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Global Trends in Intra-household Gender Inequality

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Abstract

We present trends in intra-household gender inequality for forty five different countries across a four decade period (1973–2016), using global micro-data from 2.85 million households. Intra-household gender inequality has declined by 20% in the four decades that we study. However, current levels are are still significant so that any neglect of intra-household gender inequality results in a substantial underestimation of overall earnings inequality. For a sub-sample of countries, we show that the relationship between intra-household gender inequality and household economic status is non-monotonic – that we refer to as the "micro-GKC" (micro Gender Kuznets Curve) relationship. We also develop an empirical framework to measure the aggregate welfare loss from intra-household gender inequality. For a range of plausible inequality aversion assumptions, we report a median welfare loss of over 15% of aggregate earnings.

Key words: Micro-GKC, Atkinson Inequality Metric, Gender Equality, LIS & LWS

JEL codes: D63, I31, J16, O10

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1 Introduction

Conventional inequality and poverty analyses treat the household as a black box and implicitly assume an equal distribution of economic resources within a household. However, there is evidence to the contrary that suggests gendered fault lines exist *within* households, with women and girls discriminated relative to men and boys (for recent evidence, *cf.* Lise and Seitz, 2011; Vijaya et al., 2014; Rodríguez, 2016; De Vreyer and Lambert, 2020; Guio and Van den Bosch, 2020; Klasen and Lahoti, 2020). Ignoring within-household variations can lead to a flawed understanding of overall inequality patterns (Chiappori and Meghir, 2015). We show that the global policy goal of gender equality (Ridgeway, 2011; Ponthieux and Meurs, 2015) cannot be fully achieved unless we analytically and empirically unpack the household black box.

We contribute to the literature on intra-household economic inequality by taking a global perspective, and focusing on labor market earnings of couples within a household. Previous intra-household studies focusing on inequality between couples have usually considered consumption (Lise and Seitz, 2011; Piccoli, 2017; De Vreyer and Lambert, 2020), deprivation (Guio and Van den Bosch, 2020), or health and nutrition (Haddad and Kanbur, 1990; Sahn and Younger, 2009; Rodríguez, 2016). Using micro data on individual labor market earnings from 2.85 million households (drawn from 302 country-year datasets), we develop a global portrait of intra-household gender inequality. We delineate four related global trends. First, we show that intra-household gender inequality is prevalent across a diverse set of countries, and across four decades (1973-2016). Second, we find that intra-household gender inequality is pervasive across the earnings distribution. Third, we present a "micro-GKC" (micro Gender Kuznets curve) framework to account for the non-linear relationship between intra-household gender inequality and household economic status. Finally, we develop a welfare theoretic framework to estimate the aggregate economy-wide welfare loss attributable to intra-household gender inequality.

Our primary intra-household gender inequality indicator, women's share of couple earnings, is a function of their engagement with the labor market. Men and women differ in their labor market experience along several dimensions. On average, women are less likely to be in full-time employment, have reduced hours of work, and face greater career breaks due to life cycle events such as childbirth (OECD, 2015). The gender wage gap has declined but continues to exist across developed and developing countries (OECD, 2015). Sticky gender norms ensure that women continue to carry the main responsibility of social reproduction activities that are not only unpaid and undervalued, but also limit their labor market engagement

(Bertrand et al., 2015; Pepin et al., 2018). Women's reduced labor market attachment has implications for gender equality for both pecuniary and non-pecuniary outcomes. Starting with obvious material losses, unequal labor market experience for women can lead to reduced income in old age when pension policies are indexed to labor earnings (Brown et al., 2016), reduced life-time wealth accumulation (Ruel and Hauser, 2013), and increasing poverty rate (Nieuwenhuis et al., 2020).

Intra-household research adds to the evidence on women's employment and gender equality. Employment potentially gives women a source of independent earnings, which can alter the balance of power within the household. Indeed, "even if household income were shared completely, it is problematic to assume that it does not matter in a well-being assessment whether a person has earned this money herself or obtained it from her partner" (Robeyns, 2003, p.63). Further, the very act of stepping outside the confines of the home and interacting with others can also be empowering and liberating, particularly in certain social and geographical contexts.[1]

Employment, individual-level earnings, and an associated sense of empowerment all reinforce each other to impact several well-being outcomes. Independent resources (property, income, wealth) and employment largely reduce the risk of intimate partner violence (Panda and Agarwal, 2005; Bhattacharyya et al., 2011; Oduro et al., 2015). Greater resource control also benefits women's empowerment as measured by involvement in household decision-making or mobility (Anderson and Eswaran, 2009; Swaminathan et al., 2012; Majlesi, 2016), and has positive impacts on children's human capital (Lundberg et al., 1997; Allendorf, 2007; Park, 2007; Bobonis, 2009). Not accounting for intra-household inequalities in resources can underestimate poverty — whether measured in a uni-dimensional context (Haddad and Kanbur, 1990; Piccoli, 2017; De Vreyer and Lambert, 2020), or in a multidimensional context (Vijaya et al., 2014; Klasen and Lahoti, 2020). Similarly, individual consumption inequality is also underestimated with the assumption of equal sharing of the household income (Lise and Seitz, 2011; De Vreyer and Lambert, 2020). Finally, recent evidence links the intra-couple gender deprivation gap to the individual employment status of the couple and their share of joint income (Guio and Van den Bosch, 2020).

There has been renewed interest in the contribution of women's earnings to inter-

[1]Feminist scholars note the dangers of considering all types of work as empowering for women. Women's work is often driven by subsistence needs, tends to be low-skilled, poorly remunerated, and with little scope for empowerment. Thus, formal and semi-formal sector employment is preferred over informal or casual employment (Anderson and Eswaran, 2009; Kabeer et al., 2013). Our paper, however, abstracts from these discussions.

household — between households — earnings inequalities (for example, Esping-Andersen, 2009; OECD, 2015). On average, women's earnings have been rising largely due to a reduction in the gender employment gap and in the gender wage gap. Women's rising earnings tend to reduce inter-household inequalities even as there may be some regional variations (Gregory et al., 2009; Harkness, 2013). A study by Nieuwenhuis et al. (2017) that examined the long-term trends (1973–2013) across 18 OECD countries reinforced these results. However, there is no explicit consideration of within-household earnings inequality in these studies.

Most indicators of gender inequality are almost always computed at the population level; there are few that measure inequality *within* households. Empirically, there is disconnect between the unit of analysis and the unit of data collection. Typically, one is concerned with the well-being of the individual, but the smallest unit for which data is widely collected is usually the household. This is true for income, consumption, or wealth data, which are the standard foci of economic inequality analysis.[2] To move from the household to the individual, a per capita method is adopted that entails equally apportioning the household total among all its members. Sometimes, equivalence scales are used to adjust these figures for age and sex. The problem with this methodology is that it assumes away any intra-household inequality with the consequence that one gets an underestimate of poverty and inequality (Haddad and Kanbur, 1990; Lise and Seitz, 2011; Swaminathan et al., 2012; Vijaya et al., 2014; De Vreyer and Lambert, 2020). For many women, the myriad experiences within their homes constitute an important element of the gender discrimination they encounter all too frequently. Power imbalances, social norms and values systems that are biased against women certainly have their basis in the larger community, but are also nurtured within the household.

An important extension is to be able to trace the relationship between intra-household inequality in earnings and economic prosperity. We investigate if there is a secular decline in intra-household inequality as one moves higher on the economic distribution of households. One would expect a convergence of earnings between spouses with greater assortative matching in the marriage market. In other words, as individuals with similar levels of education come together to form households, they are likely to encounter similar employment opportunities. How this translates into earnings is governed by structural conditions in the labor market (gender pay gap, discrimination in hiring, and so on) and by the labor supply

[2]In developed economies with a dominant formal sector, income data is indeed collected at the individual level even as consumption and wealth data are typically available only at the household level. However, in developing countries with large informal sectors, even income data is also usually available only at the household level.

choices made by the couple (Chiappori, 1997; Bertrand et al., 2015). These choices will affect both the intent to participate (to work or not in the formal labor market) as well as the intensity of work (hours committed to the labor market). The focus of our work is not explaining factors driving women's employment (*cf.* Klasen, 2019, for a comprehensive review), but rather in linking these trends to intra-household inequality.

Our study also speaks to the literature that examines how economic growth impacts gender equality in economic outcomes.[3] The relationship between economic development and women's labor force participation has been an area of active scholarship across diverse geographies. Goldin's 1994 seminal study found a U-shaped relationship between women's Labor Force Participation (LFP) and economic development as measured by the Gross Domestic Product (GDP). This phenomenon is explained by a combination of factors — the economic structure, changes in women's educational levels, and impact of income and substitution effects. This stylized finding, however, does not hold uniformly across countries (Gaddis and Klasen, 2014). It is hypothesized that social norms that promote gender biases and entrenched patriarchal institutions are sometimes strengthened during the process of economic development (Forsythe et al., 2000; Eastin and Prakash, 2013). Using macro data from 146 countries covering 1980-2005, Eastin and Prakash (2013) investigate the relation between a broad set of gender equality indicators including female labor force participation and economic development (proxied by GDP). The authors find a non-monotonic association of gender equality with economic growth, which they term as a Gender Kuznets Curve (GKC). The evidence is suggestive of an S-shaped curve where in the first stage of development there are gains for gender equality; these are eroded in the second stage but are recouped once economic development crosses a certain threshold.

In our paper, we shift the analytic focus from sovereign nation states as the unit of analysis. Instead of large macro outcomes, we are interested in the micro dynamics of gender relationships at the most elementary aggregation of individuals — the household. Is there a micro-GKC (micro Gender Kuznets Curve) relationship between intra-household gender inequality and household economic status? Our indicators for gender equality are women's employment status, and women's labor market earnings, both of which are directly relevant for women's status within the household as well as other development outcomes. Household net wealth is used as a proxy for household economic status. We find that a micro-GKC relationship does not fully mirror macro-level findings. This analytic focus is central to how our micro-GKC exercise relates to the other principal contributions of the paper. Broadly,

[3] *Cf.* de Haan (2017) and Silva and Klasen (2021) for recent reviews on how gender inequality can affect economic growth.

our results point to the household as an indispensable socio-economic unit driving inequalities between men and women. The global perspective adopted here tracks changes over time and across diverse contexts, and emphasizes the enduring role of intra-household dynamics and its implications for macro welfare loss.

2 Data

We use data from the Luxembourg Income Study (LIS) global database that provides harmonized micro data over four decades across a range of countries (*cf.* Appendix Table A1 for details). LIS data, like most standard household surveys, has information on demographics, household structure, labor market activity, income and expenditures. Most centrally for the purposes of measuring intra-household gender inequality, earnings data is available at the individual level. What makes the LIS data unique is that all information has been harmonized into a common template making it invaluable for cross-country comparisons — and in our case developing a global portrait of intra-household gender inequality (LIS, 2016).[4]

This paper uses data from 45 unique countries, with repeated cross-sections available for most countries, giving us a total of 302 country-year datasets, spanning 1973-2016. This large volume of information is used to delineate long-term patterns in intra-household inequality, while other analyses are based on the most recent wave of data collection, and described in appropriate sections below. The LIS repository has been used extensively to develop a portrait of global inequality, but intra-household gender inequality has largely escaped attention.[5]

Earnings in LIS data are at the individual level, and classified as "gross" or "net" depending on how taxes and social security contributions are captured. Gross income is netted down using household-level or person-level tax information while datasets classified as "mixed" (data is a mixture of gross and net earnings) are dropped from our analysis (Nieuwenhuis et al., 2017). Negative earnings are set to zero, while the top one percentile is top-coded to the 99^{th} percentile (Harkness, 2013). Our measure of earnings is broad, and is defined as monetary returns to paid employment including returns to self-employment activity. Earnings are set to zero if an individual does not undertake any paid work. We use women's share of aggregate couple earnings to track within-household gender inequality.

[4] *Cf.* https://www.lisdatacenter.org/our-data/ for further information on LIS data

[5] *Cf.* https://www.lisdatacenter.org/working-papers/ (accessed, December 24, 2020) for a list of all studies that have used the LIS micro-data.

Our analytic sample comprises heterosexual couple households (n = 2,847,697 couple units) where the head is living with a partner in a marriage, co-habiting, or in a consensual union. Further, both partners are of working age (18–65 years), and not currently enrolled in a full-time educational program. Sampling weights are applied to all calculations.[6] We use the terms "intra-household," and "intra-couple" interchangeably throughout this paper to be consistent with the extant literature. Global trends apart, we also focus on contemporary levels of intra-household gender inequality, by further analyzing the 39 most recent LIS datasets in our full ensemble (2010–2016). This sub-sample contains 466,475 couple units as opposed to our full analytic sample of 2,847,697 couple units (*cf.* Appendix Table A2).

Our portrait of global trends is robust to alternative specifications of the analytic sample. We restrict our sample to include only couple units in the 25–55 age-range to identify potential sample bias due to educational attainment. However, our results are not altered with this restriction. The four panels of Figure A1 describe different summary statistics for the 302 datasets that we use in our ensemble. Panel-A and Panel-B show the high correlation for female share of couple earnings between the main analytic sample and the modified sample with the 25–55 age restriction (median and mean, respectively). Panel-C and Panel-D depict the similarly high correlation for mean female employment (full-time and part-time, respectively).[7]

For a small subset of the micro datasets in the LIS repository, we are able to merge individual-level earnings data with the corresponding household wealth data available in the Luxembourg Wealth Study (LWS) repository. Similar to LIS, LWS is a cross-country wealth database harmonized into a common framework (LWS, 2014). For five countries (Australia, Germany, Italy, Norway, and Sweden), detailed wealth and income data were collected for the same household in the same year, making it possible to generate a combined dataset to examine the existence of a potential micro-GKC relationship — a non-monotonic association between intra-household gender inequality and household economic status. We use household net wealth to proxy economic status. The LIS-LWS merge gives us 15 country-year datasets, with an analytic sample of 301,519 couple-units (*cf.* Appendix Table A3).

[6]The analytic subset speaks to our primary interest in gendered intra-household dynamics. Thus, we do not consider non-coupled households even as evidence suggests that female-headed households and especially, households where the woman is the only adult member are likely poorer than male-headed households (Maldonado and Nieuwenhuis, 2015).

[7]We thank an anonymous reviewer for suggesting this robustness test. Besides mean and median, the standard deviations for female earning shares in our analytic sample and the restricted age sample are highly correlated (≈ 0.99).

3 Global Trends

Figure 1 illustrates why accounting for within household inequality is analytically important in characterizing overall inequality in a society. Panel-A shows the distribution of Gini coefficients computed for the couple units from 302 LIS datasets. We compute inequality for the individual-distribution ($2n$ individuals), as well as the couple-distribution (n couples). The panel shows that over the last four decades, and across a diverse set of countries, the difference between inequality measured at the individual level, versus household level (aggregate couple earnings) is substantial. This difference between individual and couple Gini coefficients reflects intra-household (or accurately, intra-couple) earnings inequality. The use of the couple distribution amounts to a neglect of intra-household inequality in earnings. It is equivalent to the assumption that earnings within a household (couple unit) are equally distributed so that Gini is computed using per capita household earnings. Panel-B of Figure 1 presents the evolution of this intra-couple inequality, measured as the difference between individual-level and couple-level Gini coefficients (1973–2016). Inequality within couples has declined monotonically in the last forty years, consistent with increased assortative mating, and also greater labor force participation by women (Harkness, 2013). Despite a 20% decline in intra-couple inequality, current levels continue to be significant as indicated by the 39 country-year points from the latest wave represented in aqua.

Panel-C of Figure 1 plots the percentage spread between Gini coefficients computed from individual, and aggregate couple distributions against overall level of individual earnings inequality (measured as Gini coefficient computed using disaggregated individual-level earnings data). We have once again separated out the latest 39 country-year points. Overall, Panel-C of Figure 1 shows a non-monotonic relationship between the extent of intra-household gender inequality (measured crudely as the percentage spread between Gini coefficients and the overall level of inequality (measured as individual-level Gini). However, for the most recent wave of global earnings data (represented by 39 country-year points in aqua), there is no discernible relationship between overall inequality and intra-household gender inequality. Panel-C thus illustrates the need for an independent analytic and empirical focus on intra-household gender inequality.

Using the same 39 country-year points, Panel-D of Figure 1 maps the relationship between Gini coefficients computed at individual and couple scales. The Gini coefficient for individual earnings distribution is highly correlated with the Gini for the couple earnings distribution. Thus, any macro-level or cross-country analysis of the impact of inequality is likely unaltered by the use of household, rather than the individual as the unit of analysis.

However, neglecting intra-household inequality amounts to an implicit income pooling assumption that has been shown to be both theoretically and empirically untenable.

In the remainder of this section, we characterize intra-household gender inequality along two dimensions. In Section 3.1, we explore the relationship between intra-household gender inequity and over levels of inequality in a society. In the following Section (§3.2), we investigate how (if) intra-household gender inequality varies across the economic spectrum? Are richer households more (or less) equal? We conclude this section by investigating trends in female labor market intensity, and possible childcare penalty — two principal factors that likely contribute to intra-household gender inequality (§3.3). As detailed in Figure 1, we focus on the smaller subset of recent data from the LIS data ensemble to shed further light on global intra-household gender inequality.

3.1 Intra-household Gender Inequality and Overall Inequality

The lack of a straightforward linear relationship between intra-household gender inequality and overall level of inequality is illustrated in Figure 2. This depicts the relationship between the extent of intra-household gender inequality and overall earnings inequality as country-ranks. We ranked the 39 countries by overall level of inequality in our couple-household analytic sample (on the X axis of the figure; country with the lowest inequality is ranked "1," and the country with the highest is ranked "39"). We also ranked countries by the percentage divergence between Gini coefficients measured at the individual level, and for the aggregate couple distribution – a proxy for extent of intra-household gender inequality (the country with the lowest divergence is ranked "1" on the Y axis).

We divide Figure 2 into four quadrants defined by midpoint country ranking. The distribution of the countries across these four quadrants underscores why it is important to analytically and empirically track intra-household gender inequality separately from overall inequality. Consider the four Nordic countries – Denmark, Finland, Iceland, and Norway – all with low levels of overall inequality. While Finland and Denmark (in the **Q3** quadrant) also have low levels of intra-household gender inequality, Iceland's intra-household inequality rank is comparable to that of the United States that has much higher level of overall inequality. At the other end of the spectrum, South Africa and Egypt both have high levels of overall inequality but South Africa (along with Latin American countries of Brazil, Chile, and Panama in **Q2**) display low levels of intra-household gender inequality. Only Hungary, the United Kingdom, and Greece have the same ranks for both overall inequality and intra-

household gender inequality (shown on the $x = y$ diagonal line).

The need for an independent analytic and empirical treatment of intra-household gender inequality is underscored by Lorenz curves corresponding to individual earnings and aggregate household (or couple) earnings. To illustrate this difference between individual and couple earnings distribution, we have singled out four diverse countries — Finland, Germany, India, and the United States, that each occupy a distinct quadrant in Figure 2. Finland in the **Q3** quadrant has low overall inequality as well as low intra-household gender inequality; Germany in the **Q4** quadrant has low overall inequality, but a high level of intra-household gender inequality; India in the **Q2** quadrant has a high level of overall inequality, but a low level of intra-household gender inequality; and finally the United States in the **Q1** quadrant has high levels of both overall inequality and intra-household gender inequality. In Figure 3, the individual earnings distribution represents the overall level of inequality. The percentage spreads between the Gini coefficients corresponding to the two Lorenz curves represents the extent of intra-household gender inequality. The panels in Figure 3 reinforce our observation that the extent of intra-household gender inequality is uncorrelated with overall level of inequality in an economy. Taken together, the Lorenz curves in Figure 3, and the cross-national analysis in Figure 2 show why a fuller characterization of intra-household gender inequality is contingent on *within*-country micro analysis — how (if) is intra-household gender inequality related to the economic status of the household?

We have singled out four diverse country-year points in Figure 3. Despite representing diverse economies, these four countries cannot adequately proxy four decades worth of global data. While we will often rely on the four datasets used in Figure 3 in our further analysis, in every case we also provide a link to an external file that replicates a given analysis for the larger analytic ensemble.[8]

3.2 Are Richer Households More (or Less) Equal?

For the same set of 39 countries in Figure 2, we investigate variations in women's share of couple earnings across the earnings distribution in Figure 4. Women's share is shown for our full sample (where one member of the couple may have zero earnings) as well as for the subsample with strictly positive earnings for each member of the couple unit. The trend-lines are LOESS-fitted curves (Cleveland, 1979) that trace the trajectory of women's share across the distribution of households by couple earnings quantile. The horizontal lines represent

[8]The Lorenz curves in Figure 3 are available for the entire sample at https://tinyurl.com/LorenzFullSample (as an ≈ 25 MB PDF file).

the median share of women's earnings for the two samples. The difference between these median shares is indicative of women's low labor force participation. For the full sample, there are five countries where the median earning share is effectively zero. At the other end of the spectrum, Nordic countries show little difference in the median shares between the two samples. Moving from the full sample to the sub-sample of only positive earnings couple households ($\approx$ 300,000 couple units), we find that women's share of couple earnings is increasing in overall position of the household in the couple earnings distribution. This is as expected, but what is revealing is that not in a single country do women earn as much as men (with same earnings, the share would be 50%). Previous studies of intra-couple income distribution have shown that gender identity norms explain the constraints on women earning more than 50% of the aggregate couple income (Bertrand et al., 2015), and follows more generally from how socially constructed identities such as gender mediate economic outcomes (Akerlof and Kranton, 2000).

The median woman's share of couple earning is higher than 40% in 28 countries. While across countries, women's share is increasing as households become more prosperous; in the top percentiles, their share either plateaus or even shows a slight decline. Figure 4 highlights the importance of women's paid work for reducing intra-couple earnings inequality. However, when women do participate in the labor market, there continue to be differences in earnings between men and women that could reflect differences in intensity of work (hours), concentration of women in low wage and low skill jobs, and labor market discrimination against women (Harkness, 2013; OECD, 2015).

Evidence suggests that intra-household earnings inequality is driven by several interacting social, cultural, and economic channels. Social norms that reinforce men as breadwinners, and women as homemakers and caregivers could push women out of the workforce as households make choices about labor market engagement versus household duties (Fernández et al., 2004; Fortin, 2005; Andrew et al., 2020). The responsibilities of social reproduction are a why women are not able to undertake, or cut back on the hours of paid work. Family support policies (such as paid maternity and paternity leave, paid sick leave, daycare facilities for young children and so on) are crucial in supporting women's paid work. Social security policies that are not conditional on employment are another source of significant support (Andringa et al., 2015). We therefore investigate how full-time employment modulates intra-household gender inequality in earnings.

3.3 Labor Market Intensity and Child Care Penalty

For the four diverse countries that we previously singled out, we examine the association between paid full-time work and intra-household earnings inequality using the positive earners sub-sample (Figure 5). These countries represent variations in women's labor force participation, median women's share of couple earnings, overall level of inequality, and the level of state support for women's employment. The X axis shows, as previously, the earnings quantile of the couple distribution, while the Y axis now represents the individual earnings distribution. The points in each of the panels and associated LOESS trend lines show how individual members of a couple-unit occupy different points on the individual earnings distribution across the aggregate couple earnings distribution. The four panels for each country in Figure 5 show differing combinations of labor force intensity of the couple; both partners have any sort of labor market participation (panel A), both partners have full year full-time (FYFT) jobs (panel D), and women (men) have FYFT jobs but men (women) have either part-time jobs or have not worked the full year (panels B and C, respectively). The residual category where neither men nor women in couple units hold full-time jobs is not shown.

As reported in Appendix Table A4, and not surprisingly, India as the only non-OECD country in Figure 5 is an outlier with 36% of couple units where both partners have non-zero earnings. This is largely reflective of the low labor force participation rates of women (Lahoti and Swaminathan, 2016), which is also evident from the stark difference in median share of women's earnings between the full and positive samples. Further, 66% of couples within this small sub-sample are men and women who both do not have full-year full-time employment. In Germany, men working full time with part-time women are by far the dominant category; while in Finland, there is greater symmetry in the roles of men and women (Table A4). Among developed countries, the United States is an exception with 58% of couples in full-time work.

Trends reported in Figure 5 and Table A4 make clear how FYFT employment is key to reducing earnings inequality within the household. Interestingly in Finland, dual income households with both partners working full-time are not even represented in the lowest 25^{th} percentiles (panel D). There is almost complete convergence in earnings at the bottom percentiles for all countries, while in the higher percentiles, men's earnings on average, are higher than women's earnings. Among other factors, these trends reflect family-friendly state policies or the lack thereof, tax policies that penalize a second earner in the household, and effect of gender norms surrounding childcare (Harkness, 2013; Kleven et al., 2019). As expected, when only men are in full-time employment their earnings dominate women's earnings with the gender gap in earnings peaking around the middle of the distribution, as seen in Fig-

ure 5. There is substantive inequality in earnings at the intra-household level at the top end of the distribution for Germany, the United States and India (panel C). In the former two countries, this reflects the fact that women with highly paid partners are choosing more flexible forms of labor market engagement (Goldin, 2014).

Recent evidence from developed countries suggests a 'motherhood penalty,' or a negative impact of childbirth and caring of young children on women's labor market outcomes (Kleven et al., 2019). Interestingly, parenthood does not impose any such penalty on fathers. Essentially, mothers either exit the labor force or reduce their hours of work, both of which impacts earnings in the immediate and long term (Kleven et al., 2019). Women may also switch to jobs that are more family friendly and offer greater flexibility, often at the cost of economic security. Goldin (2014) shows that in certain occupations, flexibility in hours and career interruptions have disproportionate impact on earnings. The finance, legal, and corporate sectors in particular show a nonlinear relationship of earnings with respect to hours worked. In India, on the other hand, there is an income effect on women's labor supply wherein high household income causes many women to exit the labor market (Eswaran et al., 2013). However, panel B in Figure 5 suggests that the converse is not strictly true across the distribution. Men are relatively disadvantaged in Finland, Germany and the United States when couple earnings are low, but catch up with women as the household economic status improves.

We also examine the association between the presence of young children and intra-household gender inequality in the Appendix (Figures A2, A3, A4, and A5).[9] Evidence is mixed; for Finland and Germany, it is seen that care work does indeed have an association with worsening intra-household gender inequality across the earnings distribution. In the United States, this association is weak, and is negligible in India. Employment is largely concentrated in the informal sector in developing economies like India (Bonnet et al., 2019), which may allow women the flexibility of combining work with childcare. Further, family arrangements may provide for childcare, ensuring mothers labor market participation.

[9]While the Appendix shows the association between childcare penalty and intra-household gender inequality for the four countries that we have analyzed in Figure 5, such portraits are also available for other datasets in our ensemble (`https://tinyurl.com/nChildFullSample`, ≈ 233 MB `PDF` file).

4 A Micro-GKC Relationship?

How does intra-household gender inequality vary with household economic status? Our discussion in Section 3.2 suggests that this relationship is likely non-linear. Here, we formally explore this question by testing if there is micro counterpart of the macro-GKC that posits a non-linear relationship between gender equality and economic development (Eastin and Prakash, 2013). In our exploration of the micro-GKC relationship, we use women's employment status as a proxy for gender equality. As we have already discussed, labor market engagement is potentially foundational for women's economic empowerment, while also serving as the mechanism for enhancing her status and agency within the household. Further, for the sub-sample of women who are employed, we probe the micro-GKC relationship using women's share of couple earnings as an intra-household proxy for gender equality. The advantage of using earnings share over labor market participation or absolute earnings is that it captures women's relative status with respect to household resources (or accurately couple earnings). It compares her earnings in relation to her partners' earnings and thus, incorporates any changes that may be occurring in men's earning capacities. It also abstracts away from the concern about the type of employment women are engaged in. Even if women are in poorly paid jobs that are not necessarily empowering, they will still have a positive income, which could be a valuable addition to household finances.

Our key independent variable is per capita household net wealth measured in constant 2011 PPP US.[10] Household wealth is the closest approximation for household economic status over the long term or at least, medium term. Wealth differs from income in that it represents accumulated stock and is likely to experience a lower level of variation. As described in our data section, we use the LIS-LWS merged 15 country-year datasets for the micro-GKC analysis. The analytic sample remains the same as described previously; heterosexual couple households with working age individuals not currently enrolled in full-time education (*cf.* Appendix Table A3 for details).

For our first measure of gender equality — women's employment status — we estimate the following linear probability model (LPM):

$$\Omega_{ikt} = \alpha + \beta W_{ikt} + \gamma \vec{X}_{ikt} + \lambda \vec{K}_{ikt} + \mu \vec{Z}_{ikt} + \epsilon \tag{1}$$

where Ω_{ikt} is a binary variable that takes on a value of 1 when the woman in household i (in

[10] Wealth values are deflated using the 2011 LISPPs that help compare monetary values across countries and over time (*cf.* https://www.lisdatacenter.org/resources/ppp-deflators/, accessed on January 15, 2021).

country k and year t) is employed. W_{ikt} is the per capita household net wealth; we include quadratic and cubic specifications of the wealth variable to test for a curvilinear relationship between gender equality and household economic status. $\vec{X}_{ikt}$ is a vector of individual variables that are likely to influence her labor market participation (quadratic specification of age to pick up life cycle effects, and educational attainment). $\vec{K}_{ikt}$ is a vector of household characteristics and includes number of own children living in the household, presence of a child under five years of age, and whether the wife was considered the household head.[11] $\vec{Z}_{ikt}$ is a vector of spouse or partner information (husband's education status and employment status), and couple characteristics (age gap between husband and wife). We normalize all continuous variables, and report robust standard errors.

Conditional on wife's employment status, we estimate a second model with her share of couple earnings as the dependent variable (Y_{ikt}).

$$Y_{ikt}|_{\Omega_{ikt}} = \alpha + \beta W_{ikt} + \gamma \vec{X}_{ikt} + \lambda \vec{K}_{ikt} + \mu \vec{Z}_{ikt} + \epsilon \tag{2}$$

The independent variables in Eq. 2 are identical to the model in Eq. 1. The model is estimated using ordinary least squares (OLS). However, in order to better understand the relationship between the distribution of women's earnings share and the independent variables, we also estimate quantile regression models at 25%, 50% (median), and 75% quantiles. All models include country-year fixed effects to control for time-varying unobserved country attributes. Figure 6 shows why quantile regression estimates are needed to fully describe the association between woman's share of couple earnings and household economic status. The figure plots the bi-variate relationship at different deciles to show how this association can vary across the earning share distribution. Models in equations 1 and 2 are estimated for all 15 country data sets.

4.1 Micro-GKC Results

The LPM results are presented in Table 1. We find that per capita net household wealth is significantly associated with women's employment status. However unlike Eastin and Prakash (2013), there is no indication of a S-shaped relationship, but rather a faint U-shaped relation, bordering on a straight line. As per capita wealth rises initially, women are less likely to be employed. As households become wealthier and more prosperous, women are more likely to participate in the labor market. This could reflect an income effect with women initially withdrawing from employment as their work is perceived to be supplemental.

[11] We refer to the couple unit as 'husband-wife,' but include all heterosexual couples living together.

However, as households move along the wealth distribution, women are more likely to be employed, reflecting the higher opportunity costs of lost wages. This U-shaped relationship is a 'Norway effect,' that is, it reflects the relationship between women's employment and household economic status in Norway.

Estimating the LPM excluding Norway, our results indicate a S-shaped relationship between women's employment and household economic status. The linear and the cubic terms of per capita household wealth show a positive association with wife's employment, while the square term shows a negative association. This result is consistent with a micro-GKC relationship between gender equality and household economic status at the macro-scale (Eastin and Prakash, 2013). At a micro level, this suggests three stages with respect to the economic status of the household. In the first stage, one could argue that economic factors and monetary concerns push women into employment. The household and women themselves may not be in a position to exercise any discretion over their employment due to economic necessity. As households become monetarily more secure, women step back into traditionally defined social reproduction roles. However, in wealthier households, women once again are more likely to be employed. Perhaps, in such households, there is a relaxation of restrictive gender expectations on the part of both men and women to facilitate women's entry into employment. Alternatively, it could mean that wealthier households are able to afford substitutes for women's home production responsibilities that allow them to engage with the labor market.[12]

Our second indicator of gender equality — wife's earning share conditional on employment — shows a curvilinear relationship with per capita household wealth (Table 2).[13] This is true for both OLS and quantile regression estimates. The linear and cubic terms on per capita household wealth have negative signs (although the point estimates on the cubic term are very small), while the square term has a positive sign. In poorer households, wives' earnings share is low presumably due to their greater representation in jobs that are low skill or low pay. As households gain in economic status, wives' share of couple earnings also improves, driven in part by better employment options. As the household's economic status improves further, there is a slight dip in wives' earning share. This is presumably due to reduced hours of work with many of them choosing part-time instead of full-time work (however, the point estimate on the cubic term is close to zero even as it is significant). Unfortunately, we are not able to control for women's intensity of work, either in terms of full-time status or hours worked as this information is not uniformly available across all countries and over the different time periods. There is also no information in the LIS or

[12] *Cf.* for example, Cortés and Pan (2019). We are grateful to an anonymous reviewer for this example.
[13] For this second indicator, we present results from models that exclude Norway.

LWS data on time devoted to social reproduction activities such as caregiving and household maintenance. There is heterogeneity of the relationship of wealth with earnings share – it is strongest for women in the 25^{th} percentile of earnings share and non-existent for women in the 75^{th} percentile.

The regressions control for several individual and household attributes. As wives' education increases, it is associated with higher chances of their employment and increased share of earnings. Husband's (partner's) education, on the other hand, has a positive association with wife's employment status, but a negative one with her earnings share. This is suggestive of differing labor market intensities of men and women in the couple unit being reflected in their actual earnings. Being a household head positively impacts wife's employment status and her earnings share. An increasing number of own children in the household and presence of a young child (less than five years of age) has the expected negative relationship with wife's employment and her earnings share – consistent with our descriptive childcare penalty findings (§ 3.3). Interestingly, husband being employed has a negative association with wife's employment status and earning share.

Broadly, several points of interest emerge from our micro-GKC analysis. Both indicators of gender equality (women's employment status, and intra-household gender inequality in earnings) exhibit a non-monotonic relationship with household economic status. While there is economic stratification, there could also be social stratification in terms of access to jobs and gender norms governing women's employment (Ridgeway, 1997; Ridgeway and Bourg, 2004; Ridgeway, 2014). Thus, there is no guarantee that as households become richer, women's status within the household will also show an improvement. Second, while women's employment status is relevant for economic empowerment via her independent earnings, it does not reveal the full story of within-household inequalities in earnings. There is considerable variation across countries in the direction and magnitude of the micro-GKC relationship (*cf.* Appendix Tables A5 and A6).

It is important to underscore that the micro-GKC results presented here are from a pooled cross-section regression, and do not imply a causal relationship. A definitive test of the micro-GKC relationship requires panel data. In particular, from a pooled cross-section analysis, we cannot rule out differential trajectories of poor and moderately well-off households as they get wealthier. It is plausible that different decisions are made by households as they become wealthier. Women may retreat from the labor force due to an income effect initially, to focus on caregiving, but increasing economic status may allow households to employ domestic staff and free up women's time. These interactions are also likely to vary

across contexts. Outsourcing of household responsibilities may be acceptable in developed countries (for example, Cortés and Pan, 2019, find this result for the US), but cannot explain why in developing countries like India with a tradition of domestic staff in upper middle class households, women's labor market engagement is still low. The constraint plausibly, is not household maintenance, but also gendered expectations that may affect both the supply of, and the demand for women's work.

Despite data limitations, the LIS ensemble offers broad pointers. The central question is this: how (if) do "collective" household labor supply decisions (Chiappori, 1988, 1992) vary across the economic spectrum? Direct empirical testing of time allocation decisions within a couple unit (Couprie, 2007), especially in the context of production of household public goods (Chiappori, 1997), is not possible with the LIS global data ensemble. However, the trends presented here provide suggestive evidence. For example, our discussion in Section 3.3 shows that childcare penalty alone cannot account for how "collective labor supply with children" varies across the economic spectrum (Blundell et al., 2005). Indeed, our analysis in Figure 5 suggests that female labor intensity is also an important driver.

5 Intra-household Gender Inequality and Welfare

Our analysis of global data spanning multiple decades has shown that intra-household gender inequality in earnings is persistent across countries, and across the earnings and wealth distributions within a country. Here, we develop a simple empirical framework to account for the normative welfare consequences of such inequality.

A normative welfare characterization of a society with mean income ($\bar{Y}$), and inequality (I; $0 \leqslant I \leqslant 1$), is represented as (Lambert, 1989):

$$W = \bar{Y}(1 - I); \;\; 0 \leqslant I \leqslant 1 \tag{3}$$

We adapt the well-studied formulation in Eq. 3 to an intra-household setting. Our primary goal here is to develop an empirically useful normative welfare framework, and we steer clear of various earnings versus consumption debates (Krueger and Perri, 2006; Aguiar and Bils, 2015). Welfare is clearly more directly related to consumption rather than earnings that we have used to characterize intra-household gender inequality. In particular, individual earnings within a household can be pooled, and even imperfect income pooling can result in considerable consumption welfare from household-level public goods. Consider two house-

holds A, and B so that woman in household A contributes 50% of the couple income, and the woman in B only 30% of exactly the same aggregate couple income. Given that household income is potentially pooled and consumption includes household-level public goods like physical dwelling, the impact of intra-household earnings inequality on aggregate household welfare is indeterminate without information on the extent of pooling, or lack thereof.

Consider a household i at time t with average (per capita) earnings of $\bar{Y}_{it}$. Let Φ_{it} be the distribution of per capita earnings across all analytically relevant members of the household. We assume that we can define a welfare function, $U(\cdot)$ that allows for a normative characterization of household-level welfare as a function of mean earnings and the intra-household distribution of earnings.

$$W_{ijt} = U\left(\bar{Y}_{it}, \Phi_{it}\right) \tag{4}$$

The specification in Eq. 4 allows for welfare computations to vary by who within the household is determining aggregate household welfare. W_{ijt} represents the welfare computed by the jth individual in household i and time t. From our perspective, this specification is important as it is conceivable that women in a household can evaluate aggregate welfare differently from men (Neumark and Postlewaite, 1998; Lambert et al., 2003; Croson and Gneezy, 2009), even when there is no discernible difference between how income aspirations mediate subjective well-being (Stutzer, 2004; Herreiner and Puppe, 2010).

The flexibility accorded by the specification in Eq. 4 is particularly important because it is likely that aggregate welfare as computed by the dominant member of the couple unit is likely different from the subordinate member even with perfect pooling of earnings. Consider two couple units A and B with exactly the same aggregate earnings. The woman in A dominates couple earnings so that she earns 70% of the total couple earnings, and the woman in B contributes only 30% of the aggregate earnings. Even with perfect pooling of earnings in both A, and B, it is entirely plausible that the aggregate welfare evaluations by the women in these two units will be different and impacted by their individual shares of aggregate couple earning (Haussen, 2019). While our analysis is motivated by the fact that households resembling B (where the men dominate couple earnings) are preponderant, a welfare framework must be generic enough to account for households where women dominate couple earnings. Across 302 country-year datasets in our analytic ensemble, about 20% of the couple units, on average, show female dominance of couple earnings. As seen in our analysis of the relationship of intra-couple gender inequality and labor market intensity (§ 3.3), female dominance of couple income is tied to relative labor market intensities of men

and women.[14]

While direct welfare comparison across different households is theoretically fraught, the "intra-household distribution penalty" on aggregate household welfare is comparable. Thus, even when direct welfare comparison between our hypothetical households A and B is not possible, the loss in welfare as evaluated independently for each household is indeed comparable. The existence of U in Eq. 4 is a sufficient condition for such welfare-loss comparisons. The maximum social welfare, W^*_{ijt}, that the household i (as measured by member j) can attain for a given level of mean earning, $\bar{Y}$, corresponds to the perfect equality case ($\Phi = \Phi^*$):

$$W^*_{ijt} = U\left(\bar{Y}_{it}, \Phi^*\right) \tag{5}$$

As long as $U(\cdot)$ is egalitarian — so that for any intra-household distribution that is not perfectly equal — aggregate household welfare cannot be greater in any case other than for perfect intra-household equality. The household welfare lost due to intra-household inequality can be represented as:

$$\Delta_{ijt} = 1 - \left(\frac{W_{ijt}}{W^*_{ijt}}\right) \tag{6}$$

Δ_{ijt} is the fraction of aggregate household welfare lost – consistent with inequality aversion corresponding to member j. Conceivably, Δ_{ijt} can be zero in our hypothetical household B as evaluated by the woman in the household despite her earning share being only 30% of the couple income. Inequality aversion can vary by individuals within a household so that the man and woman in households A or B can have divergent tolerance for inequality (Croson and Gneezy, 2009). In developing our empirical measurement framework, we allow for any egalitarian preference but not inequality aversion that actually prefers greater intra-household inequality. However, it might be conceivable that a household might make completely voluntary and welfare enhancing labor market decisions resulting in intra-household earnings inequality. For example, a couple might make a (household-welfare enhancing) decision to have the woman weaken labor market ties and devote herself to care work at home (Couprie, 2007; Grossbard, 2014).

5.1 Egalitarian Preferences and Assortative Mating

Is there any empirical evidence for the normative assumption of egalitarian preferences in Eq. 5? The marriage market with rising assortative mating has been documented for over

[14] *Cf.* Figure A6 in the Appendix for the distribution of female dominance of couple earnings across the 302 datasets in our analytic ensemble.

a generation (Mare, 1991; Schwartz, 2013), and potentially suggests a *prima facie* evidence for egalitarian preferences. However, there are limitations to this argument. The extent of assortative mating across countries is not uniform. Appendix Figure A7 suggests assortative mating cannot constitute the modal evidence for the normative assumptions underlying our welfare loss framework — especially when taking a global perspective. The figure shows the assortative mating proportions (by both education and occupation status) across a nearly four-decade period for various country-year points in our ensemble. We find a modest increase in the extent of assortative mating over time. However from the perspective of intra-household gender inequality, the striking difference between assortative mating extents measured by education and occupation status is instructive. The figure suggests that while couple units are characterized by equality in educational attainment, this parity does not fully translate to occupations (likely due to gendered norms characterizing labor markets).[15]

Assortative mating may or may not be indicative of egalitarian preferences within a couple unit. It could be argued that sorting on education or income signals such preferences, but it is also true that higher education, specifically college degrees are likely to depend on parents' socioeconomic status. Choosing a partner with similar characteristics as oneself might reflect the circle one is exposed to, which could be rather narrow given the generally high levels of inequality and stagnating intergenerational mobility (Chetty et al., 2014a,b). Even if there is assortative mating on the basis of education, it is not necessary that it translates into equal economic opportunities. Without considering couples specifically, Goldin (2014) finds that in the United States, women and men with the exact same MBA degree have near identical initial salaries, but women earn only 55% of what men earn about 10-16 years later. Similar trends are observed for lawyers as well. Goldin argues that these highly paid professions exhibit non-linear relationship between earnings and hours worked in the later years of the profession, thus penalizing demand for flexibility in the workplace. Further, women's reduced hours are mostly related to childbirth but are also a function of spousal income. Women with children, whose partners are not high income earners, have a higher likelihood of remaining employed. Gender norms that dictate division of labor between men and women within and outside the home have certainly become more liberal, but continue to have salience either in terms of gender identity (Bertrand et al., 2015), or perceptions about the attributes that make women attractive in the marriage market (Bursztyn et al., 2017).

The impact of assortative mating on overall inequality is well-understood (Lise and Seitz,

[15]We thank an anonymous reviewer for highlighting the need to closely examine assortative mating patterns as possible evidence for intra-household equality preferences.

2011; Greenwood et al., 2014), its consequences for intra-household gender relations, and women's labor supply is more complex. For example, in the United Kingdom, Lise and Seitz (2011) find that marital sorting on earnings can explain the substantive shifts in consumption inequality over 1968–2001. There is an increase in inequality between households, and a decrease within households. However, the association between assortative mating (through education or occupation), and labor market earnings is not well established.[16] Given the variation in association between assortative mating and intra-household gender inequality in earnings, the overall household welfare implications remain unclear. Figure A8 in the Appendix shows how assortative mating has only a marginal association with the extent of intra-household gender inequality in the United States.[17]

The mixed empirical evidence for equality preference in the marriage market (Couprie, 2007; Grossbard, 2014) and assortative mating literature underscores why the egalitarian preferences implicit in the definition of optimal welfare in Eq. 5 has to be defended normatively. The framework specified in Eq. 4 is general enough that optimal welfare specifications other than perfect equality can be seamlessly incorporated. The empirical framework that we develop below makes the normative assumption that perfect intra-household equality corresponds to maximum aggregate household welfare for at least two reasons. First, there is emerging evidence that inequality aversion preferences are indeed shaped by extent of intra-household gender inequality (Haussen, 2019). Second, and more centrally, a central assumption in any measurement of normative welfare is contingent on the status gradient (Ridgeway, 2011, 2014) between man and woman in a couple unit. Specifying optimal welfare to be coterminous with perfect earnings equality allows us to (however imperfectly) characterize this status gradient. The welfare-loss framework specified in Eq. 6 serves as a proxy measure of the relationship between this gender status differential and intra-household gender inequality.

5.2 Empirical Framework for Welfare Loss

We empirically operationalize the intuition in Eq. 6 using the workhorse normative measure of inequality developed by Atkinson (1970). The "Equally Distributed Equivalent Income" (EDEI) formulation is easily adapted to the individual-level earnings data that we have used to characterize intra-household gender inequality. In terms of the welfare function

[16] OECD (2011) and Bredemeier and Juessen (2013) also consider assortative mating based on earnings of the couple.

[17] This variation is also seen in other datasets in our ensemble. The gender difference in earnings distribution as a function of assortative mating for other datasets is available at (https://tinyurl.com/assortative302) as a single PDF file (≈ 150 MB).

specification in Eq. 5, Atkinson's EDEI represents perfectly equal earning ($\Phi = \Phi^*$) such that the aggregate social welfare, W_{ijt} is no different from aggregate welfare with actual extant distribution, Φ_{it}. We define the "Equally Distributed Equivalent Earning," or EDEE to mirror Atkinson's EDEI. If Λ_{ijt} is the EDEE at time t for household i, corresponding to the inequality aversion of member j, we obtain:

$$W_{ijt} \;=\; U\left(\bar{Y}_{it}, \Phi_{it}\right) \;=\; U\left(\Lambda_{ijt}, \Phi^*\right) \tag{7}$$

In terms of EDEE, the aggregate household welfare loss for a household (as computed by its member j) is simply:

$$\Delta\mathbf{A}_{ijt} = 1 - \left(\frac{\Lambda_{ijt}}{\bar{Y}_{it}}\right) \tag{8}$$

For any household i, the divergence between the mean household earning ($\bar{Y}_{it}$) and EDEE (Λ_{ijt}) is the intra-household inequality penalty on aggregate household welfare ($\Lambda_{ijt} \leqslant \bar{Y}_{it}$, so that, $0 \leqslant \mathbf{\Delta A_{ijt}} \leqslant 1$).

The Atkinson's normative measure of inequality is perfectly sub-group decomposable. We operationalize Eq. 8 by computing an Atkinson index for overall earnings inequality, decomposing it into "within-household," and "between-household" components, and using the "within" component to characterize aggregate welfare loss related to intra-household gender inequality. We follow the specification of Atkinson (1970) to construct our intra-household welfare loss metric. For ($i = 1, \ldots n$) individuals, we begin by considering an additive social welfare function that is a function of individual earnings as well as the distribution of these earnings. For country k in year t, we can write this additive social welfare function as:

$$W_{kt} = \frac{1}{n}\sum_{i=1}^{i=n} U_{kt}\left(Y_{kit},\, \phi_{kt}\right) \tag{9}$$

Using the specification of Atkinson (1970), U_t in Eq. 9 can be written in terms of an inequality aversion parameter.

$$U_{kt} = \begin{cases} \frac{(Y_{kit})^{1-\varepsilon_{kt}}}{1-\varepsilon_{kt}} & ; \quad \varepsilon_{kt} \neq 1,\ \varepsilon_{kt} \geqslant 0 \\ \\ \ln\left(Y_{kit}\right) & ; \quad \varepsilon_{kt} = 1 \end{cases} \tag{10}$$

In the specification above, we allow for the inequality aversion, ε_{kt}, and therefore U_{kt}, to vary by place and time (Lambert et al., 2003; Alesina et al., 2004; Harvey, 2005; Aristei and Perugini, 2010). This will allow us to make welfare-loss comparisons across time, and across different countries in our multi-year and multi-country dataset with varying preferences for redistribution (Senik, 2005; Guillaud, 2013). It is straightforward to combine Eqs. (7), (9),

and (10) to compute Atkinson's EDEE (Λ) as:

$$\Lambda_{kt} = \begin{cases} \left(\frac{1}{n} \sum_i \left((Y_{kit})^{1-\varepsilon_{kt}} \right) \right)^{\frac{1}{1-\varepsilon_{kt}}} & ; \quad \varepsilon_{kt} \neq 1, \ \varepsilon_{kt} \geq 0 \\ \left(\prod_i (Y_{kit}) \right)^{\frac{1}{n}} & ; \quad \varepsilon_{kt} = 1 \end{cases} \tag{11}$$

The general specification of EDEE (Λ_{kt}, in Eq. 11) allows for the inequality aversion parameter to take on a wide range of values including $\varepsilon = 0$, corresponding to when the inequality aversion parameter is set to unity ($\varepsilon = 1$), the Atkinson welfare loss is the same as that computed with a Foster welfare function. We adapt the logic of Eq. 8 to compute the overall welfare loss for each of our over 300 datasets, as the standard Atkinson's index:

$$\mathbf{A}_{kt} = 1 - \left(\frac{\Lambda_{kt}}{\bar{Y}_{kt}} \right) \tag{12}$$

where $\bar{Y}_{kt}$ is the mean individual earnings in country k and year t. While the Atkinson's index in Eq.12 is computed for overall earnings inequality, we are interested in only the contribution of intra-household inequality to welfare loss. We therefore decompose the Atkinson's inequality index into "within" and "between" household components.

$$\mathbf{A}_{kt} = \mathbf{A}^W_{kt} + \mathbf{A}^B_{kt} \tag{13}$$

In our empirical results for welfare-loss, we analyze the geographic and time trends of $\mathbf{A}^W_{kt}$ for various plausible values of inequality aversion.

5.3 Welfare-Loss Results

We empirically examine the extent of economy-wide welfare-loss attributable to intra-household gender inequality in earnings ($\mathbf{A}^W_{kt}$ from Eq. 13). We perform the sub-group decomposition of the Atkinson inequality metric using the method of Blackorby et al. (1981). We present summary statistics in Table 3. We used 302 country-year points (*cf.* Appendix Table A1) containing approximately 2.85 million couple-household units. We compute the intra-household component of the Atkinson welfare loss for various values of inequality aversion ($\varepsilon \in [0.1, 1.0]$). For the midpoint value of inequality aversion ($\varepsilon = 0.5$), the median value for welfare lost due to intra-household gender inequality is 21.9%. In other words, at the median level of intra-household inequality, an economy could achieve current welfare levels with over 20% lesser earnings if the aggregate earnings were perfectly distributed *within* each household. Even at $\varepsilon = 0.3$, an inequality aversion value that has widely been used in the

literature (*cf.* for example, Lambert et al., 2003), the median economy in our dataset loses 10% of earnings welfare to intra-household gender inequality.

We once again contrast intra-household gender inequality with economy-wide inequality in earnings of men and women. In Table 4, we present welfare loss, but this time attributed to gender inequality computed as the inequality between sexes. Both Table 3 and Table 4 use exactly the same underlying data but the overall Atkinson's index of earnings inequality is decomposed differently. In the former, gender inequality is the gendered differences in intra-household earnings, and in the latter, it is the economy-wide difference in earnings between sexes. Comparing these tables shows how gender inequality in the form of intra-household gendered differences has a significantly larger welfare consequence than aggregate economy-wide differences between the earnings of men and women.

In Figure 7, we present a detailed time-trend of welfare losses related to gender inequality in earnings. First, the figure underscores how intra-household gender differences in earnings results in greater welfare loss compared to economy-wide earnings inequality between men and women. Indeed, across four decades, the welfare loss from gender inequality within the household is at least twice as much as the loss from economy-wide gender inequality in earnings. Second, there is considerable convergence between diverse countries over time on welfare lost due to economy-wide earnings inequality between men and women. However, no such convergence is seen in welfare loss attributable to intra-household gender inequality. Third, Figure 7 also shows how welfare loss related to gender inequality (and especially intra-household inequality in earnings) is persistent across geographically and economically diverse set of countries. Thus our framework to uncover the welfare consequences of gender inequality affirms our central finding that gendered patterns of intra-household inequality is persistent across widely varying levels of economic development.

6 Conclusion

Our analysis provides compelling evidence that distributional questions within the household — the most elementary social unit — cannot be ignored. Using global micro data, we find that earnings inequality between men and women within a household is systemic and prevalent across disparate societies. Further, this intra-household gender inequality does not abate substantially across the earnings and wealth distribution. For a smaller subset of countries, we show that the non-monotonic relationship between economic development and gender inequality at the macro level has a micro parallel. Broadly, we find woman's employ-

ment and her earnings share have a curvilinear relationship with household economic status even as there are country-level variations. We also developed a simple empirical theoretic framework using the widely used Atkinson inequality metric to measure aggregate welfare loss attributable to intra-household gender inequality. We show that the welfare loss from gender inequality within households exceeds welfare loss from population-level differences between the earnings of men and women. A limitation to our work is that the findings apply only to coupled heterosexual households, which is the modal unit of analysis in terms of intra-household gender inequalities. However, this analysis is easily extended to same sex coupled households for a broader understanding of intra-couple dynamics.

There is a principle of justice and fairness in pushing for gender equality, and there are also instrumental reasons to desire this outcome. Intra-household inequality is correlated (as both cause and consequence) with gendered patterns of power dynamics within a household. Inequality in economic resources and power relations between partners has negative implications for women themselves, and children (especially girls) in certain contexts, in the household. The intergenerational transmission of gendered disadvantages, be it in terms of economic outcomes or power relations or biased social norms, makes a compelling case for greater attention to within-household distributions.

There is considerable policy attention on gender inequality via the Sustainable Development Goals (SDG 5 specifically seeks to achieve gender equality, but it is also implicit in other goals). We emphasize the multidimensional nature of gender inequality from a measurement perspective. The findings show that inequalities between men and women in the population are not to be confused by inequalities between the man and the woman within a household. Their magnitudes are different, and so is their rate of decline. Both measures are important to understand how gender inequalities operate. This strengthens a call for individual-level data collection on income, wealth, and consumption to calculate gender inequality accurately. Further, norms, particularly those governing gender roles relating to care work and labor market engagement, need to be aligned with the desire for equality. This is a complex and challenging task for global policy makers.

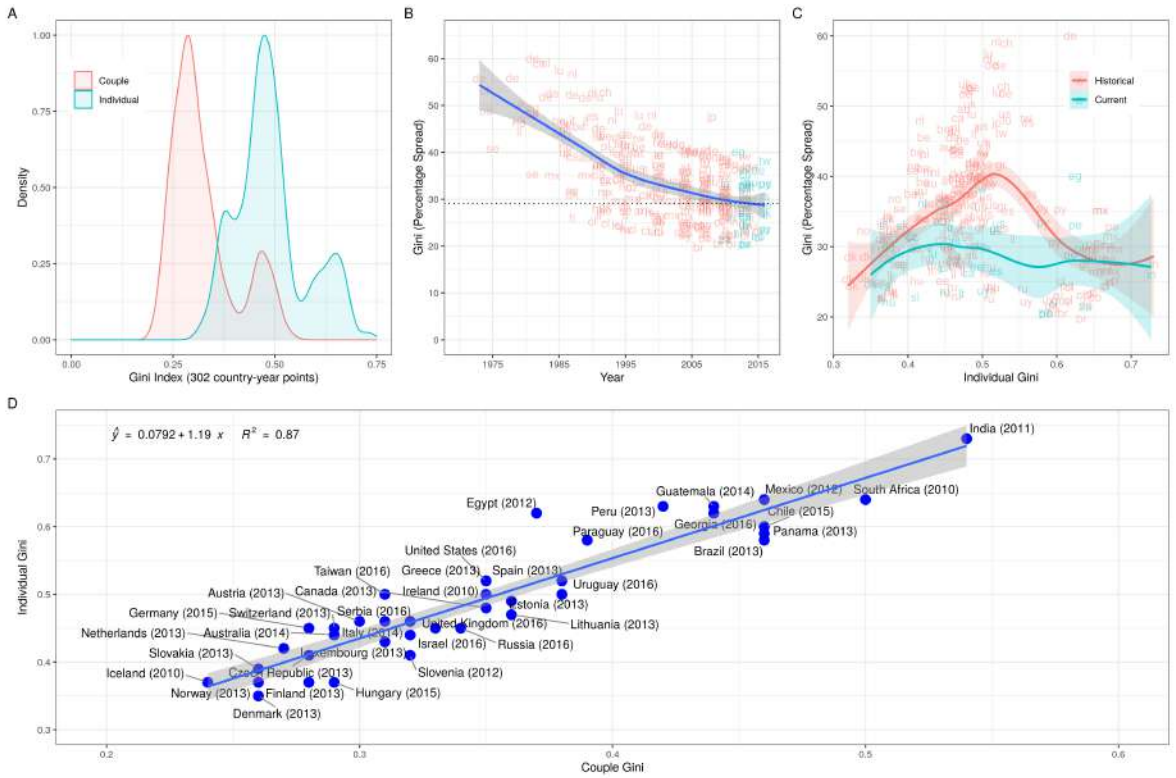

Figure 1: ***Intra-household Gender Inequality: Global Trends***. *Panel-A shows distribution of Gini coefficients computed at individual and couple-unit scales (n = 302 LIS data sets). Panel-B shows the time-trend for percentage difference between individual and couple scale Gini coefficients. The latest available data from the present decade (2010-2016), for 39 countries are identified by aqua-colored points. Panel-C shows the relationship between percentage difference between individual and couple Gini coefficients as a function of individual-level Gini coefficient. Once again, the 39 datasets from the latest LIS wave are singled out. The median Gini difference for these 39 datasets is shown as a dotted line (≈ 30% spread). Panel-D is from the 39 country-year points (n = 466,475 couple units, 932,950 individuals).*

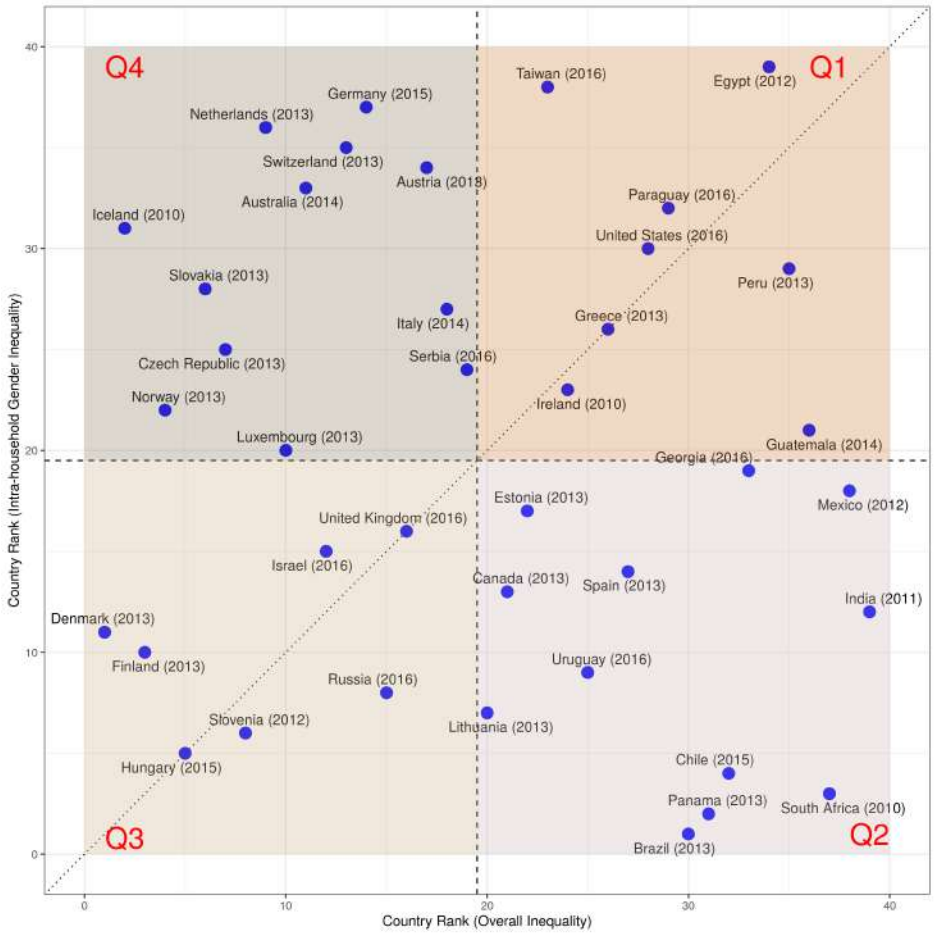

Figure 2: ***Overall Inequality and Intra-Household Gender Inequality***. *Countries are ranked by overall inequality in individual earnings (X axis), and intra-household gender inequality (Y axis). The most equal country (on respective dimension) is ranked '1,' and the most unequal country is ranked '39.'*

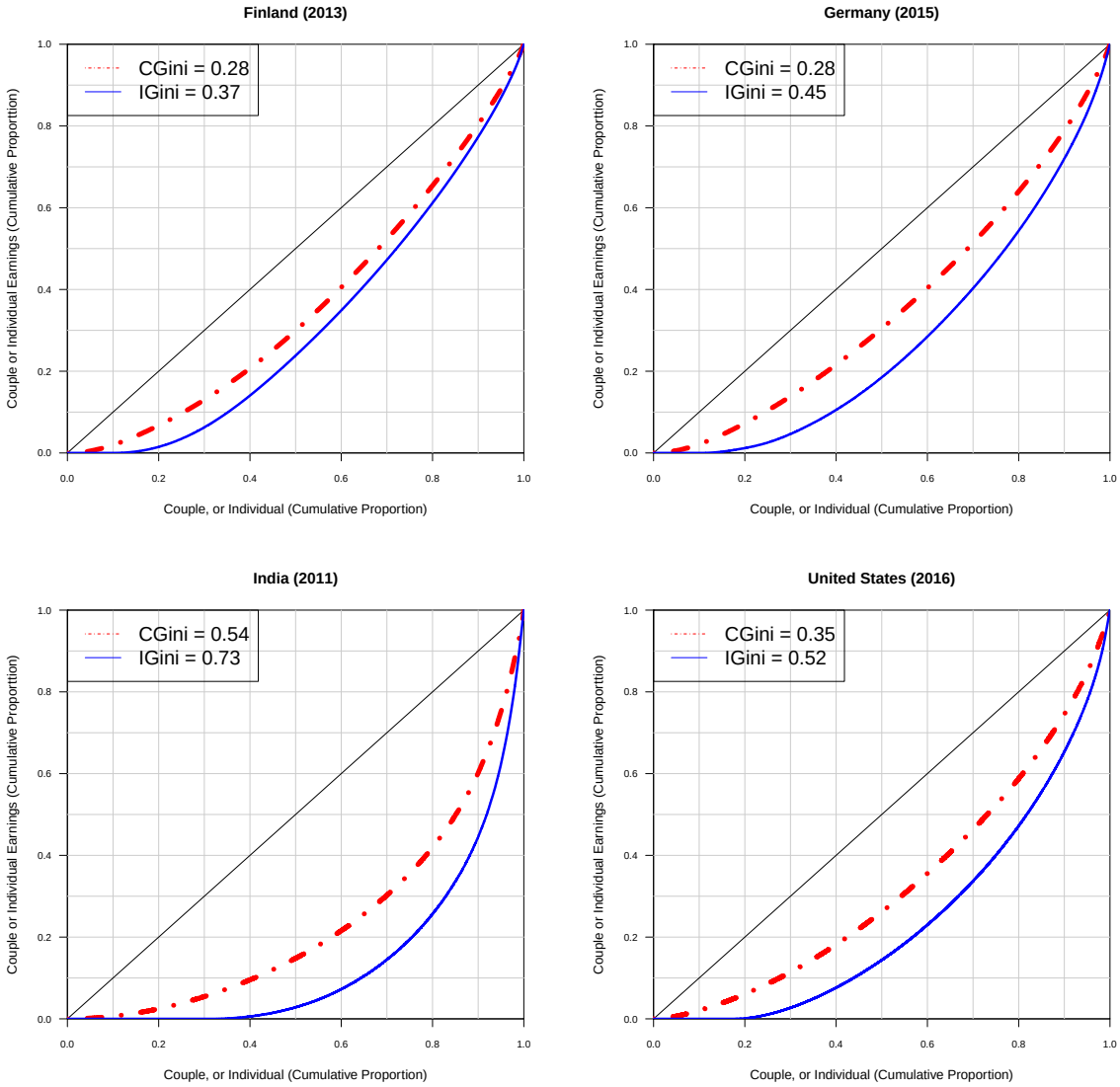

Figure 3: ***Lorenz Concentration Curves***. **CGini** *is couple-Gini, and* **IGini** *is individual-level Gini.*

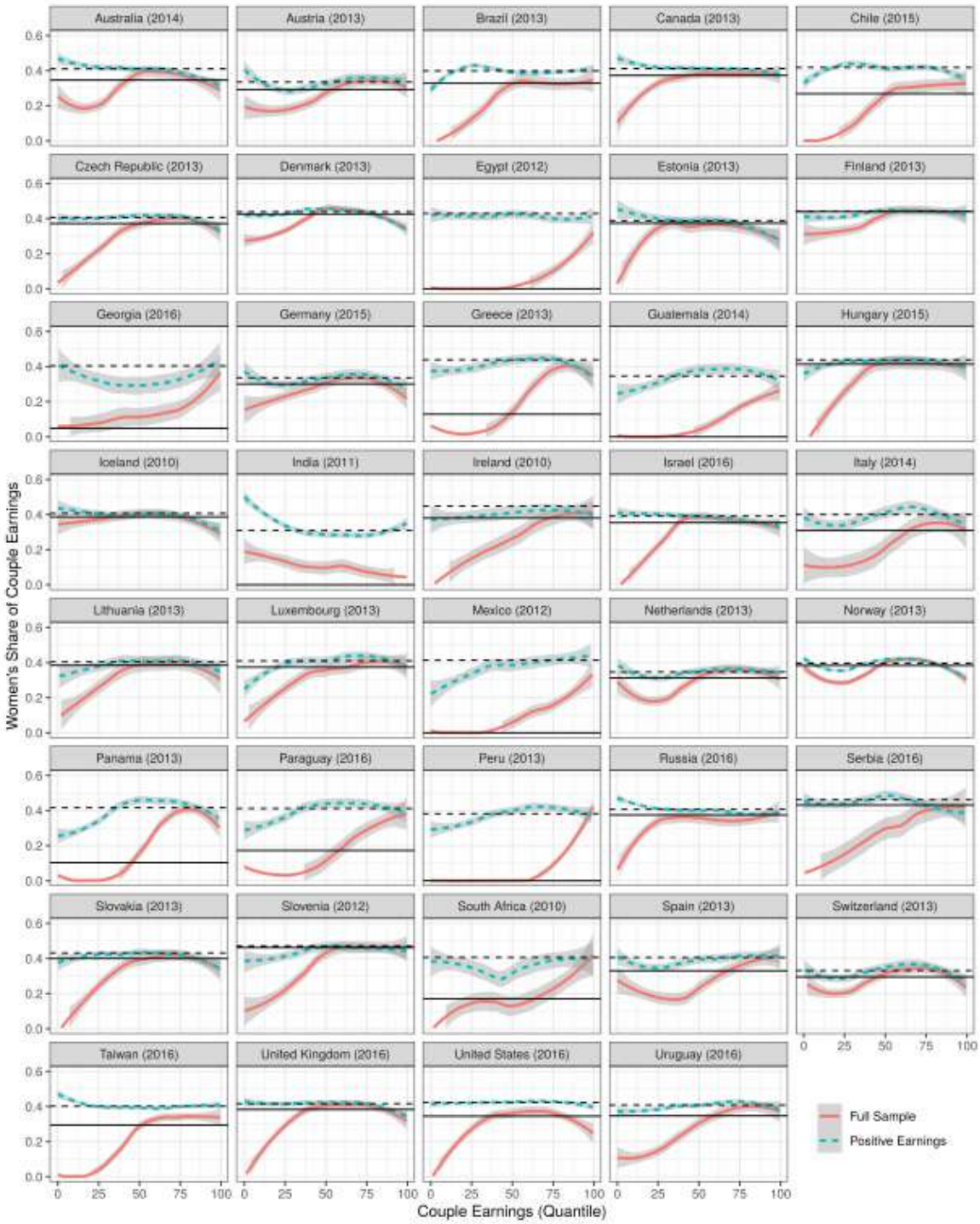

Figure 4: ***Woman's Share of Couple Earning***. *The red curves use the complete couple sample (n = 932,950 individuals across 39 datasets); and the blue curves represent only those couple units where both the man and woman have positive non-zero earnings (n = 589,708 individuals). The solid line represents median women's earning share of couple earnings for the full sub-sample, and the dotted line is the share for the positive earnings sub-sample. 95% confidence bands around LOESS smoothing lines (Cleveland, 1979) are shown for both schedules. Cf. main text for more details.*

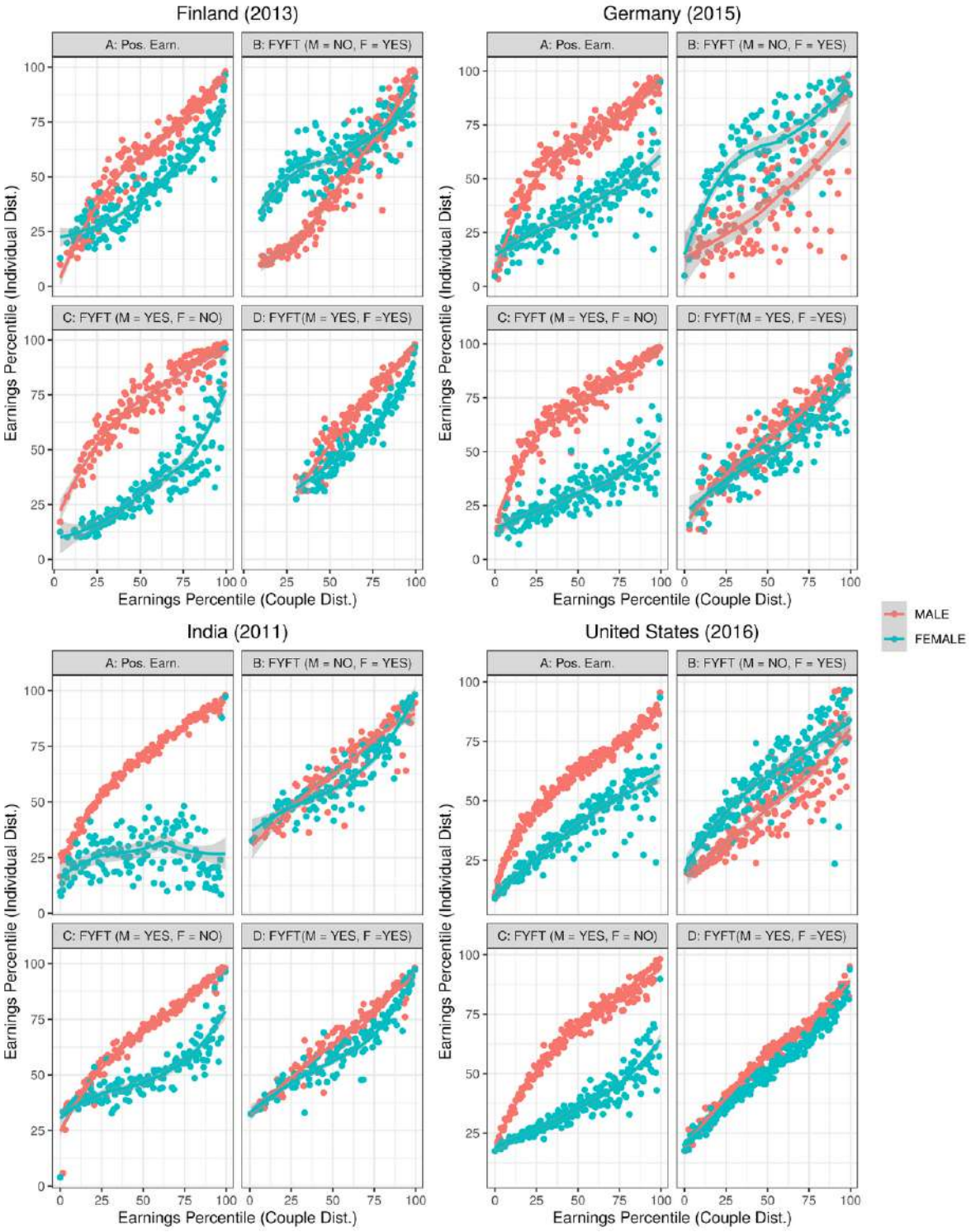

Figure 5: ***Intra-Couple Inequality and Labor Market Intensity***. *FYFT is Full Year Full Time employment. M is Male, and F is Female. Cf. main text for further details.*

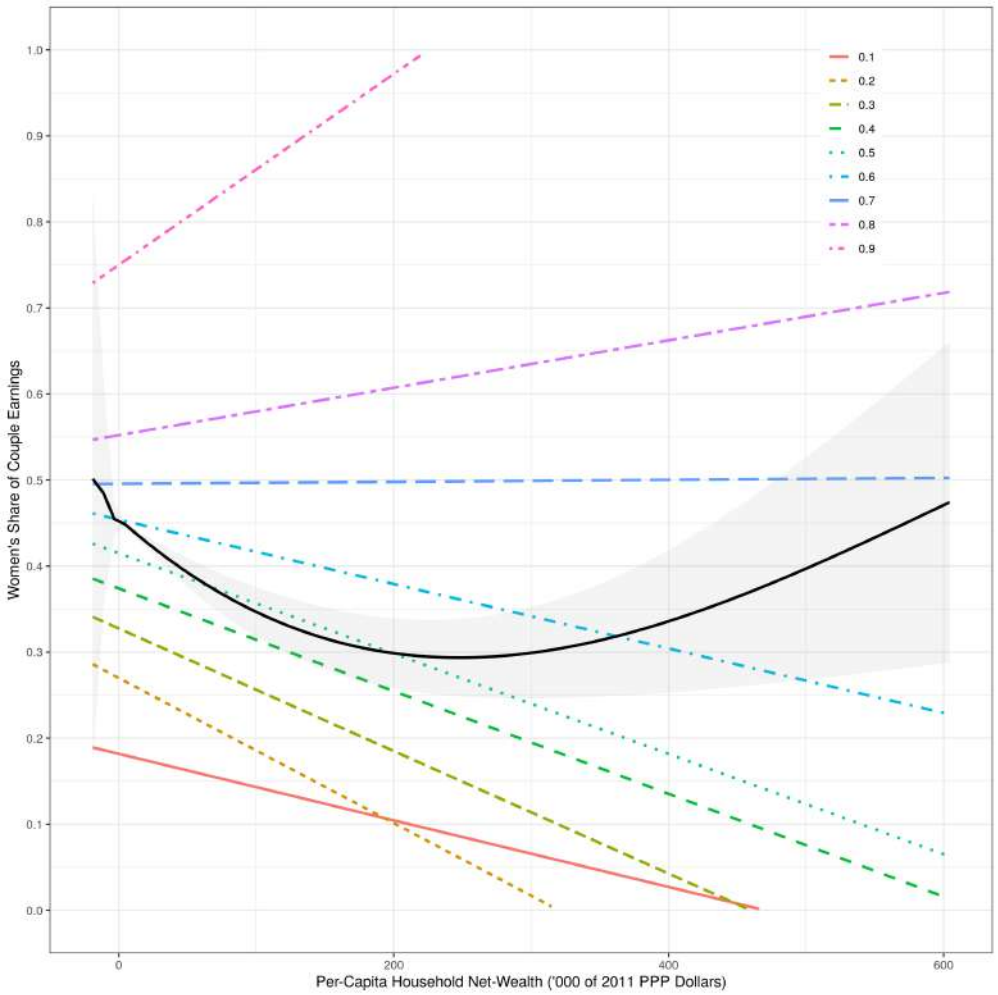

Figure 6: ***Household Economic Status and Intra-household Gender Inequality***. *The solid curve is the locally weighted (LOESS) regression with 95% confidence bands. The quantile regression lines for each decile represents bivariate relationship* ($Y_i|_{\Omega_i} \sim W_i$, *without any controls from Eq. 2).*

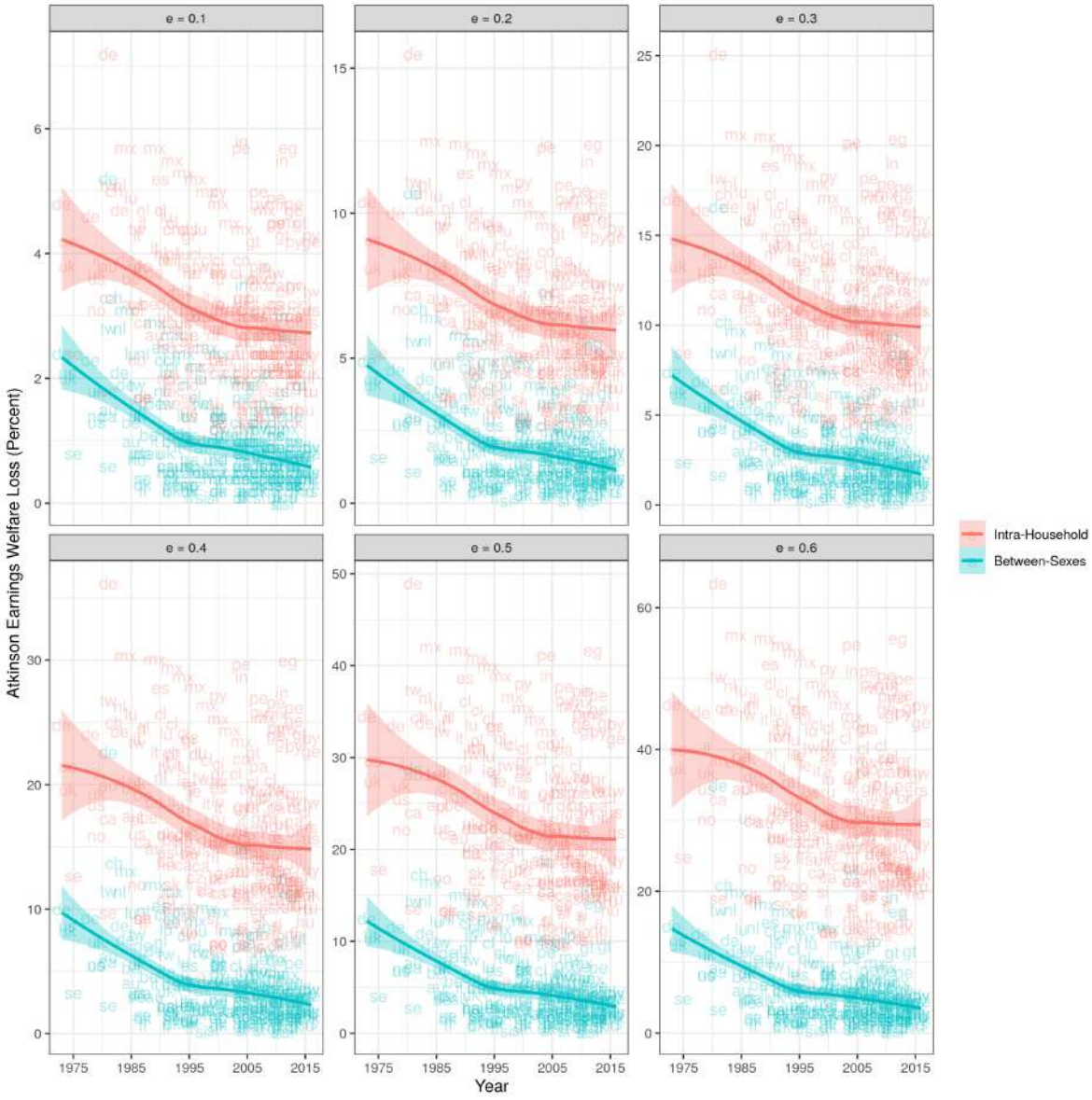

Figure 7: ***Gender Inequality and Earnings Welfare Loss***. *For each value of inequality aversion, the panels show aggregate economy-wide Atkinson welfare loss due to gender inequality computed by decomposing the Atkinson's index in two different ways — between, and within households; and between, and within sexes. Each panel shows (for both decomposition exercises) 302 country-year points in the LIS repository (with a total of ≈ 2.85 million couple-households). LOESS smoothing with 95% CI bands are shown in all panels.*

Wife's Employment Status (LPM Models)		
	(1)	(2)
	All Countries	**Without Norway**
Per capita household net wealth	-0.0159***	0.0786***
	(0.0032)	(0.0102)
Per capita household net wealth, sq	-0.0002	-0.0058***
	(0.0002)	(0.0017)
Per capita household net wealth, cubic	0.0000**	0.0001***
	(0.0000)	(0.0000)
Wife's age	0.0057***	-0.0412***
	(0.0011)	(0.0023)
Wife's age, sq	-0.0911***	-0.0835***
	(0.0011)	(0.0021)
Husband-wife age gap	-0.0011	-0.0063***
	(0.0010)	(0.0018)
Wife's Education (Medium)	0.1499***	0.1599***
	(0.0027)	(0.0051)
Wife's Education = (High)	0.2146***	0.2201***
	(0.0027)	(0.0056)
Husband's Education = (Medium)	0.0292***	0.0381***
	(0.0025)	(0.0050)
Husband's Education = (High)	0.0139***	0.0220***
	(0.0028)	(0.0058)
Husband is employed	0.0173***	-0.1413***
	(0.0032)	(0.0063)
Wife is household head	0.0137***	0.0713***
	(0.0022)	(0.0038)
No. of own children in household	-0.0221***	-0.0470***
	(0.0009)	(0.0019)
Child less than 5 years	-0.0031	-0.0738***
	(0.0023)	(0.0049)
Observations	224,154	57,974
R-squared	0.1200	0.1535

Robust standard errors in parentheses, and all models include country-year fixed effects
*** p<0.01, ** p<0.05, * p<0.1
"Low" education is less than upper secondary education completed
"Medium": upper secondary education completed or post-secondary non-tertiary education
"High": tertiary education completed
"Low" is the base education category

Table 1: ***Micro-GKC: Wife's Employment and Household Wealth***

	Wife's Share of Couple Earnings			
	(1)	(2)	(3)	(4)
	OLS	**Quantile Reg (.25)**	**Quantile Reg (.50)**	**Quantile Reg (.75)**
Per capita household net wealth	-0.0222***	-0.0504***	-0.0251***	-0.0013
	(0.0046)	(0.0048)	(0.0053)	(0.0035)
Per capita household net wealth, sq	0.0015***	0.0036***	0.0018***	0.0002
	(0.0004)	(0.0003)	(0.0003)	(0.0002)
Per capita household net wealth, cubic	-0.0000***	-0.0000***	-0.0000***	-0.0000**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Wife's age	0.0162***	0.0070***	0.0103***	0.0127***
	(0.0012)	(0.0015)	(0.0011)	(0.0010)
Wife's age, sq	-0.0046***	-0.0072***	-0.0024**	-0.0004
	(0.0011)	(0.0014)	(0.0011)	(0.0008)
Husband-wife age gap	0.0059***	0.0012	0.0017*	0.0048***
	(0.0010)	(0.0011)	(0.0009)	(0.0008)
Wife's Education (Medium)	0.0233***	0.0242***	0.0222***	0.0130***
	(0.0025)	(0.0029)	(0.0026)	(0.0018)
Wife's Education (High)	0.0688***	0.0675***	0.0685***	0.0496***
	(0.0029)	(0.0034)	(0.0029)	(0.0024)
Husband's Education = (Medium)	-0.0101***	-0.0077***	-0.0090***	-0.0069***
	(0.0024)	(0.0029)	(0.0024)	(0.0017)
Husband's Education = (High)	-0.0458***	-0.0420***	-0.0461***	-0.0359***
	(0.0029)	(0.0036)	(0.0029)	(0.0024)
Husband is employed	-0.4758***	-0.5459***	-0.5364***	-0.5104***
	(0.0037)	(0.0045)	(0.0030)	(0.0019)
Wife is household head	0.1186***	0.1060***	0.0962***	0.1002***
	(0.0022)	(0.0034)	(0.0021)	(0.0022)
No. of own children in household	-0.0236***	-0.0270***	-0.0227***	-0.0130***
	(0.0010)	(0.0013)	(0.0010)	(0.0009)
Child less than 5 years	-0.0442***	-0.0704***	-0.0454***	-0.0232***
Observations	40,730	40,730	40,730	40,730
R-squared	0.5156	0.5048	0.5114	0.4952

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
All models have country-year fixed effects
None of the models include Norway
"Low" education is less than upper secondary education completed
"Medium": upper secondary education completed or post-secondary non-tertiary education
"High": tertiary education completed
"Low" is the base education category

Table 2: ***Micro-GKC: Wife's Share of Couple Earnings and Household Wealth***

Atkinson Welfare Loss (Intra-Household)						
Ineq. Aversion	**Min.**	**1st Qu.**	**Median**	**Mean**	**3rd Qu.**	**Max.**
$\varepsilon = 0.1$	1.0	2.2	2.9	3.0	3.7	7.2
$\varepsilon = 0.2$	2.1	4.8	6.4	6.6	8.1	15.5
$\varepsilon = 0.3$	3.2	7.9	10.5	10.9	13.5	25.1
$\varepsilon = 0.4$	4.4	11.8	15.6	16.3	20.0	36.2
$\varepsilon = 0.5$	5.5	16.7	21.9	23.0	28.2	49.0
$\varepsilon = 0.6$	6.7	23.4	30.2	31.8	39.0	63.5
$\varepsilon = 0.7$	7.9	33.1	41.6	43.7	53.3	78.9
$\varepsilon = 0.8$	9.2	47.5	58.8	60.0	72.0	92.4
$\varepsilon = 0.9$	10.5	70.4	81.5	79.9	91.7	99.1
$\varepsilon = 1.0$	11.8	93.8	97.7	95.4	99.6	100.0

Table 3: ***Atkinson Intra-household Welfare Loss ($\mathbf{A}^W_{kt}$, Percent).*** *Summary statistics tabulated across 302 country-year points in the LIS repository (with a total of $\approx$ 2.85 million couple-households).*

Atkinson Welfare Loss (Between Sexes)						
Ineq. Aversion	**Min.**	**1st Qu.**	**Median**	**Mean**	**3rd Qu.**	**Max.**
$\varepsilon = 0.1$	0.0	0.4	0.8	0.93	1.2	5.2
$\varepsilon = 0.2$	0.0	0.9	1.5	1.88	2.4	10.7
$\varepsilon = 0.3$	0.1	1.3	2.3	2.83	3.7	16.6
$\varepsilon = 0.4$	0.1	1.7	3.0	3.79	4.9	22.6
$\varepsilon = 0.5$	0.1	2.2	3.8	4.75	6.1	28.8
$\varepsilon = 0.6$	0.1	2.6	4.6	5.72	7.4	35.0
$\varepsilon = 0.7$	0.2	3.0	5.3	6.68	8.6	41.2
$\varepsilon = 0.8$	0.2	3.5	6.1	7.64	9.9	47.1
$\varepsilon = 0.9$	0.2	3.9	6.8	8.57	11.1	52.6
$\varepsilon = 1.0$	0.2	4.3	7.6	9.51	12.3	57.6

Table 4: ***Atkinson Between-Sexes Welfare Loss (Percent)***. *Summary statistics tabulated across 302 country-year points in the LIS repository (with a total of $\approx$ 2.85 million couple-households).*

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Online Appendix

Country	Start Year	End Year	Total Datasets	Total Couple Households
Australia	1981	2014	10	49711
Austria	1994	2013	7	13137
Belgium	1985	2000	6	11991
Brazil	2006	2013	4	238868
Canada	1981	2013	11	130807
Chile	1990	2015	12	351287
Colombia	2004	2004	1	5306
Czech Republic	1992	2013	7	38612
Denmark	1987	2013	8	206900
Dominican Republic	2007	2007	1	4024
Egypt	2012	2012	1	6005
Estonia	2004	2013	4	8672
Finland	1987	2013	8	48174
Georgia	2010	2016	3	3263
Germany	1973	2015	27	196272
Greece	1995	2013	6	13629
Guatemala	2006	2014	3	24948
Hungary	1991	2015	8	6259
Iceland	2004	2010	3	5491
India	2004	2011	2	42629
Ireland	1994	2010	7	10540
Israel	1979	2016	11	34643
Italy	1986	2014	12	40102
Japan	2008	2008	1	1791
Lithuania	2010	2013	2	3797
Luxembourg	1985	2013	9	13599
Mexico	1984	2012	12	93285
Netherlands	1983	2013	9	32612
Norway	1979	2013	9	288153
Panama	2007	2013	3	17230
Paraguay	2000	2016	5	10364
Peru	2004	2013	4	27003
Poland	1986	1992	2	6762
Russia	2000	2016	9	130923
Serbia	2006	2016	4	5999
Slovakia	1992	2013	5	18443
Slovenia	1997	2012	6	10868
South Africa	2010	2010	1	1378
Spain	1990	2013	7	37001
Sweden	1975	2005	7	43762
Switzerland	1982	2013	5	16039
Taiwan	1981	2016	11	87485
United Kingdom	1974	2016	12	80311
United States	1974	2016	12	342464
Uruguay	2004	2016	5	87158
TOTAL	1973	2016	302	2,847,697

Table A1: ***Extent of LIS Data Repository Used***

Country	Year	Household Total	Couple households		Women's Share of Couple Earnings		Couple Gini	Ind. Gini	Percentage Spread
			Working-age (all couple units)	Working-age (Positive Earnings)	Median (all couple units)	Median (Positive Earners)			
Australia	2014	14,162	6,252	4,307	0.35	0.41	0.29	0.44	34.09
Austria	2013	5,909	2,267	1,723	0.29	0.34	0.3	0.46	34.78
Brazil	2013	1,16,543	56,095	28,228	0.33	0.4	0.46	0.58	20.69
Canada	2013	23,014	10,655	8,016	0.37	0.41	0.35	0.48	27.08
Chile	2015	83,887	36,173	15,928	0.27	0.42	0.46	0.6	23.33
Czech Republic	2013	8,053	3,127	2,232	0.37	0.41	0.28	0.41	31.71
Denmark	2013	87,517	31,681	26,474	0.43	0.44	0.26	0.35	25.71
Egypt	2012	12,060	6,005	914	0	0.43	0.37	0.62	40.32
Estonia	2013	5,871	2,433	1,773	0.37	0.39	0.36	0.49	26.53
Finland	2013	11,030	5,871	4,812	0.44	0.44	0.28	0.37	24.32
Georgia	2016	2,768	815	280	0.05	0.4	0.44	0.62	29.03
Germany	2015	14,426	5,475	4,240	0.3	0.34	0.28	0.45	37.78
Greece	2013	8,620	2,868	1,205	0.13	0.44	0.35	0.52	32.69
Guatemala	2014	11,536	7,462	2,474	0	0.35	0.44	0.63	30.16
Hungary	2015	2,772	904	661	0.41	0.44	0.29	0.37	21.62
Iceland	2010	3,018	1,829	1,628	0.39	0.41	0.24	0.37	35.14
India	2011	42,152	20,994	7,538	0	0.31	0.54	0.73	26.03
Ireland	2010	4,333	1,534	849	0.38	0.45	0.35	0.5	30
Israel	2016	8,903	4,615	3,150	0.35	0.39	0.32	0.44	27.27
Italy	2014	8,156	2,498	1,236	0.31	0.4	0.31	0.46	32.61
Lithuania	2013	5,194	1,880	1,411	0.38	0.4	0.36	0.47	23.4
Luxembourg	2013	3,879	1,783	1,245	0.37	0.41	0.31	0.43	27.91
Mexico	2012	9,002	3,761	1,036	0	0.41	0.46	0.64	28.13
Netherlands	2013	10,174	5,148	4,099	0.31	0.35	0.27	0.42	35.71
Norway	2013	2,35,732	88,412	74,610	0.38	0.4	0.26	0.37	29.73
Panama	2013	11,905	5,639	2,640	0.1	0.42	0.46	0.59	22.03
Paraguay	2016	10,219	3,135	918	0.17	0.41	0.39	0.58	32.76
Peru	2013	30,453	8,875	2,113	0	0.38	0.42	0.63	33.33
Russia	2016	1,60,008	60,252	39,578	0.38	0.41	0.34	0.45	24.44
Serbia	2016	6,457	1,793	861	0.43	0.46	0.32	0.46	30.43
Slovakia	2013	5,490	2,327	1,619	0.4	0.43	0.26	0.39	33.33
Slovenia	2012	3,663	1,664	1,122	0.46	0.47	0.32	0.41	21.95
South Africa	2010	6,786	1,378	521	0.17	0.41	0.5	0.64	21.88
Spain	2013	11,965	5,174	3,177	0.33	0.41	0.38	0.52	26.92
Switzerland	2013	6,792	3,009	2,528	0.29	0.33	0.29	0.45	35.56
Taiwan	2016	16,528	7,401	3,598	0.29	0.4	0.31	0.5	38
United Kingdom	2016	19,380	7,079	4,989	0.38	0.42	0.33	0.45	26.67
United States	2016	69,957	30,234	19,785	0.35	0.42	0.35	0.52	32.69
Uruguay	2016	45,158	17,978	11,400	0.35	0.41	0.38	0.5	24

Table A2: ***LIS Data: Latest Wave***. *This sub-sample contains 466,475 couple units.*

Country	Start Year	End Year	Total Datasets	Total Couple Households
Australia	2004	2014	3	18408
Germany	2002	2012	3	16609
Italy	1995	2014	6	19004
Norway	2010	2013	2	173987
Sweden	2005	2005	1	7075

Table A3: ***Extent of LIS-LWS Merged-Data Used***. *The LIS-LWS merge contains 301,519 couple units.*

Dataset	A: Positive Sub-sample (percent of full couple sample)	B: FYFT (M = NO, F = YES, percent of Pos. Sub-sample)	C: FYFT (M = YES, F = NO, percent of Pos. Sub-sample)	D: FYFT (M = YES, F = YES, percent of Pos. Sub-sample)	E: FYFT (M = NO, F = NO, percent of Pos. Sub-sample)
Germany (2015)	77.4	5.2	58.5	24.1	12.2
Finland (2013)	81.9	20.8	19.9	30.0	29.3
India (2011)	35.9	05.0	19.1	09.4	66.6
USA (2016)	65.4	08.8	25.6	57.6	08.0

Table A4: ***Intra-Couple Inequality and Labor Market Intensity.*** *Sample sizes correspond to data used in Figure 5.*

Wife's Employment Status (LPM)					
	(1)	(2)	(3)	(4)	(5)
	Australia	**Germany**	**Italy**	**Norway**	**Sweden**
Per capita household net wealth	0.0312**	-0.0027	0.1887***	-0.0368***	0.2664***
	(0.0127)	(0.0212)	(0.0245)	(0.0034)	(0.0555)
Per capita household net wealth, sq	-0.0027	-0.0042	-0.0504***	0.0008***	-0.5002***
	(0.0017)	(0.0088)	(0.0117)	(0.0002)	(0.1463)
Per capita household net wealth, cubic	0.0000	0.0002	0.0020***	-0.0000*	0.1944**
	(0.0000)	(0.0003)	(0.0005)	(0.0000)	(0.0818)
Observations	18,175	15,647	19,000	166,180	5,152
R-squared	0.1386	0.0925	0.1928	0.1084	0.1309

Robust standard errors in parentheses
All models include year fixed effect and all other controls from the full-sample regression in Table 1
*** p<0.01, ** p<0.05, * p<0.1

Table A5: ***Micro-GKC: Wife's Employment and Household Wealth***. *Country sub-sample results using model described in Eq. 1.*

Wife's Share of Couple Earnings (OLS)					
	(1)	(2)	(3)	(4)	(5)
	Australia	**Germany**	**Italy**	**Norway**	**Sweden**
Per capita household net wealth	-0.0011	-0.0247*	-0.0446***	-0.0228***	-0.0068
	(0.0068)	(0.0134)	(0.0075)	(0.0023)	(0.0285)
Per capita household net wealth, sq	-0.0000	0.0009	0.0059***	0.0009***	0.0224
	(0.0003)	(0.0038)	(0.0022)	(0.0002)	(0.0909)
Per capita household net wealth, cubic	-0.0000	0.0000	-0.0002*	-0.0000***	0.0234
	(0.0000)	(0.0001)	(0.0001)	(0.0000)	(0.0446)
Observations	13,939	12,267	10,345	134,255	4,179
R-squared	0.6343	0.3910	0.6867	0.4243	0.5397
Robust standard errors in parentheses					
All models include year fixed effect and all other controls from the full-sample regression in Table 2					
*** p<0.01, ** p<0.05, * p<0.1					

Table A6: ***Micro-GKC:Wife's Share of Couple Earnings, and Household Wealth***. *Country sub-sample results using model described in Eq. 2.*

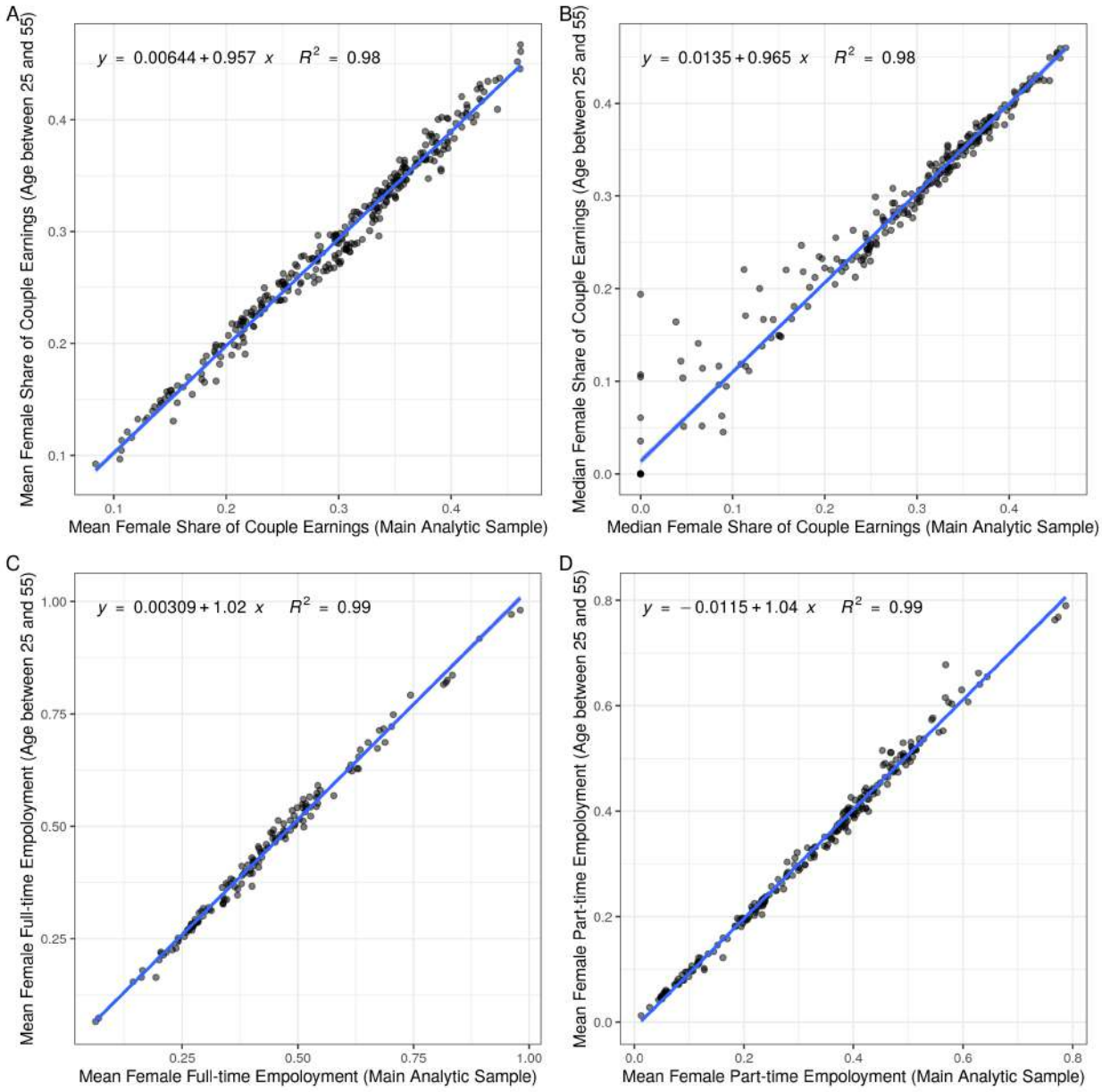

Figure A1: ***Results are Robust to Reducing Sample Age-range***

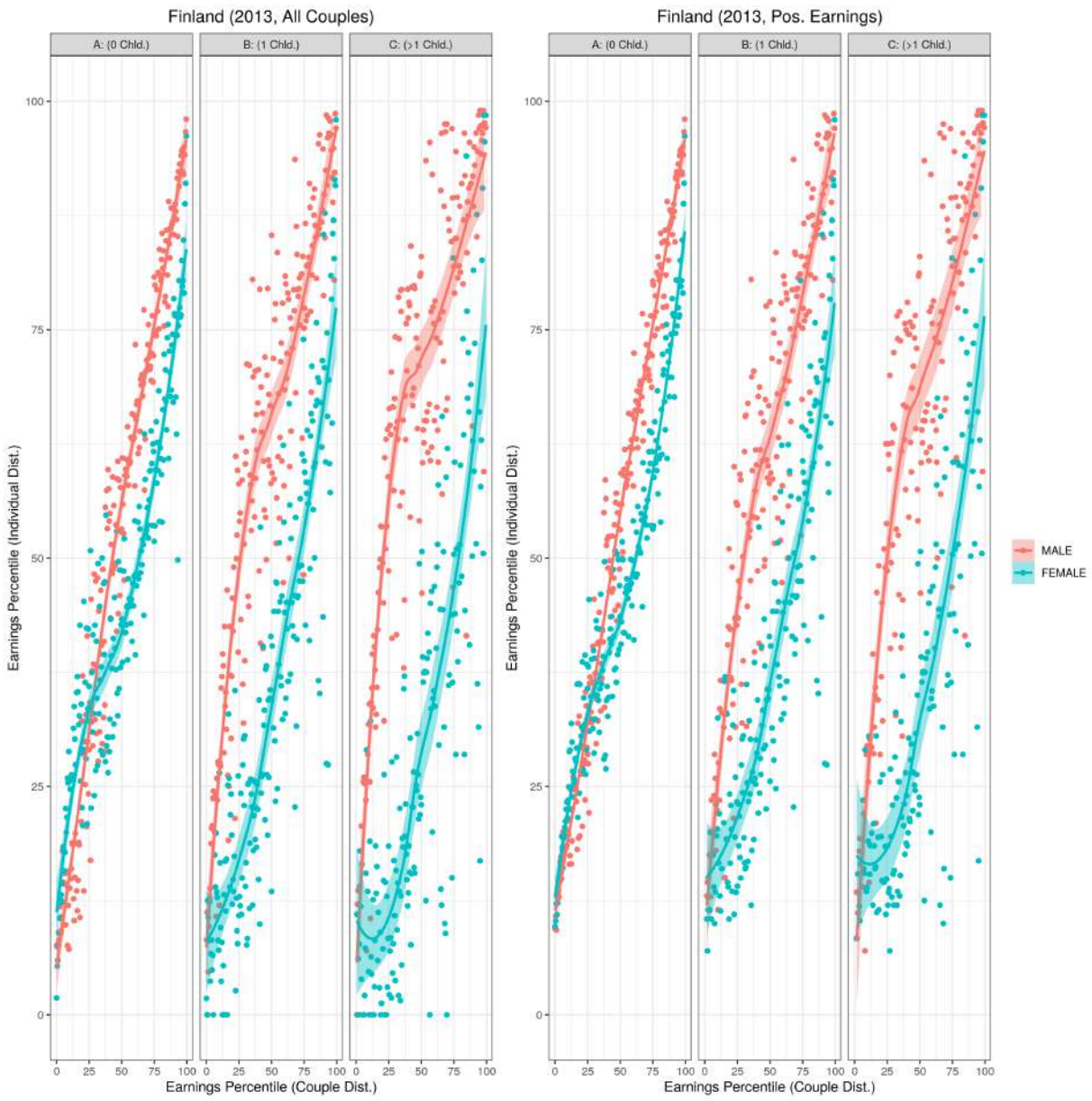

Figure A2: ***Intra-Couple Earnings Inequality and Child Care Penalty***. *"Children" are defined as household members who are five or younger. Cf. main text for further details. An external* `PDF` *file (≈ 233 MB,* `https://tinyurl.com/nChildFullSample`*) reproduces this child care penalty analysis for all datasets in our ensemble.*

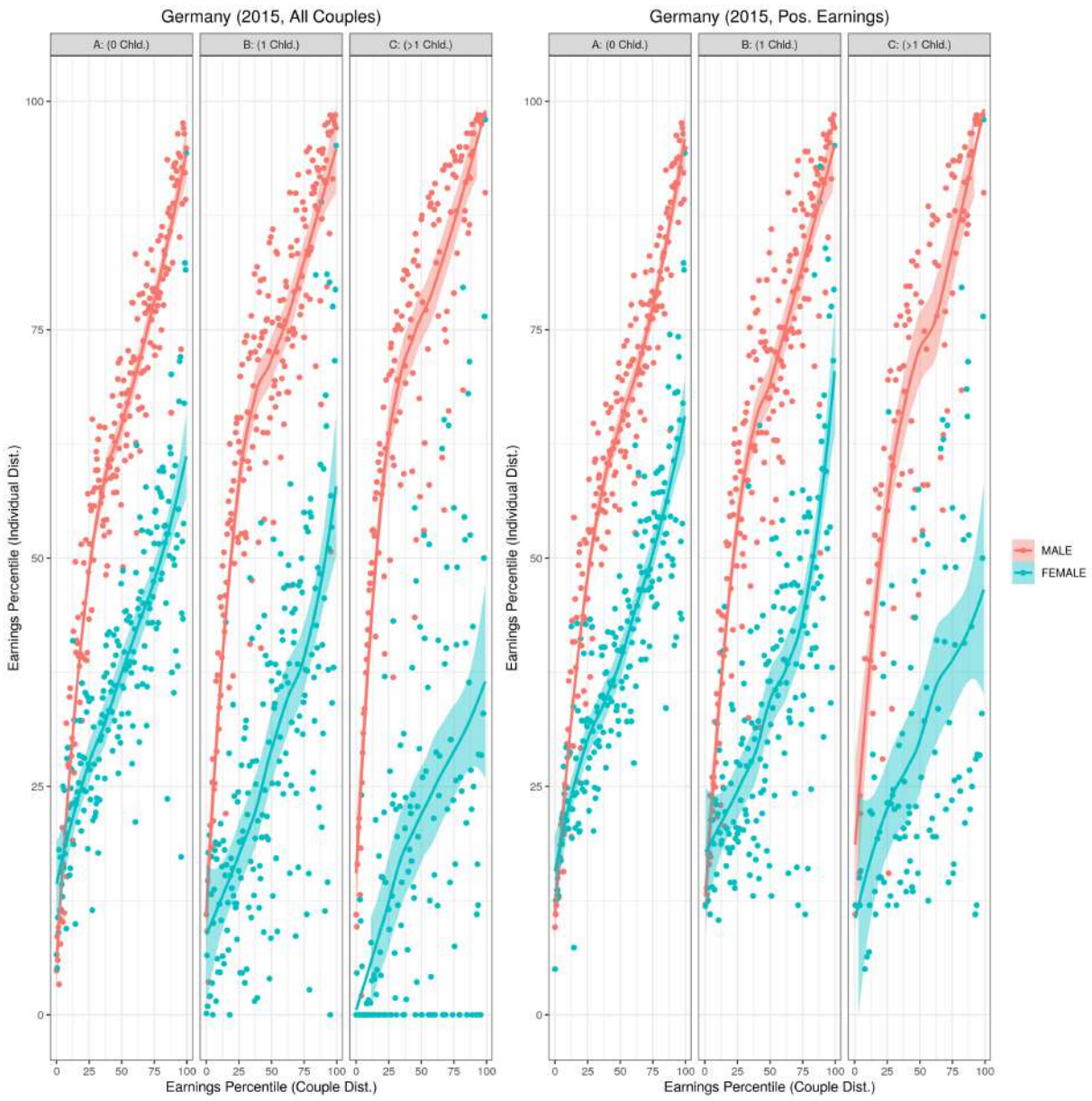

Figure A3: ***Intra-Couple Earnings Inequality and Child Care Penalty***. *"Children" are defined as household members who are five or younger. Cf. main text for further details. An external* `PDF` *file (≈ 233 MB,* `https://tinyurl.com/nChildFullSample`*) reproduces this child care penalty analysis for all datasets in our ensemble.*

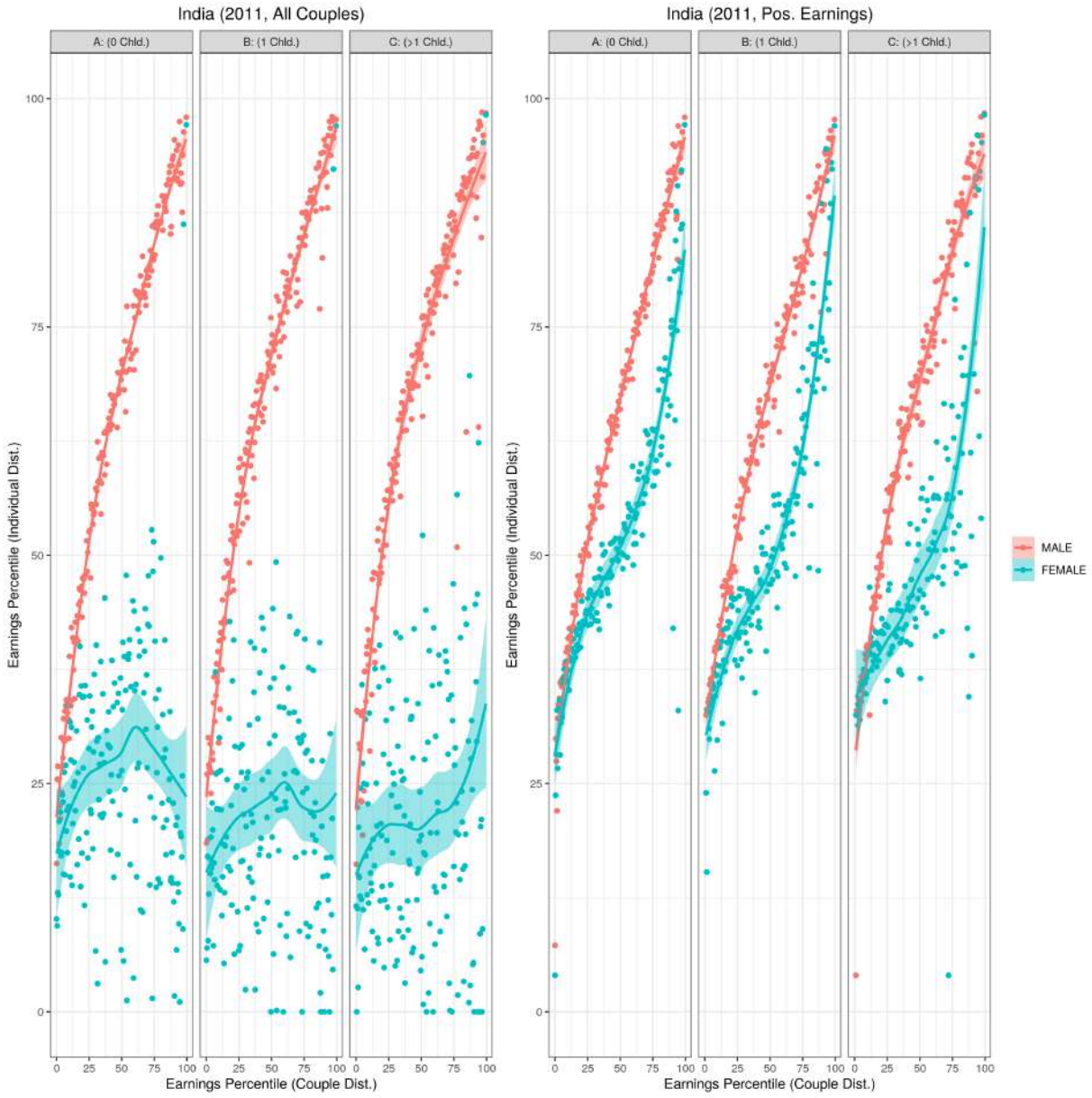

Figure A4: ***Intra-Couple Earnings Inequality and Child Care Penalty***. *"Children" are defined as household members who are five or younger. Cf. main text for further details. An external* `PDF` *file (≈ 233 MB,* `https://tinyurl.com/nChildFullSample`*) reproduces this child care penalty analysis for all datasets in our ensemble.*

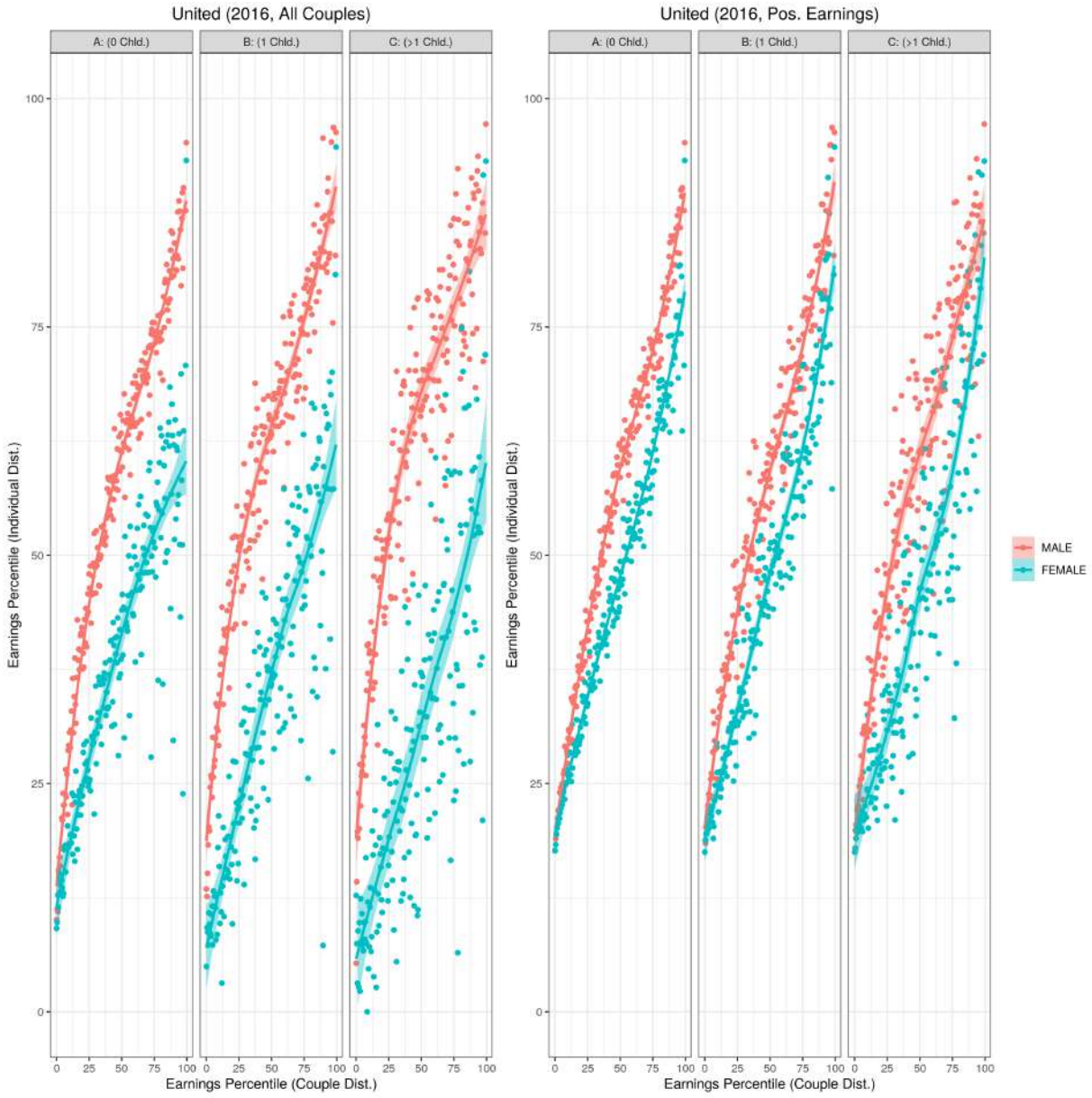

Figure A5: ***Intra-Couple Earnings Inequality and Child Care Penalty***. *"Children" are defined as household members who are five or younger. Cf. main text for further details. An external* `PDF` *file (≈ 233 MB,* `https://tinyurl.com/nChildFullSample`*) reproduces this child care penalty analysis for all datasets in our ensemble.*

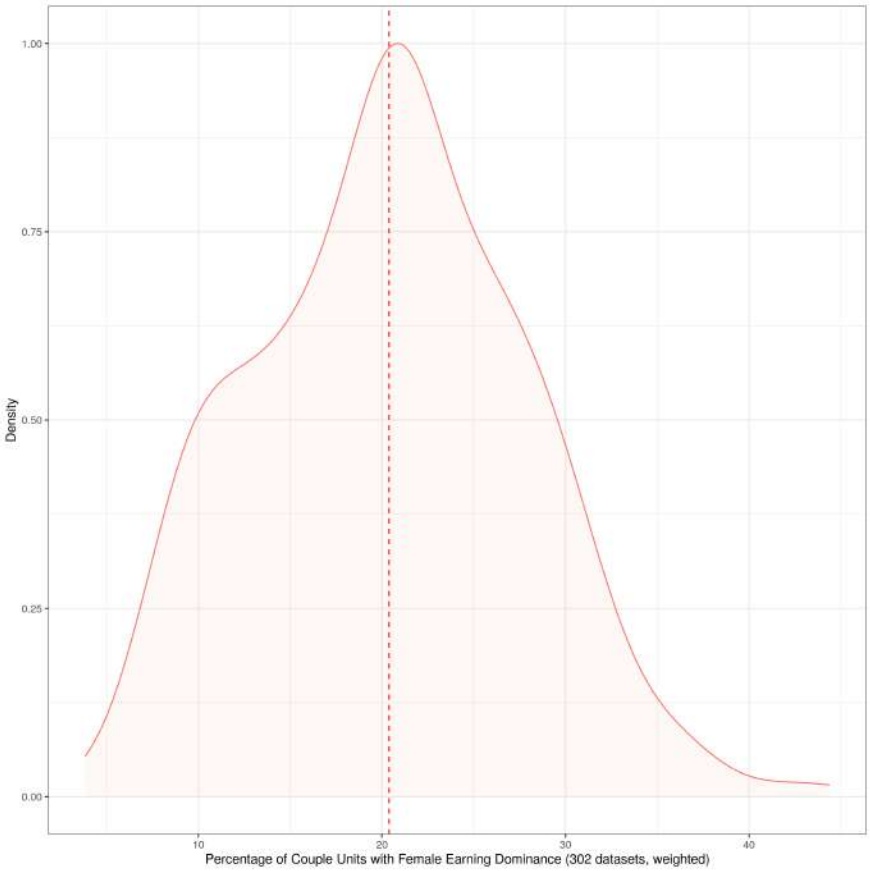

Figure A6: ***Female Dominance of Couple Earnings***

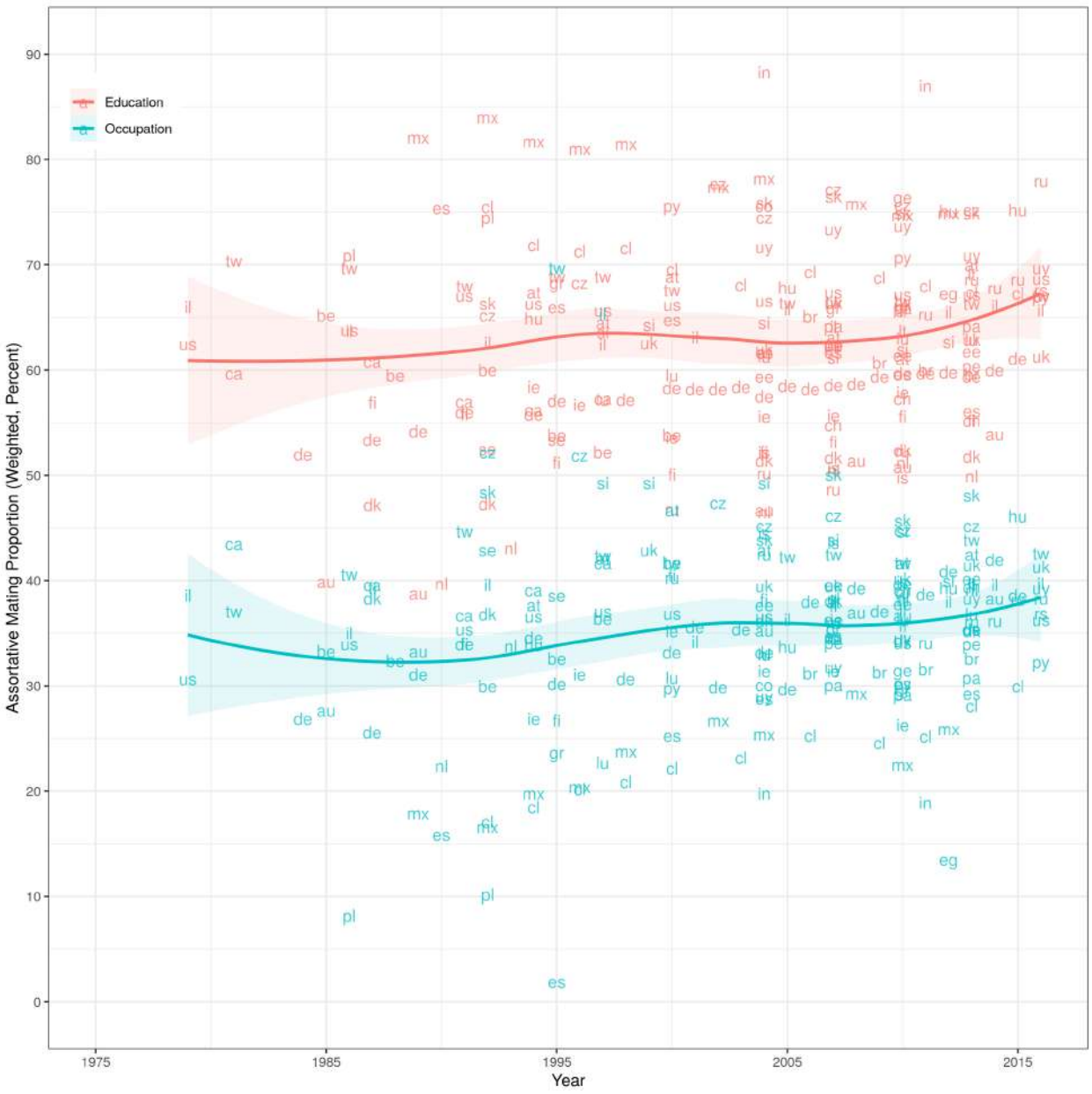

Figure A7: ***Assortative Mating: Global Trends***. *Occupational and education matching are based on the classifications provided by LIS. The main job is classified into three tiers as "managers and professionals," "other skilled workers," and "laborers and elementary." Education is classified as "low," "medium," and "high."*

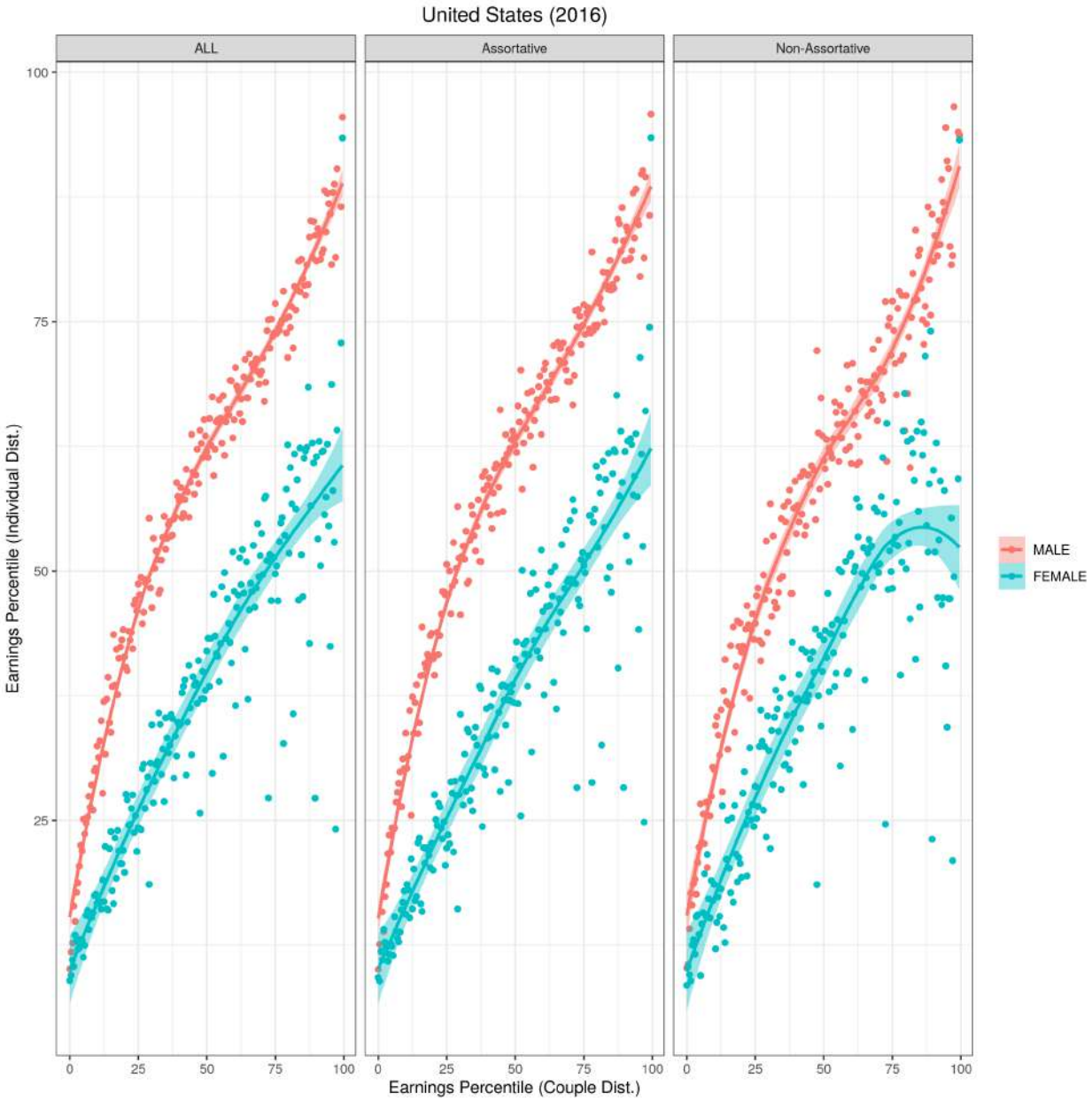

Figure A8: ***Earnings Distribution by Assortative Mating (Education), United States, 2016.*** *The gender difference in earnings distribution as a function of assortative mating for all 302 datasets in our analytic ensemble is available at (*`https://tinyurl.com/assortative302`*) as an* $\approx$ *150 MB* `PDF` *file.*