Growth, Distribution, and Social Reproduction in the Indian Economy

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Abstract

This paper aims to explore the relationship between economic growth and gender equality across India's diverse states from 2007 to 2020, a period marked by significant economic reforms and social changes. Our aim is to analyse the specific conditions under which growth may reinforce or reduce gender disparities. We will use the Principal Component Analysis (PCA) to construct stylized regimes that intersect demand-side factors, where macroeconomic structures and policies drive investment and growth, with supply-side factors shaped by the distribution of social reproduction between women, men, capital, and the state. Based on the nature of jobs created and the availability and distribution of care we first evaluate the extent of gender equality in each state. Our analysis than tracks how these demand side (job opportunities) and supply side (care infrastructure) have evolved with growth in the state and based on that we have categorised them into different social reproduction regime over the study period, providing insights into the dynamic interplay between economic growth patterns and gender equality. By analysing this dynamic at the state level, we offer more focused policy recommendations that promote gender equality and inclusive development, with special attention to the role of social reproduction. More broadly, this study points to a more dynamic and nuanced framework for understanding the complex relationship between growth and gender equality in a large, diverse and developing economy, that aims to contribute for the further development of gender sensitive and intersectional macroeconomic policy models.

Keywords: Growth regimes, Social reproduction, Wage share, Human development index, Principal components, Care infrastructure

JEL codes: B54, E11, E12

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1. Introduction

The relationship between economic growth and development has always been a complex question in India. Historically, the post-independence growth experience can be seen through some of the developmental constraints in the early planning period leading up to 1990s period where the economy underwent a transition from a closed to an open economy. In simple terms, the post-independence period can be seen through three different constraints that it faced at different points in time, namely, the capital-goods constraint in the 1950s, the wage-goods constraint in the 1960, and the foreign exchange constraint in the 1990s.[3] Each of these constraints forced the economy on to a particular growth path, whose structural consequences led to the emergence of newer constraints. For example, the foreign exchange constraint in the 1990s forced the economy to the export-led growth path and further financialization of the economy, whose structural consequences is what is being witnessed in terms the phenomenon of jobless growth and the non-standard pattern of structural transformation of the economy.

The post-liberalization (or post-1991) growth process in India was marked by three characteristics: privatization of the economy, export-led, and financialization. Briefly, with regards to privatization, in contrast to the 1980s where public consumption and investment provided the stimuli for growth, the post-liberalization period was associated with withdrawal of such stimuli. With the exception of a few odd years, government expenditures hardly played any significant stimulating role in India's growth process for the post-liberalization period as a whole. Instead of public investments, however, India's high growth episodes have been driven by private corporate investments (Nagaraj, 2013 and Dasgupta, 2020). Economic growth in the decades of 2000s and 2010s was export-led where the stimulus for investments was provided by higher export growth rate in specific period (Azad et al, 2017). The privatization and a steady de-regulation of the financial sector of economy also led to the financialization of the economy. There has been a steady shift in the portfolio of investments of the corporate sector towards the financial assets and away from physical assets (Sen and Dasgupta, 2015). On the other

[3] See Raghavendra and Dasgupta (2023) for further elaboration on the interlinkages between these constraints.

hand, the households have been moving their savings away from bank deposits towards more risky financial assets such as mutual funds and other financial derivative products.[4]

The post liberalization growth process, which is mainly driven by external demand, has unveiled other developmental challenges that impinge on the structural transformation of the economy. The Indian economy has been characterized by the problem of jobless growth where the employment growth rate has been largely irresponsive to changes in output growth rate and investment rate. While higher investment rates have been associated with higher output growth rate, the responsiveness of employment growth rate has been weak (CSE, 2018). The export-led growth and the associated rise in labour productivity growth rate that lies at the heart of jobless growth problem in India and can be seen by the presence of very high Kaldor-Verdoorn (KV) coefficient in India (Tejani, 2018) along with the change in demand pattern that evolved during the liberalization period. This is also one of the root causes of the non-standard structural transformation problem in India, where of workers moving away from less productive agriculture sector end up in informal jobs in construction and in other non-tradable services sector of the economy.

Such a process of growth and development has also led to another issue that has not been given much attention in the Indian context. In addition to the informalization of the economy and its distributional consequences, the post-liberalization era in India has also unleashed the crisis in the *social reproduction* sector. There is very little attention to this problem in the macroeconomic growth literature on the Indian economy. This paper aims to fill the lacuna in the literature and aims to shed a light on the dynamics of growth, distribution and social reproduction across the states in India.

The paper is structured as follows: Section 2 provides a brief review of literature and places our paper in the wider literature. Section 3 provides the theoretical framework for the subsequent analysis. We have divided that section into two parts. The first part locates the empirical context for our theoretical model by discussing the classification of production boundary as defined by the System of National Accounts (SNA) and the challenges of defining and measuring unpaid work in an economy. The second part of this section uses this classification to articulate a simple analytical framework to the analysis of the interrelation between growth, distribution, and social reproduction

[4] In 2022, the assets under managed investment as a proportion of fixed deposits stood at 79% (CRISIL 2022).

regimes. In section 4, we analyse the demand and supply indicators of social reproduction across India states from 2007 to 2019. In section 5, we provide the empirical analysis of growth and distributional shares in various Indian states for the period of the study. In section 6, we bring together the analysis of the previous sections (3 and 4) to analyse the social reproduction regimes that underpin economic growth regimes in various states, and we conclude with a few general observations in the concluding section.

2. Review of Literature

The Feminist economics literature have been pushing the frontiers to advance gender-aware analysis in exploring the connections and differences between care economy and capitalist market economy.[5] Early foundational work in this area critically engaged with the Marxian analysis and articulated alternative conceptualization that considers the relationship between labour time embodied in commodity production and the family labour time that reproduces the former in the framework of the Labour Theory of Value (Folbre 1982). Further, in the context of the structural adjustment policies, feminist scholars explored the gendered cost of macroeconomic policies by arguing how women's unpaid care work could act as the "shock absorber" in times of economic crisis (Palmer 1991; Elson 1995). Further studies analysed the gendered impact of trade liberalisation, particularly in the context of developing countries, on how the competitive pressures translate to inequalities for women in the sphere of social reproduction at home (Fontana 2004). Similarly, in the decade of austerity following the 2008 financial crisis, studies highlighted how the adverse impact of fiscal consolidation, particularly through expenditure cuts in public welfare services, ultimately absorbed by women's unpaid care at home (Karamissini and Rubrey 2014). The Covid-19 crisis, yet again, reinforced these arguments and established the anchoring role of unpaid care to the market economy (Heintz et al. 2021).

A more recent literature has emerged exploring the link between unpaid care work and commodity production. Braunstein et al (2011) proposed a mathematical model in the Post Keynesian/Structuralist framework to investigate the relationship between economic growth and social reproduction. The model introduced the notion of "caring

[5] See Razavi (2007) for an in-depth review and insightful analysis of the connections between care and the economy.

spirits", in terms of investment in the development of human capacities, and together with the Keynesian notion of "animal spirits" it analysed the interaction between social reproduction and growth. More recent theoretical work in this tradition extends this framework to study the interrelation between self-employment and care work in a developmental perspective (Vasudevan and Raghavendra 2022). On the empirical front, Braunstein et al. (2020), examined the social reproduction regimes in 156 countries to study the characteristics that render reinforcement and contradiction between growth and social reproduction regimes. Onaran et al (2022) develops an empirical macroeconomic model to derive the multiplier effects of care investment across the economy to guide gender aware macroeconomic policies.

There are studies in the intra-household bargaining framework developed by Becker (1965) and further extended to the inter-temporal general equilibrium approach (Agénor 2017) that integrates unpaid household work in the analysis of capitalist commodity production. In terms of applied policy models, recent work that integrates unpaid care in the framework of computable general equilibrium was proposed by and Lofgren and Cicowiez (2021) in the context of South Korea. Blecker and Braunstein (2022) provide a succinct review of both the strands of literature and an overview of the contributions from a diverse set of most recent theoretical and empirical papers that integrate unpaid care in macroeconomic models.

3. Empirical foundations of theoretical framework: Classification of the production boundary

In the standard economic model of household optimization, the rational agent maximizes its utility which is determined by consumption and leisure. Although the rational agent is assumed to be gender-neutral, there is an implicit male bias in these models, as evidenced by the dichotomous division of time between work (paid market work) and leisure in its utility function. However, women do not enjoy the same privilege of such clearly demarcated dichotomy between work and leisure. In any given day, the determination of women's leisure time is more complex and is contingent on market work and household work, and further substitution between various categories of household work, such as unpaid subsistence activities and unpaid care activities. The complexity of women's time use is captured in the United Nations System of National Accounts (SNA) where their

activities are divided into those that lie within the *production boundary* and those that lie in the *extended production boundary* as shown in Table 1 below.

Table 1: The System of National Accounts classification

SNA production boundary	**A**. Paid emp. work (for market)	**B**. Unpaid work (for market)	**C**. Unpaid work (non-market household work)
Extended SNA production boundary Unpaid non-economic work (non-SNA)		**D**. Unpaid work (non-market household work)	**E**. Unpaid care work (non-market household work)

In terms of the SNA classification, work is basically defined as any human activity that can be delegated to a third person for the production of goods and services destined to satisfy a person's needs: education (in the sense of going to school) or playing a game or watching television are not work because they cannot be delegated to a third person, but preparing meals or caring for children are work because it is possible to hire somebody to do it. Unpaid work is essentially that work which does not receive direct remuneration. It includes unpaid work that falls within the production boundary of the System of National Accounts, i.e., SNA work, and unpaid work that falls outside the production boundary, i.e., non-SNA work.

The demarcation is not very robust and prone to country specific time-use definitions and there is overlap between unpaid work that goes towards producing for the market and for own use consumption as recorded in cells B, C and D in Table 1. In India, for instance, some activities like the preparation of cow dung cakes that takes care of the fuel requirements of the household (Mehrotra and Sinha 2017), are not included in the production boundary even though the United Nations SNA classification might include them. Hirway (2015) have long argued that the demarcation between SNA and non-SNA activities is arbitrary in India and that, for instance, the demarcation line between cells B, C and D in Table 1 is somewhat ad hoc. Notwithstanding the general issue of demarcation in the SNA, the arbitrariness of the definition applied in country specific time use surveys can also be a problem and has wider consequences for women's work

force participation and empowerment in general. The definitional arbitrariness can have implications for work force participation and can lead to differential status for women in the economy and society.

A more general rule to remember is that unpaid work that goes to produce *goods* for own use is included in the production boundary (viz., in cells B and C in Table 1), whereas the unpaid work that goes to produce *services* for own use is considered as non-SNA work (cell D in Table 1) that lies in the extended production boundary.[6] From an economic theoretic perspective, it has long been argued that the unpaid activities that are for own-use for the household, for instance collection of firewood for cooking, sewing, tutoring etc., can be thought of carrying implicit income for the households as they increase the overall consumption of goods and services at any given real wage (Becker op. cit.).

The other category of non-SNA unpaid work is the care work (cell E in Table 1), which can be defined as meeting the physical and emotional requirements of dependent adults, children, and others in the household. In the literature, "unpaid care work" to refer to unpaid direct and indirect care activities (care of family members and housework) (Razavi, op cit.). Together, the direct unpaid care activities (such as feeding a person, bathing a person, reading to a child, or teaching a child) and the indirect unpaid care in the household (such as food preparation, household upkeep, and more generally, household maintenance), form an integral part of the process of social reproduction from day-to-day nurturance and reproduction of labour in the short run and enhancing human capacities in the long run (Folbre and Yoon, 2008).[7]

In the developing economies, women spend between 35-60 percent of their total time in unpaid non-SNA work that comprise both of subsistence activities (e.g., the production of goods by households for own consumption, such as husking paddy, grounding grains, collecting firewood, cow dung cakes, collecting fruit, etc.) and care work (e.g., care of

[6] To add to this point, the recent redefinition by the International Conference of Labour Statisticians (ICLS 2013) would include many of the own-use services in the production boundary.

[7] The concept of social reproduction encompasses all dimensions of market care, public and public care, and unpaid care in the household. In this paper, for analytical simplicity and tractability, we consider only the unpaid care in the household setting while taking the other two components as exogenous and part of the overall care infrastructure in the economy at any point in time.

children, the old, the sick, disabled and others in the family who need care). For instance, in Ghana women spend about 60% in the unpaid non-SNA activities (Ferrant et al., 2014). In India, about 60.9 percent of women population is engaged in unpaid domestic work in 2011–12 compared to 48.8 percent in 1993–94 with about 63.7 percent and 59.7 percent urban-rural split in 2011-12 (Singh and Patnaik 2020).

Considering the definitional complexities of demarcation between the SNA and non-SNA categories of unpaid work, in this paper we broadly group activities recorded in cells B, C and D and label them as *subsistence work*, and the unpaid non-SNA care activities in cell E as *care work* (hereafter "unpaid care work"). Note that the category of subsistence work includes the output or services that is produced for market, including self-employment of women in family farms or household production etc. Since the overlap between these activities present considerable trade-off for women, we problematize the trade-offs women face between the two broad categories of unpaid subsistence work and care work. In addition to the level of the burden that the trade-off poses, the intensity of carrying out multiple overlapping activities also depend on the degree of flexibility in the trade-offs between these activities that women face in the realm of social reproduction.

However, these micro level trade-offs are not just a matter of intra-household bargaining choice for women but are influenced by the macroeconomic environment determined by the interaction between aggregate demand and distributional regimes on the demand side and the availability of care infrastructure and other wider institutional supports on the supply side. The aim of the paper empirically explores this *macro-micro* dialectic and highlight the nature of the social reproduction regime that underpinned economic growth across the states in India for the past decade. Before, we proceed, we need to develop a theoretical framework that will enable us to help analyse this dialectic as the standard theory lacks such an articulation. We propose the theoretical framework in the following sub-section.

3.1. Theoretical framework: Rethinking dynamics of growth and distribution

The GDP from the income side is

$$pY = W + \Pi \qquad (1)$$

and in terms of incomes shares,

$$1 = \frac{W}{pY} + \frac{\Pi}{pY} \qquad (2)$$

Decomposing the wage share component between male and female labour and adjusting for their labour force participation shares yields,

$$w \equiv \frac{W}{pY} = \frac{w_m(L_m/L)}{(pY/L)} + \frac{w_f(L_f/L)}{(pY/L)} \qquad (3)$$

where $L = L_m + L_f$ is the total labour in the economy.

Since women carry the unequal burden of unpaid household work, their paid market time is the difference between total available time and time spent on unpaid work as given by

$$L_T = L_f + L_H \qquad (4)$$

where L_T the total available time is split between L_f which denotes paid market work and L_H which denotes unpaid household work that includes unpaid subsistence for market, unpaid subsistence household consumption and unpaid care work.

Substituting (4) in (3) yields,

$$\frac{W}{pY} = \frac{w_m(L_m/L)}{\left(\frac{pY}{L}\right)} + \frac{w_f\left(\frac{L_T - L_H}{L}\right)}{\left(\frac{pY}{L}\right)} \qquad (5)$$

Dividing and multiplying (5) by the household unpaid labour component of female wage share by the household output, Y_H (unpaid subsistence work for market plus unpaid subsistence household consumption and unpaid care work) yields,

$$\frac{W}{pY} = \frac{w_m(L_m/L)}{\left(\frac{pY}{L}\right)} + w_f\left[\frac{(L_T/L)}{\left(\frac{pY}{L}\right)} - \frac{(L_H/L)}{\left(\frac{pY}{L}\right)}\frac{Y_H}{Y_H}\right] \qquad (6)$$

and further simplification results in

$$\frac{W}{pY} = \frac{w_m(L_m/L)}{\left(\frac{pY}{L}\right)} + w_f\left[\frac{(L_T/L)}{\left(\frac{pY}{L}\right)} - \frac{Y_H/pY}{Y_H/L_H}\right] \qquad (7)$$

$$= \frac{w_m(L_m/L)}{\left(\frac{pY}{L}\right)} + w_f\left[\frac{(L_T/L)}{\left(\frac{pY}{L}\right)} - \frac{y_h}{x_h}\right]$$

where y_h is share of household output in total output and x_h is the household labour productivity. And letting $l_m = \frac{L_m}{L}$, $l_t = \frac{L_T}{L}$ and $x = \frac{pY}{L}$, Eq (7) can be concisely written as

$$\frac{W}{pY} = \frac{w_m l_m}{x} + w_f\left[\frac{l_t}{x} - \frac{y_h}{x_h}\right] \qquad (7a).$$

Eq. (7) highlights the invisible trade-off that underpins women's wage share and shows how unpaid household work acts as the *adjusting variable* in regulating or maintaining women's share of wages over the cycle. For instance, during the growth phase where employment and wages are rise, women must reduce the unpaid household activities to release that time for market work to increase their earnings and wage share. In this case, y_h must fall at any given level of household productivity (x_h) for them to release more time from unpaid household work to undertake paid market work (l_t). If there are no market substitutes for care work, women might have to endure the double burden of market work and care work during the growth phase.

On the other hand, during recessionary times where employment and wages dwindle, women must increase either household output share (y_h) or increase their household productivity (x_h) to sustain their wage share. Since the latter is more plausible, the recessionary times can inflict more stress for women as they must use household work

time more judiciously, i.e., more productively, to maximize their time for market work to make up for the fall in wages.

Either way, given the patriarchal gender norms that tie women to be responsible for household work, the variations in the female wage share, and hence the total wage share, in both the growth and recessionary phases is underpinned by how women negotiate the double burden of market work and household work. In other words, variation in class distribution of income is underpinned by adjustments in the social reproduction realm.

Using the simple analytical framework, we can now begin to analyse what type of social reproduction regime that could underpin different phases of economic growth. So, depending on whether economic growth is driven by profits or wages, we can now see the relationship between aggregate income distribution and social reproduction in these growth phases. The following table summarizes this analysis.

Table 2: Social reproduction regimes in different growth regimes

		Economic growth regimes	
		Profit driven $(\dot{w} < 0)$	***Wage driven*** $(\dot{w} > 0)$
Care infrastructure (supply side)	***Low***	**Distress social reproduction regime**	***Time stress social reproduction regime***
	High	***Time stress social reproduction regime***	***Egalitarian social reproduction regime***

From Eq. (7) or (7a) we can see that when economic growth is profit driven (where wage share falls), the household production (subsistence or self-employment must increase to sustain their earnings and shore up the falling wage share. Depending on the availability of care infrastructure (low or high), the social reproduction regime that could underpin such a growth regime could either be distress production (low care infra) or time stressed subsistence production (high care infra).

On the other hand, when economic growth is wage driven (where wage share rises), depending on the availability of care infrastructure (low or high) the social reproduction regime that could underpin could either be a double burden inducing regime, between paid market and unpaid household work for women, or an egalitarian regime.

4. Demand and Supply indicators of social reproduction in Indian states

Against this background, we have examined the status of social reproduction realm using a panel data from 12 major Indian states. To understand how the traditionally defined social reproduction roles for women impinge on their ability to participate in the labour market, we analyse the influencing factors into two broad categories: demand-side and supply-side factors. The demand side factors fare those that provide opportunities for women to participate in the market and both in terms of creating employment opportunities. For instance, government social sector expenditure on health care, education etc., provide direct employment opportunities for women in these sectors. These expenditures that government undertake to stimulate the aggregate demand of economy and at the same time empower women is driven by what Braunstein et. al (2010) call as the "caring spirits". On the supply side we consider those factors that enable women to participate in the labour market. For example, government expenditure on public provisioning of childcare and other spending such as providing water and sanitation, and that strengthen the security infrastructure to prevent crimes against women are all supply side factors because they enable women to participate in the labour market.

From the point of view of theoretical framework developed in the previous section, we can see that the demand side factors come under the wage-driven growth regime as public expenditure stimulates employment for women and aggregate demand in the economy. In such regime, government investment in the public health care and education sectors does provide good quality and certainty to those jobs leading to a more equitable aggregate distributional impact in the economy. On the other hand, when government withdraws from these sectors it creates a vacuum for private sector to crowd-in and seek profitable opportunities leading to relative low-quality and uncertain jobs in general and for women, in particular. Such a growth regime can be underpinned by the profit-motive can result in an adverse distributional consequences for workers in general, and women

in particular since women tend to take up such low-paying and uncertain jobs due to the burden of unpaid household work

Thus, in this model the growth regimes, viz., profit-driven and wage-driven growth regimes, reflect the demand side factors that help women that directly influence women's empowerment through their labour market participation. We then compare these growth regimes with the supply side factors, i.e., how much of supply of care and social infrastructure that help women to realise those employment opportunities in these two aggregate demand regimes.

To operationalize this comparison, we use Principal Component Analysis (PCA) to construct two composite indices that represent the demand and supply dimensions of social reproduction across Indian states. It is an unsupervised method commonly used for dimensionality reduction, especially when the underlying variables are highly correlated. It transforms the original set of correlated variables into a new set of uncorrelated variables called principal components, each of which is a linear combination of the original variables.

In mathematical terms, PCA works by performing an eigen decomposition of the covariance matrix of the input variables. The amount of variation captured by each component is determined by its corresponding eigenvalue. In practice, this means the first few components can represent most of the variation in the data, allowing us to summarize complex phenomena like care provisioning or job creation capacity into a single index

That said, PCA has its limitations. It is a data-driven technique that doesn't account for theory or causality, it simply tells us which variables move together. So, interpretation depends a lot on how we choose and group the original variables. Also, PCA assumes linear relationships and can be sensitive to outliers. In some cases, the components might be hard to interpret if many variables load similarly or in unexpected directions. To address this, here the variables are carefully selected based on theoretical relevance and existing literature. The final indices are not just statistical constructs but are meant to reflect meaningful economic dimensions that help in understanding the evolution of gendered labour market structures in the context of economic growth.

Before proceeding, we discuss the demand side and supply side factors under consideration and analyse how they have evolved in different states.

4.1. The demand side factors

To analyze the macroeconomic factors than enhance women's workforce participation in the labour market, we focus on the non-income components of the Human Development Index (HDI). These components capture critical aspects of societal well-being and public investment that influence labour demand, particularly for women. This is because given the current rates of occupational segregation, the new jobs generated in the social sector will be those traditionally held by women, thereby significantly increasing their employment opportunities (Onaran, Oyvat, & Fotopoulou, 2022).

The selected indicators are:

- **Life Expectancy**: This reflects the overall health and well-being of the population, serving as a proxy for the healthcare system's effectiveness. A robust healthcare system typically correlates with higher public investment, creating job opportunities, particularly for women, who make up approximately 50% of the health workforce in India (India Gender Equity Report, 2023).
- **Infant Mortality Rate**: As an indicator of maternal and child health, infant mortality is also sensitive to healthcare quality. Improvements in this area often result from public expenditure on health, leading to stronger healthcare systems and increased employment opportunities, particularly for women in caregiving and medical roles.
- **Mean Years of Education**: This metric represents the general education level of the population and reflects the state's educational infrastructure. Higher educational attainment facilitates greater labour force participation, especially for women, by enabling access to skilled jobs.
- **Expected Years of Education**: This indicator predicts future human capital development by assessing the potential for investment in education. States with higher expected years of education signal strong commitments to education, which can generate long-term employment opportunities for women.

A high non-income HDI is often the result of substantial government expenditure in the health and education sectors (Ramirez, Ranis, & Stewart, 1997; Drèze & Khera, 2012; Raj, Gupta, & Shrawan, 2024). Investments in these sectors have a direct and transformative impact on the demand for women's labour, particularly in developing

economies where the social sector (education, health, and social care) employs a significantly larger share of women compared to other sectors (Onaran et al., 2022b). For instance, in Turkey, public spending on universal childcare services was found to generate 1 million jobs, 57 percent of which employed women (Ilkkaracan et al., 2021).

Beyond direct job creation, such investments can also influence labour productivity, both directly and indirectly. Directly, they enhance human capabilities through improved education and health services. Indirectly, they alleviate the unpaid care burden on women, freeing up their time for productive employment. This dual effect boosts productivity and labor force participation, particularly for women, in the medium term. A key concern, however, is whether such investments lead to sustained long-term job creation. Studies from the UK and South Korea provide compelling evidence that they do. Research by Onaran, Oyvat, and Fotopoulou (2019), as well as Oyvat and Onaran (2020), demonstrates that public investments in social infrastructure not only boost productivity in the medium term but also result in sustained long-term increases in employment opportunities, especially for women. These studies show that, over time, output growth can surpass productivity gains, leading to the creation of enduring job opportunities.

Table 3 shows PCA loadings for the demand-side index. The value are weights associated with the variable. As expected, variables such as Life Expectancy, Expected Years of Schooling, and Mean Years of Schooling load positively on the first principal component, while Infant Mortality Rate loads negatively. This aligns with theoretical expectations, where a high value on positively loaded variables or a low value on negatively loaded variables contributes to a higher demand-side score. The first component explains between 77% to 83% of the variance across years, suggesting a robust and stable index over time.

Table 3: PCA Loadings of Demand-side Indicators

Variable	2007-08	2009-10	2011-12	2017-18	2018-19	2019-20
Life Expectancy	0.54	0.52	0.52	0.5	0.5	0.5
Expected Year of Schooling	0.44	0.46	0.44	0.5	0.49	0.49
Mean Year of Schooling	0.51	0.49	0.48	0.49	0.5	0.5
Infant Mortality Rate	-0.49	-0.51	-0.53	-0.49	-0.49	-0.49

Variance Explained (%)	77.93	79.54	77.35	83.35	80.94	79.64

Source: Based on authors' calculations using various data sources.

4.2. The supply side factors

The supply side here focuses on the availability and distribution of unpaid domestic labor, which serves as a cornerstone of social reproduction and is provided by women. Economic growth often brings the expectation that more individuals, including women, will transition into paid employment. However, if women continue to shoulder the bulk of unpaid work alongside paid employment, gender equality remains elusive. This scenario results in a double burden, where women are required to balance professional responsibilities with household duties, exacerbating existing inequalities.

Several indicators are useful in assessing supply-side dynamics:

- **Proportion of Women Engaged in Domestic Work**: This indicator represents the proportion of women engaged in domestic work relative to the total number of unemployed women (as defined in the NSS Report (2009-10)). It serves as a reflection of the gender norms prevailing in a particular state. States with a higher proportion of women engaged in domestic work relative to other unemployed women indicate a society where the division of unpaid work is less equitable.
- **Water Supply and Public Health Infrastructure**: These are critical in evaluating government interventions that alleviate unpaid labor. For instance, a reliable water supply reduces the time women spend fetching water, and accessible healthcare minimizes the time required for caregiving for sick or elderly family members. Such infrastructure support reduces the burden of unpaid household work on women and allows for greater engagement in paid work or other productive activities.
- **Crime Against Women**: High level of crime against women can be indicative of deeply entrenched traditional gender norms and a lack of governmental commitment to fostering gender equality. Such conditions suggest societal attitudes that perpetuate gender-based disparities and highlight gaps in governmental efforts to improve the status and well-being of women. This neglect can even reflect inadequate investments in critical sectors by government, such as care work and social infrastructure, which are essential for reducing the burden on women and promoting a more equitable society.
- **Relative Female Wages**: Higher wages for women in one state relative to other states can significantly enhance household income, reducing reliance on unpaid labor. This shift

occurs as higher household income enables women to buy out unpaid care work such as food preparation, childcare, or eldercare, thereby alleviating some of the burdens traditionally fall on them.

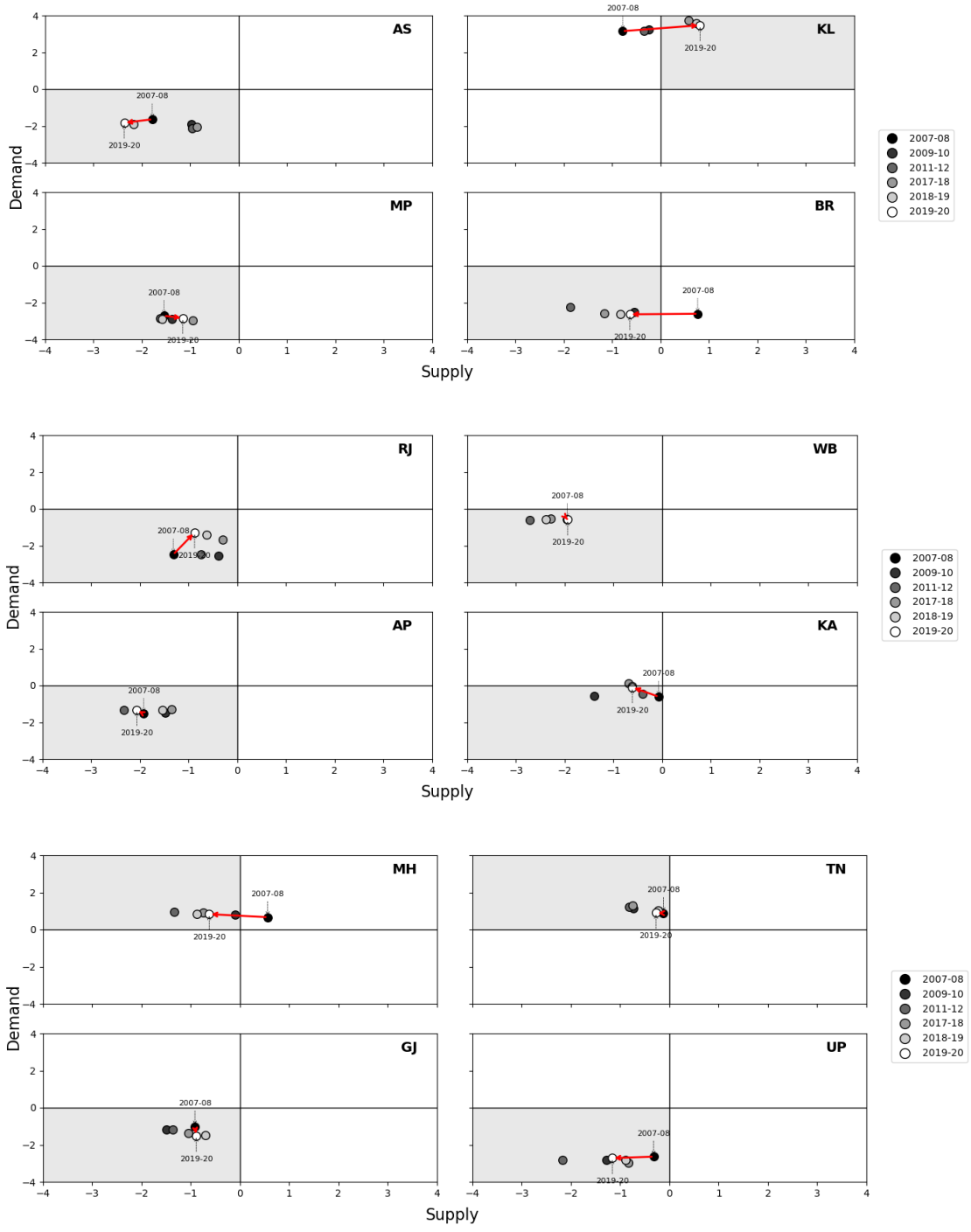
Table 4: PCA Loadings of Supply-side Indicators

Variable	2007-08	2009-10	2011-12	2017-18	2018-19	2019-20
Female Wages	0.55	0.51	0.51	0.48	0.59	0.46
Proportion of female engaged in domestic work	-0.49	-0.52	-0.49	-0.48	-0.12	-0.53
Water and Sanitation	0.1	0.48	0.41	0.43	0.44	0.36
Medical and Health	0.39	0.43	0.44	0.56	0.56	0.46
Crime Rate	-0.55	-0.22	-0.35	-0.18	-0.34	-0.38
Variance Explained (%)	44.05	44.85	49.23	37.84	44.28	44.28

Source: Based on authors' calculations using various data sources.

We can now analyze the demand and supply side factors across various states for the time period 2007-08 to 2019-20. Figure 1 shows how these factors have evolved across the states over the study time period.

Figure 1: State-Level Demand and Supply Factors for Gender Equality (2007–2020)



Source: Based on authors' calculations using various data sources.

The analysis of the PCA scores is shown in the sub-plots, each representing a state, is divided into four quadrants. The north-east quadrant represents positive demand and supply, which is the case of Kerala, indicating both job creation and a reduced unpaid work burden. This quadrant signifies a virtuous cycle where states provide employment

opportunities while also addressing gender disparities by redistributing unpaid work through public infrastructure, markets, or equitable household practices.

In contrast, the south-west quadrant signifies negative demand and supply, reflecting a vicious cycle where deficiencies in both the demand and supply sides of gender equality reinforce each other. Limited job opportunities on the demand side exacerbate the entrenched gender norms and unpaid care burdens on the supply side, which, in turn, hinder women's ability to participate in the workforce. This cyclical relationship perpetuates gender inequality, leaving women marginalized in both paid and unpaid spheres and creating a systemic barrier to progress.

The south-east quadrant represents positive demand but negative supply, exemplifying a lopsided regime. States in this quadrant create job opportunities on the demand side but fail to address supply-side barriers, such as the persistent burden of unpaid care work on women. This creates a double burden for women, as they are expected to manage both paid employment and unpaid household responsibilities, reinforcing systemic gender inequality. Finally, the north-west quadrant represents positive supply but negative demand, a lopsided demand regime. In this quadrant, states succeed in reducing the unpaid work burden through improved public infrastructure or market participation but fail to generate sufficient job opportunities.

Moreover, it can be seen that approximately 75 percent of the states (9 out of 12) are trapped in the vicious cycle category, where both demand for women's labor and the institutional support to reduce the burden of unpaid care work remain inadequate. These states include Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, Gujarat, Assam, Karnataka, Andhra Pradesh, and West Bengal. The states of Maharashtra and Tamil Nadu are positioned in the quadrant characterized by positive demand and negative supply, reflecting inclusive job creation but the lack of supply infrastructures results in persistent time burden of unpaid care work on women attributed by the entrenched gender norms. It can also be observed that, except for Kerala, there has been little to no improvement in the regimes, as most states have remained in their original quadrants without transitioning to more balanced quadrants. Interestingly in the case of Maharashtra, which was initially in the positive quadrant eventually shifted to a regime characterized by positive demand but negative supply, highlighting the ongoing challenges in addressing supply-side barriers critical to achieving gender equality.

The analysis in Figure 1 can be summarized in the Table 5 depending on the sign of the of demand and supply side factors.

Table 5: Demand and Supply Scores

State	Demand	Supply
Kerala	Positive	Positive
Maharashtra	Positive	Negative
Tamil Nadu	Positive	Negative
Gujrat	Negative	Negative
Uttar Pradesh	Negative	Negative
Assam	Negative	Negative
Madhya Pradesh	Negative	Negative
Bihar	Negative	Negative
Rajasthan	Negative	Negative
West Bengal	Negative	Negative
Andhra Pradesh	Negative	Negative
Karnataka	Negative	Negative

5. Growth and Distribution in Indian states

India's economic growth trajectory has been accompanied by a significant shift in the distribution of income between labour and capital. According to Oyvat, Öztunalı, and Elgin (2020), the Indian economy is classified as profit-led [8], meaning that growth is primarily driven by profits rather than wages. This characteristic is evident in the long-term decline of India's wage share, which has been a persistent trend since the 1970s. The decline accelerated after the liberalization reforms of the 1990s, which aimed to deregulate the economy, boost private sector participation, and integrate India into global markets. As of 2007, the wage share index was 17.6% lower compared to 1980, signalling a significant redistribution of income away from labour (op.cit, 2020).

However, in India, the profit-led nature of the economy is not as pronounced as in other developed countries. While the distributional shift from wages to profits might theoretically spur investment and growth, the actual effects have been relatively weak. The impact of increased profits on investment has been negligible, suggesting limited effectiveness of profit-led mechanisms in driving economic expansion. Furthermore, the decline in wage share has reduced consumption demand, given labour's reduced

[8] In a profit-led regime, increases in profits (e.g., through lower wage costs or higher investment returns) stimulate higher aggregate demand and economic growth. In contrast, a wage-led regime relies on rising wages to boost consumption and thereby drive growth.

purchasing power. A high net export effect has slightly offset these weakened consumption dynamics, underlining the role of external demand in sustaining India's growth (op. cit, 2020).

To better understand the dynamics behind the reduction in wage share, it is crucial to examine these trends at the state level. A state-wise analysis allows us to explore how income distribution varies across regions and identify the specific factors influencing wage share in different contexts. However, due to limitations in data availability, this study focuses exclusively on the organized manufacturing sector.

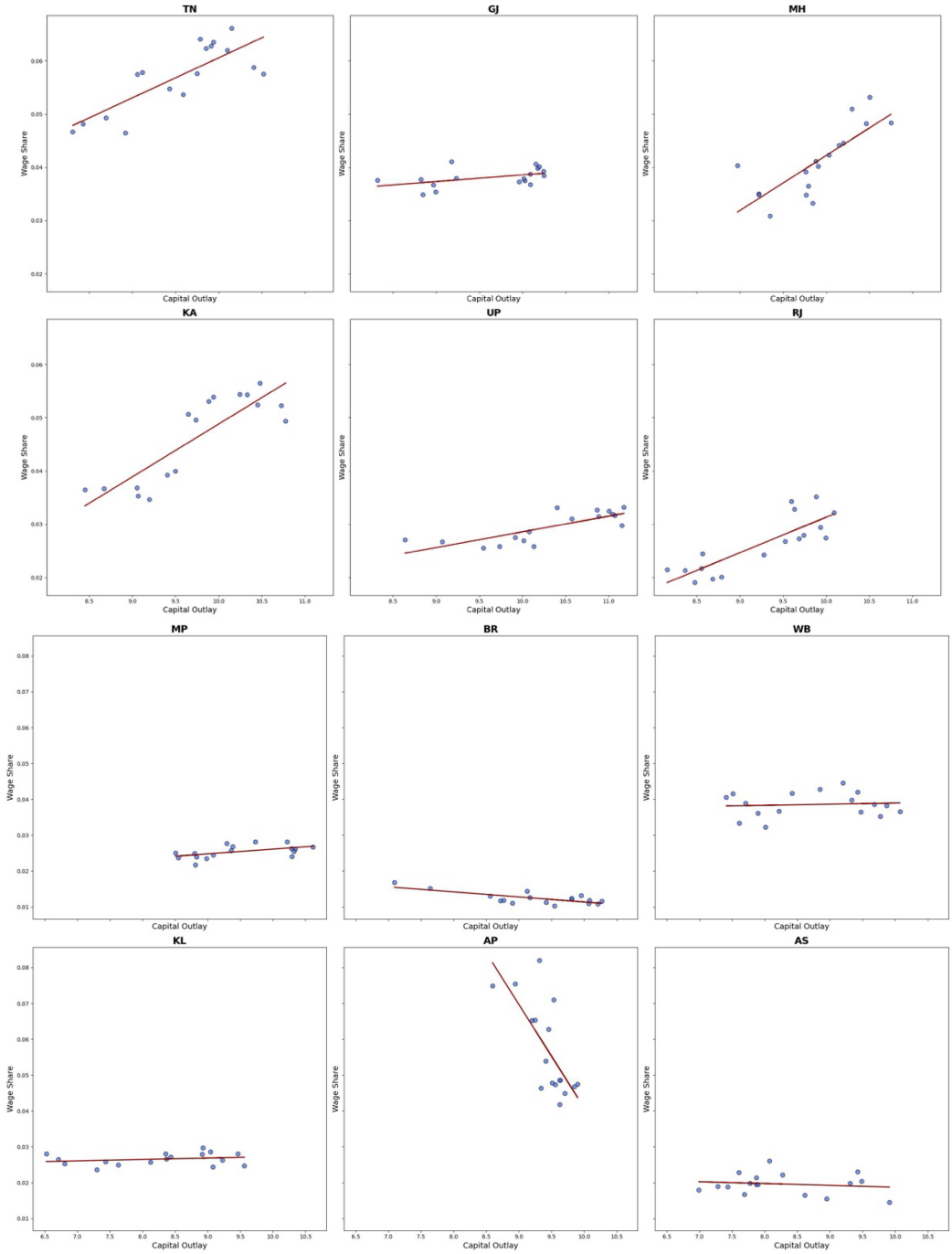
The organized manufacturing sector represents only a small fraction of total employment in the Indian economy approximately 5 percent. Additionally, a significant portion of the workforce around 50 percent is self-employed, making their labour contributions less directly measurable. This large informal sector adds complexity to assessing wage share trends comprehensively. Despite these limitations, the persisting decline in wage share observed within the organized manufacturing sector appears to mirror broader trends in the Indian economy (Abraham & Sasikumar, 2017, p. 9).

The figure 2, shows on the X-axis capital outlay[9] , and the wage share by industrial sector on the Y-axis. The fitted linear trend lines provide a visual representation of the direction and strength of this association. This essentially illustrates how increases in investment are associated with changes in wage shares within the industrial sector. A state where an increase in investment in a sector does not lead to a decline in wage share may reflect wage-led tendencies.

From the figure 2, it can be seen that the majority of states do not exhibit a sharp trend of increasing(or decreasing) wage share with increase in capital outlay(except Andhra Pradesh), indicating a weak relationship between capital outlay and wage share. Some states such as West Bengal, Kerala, Assam, and Madhya Pradesh show that increases in capital outlay does not have much effect on wage share. In contrast, industrialized states like Tamil Nadu, Maharashtra, and Karnataka display a positive association, though it is not particularly strong. Even in these cases, labour's share of income has not shown substantial improvement.

[9] Capital outlay refers to capital expenditure minus interest and borrowing.

Figure 2: Relationship between Capital Outlay and Wage Share



Source: Annual Survey of Industries (ASI) and Domestic GDP data, various years, as reported by the Economic and Political Weekly Research Foundation (EPWRF)

While Gujarat being an industrialized state does not reflect this trend, the expansion of capital intensive industries such as automobile manufacturing, heavy machinery, and petrochemicals in the state has tended to prioritize returns to capital over labour, resulting in growing income inequality. Conversely, states with lower levels of industrialization, such as Bihar, exhibit declining trends in wage share despite their

reliance on agriculture and informal labour markets. In this state, the dominance of low-productivity sectors, high self-employment rates, and informal labour structures further limit workers' ability to benefit from economic growth.

Thus, while there is some degree of association in a few states, the overall outcome remains the same: a persistent erosion or lack of increase in labour's income share across diverse economic and structural contexts.

6. Growth, Distribution and Social reproduction

The preceding analysis has shown that states differ not only in their social reproduction structures (as captured by PCA scores), but also in how these structures evolve in relation to economic growth. To understand these interactions better, this section brings together the demand and supply side indices with log-transformed per capita GSDP to classify states into distinct social reproduction–growth regimes.

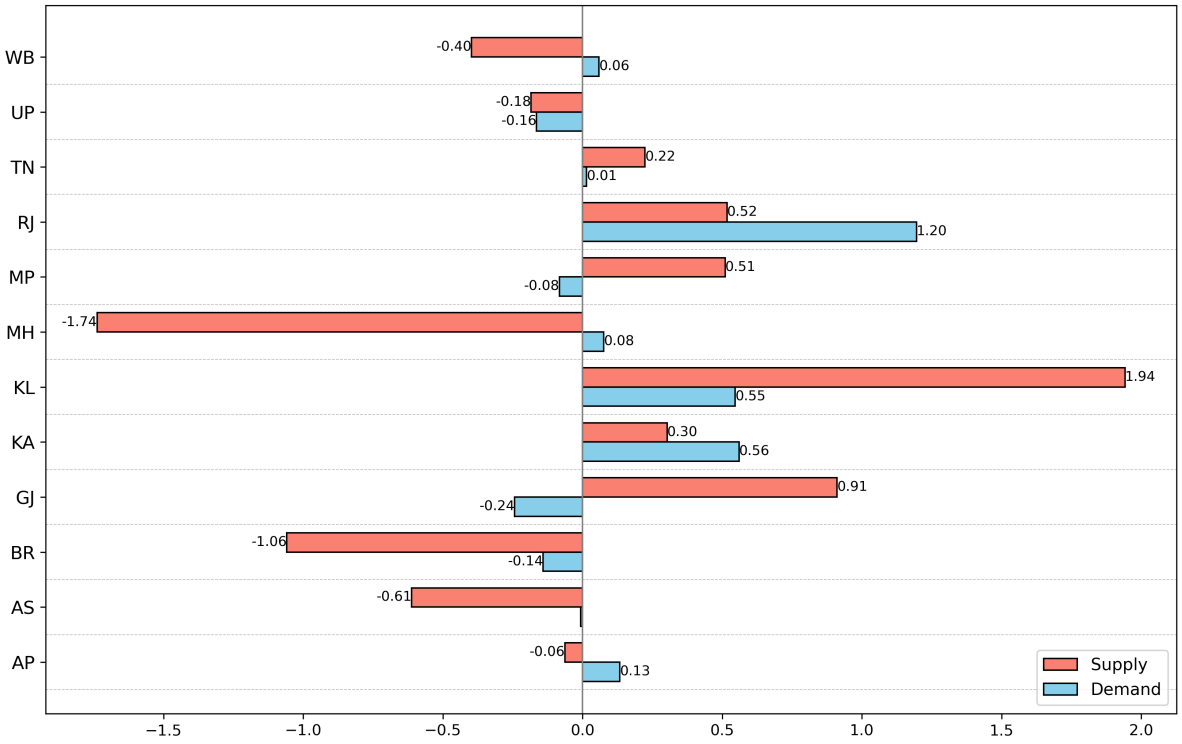
6.1. Linking Social Reproduction and Growth: Regression Results

To assess how growth relates to the structure of social reproduction, I estimate the following regression:

$$Score_{it} = \beta_0 + \beta_1 log(GSDP_{it}) + \beta_2 log(GSDP_{it}) \times State_i + State_i + \epsilon_{it}$$

where $Score_{it}$ is either the demand-side or supply-side PCA score for state i at time t, and $State_i$ captures state fixed effects.

Figure 3:Semi-Elasticity of Social Reproduction Scores with Respect to Wage Share Growth



Note: This plot illustrates the semi-elasticity of demand-side and supply-side social reproduction scores with respect to changes in log(gdp per capita).

Source: Based on authors' calculations using various data sources.

Figure 3 presents the results from the regression analysis. It illustrates the semi-elasticity of the PCA scores with respect to economic growth, that is, the effect of a one percent increase in log(GSDP) on the demand- or supply-side score. The values plotted represent the sum of the coefficient on log(GSDP) and the interaction term log(GSDP)×$State_i$, capturing state-specific elasticities. Thus the value of –0.24 for Gujrat imply that a 1% rise in GDP per capita is associated with a 0.0024 unit decline in the supply score. Equivalently, this means that doubling GDP per capita, a 100% increase, would lead to a 0.24 decline, or a 24 percentage point drop, in the supply score in Gujrat. Positive coefficients indicate that growth is associated with improvements in either social infrastructure (supply) or female employment opportunities (demand), while negative coefficients imply a weakening or exclusionary pattern of development.

The results suggest that while economic growth is not necessarily associated with improvements in the social reproduction condition in the state either through demand or supply score. In some cases, growth is positively associated with greater absorption of women into the workforce (i.e., positive demand elasticity), but simultaneously linked to

a deterioration in social infrastructure (i.e., negative supply elasticity). For instance, states like MH , GJ ,MP, AP and WB. While states like UP and BR exhibit negative elasticities for both dimensions, indicating that rising income levels are accompanied by worsening outcomes in both social infrastructure and women's labour absorption. In contrast, states such as KL, KA, RJ, and TN display positive elasticities on both fronts suggesting that economic growth in these regions is more gender inclusive, as it is accompanied by simultaneous improvements in both the demand and supply aspects of social reproduction[10] .

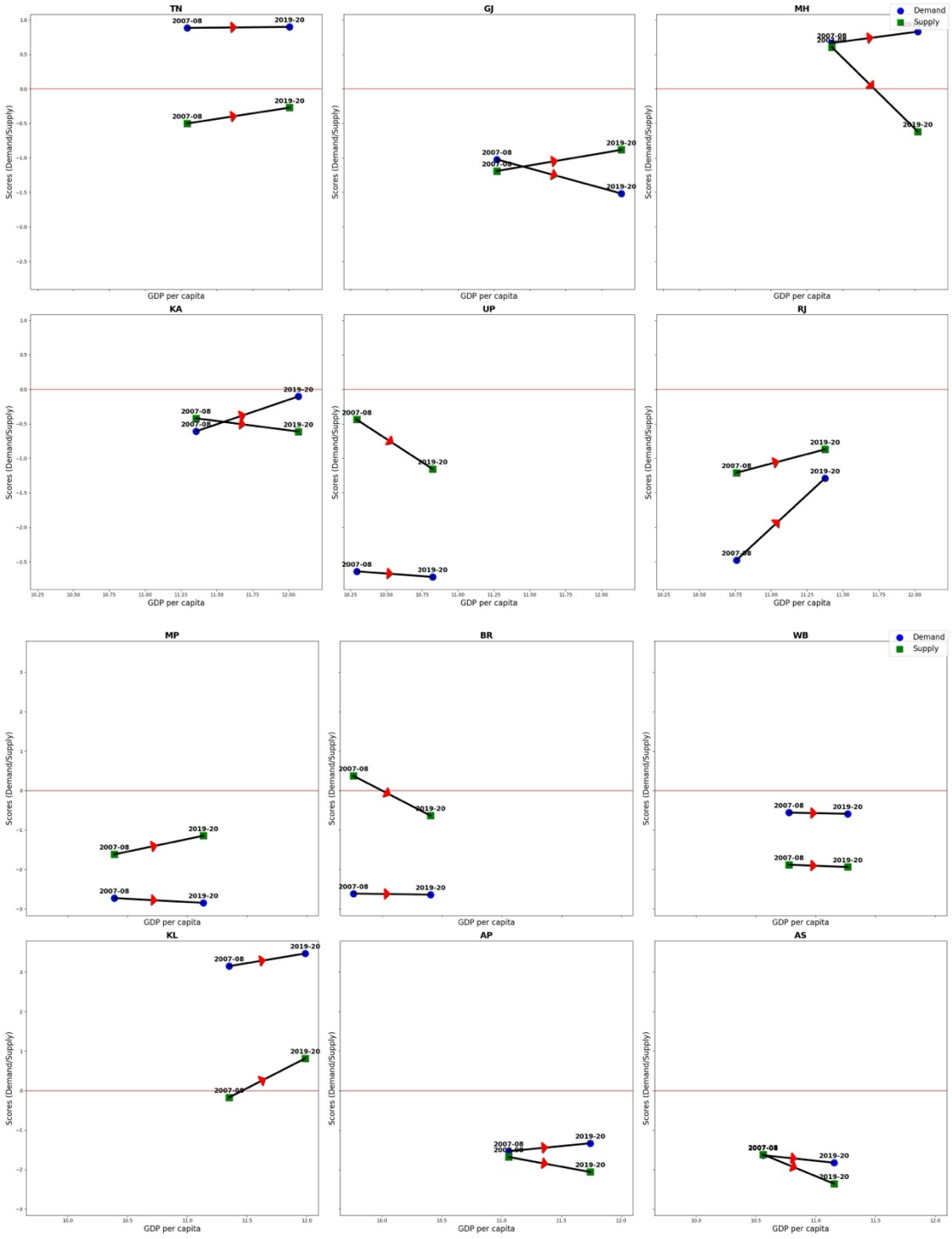
Although the regression results indicate whether a state's demand or supply score is moving in a positive direction with respect to growth, this does not guarantee that the actual level of the score is positive. A state might be improving over time but still remain negative. Hence, we rely on the scatter diagrams of PCA scores, rather than the regression trends alone, to classify states. The diagrams allow me to directly observe whether a state lies above or below the average in each dimension at a given point in time, which is more appropriate for defining growth regimes.

6.2. Visualizing State Trajectories

The figure 4 plots each state's trajectory between 2007–08 and 2019–20, with log GDP per capita on the x-axis and normalized scores of the demand and supply side PCA indices on the y-axis. Each subplot shows how the two components representing employment generating capacity (demand) and social infrastructure(supply) have evolved over time alongside economic growth.

[10] That said, the magnitude of the coefficients should be interpreted with care. Since the PCA score is a relative measure without an absolute scale, the coefficients mostly tell us about the direction of the relationship, not the precise magnitude of change.

Figure 4:GDP per Capita vs Demand and Supply Score by State



Note: GDP per capita shown in log scale.
Source: Based on authors' calculations using various data sources.

Based, on figure 4 we can group the states in three categories.

Figure 5:Classification of States by Growth and Social Reproduction Regimes

SOCIAL REPRODUCTION	GROWTH REGIMES	
	Wage Driven	**Profit Driven**
High	*KL* Growth in capital outlay Growth in Wage share stagnant Social reproduction regime is positive. **EGALITARIAN**	
Low	*AS, GJ, MP, UP, MH, TN, RJ, KA, WB* Growth in capital outlay Wage share increasing or stagnant (AS, GJ, WB) Social reproduction regime is negative. **TIME STRESSED**	*BH & AP* Growth in capital outlay Wage share decreasing Social reproduction regime is negative. **DISTRESSED**

Therefore, in states where an increase in capital outlay does not lead to a decline in the wage share, it suggests that rising public investment is not occurring at the expense of labour's share in income. When such states also exhibit a positive trajectory in both demand- and supply-side social reproduction scores over time (as illustrated in Figure 3), this indicates that growth is accompanied by improvements in social reproduction. Importantly, this upward movement translates into positive PCA scores on both dimensions. Taken together, these trends point to a growth process that is egalitarian in nature one that support economic expansion alongside more equitable distribution and gender-responsive infrastructure. Kerala is a clear example of this pattern, where the trajectory of growth appears to be underpinned by inclusive and socially supportive development dynamics.

In contrast, the majority of other states including AS, GJ, MP, UP, MH, TN, RJ, KA, and WB can be categorized into the Time-Stressed category. As these states exhibit low social reproduction scores(either due to a negative demand-side or supply-side index), despite notable increases in capital outlay. Although wage shares in these states remain stagnant or show only modest improvement, the weak provisioning of social reproduction infrastructure limits the extent to which growth can support broader inclusion. In such contexts, economic expansion has not been accompanied by the systemic support necessary to redistribute unpaid care work or to expand access to labour markets for women. So, growth process in this case can impose a double burden on women who participate in the labour market as they must compensate for the lack of adequate social infrastructure for social reproduction. Thus, the growth process in these states can be

characterized as being underpinned by time stressed or time poor social reproduction regime.

Finally BH and AP can be classified as Distressed. As these states combine a negative social reproduction regime with a profit driven growth path, characterized by capital expansion accompanied by declining wage shares. In such cases, economic growth appears to be not only exclusionary but actively undermining the conditions needed for gender equitable participation in the economy. The erosion of wage shares alongside weak care infrastructure suggests that these states are experiencing the most regressive combination of production and reproduction outcomes.

7. Conclusion

The aim of the paper is to study the problem of interrelation between growth, distribution and social reproduction across the states in India. It is now well accepted that the post liberalization growth process, which is mainly driven by external demand, has unveiled the problem of jobless growth impinging on the structural transformation of the economy. The export-led growth and the associated rise in labour productivity growth rate is one of the root causes of the non-standard structural transformation problem in India, where of workers moving away from less productive agriculture sector end up in informal jobs in construction and in other non-tradable services sector of the economy. The non-standard structural transformation and the informalization of the economy, and the associated distributional consequences in the post-liberalization era in India has also unleashed the crisis in the social reproduction realm. This crisis has been nurtured by the very logic of the post liberalization growth trajectory in India. Since it remained invisible to the mainstream theory and its associated data, there has not been much attention to this problem in the literature on the Indian economic growth and development.

Our aim in this paper is to develop an intersectional framework to study the interrelation between growth-distributional regimes and their underpinning social reproduction regimes. In this paper, we develop the analytical framework and use it to study the pattern of growth-distributional regimes across various states in India for the past two decades (2001-10 and 2011-20).

With that aim, we have examined the existing status of social reproduction realm using a panel data from 12 major Indian states (Section 4). We categorized the influencing factors into two broad groups: demand-side and supply-side factors that enables us to assess not only the availability of employment opportunities for women but also the conditions under which these opportunities translate into equitable and sustainable participation without exacerbating gendered responsibilities.

We then looked at the growth and distributional regimes across states in India. If the impact of export-led growth and non-standard structural transformation must reflect in the distributional shares of contenting economic classes, it must also influence and influenced by the social reproduction regime that underpins such a monetary production economy. In section 6, we integrated the analysis of growth and distribution with the demand and supply side factors of social reproduction developed in section 5, which paves the way for an intersectional analysis of economic growth in section 6.

The analysis helps us identify the growth regimes of various states, which are underpinned by egalitarian, time-stress, and distress modes of social reproduction. Our results suggest that, over the past two decades, the growth regimes in the northern and eastern states as well as in most other states including Assam (AS), Gujarat (GJ), Madhya Pradesh (MP), Uttar Pradesh (UP), Maharashtra (MH), Tamil Nadu (TN), Rajasthan (RJ), Karnataka (KA), and West Bengal (WB) are shaped by unequal social reproduction regimes. These regimes can be characterized as inducing time-stress, or time poverty, for women participating in the labour market. Bihar (BH) and Andhra Pradesh (AP), in contrast, can be classified as distressed, as they combine a negative social reproduction regime with a profit-driven growth path, characterized by capital expansion accompanied by declining wage shares. Within our sample, Kerala stands out as the only state that exhibits a more egalitarian social reproduction regime, where improved public provision of care infrastructure has enabled women to participate more fully in the market sphere.

The intersectional analysis in Section 6 highlights the fundamental conflict in India's growth trajectory. On one hand, economic growth in India, driven by a profit-driven aggregate demand regime, is reducing the share of wages, thereby generating adverse distributional effects. On the other hand, stagnant or declining growth in state expenditure on supply-side enablers particularly those that facilitate women's

participation in market production is limiting the potential for growth to become more inclusive from a gender perspective.

This pattern of economic growth appears to exacerbate the burden on women, who must manage both financial support for their households often through subsistence work or self-employment and the social reproduction of market labor within the household. This dynamic suggests that the sustainability of such profit-driven growth, which relies on a declining wage share and insufficient investment in social infrastructure, is dependent on the extent to which women can endure this "double burden".

Viewed through such an intersectional lens, the post-liberalization growth of the Indian economy seems to reinforce both income inequality within the sphere of commodity production and gender inequality within the sphere of social reproduction.

The results of our analysis also have broader implications for the study of political economy. Firstly, it appears that in the profit-driven growth process experienced by the Indian economy, the limits of cooperation between the contending classes within market production are closely tied to the extent to which women can compensate for declining incomes by adjusting the balance between subsistence work and unpaid care work. Such a scenario can lead to significant time stress for women, as they are forced to reduce their unpaid care work to free up more time for income-generating subsistence activities to support their households. Ultimately, the limits of class cooperation (or conflict) in such a profit-driven growth model are shaped by the degree of inequality embedded within the prevailing social reproduction regime.

Second, our analysis is particularly relevant to wage-driven growth policies from a heterodox perspective, which emphasize economic growth through employment generation initiatives. In this context, employment guarantee schemes, as advocated by Minsky (1965), have been widely implemented in many developing countries. [11] However, based on the intersectional analysis developed here, it appears that while employment guarantees are a necessary condition for wage-driven growth, they must be complemented by a robust care infrastructure. Without such support, wage-driven growth—despite being more equitable from a class perspective—may still perpetuate inequalities from a gender perspective.

[11] For example, the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) of 2005.

Finally, economic policies that overlook the intersectional dynamic between categories such as class, gender, and caste are likely to exacerbate and reinforce gender and social inequalities perpetuated by the modern capitalist economy that is embedded in a patriarchal societal structure.

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9. Data Appendix

Variable	Source	Notes
Mean Years of Schooling	Global Data Lab (https://globaldatalab.org/)	Calculated as the average of two consecutive years where applicable (e.g., for 2009-10, the average of 2009 and 2010 is used).
Expected Years of Schooling	Global data lab (https://globaldatalab.org/)	Calculated as the average of two consecutive years where applicable (e.g., for 2009-10, the average of 2009 and 2010 is used).
Life Expectancy	Global data Lab (https://globaldatalab.org/)	Calculated as the average of two consecutive years where applicable (e.g., for 2009-10, the average of 2009 and 2010 is used).
Infant Mortality Rate	Handbook of Statistics on Indian States 2022-23	Data reported for all years at the state level.
Proportion of Women	NSS Employment-	- Activity status codes used: 92 (Domestic duties only), 93 (Domestic duties and

Engaged in Domestic Work	Unemployment Survey and PLFS	activities like free collection of goods, tailoring, etc.). Total unemployed women calculated using codes 91, 92, 93, 94, 95, 97. Proportion = (Women in domestic work) / (Total unemployed women). Calculated for individuals aged 15-59 years at the State/UT level.
Water Supply and Public Health Infrastructure	State Accounts Report by Comptroller and Auditor General of India (https://cag.gov.in/en)	Ratio = Total expenditure on water supply and public health / Total social sector expenditure (State-wise for each year).
Crime Against Women	State-wise crime rates from National Crime Records Bureau (NCRB)	Data focuses on crimes against women, reported annually at the state level.
Female Wages (Rs.)	NSS Employment-Unemployment Survey and PLFS Report	Average daily earnings (in Rs.) received by regular wage/salaried employees. Activity status codes used: 31, 71, 72. Calculated for individuals aged 15-59 years at the State/UT level.