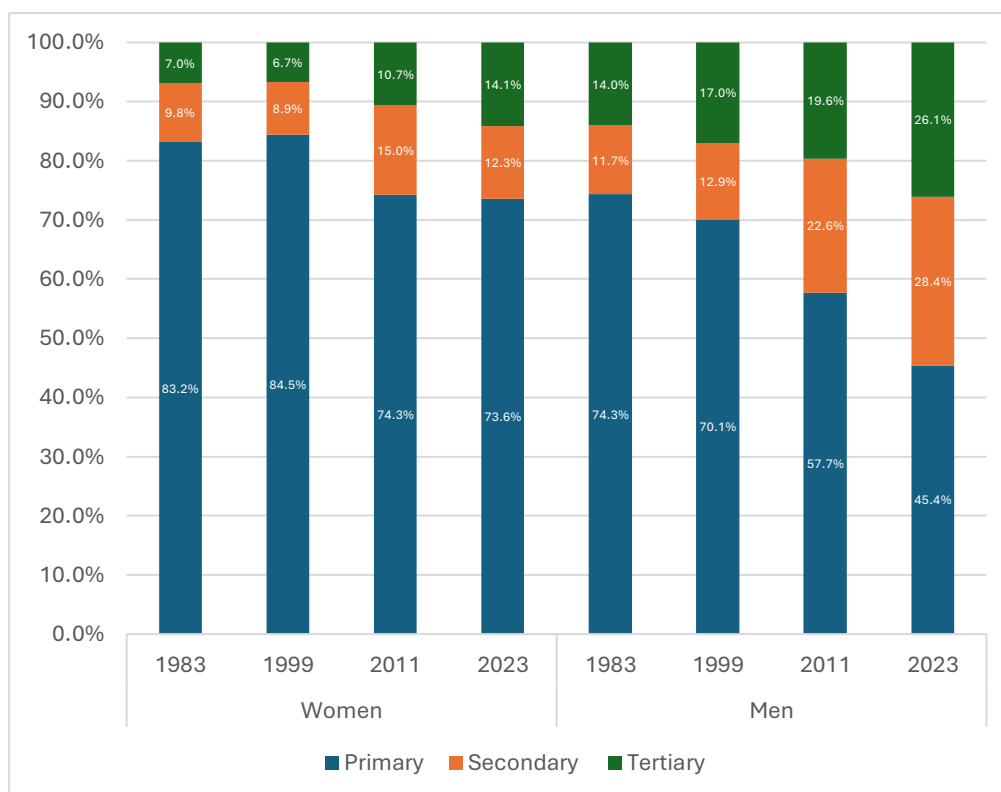


Figure 4 Sector-Wise distribution of Labour Force in Rural Areas

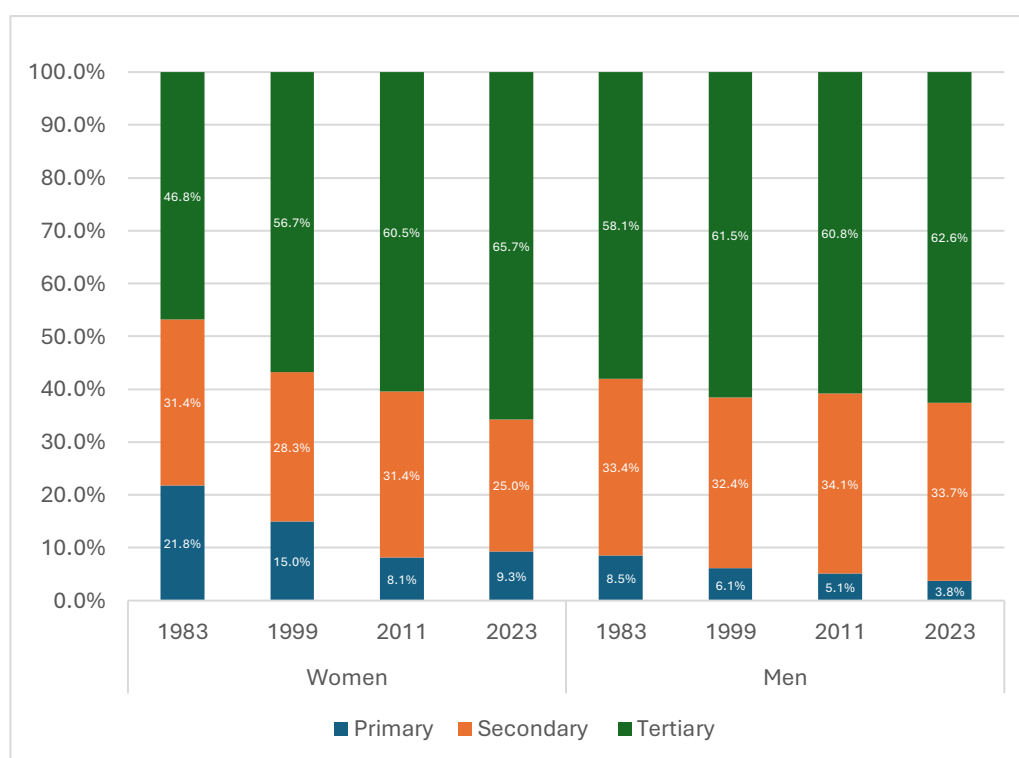


Figure 5 Sector-wise distribution of Labour Force in Urban Areas (1983-2023)

The proportional changes by sector for men and women paint an incomplete picture of the transformations within the labour force. Hence, it is crucial to understand how the disaggregation of types of employment can categorise the transformations. Figure 6 display disaggregation of the kind of employment men and women are engaged in rural areas (Employment type disaggregation for Urban areas can be found in the Appendix). From these figures, it is observed that in the case of rural areas, the proportion of casual female workers has declined from 37.5 percent in 1983-84 to 17 percent in 2023-24, and there has been a small uptick in salaried employment in salaried employees from 4 to 9.7 percent in the same period. For men, the rise in salaried employees has been sharper, with an increase from 10.7 percent to 17.3 percent, and this increase mainly happened between 2011-12 and 2023-24. Casual male workers' proportion has remained relatively unchanged. For women, though there was a slight decline in the proportion of self-employed workers where it declined from 58.5 in 1983-84 to 52.9 percent; between 2011-12 and 2023-24, the proportion of self-employed workers rose sharply to 73.4 percent. An increase in own-account self-employed workers mainly drives this rise.

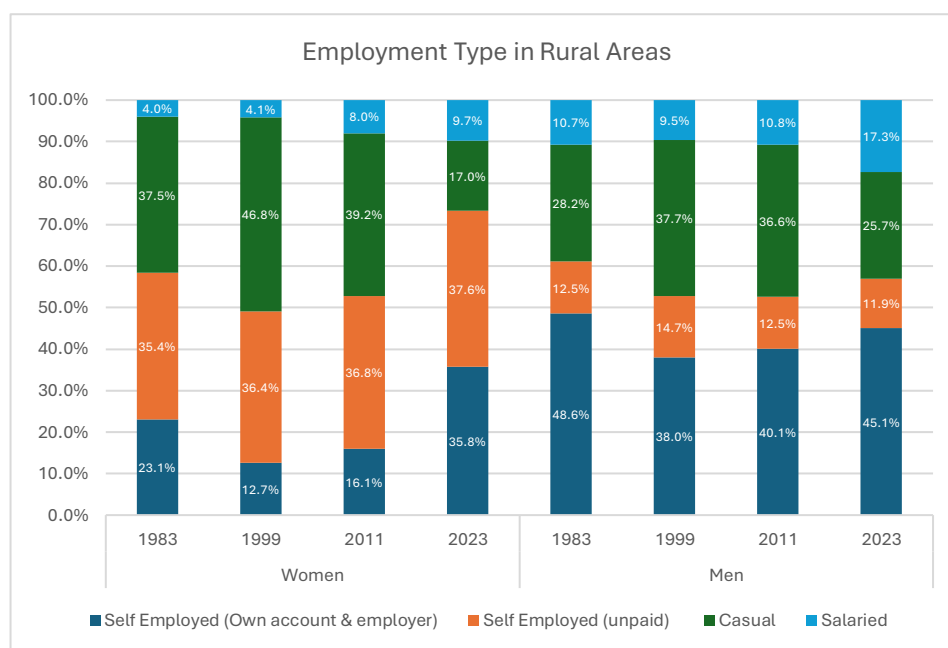


Figure 6 Employment Type for FLFPR in Rural Areas

Self-employment encompasses any activities where one is not working for an employer and this is a large group that includes large entrepreneurs but also farmers, vegetable sellers, etcetera. So, in other words, due to the heterogeneity of this group, it is hard to analyse the

repercussions that changes in this category have on macro-trends. In the case of India's rural areas, though at first glance, the significant decline in casual female workers may seem to be a positive trend, as this class of workers tends to be the most vulnerable to shocks, the fact that this decline was not accompanied by an increase in salaried but rather self-employed workers; it may signify that while the proportion of casual workers has changed, it may just be as a consequence of growth in the two sub-sections of self-employed workers (Deshpande 2024). This could signal that this increase in self-employment in rural areas for women is merely an increase in disguised unemployment or underemployment. In this situation, workers are not being utilised to their full productivity. This inference is substantiated by Deshpande (2023) where they found that between 2017 and 2022 (based on the Periodic Labour Force Survey), self-employed (own account workers) earnings have declined. Subsequently, the significant difference in the proportion of self-employed workers between 2011-12 and 2023-24 could also be a reflection of the change in the survey methodology becoming better at counting women's participation of women since similar changes in self-employment are not witnessed for men.

Finally, as discussed earlier, unlike East Asian countries (Klasen, 2019), India's FLFPR and education display a U-shaped relationship, where labour force participation tends to be the highest for women with low or no literacy and then FLFPR for women with primary and middle and secondary education is the lowest in all years (Figure 5). FLFPR rises again for women with graduate degrees and is highest for women with Post-graduate degrees. In the years covered in this study, FLFPR for women with little or no literacy was the highest for all years except 2011-12, and in this year the FLFPR for women with post-graduate degrees was the highest. Similarly in all years, barring 1983-84, women with secondary education had the lowest FLFPR. The explanation lies in the fact that illiterate women often face a more urgent need to work, as they typically belong to the poorest households. As a result, they are more likely to accept low-paying, unskilled wage labour. In contrast, women with relatively higher levels of education may find such work undesirable and opt out of the labour force. Furthermore, women with tertiary education have access to better-paying, more stable white-collar jobs, which makes employment a more appealing option for them (Chatterjee et al., 2015b; Deshpande & Kabeer, 2019; Kingdon & Unni, 2001)

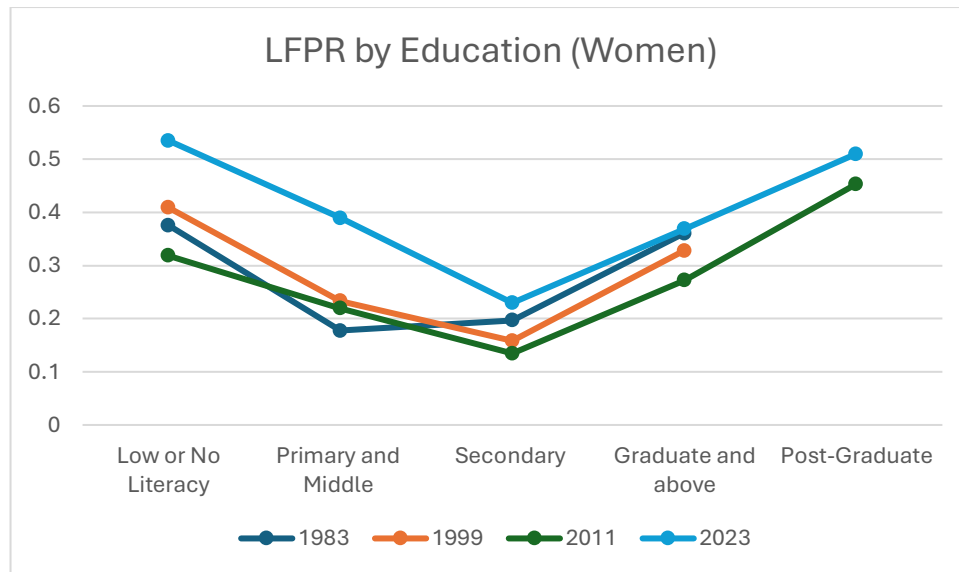


Figure 7 FLFPR by Education Levels

4. Data

Employment and Unemployment Survey (EUS)- The EUS was a quinquennial survey undertaken by the National Sample Survey Organisation (NSSO) that served as the primary source of data on various indicators of the labour force at National and State levels. However, Employment and unemployment surveys have been conducted by the NSSO since 1955, though with varying concepts and limited comparability across rounds. It was in 1972-73, following the Dantwala Committee's recommendations, that the NSSO standardised the concepts and definitions of labour force, employment and unemployment, and the first Employment and Unemployment Survey was released (Mitra, 2018). This study begins with utilising data from 1983 and not 1972 because despite 1983 being the third EUS, it is the first year for which microdata is made available by the Ministry of Statistical and Programme Implementation (Government of India) on their Online Microdata Library.

The primary goal of the EUS was to record “three different rates of employment and unemployment, i.e. the ‘usual status’ rates based on the activities pursued during a long period in the past, any one year, the ‘current weekly status’ rates based on the data on activities pursued during and reference period of seven days (one week) preceding the date of survey and the ‘current day status’ rates based on the activities pursued on each day of the same seven days’ (one week) period of reference (NSSO 38, 1983)”. Furthermore, the survey also tried “to elicit information on the extent of underutilization of labour time of

those classified as employed, unemployed, students, house workers etc. through separate sets of probing questions put to the relevant respondents in the households at the time of investigation". Mitra (2018) notes that in doing so, the EUS provided comprehensive insights into under-employment, worker classifications, their living and contractual conditions, wage levels, occupational distribution, the prevalence of informal labour, and broader indicators of labour market quality. Moreover, it served as an exceptional source for tracking employment data disaggregated across religious and social groups as well as by socio-demographic trends.

For this study, data from EUS for the years 1983-84, 1999-00 and 2011-12 was used.

Periodic Labour Force Survey (PLFS)- After 2011, the EUS was discontinued and in its place came the PLFS. The PLFS was launched by NSSO in April 2017, and similar to the EUS, its aim was "to estimate the key employment and unemployment indicators (viz. Worker Population Ratio, Labour Force Participation Rate, Unemployment Rate) in the short time interval of three months for the urban areas only in the 'Current Weekly Status'" and "to estimate employment and unemployment indicators in both 'Usual Status' and 'Subsidiary Status' or with Current Weekly Status in both rural and urban areas annually". Unlike the EUS, the PLFS is conducted annually, and to date, seven annual reports have been released, with the latest one being based on data collected from July 2023 to June 2024 (NSSO, 2024).

For the purpose of this study, the data on all households and all persons will be used. After accounting for the presence of children in a household, the EUS and PLFS data was restricted to those between the ages of 15 and 59 (Working age). Only men and women were considered, and people assigned under the third gender were ignored for the analysis. To capture the nature of involvement in the labour force, Current Weekly status (CWS) rather than 'usual' + 'subsidiary' status because CWS was better suited for capturing individuals who were involved in the labour force more sporadically, which is often the manner in which women are involved in the labour force (NSSO, 2024). CWS is recorded in both EUS and PLFS, and the methodology for recording the variable is standardised. The appendix elaborates further on how the survey data was utilised and the methodology for generating variables for the study.

As per the CWS, "A person is considered working (or employed)) if he/ she worked for at least one hour on at least one day during the 7 days preceding the date of the survey or if he/she had worked for at least 1 hour on at least one day during the 7 days preceding the date of the survey but did not do the work. A person is considered 'seeking or available for work (or unemployed)' if, during the reference week, no economic activity was pursued by the person, but he/ she made efforts to get work or had been available for work for at least one hour on any day during the reference week. A person who had neither worked nor was available for work any time during the reference week is considered to be engaged in non-economic activities (or not in the labour force)." (NSSO, 2024)

Issues with Comparability of EUS with PLFS

The Ministry of Statistics and Programme Implementation (MoSPI) assert that Periodic Labour Force Survey (PLFS) estimates are not comparable with the Employment-Unemployment Survey (EUS) results from 2011-12 and earlier years. This lack of comparability between the two surveys arises because the PLFS is conducted at much more frequent intervals than the EUS (MoSPI, 2020). However, (Mohan, 2021) posits that on technical counts, specifically concerning the statistical properties of the estimators and the concepts and definitions utilized, the PLFS remains fully comparable to the EUS. This perspective suggests that considering the degree of foundational alignment between the surveys, the surveys should be comparable. However, the practical application of combining these datasets for analysing employment trends between 2011-12 and 2017-18 encounters significant challenges and raises scepticism (Mohan, 2021), evidenced by empirical findings like the lower Work Participation Rate reported in the first PLFS relative to the last EUS and conflicting estimates for manufacturing employment growth when EUS and PLFS data are combined. The substantial time gap between the final EUS in 2011-12 and the initial PLFS in 2017-18 could also contribute to the complications in the assessment of directional changes over this period.

GDP Data – This study utilises two sources for GDP Data – the first is “Summary of macroeconomic aggregates at constant (2004-05) prices, 1950-51 to 2013-14”. This dataset

was made available on their website by the Ministry of Statistics and Programme Implementation (MoSPI), Government of India on their [website](#). This data includes disaggregated data for GDP following the income approach for the following industries- electricity, gas and water supply, trade, hotels and restaurants, transport, storage, communication, banking and insurance, real estate, ownership of dwellings, business services, public administration and defence and other services. In the case of agriculture, forestry and logging, fishing, mining and quarrying, registered manufacturing (establishments registered under the Factories Act, 1948) and construction, the GDP data was produced following the production approach. The prices in this dataset were set at constant prices in 2004-05.

The second source of data for GDP was taken from National Account Statistics 2024, titled “Gross Value Added by economic activity at current and constant prices”. This dataset was available at current prices and constant (2011-12) prices. This dataset, too, was made available by the Ministry of Statistics and Programme Implementation, Government of India, on their website (MoSPI, 2025). The data was disaggregated along the following industries: agriculture, mining, registered manufacturing, construction, electricity, gas and water supply, trade, hotels and restaurants, transport, storage, communication, banking and insurance, real estate, ownership of dwellings, business services, public administration and defence and other services.

This data was instrumental in the shift-share analysis. The major issue with the GDP data is that the data from 1950-51 to 2013-14 is Gross Domestic Product at factor cost (2004-05 constant prices) while the data from 2024 is Gross Value Added (2011-12 constant prices). Both datasets follow different calculation procedures and are set to different constant prices, so standardising them was not possible. However, considering shift-share analysis is not continuous in nature, and values for 2011-12 were available in both datasets, I pursued a different solution. Values for 1983-84, 1999-00 and 2011-12 were taken from the first GDP data set and were used for the first two phases of the shift-share analysis. Meanwhile, values for 2011-12 and 2023-24 were taken from the second dataset for the third and final phase of the shift-share analysis.

Subramanian (2019) notes that there was a shift to reporting GVA estimates in 2011, from predominately capturing volume-based estimates to value-based estimates in an effort to capture the impact of the quality and technological changes in the economy. He suggests that this change in methodology since 2011 could be overestimating GDP figures by more than two percentage points. Subramanian (2019) locates these issues of GDP over-estimation in the lack of effect on formal manufacturing, which is an oil-intensive sector, of the fall in oil prices in the post-2011 period, which declined even sharply in 2014.

Furthermore, this miscalculation also affects the GVA calculation of the services sector, as the incomes of services are deflated using the aggregate WPI manufacturing pricing index. The prices in the manufacturing index are rising slower than they are in services, and using that index as a deflator leads to over-estimation of growth in the services sector.

(Subramanian, 2019) also highlights that the current methodology of calculating GVA growth for the informal sector fails to capture the detrimental impact of major policy actions in this period- demonetisation (2016) and implementation of goods and services tax (2017) which disproportionately affected the informal economy.

Population Data – Data for India’s total population was taken from World Bank Open Data. This data was necessary to chart the increases in India’s population between 1983-84 and 2023-24, which was then used to adjust the population of surveyed individuals.

5. Methodology

5.1 Shift Share Analysis

This paper follows the methodology for a variant of Shift-share analysis that (Timmer & de Vries, 2009) call the decomposition method. In de Vries et al.(2015), they are extending the database to include more countries and years and then applying it to the shift-share analysis they undertook in Timmer & de Vries (2009) which was first introduced by Fabricant (1945). Decomposition shift-share analysis aims to measure the contribution to aggregate growth that comes from the reallocation of workers across sectors of the economy. This method is based on the concept of structural transformation (Lewis, 1954; Ranis & Fei, 1961) in developmental economics, wherein labour and capital are reallocated from lower-

productivity sectors like agriculture towards higher-productivity sectors like manufacturing and services. de Vries et al. (2015) notes that while structural change is well-documented for advanced economies, given the availability of long-run macro data for those countries, the same has been scarce for developing countries. The Groningen Growth and Development Centre database offered a solution to their problems. Similarly, in the case of India, I was able to find detailed data for the labour force through NSSO surveys and data for GDP from MoSPI.

The aim of the decomposition method for shift-share analysis, which was first introduced by Fabricant (1945), has been used in many studies (Broadberry, 1998; de Vries et al., 2015; McMillan et al., 2017; Timmer & de Vries, 2009) is to measure the contribution of structural change to aggregate growth (Timmer & de Vries, 2009). The traditional decomposition method is as follows:-

$$P^T - P^0 = \sum_{i=1}^n (P_i^T - P_i^0) \bar{S}_i + \sum_{i=1}^n (S_i^T - S_i^0) \bar{P}_i$$

However, Timmer & de Vries (2009) notes that this method has a limitation in the way that it accounts for all expanding *sectors* to be positively contributing to aggregate growth. So, even if a sector is at below-average productivity, if it is increasing, this method would capture its contribution as positive on aggregate economic growth. Timmer & de Vries (2009) provides a modified formula that considers the contribution of *specific sectors* within the whole economy, rather than just their expansion, and how that affects aggregate growth. To expand, the modified approach Timmer & de Vries (2009) adjusted the between and the cross term of an expanding sector to take into account its relative productivity level and its growth rate. They also has an added step to account for shrinking sectors, but I did not pursue that method and instead used a simplified version of their shift-share analysis. The equation for the modified approach to decomposition shift-share analysis is as follows:-

$$P^T - P^0 = \sum_{i=1}^n (P_i^T - P_i^0) \bar{S}_i + \sum_{i=1}^n (S_i^T - S_i^0) \bar{P}_i + \sum_{i=1}^n (P_i^T - P_i^0)(S_i^T - S_i^0)$$

Going from the left, the first component captures the sectoral productivity within sectors or intra-productivity change, which are the improvements/declines in sector productivity. The second component captures the movements of labour from less to more productive sectors and is the structural change or the shift effect. The final component captures the joint impact of changes in employment shares and sectoral productivity growth, which is known as the dynamic effect.

While Timmer & de Vries (2009) work utilises the GCDC database, which has GDP and population data distributed amongst 10 industries, this paper has GDP and population data for nine industries, and they are Agriculture, Manufacturing, Mining, Construction, Utilities, Trade, Transport, Financial Services and Real Estate and lastly Community and Government Services².

Since the goal of this paper is to capture the difference in productivity growth of the female labour force, and the data for that is available through the NSSO surveys, this study conducts the shift-share analysis for the female labour force separately. For comparison, the shift-share analysis is also done for the whole labour force, as well as the male labour force. Since it is not possible to trace how much of the GDP in each industry is the contribution of either male or female component of the labour force, the GDP data for all three analyses (whole labour force, female labour force and male labour force) is the same.

5.2 Probit Modelling with Margins

When it comes to documenting how individual factors come to affect women's participation in the workforce, Agénor et al. (2015) finds that the probit model is more suitable rather than an OLS model. Where the OLS model calculates the average correlation between the dependent variable and each explanatory variable while holding the rest of the explanatory variables constant, the Probit model instead captures the average changes in the probability

² The main difference in the GCDC database and my GDP data is that Community and government services are two separate categories in the former but one in my data.

of women engaging in the workforce for unit changes in the explanatory or changes in the dummy variables. This allows for the Probit model to give a more nuanced picture of how each variable, compared to its counterparts, affects women's probability of participating in the workforce.

Additionally, considering that participating in the workforce is a binary choice and the aim here is to capture the determinants of women's labour force participation, the probit model is employed. The Probit model estimates how the probability of participation varies with individual characteristics such as marital status, religion, social group, and income level. The estimation strategy follows the methodologies used other studies (Agénor et al., 2015; Ashwini Deshpande, 2019; Gupta, 2023; Klasen & Pieters, 2015) and is specified as follows:

$$P_{it} = F(\alpha_{st} + \beta_{xt}X_{it} + \beta_{zt}Z_{it})$$

Here, P_{it} refers to the probability of women i participating the labour force in the year t . F signifies the standard normal cumulative distribution, α_{st} refers to the state fixed effects, X_{it} represents the socio-demographic and household characteristics, and finally Z_{it} Refers to the local labour demand and supply variables. The variations in local labour demand and supply are recorded through instating State controls.

To expand on the Probit analysis, I also computed the marginal effects for the model. While the probit analysis reveals the likelihood of participation in the workforce as a function of the explanatory variable, its coefficients cannot be directly interpreted to understand the magnitude of the impact. Calculating marginal effects of the probit model produces values that predict the magnitude of effect changes in explanatory variables have on the probability of engaging the workforce (Wooldridge, 2010). In other words, in the context of this study, marginal effects provided a more interpretable path to understanding how key socio-demographic and economic variables have, over time, influenced women's likelihood of participating in the workforce. The list of variables can be found in Table 1.

	Variable Description
<i>Dependent Variables</i>	
Labour force participation of persons	is 1 if the female participates in the labour force in the Current Weekly Status (CWS), 0 otherwise (Tabulated separately for men and women)
<i>Independent Variable</i>	
Marital status	Single, Married(reference), Widowed, Divorced/Separated
Social Group	Scheduled Tribe, Scheduled Caste, Other Backward Castes and All Other Castes(reference)
Religion	Hinduism (reference), Muslim, Christianity
Education ³	Low or no literacy (reference), Primary and Middle, Secondary and Higher Secondary, Diploma/certificate, Graduate and above, Post-Graduate and above
Age	Respondent's age in years
Age square	Square of Respondent's age
MPCE quintiles of the household	Usual monthly per capita consumer expenditure (Rs.) in 5 quintiles (1st is lowest, 5th is highest), separately calculated for rural and urban areas, 3rd quintile is the reference
Log(MPCE)	Log of Monthly per capita expenditure of the household
Household type (Rural)	Self Employed in Agriculture, Self Employed in Non Agriculture (reference),Regular Salaried or Wage Work, Casual Labour in Agriculture, Casual Labour in Non-Agriculture Others
Household type (Urban)	Self Employed(reference),Regular Salaried or Wage Work, Casual Labour, Others
Presence of Children under 15	is 1 if there are children up to the age of 14 years in household, 0 otherwise
Presence of elders above 60	is 1 if there are elders above the age of 60 years in household, 0 otherwise
Working Mother in Law	is 1 if the mother in law is working, 0 otherwise
Household size	Total no. of persons in the household
Household head's education	Years of education of the household head ('low or no literacy' is the reference)
State	State codes for 35 states, introduced as dummies (Fixed Effects)
Sector	is 1 for rural areas; 2 for urban areas

Table 1 Variables used in Probit Model with Descriptions

6. Results and Discussion

6.1 Shift Share Analysis

Figure 8 contains the results of decomposition analysis for India between 1983-1999, 1999-2011 and 2011-2023. In the case of the whole labour force, for all three phases, within-sector productivity, static effect, and dynamic effect of productivity is positive, though the magnitude varies. The positive within-sector productivity in all three phases, considering it to be the biggest contributor to growth in all the phases, implies that growth that happened within a particular sector was the biggest contributing factor to overall aggregate productivity growth. In other words, all sectors experienced productivity growth, and this within-sector improvement contributed positively to the overall increase in aggregate labour productivity.

Next, the positive between-static effect across all phases implies that the increase in aggregate productivity was driven by the reallocation of labour because labour was moving to sectors with higher productivity. The magnitude of the effect is largest in the second phase (1999-00 to 2011-12), which is indicative of labour moving out of sectors like mining and agriculture and into financial and real estate services and construction. This phase encompassed what Nagaraj (2013) called the 'dream run of economic growth'. The shift-share results for this phase demonstrate that the growth happening in the economy was growth being driven by labour moving to more productive sectors. Another important observation is that even though growth is higher in the third phase compared to the second phase, the contribution of the between-static effect to overall productivity growth is lowest in the third phase.

Finally, the positive between-dynamic effect captures the fact that the workers are moving to sectors that are experiencing positive productivity growth. It sounds similar to between-static but is different in that while between-static simply captures whether labour is moving to sectors with above-average productivity, between-dynamic also accounts for whether

³ For 1983-84 and 1999-2000, it was only possible to classify education into four variables and not six- Low or no literacy, Primary and Middle, Secondary and High-Secondary and Graduate and above.

productivity growth is truly higher in sectors that expand in terms of employment shares. The dynamic effect is low in the first phase, then rises both in magnitude and as a share of growth in the second, then declines sharply (though remains positive) in the third phase. The decline in the magnitude of the dynamic effect indicates that in comparison to phase two, for phase three, the sectors which experienced an expansion in employment share were relatively less productive (and were relatively more productive for phase two).

The reduced share between static and dynamic in the third phase (2011-12 to 2023-24) demonstrates that growth was mainly driven by growth in particular sectors, and shifts in labour were not as dramatic as they were in the previous two phases. This is quite concerning for structural change, as despite moderate development in the Indian economy, India remains largely an agricultural economy when it comes to labour shares, as seen in Figure 8. The slowing down of structural change could have harmful consequences for productivity growth, which is considered vital for long-run growth (Rodrik, 2003, 2013). Moreover, in light of the concerns brought forth by Subramanian (2019) about the mis-estimation of GDP in this period, that suggests that there has been an over-calculation of GDP in the recent decade; this miscalculation would show up strongest in the within-sector variable of the shift-share methodology. In other words, the within-sector growth that the shift-share model is predicting in Figure 8, could be over-exaggerated. These results of slowing down in the last phase are more pronounced for the female labour force.

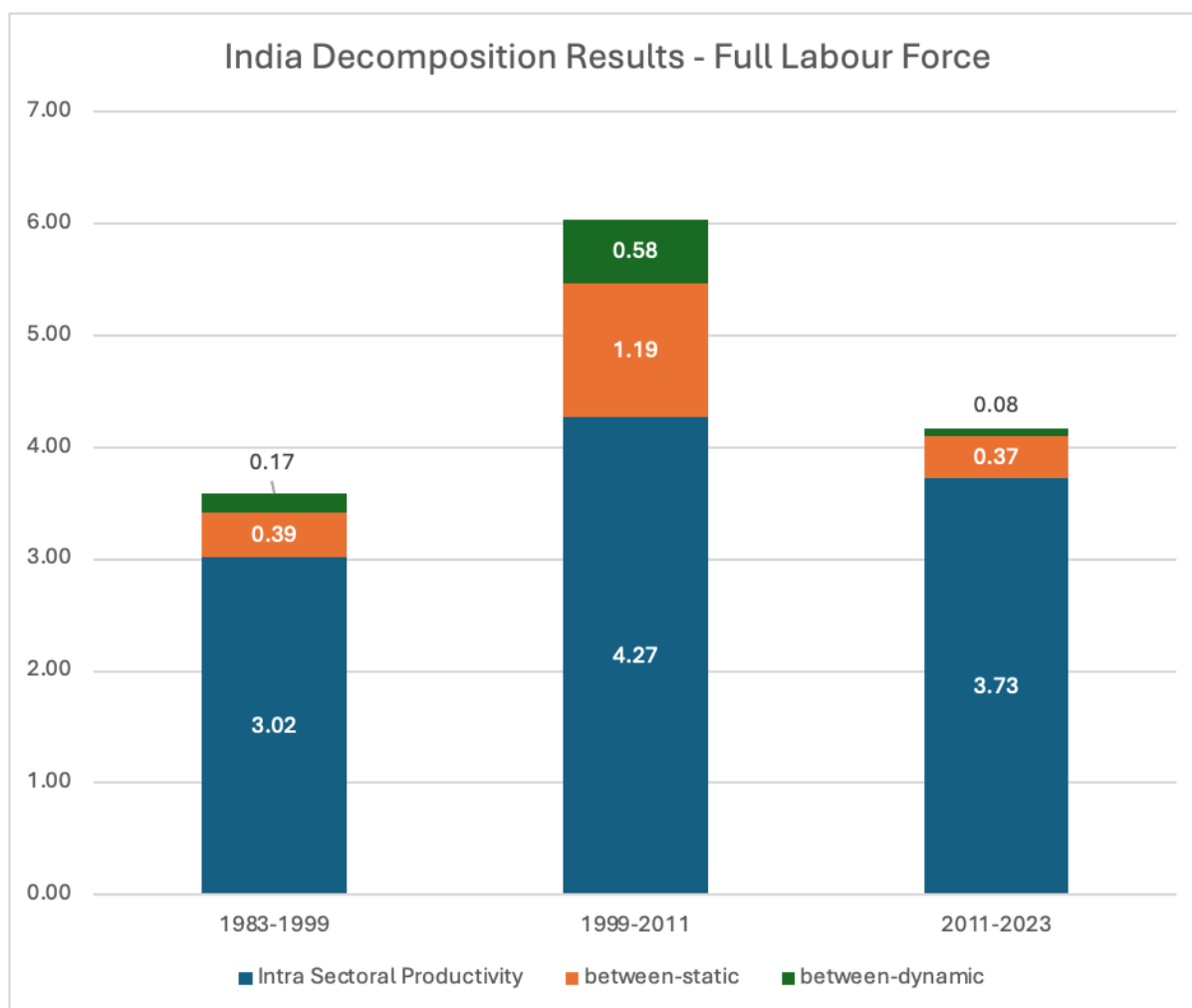


Figure 8 India Decomposition Results - Full Labour Force (1983-2023)

Shift Share Results for the Female Labour Force

In the case of decomposition results for the female labour force, while most values were positive, the dynamic effect for the third phase was negative (Figure 9). Also, the positive values were lower overall in magnitude for phases one and three but were slightly higher in magnitude compared to men and the full labour force for phase two.

In the first phase, the overall growth was lower for the female labour force, as compared to the full labour force results. Most of the growth in this period was driven by within-sector growth. Though, the between-static effect was larger for the female labour force, and the between-dynamic effect was smaller.

In the case of phase two, between static effect was the largest contributor to aggregate productivity growth, indicating that women, in this period, moved out of low-productivity sectors and into higher-productivity sectors. The dynamic effect in this period was similar to it for the full labour force. As seen in Figure 3, this phase saw a considerable contraction in the labour force, with FLFPR dropping from 32.4 percent in 1999-00 to 24.6 percent in 2011-12. This drop in FLFPR can be traced wholly to women in rural areas, with rural FLFPR decreasing from 37.2 percent to 26.9 percent, while urban FLFPR remained the same. As discussed before, this reduction in the labour force on account of women leaving agriculture is par for the course (Kapsos et al., 2014; Klasen et al., 2012).

In light of these changes to the FLFPR in this phase and the increased between-static effect; the interpretation is that despite overall reductions, the remaining female labour force moved from below-average productivity to above-average productivity sectors. In other words, the second phase, which was a period of high growth, allowed for women to enter sectors with better productivity and for women in un-productive sectors to retreat from the workforce, as they no longer needed to remain in low-productive jobs to survive.

The third phase is one where the results for the female labour force differ drastically from those of the full labour force. Overall productivity growth was much lower for the female labour force and the dynamic effect is even negative (while it was small but positive for the full and male labour force). This indicates that between 2011-13, women moved to sectors that had lower marginal productivity for every additional worker. Furthermore, the third phase witnessed the lowest growth in within-sector and between-static productivity, indicating that in comparison to previous phases, the productivity growth for female labour was slower and that fewer women moved to sectors with higher productivity. This phase is also when economic growth in India started to slow down (Subramanian & Felman, 2019). Given this slowdown, from the shift-share analysis for the female labour force, it is clear that the adverse effects of the slowdown impacted the female labour force more significantly, than it did the male labour force.

Where the second phase saw contractions in the labour force, the third phase saw an expansion of the female labour force, with LFPR increasing to 38.5 percent in 2023-24 (from

24.6 percent in 2011-12). This expansion was seen in both rural, where FLFPR rose from 26.9 percent to 42.6 percent, and urban, where FLFPR increased from 19 percent to 28.9 percent, areas. In essence, despite substantial expansions in the labour force, this period saw the lowest productivity growth for the female labour force because the sectors in which women were working were actually sectors with much lower productivity.

Moreover, as seen in Figure 10, the primary sector continues to hold the largest share of the female labour force, while the tertiary sector made the most gains. The secondary sector employment share for women declined the most in this period despite having productivity levels equivalent to the tertiary sector. In contrast, as seen in Figure 11, the male labour force saw contractions only in its employment share in agriculture and significant expansions in the tertiary and secondary sectors. The latter two sectors are higher in relative productivity.

The decomposition results for the Male labour force and the Correlation between sectoral productivity and the figure for change in employment shares in India (2011-2023) can be found in Appendix (Appendix Figure 4).

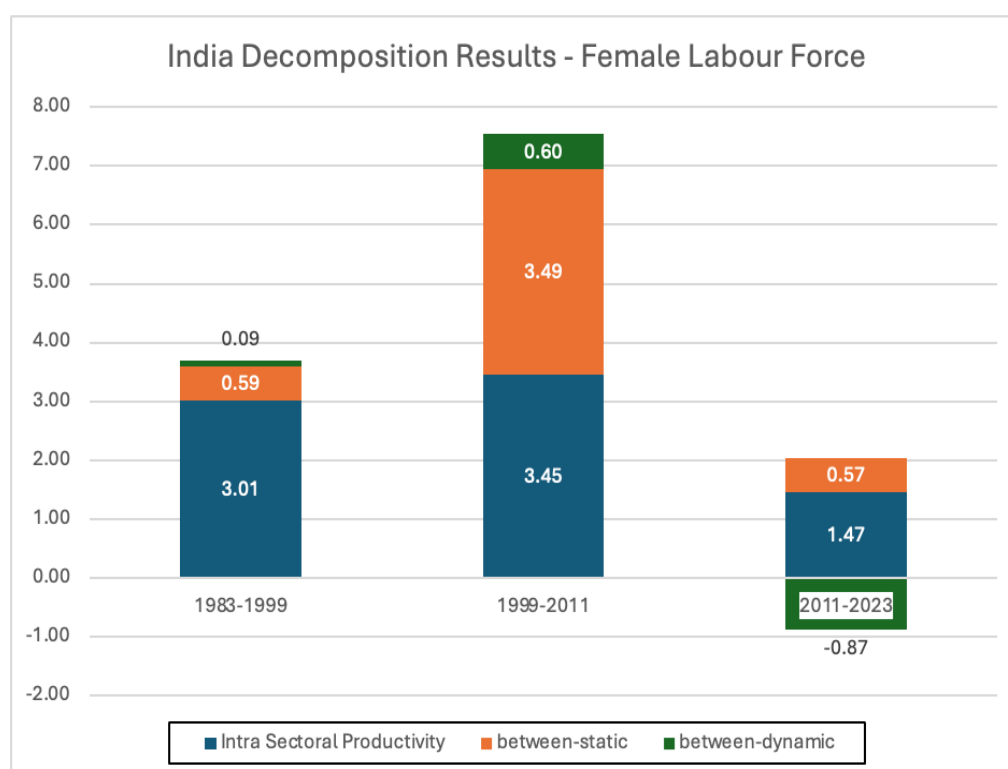


Figure 9 India Decomposition Results - Female Labour Force (1983-2023)

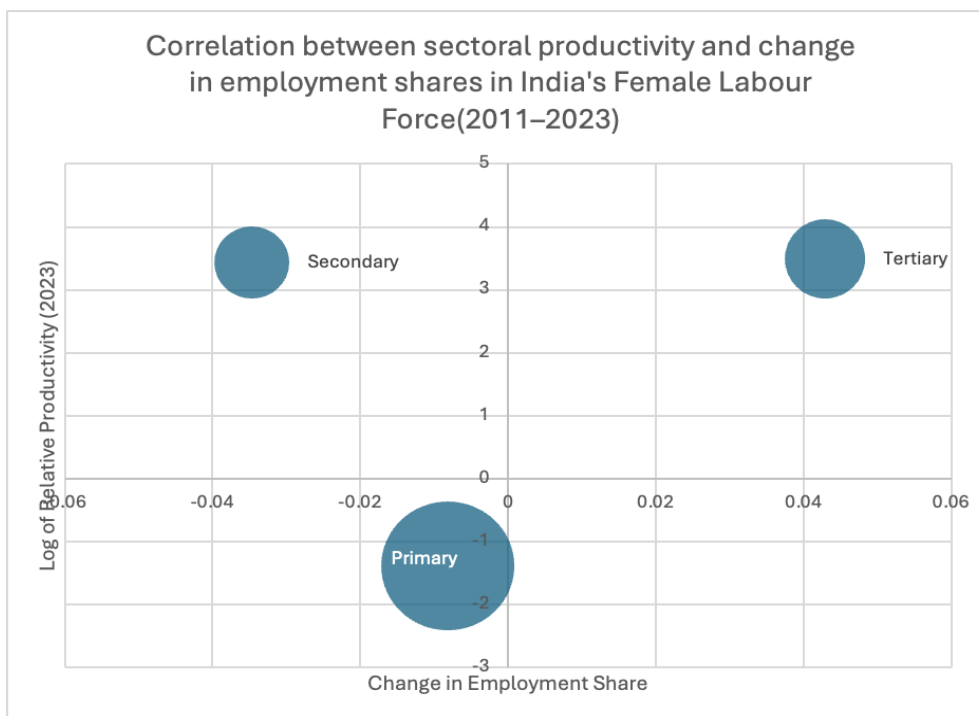


Figure 10 Correlation between sectoral productivity and change in employment shares for female labour force (2011-2023)

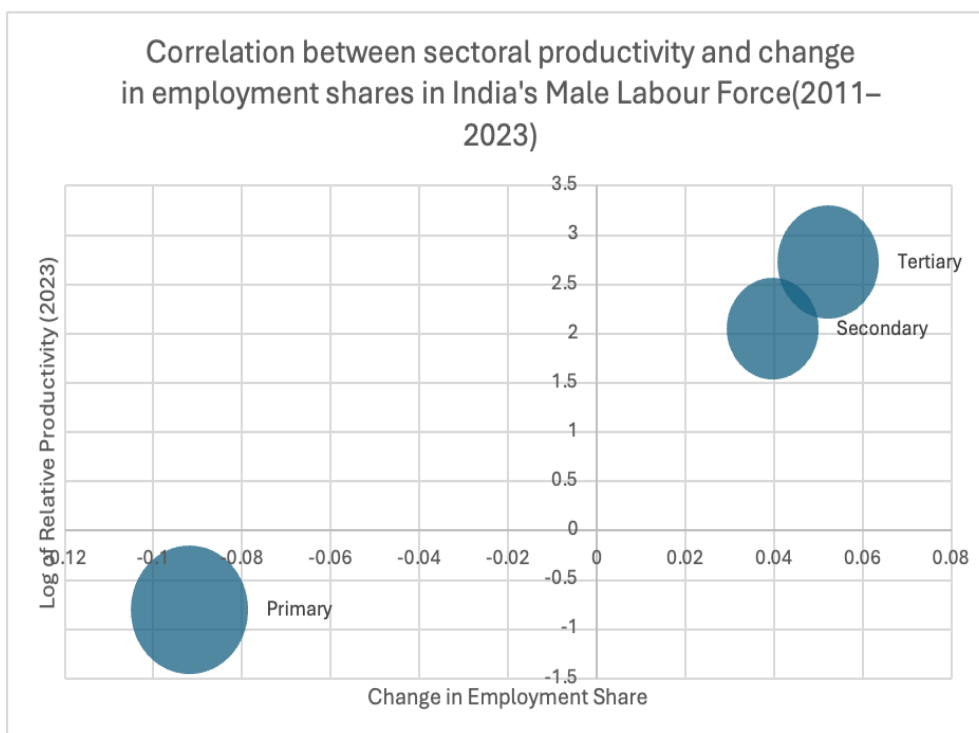


Figure 11 Correlation between sectoral productivity and change in employment shares for full labour force (2011-2023)⁴

⁴ The circles represent employment shares in 2011 and the x-axis displays the change in employment share between 2011 and 2023. The y-axis contains the log of productivity growth between 2011 and 2023.

6.2 Probit Modelling and Margins

Rural Areas

Table 2 displays the margins for Probit regression for women and men in rural areas. The probit results are available in the Appendix as Appendix figure 5. In terms of the Pseudo R^2 , the values for the probit model for men's LFPR in rural areas are higher than it is for women's LFPR at around 53 percent for 2023-24, 56 percent for 2011-12, 40 percent for 1999-2000 and 24 percent for 1983-84. For women, LFPR is harder for the model to predict, with Pseudo R^2 coming in at 23 percent for 2023-24, 25 percent for 2011-12, 26 percent for 1999-2000 and 22 percent for 1983-84. Essentially, even though the Pseudo R^2 is lower for women, the model can still be considered a strong fit for prediction (McFadden, 1974)

Individual Characteristics

Moving on, it can be seen in Table 2, that all results for marital status are significant and that in rural areas, married women have the lowest probability of participating in the workforce. Single women, in all years, have the highest probability of working, followed by divorced women and then widowed women. Though, the difference in magnitude of single working, as compared to married women, declined between 1983-84 and 1999-00, stayed around 13 (same as 1999-00) percent in 2011-12 and then declined further in 2023-24. In the case of divorced and widowed women, their probability of working as compared to married women is highest in 2011-12 but has fallen again in 2023-24. In the case of men, the probability of men working is much lower if they are single, widowed or divorced compared to married men, and in the three years (where divorce is a separate category), divorced men have the lowest probability of being in the workforce (Papps, 2006).

Furthermore, as seen in Table 2, the Rural LFPR for women is the lowest in 2011-12. The sharp differences in the probability of participating in the LFPR between married women and especially widows and divorced women in 2011-12 could reflect that demographic of women who continued working are those on whom the survival of the family depended. The decline in the probability of single, divorced and widowed women working, as compared to married women, indicates that the 'marriage effect' (Deshpande & Kabeer, 2019) reduced in 2023-24 for rural areas.

In the case of religion, Hinduism (and is the reference variable) is the largest religion in the country, followed by Islam and Christianity. In rural areas, Muslim women have a significantly (barring in 1999-00) lower probability of participating in the labour force and barring in 1983-84. Christian women, too have a lower, albeit non-significant, chance of participating in the workforce. In rural areas, the chances of women participating in the workforce, if they are Muslim, is 8 percent in 1983-84, and the difference increased to 2 percent in 2011-12 but then declined again in 2023-24 to 4 percent. In contrast, though, Muslim men have a significantly (barring in 1999-00) positive probability of participating in the workforce, while the results for Christian men are sporadic and not significant for three of the years (Azam & Han, 2020).

When it comes to social groups, the results are always significant for women. In comparison to women from all other castes, women who belong to Scheduled Tribes, Scheduled caste and Other Backward Classes (OBC) always have a higher probability of engaging in the workforce in rural areas, and there is no as such change in magnitude (barring a surge for OBC women in 2011-12) (Chatterjee et al., 2015a; Datta et al., 2020; Mondal et al., 2023). For men from marginalised social groups, the margin of difference is lower across social groups, but results are still mostly positive, barring for Scheduled Caste, which is only positive in 2023-24.

Expectedly, for men and women in rural areas, age is positively associated with the probability of participating in the workforce, while age-square is negatively associated. In terms of education, for rural women, having both primary and secondary education has a significantly negative effect on participating in the workforce. Subsequently, even in rural areas, having a higher degree always has a significantly positive effect on the probability of a women participating in the workforce, though the magnitude is lower in comparison to urban areas.

Household Characteristics

Firstly, for rural areas, the size of the household is inversely related to the probability of women working, implying larger households typically reduce the probability of women working. This may occur considering larger households could also demand more care work, which would fall on the women in the family. However, surprisingly, the presence of children or elders seems to be positively related to the probability of women working. Though the margins are not estimable for this, I also recorded the probit measures (Appendix Figure 5) for the interaction of Child Dummy and education. It is documented, that in rural areas, the presence of a child is negatively associated with the probability of women working, as their education level increases, with significant results for women with higher degrees. But this may be because most households have at least one child under the age of 15 and an elder above the age of 60, making these results harder to interpret.

The strongest positive predictor, in rural areas (even more than having a post-graduate degree), for women engaging in the workforce is the presence of a working mother-in-law in the family. If the mother-in-law is working in the household, the probability of the woman in the house working increased by more than 30 percent of the time for 1983-84, 1999-00 and 2011-12 and 25 percent for 2023-24.

In the case of centile ranks, for rural areas, 'the income effect' (Klasen et al., 2012) is only observed in 1983-84 and 1999-00, where women from the bottom two centiles have a higher probability of working against the women from the middle centile, while women from the highest two centile groups have a lower probability of working. Centile groups have not seemed to yield significant results in recent years. However, as seen in Appendix Figure 5, the log of the Monthly Per-capita expenditure of the household in rural areas is associated with having an inverse effect on the probability of women working; hence, as households go up in expenditure, the probability of women in the household working goes down. However, the education of the head plays a pivotal role in all four years, wherein the higher the education

Table 2 Margins for Probit Estimates for Labour Force Participation in Rural Areas (2011-2023)

VARIABLES	1983-84		1999-00		2011-12		2023-24	
	Rural		Rural		Rural		Rural	
	Women	Men	Women	Men	Women	Men	Women	Men
Marital status (Ref=Married)								
Single	0.175*** (0.0055)	-0.082*** (0.0035)	0.134*** (0.0055)	-0.090*** (0.0036)	0.138*** (0.0064)	-0.110*** (0.0046)	0.115*** (0.0065)	-0.081*** (0.0052)
Widowed	0.068*** (0.0051)	-0.081*** (0.0058)	0.057*** (0.0058)	-0.090*** (0.0076)	0.176*** (0.0072)	-0.111*** (0.0092)	0.0588*** (0.0072)	-0.069*** (0.0094)
Divorced/Separated			0.116*** (0.0167)	-0.124*** (0.0215)	0.213*** (0.0223)	-0.152*** (0.0279)	0.069*** (0.0228)	-0.100*** (0.0217)
Religion (Ref: Hinduism)								
Muslim	-0.088*** (0.0050)	0.010*** (0.0033)	-0.061 (0.114)	-0.053 (0.0531)	-0.026*** (0.0051)	0.007** (0.0032)	-0.0467*** (0.0060)	0.0148*** (0.0035)
Christian	0.025*** (0.0081)	0.004 (0.0052)	-0.112 (0.1140)	-0.043 (0.0532)	0.008 (0.0080)	-0.0071 (0.0032)	-.013 (0.0101)	-0.017*** (0.0065)
Social Group (Ref: All other Castes)								
Scheduled Tribe	0.103*** (0.0052)	0.007** (0.0030)	0.128*** (0.0056)	0.015*** (0.0038)	0.083*** (0.0055)	0.006* (0.0038)	0.103*** (0.0068)	0.015*** (0.0042)
Scheduled Caste	0.022*** (0.0040)	-0.016*** (0.0030)	0.044*** (0.0046)	-0.003 (0.0031)	0.031*** (0.0048)	-0.007** (0.0032)	0.045*** (0.0061)	0.007* (0.0037)
Other Backward Caste	-	-	0.033*** (0.0037)	0.006** (0.0024)	0.188*** (0.0038)	-0.003 (0.0025)	0.055*** (0.0051)	0.006* (0.0032)

Age	0.042*** (0.0008)	0.032*** (0.0030)	0.046*** (0.0008)	0.047*** (0.0005)	0.049*** (0.0009)	0.053*** (0.0004)	0.0793*** (0.0011)	0.055*** (0.0005)
Age Square	-0.0006*** (0.0000)	-0.0004*** (6.31e-06)	-0.0006*** (0.0000)	-0.0006 (6.35e-06)	-0.0006*** (0.0000)	-0.0006*** (6.30e-06)	-0.0009*** (0.00001)	-0.0006*** (7.12e-06)
Education (Ref: Low or No Literacy)								
Primary and Middle	-0.078*** (0.004)	-0.101*** (0.0030)	-0.068*** (0.0036)	-0.019*** (0.0026)	-0.219*** (0.0038)	0.045*** (0.0038)	-0.031*** (0.0051)	0.098*** (0.0052)
Secondary and Higher Secondary	-0.015 (0.0119)	-0.179*** (0.0062)	-0.080*** (0.0062)	-0.100 (0.0037)	-0.055*** (0.0200)	-0.042*** (0.0043)	-0.063*** (0.0064)	0.038*** (0.0056)
Diploma/certificate					0.160*** (0.0099)	0.019** (0.0090)	0.1405*** (0.0212)	0.131*** (0.0105)
Graduate and above	Not Estimable Not Estimable	Not Estimable Not Estimable	0.112*** (0.0156)	-0.031*** (0.0063)	0.072*** -0.0099	-0.015*** (0.0057)	0.015* (0.0094)	0.092*** (0.0067)
Post-Graduate and above					0.214*** (0.0215)	0.035*** (0.0101)	0.107*** (0.0174)	0.086*** (0.0128)
Children Dummy	0.020*** (0.0044)	0.003 (0.0029)	0.004 (0.0039)	-0.006** (0.0023)	0.015*** (0.0034)	-0.0007 (0.0022)	0.0113*** (0.0042)	-0.0037 (0.0026)
Elder Dummy	0.027*** (0.0044)	-0.0030 (0.0030)	0.032*** (0.0043)	-0.0070** (0.0028)	0.021*** (0.0045)	-0.004 (0.0030)	0.009* (0.0055)	-0.0083** (0.0034)
Mother in Law Dummy	0.377***	0.019***	0.365***	0.011***	0.334***	0.015***	0.248***	0.010**

	(0.0043)	(0.0033)	(0.0042)	(0.0034)	(0.0050)	(0.0042)	(0.0064)	(0.0044)
Centile Ranks								
1st Income group (Lowest)	0.024***	-0.011***	0.032***	-0.008**	0.121*	0.0008	-0.0060	0.0035
	(0.0057)	(0.0041)	(0.0060)	(0.0040)	(0.0063)	(0.0047)	(0.0088)	(0.0053)
2nd Income Group	0.006	0.003	0.018***	0.003	0.006	0.003	-0.0041	-0.007*
	(0.0045)	(0.0030)	(0.0044)	(0.0030)	(0.0044)	(0.0032)	(0.0060)	(0.0037)
4th Income Group	-0.010**	-0.007**	-0.017***	-0.014***	0.006	0.003	-0.0062	-0.006*
	(0.0045)	(0.0030)	(0.0046)	(0.0030)	(0.0047)	(0.0031)	(0.0059)	(0.0037)
5th Income Group	-0.018***	-0.008*	-0.032***	-0.019***	0.035***	0.015***	-0.0148	-0.010*
	(0.0061)	(0.0041)	(0.0061)	(0.0040)	(0.0066)	(0.0043)	(0.0092)	(0.0058)
Household Size								
	-0.024***	-0.003***	-0.018***	-0.0007**	-0.012***	-0.002***	-0.0246***	.0003
	(0.0006)	(0.0035)	(0.0005)	(0.0003)	(0.0009)	(0.0005)	(0.0011)	(0.0007)
Head Education Level								
Primary and Middle	-0.438***	0.022**	-0.035***	-0.016***	-0.037***	0.044***	-0.0022	-0.049***
	(0.0035)	(0.0024)	(0.0032)	(0.0023)	(0.0038)	(0.0038)	(0.0045)	(0.0027)
Secondary and Higher Secondary	-0.063***	0.038***	-0.070***	-0.011***	-0.065***	-0.042***	-0.0169***	-0.049***
	(0.0072)	(0.0040)	(0.0050)	(0.0033)	(0.0048)	(0.0043)	(0.0056)	(0.0036)
Diploma/certificate					-0.090***	0.018**	-0.0501**	-0.088***
					(0.0124)	(0.0090)	(0.0207)	(0.0190)
Graduate and above	-0.078***	-0.012	-0.071***	-0.030	-0.093***	-0.015***	-0.0713***	-0.082***
	(0.0148)	(0.0110)	(0.008)	(0.0060)	(0.0069)	(0.0057)	(0.0093)	(0.0073)
Post-Graduate and above					-0.095***	0.035***	-0.0458***	-0.0851***
					(0.0106)	(0.0042)	(0.0174)	(0.0156)

of the head is, the probability of women working in the household actually goes down. So, the group of women who have the highest probability of working in this category are those where the head of the household has no or low literacy. Rather than increased education of the head of the family has a positive effect on women's probability to work, it has a negative effect. The negative effect of this variable on women's probability to participate is the highest in 2011-12, which is also the year after which the tide of economic growth slowed down in the country.

Urban

Table 3 displays the margins for Probit regression for women and men in urban areas. The probit results are available in the Appendix as Appendix figure 6. In terms of the Pseudo R^2 , the values for the probit model for men's LFPR in urban areas are higher than it is for women's LFPR at around 54 percent for 2023-24, 56 percent for 2011-12, 46 percent for 1999-2000 and 36 percent for 1983-84. For women, LFPR is harder for the model to predict, with Pseudo R^2 coming in at 19 percent for 2023-24, 21 percent for 2011-12, 19 percent for 1999-2000 and 17 percent for 1983-84. Essentially, even though the Pseudo R^2 is lower for women (and lower than in rural areas), the model can still be considered a moderate fit for prediction (McFadden, 1974)

Individual Characteristics

As seen in Table 3, similar to in rural areas, in urban areas, all results for marital status are significant and married women have the lowest probability of participating in the workforce. Moreover, for urban areas, the comparative difference in probability between married women and others working is even more substantial, with single women having the highest probability of working in 1983-84 and 2023-24 while divorced women having the highest probability in 1999-00 and 2011-12. Additionally, unlike in rural areas, the probability of single, divorced or widowed women working compared to married women is not declining, implying that the 'marriage effect' (Deshpande & Kabeer, 2024) continues to affect the

probability of working in a similar magnitude. Finally, like rural areas, unlike women, married men have the highest probability of working, especially widowers or divorced men.

However, the model also estimates that this penalty for being married is stronger in urban areas than it is in rural areas, with the margin of difference of participating in the workforce for other women, especially those who had never been married, being much larger for all years in urban areas than it is in rural areas. This could be on account of the fact that most women in rural areas are engaged in agriculture and are able to balance working on the farms with their care responsibilities.

In the case of religion, similar to rural areas, Muslim women in urban areas have a significantly lower probability of participating in the workforce in all the years and their likelihood has fallen in 2023-24 as compared to previous years, which could be a consequence of rising communal tensions in the country and these tensions seem to have increased the social isolation of the Muslim community, and especially its women (Jain, 2024). But unlike rural areas, Christian women in urban areas have a significantly positive probability of participating in the workforce, implying that Christian women are more likely to work as compared to Hindu women, while Muslim women are less likely to engage in the workforce (Iyer, 2018). On the one hand, the results for Muslim men in urban areas mirror that for rural areas, where they tend to have a higher probability of being engaged in the workforce as compared to Hindu men, and Christian men are less likely to be engaged in the workforce.

As in rural areas, when it comes to social groups, the results are always significant for women. Women from marginalised groups have a higher probability of engaging in the workforce, as compared to women from all other castes, and there is no such change in magnitude. In the case of men, it is only in 1983-84, that men from marginalised communities are less likely to be engaged in the workforce, but since then, their co-efficient are positive, albeit mostly not significant.

Same as rural areas, expectedly, for men and women in urban areas, age is positively associated with the probability of participating in the workforce, while age-square is negatively associated. In terms of education, urban women with primary and middle

education always have a negative probability of engaging in the workforce, as compared to women who have low or no literacy. Women with secondary education had a higher probability of being in the workforce as compared to women who had low or no literacy in 1983-84 but for 2011-12 and 2023-24, women with a secondary education are significantly less likely to be in the labour force. This may coincide with the fact that in 1981, India's literacy rate is 41 percent, so basic literacy is rarer at that time and could consequently have a positive effect on job-market outcomes, especially in urban areas. But now, in 2023, India's literacy rate is 77 percent, which while, below the global rate, would still mean that the marginal positive effect of basic literacy is not as high as it is in 1983. In the case of men, the effect of school education tends to be more sporadic but usually positive.

Additionally, women with a higher education (Diploma Certificate, Graduate and Postgraduate) have a significantly positive effect on the chances of women engaging in the workforce. The categorisation of post-graduate and diploma certificate is only available in the last two rounds of the survey, and women in both these categories tend to more likely to be engaged in the workforce compared to women with a graduate degree (and at least 20 percent more likely than women who had low or no literacy). Having a graduate degree in 1983-84 and 1999-00 increased the probability of women participating in the workforce by around 20 percent.

Household Characteristics

In urban areas too, just like rural areas, larger household sizes are significantly positively related to women in the family working. The presence of children is also associated positively (significant for 1983-84 and 2011-12) with the probability of women working, albeit at less than 1 percent. As seen in the probit table in appendix (Appendix Figure 6), the interaction of the Child Dummy and education reveals that in urban areas, the presence of a child is negatively associated with the probability of women working as their education level increases, especially for women with higher degrees. The presence of an elder is significantly and positively associated with women in the household working by around 2 percent. This

could indicate that the presence of an elder could help share the burdens of child-rearing, freeing up time for women to work.

Just like in rural areas, the presence of a working mother-in-law in the family is one of the strongest predictors of women working. If there is a working mother-in-law in the family, the probability of the other women in the family working increases by around 30 per cent in all four years.

Same as in rural areas, as seen in Appendix (Appendix Figure 6), the log of Monthly Per-capita expenditure of the household in urban areas is associated with having an inverse effect on the probability of women working. In terms of how different centile groups perform in urban areas, the centile effect refers to the phenomenon by which women from lower centile groups have a higher compulsion to join the workforce to support the family- while women in upper centile choose to engage in work, is well documented in 1983-84, 1999-00 and 2023-24 (though some results are not statistically significant). Additionally, just like in rural areas, the education level of the head of the family has an inverse effect on the probability of women working. Instead of more women working in the family, if the head is better educated, women tend not to work, and the highest participation is recorded if the head is not educated. Furthermore, the negative effect of the head of the household's education level has almost doubled in magnitude in urban areas compared to rural areas over all the years. Furthermore, the negative effect this variable has on women's probability to participate in the workforce is highest in 2023-24, albeit by a small margin.

Table 3 Margins for Probit Estimates for Labour Force Participation in Urban Areas (2011-2023)

VARIABLES	1983-84		1999-00		2011-12		2023-24	
	Urban		Urban		Urban		Urban	
	Women	Men	Women	Men	Women	Men	Women	Men
Marital status (Ref=Married)								
Single	0.178*** (0.0070)	-0.108*** (0.0048)	0.196*** (0.0069)	-0.107*** (0.0050)	0.219*** (0.0080)	-0.125*** (0.0061)	0.258*** (0.0077)	-0.086*** (0.0060)
Widowed	0.150** (0.0072)	-0.122*** (0.0103)	0.130*** (0.0072)	-0.120*** (0.0117)	0.207*** (0.0086)	-0.112*** (0.0126)	0.158*** (0.0082)	-0.109*** (0.0119)
Divorced/Separated			0.228*** (0.0209)	-0.175*** (0.0317)	0.266*** (0.0234)	-0.076** (0.0312)	0.221*** (0.0209)	-0.0823*** (0.0233)
Religion (Ref: Hinduism)								
Muslim	-0.0342*** (0.0046)	0.007* (0.0038)	-0.026*** (0.0045)	0.016*** (0.0034)	-0.031*** (0.0048)	0.030*** (0.0035)	-0.07*** (0.0054)	0.027*** (0.0338)
Christian	0.055*** (0.0097)	-0.0188** (0.0076)	0.046*** (0.0088)	-0.014** (0.0071)	0.047*** (0.0101)	-0.007 (0.0080)	0.048*** (0.0115)	-0.023*** (0.0770)
Social Group (Ref: All other Castes)								
Scheduled Tribe	0.066*** (0.0104)	-0.021*** (0.0081)	0.085*** (0.0088)	-0.004 (0.0066)	0.078*** (0.0090)	-0.002 (0.0061)	0.070*** (0.0101)	0.008 (0.0651)
Scheduled Caste	0.050*** (0.0070)	-0.019*** (0.0053)	0.048*** (0.0059)	0.003 (0.0042)	0.034*** (0.0057)	-0.0001 (0.0041)	0.043*** (0.0064)	0.009** (0.0040)
Other Backward Caste	0.0042 (0.0331)	Not Estimable Not Estimable	0.033*** (0.0039)	0.011*** (0.0030)	0.019*** (0.0041)	0.003 (0.0030)	0.026*** (0.0049)	0.008** (0.0031)

Age	0.036*** (0.0041)	0.056*** (0.0007)	0.041*** (0.0010)	0.060*** (0.0050)	0.048*** (0.0011)	0.057*** (0.0005)	0.074*** (0.0097)	0.058*** (0.0006)
Age Square	-0.0005*** (0.0001)	-0.0007*** (8.31e-06)	-0.0005*** (0.00001)	-0.0008*** (0.0051)	-0.0005*** (0.0000)	-0.0007** (7.46e-06)	-0.0009*** (0.0000)	-0.00007*** 7.71e-06
Education (Ref: Low or No Literacy)								
Primary and Middle	-0.0400*** (0.0041)	-0.041*** (0.0036)	-0.030*** (0.0040)	0.027*** (0.0050)	-0.018*** (0.0050)	0.075*** (0.0061)	-0.024*** (0.0067)	0.147*** (0.0085)
Secondary and Higher Secondary	0.048*** (0.0070)	-0.116*** (0.0048)	0.003 (0.0054)	-0.046*** (0.0055)	-0.031*** (0.0057)	-0.016** (0.0065)	-0.045*** (0.0074)	0.086*** (0.0088)
Diploma/certificate					0.246*** (0.0057)	0.041*** (0.0096)	0.232*** (0.0213)	0.177*** (0.0116)
Graduate and above	0.226*** (0.0142)	- -	0.206*** (0.0090)	0.023*** (0.0064)	0.141*** (0.0088)	0.0261*** (0.0073)	0.115*** (0.0090)	0.172*** (0.0093)
Post-Graduate and above					0.310*** (0.0146)	0.0831*** (0.0096)	0.233*** (0.0122)	0.228*** (0.0110)
Children Dummy	0.008* (0.0047)	0.010*** (0.0036)	0.006 (0.0037)	-0.004 (0.0028)	0.0088** (0.0038)	0.004 (0.0030)	-0.006 (0.0045)	0.003 (0.0032)
Elder Dummy	0.022*** (0.0051)	-0.008** (0.0040)	0.029*** (0.0048)	-0.005 (0.0038)	0.021*** (0.0057)	-0.0041 (0.0042)	0.029*** (0.0067)	-0.010** (0.0043)

Mother in Law Dummy	0.326***	-0.001	0.310***	0.018***	0.280***	-0.005	0.276***	0.016*
	(0.0068)	(0.0070)	(0.0064)	(0.0069)	(0.0071)	(0.0069)	(0.0081)	(0.0064)
Centile Ranks								
1st Income group (Lowest)	0.057***	-0.004	0.054***	0.023***	0.012*	0.007	0.018*	0.001
	(0.0074)	(0.0060)	(0.0077)	(0.0055)	(0.0072)	(0.0054)	(0.0097)	(0.0061)
2nd Income Group	0.026***	0.010**	0.027***	0.010***	0.008*	0.001	0.013**	0.003
	(0.0053)	(0.0044)	(0.0051)	(0.0039)	(0.0051)	(0.0040)	(0.0066)	(0.0043)
4th Income Group	-0.013**	0.0006	-0.020***	-0.0079*	0.004	0.009**	-0.001	0.006
	(0.0052)	(0.0043)	(0.0050)	(0.0040)	(0.0053)	(0.0039)	(0.0064)	(0.0042)
5th Income Group	0.0102	-0.007	-0.002	-0.017***	0.031***	0.020***	-0.004	0.006
	(0.0078)	(0.0064)	(0.0074)	(0.0061)	(0.0077)	(0.005)	(0.0099)	(0.0066)
Household Size	-0.017***	-0.0013**	-0.022***	-0.004***	-0.014***	-0.004***	-0.026***	-0.008***
	(0.0007)	(0.0005)	(0.0008)	(0.0006)	(0.0011)	(0.0008)	(0.0013)	(0.0007)

Head Education Level(Ref:**Low or no literacy)**

Primary and Middle	-0.084*** (0.0044)	-0.010*** (0.0035)	-0.068*** (0.0051)	-0.031*** (0.0035)	-0.054*** (0.0061)	-0.035*** (0.0037)	-0.039*** (0.0069)	-0.05*** (0.0039)
Secondary and Higher Secondary	-0.127*** (0.0052)	-0.030*** (0.0045)	-0.123*** (0.0059)	-0.055*** (0.0041)	-0.118*** (0.0066)	-0.050*** (0.0041)	-0.090*** (0.0075)	-0.058*** (0.0043)
Diploma/certificate					-0.147*** (0.0106)	-0.075*** (0.0098)	-0.128*** (0.0140)	-0.113*** (0.0120)
Graduate and above	-0.131*** (0.0064)	-0.082*** (0.0069)	-0.133*** (0.0067)	-0.111*** (0.0055)	-0.145*** (0.0074)	-0.08*** (0.0055)	-0.150*** (0.0084)	-0.112*** (0.0059)
Post-Graduate and above					-0.150*** (0.0086)	-0.122*** (0.0090)	-0.155*** (0.0105)	-0.168*** (0.0113)

7. Conclusion

India's female labour force participation rates have been fluctuating, starting with a decline that started in the 2000s, as economic growth was booming, then reaching an all-time low at 22.5 percent in 2017-18, which then rose rapidly to 38.5 in 2023-24. This period of changing dynamics of the female labour force coincides with India's steady economic growth since liberalization in 1992 and moderate structural transformation. In response, this paper set out to examine how differences in productivity growth manifested for the female labour force, compared to the whole labour force in India between 1983-84 and 2023-24. It also aimed to analyse how the probability of workforce participation differs between women and men using supply-side indicators and understand how changes in female labour force productivity are linked to the nature of recent employment.

The analysis utilized the decomposition method of shift-share analysis, following Timmer & de Vries(2009). The results revealed significant trends in productivity growth across the three phases. For the whole labour force, within-sector productivity was consistently the largest contributor to overall aggregate productivity growth across all three phases (1983-1999, 1999-2011, and 2011-2023). The reallocation of labour to higher-productivity sectors (between-static effect) was most prominent in the second phase (1999-00 to 2011-12), which coincided with India's 'dream run' of economic growth. Finally, in the third phase (2011-12 to 2023-24), structural change had a substantial reduction in contribution, given that shifts in labour were less in magnitude compared to previous phases.

These results concerning structural change are more pronounced for the female labour force. The second phase saw a significant contraction in female labour force participation, driven mainly by the retreat of rural women from agriculture as incomes rose and women no longer needed to work to ensure the survival of their families. Consequently, the remaining female labour force appeared to move from lower-productivity to higher-productivity sectors, as indicated by a larger between-static effect compared to the full labour force and between-static being the biggest component of productivity growth. In contrast, the third phase (2011-12 to 2023-24), despite a notable expansion in FLFPR in both rural and urban

areas, showed much lower overall productivity growth for the female labour force. Specifically, the dynamic effect on the female labour force was negative in this period. This indicates that women in this phase moved into sectors that had lower marginal productivity for every additional worker. The lower marginal productivity for each added worker could be an indicator of rising under-employment, as pointed out by Deshpande and Kabeer (2024). The third phase also saw the lowest growth in within-sector and between-static productivity for female labour compared to previous phases. The analysis shows that the primary sector continued to hold the largest share of the female labour force, while the secondary sector employment share for women declined significantly in this period, even though it has productivity levels equivalent to the tertiary sector. This contrasts with the male labour force, which saw expansions in higher-productivity secondary and tertiary sectors.

The probit model with margins analysis highlighted the significant influence of individual and household characteristics (supply-side factors) on the probability of women participating in the workforce, revealing important differences between rural and urban areas. In both rural and urban areas, married women consistently had the lowest probability of participating compared to single, divorced, or widowed women, signalling the marriage effect. The marriage effect was stronger in urban areas than in rural areas. Muslim women had a significantly lower probability of participating in the workforce, and this effect was highest for Muslim women in urban areas, which could be an indicator of heightening social exclusion. The probability of women from marginalized social groups (Scheduled Caste, Scheduled Tribe and Other Backward Classes) participating in the workforce was always higher than it was for the general population.

Education presented a more multifaceted picture. In rural areas, women with low or no literacy initially had the highest probability of working, likely due to economic necessity. While higher education (graduate and above) was associated with a significantly positive probability of working, primary, middle, and secondary education were both significantly and negatively associated with the probability of working. In rural areas, secondary education shows the lowest probability than primary literacy (barring 1983-84). In urban areas, primary and middle education always had a negative association, and secondary education showed a significantly lower probability of working compared to low literacy in

the later periods (2011-12 and 2023-24). The positive effect of secondary education in the earlier years could have been a result of the added benefit of literacy in those years, which diminished in the later years with the expansion of education. However, women with higher education (Diploma/Certificate, Graduate, Post-Graduate) consistently had a significantly positive effect on their chances of workforce participation in both rural and urban areas, though the effect is more pronounced in urban areas. Having a post-graduate degree is one of the highest marginal effects on the probability of a woman participating in the workforce.

Household characteristics also played a crucial role. The presence of children and elders generally had a positive association with labour force participation, which was surprising, but earlier studies have indicated that despite women responding (Sudarshan, 2013; Sudarshan & Bhattacharya, 2009) that they leave the workforce with the birth of the first child, it has not been possible to record this effect in probit models for India. However, the size of the household was always similarly negatively correlated for rural and urban households with women's labour force participation, indicating that if there are more members in a family, consequently more care work responsibilities, women tend to abstain from the workforce. When it comes to household characteristics, the most interesting finding for me was the mother-in-law effect. With the presence of a working mother-in-law in the household, the probability of other women in the households working increased by almost 30 percentage points. These findings point to the presence of *virtuous cycles*, where if older women in a family work, they open the possibility for the following generations of women working as well.

Linking the shift-share and probit results, the analysis suggests that while there has been a notable increase in female labour force participation between 2011-12 and 2023-24, the nature of employment women are entering is often in sectors or roles associated with lower marginal productivity, particularly in the third phase. This contrasts with the second phase (1999-2011) where while women left the labour force in large numbers, the contraction was positively linked to a shift towards more productive sectors for those who remained employed. The probit findings illustrate how supply-side factors, such as marital status, social norms around marriage and care work, household dynamics, and the value placed on education (sometimes for marriage rather than employment), alongside demand-side issues

like the limited availability of 'appropriate jobs' and India's 'premature de-industrialization', constrain women's choices and opportunities in the labour market. The demand-side issues have a significantly adverse effect on women than they do on men.

The stagnation in the manufacturing sector, which Rodrik (2013) calls the unconditional path to convergence, is concerning in itself. Furthermore, this analysis points out how the adverse effects of this stagnation impact women more than men because women's share in the sector is declining. On the other hand, despite the slowdown of economic growth in the third phase (2011-2023), both the productivity and labour share of women in services increased in this period. Hence, women's proportion in services jobs, specifically in urban areas, is on the rise, while in rural areas, women's participation in low-paid agriculture is increasing. Consequently, the differences in economic outcomes for women in urban and rural areas are on the rise. These differences are another instance of India's deeply entrenched inequalities manifest. While women in urban India are entering more productive jobs, rural women are regressing along the structural transformation path to re-enter agricultural jobs they left a decade ago.

In conclusion, while India has witnessed a recent surge in female labour force participation, the analysis suggests that this has occurred alongside a concerning trend of slowed structural change and a shift of female labour into lower-productivity sectors. This highlights the complex interplay of structural economic challenges, insufficient demand for suitable female labour, and deep-seated social and household norms that collectively shape women's opportunities and contribute to disparities in productivity and participation outcomes across the country.

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Appendix

AI Note

For me, AI tools were not utilised for ideation or writing, but did improve my efficiency when it came to coding, literature synthesis, and editing. I used AI tools such as ChatGPT by OpenAi and Google's NotebookLm in my thesis. ChatGPT was instrumental in problem solving when it came to Stata. Some of the major problems that I used it for were- best ways of exporting data into excel, figuring out why I was getting errors when the code seemed right to me and how I could clean data efficiently. NotebookLm main purpose for me was to sort literature I required for the thesis. I did not use any AI tools for generating text for the thesis, but I did use NotebookLm, at times, to summarise and cross reference different papers for my understanding. For editing and grammar checks, I utilised Grammarly and that also gave alternate word choices for the improvement of flow, tone and word choices.

Data Cleaning

I downloaded the data from Mospi's microdata library. To extract data for Stata as .dta files, I utilised a software called Nesstar. From Nesstar, the data was segregated into various blocks and which were divided by households and persons in households. I required data from both blocks, so I had to merge the data. For some of the years, the data for all individuals was available in each block separately, while for others that was not the case. In case of the former situation, I had to create a unique person ID, following instructions provided by NSSO and other scholars. To merge household and individual data I utilised the Household ID that was available or created one following their [instructions](#). There were a few entries, some for households and some for individuals, that did not merge, especially for 1983-84 and 1999-00 and those were consequently dropped.

Dealing with NSSO data is quite cumbersome, especially when one must utilise data over a large period. There were some variations across all four datasets as to how they are stored and as such a close eye had to be kept while cleaning the data. One notable difference in the arrangement of the four data sets was that 1983-84 and 1999-00, both had a different classification for Industries while 2011-12 and 2023-24 followed a different classification.

Following the documents provided by MosPi, an industry variable was created following how the GDP data was disaggregated amongst industries. Once the data was arranged, Child dummy, elder dummy and mother-in-law dummy were created, the datasets were restricted to working age, i.e. 15 to 60 years.

Variable Description

Cent Ranks – I calculated the variable Centile Ranks using Monthly Per capita expenditure for households in the Employment and Unemployment Surveys (EUS). In the case of the Periodic Labour Force Survey (PLFS) data set that was utilised for 2023-24, MPCE was not directly available so that was calculated by using total household expenditure and dividing that by total members in a household. Then, I calculated centile values for MPCE for all years separately for urban and rural regions considering consumption is often lower in the latter and attributed them corresponding ranking in an ascending order.

Mother-in-law Dummy- The mother-in-law dummy was assigned before the dataset was cut the working age population. In the dataset, there is only one variable that can identify the relationship of the surveyed individual to their other members and that does not separately account for the relationship of mother-in-law and daughter in law. So, Mother dummy was generated if relationship to head of the surveyed individual was that of a 'parental' figure and the sex was female. And from that mother-in-law dummy was assigned if the surveyed individual was female and spouse of the head. Subsequently, if the head of the family was an elderly male, the mother-in-law dummy was also marked as positive if there existed a female person as the spouse of married child and the elder's spouse was working. Here, considering in Indian families, the norm is of patrilineal virilocality (Menon 2022); it was assumed that the woman moved to the husband's household.

Child and Elder Dummy- These were generated prior to the dataset being cut to working age population. If there was the presence of a child (below the age of 15) and elder (above the age of 60), the value 1 was assigned to the household, corresponding to all surveyed individuals and then the data was trimmed down to working age population (15-65).

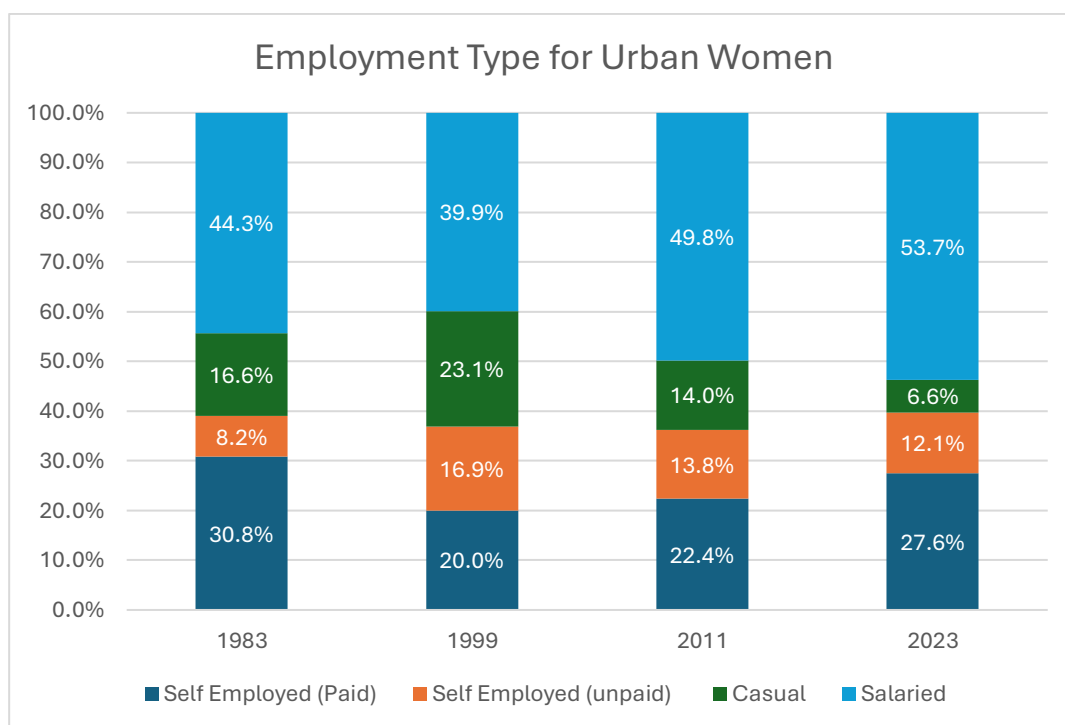
Industry Divisions- Industry divisions were assigned based on National Industry Classification (2004) for 1983 and 1999. National Industry Classification (2008) was utilised for 2011 and 2023. Depending on the classification, industry codes were classified into Agriculture, Mining, Manufacturing, Construction, Utilities, Finance, Trade, Transport, and Community and Government Services.

Age_sq – Age square is the square of the surveyed individual's age.

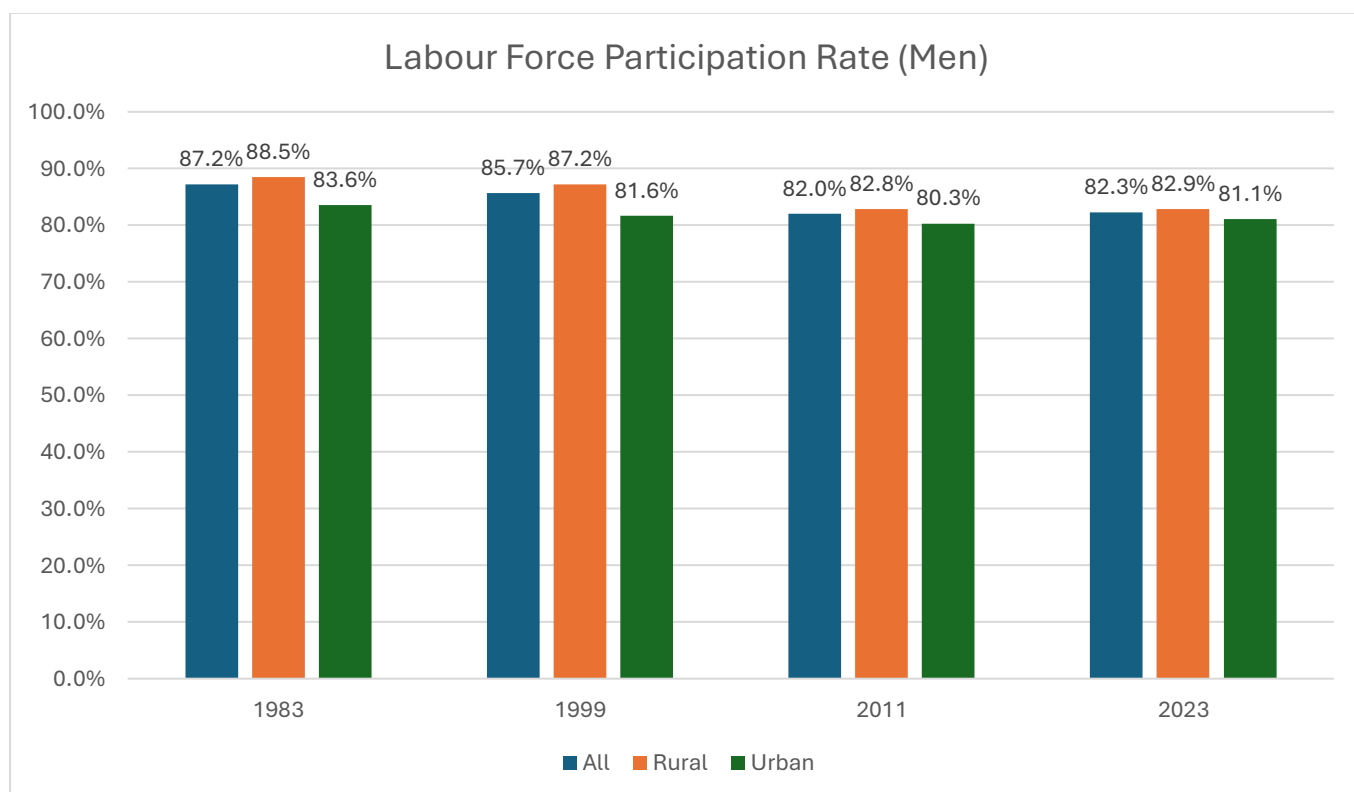
Year	Households	Total Individuals	Working Age (15-60)
1983	1,20,909	6,23,494	1,95,933
1999	1,20,578	5,96,200	1,96,087

2011	1,01,724	4,56,999	1,49,132
2023	1,01,920	4,18,159	1,53,302

Appendix Figure 1 Survey Population (EUS and PLFS)



Appendix Figure 2 Employment Type for Urban Women



Appendix Figure 3 Male LFPR (1983-2023)



Appendix Figure 4 Decomposition Results for Male Labour Force

VARIABLES	1983		1999		2011-12		2023-24	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
	Rural		Rural		Rural		Rural	
					Women	Men	Women	Men
Log MPCE	-0.0194 (0.0181)	0.0459** (0.0232)	0.0322 (0.0219)	0.0482* (0.0250)	-0.142*** (0.0231)	-0.0178 (0.0353)	-0.114*** (0.0333)	0.130*** (0.0495)
Marital status (Ref=Married)								
Single	0.587*** (0.0187)	0-.494*** (0.0192)	0.490*** (0.0200)	-0.608*** (0.0228)	0.540*** (0.0246)	-0.792*** (0.0299)	0.400*** (0.0246)	-0.574*** (0.0338)
Widowed	0..234*** (0.0172)	-0.4866*** (0.0286)	-0.212*** (0.0215)	-0.604*** (0.0423)	0.674*** (0.0254)	-0.801*** (0.0560)	0.202*** (0.0250)	-0.502*** (0.0607)
Divorced/Seperated			0.427*** (0.0586)	-0.780*** (0.1068)	0.801*** (0.0764)	-1.037*** (0.1527)	0.239*** (0.0795)	-0.690*** (0.126)
Religion (Ref:Hinduism)								
Muslim	-0.311*** (0.0185)	0.0688*** (0.0227)	-0.409 (0.397)	-0.371 (0.517)	-0.113*** (0.0221)	0.0610** (0.0271)	-0.154*** (0.0198)	0.119*** (0.0290)
Christian	0.0843*** (0.0268)	0.0292 (0.0351)	-0.142 (0.397)	-0.707 (0.518)	0.0332 (0.0322)	-0.0587 (0.0478)	-0.0460 (0.0334)	-0.131*** (0.0491)
Social Group (Ref:All other Castes)								
Scheduled Tribe	0.366*** (0.0314)	0.109** (0.0479)	0.423*** (0.0394)	0.366*** (0.0684)	0.386*** (0.0479)	0.123 (0.0941)	0.431*** (0.0537)	0.282*** (0.106)
Scheduled Caste	0.0681** (0.0286)	-0.151*** (0.0390)	0.153*** (0.0361)	0.0398 (0.0587)	0.242*** (0.0471)	-0.00636 (0.0862)	0.152*** (0.0494)	0.00569 (0.0949)
Other Backward Caste	0.244 (0.169)	-0.152 (0.231)	0.144*** (0.0300)	0.0420 (0.0508)	0.155*** (0.0397)	0.104 (0.0763)	0.244*** (0.0440)	0.0885 (0.0863)
Age	0.145***	0.209***	0.174***	0.338***	0.205***	0.448***	0.262***	0.435***

	(0.00273)	(0.00330)	(0.00321)	(0.00401)	(0.00402)	(0.00506)	(0.00404)	(0.00522)
Age Square	-0.00199***	-0.00284***	-0.00228***	-0.00435***	-0.00259***	-0.00560***	-0.00309***	-0.00536***
	(3.77e-05)	(4.21e-05)	(4.34e-05)	(5.10e-05)	(5.25e-05)	(6.37e-05)	(5.19e-05)	(6.56e-05)
Education (Ref:Low or no Literacy)								
Primary and Middle	-0.326***	-0.518***	-0.223***	-0.0433	-0.0796**	0.587***	-0.0684*	0.799***
	(0.0376)	(0.0341)	(0.0300)	(0.0445)	(0.0351)	(0.0697)	(0.0382)	(0.0784)
Secondary and Higher Secondary	0.0321	-1.037***	-0.231***	-0.591***	-0.164***	-0.213***	-0.121***	0.376***
	(0.0681)	(0.0472)	(0.0432)	(0.0476)	(0.0425)	(0.0683)	(0.0448)	(0.0778)
Diploma/certificate					0.763***	0.177	0.569***	1.227***
					(0.134)	(0.131)	(0.170)	(0.186)
Graduate and above	0.711***	-0.337***	0.385***	-0.208***	0.266***	-0.0267	0.340***	0.786***
	(0.168)	(0.111)	(0.0789)	(0.0719)	(0.0667)	(0.0816)	(0.0659)	(0.0976)
Post-Graduate and above					1.002***	0.196	0.881***	0.951***
					(0.109)	(0.134)	(0.119)	(0.184)
Children Dummy	0.0553*	0.0942**	-0.0347	0.0311	0.102***	0.179***	0.0423	0.113*
	(0.0297)	(0.0391)	(0.0291)	(0.0443)	(0.0333)	(0.0593)	(0.0321)	(0.0617)
Elder Dummy	0.0924***	-0.0194	0.120***	-0.0503**	0.0867***	-0.0367	0.0306*	-0.0657**
	(0.0152)	(0.0190)	(0.0162)	(0.0207)	(0.0186)	(0.0255)	(0.0185)	(0.0271)
Mother in Law Dummy	1.291***	0.127***	1.358***	0.0830***	1.376***	0.125***	0.820***	0.0847**
	(0.0163)	(0.0218)	(0.0173)	(0.0247)	(0.0220)	(0.0356)	(0.0220)	(0.0353)
Centile Ranks								
1st Income group (Lowest)	-0.0396	-0.145**	-0.0682	-0.130**	0.149***	0.153**	-0.0538	-0.0713
	(0.0488)	(0.0608)	(0.0535)	(0.0650)	(0.0465)	(0.0601)	(0.0565)	(0.0776)
2nd Income Group	0.102**	0.0744	0.0414	-0.0223	0.0393	0.0121	-0.0965*	-0.0412

	(0.0423)	(0.0538)	(0.0440)	(0.0528)	(0.0440)	(0.0517)	(0.0505)	(0.0682)
4th Income Group	-0.0134	-0.0152	-0.0790*	-0.0690	0.0439	0.0294	0.00250	-0.0275
	(0.0372)	(0.0449)	(0.0407)	(0.0461)	(0.0476)	(0.0522)	(0.0445)	(0.0612)
5th Income Group	-0.0622	0.0519	-0.149***	-0.0927**	0.280***	0.181***	-0.00777	0.0117
	(0.0383)	(0.0462)	(0.0421)	(0.0469)	(0.0522)	(0.0590)	(0.0496)	(0.0694)
Household Size	-0.0831***	-0.0172***	-0.0671***	-0.00548**	-0.0518***	-0.0207***	-0.0815***	0.00249
	(0.00202)	(0.00230)	(0.00218)	(0.00262)	(0.00379)	(0.00489)	(0.00393)	(0.00592)
Head Education Level (Ref:Low or no Literacy)								
Primary and Middle	-0.150***	0.151***	-0.129***	-0.119***	-0.146***	-0.282***	-0.00730	-0.395***
	(0.0122)	(0.0170)	(0.0119)	(0.0174)	(0.0150)	(0.0213)	(0.0149)	(0.0220)
Secondary and Higher Secondary	-0.220***	0.268***	-0.262***	-0.0880***	-0.266***	-0.350***	-0.0559***	-0.394***
	(0.0258)	(0.0307)	(0.0191)	(0.0241)	(0.0196)	(0.0264)	(0.0186)	(0.0290)
Diploma/certificate					-0.377***	-0.551***	-0.166**	-0.671***
					(0.0572)	(0.0873)	(0.0689)	(0.130)
Graduate and above	-0.275***	-0.0750	-0.265***	-0.213***	-0.393***	-0.561***	-0.236***	-0.634***
	(0.0544)	(0.0651)	(0.0327)	(0.0407)	(0.0309)	(0.0413)	(0.0310)	(0.0519)
Post-Graduate and above					-0.401***	-0.848***	-0.151***	-0.650***
					(0.0487)	(0.0752)	(0.0577)	(0.108)
House Type (Reference: Self-employed in Non Agriculture)								
Self Employed in Agriculture	0.0485***	-0.0167	0.0436***	-0.0433**	0.156***	0.000532	0.363***	0.00503
	(0.0158)	(0.0205)	(0.0157)	(0.0206)	(0.0156)	(0.0213)	(0.0160)	(0.0240)
Salaried or Wage					0.0453**	-0.131***	0.0142	-0.0366
					(0.0180)	(0.0245)	(0.0181)	(0.0274)
Casual labour in Agriculture	0.176***	-0.188***	0.271***	0.0101	0.329***	0.0798**	0.292***	-0.165***

	(0.0168)	(0.0228)	(0.0169)	(0.0246)	(0.0228)	(0.0348)	(0.0256)	(0.0371)
Casual labour in non Agriculture	0.107***	-0.115***	-0.0471**	-0.0316	0.0202	0.104***	-0.00920	-0.0380
	(0.0223)	(0.0297)	(0.0222)	(0.0316)	(0.0191)	(0.0274)	(0.0192)	(0.0288)
Others	-0.372***	-0.379***	-0.226***	-0.526***	-0.776***	-1.603***	-1.868***	-2.169***
	(0.0228)	(0.0264)	(0.0201)	(0.0240)	(0.0443)	(0.0481)	(0.0748)	(0.0836)
Child Dummy#Education								
1.child_dummy#1.education	0.0199	-0.119***	-0.0149	-0.117***	-0.0353	-0.249***	0.0223	-0.201***
	(0.0388)	(0.0340)	(0.0268)	(0.0381)	(0.0280)	(0.0558)	(0.0286)	(0.0585)
1.child_dummy#2.education	-0.0714	0.137***	0.0430	0.0489	0.00131	-0.108*	0.0384	-0.111*
	(0.0746)	(0.0486)	(0.0414)	(0.0421)	(0.0348)	(0.0552)	(0.0335)	(0.0570)
1.child_dummy#3.education	-0.377**	0.0664			-0.289**	-0.0535	-0.192	-0.417**
	(0.190)	(0.120)			(0.124)	(0.134)	(0.144)	(0.177)
1.child_dummy#4.education	-0.377**	0.0664	0.0353	0.105	-0.120*	0.0148	-0.313***	-0.105
	(0.190)	(0.120)	(0.0844)	(0.0741)	(0.0626)	(0.0756)	(0.0547)	(0.0851)
1.child_dummy#5.education					-0.303**	-0.0557	-0.366***	-0.223
					(0.120)	(0.146)	(0.110)	(0.192)
State Fixed Effects								
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.2172	0.2467	0.2645	0.4047	0.253	0.5629	0.2279	0.5313
Observations	97,840	101,893	91,017	96,285	64,355	66,343	64,355	66,343

Appendix Figure 5 Probit Estimates for Rural Areas

	1983		1999		2011		2023-24	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
	Urban		Urban		Urban		Urban	
VARIABLES	Women	Men	Women	Men	Women	Men	Women	Men
Log MPCE	-0.0216 (0.0275)	0.0415 (0.0305)	-0.00573 (0.0307)	0.0442 (0.0348)	-0.133*** (0.0300)	-0.0790** (0.0339)	0.00251 (0.0353)	0.0267 (0.0486)
Marital status (Ref=Married)								
Single	0.710*** (0.0257)	-0.625*** (0.0266)	0.797*** (0.0261)	-0.658*** (0.0287)	0.886*** (0.0303)	-0.840*** (0.0372)	0.902*** (0.0289)	-0.601*** (0.0378)
Widowed	-0.617*** (0.025)	-0.687*** (0.0475)	0.563*** (0.00272)	-0.721*** (0.0586)	0.848*** (0.0299)	-0.766*** (0.0735)	0.570*** (0.0281)	-0.730*** (0.067)
Divorced/Seperated			0.902*** (0.0689)	-0.978*** (0.142)	1.042*** (0.0766)	-0.550*** (0.1988)	0.778*** (0.0699)	-0.574*** (0.141)
Religion (Ref:Hinduism)								
Muslim	-0.159*** (0.0223)	0.0446* (0.0240)	-0.123*** (0.0219)	0.110*** (0.0234)	-0.149*** (0.0240)	0.242*** (0.0287)	-0.272*** (0.0212)	0.221*** (0.0278)
Christian	0.223*** (0.0368)	-0.113** (0.0443)	0.195*** (0.0349)	-0.0932** (0.0454)	0.204*** (0.0407)	-0.0510 (0.0609)	0.164*** (0.0381)	-0.172*** (0.0554)
Social Group (Ref:All other Castes)								
Scheduled Tribe	0.272*** (0.0775)	0.0154 (0.110)	0.415*** (0.0750)	0.259** (0.120)	0.276*** (0.0859)	0.335** (0.161)	0.497*** (0.0929)	0.179 (0.170)
Scheduled Caste	0.356*** (0.0515)	-0.0623 (0.0691)	0.426*** (0.0578)	0.119 (0.0835)	0.232*** (0.0641)	0.217** (0.109)	0.369*** (0.0642)	0.126 (0.115)
Other Backward Caste	0.0198 (0.258)	-0.249 (0.356)	0.310*** (0.0455)	0.192*** (0.0684)	0.218*** (0.0525)	0.183** (0.0890)	0.285*** (0.0560)	0.0336 (0.0964)

Age	0.161*** (0.00442)	0.346*** (0.00464)	0.219*** (0.00534)	0.450*** (0.00582)	0.219*** (0.00534)	0.450*** (0.00582)	0.266*** (0.00508)	0.448*** (0.00572)
Age Square	-0.00212*** (6.04e-05)	-0.00461*** (5.94e-05)	-0.00275*** (6.95e-05)	-0.00571*** (7.30e-05)	-0.00275*** (6.95e-05)	-0.00571*** (7.30e-05)	-0.00325*** (6.49e-05)	-0.00562*** (7.14e-05)
Education (Ref:Low or No Literacy)								
Primary and Middle	-0.176*** (0.0419)	-0.219*** (0.0443)	-0.101** (0.0411)	0.207*** (0.0589)	-0.0203 (0.0502)	0.789*** (0.0814)	-0.0747 (0.0493)	0.948*** (0.0848)
Secondary and Higher Secondary	0.200*** (0.0478)	-0.828*** (0.0467)	0.163*** (0.0447)	-0.292*** (0.0592)	0.0186 (0.0521)	0.0230 (0.0783)	-0.0142 (0.0512)	0.536*** (0.0830)
Diploma/certificate					1.223*** (0.108)	0.591*** (0.119)	0.862*** (0.139)	1.138*** (0.137)
Graduate and above	0.900*** (0.0613)	-0.421*** (0.0592)	0.884*** (0.0502)	0.165** (0.0652)	0.862*** (0.0563)	0.417*** (0.0840)	0.694*** (0.0552)	1.194*** (0.0898)
Post-Graduate and above					1.361*** (0.0720)	0.981*** (0.113)	1.175*** (0.0679)	1.812*** (0.134)
Children Dummy	-0.0102 (0.0430)	0.0687 (0.0517)	0.0282 (0.0418)	-0.154** (0.0609)	0.225*** (0.0463)	0.260*** (0.0772)	-0.0243 (0.0448)	0.157* (0.0819)
Elder Dummy	0.0982*** (0.0229)	-0.0505** (0.0251)	0.132*** (0.0220)	-0.0349 (0.0252)	0.100*** (0.0262)	-0.0323 (0.0334)	0.106*** (0.0239)	-0.0822** (0.0334)
Mother in Law Dummy	1.452*** (0.0322)	-0.00823 (0.0435)	1.415*** (0.0308)	0.121*** (0.0461)	1.294*** (0.0343)	-0.0448 (0.0547)	0.986*** (0.0302)	0.128** (0.0496)
Centile Ranks								
1st Income group (Lowest)	0.140** (0.0636)	-0.133** (0.0666)	0.192*** (0.0577)	0.134** (0.0609)	0.174*** (0.0517)	0.200*** (0.0594)	-0.423*** (0.0670)	-0.254* (0.149)

2nd Income Group	0.168*** (0.0548)	0.0729 (0.0552)	0.173*** (0.0475)	0.0916* (0.0467)	0.0215 (0.0474)	0.0921* (0.0517)	0.140** (0.0546)	0.0171 (0.0682)
4th Income Group	-0.125** (0.0491)	0.133*** (0.0455)	-0.0244 (0.0441)	-0.0769* (0.0405)	0.0483 (0.0495)	0.0913* (0.0517)	0.0686 (0.0477)	0.0474 (0.0595)
5th Income Group	0.0326 (0.0535)	0.142*** (0.0511)	0.0187 (0.0498)	-0.122** (0.0486)	0.161*** (0.0576)	0.146** (0.0597)	-0.0250 (0.0429)	0.0537 (0.0539)
Household Size	-0.0771*** (0.00336)	-0.00813** (0.00326)	-0.0988*** (0.00376)	-0.0265*** (0.00367)	-0.0651*** (0.00537)	-0.0377*** (0.00604)	-0.0941*** (0.00492)	-0.0666*** (0.00615)
Head Education Level								
Primary and Middle	-0.345*** (0.0180)	-0.0644*** (0.0222)	-0.270*** (0.0196)	-0.225*** (0.0257)	-0.213*** (0.0234)	-0.296*** (0.0312)	-0.134*** (0.0232)	-0.418*** (0.0334)
Secondary and Higher Secondary	-0.564*** (0.0251)	-0.185*** (0.0274)	-0.529*** (0.0248)	-0.379*** (0.0293)	-0.508*** (0.0278)	-0.406*** (0.0347)	-0.314*** (0.0260)	-0.485*** (0.0366)
Diploma/certificate					-0.666*** (0.0570)	-0.596*** (0.0739)	-0.457*** (0.0535)	-0.871*** (0.0823)
Graduate and above	-0.589*** (0.0328)	-0.471*** (0.0374)	-0.585*** (0.0300)	-0.716*** (0.0355)	-0.661*** (0.0342)	-0.686*** (0.0430)	-0.546*** (0.0313)	-0.866*** (0.0452)
Post-Graduate and above					-0.690*** (0.0439)	-0.932*** (0.0633)	-0.571*** (0.0412)	-1.209*** (0.0708)
House Type (Ref:Self Employed)								
Casual Labour ⁵	-0.0497*** (0.0151)	-0.262*** (0.0171)	0.108*** (0.0216)	0.0273 (0.0288)	0.0301* (0.0169)	-0.103*** (0.0213)	0.0368** -0.0149	-0.0480** -0.0208

⁵ In the case of 1983, the estimates are for 'All other households'

Salaried			-0.0267*	-0.181***	0.0645***	0.0878***	0.0684***	-0.0217
			(0.0155)	(0.0176)	(0.0236)	(0.0319)	-0.0237	-0.0328
Others			-0.572***	-1.305***	-0.987***	-1.675***	-1.431***	-1.841***
			(0.0337)	(0.0300)	(0.0479)	(0.0435)	-0.0522	-0.0489
Child Dummy#Education								
1.child_dummy#1.education	-0.0152	-0.0733	-0.0182	0.0386	-0.0940**	-0.339***	-0.312***	-0.0975
	(0.0442)	(0.0471)	(0.0381)	(0.0569)	(0.0426)	(0.0752)	(0.0765)	(0.161)
1.child_dummy#2.education	0.0381	0.213***	-0.0879**	0.162***	-0.132***	-0.103	0.109**	-0.189**
	(0.0506)	(0.0495)	(0.0427)	(0.0579)	(0.0451)	(0.0730)	(0.0425)	(0.0792)
1.child_dummy#3.education					-0.329***	-0.316**	0.0769*	-0.00461
					(0.110)	(0.129)	(0.0444)	(0.0771)
1.child_dummy#4.education	-0.0618	0.301***	-0.0715	0.255***	-0.282***	-0.143*	-0.134	0.0197
	(0.0684)	(0.0670)	(0.0508)	(0.0688)	(0.0522)	(0.0849)	(0.126)	(0.158)
1.child_dummy#5.education					-0.262***	-0.426***	-0.298***	-0.0984
					(0.0744)	(0.126)	(0.0504)	(0.0914)
State Fixed Effects								
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.176	0.3687	0.1944	0.4651	0.2122	0.5673	0.1921	0.5463
Observations	51,399	59,329	59,914	67,280	49,114	53,129	48,101	51,356

Appendix Figure 6 Probit Estimates for Urban Area

