The Road to Gender-Equitable Growth: A State-level Analysis of Social Reproduction in the U.S.

Aashima Sinha

The Road to Gender-Equitable Growth: A State-level Analysis of Social Reproduction in the U.S.

Aashima Sinha[1]

Abstract

Building on a Kaleckian-structuralist macroeconomic growth model this paper examines the impact of the interaction between labor market gender equality and social reproduction (SR) or care provisioning, on economic growth across U.S. states. Using panel data for 2003-2017 and principal component analysis, I construct two composite scores for each state to capture care provisioning by household, state, and the market sectors on the supply side and caring tendency to invest in human capacities on the demand side. The interaction of these scores results in four stylized SR regimes. Next, I examine the relationship between women's labor force participation rate (WLFPR) and state's per-capita growth rate across these regimes. The paper contributes new evidence to the engendering macroeconomics scholarship on promoting gender-egalitarian and pro-care economic growth by showing that: 1) regimes characterized by strong public, market, and gender-equal care provisioning experience higher per-capita growth rates compared to regimes that lack such care provisioning; 2) higher WLFPR is compatible with higher economic growth in states with gender-equal care structures and 3) gender-equitable growth can be achieved via state-level policies that expand social spending, access to care services, and gender equality in labor market.

---

[1] Department of Economics, University of Utah, aashima.sinha@utah.edu

1. Introduction

Social reproduction (SR) or care provisioning through which labor force is produced on a daily and intergenerational basis involves gender-differentiated activities that are asymmetrically distributed between men and women in both paid and unpaid sectors. SR can broadly take place in the three sectors of the economy– household, public and/or market sectors. Care needs within households are increasing globally, owing to ageing populations, more people living longer with disabilities, lower infant mortality rate and lack of publicly provided and affordable care infrastructure. The disproportionate burden of care provisioning on women can not only have consequences for gender equality but also hamper economic growth and inclusive development through multiple routes, including via underutilization of women's labor force (Beneria, Berik, and Floro, 2016; Elborgh-Woytek et al., 2013). While feminist economists have drawn attention to the importance of unpaid care work for reproducing the labor force and ensuring the functioning of the macroeconomy (Folbre, 1994; Folbre, 2006), measuring the potential macro-level adverse effects of unpaid care burdens are largely unexamined due to the neglect of care work in macroeconomic models. Further, the invisibility of care work to macroeconomic policy makers in turn contributes to public underinvestment in care work and infrastructure, restricts women's labor force participation (WLFP) and contributes to persistent gender inequality. This study builds on recent feminist macroeconomics scholarship and provide new empirical evidence on the interlinkages between care provisioning, WLFP, and economic growth through a state-level analysis of the United States (U.S.). I extend the empirical models of Braunstein, Bouhia and Seguino (2020) and Braunstein, Seguino and Altringer (2021) and examine the theoretical propositions of Braunstein, Van Staveren, and Tavani (2011) concerning the relationship between WLFP and economic growth in different caregiving contexts. I first characterize the context of

each state in terms of the level and distribution of care provisioning and the tendency to value investment in human capacities and then examine which contexts are more conductive to generating high WLFPR with high economic growth.

Since the early 1990s feminist macroeconomists have sought to incorporate unpaid care work in macroeconomic analysis to prevent disproportionate adverse impacts of gender-unaware macroeconomic policies on well-being, in particular, for low-income women (Elson, 1991, 1995; Beneria and Feldman, 1992; Cagatay, Elson and Grown, 1995; Grown, Elson and Cagatay, 2000). Most of these early efforts were limited to developing the possible theoretical interlinkages between care and the macroeconomy. Braunstein et al. (2011) was the first attempt to develop a *macroeconomic model* that integrates both unpaid and paid care work in examining the determinants of aggregate demand and economic growth based on a Kaleckian-structuralist framework. More recently, Braunstein et al. (2020; 2021) tested the propositions of this growth model using a cross-country analysis. These studies construct a composite supply score to capture SR provisioning of countries, and a composite demand score to measures their values that prioritize and invest in provision of care. In combination, these scores generate four care regimes, hereafter SR regimes: 1) mutual (high/positive supply score and high/positive demand score); 2) time squeeze (low/negative supply score and high/positive demand score); 3) exploitative (low/negative supply score and low/negative demand score), and 4) wage squeeze (high/positive supply score and low/ negative demand score). These empirical studies show that only the "mutual" regime, characterized by greater tendency to invest in human capacities and more gender-egalitarian organization of care work, is positively associated with economic growth. Further, Braunstein et al. (2021) argue that this regime creates conditions such that higher WLFP can promote economic growth, albeit they do not empirically test this proposition.

In this study, along the lines of Braunstein et al. (2020; 2021), I construct two composite scores for each state in the U.S using principal component analysis (PCA). I use a different and more relevant set of variables and combining the two scores I assign states into one of the four SR regimes. As such, this is the first attempt to design a U.S.-specific gender-aware empirical model that incorporates the concept of SR by including aspects of gender inequality in unpaid care work, public and market sector provisioning of care, and social-welfare policies. The second contribution of the study is to empirically examine the effect of WLFPR on economic growth conditional on different SR regimes. I do so by testing two key predictions of the Braunstein et al. (2011) model, first by comparing the average per-capita growth rate of states in different regimes, and second by examining how an exogenous change in WLFPR interacts with the different SR regimes to determine growth. Third, the study is a novel attempt that utilizes unpaid care work data from the American Time-Use Survey (ATUS) for state-level comparisons and to assess macroeconomic outcomes. The study thus provides new empirical insights on how regimes compare to each other in terms of economic growth and how they affect growth when WLFP is integrated in the model. I show that the mutual regime experiences higher per-capita growth rate compared to the exploitative, wage-squeeze, and time-squeeze regimes, and that increasing WLFPR is positively associated with growth in mutual regime and wage-squeeze regimes. The results indicate that increasing WLFP to achieve economic growth may not be sufficient to achieve gender-egalitarian and pro-care growth, thus drawing attention to assessing the *nature* of growth or the pathway to achieving growth such that its costs in terms of gender unequal sharing of SR is incorporated in societal well-being analysis. Finally, the study highlights the importance of generating additional empirical evidence on the relationship between WLFP and growth conditional on SR regimes for a more comprehensive understanding of the linkages between gender equality at the labor market

and intra-household levels, care provisioning and economic growth. Moreover, doing such empirical analysis at the subnational level will yield greater insights in devising effective policies sensitive to the geographical context, cultural norms, and institutions.

2. Literature Review: Gender, Care, and Macroeconomics

In standard macroeconomic analysis, SR activities were not included as potential contributors to a country's economic growth. The lack of recognition of unpaid care work in economic analysis contributed to the feminist research and policy agenda on care work (Benería, 1979; Waring, 1988). In 1990s, feminist economists highlighted the importance of developing new gender-aware approaches to macroeconomic analysis at four different levels: conceptual frameworks, formal models, empirical research, and policy formulation (Çağatay, Elson and Grown, 1995; Grown, Elson and Çağatay, 2000). One of the key propositions was to make unpaid reproductive labor visible, thereby setting the stage for expanding the role of gender and care work in macroeconomics. Research around the two-way linkage between gender equality and macroeconomic outcomes, structure, and policies gained momentum.

The first linkage examining the effect of macroeconomic policies on gender (in)equality gained attention while evaluating the gender differentiated effects of structural adjustment policies of 1980s and 1990s. Following these studies, researchers also assessed the impact of economic crisis on gender equality (Baneria and Feldman, 1992; Çağatay and Ozler 1995; Floro, Tornqvist and Tas, 2009; Fukuda-Parr, Heintz, and Seguino, 2013). Further, studies examined the impact of macro-level changes, such as labor force feminization, export-oriented growth, and technological development, on labor market gender inequality (Çağatay and Berik, 1990; Seguino, 2000; Tejani and Milberg, 2016; Braunstein and Seguino, 2018).

The second linkage or the reverse link examine the effects of gender equality on macroeconomic outcomes. Studies have mostly focused on how gender equality in the labor market affects macroeconomic variables like consumption, investment, trade, and economic growth (Blecker and Seguino, 2002; Berik, Rodgers, and Zveglich, 2004; Çağatay, 2007). Studies have found a positive effect of gender equality in education and employment on economic growth (Kabeer and Natali, 2013, Kabeer 2016; 2021). In the beginning of the 21st century, there was extensive research on the interaction of gender occupational segregation, gender wage inequality, and the structure of production (Braunstein, 2000; Seguino, 2000; Berik, Rodgers, Seguino 2009; Seguino 2010). However, the field of gender and macroeconomics has seen limited work on how care work that is disproportionately provided by women affect growth and development (Arora and Rada, 2017; Akram-Lodhi and Hanmer, 2008; Braunstein et al., 2011).

Moreover, gendered macro modelling has been relatively recent and limited in the feminist literature. Early feminist models focus on the macroeconomic consequences of changes in women's labor market participation and gender wage inequality (Darity,1995; Ertu ̇rk and Çağatay, 1995; Braunstein, 2000; Blecker and Seguino, 2002; Seguino, 2010). More recent feminist models are based on Keynesian, Kaleckian, and structuralist theories, with strong emphasis on the role of demand and distribution of income in determining macroeconomic outcomes in addition to supply-side factors. However, macro modelling of care work has remained limited even in the feminist literature (Akram-Lodhi and Hanmer, 2008; Braunstein et al., 2011). Only recently, modelling, and empirical research has started to shed light on the macroeconomic effects of care provisioning and its gendered distribution. Some studies indicate a positive effect of public investment in physical and social care infrastructure, that reduce women's unpaid care burden, on employment and gender-inclusive growth (Kim, Ilkkaracan, and Kaya, 2019;

Ilkkaracan, Kim, Masterson, Memiş, and Zacharias, 2021; Onaran, Oyvat, and Fotopoulou, 2022; Onaran and Oyvat 2022). In the last decade, some feminist macroeconomists, mainly heterodox, incorporated an explicit macroeconomic role for the gendered nature of social reproduction of people and production of human capacities in growth and development theory. Braunstein et al. (2011), for the first-time integrated SR in a structuralist macroeconomic model. The model shows how the organization of SR—that is, the extent to which reproduction takes place in the household, public or market sectors— and the gender distribution of the labor in each sector influences production of human capacities on the supply side that in turn affects productivity of labor. Further, the model incorporates caring spirits of economies on the demand side by adding investment in human capacities to the investment function. The model includes paid and unpaid labor and their feedback effects on the economy. Further, Braunstein et al. (2020, 2021) provided empirical evidence on care and macroeconomics and show that societies' organization of social reproduction matters for economic growth. Braunstein et al. (2020) conducted a cross-country analysis using data for 156 countries between 1991 and 2015 and find that 18 percent of these countries belong to mutual regime, 34 percent to time squeeze, 36 percent to wage squeeze and 12 percent to exploitative. Braunstein et al. (2021) extended this analysis to examine the relationship between the *strength of belonging to a particular stylized regime* and economic growth using data for 121 countries. Their findings indicate that only the mutual regime which is characterized by greater tendency to invest in human capacity and more gender egalitarian sharing of unpaid household work, greater public provisioning of care and affordable access to market substitutes of unpaid care goods, is positively associated with economic growth. Although they argue that in a mutual regime, increasing women's wages and WLFP would reinforce growth, they do not empirically test this. They also find that time-squeeze and exploitative regimes, characterized by pressure on

women's care time when their labor force participation increases (due to absence of gender-egalitarian supports for care provisioning), was negatively associated with growth. Results for the wage-squeeze regime indicated a negative relation with growth but was statistically insignificant. However, it is important to note that this empirical work only shows how the *strength of different regimes* is associated with growth and does not completely test the 2011 model's prediction, i.e, if WLFP increases exogenously, how will it affect economic output and growth. For instance, the regression analysis only revealed that if Region A has stronger characteristics of a mutual regime than region B, region A would experience higher growth rate. In this study, I provide empirical evidence on the effects of an exogenous increase in WLFP on economic growth, in all four regimes, for U.S. states.

Finally, very few U.S.-specific studies empirically examine the relationship between gender and macroeconomic outcomes (Cavalcanti and Tavares, 2016; Berik and Kongar, 2013). Further, to my knowledge there is no U.S.-specific study that specifically examines the SR performance at national- or state-level or examine how WLFPR interacts with states' SR to affect their per-capita economic growth. Although U.S. states experience common federal policies and macroeconomic environment; they vary in terms of social spending, caring spirits, social and cultural norms, and policy implementation processes, factors which can guide more effective formulation of state-level policies. In this study, by extending the empirical work of Braunstein et al. 2020 and 2021, I contribute to the sparse scholarship on the relationship between WLFPR and economic growth driven by conditions of SR and caring spirits in the context of U.S. states. A state-level analysis will help formulate more focused policy decisions regarding gender equality and inclusive development guided by aspects of SR. While the economic development of the U.S. is comparable to other affluent countries, the U.S. has lagged these countries in indicators of

maternal health and public provisioning of care and health benefits (Gunja, Tikkanen, Seervai, and Collins, 2018). The country-level analysis conceals within country variations which are crucial in designing state-specific policies sensitive to state's demographic condition, income level, fiscal capacity, and cultural norms. For instance, states that perform poorly in terms of distribution of SR can devise policies that promote equitable sharing of unpaid housework, care-conscious workplace environment, and greater public provisioning of care in terms of affordable and good quality childcare centers.

3. Conceptual framework

Only a few structuralist models explicitly incorporate gender, primarily focusing on the macroeconomic consequences of gender wage inequality and women's labor force participation (Erturk and Çağatay, 1995; Blecker and Seguino, 2002; Seguino, 2010), albeit they leave out gender inequality in provisioning of paid and unpaid care work. Braunstein et al. (2011) filled this gap by incorporating gender and care work in a structuralist macroeconomic growth model in which the functional distribution of income as measured by wage and profit shares, plays a central role in determining consumption, investment, and the level of output. Moreover, social context of production significantly affects economic outcomes. For instance, a society with greater gender equality in wages and labor force participation, would differ from a gender-inegalitarian society in terms of demand and consumption of market substitutes of non-market goods and services.

The model by Braunstein et al. (2011) has a demand and a supply side to care provisioning. On the supply side, it integrates care work as an input into the market production process via its impact on workforce through the process of reproduction of labor. Therefore, labor is considered a *produced* means of production. On the demand side, investment in human capacities, which is reflective of *caring spirits* of economies is added to the investment function that generally includes

only investment in physical infrastructure. Braunstein et al. (2021) define "caring spirits," as the tendency (shaped by social norms, individual motivation or public preferences embedded in the social welfare state) to provide or support care for oneself and others to build up the quantity or quality of human capacities in ways that add to current aggregate demand and raise long-term productivity. The underlying idea is that investment in human capacities also adds to aggregate demand and contributes towards future productivity. The framework combines the caring spirits on the demand side and distribution of SR activities on the supply side among the three spheres– household, state, and market– to determine economic growth impacts when women's labor force participation (WLFP) and wages increase. In other words, whether an increase in WLFP and wages would increase or decrease growth would depend on the underlying SR of labor on the supply side and caring spirits on the demand side.

A) Supply side reflects distribution of the time and money costs of SR among women, men, state, and market. An increase in WLFP would affect human capacities production depending on the prevailing social structure of distribution of care provisioning. The idea is that if women increase their paid labor, the production of human capacities might adversely be affected if there is not enough support from other care providers– men, public sector, and the market. Braunstein et al (2011) classifies economies into **low-road** and a **high-road**, based on a range of factors that affect production of human capacities.

    i)   Low road is characterized by lower sharing of household work by men, poor public care services, poor care policies, lower wages for care workers who are mainly women, lower quality market care, and poor market substitutes for unpaid household work. In the low-road scenario an increase in women's labor force

participation, is associated with a decline in investment in human capacities due to the poor availability of care from other sources.

ii) High road is characterized by gender equitable sharing of household, i.e men contributing to domestic chores and caregiving, adequate public provisioning of care services and care infrastructure, higher wages for care workers who are mainly women, high quality market care, and good quality market substitutes for unpaid household work. In the high-road scenario an increase in WLFP, is associated with an increase in investment in human capacities due to the availability of good quality care provisioning from other sources.

B) The demand side focuses on investment in human capacities as a component of total investment. On the demand side, Braunstein et al. (2011) characterize economies as care-led and inequality-led.

iii) Care-led economies are the ones where greater gender equality in the labor market reflected in higher wages for women is expansionary for aggregate demand and growth. In other words, the expansionary effect of higher wages for women, in terms of increased investment in human capacities outweighs contractionary impact of higher wages on profits and investment by firms. The expansionary effect owes to gender-differentiated consumption patterns. Specifically, higher wages particularly for women result in greater demand for care provisioning as research across countries suggest that women's higher wages and their greater control over income are associated with greater spending on nutrition, health, education, and household welfare (Bruce, 1989; Thomas, 1990). This in turn would drive growth. Moreover, care-led economies have stronger caring spirits. In care-led societies

investment demand is driven by a combination of physical capital or technology, and investment in reproducing labor, which in turn contributes to growth by building labor's productive capacities.

iv) Inequality-led economies are the ones where higher wages for women workers are contractionary and negatively associated with investment demand and growth. Workers' earnings do not translate into investment in labor sufficiently, such that the contractionary impact of higher wages on profit and physical investment demand is more likely to outweigh the expansionary impact on consumption and human capacities investment demand. Inequality-led economies also represent economies that are dependent on external demand to drive growth and have public policies focusing on open markets for trade and investment. The regime reflects weak caring spirits that deprioritize and devalue spending on building human capacities.

Regimes

Braunstein et al. (2011) delineate four social reproduction regimes that predict the relationship between higher WLFP and economic growth. The underlying idea is that this relationship would depend on the organization of SR and demand- side conditions of investment in human capacities. Table 1 provide the description of each regime.

[Insert Table 1]

4. Empirical Analysis

The empirical analysis in this study is twofold. First, using Principal Component Analysis (PCA) I generate two composite scores to capture aspects of U.S. states' care provisioning on the supply side and investment in building human capacities on the demand side, respectively. The interaction

of these scores is used to classify states in the four SR regimes. Second, I use the regimes and conduct fixed-effects regression estimation, controlling for region and time fixed effects, to examine the i) per-capita GDP growth rates in different regimes, and ii) the effect of an increase in WLFPR on state's per-capita economic growth in different regimes. The objective is to analyze the variation in growth rates and relation between WLFPR and growth across varying structures of social reproduction and caring spirits of the states.

5. Data and Methodology

Data

The study uses data on a set of variables to estimate supply and demand scores for three time periods- 2003-2007, 2008-2012, 2013-2018. I selected the time periods based on state-level time-use data, which are available as five-year averages starting from 2003. The choice of these specific 5-year periods aligns with business cycles. I compiled data for 50 states and the District of Columbia (D.C) in the U.S from multiple sources. Tables 2 and 3 list the variables used to construct the composite supply and demand scores, along with their definitions, expected relation with composite scores, and data sources. In turn, I use these scores in regression analysis.

[Insert Table 2]

[Insert Table 3]

The supply score is a composite score calculated as a linear combination of unpaid work gender ratio (ratio of average daily hours spent on domestic chores and caregiving by women and men); relative median wages of care sector workers (weighted average of hourly median wages of workers in the following occupations: childcare, preschool, nursing aides, orderlies, and attendants, home health aides, and personal-care aides divided by hourly median wage of workers in all occupations combined); social spending on education and hospital expenditure (excluding

capital outlay), libraries, health, public welfare, employment security administration, unemployment compensation, employee retirement, and veterans' services, as a share of total expenditure; and licensed childcare slots (LCC) per 1000 children in the age group 0-12. All the variables, except for unpaid care work gender ratio, are associated with a more gender-egalitarian or high-road organization of social reproduction, therefore expected to have positive coefficients indicating a positive relation with the composite supply score. For unpaid care work gender ratio, a higher ratio indicates a more gender inegalitarian sharing of care work in households, therefore this variable is expected to have a negative coefficient.

The demand score is a composite score calculated as a linear combination of state capital spending as a share of GDP, Temporary Assistance to Needy Families (TANF) and Supplemental Security Income (SSI) recipient families for every 100 poor families with children under 18 in the household; share of poor families who are beneficiaries of the Supplemental Nutrition Assistance Program (SNAP), and appropriations of state tax funds for higher education as a percentage of GDP. These variables that measure the elements associated with care-led growth are expected to have a positive relation with the composite demand score.

Methodology

The empirical analysis relies on PCA to construct two composite scores to measure the demand and supply of social reproduction, respectively. PCA is a data-reduction technique that helps in getting a composite score for multiple correlated variables. The resulting principal components are a linear combination of the original variables and contain as much information as possible about the original variables. All the variables were standardized for comparison purposes since the units vary across variables. To examine sampling adequacy, Kaiser-Meyer-Olkin (KMO) test was

conducted. A KMO statistic lies between 0 and 1 and indicates whether the selected data variables are suitable for conducting a PCA. High values generally suggest that a principal component analysis is useful with the selected data. In this study, KMO score was found to be greater than 0.50, making the sample statistically adequate to conduct PCA (Table 5). Further for a robustness check I conducted a Bartlett test of sphericity. The null hypothesis of the test is that the variables are orthogonal, that is they are not correlated. For a meaningful PCA we require the variables to be correlated. The test results rejected the null hypothesis.

6. Results: Principal Component Analysis

Table 4 presents the descriptive statistics of the supply- and demand-side variables for the three time periods. The supply-side variables, reflecting the distribution of SR among men, women, public sector, and market, has remained nearly unchanged across the three time periods. Across the U.S. states women on average spend 33% more time in unpaid care work per day compared to men, in the three time periods respectively. This indicates that gender inequality in sharing of unpaid care work within households has been prevalent and nearly unchanged. The relative median wages of care sector workers stood at 68.3%, 66.8 and 65.7% in the three time periods respectively. Further, the licensed childcare slots per 1000 children in the age group 0-12 were 156, 185 and 220 in the three time periods respectively (or 15-22%), which reflects that a significant proportion of people experience poor or negligible availability of childcare service in the market, even though the share has been improving. These estimates indicate that there is potential to increase public provisioning of childcare and improve quality of market care which could potentially reduce unpaid care work burden and the associated gender unequal sharing of it. Further, the average

social spending by states on education services, public welfare, hospital, health, employment security administration and employee retirement, as a share of their total expenditure stood at 56.2.%, 57.6% and 59.2% in the three time periods respectively.

On the demand side, average state capital spending as a share of GDP has remained around 2% for all the three time periods, with a slight decline from 2008-12 to 2013-17 (Table 4). The share of TANF and SSI recipient families in total poor families with children under 18 in the household stood at around 27% in the three time periods; share of poor families who are beneficiaries of the SNAP has seen a slightly increasing trend- 39%, 44%, 45% in the three time periods respectively. However, since only a quarter of poor families receive TANF and SSI benefits, and less than 50% are SNAP beneficiaries, there is scope to expand coverage for these generosity and welfare programs for the recipient families. Further, appropriations of state tax funds for higher education as a percentage of GDP has shown a slightly declining trend – 0.56%, 0.53 %, and 0.47 % in the three time periods, respectively.

[Insert Table 4]

Table 5 presents the PCA results, showing the coordinates of the demand and supply variables on the second principal component (PC2) for demand score and first principal component (PC1) for the supply score, for all three time periods. PC2 and PC1 were selected based on the hypothesized sign of the variable loadings on the composite scores. The coordinates reflect the loading of the variables on the scores, in other words their relationship with the scores. I find that 29%, 26% and 26% of the variance is explained by PC2 of the demand score whereas for the supply score PC1 explains 39%, 40% and 34% of the variance, for the three time periods, respectively.

[Insert Table 5]

How do the demand-side variables affect the demand score?

The variables used to construct the demand score measure the elements associated with care-led growth and are expected have a positive relation with the demand score. As expected, there is a positive sign on the state capital spending as a share of total expenditure, which indicates that a higher investment in physical infrastructure, such as highways, water, sanitation, and other infrastructural development contribute positively to aggregate demand as well as create better condition for human development. Similarly, using greater share of state tax funds for investment in higher education is an indication of greater caring tendencies towards investment in education and productivity of workforce. Finally, greater share of poor families receiving TANF/SSI and SNAP benefits reflect greater generosity of the states towards the less privileged/needy section of the society.

How do the supply-side variables affect the supply score?

The variables used to construct the supply score contribute to the production of human capacities that can take place within household, in the public sphere and/or in the market sphere and are gender egalitarian. First, unpaid work gender ratio is reflective of gender equality in sharing of SR activities that takes place within households. This ratio is generally greater than one indicating that women contribute more than men towards SR in terms of unpaid care work. The variable has a negative sign, which means it contributes negatively to the supply score, primarily because a higher ratio would mean that there is gender unequal sharing of unpaid care work within household. Second, relative wage of care sector workers is reflective of market provisioning of quality of care and working conditions of care sector workers and has a positive sign. A higher ratio contributes positively to the supply score because higher wages for care sector workers would indicate better labor market conditions and better-quality care provisioning by the private and

public sector. Care services in the market are mostly provided by women workers. Lower wages for these workers mean that they are also less likely to afford market substitutes to meet unpaid care needs and thereby compensate for the decline in the nonmarket work time due to their greater market participation. The weak demand for care services, keep their prices—and the wages of these workers—low. Third, social spending as a share of total expenditure captures public sector contribution to supply score. A positive sign on this variable indicates that greater social spending can lead to production of human capacities that contributes positively to SR. Fourth, LCC facilities provides insight about the capacity and quality of childcare services available in the market. As expected, the variable has a positive sign thus contributing positively to SR.

Figure 1a presents the scatter plot of the supply and demand scores for 2013-17, classifying states in one of the four regimes based and Figure 1b shows the associated map of the U.S.

[Insert Figure 1a]

[Insert Figure 1b]

Table 6 provides distribution of states by regime for the three-time periods. While the U.S is considered one of the most affluent countries in the world with the highest GDP, according to the findings of this study, in the latest period– 2013-17, 55% states belong to inequality-led regimes (exploitative and wage squeeze combined) reflecting profit-led and low-caring spirits; and nearly 50% states belong to low-road SR regimes (time squeeze and exploitative combined) reflecting poor and gender-unequal production of human capacities This cast doubt on the nature of economic growth and development experienced in these states, specifically how that growth is generated or how the growth is utilized. Further, results show that in the period 2013-17, 20% of states belong to the mutual regime, 24% to the exploitative, 26% to the time squeeze, and

31% to the wage squeeze. Moreover, the share of states belonging to the exploitative regime has risen over time and those belonging to the mutual regime has fallen.

[Insert Table 6]

We find that the classification of most states in their respective regimes fit expectations. For example, Utah, Texas, Tennessee, Virginia, Florida, Nevada, Kansas, and Nebraska belong to exploitative regime and are also generally ranked poorly in terms of gender equality and status of women, specifically in care provisioning and political participation of women (Hess, Milli, Hayes, Hegewisch, Mayayeva, Román, and Augeri, 2015). Most of these exploitative states lie in southern, mid-western and western regions. Further, states like Vermont, Maine, Oregon, Iowa, and Wisconsin belong to mutual regime, and are also generally rank high in terms of gender equality, availability of care, women's political participation, employment and earnings equality, and women's health and well-being (Hess et al. 2015) whereas states like Pennsylvania North Dakota, Idaho, Illinois, Louisiana, and Arizona rank low in these indicators, and also lie in time squeeze regime. Both these set of states also possess high caring tendencies on the demand side. Finally, states like New Jersey and Minnesota which are generally ranked high in gender equality and care provisioning, as expected, lie in wage squeeze regime, but have lower caring spirits on the demand side compared to the states that belong to the mutual and time squeeze regimes.

For states whose regimes are counterintuitive, the results are driven by their better/worse performance compared to the average in one or more of the indicators used to construct the supply or demand scores. Therefore, the study highlights the importance of using a comprehensive set of variables to assess states' gender equality and care performance. For instance, while New York and District of Columbia, both have above average availability of licensed childcare slots, they belong to time squeeze regime/ low-road SR because they perform worse than the average in terms

of relative wages of care sector workers, gender-equitable sharing of household work, and social spending. Hence, it is important to include these latter variables in addition to the availability of market or public care centers to examine gender-equitable care provisioning in a state. In other words, increasing availability of childcare centers may not be sufficient until it is complemented with improvement in care sector workers' wages and more equitable sharing of household work. Moreover, states like Alabama, Wyoming, Montana, North Carolina, South Dakota belong to wage squeeze, however, these are generally ranked lower in gender equality and availability of public and market substitutes (Hess et al. 2015). Their position in high-road SR as characterized by wage squeeze regime is driven by their better than the average performance on public social spending and/or greater gender-equitable sharing of unpaid work. Therefore, it is importance to study gender inequality within household in addition to labor market gender-egalitarian indicators and government's willingness to spend on social needs. Similarly, for Mississippi, which belong to mutual regime but is generally ranked low in gender equality and availability of public/market care, we find near equality in sharing of unpaid household work, highest social spending as a share of total expenditure, above average availability of licensed childcare slots and 4 pp higher relative wages of care sector workers compared to the average.

One caveat of the empirical framework is that states belong to a particular regime based on the set of variables used to construct the composite scores. The choice of variables in this study is supported by theory and grounded in past literature on gender equality, social spending, care work and generosity programs. However, there could be some other variables to capture gender-equitable-sharing of SR and caring tendencies of states, therefore it is important to analyze results in light of the specific variables used and their respective component loadings or weights in constructing the composite scores. Further, PCA provides relative analysis, which means states

belong to a particular regime relative to the average, which is the origin of the 4-quadrant figure (Figure 1a).

7. Economic Growth, Women's Labor Force Participation and SR Regimes: Regression Analysis

In this section I examine the relationship between WLFPR and per-capita GDP growth rate in different regimes using a pooled ordinary least squares (OLS) regression model with region and time fixed effects. The baseline model (*Model 1*) is given in Equation 1.

$$g_{it} = \beta_0 + \beta_1 lnGDP_{it0} + \beta_2\, INV_{it} + \beta_3 H_{it} + \beta_{15} R_i + \beta_6 T_t + \varepsilon_{it} \qquad \text{Equation (1)}$$

where g_{it} is the average annual growth in real per-capita GDP (PCGR) in state i over time t, is a function of –

1. $lnGDP_{it0}$ which is log of real per-capita GDP at the beginning of the time period. This variable measures the convergence effect, which is the tendency of poor countries to grow faster than rich countries because of decreasing returns to capital and the lower costs of replication versus discovery (Mankiw, Romer, and Weil, 1992). Hence, the coefficient of this variable is expected to be negative.

2. INV captures physical investment, measured by average gross fixed capital formation over the period. The coefficient of this variable is expected to be positive.

3. H is the stock of human capital, measured as share of people with a bachelors (BA) or higher degrees in the total population aged 25 years and older during the three time periods. The coefficient of this variable is expected to be positive.

4. R_i captures region-fixed effects to control for time-invariant state-level heterogeneity and T_t captures time-fixed effects.

The baseline model is similar to an augmented Solow-type growth decomposition analysis that includes supply-side factors affecting growth (Solow, 1956) and accumulation of human capital (Mankiw, Romer, and Weil, 1992).

In Model 2, I add WLFPR to the baseline model to examine the relationship between PCGR and WLFPR, independent of states' SR regimes. Model 2 is as follows–

$$g_{it} = \beta_0 + \beta_1 lnGDP_{it0} + \beta_2 INV_{it} + \beta_3 H_{it} + \beta_4 WLFPR_{it} + \beta_{11} R_i + \beta_{12} T_t + \varepsilon_{it}$$

Equation 2

where $WLFPR_{it}$ is women's labor force participation rate in state i and in time-period t.

In *Model 3*, I add WLFPR, three regime dummies, and their interaction terms to the baseline model to examine how WLFPR interacts with SR regimes to affect economic growth. I interact WLFPR with dummy variables for three of the four regimes– mutual, time squeeze, and wage squeeze to capture the effect of change in WLFPR on PCGR in different regimes relative to the exploitative regime (reference category). Model 3 is different from the empirical model used by Braunstein et al. 2021 in that it incorporates WLFPR in the growth model and estimates its relationship with states' per capita growth rate across regimes, rather than estimating the relationship between *the strength of the regimes* and states' per capita growth rate. Model 3 is as follows–

$$g_{it} = \beta_0 + \beta_1 lnGDP_{it0} + \beta_2 INV_{it} + \beta_3 H_{it} + \beta_4 WLFPR_{it} + \beta_5 MU_{it} + \beta_6 TS_{it} + \beta_7 WS_{it} +$$
$$\beta_8(MU_{it} * WLFPR_{it}) + \beta_9(TS_{it} * WLFPR_{it}) + \beta_{10}(WS_{it} * WLFPR_{it}) + \beta_{11} R_i + \beta_{12} T_t +$$
$$\varepsilon_{it}$$

Equation 3

where $WLFPR_{it}$ is the women's labor force participation rate in state i and in time-period t; MU_{it} , TS_{it} , WS_{it} are the mutual, time squeeze, and wage squeeze dummies respectively; and εi is a random error term.

8. Regression Results

Table 7 provides description of variables used in the regression analysis while Table 8 presents their descriptive statistics. Columns (1) – (3) of Table 9 present the estimates for Model 1, Model 2, and Model 3, respectively.

[Insert Table 7]

[Insert Table 8]

[Insert Table 9]

In Table 9, Column (1), all the coefficients are statistically significant, and the signs are as expected. A negative coefficient on logPCGDP at the beginning of the period indicates the convergence effect, a positive sign on the investment variable captures the positive relation between physical investment and PCGR, whereas a positive sign on human capital stock supports the idea that greater human capital stock in terms of more educated workforce would contribute positively to growth.

In Table 9, Column (2) shows that a 1 pp increase in WLFPR above the average level is associated with 0.27 pp increase in PCGR and is statistically significant at 10 percent. In other words, on average there exists a positive relationship between WLFPR and economic growth in U.S states.

In Table 9, Column 3 shows that on average, states in mutual and wage squeeze regimes have 13.30 pp and 9.15 pp higher PCGR, respectively, compared to exploitative regime when WLFPR is set at zero. Both these estimates are statistically significant at 1 percent. States in the

time-squeeze regime have 6.46 pp higher PCGR than the exploitative regime but is statistically insignificant.

WLFPR and per-capita growth rate in different regimes–

In Table 9, Column 3 shows that a 1 pp increase in WLFPR above the average level is associated with a 0.27 pp increase in PCGR in the exploitative regime (reference category), however the coefficient is statistically insignificant. The positive coefficient is plausible because an increase in WLFPR can be associated with a higher per-capita growth in this regime, however the nature of this growth would be based on gender-unequal care structures and inequality-led investment /low caring spirit. In other words, growth is driven by potential double burden of work by women workers and/or low wages for care sector workers. Further, in mutual regime, a 1 pp increase in WLFPR above the average level is associated with a 0.06 pp increase in PCGR. This is captured by $(\beta_4 + \beta_8)$ and the F-test of joint significance reveal that it is jointly statistically significant at 5 percent. Similarly, in wage squeeze regime a 1 pp increase in WLPR above the average level is associated with a 0.11 pp increase in PCGR, captured by $(\beta_4 + \beta_{10})$ which again is jointly significant ($p<0.10$). For time squeeze regime, this estimate is positive but statistically insignificant. Therefore, in all the regimes, increasing WLFP is positively associated with growth, however this growth is characterized by different care structures.

Relative performance of regimes–

In Table 9, Column 3 also shows that, on average, mutual regime is expected to experience 13.09 pp higher average PCGR compared to exploitative regime when WLFPR is fixed at a particular level, say at an average level Xo. This is captured by $\beta_5 + \beta_8$ and is jointly significant at 5 percent. This estimate is 8.99 pp ($p<0.05$) for wage squeeze regime, and 6.35 pp for time squeeze, but is

statistically insignificant for the latter. Further, the coefficients on the interaction terms – $\beta_8, \beta_9,$ and β_{10} capture the difference, in the average *change* in PCGR when WLFPR increases by 1 pp, between mutual and exploitative regimes, time squeeze and exploitative regimes, and wage squeeze and exploitative regimes, respectively. Results show a 1 pp increase in WLFPR above the average level is associated with a greater increase in PCGR in exploitative regime compared to– mutual regime by 0.21 pp ($p<0.01$), wage squeeze regime by 0.16 pp ($p<0.05$) and time squeeze by 0.11 pp (statistically insignificant).

In sum, mutual regime experience higher average level of PCGR compared to wage squeeze, time squeeze, and exploitative regimes. Both mutual and wage squeeze regimes which are characterized by gender-equal care structures on the supply side, experience a positive (and statistically significant) relationship between WLFPR and PCGR, however the effect of a marginal increase in WLFPR is associated with a lower increase in PCGR in these regimes compared to exploitative regime. This is a plausible finding, because exploitative regime could experience greater increase in PCGR with an exogenous shock in the form of an increase in WLFPR, however this growth is achieved at the cost of unpaid and paid care providers, mainly women workers. Also, this growth would be less likely to be sustainable, especially because if higher WLFPR is not complemented with higher wages, it will discourage women works to join the workforce especially because the opportunity cost of unpaid caregiving will fall and in the lack of publicly provided or good quality market substitutes, women would tend to divert away from paid work to unpaid caregiving needs. In contrast, results show that mutual regime which is characterized by more gender equal arrangements in the household, higher public social spending on care, and better care provisioning via the market, is compatible with higher per capita growth rates. Therefore,

economies that prioritize care provisioning and investment in human capacities, can achieve higher growth rates, and in these economies, higher WLFPR is also associated with higher PCGR (even if by a smaller margin compared to exploitative or wage squeeze regimes). The results call for greater attention towards the nature of growth, in terms of gender-equal care structures and caring tendencies to investment in human capacities, and utilization of expanded gross domestic product. In other words, what it takes to achieve high economic growth or the cost of economic growth in terms of gender equality and human development is crucial and needs to be integrated in macroeconomic policy making.

Finally, the mutual-regime results substantiate the 2011 model predictions that increasing WLFPR in a mutual regime increases economic growth through human capacities production on the supply side, especially because of the supportive structure of SR, combined with higher caring spirits on the demand side. Although the results did not reveal a statistically significant relationship between WLFPR and PCGR in exploitative regime, however the positive coefficient does not align with the 2011 model predictions for the exploitive case. In contrast it shows that increasing WLFPR in an exploitative regime can be compatible with higher per-capita growth rate, however this growth is achieved at the cost of care workers and inequality-led demand structures that do not prioritize investment in human capacities.

9. Discussion and Conclusion

This study contributes new empirical evidence in the context of U.S. states on how distribution of care provisioning among men, women, the state and the market, and the state's caring tendencies to invest in human capacities create conditions for women's greater participation in the labor market and higher economic growth. I find that the mutual regime, characterized by gender-equal

care within household, strong support of care from public and market sectors, and pro-human capacity building tendency of states, is compatible with positive economic growth. In fact, states characterized by the mutual regime experience higher level of economic growth on average compared to states that belong to the exploitative, wage-squeeze or time-squeeze regimes. Moreover, the mutual regime exhibits a positive relationship between women's labor force participation (WLFP) and per-capita economic capita growth rate. However, only 20% of states in the U.S belong to this regime, which suggests that there is substantial potential to promote gender-equitable and pro-care growth and build human capacities in the remaining states. For instance, investing in public childcare infrastructure and services could be one immediate policy action. This would require federal investment along with policy initiatives at the state level that prioritize care-sector development and ease out procedural and logistical hurdles to availing care services. In addition, state paid parental leave laws and care-supportive workplace policies can also enhance gender-equitable sharing of childcare, help develop children's capacities, and increase women's labor force participation.

Going forward, there is scope to expand research using this empirical framework by adding a range of different variables including social policies. For instance, incorporating states' performance in implementing paid parental leave laws that are aimed at supporting unpaid caregiving within the household could provide additional insights on the contribution of care policies in social reproduction. In addition, to strengthen this line of research the study underscores the importance of gathering data on unpaid care work through more regularly conducted time-use surveys around the world. Stronger evidence will further substantiate the role of care in the macroeconomy and serve as a useful tool to mobilize stakeholders and policy makers. Further, future scope of this line of research includes examining the relationship between care regimes and

the ruling political party and women's political representation to assess linkages between party-specific policies, women's political empowerment, and gender-equitable economic growth.

In sum, the empirical evidence in this study substantiates that to achieve gender-egalitarian and pro-care economic growth, it is necessary to increase WLFP and ensure that economic growth is supported by gender-equitable care provisioning in the three sectors (household, public, and market sectors) and investment in human capacities. Specifically, the study calls for assessing the pathway or road to achieving economic growth and accordingly redistributing care work and modifying public investment decisions to ensure that growth targets are not met by paying women lower wages and/or squeezing their time through the double burden of paid and unpaid work.

References

Akram-Lodhi, A.H. and Hanmer, L.C., 2008. Ghosts in the machine: A Post Keynesian analysis of gender relations, households and macroeconomics. *In Frontiers in the Economics of Gender* (pp. 93-114). Routledge.

Arora, D. and Rada, C., 2017. A gendered model of the peasant household: Time poverty and farm production in rural Mozambique. *Feminist Economics*, 23(2), pp.93-119.

Benería, L., 1979. Reproduction, production, and the sexual division of labour. *Cambridge Journal of Economics*, 3(3), pp.203-225.

Beneria, L. and Sen, G., 1981. Accumulation, reproduction, and women's role in economic development: Boserup revisited. Signs: *Journal of women in culture and society*, 7(2), pp.279-298.

Beneria, L., & Feldman, S., 1992. *Unequal Burden: Economic Crises, Persistent Poverty, and Women's Work,* Colorado: Westview Press.

Benería, L., Berik, G. and Floro, M.S., 2016. Paid and unpaid work: meanings and debates. *Gender, Development and Globalization: Economics as if All People Mattered*, New York: Routledge, pp.179-226.

Berik, G., Rodgers, Y.V.D.M. and Zveglich, J.E., 2004. International trade and gender wage discrimination: Evidence from East Asia. *Review of Development Economics*, 8(2), pp.237-254.

Berik, G., Rodgers, Y.V.D.M. and Seguino, S., 2009. Feminist economics of inequality, development, and growth. *Feminist Economics*, 15(3), pp.1-33.

Berik, G. and Kongar, E., 2013. Time allocation of married mothers and fathers in hard times: The 2007–09 US recession. *Feminist Economics*, 19(3), pp.208-237.

Blecker, Robert A. and Stephanie Seguino. 2002. Macroeconomic effects of reducing gender wage Inequality in an export-oriented, semi-industrialized economy. *Review of Development Economics* 6(1): 103–19

Braunstein, E., 2000. Engendering foreign direct investment: Family structure, labor markets and international capital mobility. *World Development*, 28(7), pp.1157-1172.

Braunstein, E., Van Staveren, I. and Tavani, D., 2011. Embedding care and unpaid work in macroeconomic modeling: a structuralist approach. *Feminist Economics*, 17(4), pp.5-31.

Braunstein, E. and Seguino, S., 2018. The impact of economic policy and structural change on gender employment inequality in Latin America, 1990–2010. *Review of Keynesian Economics*, 6(3), pp.307-332.

Braunstein, E., Bouhia, R. and Seguino, S., 2020. Social reproduction, gender equality and economic growth. *Cambridge Journal of Economics*, 44(1), pp.129-156.

Braunstein, E., Seguino, S. and Altringer, L., 2021. Estimating the role of social reproduction in economic growth. *International Journal of Political Economy*, 50(2), pp.143-164.

Bruce, J. (1989). Homes divided. *World Development*, 17(7), 979-991.

Çağatay, N. and Berik, G., 1990. Transition to export-led growth in Turkey: is there a feminization of employment? *Review of Radical Political Economics*, 22(1), pp.115-134.

Çağatay, N. and Özler, Ş., 1995. Feminization of the labor force: The effects of long-term development and structural adjustment. *World Development*, 23(11), pp.1883-1894.

Cagatay, N, Elson, D, and Grown, C., 1995. Special Issue on Gender, Adjustment and Macroeconomics, *World Development,* November, 23(11).

Cavalcanti, T. and Tavares, J., 2016. The output cost of gender discrimination: A model-based macroeconomics estimate. *The Economic Journal*, 126(590), pp.109-134.

Darity Jr, W., 1995. The formal structure of a gender-segregated low-income economy. *World Development*, 23(11), pp.1963-1968.

Elborgh-Woytek, Katrin, Monique Newiak, Kalpana Kochar, Stefania Fabrizio, Kangi Kpodar, Philippe Wingender, Benedict Clements, and Gerd Schwartz. 2013. "Women, Work, and the Economy: Macroeconomic Gains from Gender Equity." IMF Staff Discussion Note. Available at: https://www.imf.org/external/pubs/ft/sdn/2013/sdn1310.pdf

Ertürk, K. and Çağatay, N., 1995. Macroeconomic consequences of cyclical and secular changes in feminization: an experiment at gendered macromodeling. *World Development*, 23(11), pp.1969-1977.

Floro, M.S., Tornqvist, A. and Tas, E.O., 2009. The impact of the economic crisis on women's economic empowerment. Swedish International Development Agency Working Paper Series, pp.2009-26.

Folbre, N., 1994. Who pays for the kids?: Gender and the structures of constraint. Routledge.

Folbre, N. 2006. Measuring care: Gender, empowerment, and the care economy. Journal of Human Development, 7(2), 183-199.

Kabeer, N., & Natali, L., 2013. Gender equality and economic growth: Is there a win-win?. *IDS Working Papers*, 2013(417), 1-58.

Kabeer, N., 2016. Gender equality, economic growth, and women's agency: the "endless variety" and "monotonous similarity" of patriarchal constraints. *Feminist Econo*mics, 22(1), 295-321.

Kabeer, N., 2021. Gender Equality, Inclusive Growth, and Labour Markets. *In Women's Economic Empowerment* (pp. 13-48). Routledge.

Fukuda-Parr, S., Heintz, J. and Seguino, S., 2013. Critical perspectives on financial and economic crises: Heterodox macroeconomics meets feminist economics. *Feminist Economics*, 19(3), pp.4-31.

Grown, C., Elson, D., & Cagatay, N. 2000. Special issue on Gender, Macroeconomics, Trade and Finance, *World Development*, 28(7).

Gunja, M.Z., Tikkanen, R., Seervai, S. and Collins, S.R., 2018. What is the status of women's health and health care in the US compared to ten other countries. *The Commonwealth Fund.*

Hess, C., Milli, J., Hayes, J., Hegewisch, A., Mayayeva, Y., Román, S., & Augeri, J. 2015. "The status of women in the states: 2015". Washington, DC: *Institute for Women's Policy Research (IWPR).*

Ilkkaracan, I., Kim, K., Masterson, T., Memiş, E. and Zacharias, A., 2021. The impact of investing in social care on employment generation, time-, income-poverty by gender: A macro-micro policy simulation for Turkey. *World Development*, 144, p.105476.

Kim, K., Ilkkaracan, I., & Kaya, T., 2019. Public investment in care services in Turkey: Promoting employment & gender inclusive growth. *Journal of Policy Modeling*, 41(6), 1210-1229.

Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, 107(2), 407-437.

Oyvat, C, and Onaran, Ö., 2022. The effects of social infrastructure and gender equality on output and employment: the case of South Korea. *World Development* 158, p.105987.

Onaran, Ö., Oyvat, C. and Fotopoulou, E., 2022. Gendering macroeconomic analysis and development policy: a theoretical model. *Feminist Economics* pp. 1-33.

Seguino, S., 2000. Gender inequality and economic growth: A cross-country analysis. *World Development*, 28(7), pp.1211-1230.

Seguino, S., 2010. Gender, distribution, and balance of payments constrained growth in developing countries. *Review of Political Economy*, 22(3), pp.373-404.

Solow, R. M., 1956. A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1), 65-94.

Tejani, S. and Milberg, W., 2016. Global defeminization? Industrial upgrading and manufacturing employment in developing countries. *Feminist Economics*, 22(2), pp.24-54.

Thomas, D. (1990). Intra-household resource allocation: An inferential approach. *Journal of Human Resources*, 635-664.

Waring, M. 1988. *If Women Counted: A New Feminist Economics*. San Francisco: Harper & Row.

Tables

Table 1. Social reproduction regimes

	Low Road	High Road
Care-led	**Time Squeeze** (Growth is elusive or unstable) Higher wages for women and higher investment in human capacities (because care-led) stimulate growth on the demand side, but greater market participation by women squeezes time and lowers human capacities production due to lower substitutability between market and non-market goods/services, lower sharing of domestic responsibilities, lower public social spending and poor-quality market care.	**Mutual** (Growth and social reproduction reinforce one another) Higher wages for women and higher investment in human capacities (because care-led) stimulate growth on the demand side. Higher WLFP and wages for women increase human capacities production on the supply side especially due to higher substitutability between market and non-market goods/services, gender egalitarian sharing of unpaid work, labor market gender equality, higher public social spending, and greater extent and quality of market care.
Inequality-led	**Exploitative** (Growth is partly based on exploiting women's labor and human resources) Higher wage for women lowers growth on the demand side and their greater market participation squeezes time and lowers human capacities production due to lower substitutability between market and non-market goods/services, lower sharing of domestic responsibilities, lower public social spending, and poor-quality market care.	**Wage Squeeze** (Growth is elusive or unstable) Higher wage for women lowers growth on the demand side but enhances human capacities production on the supply side.

Source: Braunstein et al. 2011

Table 2. Social reproduction principal component score variables

Element/Indicator	Variables	SR relation/ hypothesis	Source
1. Sharing of household responsibilities	Ratio (Women/Men) of unpaid care work (domestic chores plus direct caregiving)	Negative (a high ratio will indicate greater gender inequality in sharing unpaid work at home)	ATUS (2003-07, 2008-12, 2013-17). This data at state level is only available as 5-year average
2. Public provisioning of care	Social spending (SS) as a share of total expenditure of states (spending on Education and Hospital expenditure excluding capital outlay; Libraries; Health; Public welfare; employment security administration; unemployment compensation, employee retirement, Veterans' services)	Positive	US Census Bureau (State and Local Govt Finances) (2003-17)
3. Quality of Market care	Ratio of median wages of care sector workers to median wages of all occupation combined (weighted average of hourly median wages of workers in the following occupations – childcare; preschool; nursing aides, orderlies, and attendants; home health aides; and personal care	Positive	Bureau of Labor Statistics (BLS)- Occupation data (2003-2017)

	aides divided by hourly median wage of workers in all occupations combined)		
4. Extent of market care/access to quality care institutions	-Licensed childcare (LCC) slots per 1000 children in the age group 0-12	Positive	NARA Licensing (2005, 2008, 2011, 2014, 2017) Population data (0-13 years) US Census

Table 3. Demand-side principal component score variables

Element	Variables	Relation with demand score (Sign)	Source
1.Caring spirits towards human capacity building and productivity	• Appropriation of state tax funds towards higher education as a percentage of state GDP	Positive	Global Data Lab, Sub-national HDI (2003-17)
2. Generosity/welfare Programs	• Temporary Assistance to Needy Families (TANF) and Supplemental Security Income (SSI) recipient families for every 100 poor families with children under 18 in the household • Share of poor families who are beneficiaries of the Supplemental Nutrition Assistance Program (SNAP)		American Community Survey (ACS) (2005-2017)
3. Macro policy/Development oriented policy: -How active governments are in building up the infrastructure necessary for growth and development.	• Public capital spending (CS) as a share of GDP (nominal)	Positive	-US Census Bureau (State and Local Govt Finances -GDP data: BEA (2004-

Table 4. Descriptive statistics for social reproduction- and demand- side variables

	2003-07			2008-12			2013-17		
	Mean	Median	S.D	Mean	Median	S.D	Mean	Median	S.D
Supply									
Unpaid care work	1.33	1.33	0.16	1.33	1.31	0.19	1.27	1.27	0.15
Care sector relative wages	68.25	68.84	4.77	66.75	66.95	4.96	65.69	66.13	4.92
Social spending as a share of total expenditure (SS/TE)	56.18	57.05	5.29	57.57	58.25	5.49	59.22	59.79	5.61
Licensed childcare slots per 1000 children (LCC)	155.5	158	89	184.5	192	85.5	219.6	192.9	230
Demand									
Capital spending share of GDP	2.2	2.13	0.5	2.38	2.37	0.61	2.04	1.97	0.65
TANF/SSI to poverty ratio (TANFtoPR)	26.46	25.56	8.54	27.05	26.20	8.81	26.66	25.49	7.31
SNAP	39.27	39.35	6.88	44	44.4	6.71	45	46	6.75
Tax funds for higher education as a share of GDP (TaxfundsHE)	0.56	0.52	0.17	0.53	0.50	0.18	0.47	0.45	0.18

Note: Refer to Tables 2 and 3 for description of variables.

Table 5. Principal Component Analysis, Result

Demand score	2003-07	2008-12	2013-17	Supply score	2003-07	2008-12	2013-17
Coordinates of the variables of the principal components by time period							
Capital spending/GDP	0.39	0.25	0.38	Unpaid work gender ratio	-0.68	-0.68	-0.62
SNAP	0.33	0.34	0.23	Care sector relative wages	0.62	0.09	0.44
TaxfundsHE	0.85	0.88	0.74	(SS/TE)	0.34	0.68	0.62
TANFtoPR	0.04	0.23	0.50	LCC	0.09	0.24	0.21
Percentage of variance captured	PC2	PC2	PC2	*Percentage of variance captured*	PC1	PC1	PC1
	29	26	26		39	40	34
KMO							
	0.57	0.61	0.54		0.50	0.51	0.55
Barlett test p-value							
	0.00	0.00	0.00		0.08	0.00	0.05

Table 6. Distribution of states by social reproduction regime

	2003-07	2008-12	2013-17		2003-07	2008-12	2013-17
Regimes	Number of states				Share (%)		
Mutual	13	11	10	25.5	21.6	19.6
Time squeeze	14	12	13	27.5	23.5	25.5
Exploitative	9	11	12	18	21.6	23.5
Wage squeeze	15	17	16	29	33.3	31.4
Inequality-led	24	28	28	47	55	55
Low-road SR	23	23	25	45.5	45	49

Source: PCA result and author's calculation

Table 7. Regression variables

Variable	Acronym	Description Notes	Sources
Per-capita GDP growth (5-year average)	PCGR	Growth rate in per-capita GDP over 5-year periods	Bureau of Economic Analysis (BEA)
Per-capita GDP (initial)	PCGDP	GDP (USD million at the beginning of each period – 2003, 2008, 2013	BEA
Investment or Gross-fixed capital formation (5-year average)	GFCF	Constructed by replicating the ratio of state's GDP in total U.S. GDP to allocate the national gross fixed capital formation across states.	BEA and FRED
Human capital stock (5-year average)	HC stock	Percentage of BA or higher in the 25 years and above population.	American Community Survey (ACS)
Women's labor force participation rate/ female labor force participation rate	WLFPR	Proportion of the female population ages 15-64 that is economically active.	Bureau of Labor Statistics, Current Population Survey
Regime dummies		Mutual (MU) =1 if state belongs to a mutual regime and 0 otherwise; Time squeeze (TS)=1 if state belongs to a time squeeze regime and 0 otherwise. Wage squeeze (WS) =1 if state belongs to a wage squeeze regime. Exploitative (EX) is the reference category.	Constructed using the PCA scores

Table 8. Descriptive statistics for regression variables

|	2003-07				2008-12				2013-17			
	Mean	Std dev	Min	Max	Mean	Std dev	Min	Max	Mean	Std dev	Min	Max
Per-capita GDP growth (%)	2.1	0.9	-0.2	5.04	-0.07	1.6	-3.1	8.7	0.9	0.9	-1.7	3
Per-capita GDP ($2011 PPP, thousand)	49	18.2	32	163	52.8	20.9	34.5	184	52.8	19.6	33.6	173
GFCF (bn $)	14	17	1.3	95	14	17	1.3	96	18	23	1.5	125
HC stock	28	5.6	17	49	28.2	5.7	18	51	30.6	6.2	20	56.6
WLFPR	61	4.1	50	69	60	4.4	49	68.5	58	4.4	48	66.5

Note: Refer to Table 7 for description of variables.

Table 9. Women's Labor Force Participation Rate, Social Reproduction Regimes, and Economic Growth

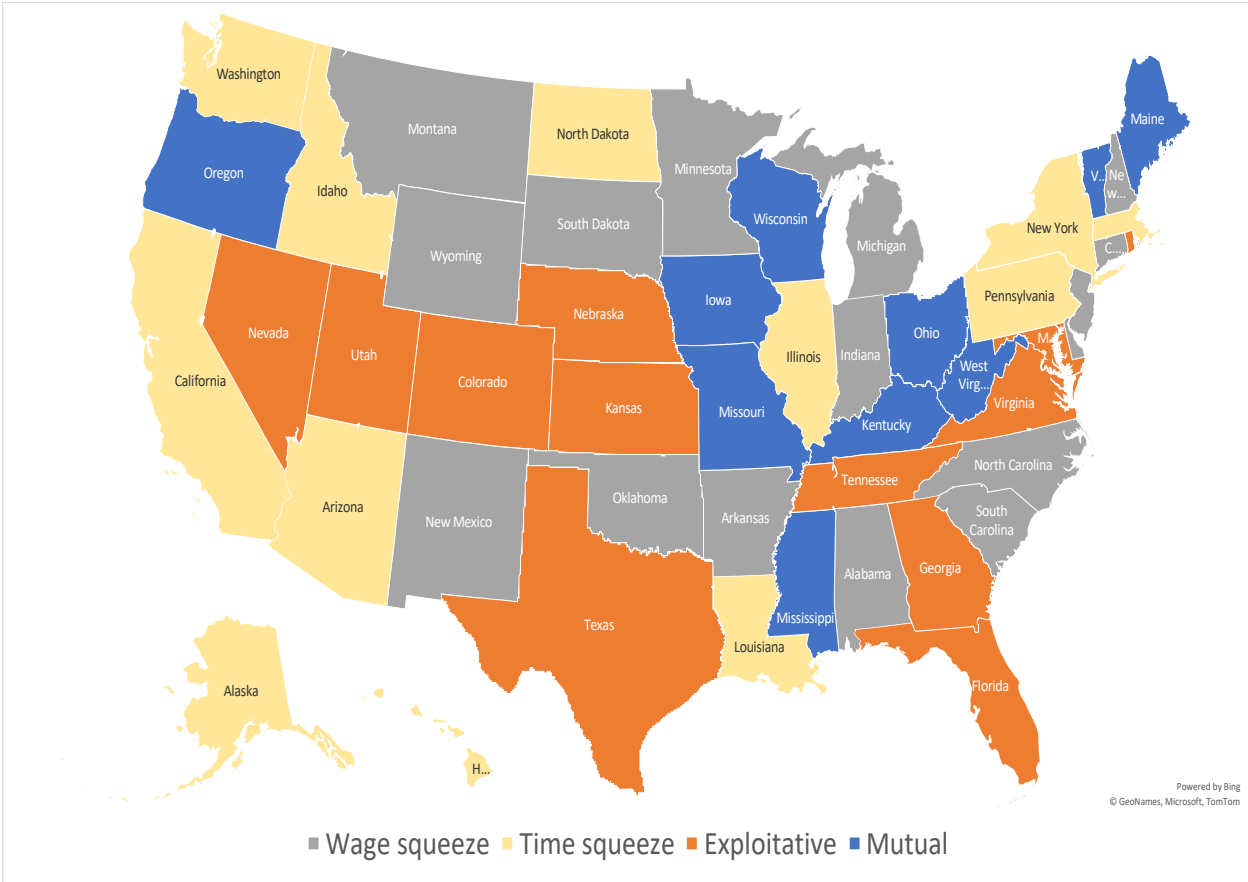|	Average annual per-capita GDP growth		
	Model 1 (Baseline)	Model 2 (WLFPR)	Model 4 (SR regimes and WLFPR)
	(1)		
log(PCGDP)	-57.90***	-52.67***	-64.12***
	(11.71)	(3.14)	(12.63)
log(GFCF)	41.15***	30.19***	44.55***
	(9.68)	(3.15)	(8.29)
log(HC stock)	35.35*	-30.33**	24.42
	(21.15)	(12.86)	(19.02)
WLFPR		0.27*	0.27
		(0.15)	(0.17)
Regime dummies			
Mutual (MU)			13.30***
			(4.79)
Time squeeze (TS)			6.46
			(7.20)
Wage squeeze (WS)			9.15***
			(4.82)
WLFPR and interaction with dummies			
MU*WLFPR			-0.21***
			(0.08)
TS*WLFPR			-0.11
			(0.12)
WS*WLFPR			-0.16**
			(0.08)
WLFPR+ MU*WLFPR			0.06**
WLFPR+ TS*WLFPR			0.16
WLFPR+ WS*WLFPR			0.11*
MU+ MU*WLFPR			13.09**
TS+ TS*WLFPR			6.35
WS+WS*WLFPR			8.99**
States	51	51	51
Observations	153	153	153

Note: Pooled ordinary-least squares (OLS) regression results with time and region fixed effects for a panel of 50 states and the District of Columbia in the U.S., for three-time periods– 2003-07, 2008-12, and 2013-17. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. MU, TS and WS are the dummies of mutual, time squeeze and wage squeeze regimes. WLFPR refers to the women's labor force participation rate.

Figure 1a. Social Reproduction Regimes, United States- 2013-17
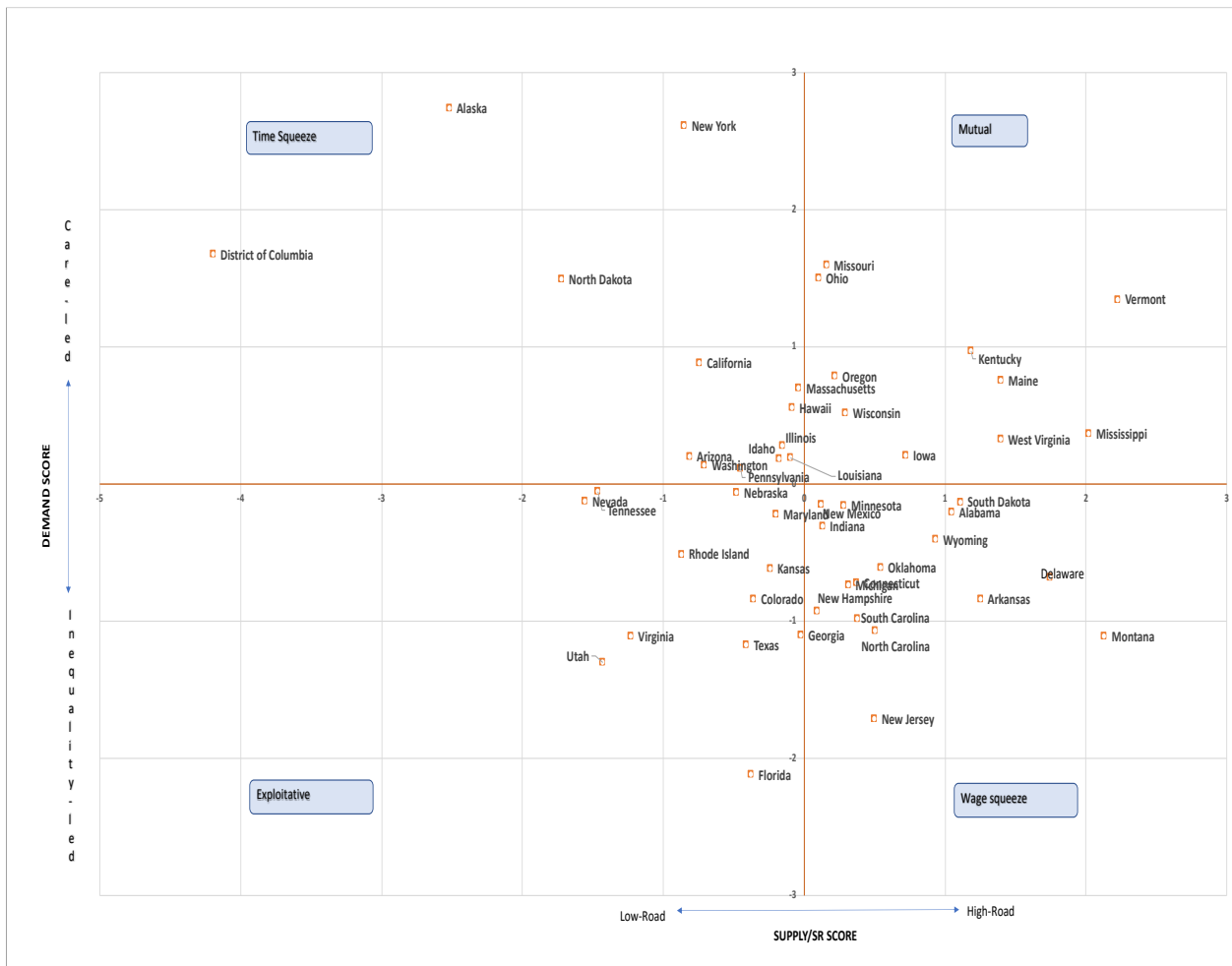
Source: Author's calculation using PCA scores

Figure 1b. Social Reproduction Regimes, United States- 2013-17

Source: Author's calculation using PCA scores