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ABSTRACT

Preferences over Relative Income within the Household*

What preferences do partners hold over their relative income within the household? We provide a flexible framework of preferences over relative income within the household that captures various motives, including inequality aversion and a preference for being the primary earner. We study the role of these preferences for marital selection, separation and household public good provision in a marriage market matching model with search frictions. We test the model predictions using large administrative tax data from Germany. We document the existence of a kink point in the relative income distribution at the point of spousal income equality, consistent with the presence of kinked preferences over relative income. We also find the presence of a convex kink in wives' household public good provision, suggesting that women bear the incidence of spousal relative income preferences. To disentangle the preferences of women and men, we implement a survey experiment. Our results indicate that women exhibit inequality aversion while men exhibit a preference for being the primary earner.

JEL Classification: D63, D64, D91, J12, J16
Keywords: relative income concerns, relative income distribution

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1 Introduction

Individuals care about their income relative to others (Clark et al., 2008). Whether a worker is satisfied with her wage will depend on the wages her peers receive (Card et al., 2012; Cullen and Perez-Truglia, 2018; Dube et al., 2019). Whether an individual enjoys living in a particular neighborhood will depend on how her income compares to her neighbors (Luttmer, 2005; Perez-Truglia, 2019).

This paper takes the notion of relative income concerns to the household by investigating the existence and form of preferences over relative income between partners. The motives for relative income concerns within the household are ambiguous. For instance, individuals may prefer to earn a similar amount to their partner, implying inequality aversion. Alternatively, they may seek to earn more than their partner, reflecting a preference for being the primary earner.

Understanding the existence and form of non-material preferences over partners' relative income has important theoretical and empirical implications. In standard economic models of marriage and the household, partner selection and household decision-making is driven by material considerations (Becker, 1973; Chiappori, 1992). By assumption, preferences over relative income do not exist in such models. If in reality they do exist, however, they will affect the selection, decision-making, and separation of couples.

In a seminal study, Bertrand et al. (2015) provide a first evidence on the existence of preferences over relative income by means of the relative income distribution - the distribution of the share earned by wives in total household income. They document a pronounced drop at the 50% threshold, a finding that has been interpreted as an artifact of a male breadwinner norm, i.e. couples' or individual spouses' preference for a male primary earner. In a reanalysis of the same data, however, Binder and Lam (2018) find no evidence for such a discontinuity rendering the existence of such preferences unclear.

Identifying preferences over relative income involves two key challenges: first, a researcher is in need of a model that yields clear and testable predictions regarding the impact of preferences over relative income on observable marriage market outcomes. Second, to test the model predictions one requires large data on marriage outcomes that allow high-powered identification. In this paper, we overcome these challenges both theoretically and empirically.

To guide our empirical analysis, we provide a flexible framework of preferences over relative income. Following the notion of a male breadwinner norm implicit in the findings of Bertrand et al. (2015), we start by considering preferences over relative income that feature a discrete jump at the point of earnings equality. This model feature allows individual spouses to obtain discrete utility from their status as either the primary or secondary earner. This utility formulation, however, rules out a wide class of alternative motives such as inequality aversion.

To generalize our framework, we build upon the canonical models of Tversky and Kahneman (1991) and Fehr and Schmidt (1999) and introduce piece-wise linear utility functions over relative

income that feature a kink at the point of income equality. The kink captures that marginal utilities from relative income will differ when being the primary as opposed to the secondary earner. This flexible framework allows us to distinguish between different classes of relative income preferences that have been discussed in sociology and psychology. For instance, following the sociological concept of homophily (McPherson et al., 2001), individuals might exhibit inequality aversion in income. Alternatively, our framework allows for a preference for or aversion against being the primary earner potentially stemming from gender-specific social roles (Eagly and Wood, 1999; West and Zimmerman, 1987).

We introduce these non-standard preferences in a marriage market matching model with search frictions to obtain empirically testable predictions for the selection and separation of couples as well as household public good provision. The main result of our model shows that the presence and structural form of preferences over relative income are identifiable from aggregate marriage outcomes. While mating preferences are generally unidentified from the global distribution of marriage outcomes (Binder and Lam, 2018), our model makes locally testable predictions for the structural form of the relative income distribution. In the absence of preferences over relative income, the relative income distribution is globally smooth. Their presence, however, produces a non-smoothness at the 50% threshold, the point where wives earn more than their husbands. In the case of a kink in preferences, the relative income distribution features a (concave) kink at the 50% threshold, while in the case of a notch, there will be a negative discontinuity.

We demonstrate that the structural distinction between a kink or notch in utility has important welfare consequences. In our model, preferences over relative income act equivalent to a tax on the other gender's income in terms of marriage market prospects. The incidence of this tax crucially depends on the structural form of these preferences as either a kink or notch in utility. For illustration, consider the situation where men hold a preference for being the breadwinner. In the case of a kink, the negative impact on marriage rates (and welfare from marriage) due to a one-unit increase in income is increasing in a women's income as each additional unit of income negatively affects *all* potential matches in which the male is the secondary earner. Hence, in the case of a kink in utility, the norm operates as a *progressive* tax affecting high earning women the most. In contrast, in the case of a notch in utility, each additional unit of income only affects those matches where the woman out-earns the potential husband due to exactly this marginal increase in income. Hence, men's preferences operate as a *proportional* tax on women's income.

Using our main model prediction, we test for the presence and structural form of preferences over relative income for the case of Germany using large administrative income tax data. There are two key benefits of using Germany as a testing ground for our model. First, the German income tax system features income tax splitting for married couples. Hence, there is no incentive for couples to distort their relative income shares. Second, relative to prior evidence by Bertrand et al. (2015), the number of observations in our sample is more than an order of magnitude larger. This allows us to

depict the relative income distribution in granular detail to uncover a potential non-smoothness at the 50% threshold, and to test for the structural distinction between a kink and a discontinuity.

Our main result shows a substantial and statistically significant concave kink at the 50% threshold of the relative income distribution. Importantly, we do not find any discontinuity. This evidence indicates the presence of preferences over relative income in form of a kink in utility. We rule out alternative explanations such as assortative matching or tax manipulation. We furthermore test for cultural variation. We demonstrate that the kink in the relative income distribution is much more pronounced in the rather conservative West Germany relative to the formerly communist and more gender-equal East Germany.

As a further model test, we investigate spouses' household public good provision as a function of their relative income share. In our model, the provision of housework can serve as compensation for partners' utility loss stemming from relative income concerns. As a consequence, patterns of household public good provision are suggestive of which side of the marriage market bears the incidence of relative income concerns. In particular, in the presence of a preference for being the primary earner among men, our model predicts that women will provide more public goods to the household when out-earning their husbands. Empirically, we find for the more conservative West Germany that women provide higher amounts of household public goods if they out-earn their husbands suggesting the existence of a preference for being the primary earner among men. In the more progressive East Germany such a pattern is absent.[1]

The observational data, however, is not enough to cleanly separate and quantify women's and men's preferences. To address this challenge, we design and implement a survey experiment in the United States and Germany that allows us to separately identify and quantify women's and men's preferences. Using two distinct methodologies we elicit preferences over relative income either through qualitative survey questions or quantitative choice questions. The quantitative choice items allow us to identify preferences over relative income from hypothetical revealed choice. Using these items, we can also quantify the strength of relative income preferences by assessing the marginal rates of substitution between a partner's own income and total household income.

Our findings from the experimental evidence are threefold. First, both men and women hold kinked preferences over relative income confirming the evidence from the observational data. Second, women exhibit symmetric inequality aversion. In quantitative terms, women are willing to forego 3% to 4% in total household income for a 10%-point increase in their relative income share when being the secondary earner. Vice versa, women are willing to forego 3% to 4% in total house-

[1] In our model, we also study the theoretical impact of preferences over relative income on the separation of couples. Intuitively, in the presence of relative income concerns, the separation rates will be higher for compositions of relative income that are disliked by their partners. As an empirical artifact, preferences over relative income introduce, depending on their structural form, a non-smoothness as either a kink or notch in the separation rate at the income equality between partners. Our model, hence, provides a theoretical explanation of empirically observed kink points in separations rates in Netherlands (Kalmijn et al., 2007), Canada (Bertrand et al., 2013), and Finland (Zinovyeva and Tverdostup, 2018).

hold income for a 10%-point decrease in their relative income share when being the primary earner. Third, men in contrast exhibit a preference for being the breadwinner. Men are on average willing to forego 4% to 5% in total household income for a 10%-point increase in their relative income share when being the secondary earner. However, men are not willing to trade off total household income and relative income when being the primary earner. These patterns are qualitatively and quantitatively stable across Germany and the United States as well as independent of the experimental methodology.

We contribute to different strands of the literature. First and most broadly, we contribute to the literature studying relative income preferences (Clark et al., 2008). Several studies provide field evidence for the existence of such preferences at the workplace (Card et al., 2012; Cullen and Perez-Truglia, 2018; Dube et al., 2019) and within neighborhoods (Luttmer, 2005; Perez-Truglia, 2019).[2] We add to this literature by providing the first comprehensive evidence on the existence and form of preferences over relative income within the household.[3] Moreover, we study how these preferences affect economic behavior by investigating the consequences of preferences over relative income for the selection, separation, and family outcomes of couples.

Second and more specifically, we add to the literature studying the connection between gender identity and relative income preferences in the household. Following the landmark study by Bertrand et al. (2015), several studies have assessed the existence of a male breadwinner norm by testing for a discontinuity at the 50% threshold in the relative income distribution. We provide an overview of these studies in Table A.1. While Bertrand et al. (2015) document a negative discontinuity in US data, Binder and Lam (2018) find no evidence for the existence of such discontinuity. In the more gender-egalitarian countries, Sweden and Finland, Hederos and Stenberg (2019) and Zinovyeva and Tverdostup (2018) find evidence for a discontinuity among co-working spouses but no such evidence for the remainder of the population. They also document patterns of earnings compression among spouses which might be a result of individual income taxation in these countries that incentivizes couples to distort their income to a 50%-50% split. Finally, using survey data Doumbia and Goussé (2019), Wieber and Holst (2015) and Sprengholz et al. (2019) document a negative discontinuity for Canada and Germany. The mixed evidence in this literature might be a result of the different countries studied, the type of data used or the estimation procedure (Kuehnle et al., 2021). Most importantly, however, none of the existing papers provided a model of preferences over relative income that yields testable predictions. As we show in our model, in the case of preferences over

[2]Moreover, preferences over relative income have been found to affect individuals' economic decision making, such as for job separation (Rege and Solli, 2013) and residence choice (Bottan and Perez-Truglia, 2017).

[3]By eliciting preferences over relative income within the household we also relate to the literature measuring distributional preferences (Cooper and Kagel, 2016). Most studies investigating distributional preferences study a setting where subjects decide about a distribution of outcomes between themselves and another unknown party (Charness and Rabin, 2002; Fisman et al., 2007). We add to this literature by providing evidence on distributional preferences within the household, a setting where the other party, the partner, is well known.

relative income being kinked, the relative income distribution will feature a kink and no discontinuity at the 50% threshold. Through our model-guided analysis we find no existence for a jump in the relative income distribution but indeed document the existence of a kink point, a feature none of the prior studies tested for.[4]

Third, we contribute to the understanding of non-standard utility (Fehr and Schmidt, 1999; Tversky and Kahneman, 1991) in matching models. Relative to standard applications in which agents optimize on a domain over which they hold kinked or notched utility, we study the role of such non-standard utility in matching models with search frictions. Whereas kinked utility leads to bunching in models with behavioral responses, in matching models it yields kink points in the resulting distribution function. By theoretically studying the consequences of non-standard preferences over relative income for marriage outcomes, we specifically contribute to the theoretical literature on marriage markets (Becker, 1973, 1974; Bertrand et al., 2016; Chiappori et al., 2009; Choo and Siow, 2006; Goussé et al., 2017; Shimer and Smith, 2000). Our theoretical results might be applicable in other matching markets where kinked utility has been studied empirically, such as the housing (Genesove and Mayer, 2001) and labor market (Eliaz and Spiegler, 2014).

Finally, by documenting that preferences over relative income within the household differ substantially between women and men, we also add to the literature studying gender differences in preferences (Bertrand, 2011; Croson and Gneezy, 2009). In contrast to existing literature that finds gender differences in social domains to either be small or insignificant (Niederle, 2016), we provide evidence that preferences over relative income differ substantially between women and men not only in their quantitative magnitudes but also in their qualitative form: women show symmetric inequality aversion, while men exhibit a preference for being the breadwinner.[5]

This paper proceeds as follows. In section 2, we present a model of preferences over relative income within the household and introduce it in a marriage market matching model with search frictions. Section 3 tests the model predictions for the case of Germany providing observational evidence on existence and form of preferences over relative income. Section 4 provides evidence from a survey experiment to disentangle and quantify women's and men's preferences. We conclude in section 5.

[4]Furthermore, two related studies analyze gender norms in survey misreporting for the US (Murray-Close and Heggeness, 2018) and Switzerland (Roth and Slotwinski, 2019). Both studies find that households deflate women's earnings in survey responses if the male partner is the secondary earner. Our finding of a sharp kink in the distribution or relative income relies on administrative tax data and is also present for third-party reported labor income where no misreporting is feasible.

[5]By documenting that the qualitative and quantitative nature of these gender differences is stable between two distinct countries, the United States and Germany, we also add to the literature studying the variability of gender differences in preferences across countries and cultures (Falk and Hermle, 2018).

2 Model

How do preferences over relative income affect marriage market outcomes?

To theoretically study how preferences over relative income affect marriage market outcomes of women and men, we provide a matching model of the marriage market. First, we outline a flexible framework of preferences over relative income that captures various motives. Thereafter, we provide the assumptions of our model. To gain intuition, we then study a one-period marriage market matching model similarly to Bertrand et al. (2016). Thereafter, we provide the full model in an infinite-horizon, continuous time setting with search frictions in the spirit of Goussé et al. (2017); Shimer and Smith (2000).

2.1 Preferences and Setup

What preferences do individuals hold over relative income within the household? Denote by y^o an individual's own income and by y^p their partner's income such that relative income is given by $y^o - y^p$. We denote by $\eta(y^o, y^p)$ the non-material utility individuals obtain from relative income concerns. If individuals only hold purely material considerations $\eta(y^o, y^p) = 0$ as visualized in Figure A.1, Panel A.

Notched Preferences over Relative Income: Following the notions implicit in the findings of Bertrand et al. (2015), we start by considering a framework in which individual spouses receive a discrete utility from their status as either the primary or secondary earner.[6] In this case, preferences over relative income can be captured by

$$\eta(y^o, y^p) = \beta_{\text{ahead}} \cdot I(y^o \geq y^p).$$

Here, β_{ahead} determines the discrete utility associated with being the primary earner. If $\beta_{\text{ahead}} > 0$, an individual exhibits a preference for being the primary earner, if $\beta_{\text{ahead}} < 0$ she holds a preference for being the secondary earner. Alternatively and equivalently to including $\beta_{\text{ahead}} \cdot I(y^o \geq y^p)$ in the utility specification, we could incorporate a term $\beta_{\text{behind}} \cdot I(y^o \leq y^p)$ which captures a preference for or aversion against being the secondary earner instead. For illustration, Figure A.1, Panel B visualizes notched preferences for being the primary earner.

Kinked Preferences over Relative Income: A substantial shortcoming of the preference formulation featuring discontinuous notches is the inability to capture that marginal utilities from relative

[6] Non-standard preferences in form of notches have been discussed in applications where individuals achieve utility from a specific goal, see e.g. Allen et al. (2016).

income might differ when being the primary as opposed to the secondary earner. As a consequence, this utility formulation rules out a wide class of potential motives.

We, consider a framework using a more flexible formulation building upon the canonical models by Charness and Rabin (2002) and Fehr and Schmidt (1999). In particular, we consider preferences over relative income as a piecewise linear function:

$$\eta(y^o, y^p) = \alpha_{behind} \cdot (y^o - y^p) \cdot I(y^p > y^o) + \alpha_{ahead} \cdot (y^o - y^p) \cdot I(y^o \geq y^p).$$

Here, α_{behind} and α_{ahead} represent the marginal utilities obtained from a one-unit increase in relative income when being ahead or behind in income relative to the partner. The difference in marginal utilities captures that concerns over relative income will depend on whether the individual is the primary or secondary earner. Holding total household income $y^o + y^p$ constant, the utility formulation captures several plausible cases of preferences over relative income.

First, individuals might have an aversion against inequality in incomes if $\alpha_{behind} > 0$ and $\alpha_{ahead} < 0$ (Figure A.1, Panels C and D). A substantial body of literature in Economics argues that in various settings individuals dislike unequal economic outcomes (Fehr and Schmidt, 1999). Work in sociology and psychology emphasizes that such inequality aversion impacts mate selection: individuals will prefer a partner who is similar in economic status to themselves, a phenomenon labeled homophily (McPherson et al., 2001). Our utility formulation captures this preference through a sign reversal in marginal utility from relative income at the point where both partners earn the same. Intuitively, if an individual is the secondary earner, she will prefer a higher relative income. In contrast, if she is the primary earner, she will prefer a lower relative income. Inequality aversion may either be symmetric (Panel C) or asymmetric (Panel D). Symmetric inequality aversion arises if $|\alpha_{behind}| = |\alpha_{ahead}|$, implying that positive and negative deviations from income equality are disvalued at the same rate. Asymmetric inequality aversion arises if, for example, $|\alpha_{behind}| > |\alpha_{ahead}|$ implying that positive deviations from earnings inequality are disvalued less than negative ones.

Second, individuals might have a preference for being the primary earner which is the case if $\alpha_{behind} > \alpha_{ahead} \geq 0$. Under this condition, individuals receive higher marginal utility from increases in relative income when being the secondary earner as opposed to the primary earner, as visualized in Figure A.1, Panel E. A preference for being the primary earner can stem from status utility. As highlighted by research in social psychology the prevalence of this preference might fundamentally differ by gender (Eagly and Wood, 1999). If the breadwinner status is perceived as a male characteristic, men will internalize a stronger preference to be the primary earner. [7]

Third, individuals might have a preference for being the secondary earner which is the case if

[7] Fisman et al. (2006) provide empirical support for this hypothesis in a speed dating experiment. They find that men hold kinked preferences over women's personality traits that are relevant for their earnings ability. In particular, men prefer women who are more ambitious and intelligent. However, if men are outperformed in these traits by the potential female partner, they value these traits negatively at the margin.

$\alpha_{ahead} < \alpha_{behind} \leq 0$. Intuitively, increases in relative income are disvalued higher at the margin when being ahead relative to being behind in earnings (Figure A.1, Panel F). This specification captures individuals' aversion against being the primary earner in the couple. Similarly to a preference for being the primary earner, a preference for being the secondary earner might be internalized as a result of the external social structure. Work in sociology highlights that individuals adapt their preferences according to their gender roles. As a result, a preference for being the secondary earner may thus be more prevalent among women, if the breadwinner role conflicts with the externally prescribed gender stereotype of males being the primary earner (West and Zimmerman, 1987).

Marriage Market Model Setup: How do preferences over relative income impact the selection of married couples? We study the impact of these preferences in a marriage market matching model. Each individual k has a job yielding income y^k and material consumption utility $c^k(y^k)$. Hence, the utility when being single is equal to $u_s^k = c^k(y^k)$. In the following, denote male types by m and female types by f. When a male individual m marries a female individual f, utility changes in three regards relative to being single.

First, the individual receives utility from an idiosyncratic taste shock q_{mf} distributed according to a continuously differentiable distribution Φ_m. The taste shock captures the (subjective) quality of the match. Second, he receives utility from partner f's income. Here, we consider two motives. On one hand, individual m obtains a material benefit from spousal income y^f. We incorporate this feature in the consumption utility function $c_m^m(y^m, y^f)$. On the other hand, individual m receives utility from non-material preferences over relative income captured by $\eta^m(y^f, y^m)$. Third, m receives a non-monetary intra-household transfer $t \gtreqless 0$. The utility considerations for a female individual f marrying a male m are analogous.

Hence, the utility for a couple (m, f) when being married equals:

$$\begin{aligned} u_m^m(f) &= c^m(y^m, y^f) + \eta^m(y^f, y^m) + t + q_{mf} \\ u_m^f(m) &= c^f(y^f, y^m) + \eta^f(y^m, y^f) - t + q_{fm} \end{aligned}$$

where $q_{mf} \perp q_{fm}$ and t denotes the net-transfer from the wife to the husband.

2.2 Simple one-period model

To gain intuition on how preferences over relative income affect marriage outcomes, we first consider a simple one-period model with transferable utility.[8] In this setting, individuals enter the marriage market being single and are matched with an individual of the other gender. If they decide to marry,

[8]We study a model with non-transferable utility in Appendix B, showing that all predictions derived in the following remain unchanged.

a marriage match is formed, otherwise both stay single.

Marriage Probabilities and Selection: To understand the impact of preferences over relative income on marriage selection, we construct the marriage probabilities for a given pair (m, f). Under transferable utility, the couple (m, f) decides to marry iff $u_m^m(f) + u_m^f(m) \geq u_s^m + u_s^f$.

Hence, the marriage probability equals

$$P_{mf}(\Delta y) = \Phi(C + \bar{\alpha}_{m\ ahead} \cdot \Delta y \cdot I(\Delta y < 0) + \bar{\alpha}_{m\ behind} \cdot \Delta y \cdot I(\Delta y \geq 0) + \bar{\beta}_{m\ behind} \cdot I(\Delta y \geq 0)\Big),$$

where

$$\begin{aligned}
\Delta y &= y^f - y^m \text{ are the female's relative earnings} \\
C &= c^m(y^m, y^f) + c^f(y^f, y^m) - c^m(y^m) - c^f(y^f) \text{ is the material benefit from marriage} \\
\bar{\alpha}_{m\ ahead} &= \alpha^f_{behind} - \alpha^m_{ahead} \\
\bar{\alpha}_{m\ behind} &= \alpha^f_{ahead} - \alpha^m_{behind} \\
\bar{\beta}_{m\ behind} &= \beta^f_{ahead} + \beta^m_{behind} \\
\Phi &\text{ is the distribution function of } -q = -(q_{mf} + q_{f_m}).
\end{aligned}$$

The parameters $\bar{\alpha}_{m\ ahead}$, $\bar{\alpha}_{m\ behind}$, and $\bar{\beta}_{m\ behind}$ govern the couple's aggregate preference over the female's relative earnings. For instance, $\bar{\alpha}_{m\ ahead}$ determines the couple's marginal utility from a one-unit increase in the wife's relative income for the case where the husband is the primary earner. This statistic is given as the average of the wife's marginal utility from an increase in her relative earnings (α^f_{behind}) plus the husband's marginal disutility from a one-unit decrease in his relative income ($-\alpha^m_{ahead}$). Similarly, $\bar{\alpha}_{m\ behind}$ governs the couples' marginal utility from a one-unit increase in the wife's relative income in case the husband is the secondary earner. Finally, $\bar{\beta}_{m\ behind}$ determines the couple's average discrete utility from the wife being the primary earner.

Mating preferences are generally hard to recover from the global distribution of marriage outcomes (Binder and Lam, 2018). Therefore, we derive locally testable predictions for the impact of preferences over relative income on marriage selection by investigating the functional form of the marriage probability at the point of equal earnings $\Delta y = 0$. For simplicity, we assume that the consumption utility functions are equal for women and men and linear such that changes in relative income do not affect the aggregate material benefits from marriage.[9] In our exposition we distinguish between preferences over relative income as either a kink or a notch in utility.

Preferences over relative income as a notch in utility: First, we note that for $\bar{\beta}_{m\ behind} \neq 0$ (implying that preferences over relative income feature a discontinuity at income equality), it follows that $\lim_{\Delta y \to 0^+} P_{mf}(\Delta y) \neq \lim_{\Delta y \to 0^-} P_{mf}(\Delta y)$. Hence, the marriage probability features a discrete jump at

[9] Our qualitative results hold if we assume any gender-specific continuously differentiable consumption utility function.

the point of equality in incomes $y^f = y^m$. The direction and magnitude of the jump depends on the relative size of the partner's preferences. For instance, if men obtain discrete disutility from being the secondary earner while women do not have a preference over relative income, the marriage probability will feature a negative jump at $\Delta y = y^f - y^m = 0$.

Preferences over relative income as a kink in utility: If preferences over relative income feature a kink instead of a notch, $\lim_{\Delta y \to 0^+} P_{mf}(\Delta y) = \lim_{\Delta y \to 0^-} P_{mf}(\Delta y)$. Hence, there will be no jump in the *level* of the marriage probability at $\Delta y = 0$. However, in the presence of kinked preferences over relative income, the *slope* of the marriage probability will feature a discontinuity. To see this, we note that if $\bar{\beta}_{m\ behind} = 0$

$$\frac{dP_{mf}}{d\Delta y} = \begin{cases} \bar{\alpha}_{m\ ahead}\phi(C + \bar{\alpha}_{m\ ahead} \cdot \Delta y) & \text{if } \Delta y < 0 \\ \bar{\alpha}_{m\ behind}\phi(C + \bar{\alpha}_{m\ behind} \cdot \Delta y) & \text{if } \Delta y \geq 0 \end{cases}$$

Hence, we obtain a kink point in the marriage probability at $\Delta y = 0$ if $\bar{\alpha}_{m\ ahead} \neq \bar{\alpha}_{m\ behind}$. Whether this kink is convex or concave, depends on the relative size of $\bar{\alpha}_{m\ ahead}$ and $\bar{\alpha}_{m\ behind}$. We note, however, that the kink has to be concave if the partners exhibit any combination of inequality aversion, a kinked preference for being the primary earner or a kinked preference for being the secondary earner.

Online Appendix Figure A.2 visualizes the marriage probabilities as a function of women's relative income for different combinations of individual preferences. Panel A shows the case where both women and men exhibit inequality aversion. Panel B and C visualize the cases where men have a kinked preference for being the primary earner or women have a kinked preference for being the secondary earner respectively. Finally, Panel D visualizes the case where men have a notched preference for being the primary earner.

Relative Income Distribution: Knowledge of the marriage probability conditional on relative income would facilitate a local test for the existence and structural form of preferences over relative income. However, marriage probabilities for a given combination of female and male types are unobservable objects. Hence, to obtain predictions that are empirically testable, we use the previous results to study the impact of preferences over relative income on the distribution of relative income. Intuitively, applying Bayes' Rule, the kink (notch) in the marriage probability conditional on relative income implies a kink (notch) in the distribution of relative income conditional on being married. This leads to our first main result:

Result 1: *(a) If preferences over relative income feature a notch at equality of incomes, the relative income distribution will feature a jump at the point where wives out-earn their husbands.*
(b) If preferences over relative income feature a kink at equality of incomes, the relative income distribution features a kink at the point where wives out-earn their husbands.

In Appendix A we provide a formal proof. Figure 1 visualizes the relative income distribution for log-normally distributed incomes and an example set of model parameters under different assumptions on preferences over relative income. The blue distributions depict simulated relative income distributions, and the gray distributions a counterfactual distributions obtained from random matching of couples.

Panel A assumes that both women and men exhibit symmetric inequality aversion. Intuitively, we obtain a concave kink point at the 50% threshold of the relative income distribution. Furthermore, there is an excess mass of couples around the 50% threshold relative to the counterfactual distribution assuming random matching of couples. Panel B shows the relative income distribution for the case in which men hold a kinked preference for being the primary earner while women have no concerns over relative income. We obtain a kink point in the relative income distribution at the 50% threshold and a missing mass of couples with a female primary earner. Panel C depicts the relative income distribution for the opposite case in which women hold a kinked aversion against being the primary earner while men have no concerns over relative income. Again, we obtain a kink point in the relative income distribution at the 50% threshold and a missing mass of couples with a female primary earner. The comparison of Panels A, B and C reveals that different combinations of partners' preferences over relative income can produce similar functional forms of the relative income distribution at the 50% threshold. In particular, Panels B and C provide identical relative income distributions even though they are determined by distinct preferences of the partners. Hence, observing a kink point in the relative income distribution at the 50% threshold is indicative of the presence of partners' preferences, but does not identify the gender-specific parameterization of the underlying preferences. However, the functional form of the relative income distribution at the 50% threshold is indicative of the structural form of preferences over relative income as either a kink or notch. This is underscored by Panel D which shows the relative income distribution for a notched preference of husbands for being the primary earner. Instead of a kink at the 50% threshold, we observe a discrete jump.

In sum, the structural form of the relative income distribution at the 50% point is indicative of the structural form of preferences over relative income. If the relative income distribution is smooth, there is no direct evidence of the existence of preferences over relative income. If it instead exhibits a kink (notch), this feature is indicative of kinked (notched) preferences over relative income. However, observing an unsmoothness does not allow for a direct parametrization of gender-specific preferences.

Transfers and Household Public Good Provision: Next, we study how preferences over relative income affect non-monetary intra-household transfers. In our empirical application, we consider the provision of housework as an intra-household transfer as it imposes costs to the provider and yields benefits to the receiver.

Following Goussé et al. (2017), we posit that intra-household transfers for a married couple (m, f) are given as the solution to the Nash bargaining problem:

$$\max_t (u_m^m(f) - u_s^m + t)^\gamma (u_m^f(m) - u_s^f - t)^{1-\gamma},$$

where γ is the husband's bargaining weight. This yields the solution:

$$\begin{aligned} t &= \frac{1}{2}\Big[\tilde{C} + (\gamma\alpha^f_{behind} + (1-\gamma)\alpha^m_{ahead})\Delta y I(\Delta y \leq 0) \\ &\quad + (\gamma\alpha^f_{ahead} + (1-\gamma)\alpha^m_{behind})\Delta y I(\Delta y \geq 0) + ((1-\gamma)\beta^f_{ahead} - \gamma\beta^m_{behind})I(\Delta y \geq 0)\Big], \end{aligned}$$

where

$$\begin{aligned} \tilde{C} &= \gamma(c^m(y^m, y^f) - c^f(y^f)) - (1-\gamma)(c^f(y^f, y^m) - c^m(y^m)), \\ &\quad \text{represents the bargaining weight-adjusted difference in material benefits from marriage.} \end{aligned}$$

Several observations about this equation are noteworthy. Consider the case where the bargaining weights of women and men are equal. In this case, if women's and men's preferences over (women's) relative income are aligned, i.e. $\alpha^f_{behind} = -\alpha^m_{ahead}$, $\alpha^f_{ahead} = \alpha^m_{behind}$, relative income concerns do not impact intra-household transfers. This is visualized in Panel A of Figure A.3, where both spouses exhibit inequality aversion of the same magnitude.

If preferences over relative income are kinked and unaligned, this will lead to a kink point in intra-household transfers at the point of equality in income. We visualize one example in Figure A.3 Panel B where we assume that the husband has a preference for being the primary earner while the wife has no preference over relative income. In this case, we obtain that intra-household transfers feature a convex kind at the point where the wife out-earns her husband. Intuitively, the husband requires a compensation for the disutility associated with being the secondary earner. Figure A.3 Panel C visualizes the opposite case in which the husband has no preferences over relative income but the wife has an aversion against being the primary earner. In this case, intra-household transfers feature a concave kink at the point where the wife out-earns her husband. Here, the opposite logic applies: the wife requires a compensation for the disutility associated with being the primary earner. In sum, while in both cases the observed relative income distributions are identical (see Figure 1, Panels B and C), patterns of intra-household transfers differ. In particular, the direction of the flow of transfers indicates whether women or men bear the incidence of preferences over relative income. Finally, Figure A.3 Panel D visualizes intra-household transfers for the case in which the husband has a notched preference for being the primary earner. Intuitively, we observe that the net transfer from wives to husbands features a positive jump at the point of equality. Hence, patterns of intra-household transfers are in addition indicative of the structural form of preferences.

In sum, the observation of intra-household transfers facilitates the separation of preferences over relative income along two margins. First, the functional form of intra-household transfers at the point of equality in incomes distinguishes between kinked and notched preferences. Second, patterns of intra-household transfers can be suggestive of which side of the marriage market bears the incidence of relative income preferences. We summarize these predictions in our next result:

Result 2: *(a) If spouses' preferences over relative income are aligned and bargaining weights equal, preferences over relative income will not affect intra-household transfers.*
(b) Unaligned kinked preferences over relative income introduce a kink point in intra-household transfers at the point of equal income.
(c) Unaligned notched preferences over relative income introduce a discontinuity in intra-household transfers at the point of equal income.
In both cases, the direction of transfers is indicative of which side of the market bears the incidence of preferences over relative income.

Divorce: Finally, we investigate the impact of preference over relative income on divorce which arises when the taste shock gets updated. For illustration, suppose that after marriage each individual lives for an additional period but a spouse's taste shock gets updated with probability π. Individuals then decide whether to stay in the match or file for divorce which occurs if $u_m^m(f) + u_m^f(m) < u_s^m + u_s^f$. Note that given an updated taste shock, a divorce occurs in period t+1 with probability $1 - P_{mf}$

Hence, for a given combination of male income y and the female relative income share $k \in [0, 1]$, the divorce probability equals:

$$Div(y,k) = \frac{\pi(1-P_{mf})P_{mf}m_m(y^m = y)m_f(y^f = \frac{1-k}{k}y)}{P_{mf}m_m(y^m = y)m_f(y^f = \frac{1-k}{k}y)} = \pi(1-P_{mf}),$$

where $m_m(\cdot)$ and $m_f(\cdot)$ denote the type distributions of male and female types.

Therefore,

$$\frac{dDiv(y,k)}{dk} = -\pi\frac{dP_{mf}}{dk}.$$

Using the previous results on marriage rates, we formulate our third result.

Result 3: *(a) If preferences over relative income feature a kink at equality of incomes, the divorce probability features a kink at the point where wives out-earn their husbands.*
(b) If preferences over relative income feature a notch at equality of incomes, the divorce probability will feature a jump at the point where wives out-earn their husbands.

Online Appendix Figure A.4 visualizes divorce probabilities for different combinations of part-

ners' preferences analogous to Online Appendix Figure A.2. Panel A shows divorce probabilities for the case where both partners feature symmetric inequality aversion. The divorce probability features a kinked V-shaped pattern reaching its minimum at the point of equal earnings. A similar structural form of the divorce probability is reported for the gender-egalitarian Finland by Zinovyeva and Tverdostup (2018) who find that divorce probabilities are lowest for couples with similar levels of income. Panels B and C show the divorce probabilities for couples in which the husband has a kinked preference to be the primary earner (Panel B) or similarly the wife has a kinked preference for being the secondary earner (Panel C). In both cases, divorce probabilities are stable until the point of equal earnings but increase in a kinked fashion for higher relative income of wives. Empirically, such a pattern has been observed for Canada (Bertrand et al., 2013) as well as the Netherlands (Kalmijn et al., 2007). A standard explanation for this empirical pattern involves women's economic independence and higher outside options on the marriage market when being the primary earner. Our model instead is able to predict these patterns as a result of couples' preferences over relative income. For instance, if husbands are averse against a female primary earner, this will increase the instability of the match. In line with this channel, Bertrand et al. (2015) find that couples with a female breadwinner report lower marriage satisfaction. Finally, Panel D shows the divorce probability for the case in which men exhibit a preference for being the primary earner in form of a notch. In this case, we intuitively observe a positive jump in the divorce probability at the point of equality in incomes. Hence, in addition to the structural form of the relative income distribution as well as intra-household transfers, the structural form of divorce probabilities can be indicative of the presence and structural form of preferences over relative income.

Marriage Rates and Welfare: The structural form of preferences over relative income as either a kink or a notch in utility has important consequences for marriage rates and welfare. We study the welfare consequences under simplifying assumptions in a non-transferable utility framework in Appendix C. Intuitively, preferences over relative income - independent of their structural form - act equivalently to a tax on the other gender's earnings in form of negative impacts on marriage prospects and resulting welfare losses. In the Appendix, we demonstrate that the structural distinction between modeling these preferences as either a kink or a notch in utility has important consequences for the incidence of this tax.

For illustration, we discuss the situation in which women hold no concerns over relative income while men exhibit a preference for being the breadwinner. In Online Appendix Figure A.5, we visualize the welfare consequences of this preference for women as a function of their income decile and different assumption on the model parameters. In the case of a kink (Panel A), the negative impact on marriage rates (and welfare from marriage) due to a one-unit increase in income is increasing in a women's income. This results from the fact that each additional unit of income negatively affects *all* potential matches where the male would be the secondary earner. Hence, in the case of a kink

in utility, the norm operates as a *progressive* tax affecting high earning women the most. In contrast, in the case of a notch (Panel B) each additional unit of income only affects those matches where the woman out-earns the potential husband due to exactly this marginal increase in income. As a consequence, the marginal impact of an increase in a woman's income is proportional to the density of potential husbands at the same level of income. In this case, the norm operates as a *proportional* tax on women's income.

2.3 Full model in continuous time and infinite-horizon

Next, we provide the full model with search frictions in a continuous time and infinite horizon setting in the spirit of Shimer and Smith (2000) and Goussé et al. (2017). We retain the basic assumptions of the simple one-period model. We further assume that only singles search for a partner, thus ruling out search for an alternative spouse during marriage. Let λ be the poisson rate at which individuals meet, s be the exogenous dissolution rate of marriages (divorce), and r be the discount rate. In terms of notation, let $m_m(\cdot)$ and $m_f(\cdot)$ be the distribution functions of male and female types with associated income distribution functions $f_m(y) = \int_{m:\, y_m=y} m_m(m)dm$ and $f_f(y) = \int_{f:\, y_f=y} m_f(f)df$. Furthermore, $m_m^s(\cdot)$ and $m_f^s(\cdot)$ denote the distribution of single male and female types with associated income distribution functions $f_m^s(y)$ and $f_f^s(y)$. Furthermore, $m(\cdot,\cdot)$ denotes the distribution of married couples with joint income distribution $f(y_m, y_f)$. The total number of married couples is denoted by $M = \iint m(m,f)dmdf = \iint f(y_m, y_f)dy_m dy_f$.

Bellman equations, search equilibrium, and stationary distribution: We first determine the Bellman equations. Consider a male individual m. The present value of being single has to equal the flow utility plus the option value of engaging in a marriage,

$$rV_s(m) = u_s(m) + \lambda \iiint I_{mfq}[V_m(mfq) - V_s(i)]m_f^s(f)dj\phi(q_{mf})\phi(q_{fm})dq_{mf}dq_{fm},$$

where $V_s(m)$ denotes the value of being single, $V_m(mfq)$ the value of being married to an individual f conditional on taste shocks $q = (q_{mf}, q_{fm})$, and I_{mfq} an indicator for a match being formed between m and f conditional on q. Suppose now individual f meets individual m. From m's perspective, the present value of accepting the match has to equal the flow utility from marriage net of divorce,

$$rV_m(mfq) = u_m(mfq) + s(V_s(m) - V_m(mfq)).$$

Subject to intra-household transfers, both individuals will accept the match iff the total utility from being married exceeds the total utility from being single or iff $V_m(mfq) + V_m(fmq) \geq V_s(m) + V_s(f)$, implying $c^m(y^m, y^f) + c^m(y^f, y^m) + \eta^m(y^f, y^m) + \eta^f(y^m, y^f) + q \geq r(V_s(m) + V_s(f))$. As a conse-

quence, the marriage probability is given by:

$$P_{mf} = 1 - \Phi\left(r(V_s(m) + V_s(f)) - c^m(y^m, y^f) - c^m(y^f, y^m) - \eta^m(y^f, y^m) - \eta^f(y^m, y^f)\right).$$

The resulting flow into marriage $m^{flow}(m, f)$ equals

$$m^{flow}(m, f) = \lambda P_{mf} m_m^s(m) m_f^s(f).$$

In the steady state, outflows and inflows into marriage must balance out. Thus the stationary distribution is pinned down by

$$\lambda m_m^s(m) m_f^s(f) \cdot P_{mf} = sm(m, f).$$

Relative income distribution: Similarly to the one-period case, if preferences over relative income feature a kink at equality of incomes, the relative income distribution features a kink at the 50% threshold. Analogously, if preferences over relative income feature a notch, the relative income distribution will feature a discontinuous jump at the 50% threshold. To see this, we translate the stationary income distribution into the relative income distribution $f_{rel}(\frac{y_f}{y_m+y_f} = k)$,

$$\begin{aligned} f_{rel}(k) &= \frac{1}{M} \iint_{\{f: \frac{y_f}{y_m+y_f}=k\}} m(m, f) df dm = \frac{\lambda}{sM} \iint_{\{j: \frac{y_f}{y_m+y_f}=k\}} P_{mf} m_m^s(m) m_f^s(f) df dm \\ &= \frac{\lambda}{sM} \int P_{mf} m_m^s(y^m = y, h^m) m_f^s(y^f = \tilde{k}y, h^f) dy, \end{aligned}$$

where we denote $\tilde{k} = \frac{k}{1-k}$. By the Leibniz Rule

$$\frac{d}{dk} f_{rel}(k) = \frac{\lambda}{sM} \int \iint m_m^s(y^m = y, h^m) \cdot \left\{ m_f^s(y^f = \tilde{k}y, h^f) \frac{d}{dk} P_{mf} + P_{mf} \frac{d}{dk} m_f^s(y^f = \tilde{k}y, h^f) \right\} dh^f dh^m dy.$$

Note that $m_f^s(y^f, h^f)$ is smooth for all y^f and $\frac{k}{1-k}$ is smooth $\forall k \in [0, 1)$. Similarly to the one-period case, note that in the case of notched preferences $\lim_{\Delta y \to 0^+} P_{mf} \neq \lim_{\Delta y \to 0^+} P_{mf}$. Hence, the relative income distribution features a jump at the 50% threshold. Furthermore, in the case of kinked preferences $\lim_{\Delta y \to 0^+} \frac{dP_{mf}}{d\Delta y} \neq \lim_{\Delta y \to 0^+} \frac{dP_{mf}}{d\Delta y}$, implying a kink point in the relative income distribution. This establishes Result 1.

Household public good provision: As in the one-period case, intra-household transfers are pinned down by maximization of the Nash bargaining criterion

$$\max_t (V_m(mfq) - V_s(m))^\gamma (V_m(fmq) - V_s(f))^{1-\gamma}.$$

This yields the solution

$$
\begin{aligned}
t \;=\; & \frac{1}{2}\Big[\gamma(c^m(y^m,y^f) - rV_s(m)) - (1-\gamma)(c^f(y^f,y^m) - rV_s(f)) + (\gamma\alpha^f_{behind} \\
& +(1-\gamma)\alpha^m_{ahead})\Delta y I(\Delta y \leq 0) + (\gamma\alpha^f_{ahead} \\
& +(1-\gamma)\alpha^m_{behind})\Delta y I(\Delta y \geq 0) + ((1-\gamma)\beta^f_{ahead} - \gamma\beta^m_{behind})I(\Delta y \geq 0)\Big].
\end{aligned}
$$

The equilibrium t in the continuous time, infinite horizon setting exhibits the same properties as in the one-period model, establishing Result 2.

Divorce: Lastly, we extend the model to allow for endogenous divorce. To model divorce, assume that every period the match-specific taste shock gets updated with probability δ according to the updating rule $q^{new}_{mf} = min\{q^t_{mf}, q^{t+1}_{mf}\}$. Varying δ, we can make the stochastic process of q_{mf}'s more or less persistent. The resulting flow of divorces equals

$$
m^{div}(m,f) = \delta(1 - P_{mf})m(m,f).
$$

We obtain that the divorce rate for a given pair (m,f) equals

$$
Div(m,f) = \delta(1 - P_{mf}),
$$

which yields Result 3 following algebra analogous to the one-period case.

3 Observational Evidence

3.1 Data

To test for the existence and form of preferences over relative income, we investigate the model predictions for the case of Germany, Europe's largest economy in terms of income and population. The German tax system administers income tax splitting for married couples, hence providing no incentive for spouses to distort their relative income shares. This feature is crucial for the identification of preferences over relative income by means of the relative income distribution. Other countries with available high-quality tax data typically feature individual-income taxation, which provides an incentive for couples to equalize their income in order to minimize tax liability. This feature may for instance explain patterns of income compression among co-working spouses detected in Sweden Hederos and Stenberg (2019) and Finland Zinovyeva and Tverdostup (2018). This concern does not apply in our context.

We use a representative 10% cross-sectional sample of the universe of German administrative tax returns for the years 2001, 2004, 2007, 2010 and 2014. To maximize precision, we pool all years for our

analysis assigning a weight of 1/5 to each year. We focus on dual-earner married couples for which we impose the following sample restrictions: we exclude from our analysis couples who engage in joint business activity and split income perfectly as the relative income share is not meaningful in this case. Technically, we drop couples reporting the same amount in one of the income categories for business activities or self-employment.[10] We also exclude couples if one of the spouses is older than 70 years or receives retirement income. Further, we exclude couples if one of the spouses reports negative income from self-employment or business activities. Finally, we only keep couples who report some income from either labor, self-employment, or business activity and no income from agriculture and forestry.[11] The final sample contains a total number of 2,675,320 dual-earner couples with a mean annual income of 63,953 EUR. The average female share in a couple's income amounts to 35.3%. We complement the administrative tax data using survey data on housework from the German Socio-Economic Panel (GSOEP) for the years 1992-2017 with 7,823 unique dual-earner spousal observations.

3.2 Relative Income Distribution

We begin testing our model predictions by analyzing the structural form of the relative income distribution – the distribution of the share of couples' income earned by wives – for the entire country. In the absence of any relative income concerns, we would expect the distribution to be globally smooth. However, in the presence of spousal preferences over relative income, we would expect a non-smoothness at the 50% threshold, the point where both spouses earn the same. Specifically, if preferences feature a kink at income equality, we would expect a kink point. In the case of a notch in preferences, we would expect a discontinuity.

Main Results: Figure 2, Panel A presents the relative income distribution for Germany, visualizing the specification of Bertrand et al. (2015) using 5%-points bins. The visual evidence suggests a negative discontinuity at the 50% threshold. A shortcoming of Figure 3, Panel A, however, is its resolution: the large binwidth renders it impossible to distinguish between a notch and a kink at the 50% threshold. Figure 3, Panel B shows the distribution for 0.5%-points bins. In contrast to the specification using 5%-point bins, the more granular resolution reveals no visible jump at the 50% threshold.

To statistically test for the presence of a level jump, we conduct the manipulation test based on density discontinuity proposed by Cattaneo et al. (2018). The advantage of this test compared to the discontinuity test developed by McCrary (2008) is that it avoids pre-binning the data.[12] The

[10] We also exclude couples for which there is a deviation of ± 1 Euro.

[11] All remaining income is either due to capital, rent, or special income categories like alimonies.

[12] Kuehnle et al. (2021) further show that the Cattaneo et al. (2018) test is less affected by mass points close to the discontinuity.

results yield an insignificant test statistic of T = 0.8383 (p = 0.4016) using a quadratic polynomial to construct the density point estimators. Using a 3rd- or 4th-order polynomial instead, similarly yields insignificant test statistics of T = -0.118 (p = 0.906) and T = -1.071 (p = 0.2841).[13]

While we do not observe a discontinuity, Figure 2, Panel B indicates at the presence of a concave kink. Left of the 50% threshold, the distribution is moderately decreasing; towards the right of the 50% threshold, there is a much steeper decline in the density, producing a concave kink. In the light of our model, this pattern is consistent with kinked preferences over relative income at the point of income equality.

To statistically test for this kink we follow a methodology proposed by Card et al. (2015) and Landais (2015). We fit different n-order polynomials within the +/ 10% percentage-point range of the 50% threshold. We allow for a slope change of the linear term by an interaction with an indicator for being to the right of the 50% threshold. The estimated coefficient on this interaction serves as the test statistic for the kink in the distribution. As a placebo, we repeat this procedure for each 10%-threshold along the relative income distribution.

Figure 3, Panel A presents the results for 3rd- and 5th-order polynomials. We obtain a statistically significant slope change at the 50% mark of the relative income distribution independently of the order of the estimated polynomial. For other Placebo thresholds, we detect no robust slope change. For completeness, we repeat this procedure allowing for a level change by including an indicator for levels above the 50% threshold. Figure 3, Panel B plots the estimated coefficients on the indicator. Confirming our prior results, there are no robust discontinuities at the 50% threshold or other points along the relative income distribution.

Alternative Explanations:

Random Matching: Would a kink point arise in the absence of preferences over relative income? While we do not observe the relative income distribution in the absence of preferences over relative income, we can benchmark the actual distribution relative to a distribution arising from random matching. To do so, we perform a random match of female and male married and single individuals within age groups and geographical regions and plot the resulting distribution using gray dots in Figure 2, Panel B. We observe that the resulting distribution (gray hollow dots) features no kink. As a secondary observation, relative to the counterfactual of random matching the empirical relative income distribution features a missing mass of couples with a female primary earner of 20.8%.

Assortative Matching: While random matching is unable to explain the observed distribution, in reality, individuals might not match randomly but instead form a match with a partner who exhibits similar attributes and characteristics. Such positive assortative matching is a standard prediction of canonical models of the marriage market (Becker, 1973; Shimer and Smith, 2000). Does assortative

[13]Excluding couples where the wife's share is exactly 50% also yields an insignificant test statistic using a 2nd-, 3rd- or 4th-order polynomial.

matching on income explain the observed distribution and in particular the kink?

To investigate assortative matching as a candidate explanation for the observed relative income distribution, we rank-order individuals according to their income and match each individual to the individual of the other gender with the same income rank. The resulting relative income distribution is shown in Online Appendix Figure A.6 which indicates that perfect assortative matching does poorly in replicating the observed income distribution. In particular, under the perfect assortative matching assumption almost all couples exhibit a male breadwinner as the income distribution of men exhibits close to first-order stochastic dominance over the one of women.

To give assortative matching a fighting chance in replicating the observed distribution, we introduce noise to the matching process. For this purpose, female and male individuals are ranked according to their income level to which a noise term is added. The noise term is distributed according to a normal distribution with a mean of zero and different scenarios for the standard deviation expressed in terms of the standard deviation of the gender-specific income distribution. The resulting relative income distributions are shown in Online Appendix Figure A.7 for different degrees of noise. For small degrees of noise, we observe, relative to the empirical distribution, a substantial excess mass in the middle of distribution. When increasing the noise, the relative income distribution under assortative matching converges to the randomly matched distribution. Again, the kink cannot be reproduced. We conclude that assortative matching is unable to explain the observed distribution.

Tax incentives: An alternative explanation might be that the observed kink in the relative income distribution does not reflect preferences over relative income, but instead is an artifact of tax manipulation. Unlike individual income tax systems, the German tax system performs joint taxation of spouses through income splitting. For the same level of household income, a couple's tax liability is independent of each partner's relative income share. As a consequence, there is no incentive for couples to distort their relative income towards equal earnings. This renders an explanation based on tax manipulation unlikely. As an additional robustness test, we calculate the relative income distribution for wage earners who only earn third-party reported income. If the observed kink is a product of tax manipulation, we would not expect this pattern for third-party reported income as it cannot be easily manipulated (Kleven et al., 2011). Online Appendix Figure A.8 shows a similar (if anything stronger) kink at the 50% for third-party reported income thus providing no support for a tax manipulation confound.

Cultural Variation: Finally, we study the cultural malleability of relative income concerns within the household.

Similar to Alesina and Fuchs-Schündeln (2007), we leverage the division and later reunification of Germany in 1949 and 1990 respectively to test for the cultural malleability of spousal relative income preferences between the more conservative West and the more gender-equal (and formerly communist) East Germany. While, as Becker et al. (2020) note, the two parts of the country have long-

standing historical differences, the differing attitudes towards gender equality have been at least in parts attributed to the differing roles women where assigned in the two parts of the country while it was divided (Rosenfeld et al., 2004).

Shortly after the establishment of the German Democratic Republic (East Germany) in 1949, the East German government took steps towards the goal of gender equality in economic and social life. In particular, the East German government aimed at abolishing the traditional single-earner model. The communist government introduced a new family law in 1950 that regulated: "The equality of men and women in social life requires their equality in family law. Laws and regulations establishing a restriction or reduction of women's rights in family law have been repealed with the entry into force of the Constitution of the German Democratic Republic. [...] The marriage does not restrict or diminish the rights of the wife. [...] The marriage must not prevent a woman from pursuing a job or pursuing vocational training and her social and political education" (§13, 14 and 15, Gesetz über den Mutter- und Kinderschutz und die Rechte der Frau). In contrast, the government of the Federal Republic of Germany (West Germany) retained the traditional family model with the husband as the main breadwinner. Until 1976 West German civil law regulated: "The wife is in charge of the household. She is entitled to work, as far as this is compatible with her duties in marriage and family." (§1356 (1), Bürgerliches Gesetzbuch). In light of this historical context, we assess whether partners' relative income preferences differ between the two parts of the reunified country today.

Online Appendix Figure A.9 plots the relative income distribution, including the randomly matched counterfactual distribution, for West and East Germany. We observe that the distribution for East Germany looks much more symmetric around the 50% threshold. In addition, relative to the randomly matched counterfactual the observed distribution in West Germany features a missing mass of couples with a female primary earner of 27.7%. In contrast, the corresponding missing mass amounts to only 4.2% in East Germany.

Testing for a discontinuity in the slope as suggested by Card et al. (2015) and Landais (2015), we find the presence of a statistically significant and strong kink point in West Germany. For East Germany, the result is less strong and only significant when using the 3rd-order polynomial (see Online Appendix Figure A.10).[14]

In sum, the evidence for West Germany indicates the existence of kinked preferences over relative income. For the more gender-equal and formerly communist East Germany relative income concerns within the household seem to be much weaker.

[14]We also do not find evidence for the presence of a significant jump in the level of the density for neither West nor East Germany. The manipulation test based on density discontinuity proposed by Cattaneo et al. (2018) yields an insignificant result for West and East Germany, again, using a 2nd-, 3rd- and 4th-order polynomial.

3.3 Household Public Good Provision

As a further model-guided test for the presence of preferences over relative income, we investigate household public good provision by wives and husbands as a function of their relative income share similarly to Lippmann et al. (2019), Wieber and Holst (2015), and Flèche et al. (2020). In our model, the provision of housework can serve as compensation for disutility stemming from relative income concerns of the partner. In the presence of preferences over relative income, our model predicts an unsmoothness in the observed household public good provision at the point of equality in income. Importantly, the structural form of this unsmoothness as either a kink or a notch is again indicative of the structural form of preferences. Hence, as we are interested in identifying the structural form of relative income preferences, in our analysis we focus on distinguishing any potential unsmoothness in household public good provision as either a notch or a kink, a feature no previous study tested for.

Furthermore, as formalized in our model, patterns of household public good provision can be suggestive of which side of the marriage market bears the incidence of relative income preferences. Consider the situation in which men hold a kinked preference for being the primary earner. Primary earner wives will bear a part of the incidence by providing intra-household transfers to compensate men for the utility loss associated with being the secondary earner. Observationally, this behavior would manifest by wives' household public good provision exhibiting a convex kink at the 50% threshold in their relative income.

Drawing from data from the GSOEP, Figure 4 plots housework (in hours per day) provided by wives (Panel A) and husbands (Panel B) as a function of the female relative share in household income. Intuitively, for both husbands and wives housework is decreasing in their contribution to household income. There is no salient kink or notch in husbands' household public good provision at the 50% threshold. However, we observe a pronounced convex kink in housework conducted by women: women provide a comparatively higher amount of household public goods when being the primary earner.

We test for the statistical significance of this pattern in Table 1, Panel A: in all columns, we regress wives' household public good provision on their relative income share. In columns 1 to 3, we include an indicator for a female primary earner. We obtain a statistically significant positive effect of being the primary earner on wives' work in the household unconditionally (column 1), or conditionally on wave fixed effects, a cubic in household income, age fixed effects for husband and wife and number of children (column 2), as well as when additionally controlling for job hours of both spouses (column 3). In columns 4 to 6, we additionally allow for an interaction of the relative income share with the dummy for being a female primary earner. The coefficient on this interaction captures a change in the slope at the 50% threshold. We observe that the coefficient on the indicator becomes insignificant, while the coefficient on the interaction becomes significant. In all specifications, the

coefficient on the interaction is roughly of the absolute magnitude of the baseline coefficient on the relative income share, indicating that the negative trend of household public good provision is fully offset for values above the 50% threshold.[15] We provide parallel regression evidence for husbands in Panel B confirming the visual evidence that there is no robust reversal in housework at the 50% threshold.

In light of our model, these patterns are suggestive of kinked preferences over relative income. Moreover, these findings suggest that women bear the incidence of preferences over relative income. For instance, in our model, the patterns of household public good provision can be rationalized by a combination of inequality aversion among women and a kinked preference for being the breadwinner among men.

We provide geographic heterogeneity by comparing the more gender-equal East Germany to the more traditional West Germany in Online Appendix Figure A.11 and Online Appendix Tables A.5 and A.8. The patterns of household public good provision in West Germany mirror the aggregate patterns for the entire country. For the more gender-equal East Germany, we observe neither a robust kink nor a notch at the 50% threshold for both wives' and husbands' household public good provision.[16]

4 Experimental Evidence

4.1 Design

The observational evidence on marriage outcomes provides evidence on the existence and structural form of preferences over relative income. Without further assumptions, however, it does not enable us to separately identify nor quantify women's and men's preferences. To address these challenges and disentangle as well as quantify women's and men's preferences, we conduct a survey experiment in the United States and Germany. We designed the experiment to empirically distinguish between different motives for relative income preferences and quantify their strength in monetary terms. We follow a dual approach eliciting preferences either through qualitative questions or quantitative choice questions. The combination of both approaches mitigates concerns that our results are driven by methodology-specific confounds. The survey is structured as follows.

Socio-economic background questions: In the first part of the survey, we elicit a battery of standard socio-economic questions, including age, gender, and marital status. Importantly, we also

[15] We also show that the same patterns hold if we restrict women's relative income to range between 30% and 70% in total household income (Online Appendix Table A.3). Furthermore, the same patterns persist when solely exploiting changes in relative income over time within the household. We provide this evidence in Online Appendix Table A.4 which additionally includes couples fixed effects.

[16] We provide robustness evidence for wives' housework in Online Appendix Tables A.6 and A.7.

inquire about respondents' personal income and the income of their partner which we use in the subsequent parts of the survey. Individuals who do not know or provide their income are excluded from the remainder of the experiment.

Qualitative elicitation of preferences: Among a subset of respondents, we elicit preferences over relative income through a battery of qualitative satisfaction questions. Each respondent is presented with 11 different situations regarding their relative income within their household holding total household income constant. In particular, total household income is set equal to the amount the respondent indicated in the pre-experimental part of the survey. We then ask the respondent to indicate on a 7-point Likert scale how satisfied they would be with a given situation. The precise survey question reads:

> *You indicated your own annual income is X and your partner's annual income income is Y. Hence, your combined annual income as a couple is $X + Y$.*
>
> *Suppose now, you earned $p\dot{(}X + Y)$ and your partner earned $(1 - p)\dot{(}X + Y)$. How satisfied would you be with this situation? Please answer on a scale from 1 (Not at all satisfied) to 7 (Very satisfied).*

The fraction p was varied in the set $p \in \{0.3,\ 0.4,\ 0.45,\ 0.47,\ 0.49,\ 0.5,\ 0.51,\ 0.53,\ 0.55,\ 0.6,\ 0.7\}$. In particular, we oversampled fractions in the vicinity of $p = 0.5$ to obtain a granular picture of the structural form of preferences over relative income at the point of income equality. In sum, the qualitative survey items allow us to non-parametrically assess partners' satisfaction with a given composition of relative incomes within the household holding total material considerations constant.

Quantitative elicitation of preferences: The advantage of the qualitative items is that they are easy to understand. However, there are two drawbacks to solely relying on qualitative items. First, the concept of satisfaction is ambiguous and subjective, which renders the comparison of answers across individuals difficult (Bond and Lang, 2019). Second, observing satisfaction measures does not allow us to quantify the strength of preferences over relative income in monetary terms or on other interpretable scales.

To address these challenges, we implement a complementary survey battery that elicits preferences over relative income using quantitative choice questions among a different set of survey participants. Each item presents two situations that involve different relative incomes of the partners as well as total household income. We ask for each item which of the two situations the respondent would prefer. We then vary across items both partners' relative income as well as their total household income in the two situations. Intuitively, by comparing the choice behavior across different items this strategy allows us to infer individuals' preferences over relative income using a revealed

preference approach. Furthermore, this strategy allows us to quantify the strength of preferences in monetary terms by calculating the marginal rates of substitution between relative income and total household income. The precise survey questions read:

Please indicate which situation you prefer:
Situation A: Your own annual income is $p \cdot H_A$ *and your partner's annual income is* $(1-p) \cdot H_A$.
Situation B: Your own annual income is $0.5 \cdot H_B$ *and your partner's annual income is* $0.5 \cdot H_B$.,

where $p \in \mathcal{P} = \{0.2,\ 0.3,\ 0.4,\ 0.45,\ 0.55,\ 0.6,\ 0.7,\ 0.8\}$ and $H_B \in \mathcal{H} = \{0.85 \cdot H_A,\ 0.9 \cdot H_A,\ 0.95 \cdot H_A,\ H_A,\ 1.05 \cdot H_A,\ 1.1 \cdot H_A,\ 1.15 \cdot H_A\}$. To keep the scenarios as realistic as possible, for a specific respondent household income H_A is set equal to the actual household income the respondent indicated in the first part of the survey.[17] While in situation A, relative incomes are always unequal, situation B always involves a situation where own relative income is precisely 50%. By varying H_B across items, respondents' switching behavior between Situation A and B across different scenarios allows us to infer individuals' willingness to pay to change the relative income shares from a $p\% - (1-p)\%$ to a 50% - 50% composition.

In order to limit the number of questions to a reasonable limit, we randomly select only two elements $p \in \mathcal{P}$ for each respondent. We then vary H_B across all elements in $\mathcal{H}_2$ such that each subject responds to a total of 14 items. The presentation order of items is randomized to prevent potential strategic response behavior of the respondents.

Identification of preference parameters: To identify the gender-specific preference parameters, we adapt the utility framework of kinked preferences over relative income from section 2. Suppose individuals' utility from total household income H and own relative income share $p \in [0,1]$ equals:

$$U = \delta H + \alpha_{\text{behind}} p \cdot I(p <= 0.5) + \alpha_{\text{ahead}} (p - 0.5) \cdot I(p > 0.5).$$

Here, δ represents individuals' marginal utility from total household income H. The terms α_{behind} and α_{ahead} again represent the marginal utilities from relative income depending on whether the individual is the secondary (α_{behind}) or primary earner (α_{ahead}).

To illustrate our identification strategy, consider a choice scenario, consisting of situations A and B (where $p_B = 0.5$). An individual will choose situation B if $U_B \geq U_A$, or iff

$$\delta(H_B - H_A) + \alpha_{\text{ahead}}(0.5 - p_A) \cdot I(p_A > 0.5) + \alpha_{\text{behind}}(0.5 - p_A) \cdot I(p_A <= 0.5) \geq 0.$$

The preference parameters are then identified from respondents' switching behavior between

[17] For respondents who do not know their partner's income we assume that total household income is twice the personal income of the respondent.

choices A and B when varying either difference in total household income $(H_B - H_A)$, relative income shares $(0.5 - p_A)$, or whether the respondent is the primary or secondary earner $I(p_A > 0.5)$. In more detail, each preference parameter is identified by varying the corresponding input to the utility function holding the other inputs constant. For instance, marginal utility from household income δ is identified from variation between differences in household income in situations A and B $(H_B - H_A)$, holding the relative income shares fixed.

To econometrically estimate the utility function, we perform the following logit regression:

$$\text{Choose B} = \delta(H_B - H_A) + \alpha_{\text{ahead}}(0.5 - p_A) \cdot I(p_A > 0.5) + \alpha_{\text{behind}}(0.5 - p_A) \cdot I(p_A <= 0.5) + q, \quad (1)$$

where Choose B is an indicator for choosing option B and q represents an idiosyncratic error term. We cluster standard errors at the individual level.

In addition, the quantitative choice approach allows us to quantify the strength of preferences over relative income in monetary terms by calculating the marginal rates of substitution between changes in total household income and relative income $\alpha_{\text{ahead}}/\delta$ and $\alpha_{\text{behind}}/\delta$. Intuitively, these statistics measure the percentage amount of total household income an individual is willing to give up in order to change relative income by 1%-point.

Recruitment and Sample Characteristics: In the United States, we recruited 420 respondents to participate in the qualitative elicitation and another 736 participants to participate in the quantitative elicitation of preferences both through Amazon Mechanical Turk. In Germany, we recruited an additional 262 participants through *clickworker.com* to participate in the quantitative elicitation of preferences. The sample was restricted to individuals who are in a dual-earner relationship.[18] Table A.2, Panel A presents the summary statistics for the qualitative US sample. Men represent 50% of our sample with an average age of 38 years. In total, 60% of the respondents are married. 85% of our sample are employed full-time and earn an average income of 52,143 USD. Summary statistics for the other samples are very similar (Table A.2, Panels B and C).

4.2 Results

4.2.1 Qualitative Evidence:

Figure 5 presents the qualitative evidence on preferences over relative income for women (Panel A) and men (Panel B) in the United States. The figure plots gender-specific standardized satisfaction as a function of the own relative income. For men, we observe satisfaction to be strongly increasing in their own relative income share until the point where both partners earn equal amounts. At the point of equality, we observe a kink: satisfaction stays roughly constant for an even higher amount of

[18] In addition, we required participants to know and provide their personal annual income before taxes.

own relative income. In sum, in the aggregate men display a preference for being the primary earner. Furthermore, we do not observe any noticeable jump in stated satisfaction at equality of incomes. This pattern indicates that the structural form of men's preference for being the primary earner is in form of kink and not a notch in utility.

For women, we again observe that satisfaction is increasing in their own relative income share for levels below 50%. However, for levels higher than 50%, satisfaction is decreasing in a quantitatively similar magnitude. Said differently, satisfaction is a decreasing function in the absolute distance to an equal 50%-50% composition. This pattern suggests that women exhibit symmetric inequality aversion.[19]

In sum, the qualitative evidence indicates that the structural form of preferences over relative income for both women and men can be captured by a kinked utility function. However, the underlying psychological motives of men and women differ sharply: while men exhibit a preference for being the primary earner, women show inequality aversion.

4.2.2 Quantitative Evidence:

Baseline Estimates: Next, we present the results from the quantitative choice questions. Columns (1) to (3) in Table 2 show the estimates of δ (preference weight on total household income), α_{behind} (preference weight on relative income when being secondary earner), and α_{ahead} (preference weight on relative income when being primary earner) when estimating equation (1) for all respondents, as well as separately for women and men.

For the pooled sample of women and men, we find a large and positive coefficient $\delta = 10.85$ (s.e.=0.45), indicating that respondents strongly value total household income. Turning to our coefficients of interest, we find a positive weight on own relative income when being the secondary earner $\alpha_{\text{behind}} = 4.92$ (s.e.=0.38). In contrast, when being the primary earner, the weight on own relative income is estimated to be negative in a magnitude of $\alpha_{\text{ahead}} = -2.55$ (s.e.=0.33). These patterns are consistent with preferences over relative income exhibiting inequality aversion. Furthermore, the higher weight on relative income when being the secondary as opposed to the primary earner indicates that inequality aversion is asymmetric: for a given deviation from a 50%-50% composition of relative income, individuals dislike this deviation less if their relative income increases as opposed to their partners'.

Do these estimates mask substantial heterogeneity by gender? The qualitative evidence in Figure 5 suggests that men show a preference for being the primary earner while women exhibit symmetric

[19] One notes that there is a mild jump in satisfaction at the 50% threshold. This feature might arise due two to reasons. First, a 50%-50% composition might be more focal (due to the quality of being perceived as a "round" number). Second, women might have a discrete preference for a 50%-50% composition over any composition in the local neighborhood. Note, however, that the jump to the left and the right of the 50% threshold is symmetric such there is no discrete preference for either being the primary or secondary earner.

inequality aversion. Columns (2) and (3) in 2 investigate preference heterogeneity by gender for the quantitative choice questions. Both women and men strongly care about total household income with an estimated δ of roughly 10 independent of gender. However, the genders strongly differ in terms of their concerns regarding relative income. Consistent with the qualitative evidence from Figure 5, women exhibit symmetric inequity aversion with estimated $\alpha_{\text{behind}} = 4.29$ (s.e.=0.55) and $\alpha_{\text{ahead}} = -4.17$ (s.e.= 0.48). A Wald-test of the Null-hypothesis of symmetry ($\alpha_{\text{behind}} = -\alpha_{\text{behind}}$) fails to reject at p=.87.

For men, on the other hand, we estimate the weight on relative income when being the secondary earner as $\alpha_{\text{behind}} = 5.68$ (s.e.=0.50). When being the primary earner the weight on own relative income shrinks to $\alpha_{\text{ahead}} = -0.91$ (s.e.=0.45). Hence, men's preferences over relative income appear to exhibit heavily asymmetric inequality aversion: men strongly dislike negative deviations from a 50%-50% composition of relative income when becoming the secondary earner. However, they only exhibit a weak distaste for inequality when being primary earners.

How strong are these preferences? To quantify the strength of preferences over relative income, we calculate the marginal rates of substitution between total household income and own relative income $\alpha_{\text{behind}}/\delta$ and $\alpha_{\text{ahead}}/\delta$. These statistics indicate the amount of total household income an individual is willing to pay (or accept) for a given change in relative income.

For women, we find marginal rates of substitution of $\alpha_{\text{behind}}/\delta = 0.41$ and $\alpha_{\text{ahead}}/\delta = -0.40$. Said intuitively, women are willing to give 4.1% of total household income for a 10% increase in relative income when being the secondary earner. Vice versa, women are willing to give up 4.0% of total household income for a 10% decrease in relative income when being the primary earner. We visualize the willingness to pay for a 50%-50% composition of relative income as a function of the own relative income share by the solid lines in Figure 6, Panel A. For men, we find implied marginal rates of substitution of $\alpha_{\text{behind}}/\delta = 0.50$ and $\alpha_{\text{ahead}}/\delta = -0.08$, visualized by the solid lines in Figure 6, Panel B.

Discrete Preference for Equal Incomes: Note that without a constant, specification (1) enforces the limits $\lim_{p\to 0.5^+} U(p,H)$ and $\lim_{p\to 0.5^-} U(p,H)$ to equal $U(0.5,H)$. In intuitive terms, individuals' preferences over relative income are assumed to be continuous at the point of equality in income. This specification, however, will lead to biased estimates if preferences feature a discreteness at income equality. This might arise if individuals have a discrete preference for equality of incomes over any composition in the local neighborhood. Similarly, bias would arise if individuals are more likely to opt for a 50%-50% composition as it is more focal. In fact, note that a symmetric discontinuity is already suggested by the evidence from the qualitative satisfaction questions for women.

To allow for this possibility, we enrich specification (1) by including a constant term which cap-

tures a discretely higher propensity to opt for a 50%-50% composition.[20] Columns (4) to (6) in Table 2 present the estimates. For women, we observe that the estimates in column (5) are qualitatively similar to the estimates obtained when excluding a constant in column (2). However, the quantitative magnitude is slightly lower. While δ remains stable at 10.51 (s.e =0.61), α_{ahead} and α_{behind} are estimated lower in magnitude of 3.35 (s.e.= 0.72) and -3.31 (s.e.= 0.64) respectively, indicating again symmetric inequality aversion.[21] The estimates imply marginal rates of substitution between relative income and total household income of 0.32 when being the secondary earner and -0.31 when being the primary earner.

For men, the coefficient α_{behind} remains large and statistically insignificant at 4.58 (s.e.=0.66), implying a marginal rate of substitution of 0.40. In contrast α_{ahead} is estimated as 0.16 (se=0.63) and not statistically significant different from zero. These patterns indicate that men's concerns over relative income in fact reflect a preference for being the breadwinner. In intuitive terms, men strongly prefer higher relative income if they are the secondary earner; they show no concerns over relative income, however, if they are in the position of the primary earner.

We visualize women's and men's willingness to pay for a 50%-50% composition of relative income as a function of their own relative income share by the dashed lines in Figure 6.[22]

Quantitative Evidence for Germany Are gender-specific preferences over relative income universal or do they differ by country? Falk and Hermle (2018) and provide evidence that gender-specific preferences can vary across countries and cultures. To explore this possibility in our setting and relate it to our observational evidence, we next investigate the case of Germany.

Table A.9 shows the model estimates from specification (1) for Germany. We find qualitatively and quantitatively similar estimates as for the United States. In particular, for women, we estimate $\delta = 12.95$ (s.e.=1.19) in the specification without a constant (column (2)). The preference weights on relative income are statistically indistinguishable with magnitudes of $\alpha_{\text{behind}} = 5.88$ (se=1.10) and $\alpha_{\text{ahead}} = -5.62$ (se=1.05). These parameters imply marginal rates of substitution between relative income and total household income of 0.45 and -0.43, indicating symmetric inequality aversion. Relative to the United States, we again find qualitatively similar but quantitatively smaller marginal rates of substitutions of 0.26 and -0.25 when allowing for a constant in column (5). We visualize this evidence in Figure A.12 Panel A.

For men, we estimate δ to be similar in magnitude (14.02, s.e.=1.19 in column (5)). The nature of preferences over relative income, however, strongly differs from women. In particular, we find in the model without constant term preference weights of $\alpha_{\text{behind}} = 5.38$ (se=0.67) and $\alpha_{\text{ahead}} =$

[20] Technically, the specification assumes that preferences fulfill the following condition $\lim_{p\to 0.5^+} U(p,H) = \lim_{p\to 0.5^-} U(p,H) \neq U(0.5,H)$.

[21] Again, a Wald-test of the Null-hypothesis of symmetry ($\alpha_{\text{behind}} = -\alpha_{\text{behind}}$) fails to reject at p=0.89.

[22] Restricting our sample to respondents who exhibit answering behavior that is consistent with non-negative utility from household income does not change our results.

-2.56 (se=0.82). These patterns appear to suggest asymmetric inequity aversion. When including a constant, however, we obtain weights of $\alpha_{\text{behind}} = 3.36$ (se=0.85) and $\alpha_{\text{ahead}} = -0.36$ (se=0.99). These values indicate that men's preferences over relative income reflect a preference for being the breadwinner. The implied marginal rates of substitution are 0.24 when being the secondary earner and -0.03 when being the primary earner. We visualize men's preferences over relative income in Figure A.12 Panel B.

In sum, the evidence for Germany resembles the patterns detected for the United States qualitatively and quantitatively: women show symmetric inequality aversion, while men exhibit a preference for being the primary earner with similar marginal rates of substitution as in the United States.

5 Conclusion

This paper provides evidence on the existence and form of preferences over relative income within the household. We provide a flexible framework of relative income preferences that either exhibit a kink or notch at income equality between partners. In a marriage market matching model with search frictions, we study theoretically how these preferences affect couple selection and separation as well as intra-household transfers.

Consistent with the existence of kinked relative income preferences we find a kink point in the distribution of wives' relative income at the point of income equality. This result cannot be explained by tax incentives or assortative mating. Furthermore, the kink result is stronger for the more conservative West Germany than the more gender-equal and formerly communist East Germany.

We also provide evidence on a convex kink point in wives' household public good provision suggesting that women carry the incidence of relative income preferences. This kink point is only found in conservative West Germany and not the more gender-equal East Germany. Through the lens of our model, these patterns can be suggestive of differing gender-specific relative income concerns. For West Germany, the kink point in the relative income distribution in conjunction with the convex kink point in wives' household public good provision suggests that men exhibit a preference for being the primary earner. For East Germany, the absence of a kink point in the relative income distribution as well as spouses' household public good provision suggests that relative income concerns within the household play less of a role.

As gender-specific preferences over relative income are not separately identified from the relative income distribution, we conduct an experiment to unambiguously identify women's and men's preferences. Using both a qualitative approach and quantitative methodology involving choice questions, we demonstrate that women feature symmetric inequality aversion over relative income while men exhibit a kinked preference for being the breadwinner. Quantitatively, women are willing to trade 3% to 4% of household income to narrow by 10%-points the gap between a given relative

income composition and income equality. In contrast, men are willing to trade off 4% to 5% of household income to increase their relative income share by 10%-points when being the primary earner but not when being the secondary earner. These findings are consistent with the observational patterns found for the distribution of relative income as well as household public good provision.

In our theoretical and empirical analysis, we emphasize the distinction of preferences over relative income as either exhibiting a kink or notch at the point of income equality. While we believe this distinction to be intrinsically important for the conceptual understanding of these non-standard preferences (Fehr and Schmidt, 1999; Tversky and Kahneman, 1991), we also highlight that the welfare implications of the two distinct structural forms differ substantially.

Conceptually, preferences over relative income of one gender can be understood as taxes on the other gender's income in terms of marriage returns. In Appendix C, we illustrate this logic from women's perspective for the case in which men exhibit a preference for being the breadwinner. While men's preferences over relative income in form of a notch in preferences act equivalent to a proportional tax, in the case of a kink they act as a progressive tax (see Online Appendix Figure A.5). As a consequence, the gender-specific preferences we uncover – women exhibiting inequality aversion while men showing a preference for being the primary earner – imply a marriage crowdout and welfare costs that are particularly pronounced for low-income men and high-income women.

From a life-cycle perspective, these findings imply that the returns to choosing a high-income career may differ between women and men due to the additional marriage tax imposed on women's income. In fact, recent research uncovered that gender gaps in choosing a STEM career are *larger* in countries that feature a higher level of women's income levels and in which women consequently are more likely to be the family breadwinner (Borrowman and Klasen, 2019). Future research in this regard may further investigate how differential preferences over relative income between women and men affect gender-specific marriage returns and career outcomes from a life-cycle perspective.

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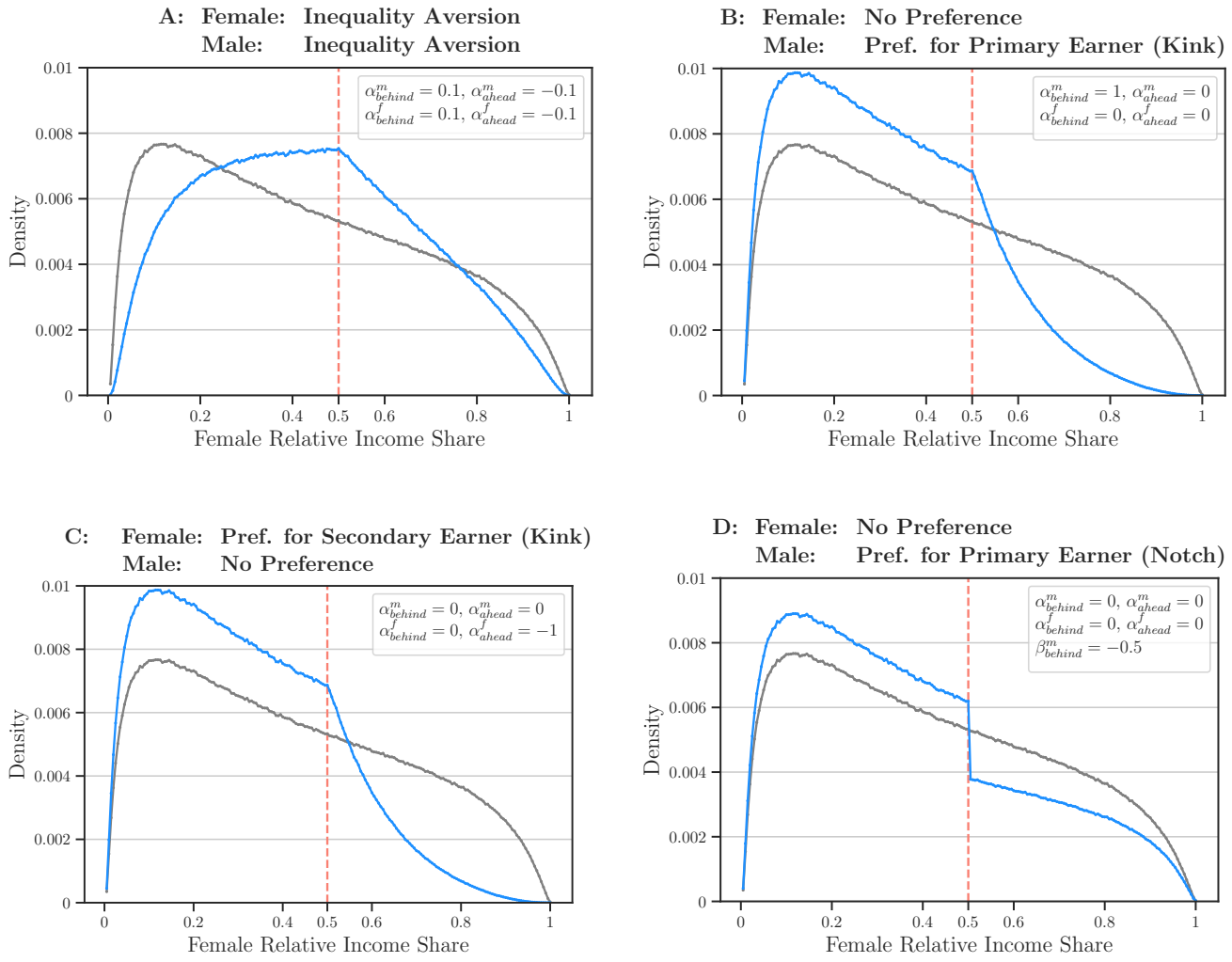
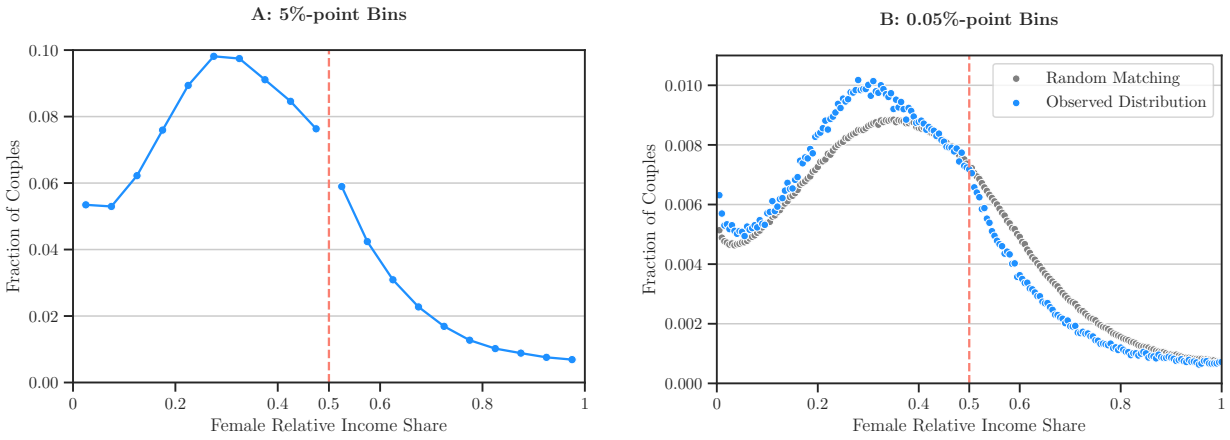
Figure 1: Simulated Relative Income Distributions



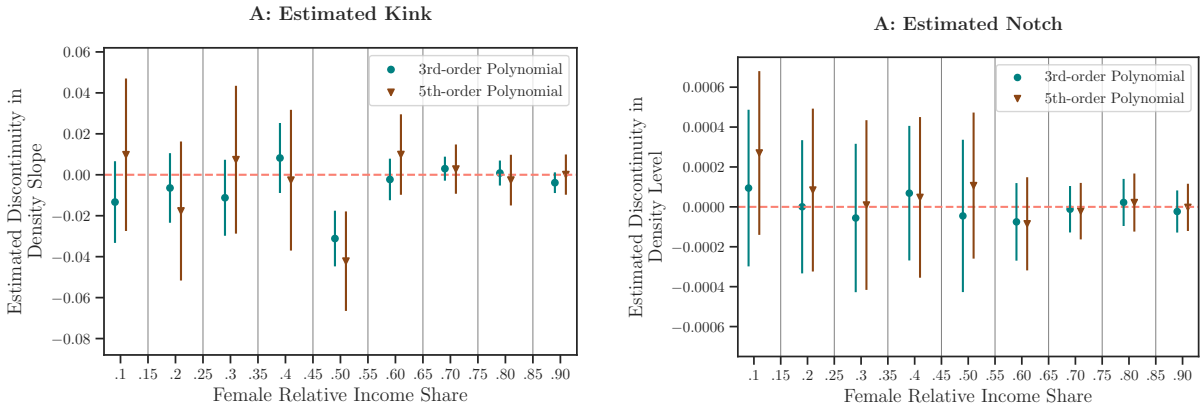
Notes: Figure 1 visualizes simulated relative income distribution under different assumptions on partners' preferences over relative income (blue distributions) and counterfactual distributions under the assumption of random matching (gray lines). We assume that male and female incomes are distributed log-normally with $\mu = 0$ or $\mu = 0.5$ respectively and $\sigma = 1$. For simplicity, we assume that utility from consumption is linear and excludable: $c^f(y^f, y^m) = c^f(y^f) = y^f$ and $c^m(y^m, y^f) = c^m(y^m) = y^m$. Panel titles indicate the combination partners' preferences over relative income. Preference parameters are listed within the panels.

Figure 2: Relative Income Distribution for Germany



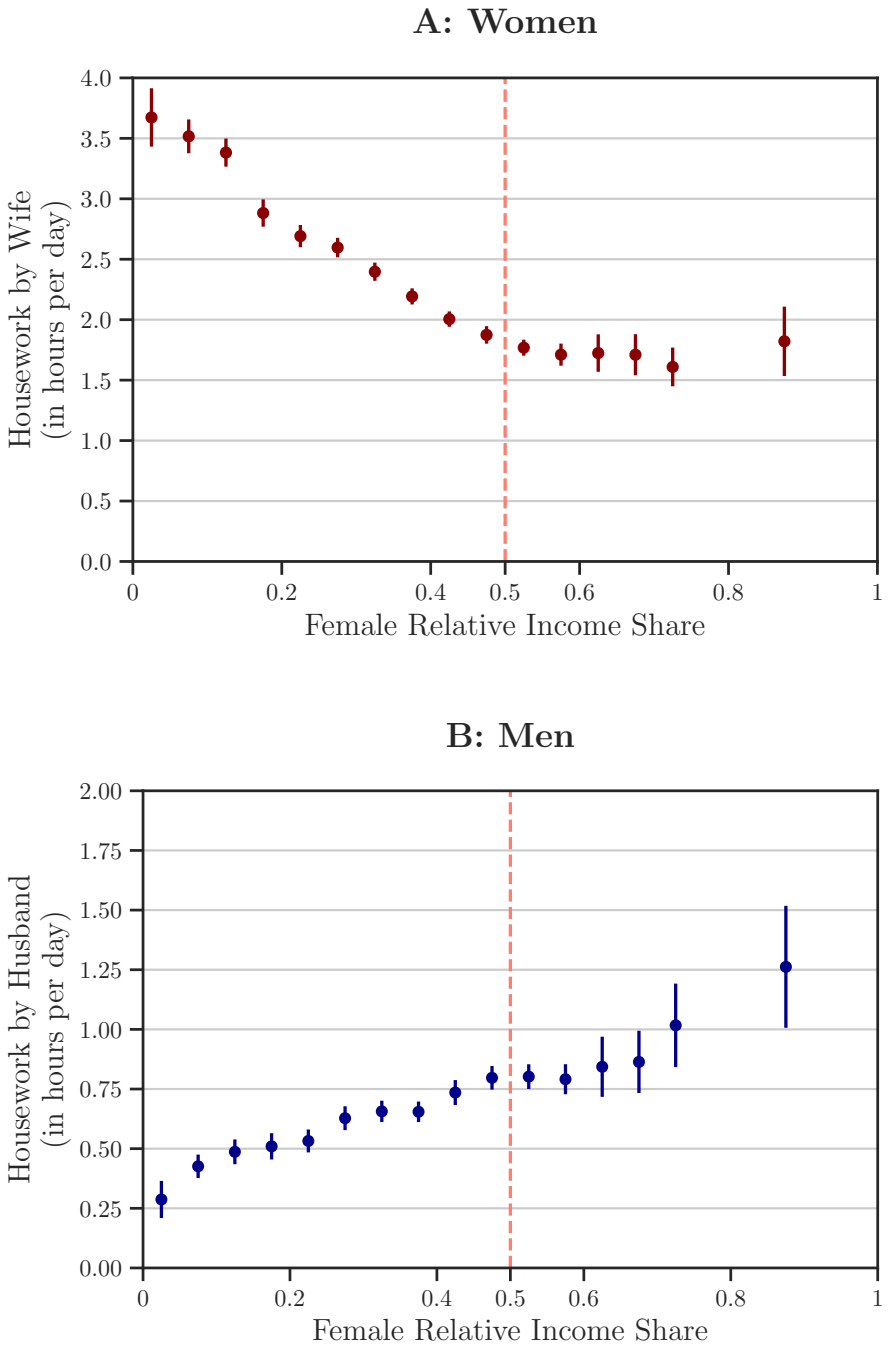
Notes: Figure 2 plots the relative income distribution using 5%-point bins (Panel A) and 0.5%-point bins (Panel B) for Germany (blue dots). Panel B additionally contains a counterfactual distribution arising from random matching of couples, including married spouses and singles (gray dots). Random matching is performed within 10-year age bins and geographical regions. The red line marks the 50% threshold at which both spouses earn the same income.

Figure 3: Testing for Kink and Discontinuity along the Relative Income Distribution



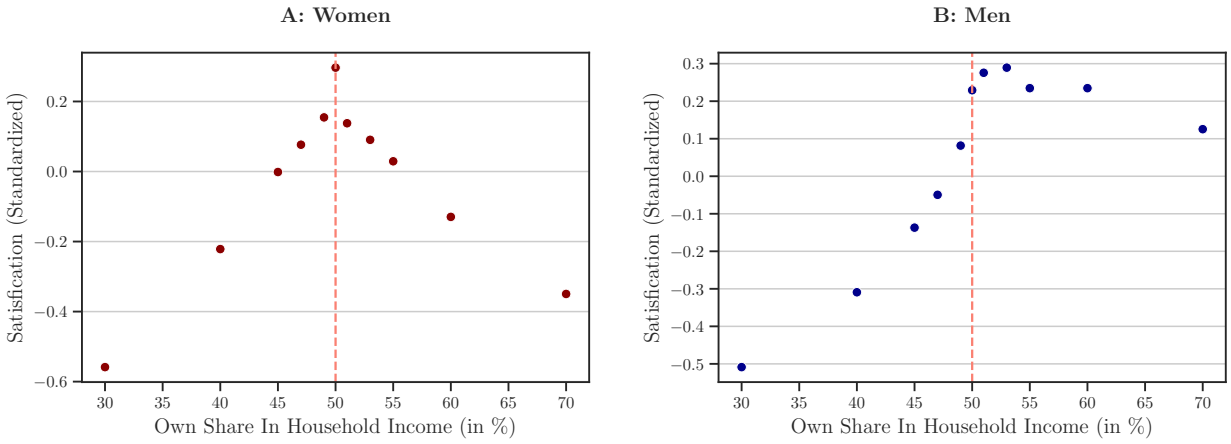
Notes: Figure 3, Panel A depicts estimated discontinuities in the slope for each 5%-threshold along the relative income distribution. A 3rd- and 5th-order polynomial is fitted to the relative income distribution within the $+/-10$%-point range of the respective threshold, allowing for a slope change in the linear term. Following a donut hole approach, we exclude the observations just to the left and the right of each threshold. The figure depicts for different order polynomials the estimated coefficient on the slope change, including 99% confidence intervals. Figure 3, Panel B repeats this exercise but allowing for a discontinuity instead of a slope change at each threshold. The figure depicts for different order polynomials the estimated coefficient on the discontinuity, including 99% confidence intervals.

Figure 4: Spouses' Housework as a Function of Female Relative Income Share



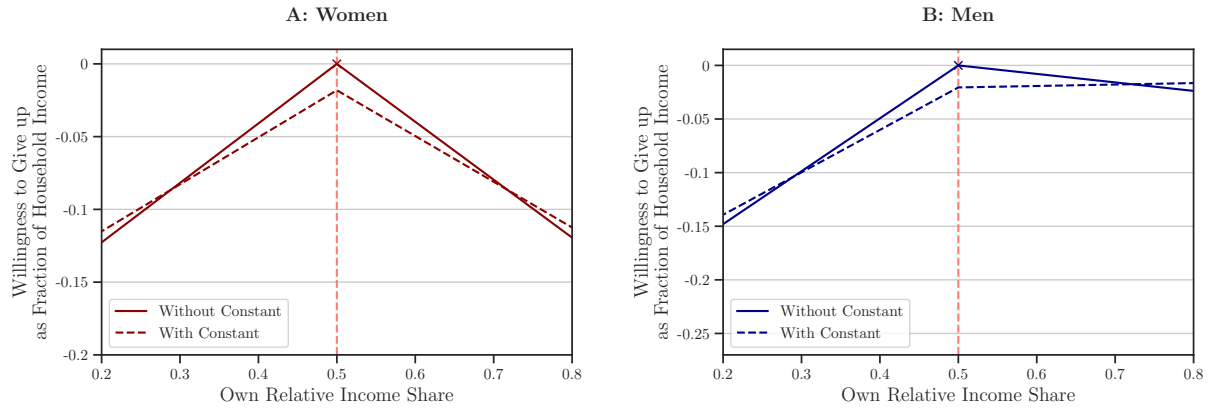
Notes: Figure 4 plots housework (in hours per day) done by wives (Panel A) and husbands (Panel B) as a function of the female relative share in household income separately. Point estimates are calculated with sampling weights provided by the GSOEP. The red line marks the 50% threshold at which both spouses earn the same income. Error bars indicate 95% confidence intervals obtained from standard errors clustered at the couple level.

Figure 5: Qualitative Evidence on Preferences over Relative Income for United States



Notes: Figure 5 shows preferences over relative income for women (Panel A) and men (Panel B) for the United States. The x-axis indicates the own relative income share for a given level of household income, the y-axis a standardized satisfaction measure elicited on a 7-point Likert scale. For a given level of household income H and relative income fraction p the survey question read: *"Suppose now, you earned $p\dot{H}$ and your partner earned $(1-p)\dot{H}$. How satisfied would you be with this situation? Please answer on a scale from 1 (Not at all satisfied) to 7 (Very satisfied)."*

Figure 6: Quantitative Evidence on Preferences over Relative Income for United States



Notes: Figure 6 visualizes gendered preferences over relative income in terms of total household income for the United States. Intuitively, the lines indicate as a function of the own relative income share the amount of total household income women are willing to give up for a 50%-50% composition of relative income. The prediction is obtained from estimating equation 1. We distinguish between the results from estimating specification 1 without a constant (solid lines) and with a constant (dashed lines). Panel A presents results for women, Panel B presents results for men.

Tables

Table 1: Spouses' Household Public Good Provision

Panel A: Women	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5))	0.314***	0.262***	0.128***	0.0629	0.0730*	0.0361
	(0.0440)	(0.0409)	(0.0387)	(0.0418)	(0.0401)	(0.0384)
Wife's Share	-3.787***	-3.356***	-1.614***	-4.129***	-3.670***	-1.824***
	(0.132)	(0.123)	(0.134)	(0.139)	(0.133)	(0.149)
(Wife's Share-0.5)				3.975***	3.125***	1.592***
× I(Wife's Share>0.5)				(0.352)	(0.338)	(0.321)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	34189	34189	34189	34189	34189	34189

Panel B: Men	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5))	-0.0450	-0.0499*	-0.0280	-0.0683**	-0.0673**	-0.0388
	(0.0285)	(0.0283)	(0.0279)	(0.0335)	(0.0334)	(0.0318)
Wife's Share	0.945***	0.985***	0.539***	0.912***	0.955***	0.514***
	(0.0738)	(0.0771)	(0.0893)	(0.0721)	(0.0748)	(0.0909)
(Wife's Share-0.5)				0.370	0.288	0.187
× I(Wife's Share>0.5)				(0.367)	(0.370)	(0.331)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	32884	32884	32884	32884	32884	32884

Notes: Table 1 provides linear regressions of housework (hours per day) conducted by wives (Panel A) and husbands (Panel B) on wives' relative income, an indicator for whether the wife is the primary earner within the couple, and their interaction conditional on a set of control variables. All observations are weighted using sampling weights provided by the GSOEP. Standard errors in parentheses are clustered at the couple level (* p<0.10, ** p<0.05, *** p<0.01).

Table 2: Estimates of Preferences over Relative Income for the United States

	(1)	(2)	(3)	(4)	(5)	(6)
	Model without constant			Model with constant		
	All	Women	Men	All	Women	Men
δ	10.85***	10.49***	11.51***	10.89***	10.51***	11.56***
[Weight on income]	(0.452)	(0.608)	(0.683)	(0.454)	(0.610)	(0.688)
α_{behind}	4.917***	4.289***	5.682***	3.928***	3.398***	4.576***
	(0.378)	(0.553)	(0.500)	(0.494)	(0.724)	(0.662)
α_{ahead}	-2.548***	-4.174***	-0.912**	-1.593***	-3.306***	0.157
	(0.327)	(0.478)	(0.449)	(0.447)	(0.638)	(0.625)
Constant				0.212***	0.191*	0.238**
				(0.0704)	(0.101)	(0.0983)
MRS (behind)	0.45	0.41	0.50	0.36	0.32	0.40
MRS (ahead)	-0.23	0.40	-0.08	-0.15	-0.31	0.01
N	10304	5278	5026	10304	5278	5026
No. Individuals	736	377	359	736	377	359

Notes: Table 2 shows for the United States estimated preferences over relative income from specification 1 for the pooled sample (columns (1) and (4)), women (columns (2) and (5)), and men (columns (3) and (6)). Columns (1) to (3) include no constant, columns (4) to (6) include a constant. Standard errors in parentheses are clustered at the individual level (* p<0.10, ** p<0.05, *** p<0.01).

Online Appendix

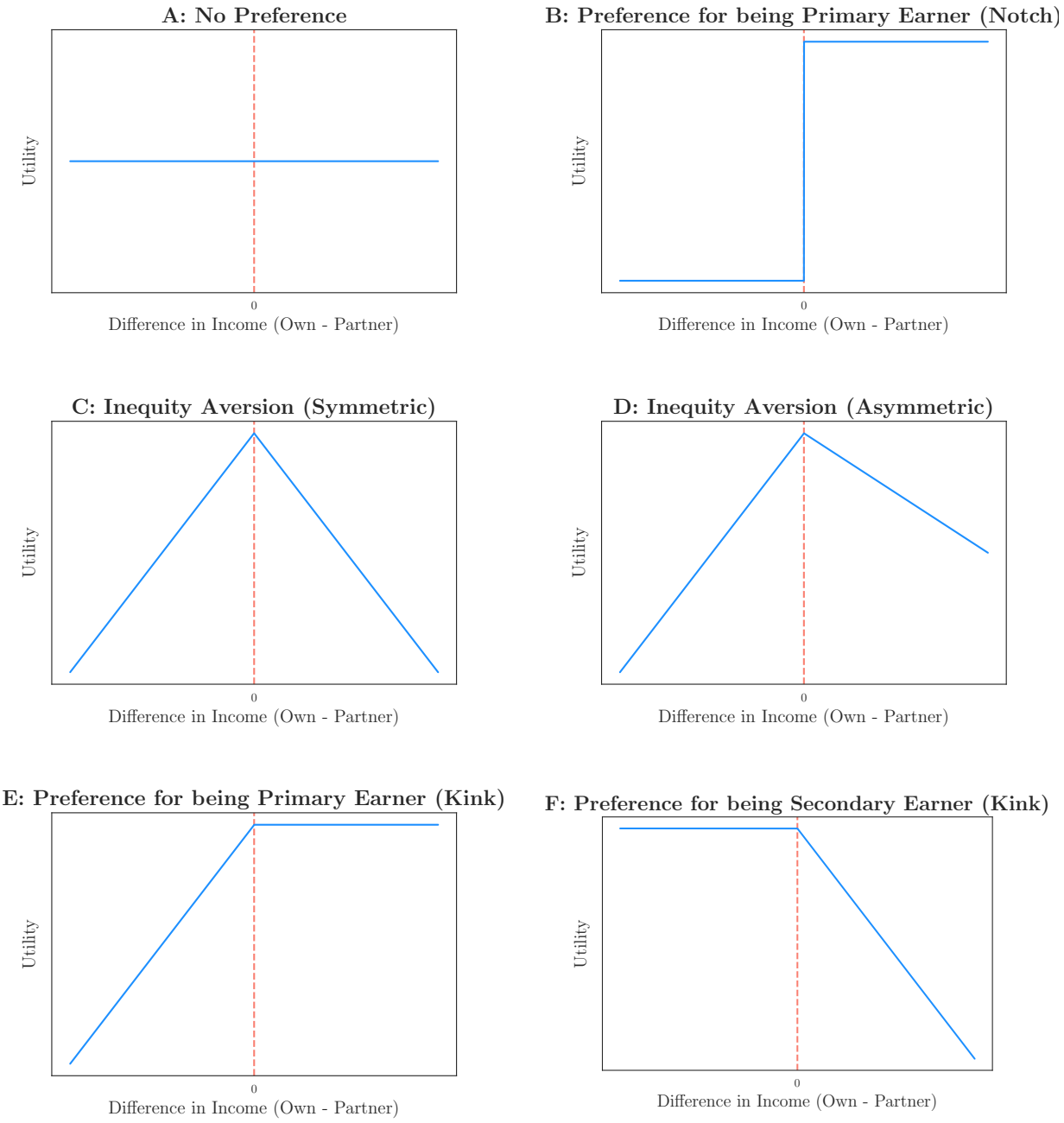
Preferences over Relative Income within the Household

Johannes Hermle, Elena Herold, Nikolaus Hildebrand

Online Appendix Figures

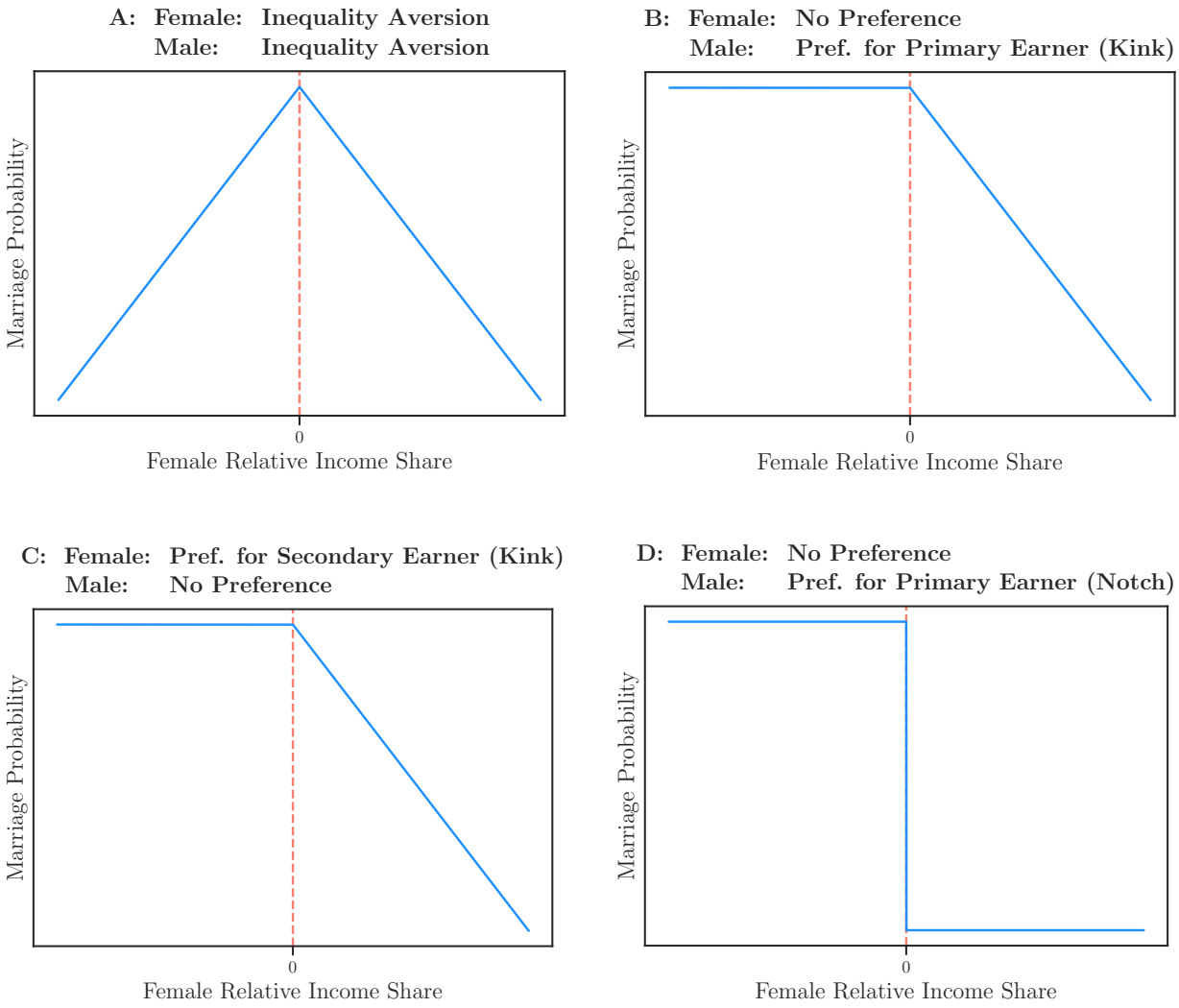
Figures

Figure A.1: Preferences over Relative Income: Illustration



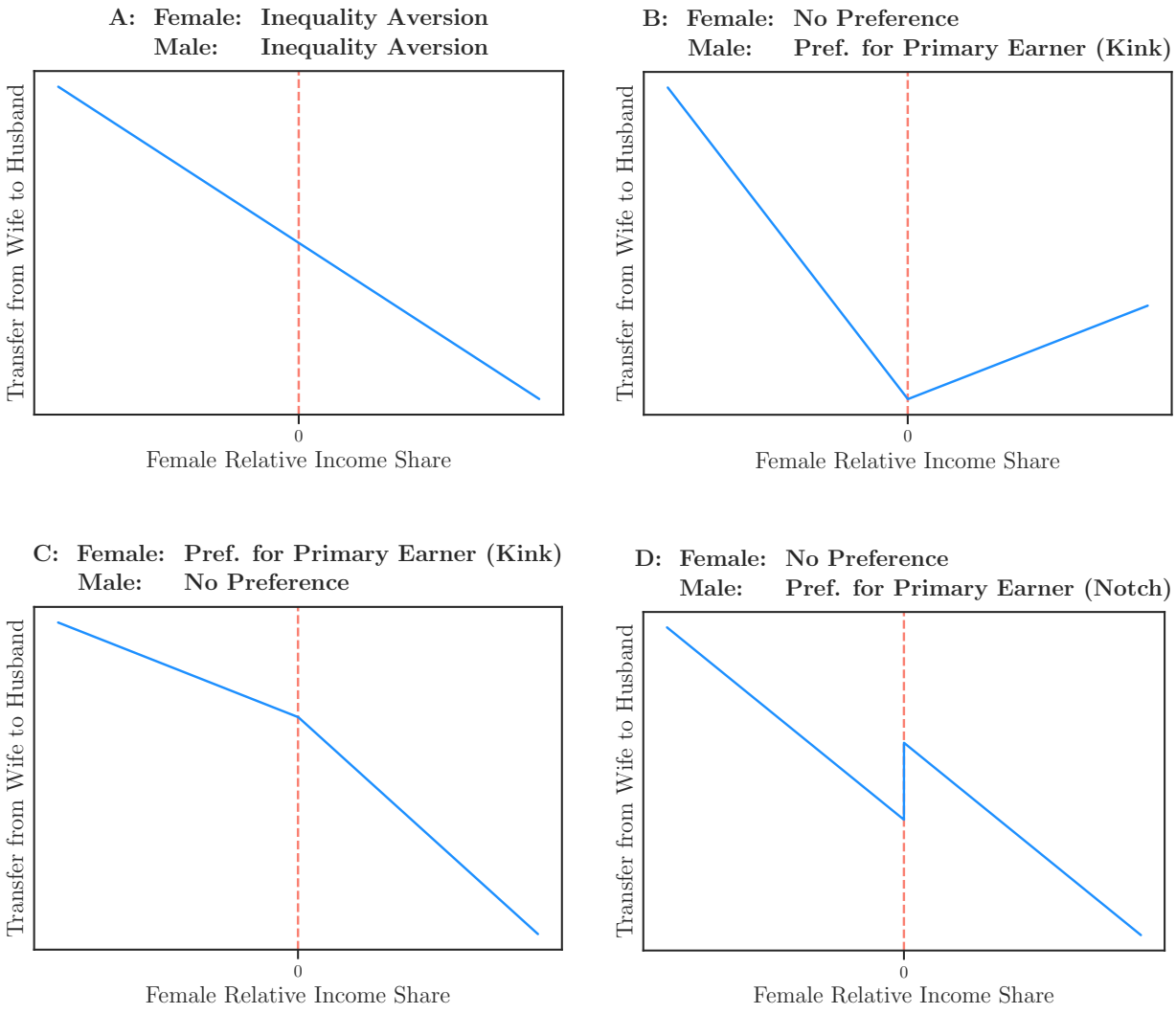
Notes: Figure A.1 visualizes different preferences over relative income. The x-axis indicates relative income, i.e. the income difference between own and partner income, the y-axis the utility level.

Figure A.2: Marriage Probabilities: Illustration



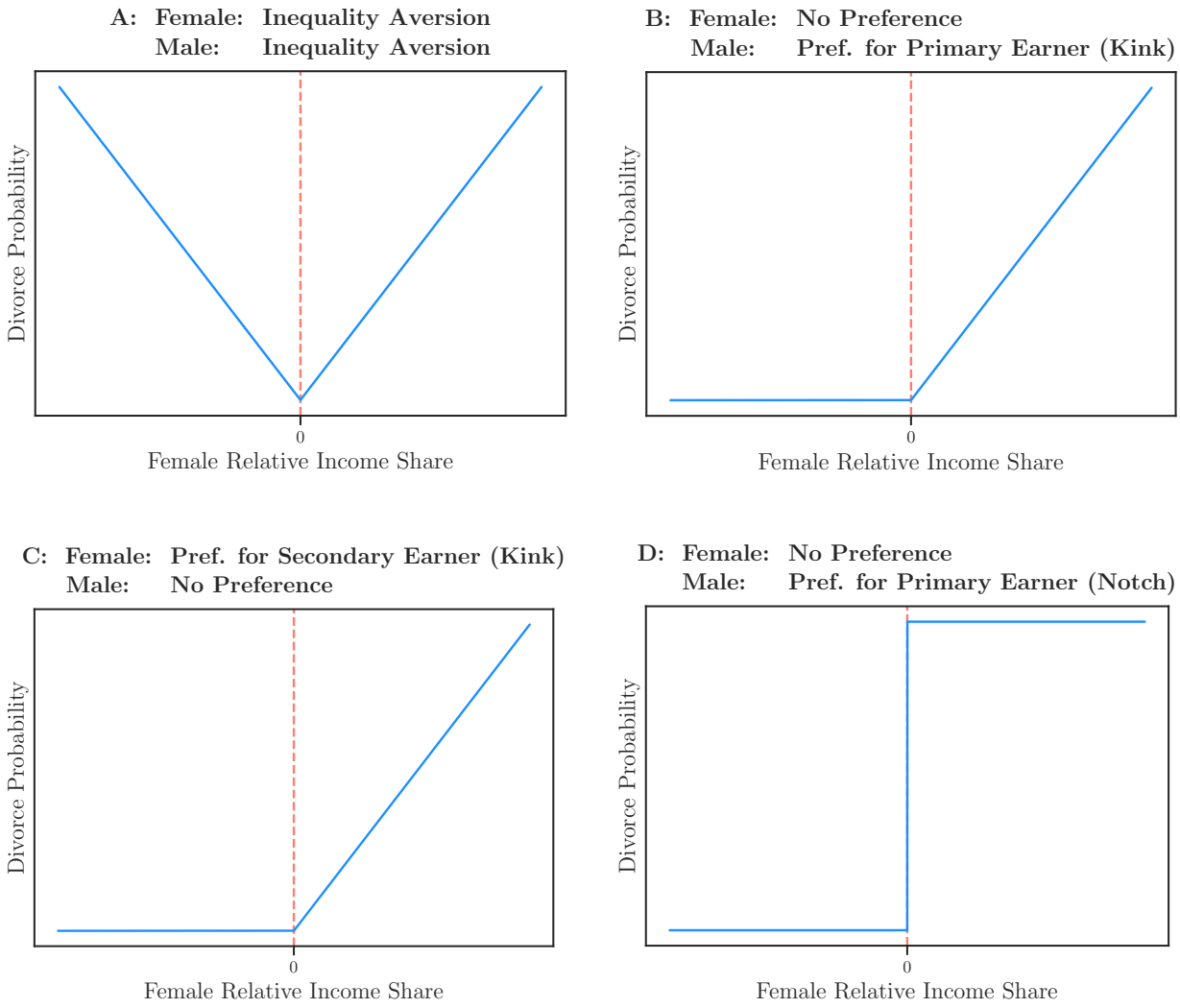
Notes: Online Appendix Figure A.2 schematically illustrates marriage probabilities for different combinations of partners' preferences over relative income. Panel A assumes that both men and women feature symmetric inequality aversion. Panel B assumes that men feature a kinked preference for being the primary earner and women have no concerns over relative income. Panel C assumes that women feature a kinked preference for being the secondary earner and men have no concerns over relative income. Panel D assumes that men feature a notched preference for being the primary earner and women have no concerns over relative income.

Figure A.3: Intra-household Transfers: Illustration



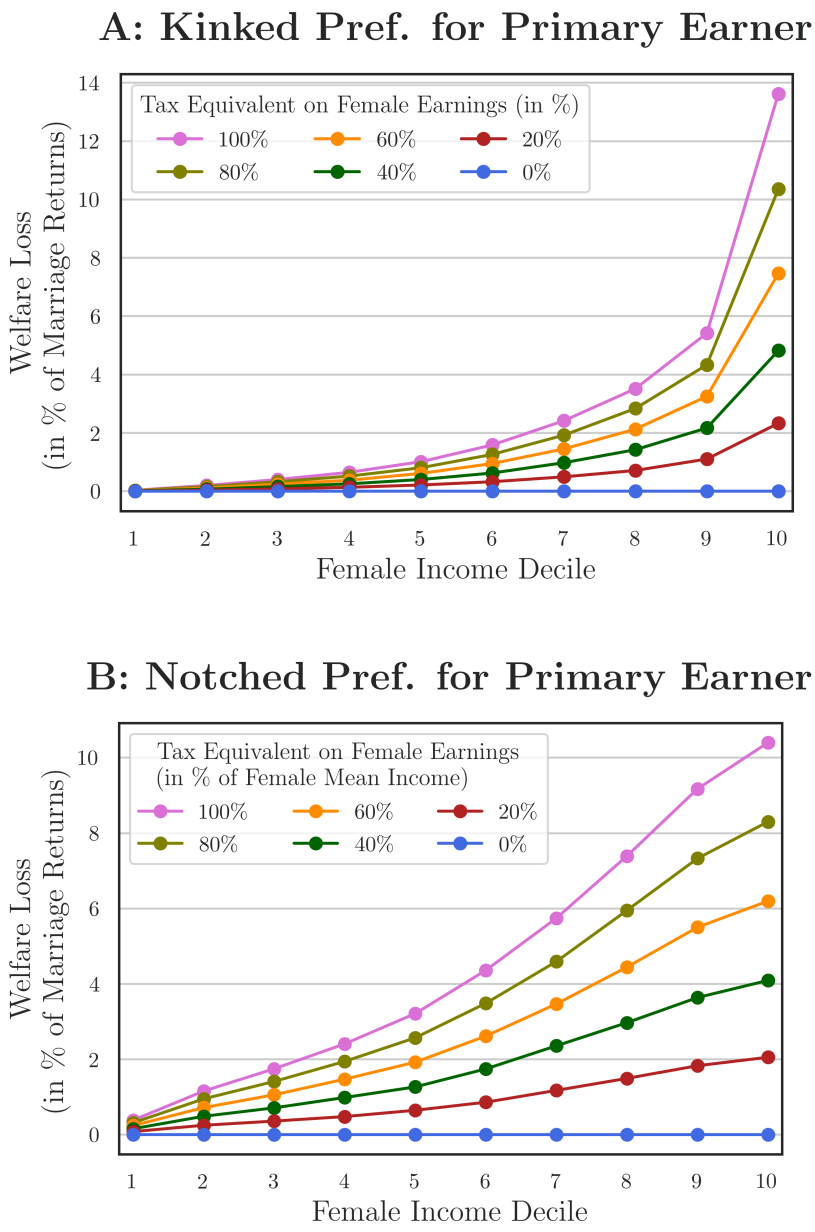
Notes: Online Appendix Figure A.3 schematically illustrates intra-household transfers for different combinations of partners' preferences over relative income. Panel A assumes that both men and women feature symmetric inequality aversion. Panel B assumes that men feature a kinked preference for being the primary earner and women have no concerns over relative income. Panel C assumes that women feature a kinked preference for being the secondary earner and men have no concerns over relative income. Panel D assumes that men feature a notched preference for being the primary earner and women have no concerns over relative income.

Figure A.4: Divorce Probabilities: Illustration



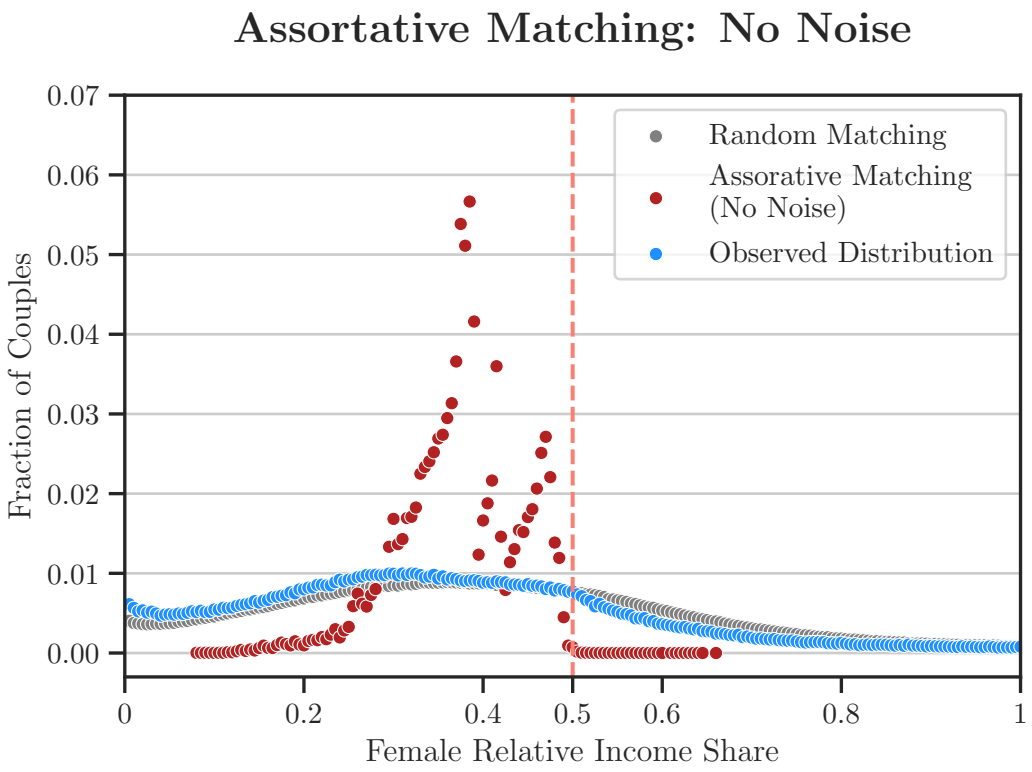
Notes: Online Appendix Figure A.4 schematically illustrates divorce probabilities for different combinations of partners' preferences over relative income. Panel A assumes that both men and women feature symmetric inequality aversion. Panel B assumes that men feature a kinked preference for being the primary earner and women have no concerns over relative income. Panel C assumes that women feature a kinked preference for being the secondary earner and men have no concerns over relative income. Panel D assumes that men feature a notched preference for being the primary earner and women have no concerns over relative income.

Figure A.5: Implications of Male Preferences for Being the Primary Earner for Women's Welfare



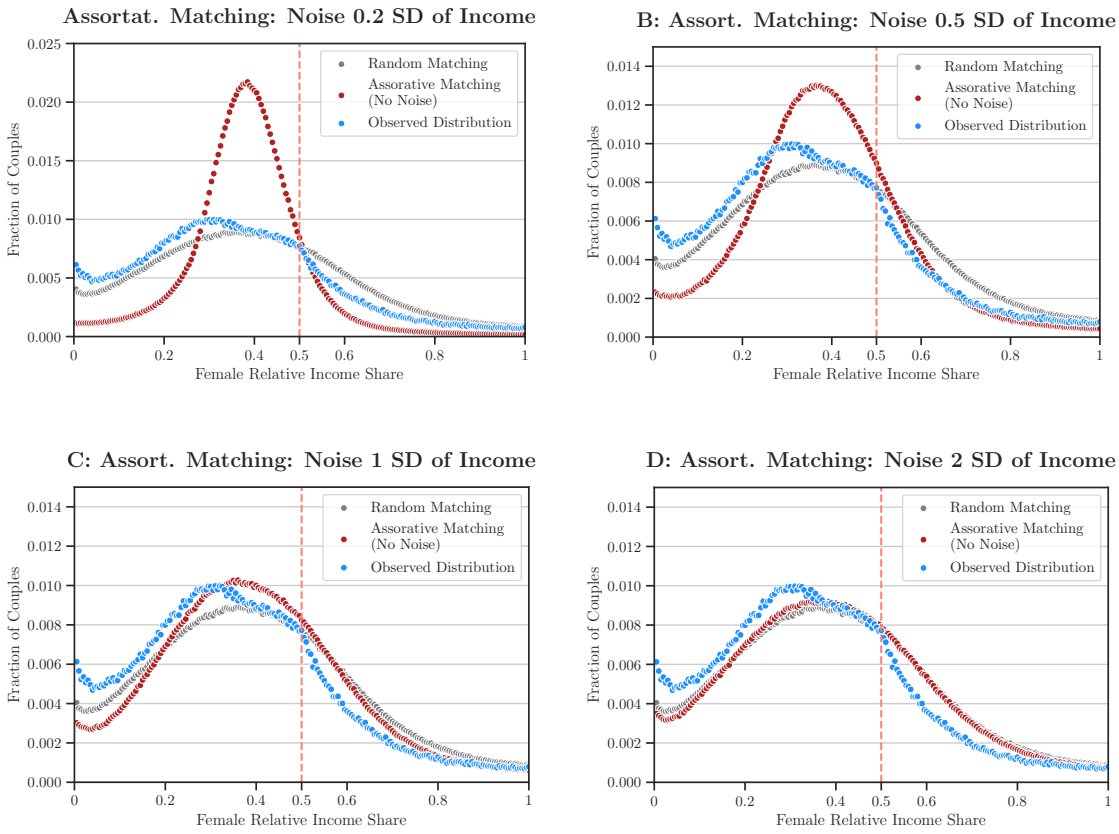
Notes: Online Appendix Figure A.5 plots the welfare loss incured by women as a function of their income decile if men hold preferences for being the breadwinner either as a kink in utility (Panel A) or as a notch in utility (Panel B). For the calibration, we assume the gender-specific income distributions in Germany. We further assume, that utility from income is linear with slope coefficient one and taste shocks are assumed to follow a uniform distribution. We further assume that women exhibit no preferences over relative income. In panel A, we assume that men's preferences over relative income are kinked with $\alpha_{\text{ahead}} = 0$ and $\alpha_{\text{behind}} \in \{0, 0.2, 0.4, 0.6, 0.8, 1\}$ which can be conceptualized as implicit taxes on women's earnings. In Panel B, we assume men's preferences to exhibit a notch that corresponds to different utility-equivalents in terms of women's average earnings.

Figure A.6: The Relative Income Distribution: Assortative Matching on Income Ranks



Notes: Online Appendix Figure A.6 plots the relative income distribution resulting from assortative matching based on income ranks. Each female and male respondent is matched to the individual of the other gender with the same rank in the income distribution. We assume there is no noise in the matching process. The red line marks the 50% threshold at which both spouses earn the same income.

Figure A.7: The Relative Income Distribution: Matching on Income Ranks with Noise

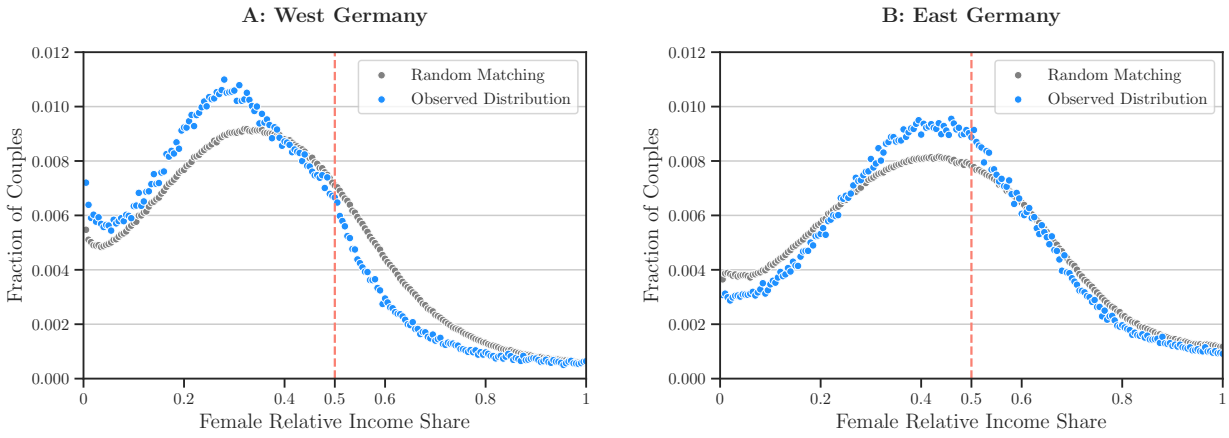


Notes: Online Appendix Figure A.7 plots the relative income distribution resulting from matching based on income ranks distorted with different degrees of noise. For this purpose, female and male individuals are ranked according to their income level to which a noise term was added. The noise term is distributed according to a normal distribution with a mean of zero and a standard deviation expressed in terms of the standard deviation of the gender-specific income distribution (see panel titles). Each female and male respondent is then matched to the individual of the other gender with the same rank. The red line marks the 50% threshold at which both spouses earn the same income.

Figure A.8: The Relative Income Distribution for Wage Earners

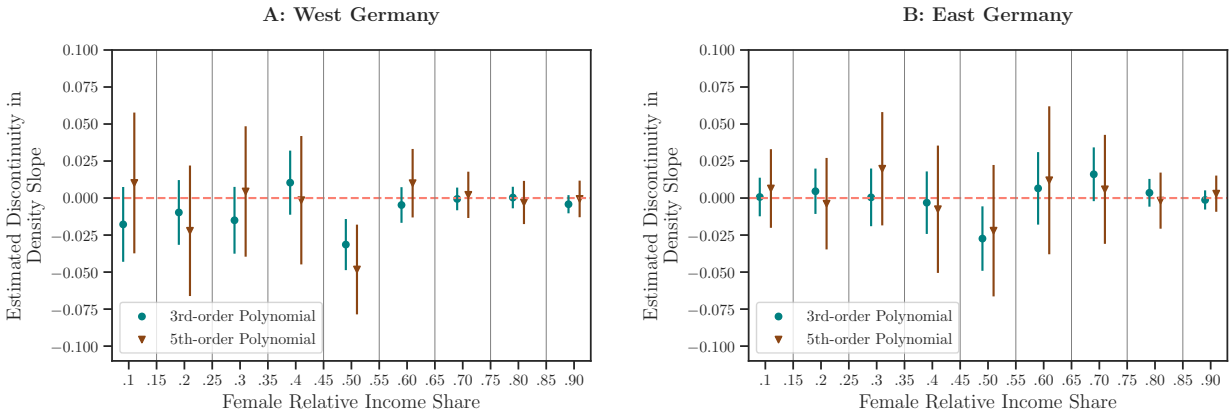
Notes: Online Appendix Figure A.8 plots the relative income distribution using 0.5%-point bins. The sample is restricted to couples who only earn third-party reported wage income. The red line marks the 50% threshold at which both spouses earn the same income.

Figure A.9: The Relative Income Distribution by Region



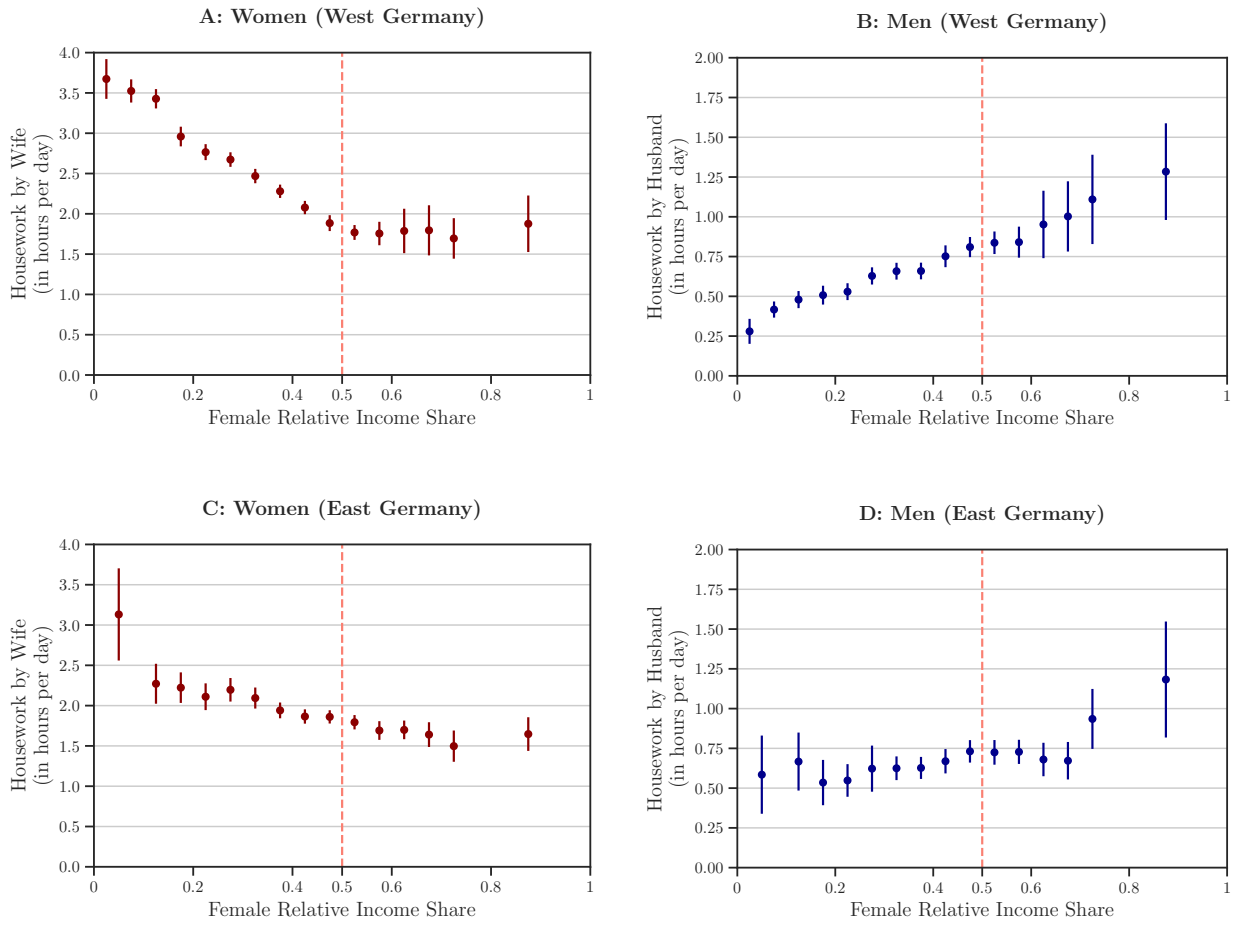
Notes: Online Appendix Figure A.9 plots the relative income distribution using 0.5%-point bins for West Germany (Panel A) and East Germany (Panel B). The red line marks the 50% threshold at which both spouses earn the same income. Colored dots represent the actual distribution, gray dots represent the counterfactual distribution based on randomly matched couples, including married spouses and singles. Random matching is performed within 10-year age bins and geographical regions.

Figure A.10: Testing for Kink along the Relative Income Distribution: West and East Germany



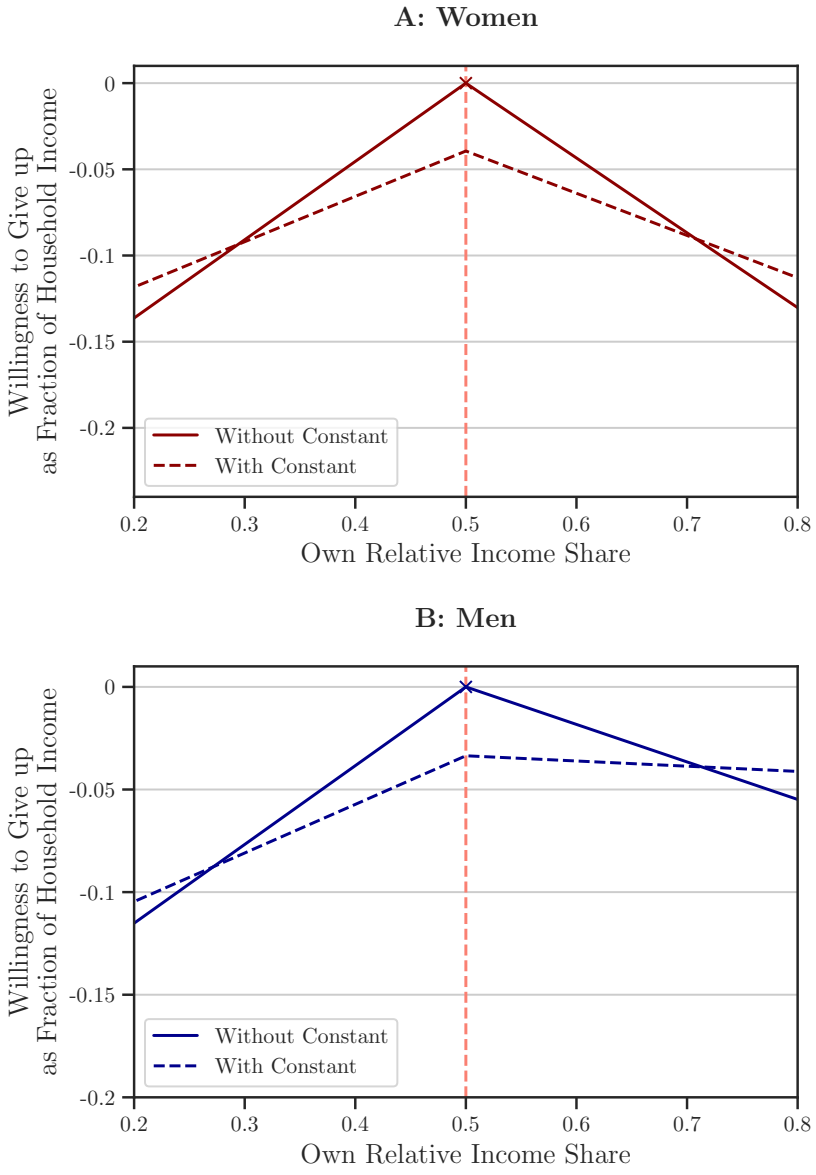
Notes: Online Appendix Figure A.10 depicts estimated discontinuities in the slope for each 5%-threshold along the relative income distribution for West Germany (Panel A) and East Germany (Panel B). A 3rd- and 5th-order polynomial is fitted for the relative income distribution within the $+/-10$%-point range of the respective threshold, allowing for a slope change of the linear term. Following a donut hole approach, we exclude the observations just to the left and the right of each threshold. The figure depicts for different order polynomials the estimated coefficient on the slope change, including 99% confidence intervals.

Figure A.11: Spouses' Housework as a Function of Female Relative Income Share by Region



Notes: Online Appendix Figure A.11 plots housework (in hours per day) done by wives and husbands as a function of the female relative share in household income separately for West and East Germany. Point estimates are calculated with sampling weights provided by the GSOEP. The red line marks the 50% threshold at which both spouses earn the same income. Error bars indicate 95% confidence intervals obtained from standard errors clustered at the couple level.

Figure A.12: Quantitative Evidence on Preferences over Relative Income for Germany



Notes: Online Appendix Figure A.12 visualizes gendered preferences over relative income in terms of total household income for Germany. Intuitively, the lines indicate as a function of the own relative income share the amount of total household income women are willing to give up for a 50%-50% composition of relative income. The prediction is obtained from estimating equation 1. We distinguish between the results from estimating specification 1 without a constant (solid lines) and with a constant (dashed lines). Panel A presents results for women, Panel B presents results for men.

Online Appendix Tables

Table A.1: Studies Investigating the Relative Income Distribution

Study	Country	Data	Tested for jump	Detected jump	Tested for kink	Model of preferences over relative income
Bertrand et al. (2015)	US	SIPP/SSA/IRS gold standard files	Yes	Yes	No	No
Wieber and Holst (2015)	Germany	German Socio-economic Panel	Yes	Yes	No	No
Binder and Lam (2018)	US	SIPP/SSA/IRS gold standard files	Yes	No	No	No
Zinovyeva and Tverdostup (2018)	Finland	Administrative data	Yes	No	No	No
Hederos and Stenberg (2019)	Sweden	Administrative data	Yes	No	No	No
Sprengholz et al. (2019)	Germany	German Socio-economic Panel	Yes	Yes (for West Ger.)	No	No
Doumbia and Goussé (2019)	Canada	Survey on Labor and Income Dynamics	Yes	Yes	No	No
Roth and Slotwinski (2019)	Switzerland	SAKE Survey, Administrative Data	Yes	Yes	No	No

Notes: Online Appendix Table A.1 provides an overview of studies investigating the distribution of relative income.

Table A.2: Summary Statistics of Experimental Samples

United States (Qualitative Sample)			
	Mean	Std. Dev.	Obs.
Male	0.50	0.50	420
Age	37.78	10.29	420
Presence of Children	0.59	0.49	420
Married	0.60	0.49	420
College Degree	0.75	0.43	420
Personal Income (in USD)	52,143	33,667	420
Full-time employment	0.85	0.36	420
United States (Quantitative Sample)			
	Mean	Std. Dev.	Obs.
Male	0.49	0.50	736
Age	36.28	10.58	734
Presence of Children	0.50	0.50	736
Married	0.54	0.50	736
College Degree	0.77	0.42	736
Personal Income (in USD)	51,868	29,859	736
Full-time employment	0.88	0.33	736
Germany (Quantitative Sample)			
	Mean	Std. Dev.	Obs.
Male	0.54	0.50	262
Age	35.11	10.20	262
Presence of Children	0.36	0.48	262
Married	0.41	0.49	262
College Degree	0.53	0.50	262
Personal Income (in Euro)	42,653	25,388	262
Full-time employment	0.78	0.42	262

Notes: Online Appendix Table A.2 shows summary statistics for the experimental samples.

Table A.3: Spouses' Household Public Good Provision for Relative income $\in$ [30%, 70%]

Panel A: Women	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	0.125***	0.0792*	-0.0105	-0.0349	-0.0312	-0.0556
	(0.0455)	(0.0419)	(0.0401)	(0.0485)	(0.0447)	(0.0426)
Wife's Share	-2.993***	-2.562***	-1.031***	-3.445***	-2.899***	-1.194***
	(0.194)	(0.176)	(0.181)	(0.204)	(0.190)	(0.199)
(Wife's Share-0.5)				3.500***	2.470***	1.039**
$\times$ I(Wife's Share>0.5)				(0.606)	(0.539)	(0.502)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	26208	26208	26208	26208	26208	26208

Panel B: Men	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	-0.0454	-0.0492	-0.0248	-0.0372	-0.0386	-0.0191
	(0.0320)	(0.0319)	(0.0319)	(0.0350)	(0.0350)	(0.0343)
Wife's Share	0.908***	0.942***	0.478***	0.932***	0.975***	0.499***
	(0.125)	(0.128)	(0.139)	(0.131)	(0.134)	(0.149)
(Wife's Share-0.5)				-0.182	-0.239	-0.131
$\times$ I(Wife's Share>0.5)				(0.396)	(0.404)	(0.380)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	25261	25261	25261	25261	25261	25261

Notes: Online Appendix Table A.3 provides linear regression of housework (hours per day) conducted by wives (Panel A) and husbands (Panel B) on wives' relative income, an indicator for whether the wife is the primary earner within the couple, and their interaction conditional on a set of control variables. All specifications only include couples where the wife's relative income share lies between 30% and 70%. All observations are weighted using sampling weights provided by the GSOEP. Standard errors in parentheses are clustered at the couple level (* p<0.10, ** p<0.05, *** p<0.01).

Table A.4: Spouses' Household Public Good Provision controlling for Couple Fixed Effects

Panel A: Women	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	0.141***	0.117***	0.0902**	0.0601	0.0595	0.0516
	(0.0420)	(0.0383)	(0.0375)	(0.0396)	(0.0370)	(0.0364)
Wife's Share	-2.087***	-1.685***	-1.024***	-2.502***	-2.016***	-1.256***
	(0.213)	(0.181)	(0.185)	(0.248)	(0.214)	(0.220)
(Wife's Share-0.5)				2.384***	1.788***	1.206***
× I(Wife's Share>0.5)				(0.426)	(0.392)	(0.381)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	34189	34189	34189	34189	34189	34189

Panel B: Men	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	0.0000489	-0.00146	0.00713	-0.00126	-0.00172	0.00702
	(0.0317)	(0.0320)	(0.0321)	(0.0358)	(0.0358)	(0.0356)
Wife's Share	0.491***	0.459***	0.282***	0.484***	0.457***	0.281**
	(0.103)	(0.103)	(0.106)	(0.106)	(0.105)	(0.112)
(Wife's Share-0.5)				0.0398	0.00823	0.00335
× I(Wife's Share>0.5)				(0.349)	(0.343)	(0.327)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	32884	32884	32884	32884	32884	32884

Notes: Online Appendix Table A.4 provides linear regression of housework (hours per day) conducted by wives (Panel A) and husbands (Panel B) on wives' relative income, an indicator for whether the wife is the primary earner within the couple, and their interaction conditional on a set of control variables. All specifications include couple fixed effects. All observations are weighted using sampling weights provided by the GSOEP. Standard errors in parentheses are clustered at the couple level (* p<0.10, ** p<0.05, *** p<0.01).

Table A.5: Wives' Household Public Good Provision: Geographic Heterogeneity

Panel A: West Germany	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	0.306***	0.264***	0.148***	0.0214	0.0895	0.0520
	(0.0600)	(0.0554)	(0.0520)	(0.0558)	(0.0545)	(0.0520)
Wife's Share	-3.805***	-3.132***	-1.560***	-4.127***	-3.386***	-1.742***
	(0.150)	(0.140)	(0.157)	(0.157)	(0.152)	(0.171)
(Wife's Share-0.5)				4.198***	2.704***	1.552***
× I(Wife's Share>0.5)				(0.457)	(0.448)	(0.422)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	24704	24704	24704	24704	24704	24704

Panel B: East Germany	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	0.0492	0.0682	-0.00199	0.0135	0.0299	-0.00151
	(0.0596)	(0.0553)	(0.0525)	(0.0593)	(0.0560)	(0.0528)
Wife's Share	-1.515***	-1.535***	-0.592***	-1.663***	-1.710***	-0.589**
	(0.226)	(0.199)	(0.191)	(0.266)	(0.240)	(0.238)
(Wife's Share-0.5)				0.833*	0.920**	-0.0120
× I(Wife's Share>0.5)				(0.456)	(0.428)	(0.410)
[1em] Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	8374	8374	8374	8374	8374	8374

Notes: Online Appendix Table A.5 provides linear regression of wives' housework (hours per day) on wives' relative income, an indicator for whether the wife is the primary earner within the couple, and their interaction conditional on a set of control variables. We distinguish between West Germany (Panel A) and East Germany (Panel B). All observations are weighted using sampling weights provided by the GSOEP. Standard errors in parentheses are clustered at the couple level (* p<0.10, ** p<0.05, *** p<0.01).

Table A.6: Wives' Household Public Good Provision for Relative income $\in$ [30%, 70%]: Geographic Heterogeneity

Panel A: West Germany	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	0.123**	0.0773	-0.00144	-0.0871	-0.0413	-0.0692
	(0.0614)	(0.0560)	(0.0532)	(0.0659)	(0.0600)	(0.0578)
Wife's Share	-3.153***	-2.347***	-0.945***	-3.623***	-2.642***	-1.139***
	(0.243)	(0.216)	(0.225)	(0.246)	(0.229)	(0.240)
(Wife's Share-0.5)				4.446***	2.568***	1.503**
$\times$ I(Wife's Share>0.5)				(0.886)	(0.766)	(0.732)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	17416	17416	17416	17416	17416	17416

Panel B: East Germany	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	0.0139	0.00864	-0.0366	0.00847	-0.00553	-0.0261
	(0.0602)	(0.0563)	(0.0543)	(0.0604)	(0.0577)	(0.0547)
Wife's Share	-1.349***	-1.224***	-0.436*	-1.383***	-1.317***	-0.363
	(0.262)	(0.238)	(0.232)	(0.319)	(0.292)	(0.292)
(Wife's Share-0.5)				0.157	0.417	-0.311
$\times$ I(Wife's Share>0.5)				(0.531)	(0.515)	(0.489)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	7814	7814	7814	7814	7814	7814

Notes: Online Appendix Table A.6 provides linear regression of wives' housework (hours per day) on wives' relative income, an indicator for whether the wife is the primary earner within the couple, and their interaction conditional on a set of control variables. We distinguish between West Germany (Panel A) and East Germany (Panel B). All specifications only include couples where the wife's relative income share lies between 30% and 70%. All observations are weighted using sampling weights provided by the GSOEP. Standard errors in parentheses are clustered at the couple level (* p<0.10, ** p<0.05, *** p<0.01).

Table A.7: Wives' Household Public Good Provision controlling for Couple F.E.: Geo. Heterogeneity

Panel A: West Germany	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	0.185***	0.155***	0.135***	0.0775	0.0868*	0.0857*
	(0.0574)	(0.0515)	(0.0502)	(0.0543)	(0.0503)	(0.0490)
Wife's Share	-2.303***	-1.758***	-1.047***	-2.730***	-2.073***	-1.284***
	(0.254)	(0.212)	(0.219)	(0.284)	(0.243)	(0.254)
(Wife's Share-0.5)				2.914***	1.954***	1.420***
× I(Wife's Share>0.5)				(0.546)	(0.521)	(0.501)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	24704	24704	24704	24704	24704	24704

Panel B: East Germany	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	0.0119	-0.00826	-0.0259	0.00294	-0.0184	-0.0282
	(0.0567)	(0.0524)	(0.0518)	(0.0559)	(0.0536)	(0.0530)
Wife's Share	-1.220***	-1.030***	-0.686***	-1.341***	-1.183***	-0.722**
	(0.296)	(0.252)	(0.240)	(0.396)	(0.316)	(0.299)
(Wife's Share-0.5))				0.418	0.513	0.118
× I(Wife's Share>0.5)				(0.632)	(0.563)	(0.545)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	8374	8374	8374	8374	8374	8374

Notes: Online Appendix Table A.7 provides linear regression of wives' housework (hours per day) on wives' relative income, an indicator for whether the wife is the primary earner within the couple, and their interaction conditional on a set of control variables. We distinguish between West Germany (Panel A) and East Germany (Panel B). All specifications include couple fixed effects. All observations are weighted using sampling weights provided by the GSOEP. Standard errors in parentheses are clustered at the couple level (* p<0.10, ** p<0.05, *** p<0.01).

Table A.8: Husbands' Household Public Good Provision: Geographic Heterogeneity

Panel A: West Germany	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	-0.00370	-0.0124	-0.00764	-0.0352	-0.0328	-0.0177
	(0.0390)	(0.0385)	(0.0371)	(0.0430)	(0.0428)	(0.0411)
Wife's Share	1.004***	1.059***	0.579***	0.967***	1.028***	0.560***
	(0.0855)	(0.0907)	(0.103)	(0.0828)	(0.0882)	(0.104)
(Wife's Share-0.5)				0.464	0.315	0.163
× I(Wife's Share>0.5)				(0.459)	(0.469)	(0.424)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	23712	23712	23712	23712	23712	23712

Panel B: East Germany	(1)	(2)	(3)	(4)	(5)	(6)
I(Wife's Share>0.5)	-0.0328	-0.0425	-0.0112	-0.0417	-0.0451	-0.0196
	(0.0451)	(0.0459)	(0.0462)	(0.0485)	(0.0492)	(0.0480)
Wife's Share	0.544***	0.603***	0.243	0.506***	0.591***	0.199
	(0.169)	(0.175)	(0.189)	(0.187)	(0.197)	(0.217)
(Wife's Share-0.5)				0.212	0.0630	0.210
× I(Wife's Share>0.5)				(0.490)	(0.481)	(0.459)
Wave F.E.	No	Yes	Yes	No	Yes	Yes
Cubic in HH Income	No	Yes	Yes	No	Yes	Yes
Age F.E. for Husband and Wife	No	Yes	Yes	No	Yes	Yes
Number of Children	No	Yes	Yes	No	Yes	Yes
Job Hours Husband and Wife	No	No	Yes	No	No	Yes
Observations	8088	8088	8088	8088	8088	8088

Notes: Online Appendix Table A.8 provides linear regression of husbands' housework (hours per day) on wives' relative income, an indicator for whether the wife is the primary earner within the couple, and their interaction conditional on a set of control variables. We distinguish between West Germany (Panel A) and East Germany (Panel B). All observations are weighted using sampling weights provided by the GSOEP. Standard errors in parentheses are clustered at the couple level (* p<0.10, ** p<0.05, *** p<0.01).

Table A.9: Estimates for Preferences over Relative Income for Germany

	(1)	(2)	(3)	(4)	(5)	(6)
	Model without constant			Model with constant		
	All	Women	Men	All	Women	Men
δ	13.43***	12.95***	14.02***	13.63***	13.20***	14.20***
	(0.850)	(1.193)	(1.232)	(0.881)	(1.232)	(1.277)
α_{behind}	5.583***	5.882***	5.383***	3.390***	3.474***	3.364***
	(0.607)	(1.096)	(0.670)	(0.727)	(1.247)	(0.854)
α_{ahead}	-3.798***	-5.622***	-2.564***	-1.518*	-3.234**	-0.361
	(0.636)	(1.047)	(0.816)	(0.789)	(1.281)	(0.990)
Constant				0.497***	0.520***	0.477***
				(0.129)	(0.192)	(0.168)
MRS (behind)	0.42	0.45	0.38	0.25	0.26	0.24
MRS (ahead)	-0.29	-0.43	-0.18	-0.11	-0.25	-0.03
N	3668	1680	1988	3668	1680	1988
No. Individuals	262	120	142	262	120	142

Notes: Online Appendix Table A.9 shows for Germany estimated preferences over relative income from specification 1 for the pooled sample (columns (1) and (4)), women (columns (2) and (5)), and men (columns (3) and (6)). Columns (1) to (3) include no constant, columns (4) to (6) include a constant. Standard errors in parentheses are clustered at the individual level (* p<0.10, ** p<0.05, *** p<0.01).

A Mathematical Proofs

A.1 Proof of Result 1 in the one-period model:

Note that we can express the relative income distribution f_{rel} at a given share of female income $k = \frac{y^f}{y^f+y^m} \in [0,1]$ for the sample of married couples as

$$f_{rel}(\frac{y^f}{y^m+y^f} = k|married) = Pr(married|\frac{y^f}{y^m+y^f} = k) \cdot \frac{f_{rel}(\frac{y^f}{y^m+y^f} = k)}{Pr(married)},$$

where $f_{rel}(\frac{y^f}{y^m+y^f} = k)$ is the distribution of relative income in the sample of matched women and men. Denote by $f_m(y^m)$ and $f_f(y^f)$ the continuously differentiable income distribution of male and female types. Then, $f_{rel}(\frac{y^f}{y^m+y^f} = k)$ can be written as $\int_{y^m} f_m(y^m) f_f(\tilde{k}y^m)\mu(y^m, \tilde{k}y^m)dy^m$, where $\tilde{k} = \frac{k}{1-k}$ and $\mu(y^m, y^f)$ is the matching function of women and men. If $\mu(y^m, y^f)$ is continuously differentiable, it follows that $f_{rel}(\frac{y^f}{y^m+y^f} = k)$ is continuously differentiable.

We can write $f_{rel}(\frac{y^f}{y^m+y^f} = k|married)$ as

$$\int_{y^m} \Big(\Phi(C + \bar{\alpha}_{m\ ahead} \cdot (\tilde{k}y^m - y^m) \cdot I(\tilde{k}y^m - y^m < 0) + \bar{\alpha}_{m\ behind} \cdot (\tilde{k}y^m - y^m) \cdot I(\tilde{k}y^m - y^m \geq 0) + \bar{\beta}_{m\ behind} \cdot I(\tilde{k}y^m - y^m \geq 0)\Big) \cdot f_m(y^m) f_f(\tilde{k}y^m)dy^m \cdot \frac{f_{rel}(\tilde{k})}{Pr(match)},$$

where $\tilde{k} = \frac{k}{1-k}$.

Preferences over relative income as a notch in utility: Assume that $\bar{\alpha}_{m\ ahead} = \bar{\alpha}_{m\ behind} = 0$ and $\bar{\beta}_{m\ behind} \neq 0$. Hence,

In this case, it follows that

$$\lim_{k\to 0.5^+} f_{rel}(k|married) < \lim_{k\to 0.5^-} f_{rel}(k|married) \quad \text{iff} \quad \bar{\beta}_{m\ behind} < 0$$
$$\lim_{k\to 0.5^+} f_{rel}(k|married) > \lim_{k\to 0.5^-} f_{rel}(k|married) \quad \text{iff} \quad \bar{\beta}_{m\ behind} > 0.$$

Preferences over relative income as a kink in utility: Assume that $\bar{\alpha}_{m\ ahead} \neq 0 \vee \bar{\alpha}_{m\ behind} \neq 0$ and $\bar{\beta}_{m\ behind} = 0$. In this case,

$$f_{rel}(\frac{y^f}{y^m+y^f} = k|married) = \begin{cases} \int_{y^m} \Big(\Phi(C + \bar{\alpha}_{m\ ahead} \cdot (\tilde{k}y^m - y^m) \cdot I(\tilde{k}y^m - y^m < 0)\Big) \cdot f_m(y^m) f_f(\tilde{k}y^m)dy^m \cdot \frac{f_{rel}(\tilde{k})}{Pr(match)}, & \text{if } \tilde{k} < 1 \\ \int_{y^m} \Big(\Phi(C + \bar{\alpha}_{m\ behind} \cdot (\tilde{k}y^m - y^m) \cdot I(\tilde{k}y^m - y^m \geq 0)\Big) \cdot f_m(y^m) f_f(\tilde{k}y^m)dy^m \cdot \frac{f_{rel}(\tilde{k})}{Pr(match)}, & \text{if } \tilde{k} \geq 1 \end{cases}$$

where $\tilde{k} = \frac{k}{1-k}$.

First, note that $f_{rel}(\tilde{k})$ and $\frac{k}{1-k}$ are smooth $\forall k \in [0,1)$. Furthermore, $\lim_{k\to 0.5^+} f_{rel}(k|married) = \lim_{k\to 0.5^-} f_{rel}(k|married)$. However, taking the derivate and using 2.2, yields that $\lim_{k\to 0.5^+} \frac{df_{rel}(k|married)}{k} = \frac{\lim_{k\to 0.5^-} f_{rel}(k|married)}{k}$. As a consequence, the relative income distribution features a kink at the 50% threshold.

B Model with non-transferrable utility

This section provides a brief investigation of preferences over relative income in a matching model of the marriage market with non-transferrable utility. We retain the assumptions of section 2 but no longer assume that housework is provided through intra-household transfers t. Instead, we model each individual k provides housework h^k at cost $\hat{e}_k(h)$, such that $h^k = \arg\max_h c(y^k) + \zeta \log(h^k) - \hat{e}_k(h)$. Hence, an individual's utility from being single is equal to

$$u_s^k = c(y^k) + \zeta \log(h^k) - \hat{e}_k(h^k).$$

Analogously, to the case with transferrable utility, we specify the utilities from being married for a couple (m, f) to be equal to

$$\begin{aligned} u_m^m(f) &= c^m(y^m, y^f) + \eta^m(y^f, y^m) + \zeta \log(h^m h^f) - \hat{e}_m(h^m) + q_{mf} \\ u_m^f(b) &= c^m(y^f, y^m) + \eta^f(y^m, y^f) + \zeta \log(h^f h^n) - \hat{e}_f(h^f) + q_{fm}, \end{aligned}$$

where we specify the production function of household public goods to be multiplicative and $q_{fm} \perp q_{mf} \perp \{y^m, y^f, h^m, h^f\}$. For simplicity, we assume that idiosyncratic taste shocks q_{fm} and q_{mf} are distributed according to Φ for both women and men.

B.1 Simple one-period model

We again first consider a simple one-period model. In this setting, individuals enter the marriage market being single and are randomly matched with an individual of opposite gender. If both decide to marry, a marriage match is formed, otherwise both stay single.

Marriage Probabilities and Relative Income Distribution: An individual m decides to marry individual f iff $u_m^m(f) \geq u_s^m$, and analogous for f marrying m.
Hence, the marriage probability for a pair (m, f) equals:

$$P_{mf} = \begin{cases} \Big(1 - \Phi[\alpha^m_{\text{ahead}} \Delta y - \beta^m_{\text{ahead}} - \zeta \log(h^f)]\Big) & \\ \cdot \Big(1 - \Phi[-\alpha^f_{\text{ahead}} \Delta y - \zeta \log(h^m)]\Big) & \text{if} \quad y^m \geq y^f \\ \Big(1 - \Phi[\alpha^m_{\text{behind}} \Delta y - \zeta \log(h^f)]\Big) & \\ \cdot \Big(1 - \Phi[-\alpha^f_{\text{ahead}} \Delta y - \beta^f_{\text{ahead}} - \zeta \log(h^m)]\Big) & \text{if} \quad y^f < y^m. \end{cases} \tag{2}$$

Preferences over relative income as a notch in utility: If $\beta^f_{\text{ahead}} \neq 0$ or $\beta^m_{\text{ahead}} \neq 0 \lim_{\Delta y \to 0^+} P_{mf}(\Delta y) \neq \lim_{\Delta y \to 0^-} P_{mf}(\Delta y)$, hence it follows that P_{mf} features a discontinuity at $\Delta y = 0$.

Preferences over relative income as a kink in utility: If preferences over relative income feature a kink instead of a notch, $\lim_{\Delta y \to 0^+} P_{mf}(\Delta y) = \lim_{\Delta y \to 0^-} P_{mf}(\Delta y)$, the *level* of the marriage probability will be unaffected at $\Delta y = 0$. However, the marriage probability has a concave kink at $\Delta y = 0$. To see this, observe that

$$\frac{dP_{mf}}{dy^f} = \begin{cases} -\alpha^m_{\text{ahead}} \phi\Big(\alpha^m_{\text{ahead}} \Delta y - \zeta \log(h^f)\Big)\Big(1 - \Phi[-\alpha^f_{\text{ahead}} \Delta y - \zeta \log(h^m)]\Big) & \\ +\alpha^f_{\text{ahead}} (1 - \Phi[\alpha^m_{\text{ahead}} \Delta y - \zeta \log(h^f)]\Big) \phi\Big(- \alpha^f_{\text{ahead}} \Delta y - \zeta \log(h^m)\Big) & \text{if} \quad y^m \geq y^f \\ -\alpha^m_{\text{behind}} \phi\Big(\alpha^m_{\text{behind}} \Delta y - \zeta \log(h^f)\Big) \cdot \Big(1 - \Phi[-\alpha^f_{\text{ahead}} \Delta y - \zeta \log(h^m)]\Big) & \\ +\alpha^f_{\text{ahead}} \Big(1 - \Phi[\alpha^m_{\text{behind}} \Delta y - \zeta \log(h^f)]\Big) \cdot \phi\Big(- \alpha^f_{\text{ahead}} \Delta y - \zeta \log(h^m)\Big) & \text{if} \quad \Delta y > 0. \end{cases} \tag{3}$$

This directly yields result 1 following the same logic as in section 2.

Household Public Good Provision: Next, we study how preferences over relative income affect household public good provision. Similarly to the model with transferrable utility, housework can serve as a compensation for utility losses associated with preferences over relative income. We focus on the formulization of preferences over relative income in form of a kink. To understand how preferences over relative income affect observed household public good provision, note that a male agent m accepts the match with female f iff

$$q_{mf} \geq -\eta^m(y^f, y^m) - \zeta \log(h^f).$$

Hence, conditional on the taste shock and income levels, the cutoff level of female housework $\underline{h}^f$ accepted by the male equals

$$\begin{aligned} h^f \geq \underline{h}^f &= \exp\left[\frac{1}{\zeta}\left(-\eta^m(y^f, y^m) - q_{mf}\right)\right] \\ &= \begin{cases} \exp\left[\frac{1}{\zeta}\left(-\alpha_{\text{behind}} \Delta y - q_{mf}\right)\right] & if\ \Delta y \leq 0 \\ \exp\left[\frac{1}{\zeta}\left(-\alpha_{\text{ahead}} \Delta y - q_{mf}\right)\right] & if\ \Delta y > 0. \end{cases} \end{aligned}$$

Therefore, the minimum level of female housework accepted by a given male type i features a convex kink at $\Delta y = 0$ as

$$\frac{\partial \underline{h}^f}{\partial \Delta y} = \begin{cases} -\alpha_{\text{behind}} \frac{h^f}{\zeta} & if\ \Delta y \leq 0 \\ -\alpha_{\text{ahead}} \frac{h^f}{\zeta} & if\ \Delta y > 0. \end{cases} \tag{4}$$

Hence, if $\alpha_{\text{behind}} \neq \alpha_{\text{ahead}}$, this yields a kink point at $\Delta y = 0$. Calculating $\frac{\partial \underline{h}^m}{\partial \Delta y}$ is analogous. Moreover, if preferences over relative income feature a notch, this will produce a notch in the provision of

household public goods following a similar logic. This establishes result 2.

Divorce: Not that as in the model with transferrable utility, for a given combination of male income y, female and male housework h^i, h^j, and the female relative income share k, the divorce probability equals:

$$Div(y, h^m, h^f, k) = \frac{\pi(1 - P_{mf})P_{mf}m_m(y^m = y, h^m)m_f(y^f = \frac{1-k}{k}y, h^f)}{P_{mf}m_m(y^m = y, h^m)m_f(y^f = \frac{1-k}{k}y, h^f)} = \pi(1 - P_{mf}),$$

where $m_m(,)$ and $m_f(,)$ denote the type distributions of male and female types. Following the same argument as in section 2 yields result 3.

B.2 Full model in continuous time and infinite-horizon

Marriage Probabilities and Relative Income Distribution: We note that Bellman equations as well as steady state conditions are analogous to the model with transferrable utility. However, a couple only enters marriage if both agree to the match, which is the case if $V_m(mfq) \geq V_s(m)$ and $V_m(fmq) \geq V_s(f)$, or $c^m(y^m, y^f) + \eta^m(y^f, y^m) + \zeta \log(h^m h^f) + q_{mf} \geq rV_s(m)$ and $c^m(y^f, y^f b + \eta^f(y^m, y^f) + \zeta \log(h^f h^n) + q_{fm} \geq rV_s(f)$. As a consequence, the probability of a marriage match to be formed equals:

$$\begin{aligned} P_{mf} &= \Big(1 - \Phi(rV_s(m) - c^m(y^m, y^f) - \eta^m(y^f, y^m) - \zeta \log(h^m h^f))\Big) \cdot \\ &\quad \Big(1 - \Phi(rV_s(f) - c^m(y^f, y^f) - \eta^f(y^m, y^f) - \zeta \log(h^f h^n))\Big). \end{aligned}$$

Following similar algebra as for the one-period model, and noting that the steady state condition equals the one in the model with transferrable utility establishes result 1.

Household public good provision: Following the logic of the one-period model, note the cutoff level of female housework $\underline{h}^f$ accepted by the male equals

$$\underline{h}^f = \Big[\frac{1}{\zeta}(rV_s(m) - q_{mf} - \zeta \log(h^m) - c^m(y^m, y^f) - \eta^m(y^f, y^m))\Big].$$

Conducting analogous algebra as in the one-period model establishes result 2.

Divorce: Lastly, we extend the model to allow for endogenous divorce. To model divorce, assume that every period the match-specific taste shock gets updated with probability δ according to the updating rule $q_{mf}^{new} = min\{q_{mf}^t, q_{mf}^{t+1}\}$. Varying δ, we can make the stochastic process of q_{mf}'s more or

less persistent. The resulting flow of divorces equals

$$m^{div}(m,f) = \delta(1 - P_{mf})m(m,f).$$

We obtain that the divorce rate for a given pair (m,f) equals

$$Div(m,f) = \delta(1 - P_{mf}).$$

Holding household public good supplies fixed, as in the one-period case, this expression exhibits a convex kink at the point where $y^m = y^f$.

C Marriage Rates and Welfare Considerations

Appendix C provides a discussion of the impact of preferences over relative income on marriage rates and welfare. For simplicity, we consider the model with non-transferrable utility outlined in Appendix B. For illustration, we consider the case in which women have no concerns over relative income, while men exhibit preferences for being the primary earner. We then study how men's preferences affect marriage rates and welfare for women. Note that in the following the same intuitions carry to more alternative classes of preferences over relative income. Intuitively, in the model men's preferences over relative income act as a tax on women's earnings in terms of marriage prospects and welfare. In the exposition, we distinguish between the scenarios in which men's preferences over relative income are in form of either a notch or kink in utility. In our model notched preferences act as *proportional* taxes whereas kinked preferences act as *progressive* taxes.

C.1 Impact of Preferences over Relative Income on Marriage Rates

We first analyze the impact of men's preference for being the primary earner on marriage rates among matches in which the potential wife is the primary earner. To do so, we study how increases in women's income affect their marriage prospects. Furthermore, we investigate how these comparative statics are affected by changes in the strength of men's preferences. We first focus on the formulation of this preference in form of a kink in utility. For simplicity, we further assume that $\alpha_{\text{behind}} > \alpha_{\text{ahead}} = 0$. In addition, we assume that individuals value material consumption linearly with marginal utility $\delta > 0$ no matter they are married or single. This assumption does not affect the results but considerably shortens the math. For simplicity, we also assume that idiosyncratic taste shocks are distributed according to Φ for both women and men.

Preferences as a kink in utility: Consider a woman f earning y^f and providing housework h^f. Denote by $f_m(y)$ and $f_f(y)$ the income distributions of men and women. For f, the differential probability of marrying a secondary earner husband in the presence of men's preferences over relative income compared to the non-existence of these preferences is equal to

$$\begin{aligned}\Delta(y^f) \quad = \quad & \int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^m-\zeta\log(h^m)))(1-\Phi(-\delta y^f+\alpha_{\text{behind}}(y^f-y^m)-\zeta\log(h^f)))f_m(y^m)k_m(h^m|y^m)dh^m dy^m \\ & -\int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^m-\zeta\log(h^m)))(1-\Phi(-\delta y^f-\zeta\log(h^f)))f_m(y^m)k_m(h^m|y^m)dh^m dy^m < 0,\end{aligned}$$

where $\bar{h}$ is the maximum level of an individual's household public good provision and $k_m(h^m|y^m)$ denotes the male distribution of household public good provision conditional on income.
Taking the derivative with respect to y^f yields

$$
\begin{aligned}
d\Delta(y^f)/dy^f &= \int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^m-\zeta\log(h^m)))(\delta-\alpha_{\text{behind}})\phi(-\delta y^f+\alpha_{\text{behind}}(y^f-y^m)-\zeta\log(h^f))f_m(y^m)k_m(h^m|y^m)dh^m dy^m \\
&\quad -\int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^m-\zeta\log(h^m)))\delta\phi(-\delta y^f-\zeta\log(h^f))f_m(y^m)k_m(h^m|y^m)dh^m dy^m
\end{aligned}
$$

A complication constitutes that the density of the taste shock is variable. If we assume that y^m and y^f are bounded and taste shocks are distributed uniformly on the interval $[b,k]$ (with b and k such that all matches have positive probability of marriage), we obtain

$$
d\Delta(y^f)/dy^f = -\int_0^{y^f}\int_0^{\bar{h}}\Big(1-\frac{-\delta y^m-\zeta\log(h^m)-k}{b-k}\Big)\frac{\alpha_{\text{behind}}}{b-k}f_m(y^m)k_m(h^m|y^m)dh^m dy^m<0.
$$

Hence, for women with a higher income y^f there is a strictly stronger impact of men's preferences for being the primary earner on women's probability of marrying a secondary earner man. Said differently, there is a negative impact on the differential probability of marrying a secondary earner man for each additional unit of income earned by a women. Furthermore,

$$
d^2\Delta(y^f)/dy^{f2} = -\int_0^{\bar{h}}\Big(1-\frac{-\delta y^f-\zeta\log(h^m)-k}{b-k}\Big)\frac{\alpha_{\text{behind}}}{b-k}f_m(y^f)k_m(h^m|y^f)dh^m\leq 0.
$$

Intuitively, the negative impact on the differential probability of marrying a secondary earner man is increasing in a woman's income y^f. Hence, men's preference for being the primary earner in form of a kink acts equivalently to a progressive tax on women's income in terms of marriage prospects. Next, we study the comparative statics if we change the strength of the preference parameter. Note,

$$
d\Delta(y^f)/d\alpha_{\text{behind}} = \int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^m-\zeta\log(h^m)))(y^m-y^f)\phi(-\delta y^f+\alpha_{\text{behind}}(y^f-y^m)-\zeta\log(h^f))f_m(y^m)k_m(h^m|y^m)dh^m dy^m<0,
$$

meaning that increases in the preference parameter decrease the probability of a women entering into a marriage with a secondary earner man. Again, assume that y^m and y^f are bounded and taste shocks are distributed uniformly on the interval $[b,k]$ (such that each potential match has a positive probability of marriage). Suppose there are two women f' and f'' with incomes $y^{f'}<y^{f''}$. In this case,

$$
d\Delta(y^f)/d\alpha_{\text{behind}}\big|_{y^{f'}} = \int_0^{y^{f'}}\int_0^{\bar{h}}\Big(1-\frac{-\delta y^m-\zeta\log(h^m)-k}{b-k}\Big)(y^m-y^{f'})\frac{1}{b-k}f_m(y^m)k_m(h^m|y^m)dh^m dy^m<0
$$

and

$$
\begin{aligned}
d\Delta(y^f)/d\alpha_{\text{behind}}\big|_{y^{f\prime\prime}} &= \int_0^{y^{f\prime}}\int_0^{\bar{h}}\Big(1-\frac{-\delta y^m-\zeta\log(h^m)-k}{b-k}\Big)(y^m-y^{f\prime})\frac{1}{b-k}f_m(y^m)k_m(h^m|y^m)dh^m dy^m \\
&\quad+\int_0^{y^{f\prime}}\int_0^{\bar{h}}\Big(1-\frac{-\delta y^m-\zeta\log(h^m)-k}{b-k}\Big)(y^{f\prime}-y^{f\prime\prime})\frac{1}{b-k}f_m(y^m)k_m(h^m|y^m)dh^m dy^m \\
&\quad+\int_{y^{f\prime}}^{y^{f\prime\prime}}\int_0^{\bar{h}}\Big(1-\frac{-\delta y^m-\zeta\log(h^m)-k}{b-k}\Big)(y^m-y^{f\prime\prime})\frac{1}{b-k}f_m(y^m)k_m(h^m|y^m)dh^m dy^m \\
&< d\Delta(y^f)/d\alpha_{\text{behind}}\big|_{y^{f\prime}}<0
\end{aligned}
$$

Hence, the negative impact on the marriage probability of an increase in the preference parameter is larger among higher earner women. There are two effects. First, if $y^f = y^{f\prime}$, couples with male income in the range $[y^{f\prime}, y^{f\prime\prime}]$ are unaffected by an increase in the preference parameter. Second, there is a stronger crowding out-effect on matches with male income below $y^{f\prime}$ if $y^f = y^{f\prime\prime}$ as compared to $y^f = y^{f\prime}$.

Preferences as a notch in utility: How do these comparative statics change if men's preference for being the primary earner is in form of a notch instead of a kink in utility? In this case, we obtain that the differential probability of marrying a secondary earner husband in the presence of men's preference for being the primary earner as compared to the case where these preferences do not exist equals

$$
\begin{aligned}
\Delta(y^f) &= \int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^m-\zeta\log(h^m)))(1-\Phi(-\delta y^f+\alpha_{\text{behind}}-\zeta\log(h^f)))f_m(y^m)k_m(h^m|y^m)dh^m dy^m \\
&\quad-\int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^m-\zeta\log(h^m)))(1-\Phi(-\delta y^f-\zeta\log(h^f)))f_m(y^m)k_m(h^m|y^m)dh^m dy^m.
\end{aligned}
$$

Taking the derivative with respect to y^f yields

$$
\begin{aligned}
d\Delta(y^f)/dy^f &= \int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^m-\zeta\log(h^m)))\delta\phi(-\delta y^f+\alpha_{\text{behind}}-\zeta\log(h^f)))f_m(y^m)k_m(h^m|y^m)dh^m dy^m \\
&\quad+\int_0^{\bar{h}}(1-\Phi(-\delta y^f-\zeta\log(h^m)))(1-\Phi(-\delta y^f+\alpha_{\text{behind}}-\zeta\log(h^f)))f_m(y^f)k_m(h^m|y^f)dh^m \\
&\quad-\int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^m-\zeta\log(h^m)))\delta\phi(-\delta y^f-\zeta\log(h^f)))f_m(y^m)k_m(h^m|y^m)dh^m dy^m \\
&\quad-\int_0^{\bar{h}}(1-\Phi(-\delta y^f-\zeta\log(h^m)))(1-\Phi(-\delta y^f-\zeta\log(h^f)))f_m(y^f)k_m(h^m|y^f)dh^m.
\end{aligned}
$$

Again, assume that the income distributions are bounded and taste shocks are distributed uniformly on the interval $[b,k]$ (such that each potential match has a positive probability of marriage). Then,

$$
d\Delta(y^f)/dy^f = -\int_0^{\bar{h}}\Big(1-\frac{-\delta y^f-\zeta\log(h^m)-k}{b-k}\Big)\frac{\alpha_{\text{behind}}}{b-k}f_m(y^f)k_m(h^m|y^f)dh^m \leq 0.
$$

Hence, there is a negative impact on the differential probability of marrying a secondary earner man for each additional unit of income earned by a women. Now, consider again two women earning $y^{f''} > y^{f'}$. Does it still hold that the negative impact is increasing in a woman's income y^f, i.e. $d\Delta(y^f)/dy^f|_{y^{f'}} > d\Delta(y^f)/dy^f|_{y^{f''}}$? The effect is ambiguous as it depends on the mass of men at y^f, i.e., $f_m(y^f)$. If $f_m(y^f)$ is small, there will be a small impact of men's preferences on the marriage rate. As a consequence, the marginal impact of men's preferences will be small for women at the top of the income distribution where the density is low, and large for women around the mode of the income distribution. Hence, men's preference for being the primary earner in form of a notch acts equivalently to a proportional tax on women's income in terms of marriage prospects.

Remember that the negative marginal impact of each additional unit of income earned is increasing in a woman's income in the case of preferences in form of a kink. Where does this difference stem from? If the preference is in form of a kink, each additional unit of income earned by a women will reduce the marriage probability for *all* matches where the women out-earns the potential husband. In case of a notch, each additional unit of income earned will reduce the marriage probability only for those matches where the women out-earns the potential husband due to precisely this additional unit of income. In sum, if we conceptualize preferences over relative income as a tax on income in form of marriage returns, we can think of a preference for being the primary earner in form of a kink as a progressive tax, while in case of a notch as a proportional tax.

Next, we again study the comparative statics if we change the strength of the preference parameter. If we assume uniformity of the taste shock as before, we obtain

$$d\Delta(y^f)/d\alpha_{\text{behind}} = -\int_0^{y^f}\int_0^{\bar{h}} \Big(1 - \frac{-\delta y^m - \zeta \log(h^m) - k}{b-k}\Big)\frac{1}{b-k} f_m(y^m) k_m(h^m|y^m) dh^m dy^m \leq 0.$$

Is the impact of an increase in α_{behind} stronger if y^f is larger?

$$d^2\Delta(y^f)/d\alpha_{\text{behind}} dy^f = -\int_0^{\bar{h}} \Big(1 - \frac{-\delta y^f - \zeta \log(h^m) - k}{b-k}\Big)\frac{1}{b-k} f_m(y^f) k_m(h^m|y^f) dh^m \leq 0.$$

Again, if there is a small mass of man around y^f, an increase in the preference parameter does not affect women with higher y^f in a stronger magnitude at the margin.

C.2 Impact of Preferences over Relative Income on Welfare

We conduct a parallel analysis on the impact on women's welfare from a match with a secondary earner man. The results and their intuition mirror those for the marriage rates.

Preferences as a kink in utility: Note that a woman's differential welfare from a match with a secondary earner man in the presence of the men's preferences over relative income compared to the

situation in which such preferences are absent is equal to

$$\begin{aligned} W(y^f) &= \int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^f+\alpha_{\text{behind}}(y^f-y^m)-\zeta\log(h^f))) \\ &\int_{-\delta y^m-\zeta\log(h^m)}^{\infty}(\delta y^m+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m \\ &-\int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^f-\zeta\log(h^f)))\int_{-\delta y^m-\zeta\log(h^m)}^{\infty}(\delta y^m+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m. \end{aligned}$$

Taking the derivative with respect to y^f yields

$$\begin{aligned} dW(y^f)/dy^f &= \int_0^{y^f}\int_0^{\bar{h}}(\delta-\alpha_{\text{behind}})\phi(-\delta y^f+\alpha_{\text{behind}}(y^f-y^m)-\zeta\log(h^f)) \\ &\int_{-\delta y^m-\zeta\log(h^m)}^{\infty}(\delta y^m+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m \\ &-\int_0^{y^f}\int_0^{\bar{h}}\delta\phi(-\delta y^f-\zeta\log(h^f))\int_{-\delta y^m-\zeta\log(h^m)}^{\infty}(\delta y^m+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m. \end{aligned}$$

Again, assume that the income distributions are bounded and taste shocks are distributed uniformly on the interval $[b,k]$ (such that each potential match has a positive probability of marriage). Then,

$$\begin{aligned} dW(y^f)/dy^f &= -\int_0^{y^f}\int_0^{\bar{h}}\frac{\alpha_{\text{behind}}}{b-k} \\ &\int_{-\delta y^m-\zeta\log(h^m)}^{b}(\delta y^m+\zeta\log(h^m)+q_{fm})\frac{1}{b-k}dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m<0. \end{aligned}$$

and

$$d^2W(y^f)/dy^{f2} = -\int_0^{\bar{h}}\frac{\alpha_{\text{behind}}}{b-k}\int_{-\delta y^f-\zeta\log(h^m)}^{b}(\delta y^f+\zeta\log(h^m)+q_{fm})\frac{1}{b-k}dq_{fm}k_m(h^m|y^f)dh^m f_m(y^f)\leq 0.$$

Hence, for women with a higher income y^f there is a stronger impact of men's preferences on welfare. Furthermore, the negative impact on welfare is increasing in a woman's income y^f.
We do a parallel analysis as above for changes in the preference parameter α_{behind}. Note,

$$\begin{aligned} dW(y^f)/d\alpha_{\text{behind}} &= -\int_0^{y^f}\int_0^{\bar{h}}(y^f-y^m)\phi(-\delta y^f+\alpha_{\text{behind}}(y^f-y^m)-\zeta\log(h^f)) \\ &\int_{-\delta y^m-\zeta\log(h^m)}^{\infty}(\delta y^m+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m<0. \end{aligned}$$

Again, suppose there are two women f' and f'' with incomes $y^{f'}<y^{f''}$. and assume that y^m and y^f are bounded and taste shocks are distributed uniformly on the interval $[b,k]$ (such that each potential match has a positive probability of marriage). In this case,

$$dW(y^f)/d\alpha_{\text{behind}}\big|_{y^{f\prime}} = -\int_0^{y^{f\prime}}\int_0^{\bar{h}}(y^{f\prime}-y^m)\frac{1}{b-k}\int_{-\delta y^m-\zeta\log(h^m)}^{b}(\delta y^m+\zeta\log(h^m)+q_{fm})\frac{1}{b-k}dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m < 0.$$

and

$$\begin{aligned} dW(y^f)/d\alpha_{\text{behind}}\big|_{y^{f\prime\prime}} &= -\int_0^{y^{f\prime}}\int_0^{\bar{h}}(y^{f\prime}-y^m)\frac{1}{b-k}\int_{-\delta y^m-\zeta\log(h^m)}^{b}(\delta y^m+\zeta\log(h^m)+q_{fm})\frac{1}{b-k}dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m \\ &\quad -\int_0^{y^{f\prime}}\int_0^{\bar{h}}(y^{f\prime\prime}-y^{f\prime})\frac{1}{b-k}\int_{-\delta y^m-\zeta\log(h^m)}^{b}(\delta y^m+\zeta\log(h^m)+q_{fm})\frac{1}{b-k}dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m \\ &\quad -\int_{y^{f\prime}}^{y^{f\prime\prime}}\int_0^{\bar{h}}(y^{f\prime\prime}-y^m)\frac{1}{b-k}\int_{-\delta y^m-\zeta\log(h^m)}^{b}(\delta y^m+\zeta\log(h^m)+q_{fm})\frac{1}{b-k}dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m \\ &< dW(y^f)/d\alpha_{\text{behind}}\big|_{y^{f\prime}} < 0. \end{aligned}$$

Hence, the impact of an increase in men's preference is bigger if $y^{f\prime\prime} > y^{f\prime}$. The logic follows the intuition of the impact on marriage rates.

Preferences as a notch in utility: In the case in which men's preference for being the primary earner are in form of a notch in utility, a woman's differential welfare from a match with a secondary earner man in the presence of these preference compared to the situation where these preferences are absent is equal to

$$\begin{aligned} W(y^f) &= \int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^f+\alpha_{\text{behind}}-\zeta\log(h^f)))\int_{-\delta y^m-\zeta\log(h^m)}^{\infty}(\delta y^m+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m \\ &\quad -\int_0^{y^f}\int_0^{\bar{h}}(1-\Phi(-\delta y^f-\zeta\log(h^f)))\int_{-\delta y^m-\zeta\log(h^m)}^{\infty}(\delta y^m+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m. \end{aligned}$$

Taking the derivative with respect to y^f yields

$$\begin{aligned} dW(y^f)/dy^f &= \int_0^{y^f}\int_0^{\bar{h}}\delta\phi(-\delta y^f+\alpha_{\text{behind}}-\zeta\log(h^f))\int_{-\delta y^m-\zeta\log(h^m)}^{\infty}(\delta y^m+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m \\ &\quad +\int_0^{\bar{h}}(1-\Phi(-\delta y^f+\alpha_{\text{behind}}-\zeta\log(h^f)))\int_{-\delta y^f-\zeta\log(h^m)}^{\infty}(\delta y^f+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^f)dh^m f_m(y^f) \\ &\quad -\int_0^{y^f}\int_0^{\bar{h}}\delta\phi(-\delta y^f-\zeta\log(h^f))\int_{-\delta y^m-\zeta\log(h^m)}^{\infty}(\delta y^m+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^m)dh^m f_m(y^m)dy^m \\ &\quad -\int_0^{\bar{h}}(1-\Phi(-\delta y^f-\zeta\log(h^f)))\int_{-\delta y^f-\zeta\log(h^m)}^{\infty}(\delta y^f+\zeta\log(h^m)+q_{fm})\phi(q_{fm})dq_{fm}k_m(h^m|y^f)dh^m f_m(y^f). \end{aligned}$$

Again, assume that y^f and y^f are bounded and taste shocks are distributed uniformly on the interval $[b,k]$ and that $y^{f\prime} < y^{f\prime\prime}$ (such that each potential match has a positive probability of marriage). In this case,

$$dW(y^f)/dy^f = -\int_0^{\bar{h}} \frac{\alpha_{\text{behind}}}{b-k} \int_{-\delta y^f - \zeta \log(h^m)}^{b} (\delta y^f + \zeta \log(h^m) + q_{fm}) \frac{1}{b-k} dq_{fm} k_m(h^m|y^f) dh^m f_m(y^f) \leq 0.$$

Consider again two women earning $y^{f\prime\prime} > y^{f\prime}$. Does it still hold that $dW(y^f)/dy^f|_{y^{f\prime}} > dW(y^f)/dy^f|_{y^{f\prime\prime}}$? The effect is ambiguous as it depends on the mass of men at y^f, i.e., $f_m(y^f)$. If $f_m(y^f)$ is small there will be a small impact on welfare. Hence, the marginal impact will be small for top earning women, and large for women around the mode of the income distribution.

We do a parallel analysis as above for changes in the preference parameter α_{behind}. Note,

$$dW(y^f)/d\alpha_{\text{behind}} = -\int_0^{y^f} \int_0^{\bar{h}} \frac{1}{b-k} \int_{-\delta y^m - \zeta \log(h^m)}^{b} (\delta y^m + \zeta \log(h^m) + q_{fm}) \frac{1}{b-k} dq_{fm} k_m(h^m|y^m) dh^m f_m(y^m) dy^m \leq 0.$$

Is the impact of an increase in α_{behind} stronger if y^f is larger?

$$d^2W(y^f)/d\alpha_{\text{behind}} dy^f = -\int_0^{\bar{h}} \frac{1}{b-k} \int_{-\delta y^f - \zeta \log(h^m)}^{b} (\delta y^f + \zeta \log(h^m) + q_{fm}) \frac{1}{b-k} dq_{fm} k_m(h^m|y^f) dh^m f_m(y^f) \leq 0.$$

Hence, if there is a small mass of man around y^f, an increase in the preference parameter does not affect women with higher y^f in a stronger way at the margin.