At the intersection between Class and Gender: Unpaid care work and Macroeconomic demand regimes

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Abstract

From a gender perspective, a fundamental challenge in macroeconomics is that of incorporating unpaid work, both unpaid subsistence and unpaid care work, in the circuit of commodity production. The aim of this paper is to provide a theoretical framework to explore the link between unpaid work and the macro-economy, particularly in the context of the interrelation between aggregate demand and social reproduction regimes. Using the System of National Accounts (SNA) classification of the production boundary and time-use accounting, the paper extends the Kaleckian framework to explore the link between unpaid care labour time and aggregate income shares. The results of the intersectional model reveal a more fundamental role of social reproduction in underpinning the zones of cooperation and conflict between capitalists and workers in various aggregate demand regimes.

Keywords: Unpaid care work, Social reproduction, Time-use, Subsistence production, Productivity, Profit and Wage shares, Profit-led regime, Wage-led regime

JEL codes: B54, E11, E12

1. Introduction

There is a growing consensus in the international development literature to recognise the critical role of unpaid care work, whose burden falls more on women, in both economic production and the well-being of individuals, families, and societies. The 1995 Human Development Report, a landmark report, based on the time-use estimates from a sample of 31 countries revealed the pattern of the unequal burden of unpaid work of women. The estimates showed that women accounted for more than half of the total burden of work, time spent either in the market-based activities or in the unpaid household or community activities - 53 percent in developing countries and 51 percent in developed countries. However, women's paid market activities constituted only one-third of this total burden of work compared to three-quarters of men's work. Since unpaid care work of women in the household is considered outside the market production sphere, their contribution remains unrecognized. The monetization of this unpaid and unrecognized non-market work of women at the prevailing wages amounted to about 47 percent of the global GDP in 1995.[1]

Twenty-five years since the publication of the 1995 Human Development Report, the pattern of an unequal burden of unpaid work remains unchanged. In 2014, the OECD data showed that across all regions of the world, women spend on average between three to six hours on unpaid care activities, while men spend between half an hour to two hours. In terms of individual countries, the variations can be significant. In Australia, for instance, women spend 64.4 percent of their average weekly working time on unpaid care work compared to 36.1 percent for men. In New Zealand women spend 65.4 percent compared to 29.4 percent for men and women in Sweden spend 43.5 percent compared to 32.4 percent for men.

The monetary value of unpaid care work was estimated to be around 50.6 percent of GDP in case of Australia[2] and around 39 percent of GDP in case of New Zealand (Ongley, 2001, pp. 12). Comparing the findings from analysis of time-use data from Argentina, Nicaragua, India, the Republic of Korea, South Africa, and Tanzania, Budlender (2008) provides evidence that in all the countries the mean time spent on unpaid care work by women is more than twice that for men. While the maximum unequal burden of unpaid care work was reported in India, in the

[1] See Human Development Report 1995: Gender and human development, UNDP, p. 6
[2] Workplace Gender Equality Agency 2016: Unpaid care work and the labour market, p. 4.

case of Argentina and South Africa, of the total time spent on unpaid care work, women spent about 78 and 74 percent, whereas men spent only 22 and 26 percent, respectively. The monetary value of unpaid care work was estimated to be between 10 to 39 percent of GDP.

The gender inequality in unpaid care work also influences the gender gaps in labour market outcomes. The unequal burden of unpaid care work on women adversely affects their ability to take part in the labour market and impacts on the type and quality of employment. Recent research supports the claim that the time spent on unpaid care work is negatively associated with female labour force participation (World Bank, 2014; OCED, 2014). These reports suggests that a decrease in women's unpaid care work is related to a significant increase in women's labour force participation, controlling for GDP per capita, fertility rate, urbanisation rate, maternity leave and gender inequality in unemployment and education.

Moreover, the quality of female employment also suffers with the unequal amount of time spent on unpaid care work. In order to reconcile household care work and market work, women tend to take up part-time work, often in vulnerable employment. It is shown that countries where women contribute more to the unpaid care work than men, have a higher share of women in part-time and insecure jobs (OECD, op.cit). [3] The adverse impact of the burden of women's unpaid care work on their earning potential seems to create a self-perpetuating dynamic between the gendered division of labour and women's participation in the market production and women's economic empowerment.

The Sustainable Development Goals (SDG), which replaced the Millennium Development Goals, adopted by the United Nations General Assembly in 2015, articulates the explicit goal of achieving gender equality and empowering all women and girls with a specific target to recognize and reduce the unequal burden of unpaid care work of women.[4] The recent report of the United Nations' High-Level UN Panel on Women's Economic Empowerment reinforces the same message of reducing the unequal burden of unpaid care work of women as one of the seven primary drivers of women's economic empowerment. It further articulates the

[3] OECD 2014, op. cit.
[4] SDG Goal 5.4: "Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate".

importance of macroeconomic policies as a crucial enabler of gender equality and recommends that economic policymakers recognize and value unpaid care work of women.[5,6]

However, designing macroeconomic policies for enabling the fulfilment of developmental goals of SDGs require informing policy models to be gender-sensitive, particularly in recognizing the role of unpaid care in the macroeconomic context. Without reconceptualising and reworking macroeconomic models from a gender perspective, as opposed to adding gender as another variable in the existing models – the "add and stir" approach- the effectiveness of macroeconomic policy in enabling the fulfilment of the Sustainable Developmental Goals such as of reducing gender inequality remains moot.

Since the 1970s, Feminist economists have been pushing the frontiers to advance gender-sensitive analysis in exploring the connections and differences between these two realms.[7] Early foundational work in this area critically engaged with the Marxian analysis and articulated alternative conceptualization that consider 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, 1983). 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). Studies also 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. In terms of the related literature, Braunstein, van Staveren, and Tavani (2011) proposed a mathematical model in the Post Keynesian/Structuralist framework to

[5] See UN Secretary-General's *High-Level Panel on Women's Economic Empowerment: Leave No One Behind: Taking Action for Transformational Change on Women's Economic Empowerment*, pp. 3-4.
[6] These policy recommendations are informed by the conceptual framework of three interconnected dimensions of *Recognition, Reduction and Redistribution* developed by Diane Elson.

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

investigate the relationship between economic growth and social reproduction. The model introduced the notion of "caring 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. 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.

There are also studies in the Beckerian framework of intra-household bargaining (for example, Agénor (2017)), which articulate an inter-temporal general equilibrium approach to integrate the unpaid care work and care economy. A more recent model that integrates unpaid care in the framework of computable general equilibrium (CGE), pioneered by Fontana (op.cit), was proposed by Cicowiez and Lofgren (2021) in the context of South Korea. Blecker and Braunstein (2022) provide a succinct review of both the strands of the literature and an overview of the contributions to the special issue of the journal *Feminist Economics* that brings forth a diverse set of most recent theoretical and empirical papers on the theme of care and macroeconomics.

This paper, inspired by the Post Keynesian strand of the literature, proposes a theoretical model to explore and elucidate the interrelation between social reproduction, through women's unpaid work in the household, and functional distribution in the macroeconomic framework. The integration of women's work, both market and non-market, in a model of class distribution, highlights both the consequences of the dynamics of class distribution for women and also the underpinning role played by gender in terms of redefining the limits of cooperation and struggle between the contending classes of capital and labour. The organization of the paper is as follows: Section 2 discusses the categorization of the System of National Accounts with respect to market and non-market activities of work. Based on these definitions, Section 3 presents a theoretical model to study the intersection between social reproduction and function distribution in various aggregate demand regimes, and finally, section 4 concludes with a short discussion and some general remarks.

2. Classification of the production boundary

In the standard economic model of household optimization, the rational agent maximizes its utility which is driven by consumption and leisure. Although rational agents' gender is not explicitly stated, there is an implicit male bias in these models as evidenced by the dichotomous division of time between work (paid market work) and leisure, which is bestowed on men as a

social “norm” in a patriarchal society. However, women in the same society do not enjoy the same privilege of such clearly demarcated dichotomy between work and leisure. In any given day, the determination 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 System of National Accounts where they divide activities into those that lie within the *production boundary* and that lie in the *extended production boundary* as shown in Table 1 below.

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)

Table 1: System of National Accounts (SNA) classification

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 (SNA) and unpaid work that falls outside the production boundary (non-SNA).

The former unpaid work, which is a part of the conventional economy and is expected to be covered under the national income accounts, includes three types of work:

(1) unpaid family work in family enterprises

- collection of raw materials for *income* generating activities like crafts and other manufacturing; activities such as unpaid family work for crop production that *reaches the market*, as well as animal grazing, agro-processing, and food processing *for sale*.

(2) the production of goods by households for own consumption, and the free collection of products, also for own consumption (such as water, fuelwood, fish, fruit, etc.), and

(3) the collection of free goods for production purposes (such as fodder, wood, craft material, etc.).

Note that there can be overlap between unpaid economic work in the activities of procuring inputs and producing for own use, as well as producing for the market, i.e., those performed with a view to sell in the *market*, as in (B), and those for own use to consume within the household cell (C). A general rule to remember is that unpaid work that goes to produce goods for own use is included in the production boundary, whereas the unpaid work that goes to produce services for own use is considered as non-SNA work, or non-economic, and lies in the extended production boundary. Further, it has been argued that the demarcation between SNA and non-SNA activities is arbitrary (Hirway, 2015). For instance, in terms of Table 1, the demarcation line between cells B and D 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. For example, in India the preparation of cow-dung cakes is only 'beneficial' to the household and not considered in the production boundary, although it takes care of the fuel requirements of the household (Mehrotra and Sinha, 2017). The definitional arbitrariness can have implications for work force participation and can lead to differential status for women in the economy and society.

The second category of non-SNA unpaid work is viewed variously by unpaid care, 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 aloud to a child, or teaching a child) and the indirect unpaid care (such as food preparation, household upkeep, and more generally, household maintenance) in the household, 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). [8]

In this paper, we consider the unpaid non-SNA work that lie in the extended production boundary in cells D and E in Table 1. For simplicity, we group activities in cells D and E as follows: the unpaid household *subsistence* work for own use (cell D), such as crop cultivation, animal husbandry, forestry, and fishery, collection of basic necessities, like water and fuel wood from common or private lands and time spent on household upkeep and unpaid household *care work* (hereafter "unpaid care work"), such as cleaning, cooking, maintenance, care for children, sick, disabled and volunteer work (Cell E).

In the developing economies, women spend between 35-50% of their total time in the unpaid non-SNA work that comprise both subsistence and care work of daily household upkeep activities and care work (e.g., care of children, the old, the sick, disabled and others that need care), and unpaid services for the family. For instance, in Ghana women spend about 60% in the unpaid non-SNA activities (Ferrant et al., 2014). In India, particularly in the rural areas, the share of women engaged in the non-SNA activities increased from 51.8% in 2005 to 59.7% in 2012 (Mehrotra and Sinha, 2017).

In addition to the burden of the quantum of unpaid activities that women engage, there is also the issue of overlapping activities, which adds to the intensity of the burden (Floro, 1995). There exists strong evidence of time stress among women due to overlapping activities in the literature (see for example, the case of Australia by Floro and Miles (2003) and the case of India by Irani and Vemireddy (2021)). In developing countries with a large agricultural sector, where unpaid family workers, mostly women, constitute a larger share of the total labour, the double burden of contributing to both subsistence work and care work can lead to the overlapping of multiple activities. In any case, the quantum of burden, and the intensity of unpaid activities at the individual level is influenced by the macroeconomic environment via the availability of care infrastructure and other wider institutional supports on the supply side and the aggregate demand and distributional regime of the economy on the demand side. The aim of the paper is to understand analytically the mechanism through which the interrelation between macroeconomic level demand and supply factors determines various outcomes for

[8] In some studies, 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.

women engaged in the process of social reproduction in the household, i.e., whether they lead to gender equal, or exploitative outcomes for women. Or in other words, what are the characteristic features of the process of social reproduction at the household level that underpin various macroeconomic production and distributional regimes. We shall explore these questions analytically using a simple model in the next section.

3. The model

Post Keynesian models study the interaction between functional distribution of income and aggregate demand to explain how class conflict and cooperation emerge in the context of capitalist market economies. For example, consider the class of Post Keynesian models where an exogenously specified investment function, influenced by both profitability (profit share) and demand (capacity utilization), determines output, employment, and distribution of income between workers and capitalists in different aggregate demand regimes (for example, Bhaduri and Marglin, 1990). This genre of models, depending on whether the output expansion is due to profitability or capacity utilization, elucidate conditions that render conflict and cooperation between the contending classes of workers and capitalists in the market economies. However, the concept of "class" overrides gender and this aspect has been a persistent critique that applies to a broad range of heterodox models. Here we extend the standard Kaleckian model to integrate gender in a model of class distribution in the following.

The total labour in the economy is divided between male and female labour as,

$$\textit{Total labour} = \textit{Male labour } (L_m) + \textit{Female labour } \left(L_f\right) \quad (1)$$

$$\textit{Female labour } \left(L_f\right) = \textit{Female market labour} \left(L_f^M\right) + \textit{Female household labour } \left(L_f^H\right) \quad (2)$$

Further, the female household labour is sub-divided into two unpaid work categories which are in the extended SNA production boundary in cells D and E in Table 1.

$$\textit{Female household labour } \left(L_f^H\right) = \textit{Female labour for household subsistence non-market output } \left(L_f^s\right) + \textit{Household care labour } \left(L_f^c\right) \quad (3)$$

Therefore,

Female labour (L_f) = *Female market labour* (L_f^M) + *Female labour for household subsistence non-market output* (L_f^s) + *Household care labour* (L_f^c)

Or,

$$L_f = L_f^M + L_f^s + L_f^c \qquad (4)^9$$

Decomposing output of the economy by market and household, and along male and female market labour contributions yield,

$$Y = \underbrace{a\frac{Y^M}{L_m^M}L_m^M + (1-a)\frac{Y^M}{L_f^M}L_f^M}_{Market\ output} + \underbrace{\frac{Y^H}{L_f^H}L_f^H}_{Household\ output} \qquad (5)$$

where Y^M and Y^H denote market output and household output respectively. L_m^M and L_f^M denote male and female market labour, and L_f^H denotes female household labour. Note that the household output comprises of subsistence production and care services to members of the household such as kids, elderly and others that are outside SNA production boundary. For analytical simplicity, we assume that the household output is produced only by female household labour (L_f^H).

Letting $\lambda_m = \frac{Y^M}{L_m^M}, \lambda_f = \frac{Y^M}{L_f^M}, \gamma = \frac{Y^H}{L_f^H}$, for male market, female market, and female household labour productivity terms respectively to rewrite (5) as,

$$Y = a\,\lambda_m L_m^M + (1-a)\lambda_f L_f^M + \gamma L_f^H \qquad (6)$$

Consider the household female labour (L_f^H), which is assumed to be divided into subsistence and care work, i.e., $L_f^H = L_f^s + L_f^c$ as given in (2). As discussed in the previous section, these activities overlap and women, particularly in the developing countries, multitask to optimise their time. In continuum, the substitution between subsistence and care work can be thought of an approximation to analytically capture such multitasking "joint" household production.

[9] For expositional simplicity, leisure or self-care is not considered here.

To model the continuum of substitution between the unpaid household work categories, we postulate the following relationship between the unpaid household work categories of subsistence work and care work as

$$L_f^s = Ae^{-\beta L_f^c} \qquad (7),$$

where A is the scaling coefficient and the parameter $\beta(>0)$ captures the marginal rate of substitution between the two unpaid components of the household work. The lower values of β implies a relatively elastic, or almost constant linear, substitution between subsistence and care work, whereas higher β values exhibit a more nonlinear substitution between the two categories of household work as shown in Figure 1.

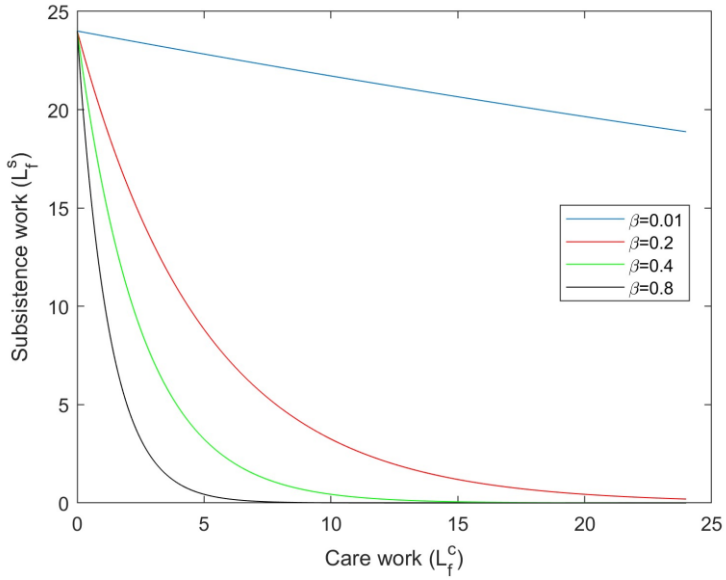

Figure 1: Relation between household subsistence work and care work

Although it could be argued that the parameter β is institutionally determined, it would vary with the economic situation of the country in question. For instance, in the context of a developed country with a reasonable institutional support for care, including private market for care, recession and fall in employment opportunities may induce women to reduce the market exposure for care and increase domestic or household care to enhance their real wages. This would, in turn, mean an increase in the value of β, implying that the substitution between the household categories of work becomes inelastic, and consequently the substitution between paid and unpaid work. In the context of developing countries, where institutional support for care is relatively weaker, the substitution parameter becomes even more important and may

indeed act as lever for women to balance their roles as care giver and as a bread winner. Therefore, irrespective of the level of development, women's work, particularly the unpaid household activities, seems to be one of the fundamental adjusting variables that responds to various macroeconomic conditions. As will be seen in the analysis of the model, we argue how the substitution parameter plays the crucial role in determining the distribution between the two contending classes of workers and capitalists.

Substituting (7) in (6)

$$Y = b\,\lambda_m L_m^M + (1-b)\lambda_f L_f^M + \gamma\left(\left(24 - L_f^M\right)e^{-\beta L_f^c} + L_f^c\right) \qquad (8),$$

and dividing (8) by total labour (L) yields aggregate labour productivity,

$$x \equiv \frac{Y}{L} = b\,\lambda_m v_1 + \frac{\gamma\left(Ae^{-\beta L_f^c} + L_f^c\right)}{L} + \frac{(1-b)\lambda_f L_f^M}{L} \qquad (9)$$

where $\frac{L_m^M}{L} = \mathrm{v}_1$, the male market labour productivity and assumed to be a constant.

The aggregate profit share is given by $h = 1 - \frac{wL}{pY} \equiv 1 - \frac{w/p}{Y/L} \equiv 1 - \frac{w/p}{x}$, where x is the labour productivity in the aggregate. Expressing in percentage terms yields,

$$\frac{\dot{h}}{h} = \frac{\dot{p}}{p} - \left(\frac{\dot{w}}{w} - \frac{\dot{x}}{x}\right) \qquad (10).$$

From (9), the percentage growth in labor productivity is

$$\frac{\dot{x}}{x} = \frac{1}{x}\left\{\gamma\left(\dot{L}_f^c(1 - \beta A e^{-\beta L_f^c}\right) + (1-a)\lambda_f\,\dot{L}_f^M\right\} \qquad (11)$$

where $-\beta\left(Ae^{-\beta L_f^c}\right) = \frac{dL_f^s}{dL_f^c}$, is the marginal rate of substitution between subsistence work and care work. As discussed in the context (7), a low β represents a high marginal rate of substitution and a high β represents a more inelastic substitution between subsistence and care work. Therefore, rewriting (11) yields,

$$\frac{\dot{x}}{x} = \frac{1}{x}\left\{\gamma\left(\dot{L}_f^c\left(1 + \frac{dL_f^s}{dL_f^c}\right)\right) + (1-a)\lambda_f\dot{L}_f^M\right\} \qquad (12).$$

Equation (12) follows the decomposition of aggregate output proposed in (6) and shows that growth in the aggregate productivity is driven by both the household labour and market labour $\left(\dot{L}_f^M\right)$.[10] The interesting feature in (12) is that the contribution from the households to the aggregate productivity mediated though both unpaid care labour $\left(\dot{L}_f^c\right)$ and the marginal rate of substitution $\left(\frac{dL_f^s}{dL_f^c}\right)$ between the household work activities. Higher or lower values of the marginal rate of substitution, (through β), can either limit or enhance the contribution of the unpaid care labour to the aggregate productivity.

We can now use (12) to see how it impacts the growth of profit share (or wage share). For profit share to rise, i.e., $\frac{\dot{h}}{h} > 0$, the inequality $\frac{\dot{p}}{p} - \left(\frac{\dot{w}}{w} - \frac{\dot{x}}{x}\right) > 0$ must be satisfied. Assuming constant prices, for simplicity, the condition for the rise in profit share is given by,

$$c_0(1 + MRS)\,\dot{L}_f^c > \left[\frac{\dot{w}}{w} - c_1\frac{\dot{L}_f^M}{L_f^M}\right] \qquad (13),$$

where $c_0 = \frac{\gamma}{x}$, the ratio of household labour productivity to aggregate labour productivity, and $c_1 = \frac{(1-a)\lambda_f}{x}$, the ratio of female market labour productivity to aggregate labour productivity, both of which are assumed to be constants.

The right-hand side of (13) shows the difference between market wage growth and the growth of female market participation. The left-hand side is simply the growth in the unpaid care work, is weighted by the marginal rate of substitution between the unpaid household categories of subsistence work and care work. The condition (13) reveals that for aggregate profit share to rise, i.e., $\frac{\dot{h}}{h} > 0$, the growth differential between market wages and female market participation must be more than offset by the growth in unpaid care work.

[10] Note that we have kept the male labour market participation as constant here and including it does not change the main argument. Also note that the female market labour productivity (λ_f) and household labour productivity (γ) are assumed constant.

The regime where a rise in profit share is accompanied by an expansion in employment opportunities and higher wages is known as the 'profit-led' regime, where cooperation between the classes of labour and capital becomes a possibility. However, limits to such cooperation emerge when rising profit share begins to slow down growth, employment opportunities and wages, leading to conflict between labour and capital (Bhaduri and Marglin, op. cit). From the intersectional perspective of the model developed here, we show that class cooperation (and conflict) between labour and capital is underpinned by a substratum defined by the relationship between household production and market production mediated through women's work in the former sphere, and in turn facilitates the latter – termed in the literature as the process of "social reproduction". The inequality (13) highlights these dynamics, and we shall use it to explore the relationship between the distributional regimes and the underpinning social reproduction process in various scenarios.

Let us consider a scenario where the economy in growth phase with both wages and female labour force participation are rising, although the latter slower than the former. In such a scenario, in general, where the cost of production is rising more than labour force participation, the only way for the firms in the productive sector to increase their profits is via rising productivity growth. In the case our model, where unpaid care work positively influences aggregate productivity (12), the question is how could labour productivity be increased to more than offset the growth in wage cost and deliver higher profit share. From the condition (13), we can infer that, the rise in profit share, through an increase in labour productivity, is contingent on the more than offsetting growth in unpaid care work vis-à-vis the relative growth differential between wages and female labour participation. And for a given level of growth differential between wages and female market participation in (13), a rise in productivity through an increase in unpaid care can be achieved in three ways; (a) by an absolute increase in growth in unpaid care, (b) through substitution between the household activities of subsistence and care work, and (c) through a combination of the above two ways. Let us understand how this could materialise and its consequences for our understanding of the interrelation between distributional regimes and the social reproduction process.

In an expanding economy with both wages and female market participation are growing, the necessary increase in unpaid care would transpire through its substitute, the paid market care,

and therefore, its absolute growth in the aggregate would depend on both the demand, and supply side factors such as care infrastructure, both public provisioning as well as private market for care. If the increase in the growth of unpaid care, via its substitute, outweighs the growth differential between wages and female market participation, then it would satisfy the condition (13) and consequently, would lead to a rise in the profit share in the economy. This implies that the cooperation between capital and labour is underpinned by a relatively gender equal social reproduction process as higher wages and increased market participation of women enhances their ability to purchase care and substitute it for the necessary unpaid care that is required for the rise in profit share.

On the other hand, the necessary growth in unpaid care, can also be brought about through increased substitution between subsistence production with unpaid care work, to bridge the deficit between relative growth of wages and female labour force participation. As can be inferred from (13), this is achieved via a higher MRS (low β), i.e., through a relatively elastic substitution between subsistence work and care work (see Figure 1), which allows for women to be able to substitute subsistence work with care work and generates the necessary growth in unpaid care and labour productivity, and in turn the profit share. Therefore, in an expanding economy, where both wages and labour force participation are growing, the increased substitution, between subsistence and care work, drives the rise in labour productivity and in turn delivers the rise in profit share.

However, both these routes are predicated upon the availability of care infrastructure, both in terms of capacity through private market for care and other institutional support, akin to the "high-road" supply side environment articulated by Braunstein et al. (op. cit). In such high-road economies, the profit-led distributional regime, where cooperation between labour and capital emerges owing to higher wages and employment opportunities, is seemingly underpinned by a "gender egalitarian" social reproduction process.

The strength of class cooperation is tested when wage growth begins to taper, and when it begins to fall, and as tensions between labour and capital begins to emerge. We can understand this scenario using (13), which holds even when wages turn negative. However, whether the fall in wages translate to conflict between workers and capitalists depend on the route through

which the necessary growth in care essential for the rise in profit share is delivered. In a falling wage scenario, where the paid market care becomes dearer, increase in the necessary care must come via increased substitution (MRS) of unpaid care work in the household. This could turn exploitative for women in terms of the increased pressure of substitution between the unpaid activities at home and for optimising their time with respect paid work whose returns are lower. Thus, in the high-road supply side environment and profit-led demand regime, depending on the scenario where wages are growing or shrinking, the limits to cooperation between capital and labour is underpinned by either gender equal or time stress social reproduction outcomes.

On the other hand, in countries where there is relatively less care infrastructure, in the "low-road" regime, the necessary condition for the realisation of higher profit share would be reliant more on the increased substitution between subsistence work and care work, as opposed to increase in the absolute growth of unpaid care work. In such economies, the macroeconomic condition for rise in profit share (13), transpires through the route of substitution, i.e., through higher substitution between subsistence work and care work (high MRS or low β), which could result in time stress for women for carrying out the dual role of financially supporting the family and as a bread winner, and as a care giver. Therefore, in such economies with poor care infrastructure, the limits to class cooperation, as wage growth begins to taper, would again be tested depending on the level of time-stress endured by women. It can get worse as wages fall, the emerging class conflict could turn exploitative for women in terms of being time poor for substitution between household activities and optimising time allocation to market work where the returns are lower. These results are summarised in Table 1.

		Aggregate demand/Distributional regime	
		Profit-led $(\dot{h} > 0)$	
		Cooperation $(\dot{w} > 0)$	*Conflict* $(\dot{w} < 0)$
Care infrastructure (supply side)	*High road*	***Egalitarian***	***Time stress***
	Low road	***Time stress***	***Exploitative***

Table 1: Interrelation between distributional regime and social reproduction process in the profit-led regime

The wage-led regime stands in contrast with the profit-led demand regime. In a growing economy with strong wage growth, workers' bargaining power increases and at some point, as wage growth outweighs productivity gains to leading to a rise in share of wages, the production regime turns conflictual between labour and capital. From the perspective of our model, the condition for such a regime to emerge, i.e., an increase in wage share $\left(\text{i.e., } \frac{\dot{h}}{h}<0\right)$ to materialise, is given by

$$\left[\frac{\dot{w}}{w} - c_1 \frac{\dot{L}_f^M}{L_f^M}\right] > c_0(1 + MRS)\, \dot{L}_f^c \qquad (14)$$

Considering the same scenario of an expanding economy with both wages and female market participation are growing, although the latter relatively slower than the former, the inequality (14) provides the condition under which the growth in wages translates to an increase in the share of wages in this regime. It states that the necessary condition for share of wages to rise is that the growth in wages, net of growth in female participation rate, must be greater than the magnitude given by the rate of change in unpaid care work, mediated by the substitution parameter (1+MRS). From (14), we can see that, the condition would be satisfied, for any given positive difference between the growth of wages and the growth of female market participation, through three routs – (a) through the fall in the growth of unpaid care work, (b) through a lower value of MRS (or a high β) parameter, (c) through some combination of (a) and (b).

In terms of the first route, the required fall in the growth of unpaid care work would enable women to release their time engaged in unpaid care work to devote more time in subsistence work, or paid employment, both of which would result in higher returns in a growth environment. At the same time, if the higher work force participation and higher wages lead increased demand for care and if care infrastructure via private or public is forthcoming, the high-road care infrastructure in the wage-led regime could lead to gender equal outcome in realm of social reproduction. In the high-road economies with a larger private care sector, increased demand for care arising from a higher women's work force participation creates bigger market for care that caters for larger profits can create the possibility of cooperation between the two classes in the wage-led regime. However, such cooperation gets strained and reaches its limit when wage growth tapers off. Thus, the limits to cooperation between labour and capital in the wage-led regime and in a high-road care infrastructure setting is underpinned

by the extent to which the process of social reproduction yields gender-equal outcome for women.

On the other hand, in the low-road regimes with relatively less care infrastructure, the reduction in the growth of unpaid care is achieved through a diminished substitution effect, i.e., through a lower marginal rate of substitution between subsistence and care work (or a high β). The necessary condition for the growth in wages to lead to a higher share of wages in a low-road regime is reliant more on the reduced substitution between subsistence work and care work, as opposed to a fall in the absolute growth of unpaid care work and can lead to relatively inegalitarian outcomes for women. In other words, our results suggest that the burden of translating the growth in wages to a higher share of wages for workers as a class is underpinned by a social reproduction process that bolsters market production by supplementing it with subsistence production. In terms of our model and condition (14), the burden of substitution is analytically captured by the fall in the value of the MRS term, or a high value of β, implying that women face a nonlinear and a relatively more inelastic substitution possibilities, as shown in Figure 1. This can result in time-stress and can turn exploitative in the case when wages fall in the low-road care infrastructure regime. Therefore, in the wage-led regime, the limit to class cooperation and conflict is underpinned by the social reproduction process that can yield both egalitarian and inegalitarian outcomes for women. These results are summarised in Table 2.

		Aggregate demand/Distributional regime	
		Wage-led $(\dot{h} < 0)$	
		Cooperation $(\dot{w} > 0)$	*Conflict* $(\dot{w} < 0)$
Care infrastructure (supply side)	*High road*	***Egalitarian***	***Time stress***
	Low road	***Time stress***	***Exploitative***

Table 2: Interrelation between distributional regime and social reproduction process in the wage-led regime

These results reveal the possibility of both gender egalitarian and gender unequal (time-stress) outcomes for women even in the high-road social reproduction setting in both the profit-led and wage-led distribution regimes. In this context, the model developed here provides a theoretical articulation for the conceptual and empirical analysis of growth and social reproduction by Braunstein et. al (op. cit). The result of our model corresponds to some of their empirical estimates in terms of gender egalitarian outcomes in countries in the high road regime. Interestingly, our model shows the possibility of time-stress outcome (or "time squeeze") even in the high road environment in both the distributional regimes and provides an analytical mechanism for such an outcome.

The model developed here provides a way to re-evaluate the distributional regimes from an intersectional point of view. For instance, in the class of Post Keynesian models that we have used here, the wage-led aggregate demand regimes are usually proven to yield more stable regimes. However, as our analysis reveals that wage growth is only a necessary condition, and for the rise in wages to translate into a gain for the workers as a class, i.e., for their share in total income to rise, the wage-led regime must be underpinned by a social reproduction process that supplements it with a higher level of subsistence production. It would be interesting to examine the intersectional characteristics of the wage-led regimes in economies, particularly the developing countries with a large subsistence sector where women engage in a sizable proportion of unpaid family labour. Further, the proposed formalism of substitution between various household work categories also provides an approximation of overlapping activities and a way to complement the existing time poverty or time-adjusted income poverty measures.[11] The role of the rate of substitution between the household categories of work in both the distributional regimes also provides a measure of time-stress or time poverty. The elasticity of substitution, as captured by the parameter β, could be an interesting way to augment the definition of time poverty in terms of capturing the intensity of work using the degree of substitutability in addition to the quantum of work reflected in the blocks of activities performed by women.

[11] See Vickery (1977), Harvey and Mukhopadhyay (2007), Zacharias (2011) for the time-adjusted income poverty measures.

4. Concluding remarks

The aim of the paper is to explore the interrelation between class and gender in the macroeconomic framework. The model rearticulates the standard class distribution model by integrating women's household work and analyses the interrelation between distributional regimes and social reproduction. The model reveals some interesting insights from the intersectional perspective of class distribution and social reproduction. From the class distribution point of view, the model reveals the underpinning limits to cooperation and conflict in the various distributional regimes. In the so-called profit-led regime, rise in profit share is now contingent on the growth of unpaid care in the economy for generating higher levels of productivity that would more than offset the growth in wages (or the cost of production). However, the insight here is the role that the marginal rate of substitution between various categories of household activities plays in terms of its influence on the degree to which such a contingency is required for the rise in profits (profit share). This aspect of substitution between household activities that is necessary for the rise in profit share in the profit-led regime leads to gender unequal 'time stress' outcome for women even in the economies with a high level of care infrastructure, the so-called 'high road' social reproduction environment. This result is in line with the empirical work on time poverty in the developed countries in the literature. In this regard, the model provides a theoretical articulation for some of the empirical results on the relation between growth and social reproduction in the literature and provides an analytical mechanism for further policy analysis.

In the wage-led regime, our analysis shows that dominant wage growth, relatively to the participation rate, alone is not sufficient to deliver higher share of wages. For the rise in wages to translate into a gain for the workers as a class, it must be underpinned by the social reproduction regime that enhances the time spent on subsistence production, either through an absolute fall in the unpaid care work or through a fall in the rate of substitution between subsistence work and care work. And the route that the social reproduction takes in the wage-led regime depends on the level of care infrastructure. In the high-road care infrastructure setting, wage growth can lead to gender equal social reproduction regime if it can enable women to replace unpaid care with market or public care substitutes. However, when wages fall, which can render the market substitutes for care more expensive, the rise in the share of wages in the high-road regime depend on the extent to women can supplement the fall in income through adjusting the rate of substitution between subsistence and care work. This can

lead to time stress for women and in this regard, the marginal rate of substitution between the household activities becomes an adjusting variable and underpin macroeconomic consequence such as class cooperation and conflict in this regime.

This is particularly relevant for a wage-led recovery policies where the heterodox perspective prescribes stimulating the economy through employment generation initiatives that will revive the demand side of the economy. In this context, employment guarantee schemes are popularly advocated (Minsky, 1965) and has been instituted in many developing countries. From the perspective of our model, while employment guarantee is a necessary condition, unless they are complemented with a wider care infrastructure, the wage-led growth, which is seen more equitable from a class perspective, may sustain or reinforce inequalities from the gender perspective. The reason being that in the absence of care infrastructure, the challenges of substitution between household work, tends women to opt for low-paid jobs, and in the macro context the ensuing wage growth might not be sufficient to translate to an increase the share of wages. The availability of a care infrastructure, particularly via public provisioning of care, will remove the burden of translating micro level increase in wages to the rise in aggregate wage share that seem to fall more on women than men. Public provisioning of care not only can bolster employment guarantee schemes but will also act as a positive externality for the whole economy. These results suggest the need for reconceptualising economic theory to integrate multiple categories such as gender, class, ethnicity etc., to appreciate the intersectional constraints that challenge public policy, which remains within the purview of the unitary rational agent-based economy that is well-insulated from the vagaries of the real world.

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