

# Social Reproduction, Gender Equality and Economic Growth

December 2017

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## *Abstract*

This article presents a conceptual macroeconomic model and principal component analysis that link structures of economic growth and development with those of social reproduction (SR) and gender inequality. SR, defined as the time and money it takes to produce, maintain and invest in the labor force influences current aggregate demand and long-run productivity growth. SR regimes can be characterized by the extent to which reproduction takes place in the household, public or market sectors, and the gender distribution of the labor in each. The analysis illustrates how the distributions of production and reproduction among women, men, the state and capital structure the dynamics of economic growth and development, and how gender inequality is both cause and consequence of these relationships.

**Key words:** Structuralist models; care economy; social reproduction; gender inequality; economic growth; structural change

**JEL classification codes:** O4 Economic Growth and Aggregate Productivity, O11 Macro analyses of economic development, E1 General Aggregative Models, J22 Time allocation and labor supply,

# Social Reproduction, Gender Equality and Economic Growth

## 1. Introduction

In recent years, a plethora of macro models have emerged that integrate the role of gender in influencing economy-wide well-being.<sup>1</sup> One strand focuses on the supply-side effects of gender equality in education and labor force participation, emphasizing the resulting benefits for productivity and economic growth. A second approach is one that incorporates those supply-side considerations but also addresses the role of aggregate demand and economic structure in influencing the relationship between gender relations and macro-level outcomes. Missing from much of this work is an explicit exploration of the role of care and more generally, social reproduction—fundamental to the production of human capacities but also a driver of employment and other macro-level outcomes.

Braunstein, et al. (2011) filled that lacuna, with a structuralist macro model that incorporates the role of social reproduction as well as gender. This paper furthers that model. It uses principal component analysis to quantify a set of regimes linking structures of economic growth and development with those of social reproduction. Social reproduction is defined in terms of the time and money it takes to produce, maintain, and invest in the labor force. Our approach differs from previous supply-side models in that social reproduction takes place not only within the household but also in the public and market sectors of the economy. Regimes can be characterized by the extent to which social reproduction takes place in any of these three domains and the gender distribution of the labor in each. More broadly, the analytical emphasis is on understanding how the distributions of production and reproduction among women, men, the state, and capital structure

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<sup>1</sup> For surveys of this literature, see, for example, Stotsky (2006), Seguino (2010), Nallari and Griffith (2011), Elborgh, *et al.*, (2013), Kabeer and Natali (2013), Cuberes and Teignier (2014), Onaran (2015), and Seguino (2017).

the dynamics of economic growth, and how gender inequality is both cause and consequence of these relationships.

We begin by developing a conceptual macroeconomic model of growth and social reproduction that allows us to define a set of stylized set of regimes for how the two interrelate. We then use principal components analysis to empirically estimate these regimes for a wide cross-section of both developing and developed countries over the period 1991-2015, though data choices are primarily geared towards capturing developing country structures. The goal is to evaluate the contradictions and complementarities embedded in systems of growth and social reproduction, as well as how these systems change over time. The resulting portrait identifies how accounting for care better specifies the economic consequences of increasing gender equality in the labor market by closing gender gaps in wages or employment participation.

## **2. A macroeconomic framework for social reproduction**

This section develops a conceptual framework connecting economic growth in with processes of social reproduction and the dynamics of gender inequality. This conceptual model reflects the formal theoretical model presented in Braunstein et al. (2011) and builds on the discussion in Braunstein (2014).

The macroeconomic approach is “structuralist” in the sense that the distribution of income by class and gender plays a central role in consumption, investment and growth, and the structure of the economy is an important determinant of how these interactions play out (Taylor 2004). A central feature of this model is that the macroeconomy is demand-constrained. This is because firms operate with excess capacity, and changes in the short-run level of output change the degree of capacity utilization of the economy.<sup>2</sup> Wages, rather than being set by the marginal product of labor,

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<sup>2</sup> This demand-side approach differs from some models in which macroeconomic disequilibria (and thus unemployment, inflation, or slow growth) are assumed to be due to a deficiency of savings (Elson 2004).

as in neoclassical models, are the result of a social bargaining process that reflects the extent of unemployment or under-employment in the economy.

Before presenting the model, we introduce how we portray the economic dimensions of care and social reproduction. We define care in both labor-process and output terms. In terms of labor process, care is a work activity that involves close personal or emotional interaction with those being cared for (Folbre 2006). In terms of output, care refers to either direct or indirect care services that are inputs into the production and maintenance of the labor force. Gender norms around care are also important. Unpaid work and care have been understood as highly gendered activities with gendered meanings, asymmetrically distributed between men and women in both the paid and unpaid sectors, and a key contributor to gender inequality in both the market and the home (Badgett and Folbre 1999; Nelson and England 2002). More specifically, time use data indicate that women carry the greatest burden of performing care work, whether construed as direct care or indirect care activities, such as fetching water or fuel wood (Connelly and Kongar 2017).

As both an output and an input, labor has two facets--quantity (time) and quality (the productivity of that time)—though we refer to both by using the term human capacities.<sup>3</sup> We conceptualize capacities in the widest sense of the term and include a broad array of features that make human beings more economically effective, such as emotional maturity and self-confidence, as well as standard human capital measures, such as education and skills.

Human capacities are produced in the household sector using unpaid labor time and commodities. In the short-run, changes in human capacities production impact labor productivity, reflecting the extent to which one is being supported and replenished at home. In the long term, spending time or money on the production of labor, whether it results in higher fertility or improved labor productivity, is treated as investment rather than daily maintenance. Investments in human

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<sup>3</sup> To some extent, quantity and quality can be traded off with one another (Becker and Lewis 1973), but declines in fertility can be so large that increased quality cannot compensate.

capacities raise future productive capacity (i.e., generate economic growth) in ways similar to building more factories and equipment, though investing in the future labor force is almost never treated as investment in macroeconomic models. In this way, we differ from any other macro models that fail to treat spending in support of developing the future labor force as investment. As with conventional treatments of investment, however, we model investment in human capacities as a factor that stimulates current aggregate demand while also contributing to long-term economic prospects.

At its core, then, the model is about treating labor as a produced means of production. Primarily women (but also men) carry out this reproduction process by doing both paid and unpaid work. A key goal of this paper is to differentiate between societies that care more and/or better than societies that invest less in care. Reasons some societies might invest more in care could be social norms around intergenerational obligation that induce altruistic preferences; strong social welfare sectors that create highly skilled and well-paid jobs in the care sector; or, more likely, gendered ideals that encourage women to provide high-quality care for little or no pay. These social production characteristics interact with the structure of the macroeconomy to influence outcomes. To set up this framework, we begin with the demand side of the macroeconomy.

## **2.1 Demand, caring spirits and growth**

The demand side of the economy is driven by investment demand, which, in the short-run, raises demand for current output and, in the long run, raises economic growth by increasing productive capacity. In our model, investment is of two types: physical (or business) investment undertaken by firms, and human capacities investment undertaken by individuals and households. Funds for both types of investment are drawn from national income, which depends on the functional distribution of income—that is, the split between the profit and wage shares of income.

The extent of business investment depends partly on expectations about the profitability of those investments, or, in the words of Keynes, “animal spirits.”<sup>4</sup> In addition to expectations, business investment is a function of sales, which in turn depend on the level of aggregate demand. The latter is influenced by the distribution of income because workers spend a larger share of their income than capitalists. A redistribution to workers in the form of higher wages will stimulate demand and, as a result, increase this component of investment (dubbed the “accelerator effect”). On the other hand, higher wages also lower the profit share of income, which dampens the incentive to invest (the “profitability effect”). These effects move in opposite directions. The net impact of higher wages on business spending and thus aggregate demand depends on which of these two effects is stronger. Economies in which increases in the wage share of income stimulate output, employment, and growth are termed “wage-led.” Their converse, where increases in the wage share are associated with lower output and growth are termed “profit-led.”<sup>5</sup>

Turning to investment in human capacities, rather than center their decisions on expected profit rates, individuals finance investments in themselves and others based on expectations about future economic opportunities. Higher wage shares of income boost expectations about future economic returns to labor, as does more current economic activity as measured by output. The pathway from expectations about future opportunities to actual investments in human capacities is governed by what we term “caring spirits”: the tendency, whether determined by social norms, individual motivation, or public preferences as reflected in the structure of the social welfare state, to provide care (or support for care) for one’s self and others in ways that add to current aggregate demand and future productivity.

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<sup>4</sup> The notion of “animal spirits” reflects the psychological element in business decision-making regarding profitability, built on the widely acknowledged but poorly understood waves of market confidence and panic. For more on this point, see Braunstein et al. (2011).

<sup>5</sup> Strictly speaking, to get to this point we need to say something about savings. On the demand side, macroeconomic equilibrium means that the investment desired by investors equals that supplied by savers (both domestic and foreign). Because investment is both the binding constraint and the mechanism for social reproduction on the demand side in our framework, we do not give further detail on savings dynamics.

Although the extent of caring spirits takes place along a continuum, for simplicity we differentiate between two stylized types of caring spirit regimes: those with “strong” caring spirits versus those with “weak” ones; we also alternatively refer to the strong/weak dichotomy as altruistic/individualistic to emphasize the difference between other-directed and self-oriented preferences. Because of these differences in preferences, economic growth or higher wage shares will have a stronger positive impact on investment in human capacities in altruistic societies than in individualistic ones. And the stronger the caring spirits, the more likely that economic growth is wage-led. The reason is that higher wages now increase not only consumer demand, but also demand for investment in human capacities.

In addition to caring spirits, the wage- versus profit-led dichotomy also partly depends on the type and extent of globalization, especially in a developing country context. The greater the dependency on external sources of demand, the less likely that wage increases boost aggregate demand enough to compensate for the decline in profits. Monetary and fiscal policy stances exclusively focused on maintaining price stability in the context of free flows of capital and trade, as opposed to those more actively and directly supportive of growth and development, tend to coincide with profit-led or individualistic regimes (Blecker 2016). Such policy stances may seem an essential part of macro management in the current era of globalization, but their deflationary effects make for poor employment growth and tend to depress investments in human capacities. **Table 1** summarizes and compares these demand-side dynamics for both wage- and profit-led economies. <Table 1 here.>

## **2.2 Supply, gender and the distribution of social reproduction**

The supply side of the model is constituted by interaction among three different spheres: the labor market, the product market, and the production of human capacities in the household sector.

Labor and product markets are characterized by a division of labor between women and men. In general, we link female labor supply with the provision of direct and indirect care services in the market, but the significance of this sector as a source of employment for women and a determinant of human capacities production will ultimately vary based on economic structure.<sup>6</sup> Wages are determined by labor's bargaining power, which rises along with output – as output rises, unemployment falls, giving workers more ability to bargain over wages. Women's collective bargaining power is presumably lower than men's, a point consistent with the prevalence and persistence of the gender wage gap across all sorts of economies.<sup>7</sup>

The wages that emerge from conditions in the labor market, combined with labor productivity as determined by the state of human capacities, specify the costs of production. Profit shares are then determined by how much price is marked up over cost, an outcome constrained by demand conditions and the firm's degree of monopoly power. We can begin to see some of the contradictory forces at work in the system: higher wages for women are desirable from the perspective of gender inequality, but they also may raise the price of care and put pressure on reproduction. At the same time, buoyant demand for paid care from either the private or public sectors is key to supporting higher wages for care workers.

Turning now to the production of human capacities in the household sector, inputs into the social reproduction are of three types: time, commodities, and infrastructure. In terms of time inputs, women, men, children, and networks of kin or community may all be important contributors of unremunerated time into social reproduction, but women perform the bulk of unpaid household work, whether or not they also participate in paid work (Budlender 2008; Charmes 2006; Folbre

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<sup>6</sup> It is worth noting that nothing intrinsically makes women more suited for such work. Rather, gender norms and stereotypes shape the gender division of labor, and macro-level policies can assist in this process, as for example, policies in Nordic countries on sharing parental leave.

<sup>7</sup> Women's relatively weaker bargaining power is a function of how they are inserted into the paid economy as workers. Insofar as women tend to be more likely to be employed in part-time work, the informal sector, and in mobile labor-intensive manufacturing firms, they are in a weaker bargaining position vis-à-vis employers than men on average. Thus the gender wage gap is at least partly related to economic structure as well as a country's labor market policies.

2006). If women (or men) spend less time at home, human capacities production may suffer. Just how much depends on the structure and productivity of that unpaid labor time, involving factors like skill, motivation, the availability of care-related commodities and, of course, the state of one's own human capacities (tired caregivers are usually less effective ones).

The second set of inputs, commodities, is financed by income from work or public and private transfers. They include direct and indirect care services and capital goods, such as stoves, refrigerators, and washing machines. The impact of income on human capacities depends not only on how much is earned and spent, but on what is purchased, and whether these commodities provide good substitutes or complements for unpaid care time. Think of professionalized and well-paid versus informal and underpaid care sector workers, purchasing a refrigerator versus a television set, or devoting public funds to the provision of childcare services versus expanding national defense. All of these arguably contribute to social reproduction, but in varying degrees.

The last input, public infrastructure, refers to goods like roads, electricity, sanitation, and water that decrease the opportunity cost of market work, mostly by lowering the time intensity of care work by women, but also by lowering the price and increasing the availability of care commodities (Agénor and Agénor 2009). Infrastructure is an often-neglected aspect of the relationships between social reproduction, gender inequality and growth, but a key determinant and outcome of the gender system.

Taken together, the production of human capacities in the household sector, combined with the determination of wages, prices and profit shares in the labor and product markets, constitute the supply side of our conceptual model. We differentiate between two stylized supply regimes that reflect the gender distribution of social reproduction: *low road* versus *high road*. The key difference between the two is that in the low-road regime, higher female labor force participation is associated with a decline in human capacities production, while in the high-road regime, increased female labor force participation also increases human capacities production.

In the low-road regime, the negative association between human capacities production and female labor force participation is driven by low wages and poor working conditions for women in general and care sector workers in particular, set against a backdrop of little public support for social reproduction.<sup>8</sup> Low wages for women mean, on the one hand, that they can ill afford to purchase care commodities to compensate for the decline in the nonmarket work time that market participation induces (we will discuss male contributions in a moment). It also suggests that the care commodities they do purchase are likely to be inferior substitutes for unpaid time, as the quality of these commodities reflects the poor labor market conditions in which they are produced. Weak demand for care services, both from workers who can ill afford them and as well as paltry public provision, keep their prices – and the wages of these workers – low. The net result from an aggregate supply perspective is that expanding market production and increasing women’s labor force participation threaten profits because the potentially higher profit share spurred by more economic activity is outweighed by the decline in human capacities production. In the short run, this decline manifests as lower labor productivity, and in the longer term, as decreased investment in human capacities. It is worth noting here that it is this element that has been strikingly absent in many gendered macro models.

Conversely, the high-road regime is characterized by the opposite: higher female labor force participation is associated with increases in human capacities production. Strong care sectors, occasioned by good wages for care workers and high levels of public and private demand for care services underlie a sort of virtuous cycle. Commodities serve as effective substitutes and complements for declines in women’s unpaid labor time with marketization, perhaps also making it possible for women to reorganize their unpaid labor time in ways that actually raise its efficiency. Less time taken up by indirect care services frees up time for work and direct care, potentially increasing human capacities production and investment. Good infrastructure for reproductive work

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<sup>8</sup> Indeed, low wages for care workers and weak public provision are empirically correlated with one another across a variety of countries (Budig and Misra 2010).

reinforces these positive relationships. While it is true that the higher wages and taxes that pay for the high road do press on the profit share, the higher prices supported by strong demand and increases in labor productivity more than compensate.

So far we have focused on female labor force participation and the fortunes of (primarily female) care sector workers. But both women and men contribute time and money to social reproduction, either directly or indirectly through taxes and charitable contributions. How they split these responsibilities is correlated with whether the high- or low-road regime prevails. The more that women and men share the time and financial costs of care, the more likely that increases in female labor force participation and output will increase the production of human capacities by more than it will cut into profits—and therefore, the more likely the high-road case will be. This is the gender egalitarian (GE) case. This is in part because women’s movement into paid labor is not so costly in terms of investments in human capacities due to men taking on some of this role. Note that gender egalitarianism is also reflected in a number of factors associated with the high road: smaller gender wage gaps (to the extent they stem from good wages for women as opposed to low wages for men), an extensive and high quality market care sector, far-reaching public provision of care services, and good reproductive infrastructure.

By contrast, in cases where men contribute very little to social reproduction in terms of either time or financing (directly or via payments to the state or other organizations), the more likely the low-road case prevails, and women’s market participation will be associated with decreases in social reproduction and profit share (because pressures on care brought about by women’s increasing market participation lower labor productivity and raise unit labor costs). We call this the feminization of responsibility and obligation (FRO) case, borrowing a term developed by Sylvia Chant (2006) to replace the notion of the feminization of poverty. Parallel to the high-road regime, the contributing factors to the low-road regime are associated with the type of gender system that leads to a feminization of responsibility and obligation: low wages for women as reflected in a large

gender wage gap, little support from men or the state in carrying out social reproduction, and limited markets for care commodities which, when they do exist, are characterized by low pay and poor quality output. **Table 2** summarizes the main features of the low- and high-road supply regimes.

<**Table 2 here.**>

### **2.3 Combining aggregate demand and supply: Growth and social reproduction**

**Table 3** shows how aggregate demand and supply interact in ways that draw out the causal connections among growth, gender inequality, and social reproduction. The result is four stylized regimes whereby we combine each potential demand regime with each supply regime, to create a 2x2 matrix. The styled regimes are labeled: 1) time squeeze, 2) mutual, 3) wage squeeze, and 4) exploitation. To assess the differences among them, we consider the impact of a decline in gender-based wage inequality and consequent increase in female labor force participation – together amounting to an increase in gender equality in the labor market.

<**Table 3 here.**>

Starting in the upper left-hand corner, “time squeeze” combines wage-led/altruistic growth with a low-road distribution of social reproduction. In this regime, more gender equality in the form of higher wages for women in general or higher wages for care workers in particular supports investment and growth because it raises human capacities production and domestic aggregate demand by more than it cuts into profits. However, as female labor force participation increases, the time devoted to human capacities production declines, and relationships in the wider economic system – from the structure of the paid care sector to the lack of support from men for care to the lack of reproductive infrastructure – mean that the care time decrease compromises labor productivity and human capacities production. The more extensive the feminization of responsibility and obligation, the stronger these negative effects. The term “time squeeze” emphasizes the trade-offs between the marketization of women’s work and the consequent time pressures on human

capacities production. If these contradictions are substantial enough, the time squeeze effects of higher wages completely counteract their positive growth effects, leading to stagnation or growth path instabilities. Again, it is worth noting that this potential outcome is widely missing in most gendered macro models, and yet is a possible result of increased female labor force participation under certain conditions.

Moving to the upper right corner of Table 3, with a high-road distribution of social reproduction and wage-led/altruistic growth, the regime is labeled “mutual” because production and reproduction reinforce one another. In this case, more gender wage equality raises growth because it raises human capacities investment and aggregate demand by more than it cuts into profits. Higher market participation among women induced by higher wages does lower the time available for human capacities production. But gender egalitarian relations of reproduction, buoyed by strong public support for care and the availability of effective care commodities, not only protect against time squeeze, they actually induce an increase in the production of human capacities (quantity and/or quality) in the context of higher incomes. From a citizen-worker-carer perspective, this is the win-win scenario.

The lower right corner of Table 3, which combines profit-led growth with a high-road distribution of social reproduction, is termed “wage squeeze” because higher wages for women enhance human capacities production, but not by enough to outweigh the negative impact that higher wages have on profits, overall investment, and growth. One can think of relatively gender egalitarian relations accompanied by a structure of production that makes long-term investments in human capacities expensive or risky. The stronger the profit-led nature of the economy – for instance, the more open to the global economy, or the more deflationary its macro policy – the more pronounced these contradictions. The result is that policies promoting gender equality may be anathema to growth, or make it unstable. Somewhat counter-intuitively, if the promotion of gender

equality via higher female labor participation actually lowers women's wages because of higher labor supply, growth, and human capacities production may increase.

The final regime, "exploitation," combines the profit-led and low-road cases. In this scenario, higher wages for women lower growth because they dampen profits and thus business investment by more than they raise human capacities investment. At the same time, the higher market participation brought about by higher wages for women actually lowers human capacities production because of the time-squeeze type effects of the low road. These effects can be so pronounced that human capacities investment plays no role in moderating profit-led growth. Thus the term exploitation refers to how production and growth are predicated on exploiting women's reproductive labor and human resources in general. As the polar opposite of the mutual regime, it is the lose-lose scenario.

### **3. Estimating social reproduction regimes**

This section uses principal component analysis (PCA) to empirically estimate and rank the supply and demand factors that promote growth for a set of developed and developing economies, based on the social reproduction model described above. This PCA analysis includes four steps: (1) selection of variables (described above); (2) application of the PCA; and (3) interpretation and illustration of results, including the classification of countries into groups based on their demand and supply regimes. The goal, more generally, is to characterize the comparative cross-sectional and time-path values of the social reproduction regimes.

#### **3.1 Data**

The PCA scores for demand (growth and investments in human capacities) and supply (the distribution of social reproduction) are derived from analysis of data that reflect the driving elements listed in Tables 1 and 2 respectively. The overall time period is 1991-2015, largely because of the

availability of gender-disaggregated employment data. The period is subdivided into three sub-periods over which variables are averaged for the PCA analysis: 1991-2001, 2002-2007, and 2008-2015; these spans optimize data coverage as well as mark economic cycles. Because the primary focus is on developing countries, the data has to be meaningful from a development perspective, as well as widely available both cross-sectionally and longitudinally. **Tables 4** and **5** list each element, the corresponding variable(s) used to measure it, and summary statistics for each time period.

**Appendix A** lists further details on sources.

**Table 4** describes the data included in the demand score, which is positively associated with wage-led/altruistic growth and negatively associated with profit-led/individualistic growth. *Caring spirits* are captured by relative achievements in the non-income (education and health) and income components of the Human Development Index (HDI), with changes taken over five-year periods.<sup>9</sup> That is, we measure caring spirits by their impact on a country's expected years of schooling and life expectancy at birth, both of which should be positively and strongly correlated with investments in human capacities, relative to the income component of the HDI. The basic argument is that countries with strong caring spirits, where investments in well-being are a central cause and consequence of economic activities, would also be top performers in terms of positive changes in their non-income HDIs relative to changes in income. That is, the stronger the caring spirits, the higher the "yield" in non-income HDI for a given level of economic activity. In that sense, it is important to emphasize that this methodology evaluates relative performance – there is no external absolute value for strong caring spirits against which country performance is evaluated. On average, achievements in non-income HDI have outweighed changes in the income component, but the positive gap has narrowed over time.

<Table 4 here.>

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<sup>9</sup> Achievements in education are measured by mean years of schooling for adults older than 25 and expected years of schooling for children entering school; achievements in health are measured by life expectancy at birth (UNDP 2013).

*Global orientation* is gauged by two measures, manufacturing exports as a share of GDP, and inward foreign direct investment (FDI) as a share of gross fixed capital formation. Both are intended to reflect the extent to which domestic wage growth might be constrained by global competition, particularly among developing countries. Global manufacturing export markets have become extremely competitive, partly due to sluggish aggregate demand growth in the global North, but also to the increasing number of developing countries trying to pursue an export-led growth path. Both factors are reflected in slow price growth for the sorts of manufactures that developing countries export, which also constrains wage growth in these industries (UNCTAD 2016). In terms of FDI, the higher the share of FDI in domestic investment, the more globally mobile is overall investment, which can constrain productivity and wage growth as firms become more likely to respond to increasing wage pressures by relocating or outsourcing rather than raising productivity (Seguino 2007). Both measures increase over the three time periods listed, which raises the probability of profit-led or individualistic growth regimes in later relative to earlier periods.

The last element on the demand side is *macro policy*. There were a number of choices for proxy variables here, and public investment and tariffs are particularly good representatives of the development-oriented activism that we wanted to emphasize.<sup>10</sup> Public investment as a share of GDP proxies how active governments are in building up the infrastructure necessary for growth and development. There is variation over the periods listed, with growth in the latter period reflecting both the declines in GDP associated with the Great Recession, and the variety of counter-cyclical fiscal policies applied in response (the standard deviation increased substantially as well). Weighted average tariff rates applied, which uses data on imports by product group (harmonized system codes at the two-digit level) to weight tariff rates, reflects more than the extent to which the domestic economy is shielded from import competition. It signals how active governments are in managing

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<sup>10</sup> Other macro policy variables we tried introduced more noise than signal into the system, potentially because of the mix of causal factors – beyond the policy sentiments we are trying to reflect – associated with these variables (e.g., real exchange rates or inflation). In future work, we will consider including measures of financial liberalization.

trade, and the extent to which they conform (either by philosophy or via trade agreement commitments) to reigning global policy sentiments around trade liberalization. As reflected by the model, we expect both public investment and tariff rates to be positively associated with wage-led growth.

**Table 5** lists summary statistics for the elements and associated variables on the supply side. The greater the resulting score, the more high-road/gender egalitarian is the distribution of social reproduction; the lower it is, the closer to the low-road/feminization of responsibility and obligation course.

<**Table 5 here.**>

The first element, *men's relative contribution to social reproduction*, is about the gender distribution of both the time and financial costs of social reproduction, but in practical terms the immediate aim is to capture gender differentials in unpaid care time (though the prospect of mining expenditure surveys by gender to produce an aggregate measure of gender differences in financial contributions to care is an interesting one). There is increasing availability of time use studies, but not nearly enough to populate a panel data analysis. The UN's Statistical Division (UNSD) has an excellent cross-national, with some time series, dataset on the average hours per day women and men spend on unpaid domestic work; that source, however, does not offer enough data coverage to make this data source a practical option. Given available proxies, we chose the female-to-male ratio of mean age at first marriage based on the logic that the greater the gap, the greater the gender inequality embodied in intra-household gender relations, and therefore, the more unequal the distribution of unpaid care time. The data that we do have bears out this hypothesis: taking average values over the time period (1991-2015) for both the female-to-male mean age at first marriage and the female-to-male ratio of hours spent on domestic work from UNSD, the correlation coefficient is -0.52 (with observations for 80 countries), a substantial association in the expected direction, particularly given

it is an average spanning over 20 years (if we limit the sample to observations taken after 2005, the correlation increases to -0.64).

The *gender wage gap* presents similar challenges for adequate proxying. We elected to use the female-to-male ratio of the share of wage and salaried employment in total employment to capture the relative quality and productivity of employment.<sup>11</sup> The balance of the categories of work include self-employed, contributing family workers, and employers. For developing countries in particular, where self-employment and contributing to family work is often an indicator of residual unemployment, using relative access to wage employment was deemed a reasonable proxy for gender-based wage inequality in the labor market. And even with average values that far exceed estimates of gender wage gaps around the world, the variable makes a significant positive contribution to the supply-side score (see discussion below).

*Public provisioning for care* is represented by public social protection and health expenditure as a share of GDP, which includes public benefits for unemployment, employment injury, disability, maternity, and general social assistance as well as health. These shares have been increasing on average over time, with higher levels in developed than developing countries (and a period mean of 20.9 versus 5.2 percent respectively). Averaging data on the percent of the population with access to electricity, non-solid fuel, improved sanitation and water sources gives a proxy for *reproductive infrastructure*, a measure with more variance among developing than developed countries. Both variables are positively associated with a gender egalitarian distribution of social reproduction.

The last element included in the supply side score is the *extent and quality of the market care sector*. Because women's service sector work tends to be concentrated in the caring professions, we use women's services employment as a share of total employment (men plus women) to proxy for the extent of the market care sector. To get at the question of quality, we effectively discount this

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<sup>11</sup> We tested additional variables, including women's education and labor force participation rates relative to men. These were not used because they did not add to the PCA, likely because they are much more highly correlated with a multitude of gender inequality dynamics than the gender wage gap, and hence did not group well with the other supply side elements.

measure by the extent of income inequality in the economy (by raising it to the power of the inverse of the income inequality measure) on the argument that the more inequality, the lower the quality (and pay) of care sector work. The so-called “Palma” ratio, which is the share of income going to the richest 10 percent of the population divided by the share of income going to the poorest 40 percent of the population, is used for income inequality (Palma 2014).<sup>12</sup> The higher the value of this variable, the more gender egalitarian the distribution of social reproduction.

### 3.2 Methodology

The objective of this analysis is to create two country-level scores that reflect demand and supply regimes and allow for cross-country and longitudinal comparisons. The technique of principal component analysis (PCA) is particularly suitable in this regard. PCA is a statistical method that provides a condensed representation of the information brought by a large number of interdependent factors, as those that shape different social reproduction regimes. More specifically, it is a multidimensional scaling tool for a set of variables, simultaneously describing both the connections among the variables and the similarities among the observed units. The resulting principal components retain as much information as possible about the original variables, with the first principal component accounting for maximal variance, as does each succeeding principal component while being orthogonal to preceding components. However, regular PCAs become problematic when there are a large number of missing values. To address this issue, we used a regularized iterative PCA algorithm (Josse and Husson, 2013) based on a “shrinkage” approach in order to impute missing values without overfitting the data, a problem for some variables in the analysis such as *mcare* (see Tables 4 and 5 for information on missing values).<sup>13</sup>

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<sup>12</sup> Using the Palma ratio emphasizes the importance of what is happening in the tails as opposed to characterizing income distribution overall.

<sup>13</sup> Overfitting occurs when the model describes random error or noise instead of the underlying relationships between variables.

To generate the two PCA scores, we first implemented three distinct PCAs over the three time periods (1990-2001, 2002-2007 and 2008-2015), and found cross-time consistency on both the component estimates and the relative contributions of the underlying data (all of which was first standardized). Then we imputed missing values following the regularized PCA algorithm for each of the three periods. And finally we implemented a “general” PCA on the dataset, including imputed values, but using only data from 2008-2015 to compute the components. Final scores for each country and time period, however, utilize these estimates as well as the underlying data for that time period. This method allows for a longitudinal comparison, taking the latter period as the reference point.

**Table 6** gives the coordinates and relative contributions of variables on the first component of the PCA, and the percentage of variance captured for both demand and supply. The three time periods are listed for comparative illustration; it is only the components in the last time period that are used for scoring in the next section.

<Table 6 here.>

Looking at the coordinate results on the first component, we can see that the signs of the variables all conform to those predicted by the conceptual model. For demand and growth, variables associated with more altruism and wage-led growth have positive values (*HDI2*, *pub*, and *TFF*), while those associated with profit-led or individualistic regimes have negative values (*mfgX* and *FDI*). Similarly, on the supply side, all of the variables are positive, and thus greater values are associated with a more gender egalitarian distribution of social reproduction. The percentage of variance accounted for by the first component is about 40 percent on the demand side and 73 percent on the supply side. In general, the supply-side estimates appear more robust and stable across time than the demand side.<sup>14</sup>

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<sup>14</sup> Improving our measure of caring spirits, and extending those for both macro policy and global orientation will be priorities for the next stage of work.

### 3.3 Results

**Figures 1** and **2** illustrate the distribution of countries across the four social reproduction regimes based on their PCA scores for the period 2008-2015; **Appendix B** lists each country individually and their respective regime as illustrated in Figures 1 and 2.

<Figure 1 here.>

<Figure 2 here.>

**Figure 1** includes developing and transition countries, and **Figure 2** developed countries only.<sup>15</sup> Note that the axes for the two groups differ. This is because the classification of countries across regime categories is based on the within-group average to which that country belongs – either developing and transition or developed countries. This brings out the point that there is no absolute, context-independent value to which country scores are being compared.

Starting with Figure 1, a majority of developing and transition countries are in either time or wage squeeze quadrants (quadrants II and IV respectively), exhibiting contradictory relations between growth dynamics, on the one hand, and high- versus low-road systems of social reproduction, on the other. On the face of it, the growth potential of more countries is limited by wage squeeze (48) than time squeeze (40), but this result is driven by the preponderance of transition economies that fall into the wage-squeeze category (14).

Combining Figure 1 with the regional details in **Table 7**, most of developing Asia is classified as wage squeeze (quadrant IV), which likely reflects the contradictions of globally-oriented production coupled with developmental states that provide generous public supports for care. That the results for Asia are driven by countries in East and Southeast Asia is consistent with this observation. Most countries in developing America are also in wage squeeze, a result driven

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<sup>15</sup> The classification of countries across development groups and regions conforms to those used by the UN.

primarily by countries in Central America and the Caribbean, which, like parts of East and Southeast Asia, tend to be more dependent on external sources of demand.

<Table 7 here.>

Adding up the developing regions detailed in Table 7, the largest group of developing countries, about 40 percent, is classified in the time-squeeze regime (quadrant II of Figure 1), indicating that despite wage-led structures of growth, which could bode well for the growth-enhancing effects of gender equality and associated investments in human capacities, growth potential is limited by prevailing low-road structures of social reproduction. As more women enter the labor market, the consequent strain on women's time limit human capacities development and the growth of labor productivity. The policy implication of this combination is clear: increasing women's paid employment must be accompanied by more support for care to sustainably deliver growth. Most African countries fall into the time-squeeze category (33), as do a number of South Asian countries.

South American countries are most likely to be classified as mutual (quadrant I of Figure 1), a somewhat surprising result given the level of inequality and informality that prevails in the region. These challenges seem to have been compensated for to an important extent by recent increases in social protection spending (a hypothesis confirmed by the time paths illustrated in Figure 3). This outcome is instructive, both because it demonstrates the importance of policy, but also because it reminds us that a mutual regime does not automatically or inherently induce economic growth. Rather, it describes relationships between gender equality in the labor market and economic growth – given the constraints and supports posed by prevailing systems of care and social reproduction. In the South American case, closing the gender wage gap by raising women's wages is good for growth and social reproduction, and could induce a virtuous cycle for development.

The exploitation quadrant (lower left in Figure 1), which pairs profit-led/individualistic structures of growth with a low-road distribution of social reproduction, is populated primarily by

countries in Southeast Asia and Africa (Appendix B). In this scenario, although the two sides of the social reproduction regime reinforce one another, improving gender equality in the labor market may threaten growth, both on the demand and supply sides. Intervening on one side of the regime – demand or supply – will induce movement towards either time or wage squeeze, depending on the nature of the policy intervention.

Figure 2 gives the distribution of developed countries, with country labels (owing to the smaller number of data points). As one would expect, most developed countries are wage-led, with their domestic economies providing significant sources of aggregate demand, and greater relative investments in human capacities given their already-high levels of development. The Nordic countries, well-known for their generous social welfare systems and commitment to gender equality, are firmly in the mutual category. Weaker commitments to a gender egalitarian distribution of social reproduction put many of the more liberal economies in the time squeeze regime, suggesting that the contributions of women's increasing participation and wages in the labor market are weighed down by insufficient supports for social reproduction. For profit-led growth countries, most tend towards a more gender egalitarian distribution of social reproduction and thus the wage squeeze case, though when countries are very close to the origin (as in the case of Germany) or a particular axis, they are weaker manifestations of the regime.

**Figure 3** illustrates the time paths of regimes for the world and broad country group, averaging PCA scores for the group in question. It is merely illustrative in the sense that what matters is the movement of individual country scores rather than the relative size of absolute values, but considering these average time paths can nonetheless give readers a sense of the longitudinal nature of the estimates.

<**Figure 3 here.**>

The world as a whole is clearly progressing towards more profit-led/individualistic growth regimes, particularly between the first two periods; it is also moving towards a more gender

egalitarian distribution of social reproduction. Developed countries, as a group, are moving towards more profit-led demand as well, though the pace has slowed down relative to achievements in gender egalitarianism on the supply side over the last decade or so. Transition economies shifted dramatically towards more profit-led growth over the 1990s, in line with the nature of their economic reforms. There has been a modest turnaround in those countries since then, which has also included more movement towards gender equality in the distribution of social reproduction, but the average is still squarely in the wage squeeze quadrant.

On average, developing Africa has likewise become more profit-led, and progress towards gender egalitarianism was reversed between the last two periods. However, the region as a whole is still squarely situated in the time squeeze quadrant, indicating that more vigorous supports for social reproduction could induce the virtuous cycle of a mutual regime. Developing Asia has also gotten more gender egalitarian in the distribution of social reproduction over time (despite a small shift towards less egalitarianism since the early 2000s). At the same time, it has also become much more profit-led, leading to a shift from the mutually reinforcing regime to the contradictions of wage squeeze over the course of the 1990s, though it is still close to the axis. Developing America shifts towards more profit-led growth over the 1990s, in line with the more neoliberal economic policies and global integration pursued by many countries in the region during that period, with a more recent shift towards more gender egalitarianism.

These dynamics indicate how various policy interventions and structural changes have coalesced to move the structures of growth and social reproduction over time, and could be used to measure the relative effectiveness of social or economic development policies. They also provide a global portrait of gendered structures of growth and care, with important implications for the relationship between gender equality in the labor market and economic growth. That the world is universally moving towards more profit-led demand regimes is consistent with the current era of globalization, where a form of hyper-integration has made competitive pressures particularly sharp

for developing countries, while at the same time offering new opportunities for development and structural change.

The increasing gender egalitarianism in the distribution of social reproduction that has accompanied this movement alights on a troubling contradiction emergent in the global system, and indicates that interventions focusing solely on the supply side risk being undermined by dynamics on the demand side. As women's labor force participation increases, the lower wages required to sustain growth undermine longer-term investments in human capacities. Supply-side policy interventions aimed at enhancing gender equality in the labor market, for instance efforts to raise women's education or skills, or provide better infrastructural supports for unpaid care work, can certainly improve the conditions for care and social reproduction. However, as illustrated by the time paths in Figure 3, when demand and investment are driven by more profit-led structures and relations, such interventions move economies into the contradictions of wage squeeze (where structures of demand and growth work undermine those of the distribution of social reproduction), rather than the complementarities of the mutual regime.

#### **4. Concluding discussion**

Though the question of care has yet to make it very far into macroeconomic models of growth, the inefficiency of gender inequality in capabilities or employment has become a stylized fact among both academic empiricists and international development institutions. When care takes on a macro dimension, it tends to get treated as a constraint on female labor force participation, and therefore women's disproportionate responsibility for care one of the ways that gender inequality inhibits growth. This point is an important one, but it misses the economic value of care—and thus, the effects of policies that reduce investments in care. By proposing that we treat labor as a resource that is produced, the model and estimates presented illustrate how care and social reproduction can have macroeconomic consequences independent of their effects on women's work participation,

and that the gendered structures of care provisioning are elemental to paths for development and growth.

More specifically, for a majority of developing countries we find that prospects for growth with increased gender equality in the labor market are limited by the contradictions between the positive growth effects of higher wages and/or more market participation by women on the one hand, and the pressures such increases in market work will bring to bear in the care economy on the other. For a large subset of developing countries more dependent on external sources of demand, many of them with developmental-type states that make substantial human capital investments, paths for growth with more gender equality are limited by what is essentially the loss in competitiveness that higher wages for women would bring. A third, much smaller group of countries with more mutual or complementary relations between growth, social reproduction, and gender equality in the labor market, illustrate how having the potential to spark a virtuous cycle does not automatically produce one. In future work, we will explore this last point further, using the estimates presented in this paper to conduct a panel data analysis of growth determinants, investigating when and how the structures of social reproduction interact with other more standard determinants of growth.

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Figure 1. Developing countries

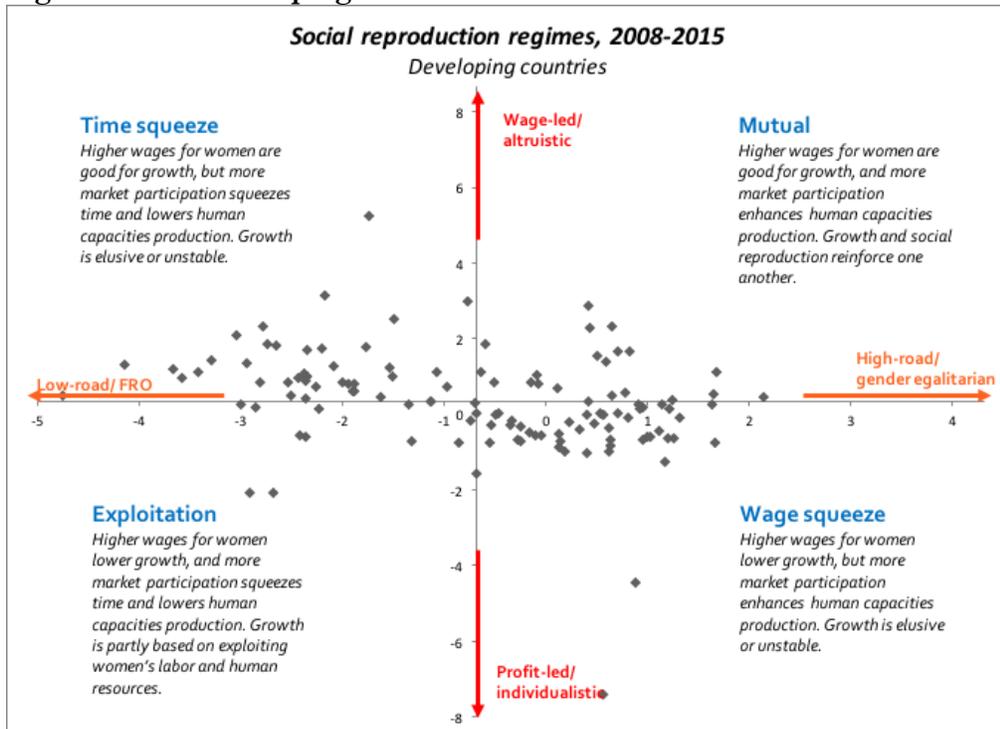


Figure 2. Developed countries

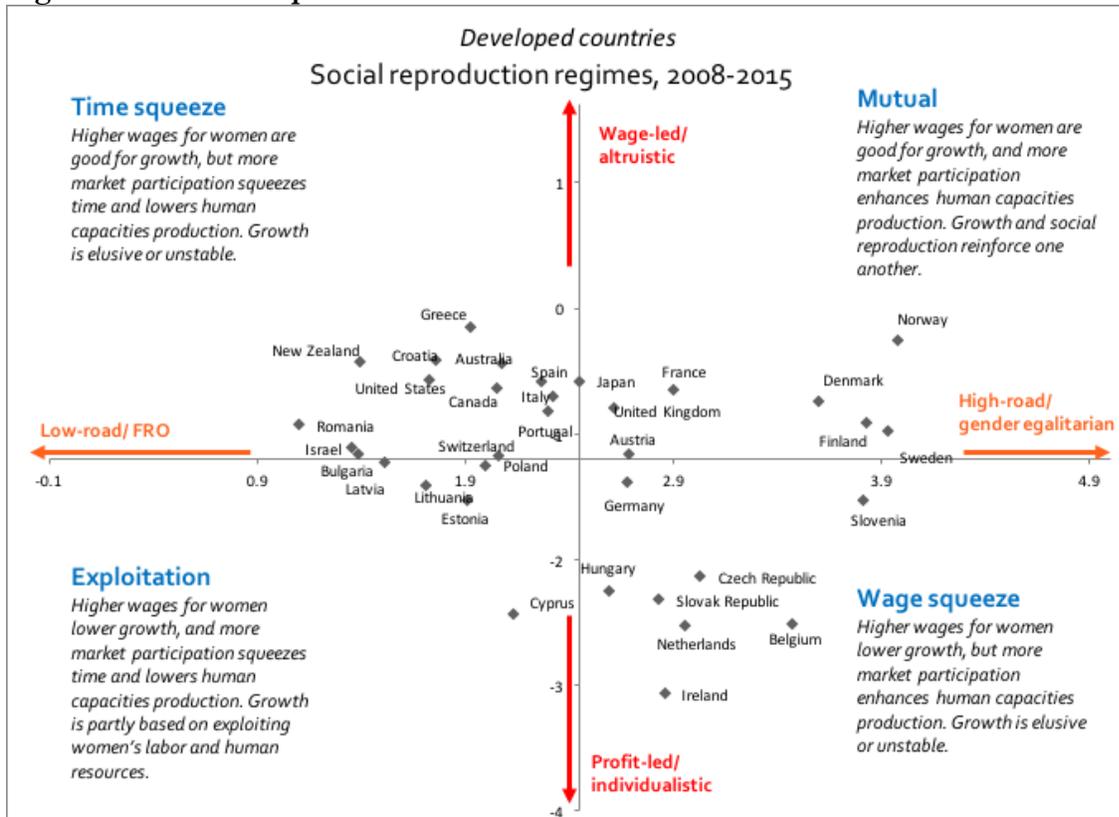
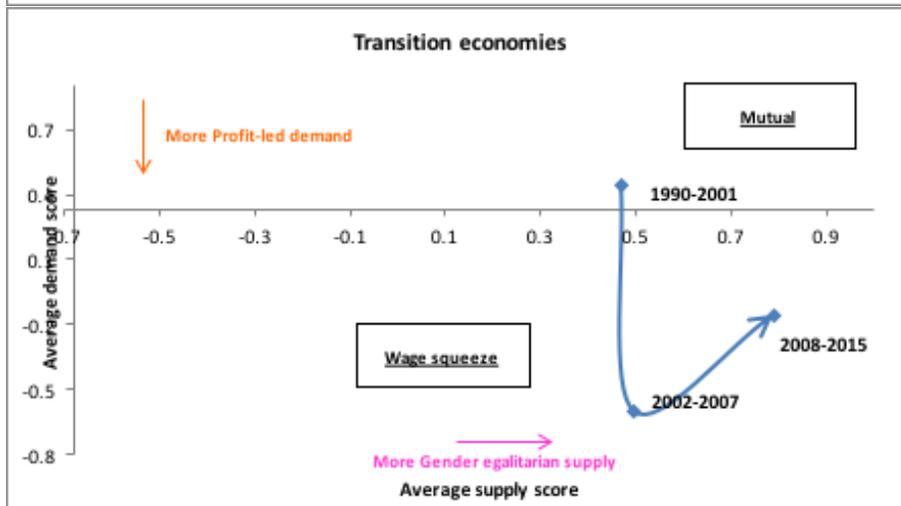
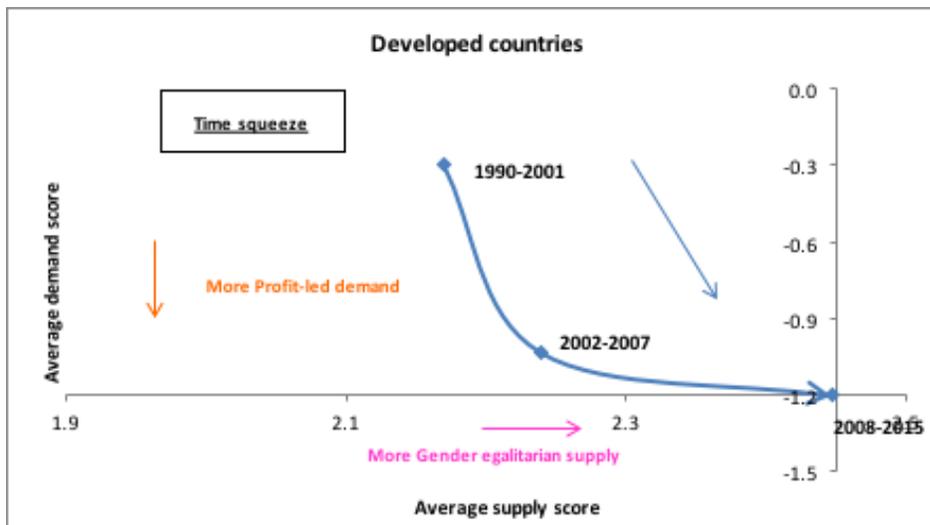
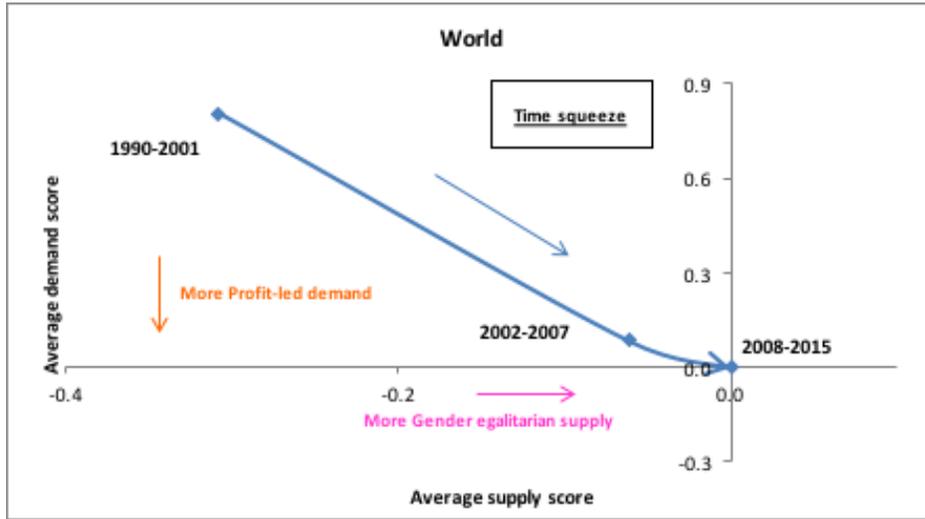
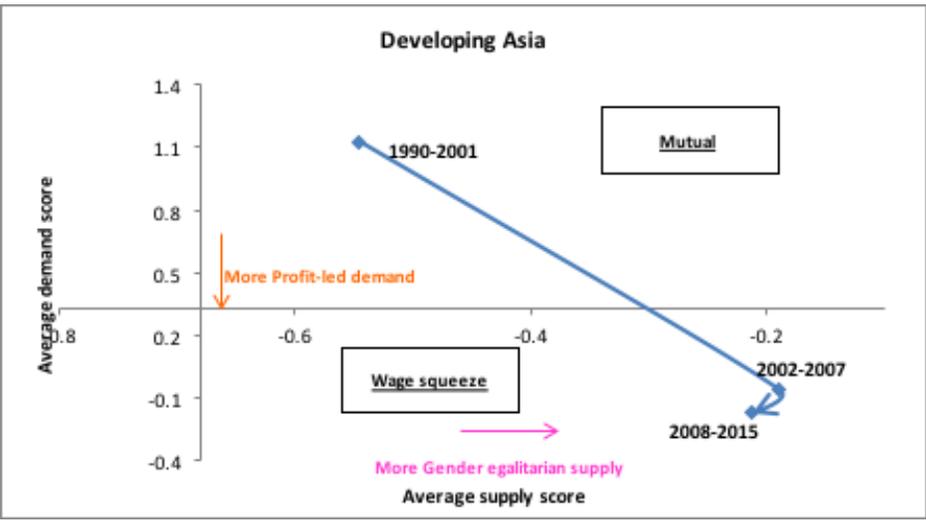
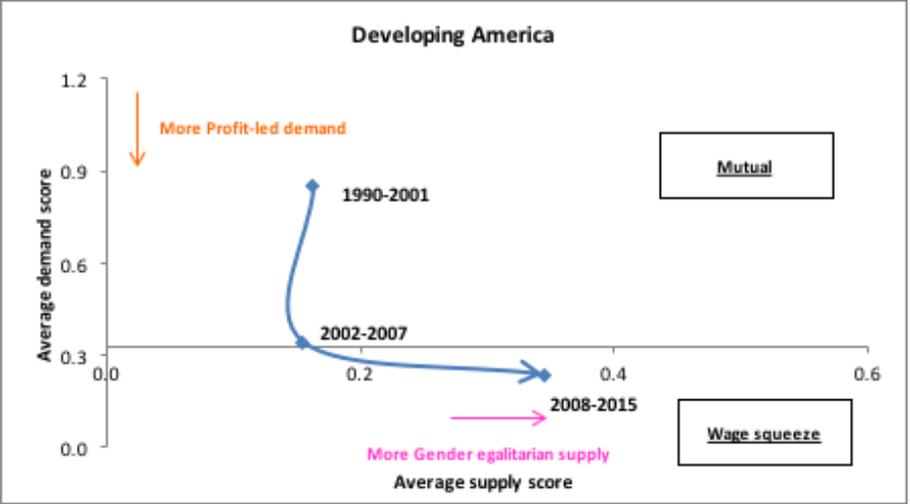
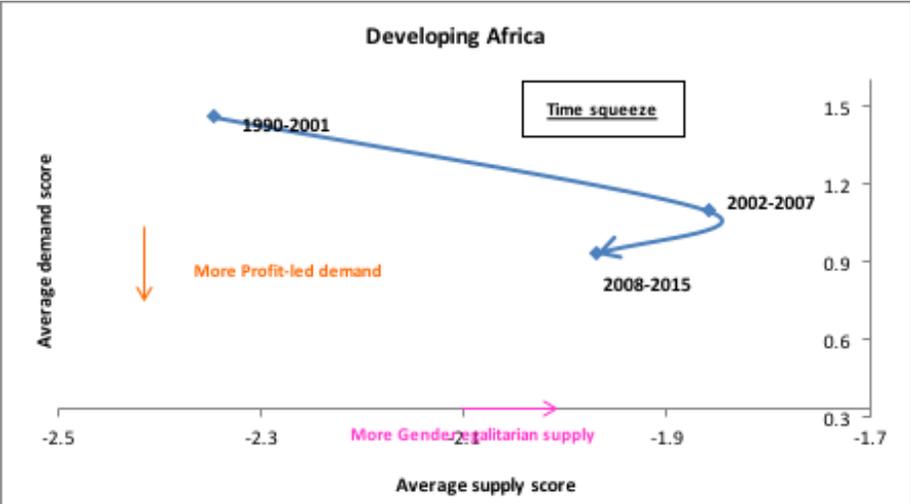


Figure 3. Time paths of social reproduction regimes, 1990-2015 (*base period: 2008-2015*)





**Table 1. Demand and Growth**

Wage-led/Altruistic	Profit-led/Individualistic
<i>Explanation</i>	
<i>Higher wage share is expansionary:</i> The positive impact of increased consumer demand, combined with increased investments in human capacities, outweigh the contractionary impact of the decline in the profit share.	<i>Higher profit share is expansionary:</i> The positive impact of increased capitalist investment demand outweighs the negative impact of lower wages on consumer demand and human capacities investment.
<i>Factors that make each scenario more likely</i>	
Strong caring spirits Domestically-oriented economy Developmental macro policy <sup>1</sup>	Weak caring spirits Globally-oriented economy Openness-oriented macro policy

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<sup>1</sup> Developmental macro policy emphasizes the objectives of fostering employment creation and other measures of broadly shared well-being, in part by policies that promote structural change, as compared to a focus on price stability alone.

**Table 2. Supply and the Distribution of Social Reproduction**

<p><b>Low Road: Feminization of responsibility &amp; obligation</b></p>	<p><b>High Road: Gender egalitarian</b></p>
<i>Explanation</i>	
<p>Increasing output and female labor force participation is associated with declines in human capacities production, ultimately lowering profits.</p>	<p>Increasing output and female labor force participation is associated with increases in human capacities production and higher profits.</p>
<i>Factors that make each scenario more likely</i>	
<p>Low male contributions to social reproduction  Large gender wage gaps Limited and/or low quality market care sector Little public provision of care Poor reproductive infrastructure</p>	<p>Significant contributions to social reproduction by both women and men  Small gender wage gaps Extensive and high quality market care sector Strong public provision of care Good reproductive infrastructure</p>

**Table 3. Growth and social reproduction**

<b>Demand: Growth</b>	<b>Supply: The distribution of social reproduction</b>	
	Low road Feminization of responsibility & obligation (FRO)	High road Gender egalitarian (GE)
Wage-led/altruistic	<p><b><i>Time squeeze</i></b></p> <p><i>Higher wages for women are good for growth, but more market participation squeezes time and lowers human capacities production. Growth is elusive or unstable.</i></p>	<p><b><i>Mutual</i></b></p> <p><i>Higher wages for women are good for growth, and more market participation increases human capacities production. Growth and social reproduction reinforce one another.</i></p>
Profit-led/individualistic	<p><b><i>Exploitation</i></b></p> <p><i>Higher wages for women lower growth, and more market participation squeezes time and lowers human capacities production. Growth is partly based on exploiting women's labor and human resources.</i></p>	<p><b><i>Wage squeeze</i></b></p> <p><i>Higher wages for women lower growth, but more market participation enhances human capacities production. Growth is elusive or unstable.</i></p>

**Table 4. Summary statistics: Demand**

Element	Variable	Short name	Period	Mean	Median	Standard deviation	Missing values (%)
<i>Caring spirits</i>	5-year percentage point change in non-income	<i>HDI2</i>	1990-2001	0.02	0.02	0.02	14.74
	HDI less 5-year		2002-2007	0.01	0.01	0.03	9.62
	percentage point change in income index		2008-2015	0.01	0.01	0.02	3.21
<i>Global orientation</i>	Manufacturing exports as a share of GDP (%)	<i>mfgX</i>	1990-2001	11.63	6.00	15.90	9.62
			2002-2007	14.66	7.10	20.39	9.62
			2008-2015	14.88	7.96	20.00	10.90
	Inward FDI as a share of gross fixed capital formation (%)	<i>FDI</i>	1990-2001	13.23	9.82	12.53	7.05
			2002-2007	21.67	16.72	20.86	5.77
			2008-2015	22.54	14.12	31.11	3.85
<i>Macro policy</i>	Public investment as a share of GDP (%)	<i>pub</i>	1990-2001	5.77	4.88	3.67	20.51
			2002-2007	5.20	4.64	2.67	20.51
			2008-2015	6.46	4.82	5.14	23.08
	Weighted average tariff rates applied	<i>TFF</i>	1990-2001	10.86	10.00	6.36	16.67
			2002-2007	8.32	7.58	5.06	7.05
			2008-2015	7.05	6.69	3.95	7.69

**Table 5. Summary statistics: Supply**

Element	Variable	Short name	Period	Mean	Median	Standard deviation	Missing values (%)
<b>Men's relative contribution to social reproduction</b>	Ratio of female age of first marriage to male age of first marriage	<i>afmr</i>	1990-2001	0.86	0.88	0.06	8.33
			2002-2007	0.87	0.88	0.06	30.77
			2008-2015	0.87	0.88	0.06	21.15
<b>Gender wage gap</b>	Ratio of the share of wage and salaried workers in women's employment to men's employment	<i>fmemp</i>	1990-2001	0.92	1.03	0.27	30.77
			2002-2007	0.93	1.03	0.26	25.00
			2008-2015	0.94	1.03	0.24	21.15
<b>Public provisioning of care</b>	Public social protection and health expenditure as a share of GDP (%)	<i>sph</i>	1990-2001	8.67	4.37	7.71	10.90
			2002-2007	9.63	6.37	7.74	10.26
			2008-2015	10.77	7.37	8.39	6.41
<b>Reproductive infrastructure</b>	Average access to electricity, non-solid fuel, improved sanitation facilities and improved water source	<i>repro</i>	1990-2001	67.01	80.35	30.11	2.56
			2002-2007	70.90	85.14	28.90	2.56
			2008-2015	73.02	88.11	28.19	2.56
<b>Extent and quality of the market care sector</b>	Share of women's service employment to total employment, raised to the power of the inverse of the Palma ratio <sup>1</sup>	<i>mcare</i>	1990-2001	10.38	2.58	17.05	37.18
			2002-2007	8.39	2.62	12.41	30.13
			2008-2015	9.32	3.11	13.07	31.41

<sup>1</sup> The Palma ratio is the ratio of the richest 10 percent of the population's share of gross national income divided by the poorest 40 percent share (Palma 2014).

**Table 6. Coordinates, contributions, and inertia of the principal component analyses**

*Coordinates of the variables on the 1<sup>st</sup> component of the PCA by time period (demand side)*

Variable	1990-2001	2002-2007	2008-2015
HDI2	0.24	0.52	<b>0.32</b>
mfgX	-0.71	-0.74	<b>-0.78</b>
FDI	-0.64	-0.58	<b>-0.50</b>
pub	0.69	0.55	<b>0.63</b>
TFP	0.68	0.74	<b>0.79</b>

*Contributions of the variables on the 1<sup>st</sup> component of the PCA by time period (demand side)*

Variable	1990-2001	2002-2007	2008-2015
HDI2	3.04	13.35	<b>4.88</b>
mfgX	26.36	27.37	<b>30.45</b>
FDI	21.79	17.03	<b>12.49</b>
pub	24.52	15.21	<b>20.16</b>
TFP	24.27	27.03	<b>32.01</b>

*Percentage of variance captured by each component for each of the 3 time periods (demand side)*

Variable	1990-2001	2002-2007	2008-2015
1 <sup>st</sup> component	38.61	40.01	<b>39.93</b>
2 <sup>nd</sup> component	20.82	19.92	<b>20.61</b>
3 <sup>rd</sup> component	16.18	17.26	<b>19.11</b>
4 <sup>th</sup> component	12.75	11.77	<b>12.03</b>
5 <sup>th</sup> component	11.63	10.99	<b>8.31</b>

*Coordinates of the variables on the 1<sup>st</sup> component of the PCA by time period (supply side)*

Variable	1990-2001	2002-2007	2008-2015
afmr	0.81	0.83	<b>0.86</b>
fmemp	0.84	0.83	<b>0.86</b>
sph	0.72	0.84	<b>0.83</b>
repro	0.91	0.90	<b>0.90</b>
mcare	0.80	0.77	<b>0.83</b>

*Contributions of the variables on the 1<sup>st</sup> component of the PCA by time period (supply side)*

Variable	1990-2001	2002-2007	2008-2015
afmr	18.68	20.11	<b>20.31</b>
fmemp	19.81	19.58	<b>20.17</b>
sph	20.45	20.11	<b>19.07</b>
repro	23.19	23.30	<b>22.13</b>
mcare	17.87	17.16	<b>18.31</b>

*Percentage of variance captured by each component for each of the 3 time periods (supply side)*

Variable	1991-2001	2002-2007	2008-2015
1 <sup>st</sup> component	70.79	69.70	<b>72.70</b>
2 <sup>nd</sup> component	13.63	14.32	<b>12.06</b>
3 <sup>rd</sup> component	7.39	7.67	<b>7.18</b>
4 <sup>th</sup> component	4.42	5.38	<b>4.82</b>
5 <sup>th</sup> component	3.77	2.91	<b>3.23</b>

**Table 7. Distribution of social reproduction regimes by region, 2008-2015**

<i>Region</i>	<i>Exploitation</i>	<i>Mutual</i>	<i>Time squeeze</i>	<i>Wage squeeze</i>	<i>Number of countries</i>
Developed economies	15%	24%	38%	24%	34
Developing Africa	15%	13%	69%	4%	48
Developing America	5%	32%	5%	59%	22
Developing Asia	15%	12%	18%	56%	34
Developing Oceania	100%	0%	0%	0%	1
Transition economies	0%	18%	0%	82%	17
<b><i>World</i></b>	<b><i>12%</i></b>	<b><i>18%</i></b>	<b><i>34%</i></b>	<b><i>36%</i></b>	<b><i>156</i></b>

Note: The classification of country groups conforms to that used by the United Nations.

## Appendix A. Data

Variable	Short name	Source
5-year percentage point change in non-income HDI less 5-year percentage point change in income index	<i>HDI2</i>	Calculated based on disaggregating components of the Human Development Index (HDI), UNDP
Manufacturing exports as a share of GDP	<i>mfgX</i>	Manufacturing exports drawn from Comtrade database, GDP from World Development Indicators (WDI) database, both in US\$.
Inward FDI as a share of GDP	<i>FDI</i>	Calculated from WDI database.
Public investment as a share of GDP	<i>pub</i>	Calculated from WDI database, based on reported shares of private investment in gross fixed capital formation.
Weighted average tariff rates applied	<i>TFF</i>	Calculated based on data drawn from TRAINS database, UNCTAD. Weights based on imports by product group at the HS 2-digit level.
Ratio of female age of first marriage to male age of first marriage	<i>afmr</i>	Calculated based on UNDESA Population Division World Marriage Data.
Ratio of the share of wage and salaried workers in women's to men's employment	<i>fmemp</i>	Calculated based on data drawn from WDI database.
Public social protection and health expenditure as a share of GDP	<i>spb</i>	Drawn from Table B.12 in the 2014/15 World Social Protection Report (ILO 2014). Public social protection expenditures include public benefits for the following: unemployment, employment injury, disability, maternity, and general social assistance.
Average access to electricity, non-solid fuel, improved sanitation facilities and improved water source	<i>repro</i>	Calculated based on series drawn from WDI database.
Share of women's service employment to total employment, raised to the power of the inverse of the Palma ratio	<i>mcare</i>	Employment share calculated based on data from WDI database; Palma ratio drawn from Global Income and Consumption Project (GICP) database.

## Appendix B. Social reproduction regime by region and country (2008-2015)

<b>Developed countries</b>			Rwanda	Time squeeze
Australia	Time squeeze		Senegal	Time squeeze
Austria	Mutual		Sierra Leone	Exploitation
Belgium	Wage squeeze		Somalia	Exploitation
Bulgaria	Time squeeze		South Africa	Wage squeeze
Canada	Time squeeze		South Sudan	Time squeeze
Croatia	Time squeeze		Sudan	Time squeeze
Cyprus	Exploitation		Swaziland	Time squeeze
Czech Republic	Wage squeeze		Tanzania	Time squeeze
Denmark	Mutual		Togo	Time squeeze
Estonia	Exploitation		Tunisia	Mutual
Finland	Mutual		Uganda	Time squeeze
France	Mutual		Zambia	Time squeeze
Germany	Wage squeeze		Zimbabwe	Time squeeze
Greece	Time squeeze			
Hungary	Wage squeeze		<b>Developing America</b>	
Ireland	Wage squeeze		Argentina	Mutual
Israel	Time squeeze		Bolivia	Mutual
Italy	Time squeeze		Brazil	Mutual
Japan	Mutual		Chile	Wage squeeze
Latvia	Exploitation		Colombia	Mutual
Lithuania	Exploitation		Costa Rica	Wage squeeze
Netherlands	Wage squeeze		Cuba	Wage squeeze
New Zealand	Time squeeze		Dominican Republic	Wage squeeze
Norway	Mutual		Ecuador	Mutual
Poland	Exploitation		El Salvador	Wage squeeze
Portugal	Time squeeze		Guatemala	Exploitation
Romania	Time squeeze		Haiti	Time squeeze
Slovak Republic	Wage squeeze		Honduras	Wage squeeze
Slovenia	Wage squeeze		Jamaica	Mutual
Spain	Time squeeze		Mexico	Wage squeeze
Sweden	Mutual		Nicaragua	Wage squeeze
Switzerland	Time squeeze		Panama	Wage squeeze
United Kingdom	Mutual		Paraguay	Wage squeeze
United States	Time squeeze		Peru	Wage squeeze
			Trinidad and Tobago	Wage squeeze
			Uruguay	Wage squeeze
			Venezuela, RB	Mutual
<b>Developing Africa</b>				
Algeria	Mutual		<b>Developing Asia</b>	
Angola	Time squeeze		Afghanistan	Time squeeze
Benin	Time squeeze		Bahrain	Wage squeeze
Botswana	Mutual		Bangladesh	Time squeeze
Burkina Faso	Time squeeze		Bangladesh	Time squeeze
Burundi	Time squeeze		Cambodia	Exploitation
Cameroon	Time squeeze		China	Wage squeeze
Central African Republic	Time squeeze		Hong Kong SAR, China	Wage squeeze
Chad	Time squeeze		India	Exploitation
Congo, Dem. Rep.	Time squeeze		Indonesia	Wage squeeze
Congo, Rep.	Time squeeze		Iran, Islamic Rep.	Mutual
Cote d'Ivoire	Exploitation		Iraq	Mutual
Egypt, Arab Rep.	Mutual		Jordan	Wage squeeze
Eritrea	Time squeeze		Korea, Dem. People's Rep.	Wage squeeze
Ethiopia	Time squeeze		Korea, Rep.	Wage squeeze
Gabon	Mutual		Kuwait	Wage squeeze
Gambia, The	Time squeeze		Lao PDR	Time squeeze
Ghana	Time squeeze		Lebanon	Wage squeeze
Guinea	Time squeeze		Malaysia	Wage squeeze
Guinea-Bissau	Time squeeze		Mongolia	Wage squeeze
Kenya	Time squeeze		Myanmar	Exploitation
Lesotho	Time squeeze		Nepal	Time squeeze
Liberia	Exploitation		Oman	Mutual
Libya	Time squeeze		Pakistan	Time squeeze
Madagascar	Exploitation		Philippines	Wage squeeze
Malawi	Time squeeze		Qatar	Wage squeeze
Mali	Time squeeze		Saudi Arabia	Wage squeeze
Mauritania	Time squeeze		Singapore	Wage squeeze
Mauritius	Wage squeeze		Sri Lanka	Wage squeeze
Morocco	Mutual		Syrian Arab Republic	Mutual
Mozambique	Exploitation		Thailand	Wage squeeze
Namibia	Exploitation		Timor-Leste	Time squeeze
Niger	Time squeeze		Turkey	Wage squeeze
Nigeria	Time squeeze			

United Arab Emirates	Wage squeeze
Vietnam	Exploitation
Yemen, Rep.	Exploitation

**Developing Oceania**

Papua New Guinea	Exploitation
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**Transition economies**

Albania	Wage squeeze
Armenia	Wage squeeze
Azerbaijan	Wage squeeze
Belarus	Wage squeeze
Bosnia and Herzegovina	Wage squeeze
Georgia	Wage squeeze
Kazakhstan	Wage squeeze
Kosovo	Mutual
Kyrgyz Republic	Wage squeeze
Macedonia, FYR	Wage squeeze
Moldova	Wage squeeze
Russian Federation	Wage squeeze
Serbia	Wage squeeze
Tajikistan	Mutual
Turkmenistan	Mutual
Ukraine	Wage squeeze
Uzbekistan	Wage squeeze