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Twenty-five hours in a day: On job flexibility and the intrahousehold allocation of time and money*

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Abstract

Flexible work schedules and telecommuting may help to improve the combination of work and family. This is arguably most important in households with (young) children. An open question is whether job flexibility can increase the well-being of the children, which depends, in part, on the time spent on child care by the parents. In couples, the allocation of time depends not only on the time and budget constraints these couples are faced with, but also on the (possibly diverging) preferences of mothers and fathers and their respective bargaining positions. To address this question, we propose a rich collective model describing the intrahousehold allocation of time and money, where children's well-being is treated as a domestically produced good. Job flexibility may influence this domestic production process as a production shifter, capturing that flexible jobs can ease constraints on child care time parents may encounter. We apply our model to a unique sample of Dutch couples with children and find that job flexibility significantly impacts the production of children's well-being. While the results indicate that more job flexibility for fathers may help parents to balance work and family, they imply that more job flexibility for mothers may not allow parents to achieve the same. The overall implications for children's well-being appear negative, albeit limited.

Keywords: Household behavior, labor supply, gender differences, amenities, job flexibility, child care.

JEL Codes: D13, J12, J22.

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1 Introduction

Many developed countries face a shortage of labor supply. This trend is mostly due to population ageing, but recently has been reinforced by increased preferences for leisure and good working conditions (Autor, 2021; Causa, Abendschein, Luu, Soldani, & Soriolo, 2022). Policymakers all over the world are therefore discussing how to increase labor supply, in particular female labor supply that has been traditionally low after childbirth. However, there are growing concerns on the impact of the increasing labor supply of mothers on the time spent on children, and its translation into child outcomes (Agostinelli & Sorrenti, 2021; Del Boca, Flinn, & Wiswall, 2014; Houmark, Løchte Jørgensen, Kristiansen, & Gensowski, 2022).

The above-mentioned changing preferences for leisure and good working conditions are strongly associated with the aim of many mothers and fathers for a better work-life balance. A recent literature in labor economics has shown that increasing job flexibility, in the form of flexible work schedules and telecommuting, may help both mothers and fathers to combine work and family life (Bang, 2021; Goldin, 2014; von Gaudecker, Holler, Simon, & Zimpelmann, 2023). What has yet to be explored is the question of whether job flexibility also helps to improve children's well-being.

This question is not easy to answer. While flexibility may *loosen* the time constraints households are faced with, it is not immediately clear how this translates into children's well-being. Children's well-being depends among other things on the time spent on child care by their parents. The intrahousehold allocation of time in turn depends not only on the time and budget constraints of couples, but also on the preferences of both mothers and fathers, and their respective bargaining positions inside their households.

To address the question of whether job flexibility improves children's well-being in couples, we extend the collective labor supply models of Blundell, Chiappori, and Meghir (2005) and Cherchye, De Rock, and Vermeulen (2012) to account for job flexibility. Within our framework, we assume that job flexibility refers to worker amenities related to the timing and location of work, such as flexible work schedules and telecommuting opportunities. It does not capture amenities related to the number of working hours (such as being able to work part-time), as the labor supply decisions of the spouses are modeled separately.

Our model further assumes that working mothers and fathers care not only about their own consumption of goods and leisure, but also about the well-being of their children, which they can influence by investing time and monetary resources into their children. In addition, parents also care for another public good inside the household, which could be interpreted as the joy of a clean and cozy house. The latter domestic good is obtained by both monetary resources (think of expenses on rent or heating) and time spent on the chores by both spouses. Importantly, the preferences of parents, including with respect to the well-being of their children, are allowed to differ from each other. The observed allocation of resources is then assumed to result from a Pareto-efficient intrahousehold bargaining process as in Chiappori (1988) and Chiappori (1992).

In our model, children's well-being is a domestically produced good à la Becker (1965). Important to our setting, is that the job flexibility of both parents are production shifters, which poten-

tially affect the intrahousehold production process. Cherchye et al. (2012) introduced production shifters in their collective model with multiple public goods for identification purposes. A production shifter is any variable that affects individual preferences only through the household production technology, and which does not affect the household budget constraint nor the bargaining power of the spouses in a couple. Since our model will be shown to be overidentified, spouses' job flexibility levels are not needed for identification. As such, our model will ultimately allow us to provide an answer on the impact of increasing job flexibility on children's well-being by letting the data speak.

The main idea behind parents' job flexibility levels as production shifters is that they may help mothers and fathers to use the time spent with children more productively. For example, it may allow parents to work from home when a child is ill, or to take a break from work to bring the child to the doctor. Our model will be able to capture that working in flexible jobs can provide a better balance between own work and family responsibilities. On top of this, the model further allows for the job flexibility of, say, the father, to influence the decisions of the mother. Fathers generally work full-time and spend few hours on child care. To the extent that more flexible jobs could enable fathers to better balance work and family, as such allowing them to take up a greater share of child care responsibilities, we could expect further positive effects on the labor supply of mothers. Flexible jobs may thus *loosen* the constraints households are faced with; empowering mothers to hold down full-time positions and allowing fathers to take up more child care responsibilities, all while maintaining the well-being of the children. Similarly, we allow job flexibility to have an influence on the production process of the other domestic good, which relates primarily to housing. For example, a spouse with a flexible job may be able to start the washing machine between two meetings, or be at home when a handyman comes.

One final issue that we need to address in our model, is that a worker's job flexibility is not necessarily exogenous: workers sort into particular jobs, and the level of job flexibility might be one of the drivers of this choice, along with the wage package and other working conditions. At the same time, it can be argued that the endogeneity of job flexibility is less pressing if changing flexibility levels around childbirth is difficult (De Schouwer & Kesternich, 2024). In addition, our data are post-Covid and thus concern a situation after a large and unexpected change in workers' flexibility levels (von Gaudecker et al., 2023). Still, to the extent that parents' flexibility levels are not unrelated to their preferences, we will instrument job flexibility using cost and demand shifters, such as the attitude of the direct superior to a change in flexibility or the availability of non-parental child care for unexpected situations.

It is clear from the above discussion that the application of our model warrants detailed data, which covers a variety of aspects of household behavior. We do not only need extensive information on time use and consumption inside households, but also on spouses' wages and job flexibility levels, and instrumental variables for the latter. Our model will be applied to a unique data set that is representative of Dutch couples with children. The sample consists of two subsets. The first subset is drawn from the Longitudinal Internet Studies for the Social Sciences (LISS) household

panel administered by Centerdata (Tilburg University). We added a module to the June 2022 wave of the LISS panel aimed at filling informational gaps in the LISS Core Study, mainly focusing on job flexibility and its instruments. Since the number of observations in this sample is somewhat small, the second subset of our data is the result of an own data collection effort in collaboration with the market research company Bilendi. Making use of the platform provided by Bilendi, we fielded our own survey between November 2022 and January 2023 to obtain another representative data set for Dutch couples with children, with the same informational content as the first subset of data.

The main findings of our structural analysis are the following: Not surprisingly, mothers and fathers care for the well-being of their children, as reflected in their respective individual preferences. We further find that job flexibility significantly influences the domestic production technologies. With respect to children's well-being, the results indicate that the job flexibility level of the father particularly matters. In couples where fathers are employed in more flexible jobs, fathers' time input in domestic production is relatively more productive. In contrast, the results show that more job flexibility for mothers does not significantly affect the relative productivity of the time and money inputs. We also find that the bargaining power of spouses is significantly affected by their wages. Thus, the fact that mothers tend to work in jobs with lower wages, implies that the intrahousehold allocations of time and money will be more according to the preferences of husbands than to their wives'. Of course, this should not hide the fact that there is substantial heterogeneity across spouses in wages, and thus in the intrahousehold allocation of resources.

To further analyze the impact of changes in parents' job flexibility levels, we conducted several counterfactual simulations. The first set of simulations increases the existing job flexibility levels of mothers and fathers, respectively. Mothers and fathers start out with similar job flexibility levels, on average. However, they do start from different positions regarding the allocation of time to market and domestic work, which may help explain potential differences in outcomes based on the parent that is targeted.

Increasing the job flexibility of mothers increases their labor supply, but reduces their time spent on child care and other chores. At the same time, fathers reduce their time on the market while increasing their domestic responsibilities. Mothers often work part-time and spend a considerable amount of time on domestic duties. For them, the domestic workload could mean that part-time positions are the most they can get out of their remaining time. The increased flexibility in their jobs may allow them to more easily work full-time positions while still maintaining the well-being of their children. To a certain extent, this will come at the expense of domestic hours. However, as a result, it may induce fathers to partly take over some of these responsibilities.

When the job flexibility of fathers is increased, the effects go in the same direction. Fathers generally work full-time and spend few hours on domestic work. For them, the full-time nature of their jobs may not allow them to spend as much time on child care and other chores. The increased flexibility in their jobs may therefore enable them to partake more in domestic work. In this case, this can alleviate part of the child care burden falling on mothers, allowing these mothers to increase their hours in the labor market.

Both simulations work to reduce specialization in the household. However, the magnitudes of the effects are bigger when the job flexibility of fathers, as opposed to mothers, is targeted. The gender gaps in labor supply and domestic work are substantially reduced in this case.

An important difference between the two simulations is observed for the domestic goods. Children's well-being slightly increases when mothers' job flexibility is increased, while children's well-being decreases when fathers' job flexibility is increased. These opposite effects can be explained by the opposing implications for household resources (which are partly spent on children's well-being). In both cases, there is substitution towards the less rewarding market labor of mothers; however, when fathers are targeted, it is not sufficiently compensated, thus resulting in a net loss.

We conducted two additional sets of counterfactual simulations: One in which more job flexibility is associated with lower wages, and one where there is also room for shifts in the spouses' bargaining positions due to these wage changes. The additional effects work to attenuate the standalone effects of increasing job flexibility of mothers, but exacerbate the standalone effects in the case of fathers. These additional effects follow from standard income and substitution effects due to changing wages and resulting income effects following from a shift in the distribution of intra-household resources. Importantly, for these simulations, we find that they imply lower children's well-being, mainly due to fewer household resources following the wage decreases.

While greater job flexibility still leads to reduced gender gaps in both market and domestic working hours, it does not lead to increased children's well-being in the short-run. Nevertheless, to the extent that the increase in female labor supply results in higher hourly wages for women in the medium- to long-run (for example, because jobs with long hours offer better pay), the long-term effect on children's well-being may be different if household incomes would consequently increase.

Our paper relates to several strands in the literature. Firstly, it relates to the literature on gender differences in preferences for flexible jobs. A number of papers have used hypothetical choice or field experiments to elicit preferences for job flexibility – in particular, having more scheduling flexibility (Eriksson & Kristensen, 2014; Wiswall & Zafar, 2018) or the ability to work from home (Maestas, Mullen, Powell, von Wachter, & Wenger, 2023; Mas & Pallais, 2017). These studies document that women tend to have a significantly higher willingness to pay for different forms of work flexibility than men, in particular when they have children.[1] In this paper, we provide a formal framework that describes a mechanism through which flexible jobs may affect the behavior of mothers and fathers. By including parents' job flexibility levels as production shifters, the model can capture that flexible jobs may facilitate a more equal division of child care duties in the household. As such, flexible jobs can be attractive as they may provide parents with a way to better combine work and family.

In doing so, we further build on a vast body of literature highlighting the role of children in driv-

[1] These findings are corroborated by De Schouwer and Kesternich (2024) on Dutch data. Interestingly, the authors show that these higher preferences for flexible jobs by women do not necessarily translate in women sorting into such jobs. They further highlight the role of preferences for meaningful work as a potential explanation for this so-called *flexibility puzzle*.

ing gender differences in labor market outcomes. A number of recent studies have employed event study approaches to analyze the consequences of children on women's labor market behaviors (Andresen & Nix, 2022; Angelov, Johansson, & Lindahl, 2016; Kleven, Landais, & Leite-Mariante, 2024; Kleven, Landais, & Søgaard, 2019). As these papers show, the arrival of children significantly impacts women's participation and labor supply behavior, as well as their preferences for jobs offering family-friendly amenities (such as the ability to work from home), whereas for men, childbirth is largely a non-event.[2] These findings resonate with the narrative provided by Goldin (2014) that gender differences in time spent on household work, particularly on child care, create gender asymmetries in participation, hours worked, and wages. As she argues, providing the dominant share of child care activities naturally constrains the amount of time available for mothers to spend on market work and creates stronger preferences for flexible jobs.

Much of the empirical literature on the labor market behavior of parents around childbirth implicitly takes a single agent perspective, ignoring that decisions on labor supply and child care time are generally taken at the household level, with parents who do not necessarily share similar preferences. Few papers have translated the idea of Goldin (2014) in models with joint household decisions making (see, for example Erosa, Fuster, Kambourov, & Rogerson, 2022 and Jang & Yum, 2022), assuming unitary household preferences.[3] In the current paper, we analyze behavior through the lens of a structural model of household labor supply that accounts for the job flexibility of parents and that explicitly recognizes that partners in couples do not necessarily have homogeneous preferences while they are involved in an intrahousehold bargaining process (Chiappori, 1988, 1992).[4] By considering the role of non-wage characteristics, such as job flexibility, in the model of Cherchye et al. (2012), we further contribute to the literature on the collective approach to household behavior.

The context of our model is static and one in which respondents have children already, therefore taking fertility as exogenously given. While we will thus not be be able to say much on how the behavior of prospective parents changes in response to childbirth (for example, as in Bang, 2021), the model will allow us to evaluate the labor market *and* child care choices of parents as a function of their job flexibility levels and bargaining positions. We do view extending the model in this paper in these directions as promising avenues for further research.

[2] In an earlier paper, Felfe (2012) uses a first-difference design on German data to explore the role of job amenities in explaining the motherhood gap in wages. Similarly, she documents that a large fraction of mothers work fewer hours after the arrival of children. In addition, a smaller fraction of mothers accommodate by changing their behavior in several dimensions, including switching to jobs with more flexible work schedules.

[3] See also Adda, Dustmann, and Stevens (2017). While these authors focus solely on female behavior over the lifecycle, they do condition on characteristics of husbands if present.

[4] The restrictions imposed on observed behavior by the unitary model have been rejected on numerous occasions. Most notably, the income pooling hypothesis, which states that the origin of nonlabor income in the household does not matter for behavior, has been rejected when tested on samples of couples. See, for example, Browning, Bourguignon, Chiappori, and Lechene (1994), Lundberg, Pollak, and Wales (1997), and Duflo (2003). Moreover, while symmetry of the Slutsky matrix is not rejected on samples of singles, it has been rejected on couples, while its collective counterpart holds for couples (Browning & Chiappori, 1998). The latter results are corroborated by nonparametric revealed preference tests of the unitary and collective model (Cherchye, De Rock, & Vermeulen, 2009; Cherchye & Vermeulen, 2008).

The rest of this paper is structured as follows. Section 2 presents the theoretical framework. It discusses the main features of our proposed collective model incorporating job flexibility and provides an identification result. In Section 3, we present the empirical application of the model. We start by discussing the data set at hand and the parametric specifications of the model components. Subsequently, we present the estimation strategy and results. Section 4 presents counterfactual simulations. Section 5 concludes.

2 Model

In this section, we will formally introduce the model by means of which we will analyze how working parents make choices regarding their time use and the allocation of the household's monetary resources to own consumption, expenses on children and other expenses in a context with job flexibility. This model starts from the collective model of Cherchye et al. (2012), which is extended with spouses' job flexibility levels.

We assume that each (heterosexual) couple consists of two adult members – mothers and fathers ($i = m, f$) – and at least one child.[5] Only adults are decision makers.[6] Mothers and fathers can allocate their time available to market work (ℓ^i), child care (t_c^i), household chores (t_h^i) and leisure (l^i). Consequently, each adult member ($i = m, f$) in the household is faced with the following time constraint, where the total time endowment is denoted by T:

$$\ell^i + l^i + t_c^i + t_h^i = T. \tag{1}$$

For each unit of time that an adult member dedicates to market work, she or he is remunerated with a market wage (w^i). Additionally, the household receives a nonlabor income (y). The household's monetary resources (consisting of the spouses' labor incomes and the household's nonlabor income) are on their turn spent on a Hicksian composite good with a prize normalized to one. We assume that this Hicksian composite good is used to cover the adult members' private expenditures (e^m and e^f), the expenditures on children (e^c) and expenditures on other public goods in the household, such as rents or expenses on energy (e^h). Hence, on top of the individual time constraints, the household is faced with the following budget constraint:

$$e^m + e^f + e^c + e^h \leq w^m \ell^m + w^f \ell^f + y. \tag{2}$$

The collective approach explicitly recognizes that spouses may have different preferences over the allocations that the couple makes. In what follows, we assume that mothers and fathers ($i = m, f$) derive utility from their own consumption e^i and leisure l^i, and from two Beckerian domestically produced goods that enter as public goods in the spouses' utility functions. The first of these goods, denoted by u^c, is children's well-being. It is produced by the parental time spent on

[5] We concentrate on heterosexual couples, since we observe very few same-sex couples with children in our data.
[6] For a discussion, see Dauphin, El Lagha, Fortin, and Lacroix (2011).

the children t_c^m and t_c^f and the household's expenses on children e^c. The second public good is denoted by u^h, and is produced by the spouses' time spent on the household chores t_h^m and t_h^f and the expenses e^h. We assume that the adult members' preferences ($i = m, f$) can be represented by individual utility functions that are strictly increasing, strongly concave, and twice continuously differentiable:

$$u^i = u^i\left(e^i, l^i, u^c, u^h\right). \tag{3}$$

Following Cherchye et al. (2012), we assume that the public goods u^c and u^h are produced by production technologies that are strictly increasing, strongly concave, twice continuously differentiable and linearly homogeneous in time and money (which implies constant returns to scale). For identification purposes, these technologies may depend on production shifters (cf. infra). As mentioned earlier, a production shifter is a variable that affects the preferences of mothers and fathers only through the household production technologies. In Cherchye et al. (2012), for example, the average age of the children in the household is a production shifter; this based on the idea that younger children require more maternal care than older children. We denote the production shifters by the vectors $\boldsymbol{s^c}$ and $\boldsymbol{s^h}$.

We further introduce the job flexibility levels of both parents as additional production shifters in the domestic technologies of both public goods. Job flexibility is assumed to be a continuous, scalar measure; however, it still captures amenities relating both to the timing and location of work.[7] Consistent with the model, it does not entail any amenities relating to the number of hours of work (such as being able to work part-time), as the labor supply decisions of parents are modeled separately.

With respect to children's well-being, the idea is that flexible jobs potentially allow parents to better balance work and family responsibilities. For example, a parent with discretion over their own working schedule or who can easily work from home could be better equipped to spend time with a suddenly ill child to increase their well-being compared to a parent with a less flexible job (e.g., due to an employer demanding schedule changes at short notice). Within our model, this implies that parents with different job flexibility levels produce children's well-being by means of different production technologies. One could expect that the marginal productivity of time spent on child care is higher with a flexible job. In addition, flexibility may also affect the domestic production of other public goods by allowing parents to flexibly switch between household chores and work.

Importantly, we do not need the job flexibility levels to identify our model. Whether job flexibility impacts the domestic production of children's well-being (or the other public goods for that matter) is therefore an empirical question that will be answered by our empirical analysis. Of course, given that individuals sort into jobs with differing levels of job flexibility, the latter is endogenous. Consequently, we will instrument the parents' job flexibility levels in the application.

[7] For more details on the definition of the job flexibility measure and the construction from the data, we refer the reader to Section 3.1 of the empirical application and Appendix C.

Let a^i denote parent i's ($i = m, f$) level of job flexibility and let $\boldsymbol{a}$ be the vector collecting both parents' flexibility levels. Summarizing, we thus obtain the following domestic technologies:

$$u^c = u^c\left(e^c, t_c^m, t_c^f; \boldsymbol{s^c}, \boldsymbol{a}\right), \tag{4}$$

$$u^h = u^h\left(e^h, t_h^m, t_h^f; \boldsymbol{s^h}, \boldsymbol{a}\right). \tag{5}$$

Parents have different preferences in our model. How then do parents allocate their time and the household's budget to the different commodities? As mentioned before, we will adopt the collective approach to provide an answer to that question (Chiappori, 1988, 1992). The collective approach does not impose any additional assumptions on household behavior other than Pareto efficiency. It implies that both parents are assumed to be engaged in a bargaining process over different allocations, where the resulting allocation is only restricted to be on the Pareto frontier. The location of the chosen allocation then depends on the relative bargaining positions of both household members. Given our assumptions on both spouses' individual preferences and the linear household budget, the spouses relative bargaining positions are represented by their Pareto weights (Browning, Chiappori, & Weiss, 2014). The latter in general depend on variables such as the spouses' wages or the household's nonlabor income and so-called distribution factors. These are defined as variables that affect the spouses' bargaining power and which do not change their preferences nor the household budget constraint. Let us denote spouse f's Pareto weight by $\mu(w^m, w^f, y, \boldsymbol{z})$, where $\boldsymbol{z}$ is the vector of distribution factors. We will assume that the Pareto weight is continuously differentiable in all its arguments. Spouse m's Pareto weight then equals $1 - \mu(w^m, w^f, y, \boldsymbol{z})$.

Formally, the observed allocations are assumed to be derived from the following optimization program:

$$\begin{aligned}
\max_{\{l^i, t_c^i, t_h^i, e^i, e^c, e^k;\ i=m,f\}} \quad & \Big(1 - \mu\big(w^m, w^f, y, \boldsymbol{z}\big)\Big) u^m\Big(e^m, l^m, u^c\big(e^c, t_c^m, t_c^f; \boldsymbol{s^c}, \boldsymbol{a}\big), u^h\big(e^h, t_h^m, t_h^f; \boldsymbol{s^h}, \boldsymbol{a}\big)\Big) \\
& + \mu\big(w^m, w^f, y, \boldsymbol{z}\big) u^f\Big(e^f, l^f, u^c\big(e^c, t_c^m, t_c^f; \boldsymbol{s^c}, \boldsymbol{a}\big), u^h\big(e^h, t_h^m, t_h^f; \boldsymbol{s^h}, \boldsymbol{a}\big)\Big) \\
\text{s.t.} \quad & e^m + e^f + e^c + e^h \leq w^m \ell^m + w^f \ell^f + y \\
& \ell^i + l^i + t_c^i + t_h^i = T, \qquad i = m, f.
\end{aligned} \tag{P}$$

The solution to optimization program (P) provides us with a system of observable functions of the parents' wages (w^m and w^f), the household's nonlabor income (y), the distribution factors ($\boldsymbol{z}$), the parents' job flexibility levels ($\boldsymbol{a}$), and the (other) production shifters ($\boldsymbol{s^c}$ and $\boldsymbol{s^h}$):

$$l^i = l^i\left(w^m, w^f, y, \boldsymbol{z}, \boldsymbol{a}, \boldsymbol{s^c}, \boldsymbol{s^h}\right), \quad i = m, f \tag{6}$$
$$t_c^i = t_c^i\left(w^m, w^f, y, \boldsymbol{z}, \boldsymbol{a}, \boldsymbol{s^c}, \boldsymbol{s^h}\right), \quad i = m, f \tag{7}$$
$$t_h^i = t_h^i\left(w^m, w^f, y, \boldsymbol{z}, \boldsymbol{a}, \boldsymbol{s^c}, \boldsymbol{s^h}\right), \quad i = m, f \tag{8}$$
$$e^i = e^i\left(w^m, w^f, y, \boldsymbol{z}, \boldsymbol{a}, \boldsymbol{s^c}, \boldsymbol{s^h}\right), \quad i = m, f \tag{9}$$
$$e^c = e^c\left(w^m, w^f, y, \boldsymbol{z}, \boldsymbol{a}, \boldsymbol{s^c}, \boldsymbol{s^h}\right), \tag{10}$$
$$e^h = e^h\left(w^m, w^f, y, \boldsymbol{z}, \boldsymbol{a}, \boldsymbol{s^c}, \boldsymbol{s^h}\right). \tag{11}$$

Based on Proposition 2 in Blundell et al. (2005) and Proposition 1 in Cherchye et al. (2012), it can be shown that the sole observation of this system of demand equations is sufficient to recover all the structural components of the model – that is, individual preferences (u^m and u^f), the domestic technologies (u^c and u^h), and the decision process as captured by the Pareto weight (μ). The model is generically identified under the relatively weak condition that either there is at least a single distribution factor and a single production shifter, or there are two different production shifters.

In the next section, we will discuss the data to which the above model will be applied to and the functional specification of the structural components of the model, together with the resulting set of demand equations.

3 Empirical application

3.1 Data and descriptive statistics

To be able to estimate the above system of demand equations, we do not only need to observe spouses' detailed time use and the allocation of the household's budget to different commodities, but also wages, nonlabor income, distribution factors and production shifters, where the latter contain spouses' job flexibility levels. We gathered unique data, representative of Dutch couples with children, which allows us to apply our collective labor supply model.

Our data set consists of two subsets. A first subset was collected through the Longitudinal Internet Studies for the Social Sciences (LISS) household panel administered by Centerdata (Tilburg University). The LISS panel gathers yearly data on a true probability sample of the Dutch population and allows researchers to collect additional information through separate modules. We appended a module to the June 2022 wave aimed at filling informational gaps in the LISS Core Study, mainly focusing on job flexibility and its instruments. Because of a relatively small sample size, we added a second subset to our data set that is the result of an own data collection effort in collaboration with the market research company Bilendi. Making use of the platform provided by Bilendi, we fielded our own survey between November 2022 and January 2023. Bilendi has a representative pool of pre-recruited participants at its disposal who are regularly invited to partake in online surveys. In the online survey, participants were presented with a series of questions regard-

ing themselves and their partner. However, in cases where preferred, the partner could make use of the option to complete a separate, abbreviated survey to provide individual responses to several questions.

The data contain detailed information on the weekly time allocation of each partner as well as information on the household's monthly expenditure. To retrieve information on weekly time use, respondents were asked to allocate 168 hours (a full week) among a range of different categories based on their (and their partner's) actual activities in a typical week.[8] Using these categories, we obtain figures for the weekly hours spent on market work, weekly hours spent on child care activities by both mothers and fathers, weekly hours spent on the household chores by both spouses, and weekly hours spent on leisure activities for each partner. In the empirical application, we will impose a weekly time endowment of 112 hours.[9]

Respondents were further asked three questions related to the household's non-durable monthly expenditure on goods and services. First, the respondent was asked to provide the overall level of common expenses in the household, including expenditures on rent, utilities, transportation, and insurance. Subsequently, the respondent was asked about the household's monthly expenditures on children. To improve accuracy, respondents in the Bilendi survey had to allocate expenditures to eight different categories, including expenditures on children's clothing, schooling, medical expenses, and child care.[10] Lastly, the respondent was asked about each partner's private expenditure – among others, how much each partner typically spends on clothing, medical expenses, personal care products, and leisure activities. We use these figures to compute the part of the household's budget that is allocated to the members' private expenditures, the expenditures on children, and other expenditures on public goods inside the household on a weekly basis.[11]

An important feature of both subsets of our data is that they contain information on individual wages and various non-wage attributes related to job flexibility for each adult in the household. Respondents were presented with a series of questions aimed at measuring the level of certain amenities in their current jobs, all of which can be related to job flexibility. In particular, respondents were asked about their ability to adjust their working schedules, and the option to work from

[8] The time use categories in the Bilendi survey are more aggregated than those in the LISS module. For example, in the LISS module, time spent cooking, doing groceries, and performing other domestic chores are all distinct categories, whereas in the Bilendi survey they are all collected under domestic chores. In total, the Bilendi survey has seven time use categories. The LISS module has fourteen categories. More details on the different categories across both surveys can be obtained upon request.

[9] This time endowment captures the weekly amount of non-sleeping time available to the individual given an average of eight hours of daily sleep and personal care. See Cherchye, De Rock, Lewbel, and Vermeulen (2015) and Cherchye, Demuynck, De Rock, and Vermeulen (2017) for the same time endowment assumption.

[10] In contrast, parents in the LISS module were not asked to allocate expenditures on children to different categories. Rather, similar categories were provided as examples to the respondents. Nevertheless, this difference in approach could lead to differences in the reported expenditures on children. By explicitly asking respondents in the Bilendi survey to allocate child-related expenditures across eight different categories, they were made aware of certain expenditures that may not have been immediately apparent, such as registration fees and costs tied to sports and other hobbies of the children.

[11] In the Bilendi survey it was possible for the respondent's partner to provide individual responses to the expenditure questions. In case the respondent's partner made use of this option, we calculate the household's common expenses as the average of what each partner responded individually. We proceed in a similar fashion for couples in the LISS module where both partners provided expenditure information.

home. To obtain a measure of job flexibility, we create an index by extracting the first principal component of these two variables.[12] These two aspects have been the focus of much of the literature on flexible work and in the policy debate.

For the empirical application of the model, we restrict the sample to heterosexual couples with at least one resident child under 18. Furthermore, we only consider couples with both partners participating in the labor market. Couples with self-employed partners are dropped. To mitigate outliers, we exclude couples with either partner outside the 2.5th and 97.5th quantiles of the male or female hourly wage distribution. After removing couples with important missing information, we have a final sample of 464 couples with children – 93 from the LISS data set and 371 from the Bilendi data set.

Table 1 presents summary statistics on the main variables in the final sample. On average, mothers have slightly lower private expenditures than fathers (195 euros per month versus 207 euros per month). These similar averages hide that in many couples, there is a substantial heterogeneity with respect to the spouses' own expenditures. For example, the average share of mothers' private expenditures in the aggregate private expenditures of both spouses equals about 50%, while the first and third quartiles are equal to respectively 44% and 57%. Couples spend 812 euros per month on their children, on average. As is clear from the table, however, the majority of the household's budget is used to cover common expenditures, such as expenditures on rent and utilities, which amount to 2086 euros per month, on average.

With respect to the time use variables, we see that fathers supply considerably more hours to the market than their spouses. Whereas fathers spend around 43.4 hours working per week, mothers only work 31.9 hours per week. On the other hand, mothers provide the dominant share of domestic work in the household. On average, mothers dedicate about 26.4 hours per week to child care and 14.8 hours to other household chores. In contrast, fathers spend 18.6 hours per week on child care duties and 9.8 hours on household chores. Taken together, mothers devote slightly more time to both market and domestic work than fathers (73.1 hours for mothers compared to 71.8 hours for fathers).

Turning to the socioeconomic variables, we can see that fathers are generally slightly older and less often highly educated than the mothers in our sample. Households in our sample have, on average, fewer than two children. The average age of the youngest child across households is around seven years old. In terms of wages, we observe fathers earning more than mothers for each hour of labor supplied to the market. While fathers earn 25.9 euros per hour worked, mothers receive only 23.4 euros per hour.

Importantly, mothers and fathers have comparable levels of flexibility in their jobs, with mothers having a bit more job flexibility, on average. Whereas mothers are more likely to enjoy more schedule flexibility in their jobs, fathers are somewhat more likely to enjoy greater telecommuting possibilities. Still, on average, mothers have both more schedule flexibility and telecommuting possibilities than fathers, which drives the difference in job flexibility levels.

[12] More details are presented in Appendix C.

3.2 Parametric specification

The collective model outlined in Section 2 was formulated in general terms, without imposing any parametric structure. To bring this model to the data, we will impose additional structure on the individual preferences, the domestic technologies, and the Pareto weights. On its turn, this will define the parametric specification of the system of demand equations, which is the reduced form of our structural model. In what follows, we discuss the proposed parametric specifications for the individual utility functions (u^m and u^f), the domestic technologies (u^c and u^h), and the Pareto weight (μ). Along the way, we discuss the distribution factors ($\boldsymbol{z}$) and production shifters ($\boldsymbol{s^c}$ and $\boldsymbol{s^h}$) that will be considered in our analysis.

We opt for a direct utility representation of the individual members' preferences. As is well-known, direct utility representations that result in an explicit reduced form are often less flexible. However, this is less of an issue here given our setting with bargaining between individuals with own preferences in a context with home production. In particular, we assume that the adult members' preferences can be represented by the following Cobb-Douglas preferences ($i = m, f$):

$$u^i\left(e^i, l^i, u^c, u^h\right) = \alpha_e^i \ln e^i + \alpha_l^i \ln l^i + \alpha_c^i \ln u^c + \alpha_h^i \ln u^h, \tag{12}$$

where the parameters α_j^i ($j = e, l, c, h$) add up to one. To allow for heterogeneity among mothers and fathers, the preference parameters will further depend on taste shifters ($\boldsymbol{d}^i$), such as the individual's age and a dummy for a university or higher vocational degree, as follows:

$$\alpha_e^i(\boldsymbol{d}^i) = 1 - \alpha_l^i(\boldsymbol{d}^i) - \alpha_c^i(\boldsymbol{d}^i) - \alpha_h^i(\boldsymbol{d}^i) \tag{13}$$

$$\alpha_j^i(\boldsymbol{d}^i) = \frac{\exp\left(\tilde{\boldsymbol{\alpha}}_j^{\boldsymbol{i}} \cdot \boldsymbol{d}^i\right)}{1 + \exp\left(\tilde{\boldsymbol{\alpha}}_l^{\boldsymbol{i}} \cdot \boldsymbol{d}^i\right) + \exp\left(\tilde{\boldsymbol{\alpha}}_c^{\boldsymbol{i}} \cdot \boldsymbol{d}^i\right) + \exp\left(\tilde{\boldsymbol{\alpha}}_{\boldsymbol{h}}^{\boldsymbol{i}} \cdot \boldsymbol{d}^i\right)} \quad \text{for } j = l, c, h. \tag{14}$$

Next, we assume that the domestic technologies can be characterized by the following Cobb-Douglas production functions:

$$\ln u^c\left(e^c, t_c^m, t_c^f; \boldsymbol{s^c}, \boldsymbol{a}\right) = \beta_e^c(\boldsymbol{s^c}, \boldsymbol{a}) \ln e^c + \beta_m^c(\boldsymbol{s^c}, \boldsymbol{a}) \ln t_c^m + \beta_f^c(\boldsymbol{s^c}, \boldsymbol{a}) \ln t_c^f \tag{15}$$

$$\ln u^h\left(e^h, t_h^m, t_h^f; \boldsymbol{s^h}, \boldsymbol{a}\right) = \beta_e^h(\boldsymbol{s^h}, \boldsymbol{a}) \ln e^h + \beta_m^h(\boldsymbol{s^h}, \boldsymbol{a}) \ln t_h^m + \beta_f^h(\boldsymbol{s^h}, \boldsymbol{a}) \ln t_h^f \tag{16}$$

The parameters $\beta_j^k(\boldsymbol{s^k}, \boldsymbol{a})$ ($k = c, h$; $j = e, m, f$) are technology coefficients. They capture the relative intensity of the inputs used in the domestic production process. Given the assumption of constant returns to scale, the technology parameters for each public good add up to one. To ensure

this holds, we assume that they depend on the production shifters as follows ($k = c, h$):

$$\beta_e^k(\boldsymbol{s}^k, \boldsymbol{a}) = 1 - \beta_m^k(\boldsymbol{s}^k, \boldsymbol{a}) - \beta_f^k(\boldsymbol{s}^k, \boldsymbol{a}), \tag{17}$$

$$\beta_j^k(\boldsymbol{s}^k, \boldsymbol{a}) = \frac{\exp\left(\tilde{\boldsymbol{\beta}}_j^k \cdot \boldsymbol{s}_j^k\right)}{1 + \exp\left(\tilde{\boldsymbol{\beta}}_m^k \cdot \boldsymbol{s}_m^k\right) + \exp\left(\tilde{\boldsymbol{\beta}}_f^k \cdot \boldsymbol{s}_f^k\right)} \quad \text{for } j = m, f. \tag{18}$$

The vector $\boldsymbol{s}_j^k$ ($j = m, f$) contains the production shifters associated with technology parameter j of public good k. It includes a constant term, the age of the youngest child in the household, and the number of children in the household.[13] Importantly, to this vector of production shifters, we add the job flexibility level a^j of adult member j in the household. To account for the possible endogeneity of this variable, we further include the member-specific first-stage residual obtained from an auxiliary regression on the exogenous variables in the model and a set of instruments (see Section 3.3 for more details). This approach originates from Hausman (1978) and is further formalized for nonlinear models in Terza, Basu, and Rathouz (2008) and Wooldridge (2015).

It is worth stressing that, although the job flexibility level of member j only enters the vector $\boldsymbol{s}_j^k$, the specific functional form for the technology parameters makes it so that it may still impact *all* parameters associated with the domestic technology of good k. To obey the assumption of constant returns to scale, a change in a technology parameter due to a change in job flexibility must thus be compensated by appropriate changes in the other technology parameters. An important implication is that the job flexibility level of spouse j may matter for the time dedicated to domestic production of *both* parents.

Finally, we assume that the Pareto weight of the father takes on the following form:

$$\mu\left(w^m, w^f, y, \boldsymbol{z}\right) = \frac{\exp\left(\gamma_0 + \gamma_1 \frac{w^f}{w^m} + \gamma_2 y + \boldsymbol{\gamma}_3' \boldsymbol{z}\right)}{1 + \exp\left(\gamma_0 + \gamma_1 \frac{w^f}{w^m} + \gamma_2 y + \boldsymbol{\gamma}_3' \boldsymbol{z}\right)}. \tag{19}$$

This functional form for the Pareto weight was proposed by Browning, Chiappori, and Lewbel (2013) and ensures that it resides within the unit interval as required by the theory.[14] This property is inherited by the mother's Pareto weight. In our specification, the vector of distribution factors $\boldsymbol{z}$ is assumed to be one-dimensional as we consider a single distribution factor: the relative years of education between father and mother.

For the proposed parametric forms, solving the household's optimization program (P) allows to obtain closed-form expressions, in terms of the observables $(w^m, w^f, y, \boldsymbol{d}^m, \boldsymbol{d}^f, \boldsymbol{z}, \boldsymbol{a}, \boldsymbol{s}^c, \boldsymbol{s}^h)$, for the individuals' private consumption and leisure as well as for the inputs in the domestic production processes. Straightforward manipulation of the obtained system of demand equations provides us with a system of budget share equations that will form the basis of the empirical application.

[13] In addition, we include a dummy indicating whether a particular household is from the LISS data set. The coefficient on this dummy will reflect possible differences in the relative intensities of the inputs used in domestic production across the Bilendi and LISS samples that may follow from differences in related survey questions. As such, we aim to control for such potential effects.

[14] A similar specification for the Pareto weight is used in Cherchye et al. (2012).

A detailed presentation of the solution to the household's optimization program and the obtained system of budget share equations can be found in Appendix A.

3.3 Methodology

We estimate the model parameters in two steps. In the first step, we regress the job flexibility levels of the mother and the father on the other explanatory variables and instruments. We consider two instruments. The first instrument captures the individual's perception on his or her direct supervisor's openness towards more flexible working arrangements. As this variable is defined at the individual level, we include the values for each partner as separate instruments. The second instrument captures the availability of non-parental child care alternatives for unexpected situations during working hours and is defined at the household level. The results of the first-step regressions are summarized in Table 2.

In the second step, we include the residuals from the first-step regressions as additional explanatory variables to account for the possible endogeneity of our measure of job flexibility. To this end, we proceed as discussed in Section 3.2. We then turn to estimate the model parameters by bringing the system of budget share equations (63)–(72) of Appendix A to the data. In doing so, we allow for unobserved heterogeneity across households by adding additive error terms to the equations that can be correlated within the household. We estimate the system of budget share equations by means of maximum likelihood. Standard errors are obtained by a bootstrap procedure. More details are presented in Appendix B.

3.4 Results

In this section, we present the coefficient estimates and standard errors for the model parameters. Estimation results are presented for both the model including and excluding first-step residuals, with the former being our main results. To ease interpretation of the parameter estimates, we further compute values and marginal effects at the mean of the observables for the preference and technology parameters. This will allow us to get a better grasp of their magnitude and how they vary with the observables. In addition, we present characteristics of the estimated distribution of Pareto weights in our sample. We conclude by showing how the level of domestic production is affected by the observables.

Preferences Table 3 shows the coefficient estimates and standard errors for the preference parameters. Although the estimates cannot be directly interpreted, they show that preferences of mothers and fathers vary with observables. To facilitate interpretation of the estimates, Table 4 depicts the values and marginal effects at the mean of the included taste shifters. As is immediately clear from this table, mothers and fathers have different preferences over both private (consumption and leisure) and public (children's well-being and other) goods.

Both the mother and the father care about the well-being of their children as reflected by the preference parameters on children's well-being that are statistically different from zero. The mag-

nitudes of these estimates are very similar, with the estimate of the father only slightly exceeding that of the mother. It further turns out that fathers put more emphasis on other public goods in the household as opposed to mothers. These results are in line with those in Cherchye et al. (2012) based on Dutch data (see in particular their Figure 3). The particular context of our data may matter though. For example, in a Japanese context, Chiappori, Meghir, and Okuyama (2024) find that mothers, not fathers, care more about public goods in the household. Although these authors abstract from domestic production, they do use a Cobb-Douglas specification for individual preferences similar to the one proposed here.

Looking at the marginal effects, we can indeed observe that preferences of fathers vary both by age and education level, whereas preferences of mothers vary only by age. Older mothers and fathers put more weight on leisure and less weight on the well-being of their children, all else equal. More educated fathers care more about their children's well-being at the expense of private consumption and other public goods in the household.

Domestic technologies Tables 5 and 6 similarly show the raw estimation results and the values and marginal effects at the mean, respectively, for the technology parameters. The mean values of the parameters for a given domestic technology reflect differences in the relative productivity of the inputs. For the given cardinalization, the parameters capture the marginal productivity in elasticity terms of the different inputs. The estimates indicate that children's well-being (u^c) is most responsive to increases in the mother's time input (maternal child care), followed by the father's time input (paternal child care) and expenditure on children. In contrast, the production of other public goods in the household (u^h) is most sensitive to changes in expenditure, followed by mother's and father's time input, respectively.

The estimated marginal effects of the production shifters further highlight some interesting patterns. These marginal effects reflect variation in the relative productivity of the inputs across households along the included dimensions, and as a result, variation in the input allocation of these households. In particular, households with different numbers of children produce children's well-being and other public household goods with different production technologies. For a given level of production, more children in the household are associated with relatively more expenses on children and fewer parental child care hours. A higher number of children also implies less paternal time invested in household chores in exchange for both more expenditures and maternal hours spent on the chores. The domestic production technologies also differ for parents with children at different stages of childhood; however, the magnitudes of these effects are rather small and the significance rather weak.

Identification of the model is obtained when there are as many production shifters as public goods in the household; each significantly affecting the production of at least one public good.[15] The estimated marginal effects are therefore informative on whether this condition is satisfied in

[15] The observation of a significant distribution factor together with a significant production shifter would also suffice. However, as it turns out, the distribution factor included in our analysis – the relative years of education between father and mother – was not estimated to be significant. We therefore depend on the case of two production shifters.

the data. It turns out that this is indeed the case, albeit relatively weak, as we only rely on the variation in the number of children and age of the youngest child for identification purposes.

Most importantly for our research question, the estimated marginal effects show that the production of both children's well-being and other public goods in the household is significantly influenced by the father's job flexibility, but not by that of the mother. An increase in the job flexibility level of the father is associated with a higher technology parameter on his time input in domestic production. This will result in (relatively) more paternal time dedicated to domestic work, both in terms of child care hours and time spent on household chores. It is important to keep in mind that these findings are in a context where most fathers work full-time, whereas 64 percent of mothers work part-time and already spend a high share of hours on domestic production.[16]

Pareto weight The parameter estimates for the father's Pareto weight are presented in Table 7. Our results show that intrahousehold bargaining clearly matters for the intrahousehold allocation of time and money. The relative wage of the father significantly influences his Pareto weight. In particular, an increase in his wage relative to that of the mother is associated with an increase in his bargaining power, resulting in household choices that are more in line with his individual preferences. This is an important result. Together with the observation that preferences differ between mothers and fathers, it constitutes a strong rejection of the unitary household model in favor of the collective approach. In contrast, neither the level of household nonlabor income nor the relative years of education between father and mother show a significant effect on the intrahousehold decision process.

For the chosen cardinalization, fathers have relatively strong bargaining positions in the household, reflected by an average Pareto weight of 0.63 as shown in Table 8. Nevertheless, there is substantial variation in Pareto weights across households. The standard deviation of Pareto weights amounts to 0.14. For the bottom 10 percent households in our sample, the Pareto weight of the father falls below a value of 0.47. For the top 10 percent of households, the value exceeds 0.82.

Domestic goods An important question is how changes in the parents' job flexibility levels influence the level of domestic goods produced within the household. Although this particular question will be addressed in greater detail in the following section, Table 9 already provides marginal effects of the main production shifters, including spouses' job flexibility levels, on children's well-being and other public goods produced in the household.

As mentioned above, a change in a production shifter effectively corresponds to a change in the domestic technology. This has important consequences. It does not only imply a different input allocation, for given prices of the inputs it may also shift the expenditure needed to produce a single unit of the domestic good. The separability of the chosen Cobb-Douglas preference structure in our case implies that such effects on the unit expenditure function can only be met by compensating changes in the level of public goods produced; it does not affect the allocation of resources to private

[16] We define part-time work as working strictly less than 36 hours per week.

and public goods. The marginal effects presented in Table 9 are reduced-form effects, masking the complex interactions that underlie them.

The main takeaway from Table 9 is that changes in the level of job flexibility of fathers can have strong effects on the level of domestic goods produced in the household. At the mean, an increase in the job flexibility of fathers is associated with lower children's well-being and lower other public goods in the household, all else equal. For mothers' job flexibility, the opposite is true. The effects are, however, less notable and not significant. To understand the mechanisms underlying these effects, we perform several counterfactual simulations in the next section that aim to paint a full picture.

4 Counterfactuals

To further analyze the role of job flexibility in the household choices made, including those concerning children's well-being, we conduct a set of counterfactual simulations in which job flexibility levels of mothers and fathers are changed. The goal of these exercises is to understand how households respond to changes in their job flexibility, which may be informative for policies concerning flexible work arrangements.

Setup We conduct three sets of counterfactual simulations. In a first set of simulations, we investigate the effects of changes in the job flexibility levels of mothers and fathers. To be more precise, we will look at the effects of increasing the level of job flexibility for all parents to the upper-quintile value. If the observed level of flexibility is already above this value, the observed level is maintained. We do so separately for each parent, keeping the job flexibility level of the partner fixed. Effectively, the increase in flexibility guarantees a minimum level of flexibility for the targeted parent. Not all households will be affected by the change and the magnitude of the change will be different across affected households. On average, the change corresponds to a standard deviation increase in the job flexibility measure.

Although we do not consider general equilibrium effects, we do acknowledge that job flexibility is just one aspect of the total compensation package offered to the worker, along with the worker's wage rate and other working conditions. If parents value amenities and working conditions related to job flexibility, then increasing flexibility levels correspond to *better* compensation packages, all else equal. However, such an exercise would disregard any cost-related aspects or other demand-side considerations associated with increasing job flexibility. To add to the realism of the proposed exercise, we therefore run a second set of simulations that impose a trade-off between wages and job flexibility levels according to a simple rule (cf. infra).

Finally, changes in the relative wages between the parents induced by counterfactual increases in one parent's job flexibility will have an impact on the relative bargaining positions in the household. To isolate this additional *bargaining power effect* from the total wage effect, we further compare the results of simulations where the Pareto weights are held constant at their initial values with

those where the Pareto weights are allowed to vary following changes in the relative wages of the parents. Any difference in the resulting simulated effects can then be fully attributed to changes in intrahousehold bargaining.

Standalone effects Table 10 presents the simulation results. The first three columns present the effects on the dependent variables and levels of domestic production for increases in the level of job flexibility of the mother. Similarly, the last three columns present the effects of increases in the level of job flexibility of the father. All effects are presented in terms of percentage changes relative to the baseline model predictions.

Panel A depicts the results of increasing job flexibility, keeping wages, and consequently bargaining power, fixed. As is immediately clear, increases in the level of job flexibility of fathers have substantially stronger effects on the dependent variables and levels of domestic production. This observation should not be surprising. While a change in job flexibility of fathers is associated with sizeable and significant changes in the domestic technology parameters (see Table 6), this is not the case for changes in the job flexibility of mothers. Importantly, changes in the job flexibility of one parent influence the time allocation and consumption decisions of *both* parents.

In particular, looking at the effects of increasing job flexibility of fathers, we see that such an increase is associated with considerable increases in maternal labor supply and with substantial decreases in paternal labor supply, on average. Although the magnitudes in percentages are similar, albeit of opposite sign, they do mask differences in the absolute changes in weekly labor supply. Maternal labor supply climbs by 3.5 hours per week, whereas paternal labor supply declines by 5.7 hours per week. In terms of time dedicated to domestic work, the effects of increased job flexibility of fathers are reversed. On average, maternal child care and time spent on household chores decrease by about 7 percent and 10 percent, respectively. For fathers, child care hours increase by around 13 percent. Time spent on household chores even increases by close to 37 percent. Even though the relative changes are considerably greater in magnitude for fathers than mothers, in absolute terms, the differences in effects are less pronounced. This stems from the fact that fathers spend markedly fewer hours on domestic work compared to mothers, on average. Time dedicated to child care and other household chores by mothers drop by 1.9 and 1.6 hours per week, respectively. For fathers, child care hours increase by 2.3 hours per week, whereas time spent on household chores increases by 3.4 hours per week.

Initially, fathers tend to work full-time and spend few hours on domestic work. For fathers, the full-time nature of their jobs may not allow them to spend as much time on child care and household chores. Giving fathers more job flexibility in the form of more flexible work schedules and greater telecommuting opportunities, may make it easier for them to partake more in the domestic responsibilities. Naturally, this may push down the amount of hours they work, but by alleviating part of the child care burden for mothers, it can help mothers to increase the amount of hours they can supply to the market.

The results for time use have clear implications. Increasing the job flexibility of fathers goes

a long way to reducing gender gaps in both market and domestic work. To emphasize this point, Table 11 presents the baseline and counterfactual gender gaps in time use. Throughout, the gender gaps are to be understood as the difference in outcomes between mothers and fathers, relative to the outcome of the fathers.[17] At baseline, the mother-father gap in labor supply, as a fraction of the father's labor supply, amounts to –27 percent. Increasing the overall level of flexibility in the jobs of fathers closes this gap substantially; by almost 22 percentage points. Furthermore, the gender gaps in child care and time spent on household chores decline from baseline levels of 51 and 57 percent, respectively, to 25 percent for child care and less than five percent for household chores.

Concerning public expenditure, both expenditure on children and on other public goods shrink following an increase in the job flexibility of fathers. This can readily be explained by the changing patterns in labor supply: Households substitute away from the more rewarding market labor of the father towards the less rewarding market labor of the mother, implying fewer household resources. Ultimately, increased flexibility in the jobs of fathers has negative effects on domestic production. The level of children's well-being attained by the household drops by 3 percent for the chosen cardinalization of the individual preferences. The level of other public goods produced in the household drops by more than 12 percent.

In other words, more job flexibility for fathers results in a more equal distribution of child care responsibilities and other domestic duties. However, this greater equality comes at a cost. Households have fewer resources at their disposal, resulting in lower levels of public goods in the household – in particular, lower children's well-being. Although greater job flexibility for fathers seems like a double-edged sword, it is important to note that the simulated effects should only be interpreted as partial and short-term. Increased labor supply of mothers may eventually result in higher hourly wages through human capital gains in the form of on-the-job experience. In turn, this could result in greater household resources and higher levels of domestic production. Such medium- to long-term effects are, however, not directly captured by the model.

A different picture emerges when the job flexibility of mothers is targeted. The effects of increased job flexibility of mothers on the time use variables of both mothers and fathers are of similar sign as for the case of fathers, but considerably smaller in magnitude. This is also confirmed by the gender gap estimates in time use. Greater job flexibility for mothers reduces the gaps in both market and domestic work, but the gains are small in comparison to the case of increased father's job flexibility.

Mothers often work part-time and spend a considerable amount of their time on domestic duties. For mothers, these domestic responsibilities often imply that they are only able to work part-time positions. By targeting mothers, the increased flexibility in the jobs they perform may allow them to more easily keep full-time positions while still being able to maintain the well-being of their

[17] That is, we define the female-male gap, or mother-father gap, in time use variable x as

$$\Delta_x = \frac{E[x^i|\, i = m] - E[x^i|\, i = f]}{E[x^i|\, i = f]} \tag{20}$$

where, as before, m denotes mothers and f denotes fathers.

children. Of course, this will put downward pressure on the amount of hours they will spend on child care and other chores. However, this provides scope for fathers to take over some of these domestic duties.

As opposed to the case of fathers, more flexibility in the jobs of mothers results in greater levels of public expenditure. Although the household is still substituting away from the more rewarding market labor of the father towards the less rewarding market labor of the mother, the increase in earnings from increased maternal labor supply more than compensates the loss in earnings stemming from lower paternal labor supply. Again, the magnitudes of the increases are rather modest. Expenditure on children grows by less than two percent. Other public expenditure increases by somewhat more than two percent.

In the end, the effect on household production is rather small. The level of children's well-being in particular is only marginally affected. Nevertheless, the model fails to capture any medium- to long-term wage growth for mothers stemming from greater labor market participation, which could mean additional positive effects.

Changing wages, fixed bargaining power What if more flexible jobs are less rewarding in terms of hourly wages? This question is addressed in Panel B of Table 10. In this panel, we assume that a change in job flexibility is accompanied by a change in hourly wages according to a simple rule. A compensating differential argument is invoked here. Some firms may offer less flexible working conditions, perhaps because it is (perceived as) costly for them. To the extent that parents value flexible working conditions, such jobs may need to compensate more in terms of hourly wages. Hence, by assuming a negative relationship between hourly wages and job flexibility, we try to account for any cost-related aspects or other demand-side considerations regarding job flexibility.

In particular, we will assume that a one standard deviation increase in job flexibility is associated with a 10 percent of a standard deviation decrease in hourly wages. This translates into a mean loss in hourly wages of 4.73 percent for fathers and 5.18 percent for mothers. The greater loss for mothers can be explained by a greater coefficient of variation for the distribution of hourly wages of mothers. To a certain extent, this simple rule can thus capture that mothers tend to value flexible working conditions more than fathers. For example, De Schouwer and Kesternich (2024) find that fathers are willing to give up close to 6 percent of wages both for more flexible working schedules and for the possibility to work from home. In contrast, mothers are willing to give up more than 9 percent of hourly wages for each of these amenities. As such, our simple rule seems realistic as the proposed wage decreases do not exceed the willingness to pay estimates and as the proposed increases in job flexibility correspond to sizeable increases in *both* scheduling flexibility and telecommuting possibilities.[18] In that sense, it may even be on the conservative side.

Accounting for wage changes following changes in job flexibility implies that individual leisure and private consumption can be affected. Note that this was not possible without accompany-

[18] It is worth noting that the estimates in De Schouwer and Kesternich (2024) are more in the upper-end of the range of estimates found in the literature. However, similar to the analysis presented here, they also rely, at least in part, on post-pandemic data on Dutch individuals from the LISS panel.

ing wage changes due to the separability between private and public goods inherent to the Cobb-Douglas individual preference structure. Whether additional wage changes exacerbate or attenuate the standalone effects of changes in job flexibility, will generally depend on standard income and substitution effects. In this part of the exercise, indirect effects through changes in bargaining power are not allowed for in order to isolate the pure additional effect of accompanying wage changes.

For Cobb-Douglas preferences, lower own hourly wages will reduce own hours supplied to the market in favor of other time uses as substitution effects, by construction, dominate. For the partner, such wage decreases serve as an income effect, pushing the partner to increase labor supply at the expense of other time uses. Given the directions of the standalone effects of increasing job flexibility for mothers and fathers, the accompanying wage decreases work to exacerbate the standalone effects in the case of fathers and attenuate the effects in the case of mothers. In fact, increasing job flexibility of mothers while allowing for accompanying wage changes not only influences the magnitudes of the effects but even flips some of the directions.

Compared to the baseline model predictions, increased job flexibility of mothers, but with lower wages, results in a decrease in maternal labor supply by more than 8 percent (–1.5 hours). On the other hand, labor supply of fathers tends to increase by about 5 percent (2.0 hours), implying a widening of the gender gap in labor supply to almost 34 percent. The decrease in maternal labor supply is accompanied by modest increases in both leisure and child care hours. Although time spent on household chores by the mother still declines, on average, the decrease is not as pronounced as for the case without wage changes. For fathers, the increase in labor supply is accompanied by modest decreases in all other time uses, including leisure. As a result, the gap in child care hours increases by 6.3 percentage points, whereas the gap in household chores is hardly affected.

In terms of expenditure, a reverse picture emerges when accounting for wage changes. Although households now perform more hours of the more rewarding market labor of the father, the resulting increase in earnings is not sufficient to compensate for the loss in earnings following from the decrease in maternal labor supply, which is now remunerated at a lower rate. Consequently, both expenditure on children and other public goods decline. Part of the loss in resources is now borne by the private expenditure of mothers and fathers. Both decline by 3.5 percent.[19] As before, domestic production of children's well-being is not significantly impacted by the increase in the job flexibility of mothers.

The additional effects of wage changes work in the same direction as the standalone effects in the case of fathers, making them more pronounced. Increased job flexibility of fathers together with lower wages has strong effects on parental labor supply. While fathers' weekly time on the market decreases by almost 26 percent (–8.1 hours), mothers' labor supply increases by almost 29 percent (6.5 hours), on average, tipping the gender gap in labor supply in favor of mothers at

[19] The symmetry in the effects on private expenditure is mechanical and follows from the fact that bargaining weights are held constant at this point.

10.2 percent. Moreover, fathers increase their child care hours further to nearly 22 hours per week, which is close to the 25.4 hours women now put in weekly. This results in a gender gap in child care hours of only 16.7 percent. Importantly, the gap in time spent on household chores closes entirely, with fathers dedicating slightly more hours weekly compared to mothers (13.8 hours vs. 13.5 hours).

Even though the decrease in paternal labor supply is well compensated by more maternal labor supply, the substitution still results in fewer household resources. By itself, the increase in earnings of mothers is not enough to compensate for the loss in earnings of fathers following the drop in their labor supply. The decrease is now even more punishing as the remaining market hours of fathers are now also less rewarding. All in all, the result is an overall decrease in the consumption levels (including private consumption), with further negative effects on children's well-being and other public goods in the household.

Changing wages and bargaining power As a final part of this exercise, we consider the full effects of accompanying wage changes by allowing Pareto weights to change accordingly. A change in wages following a change in job flexibility will generally influence the relative bargaining positions of the parents through changes in *relative* wages. Such changes in bargaining power entail additional (countervailing) income effects on the parents.

Consider, for example, an increase in the job flexibility of fathers. Under the assumption that such an increase is associated with a decrease in hourly wages, his Pareto weight will decline. Compared to the scenario where Pareto weights were held constant, this decline in his Pareto weight will result in a lower resource share for the father. Conversely, the Pareto weight of the mother increases, resulting in a positive income effect on the mother through a higher resource share.

The household's budget remains unchanged relative to the previous scenario. Therefore, any additional changes in the level of public goods produced in the household will stem from differences in the preferences of the parents for these public goods. However, as mothers and fathers *care* about their children to a similar extent, the additional effect on children's well-being will be negligible; this regardless of whether mothers or fathers are targeted in our exercise.

Allowing for changes in bargaining power attenuates some of the effects for fathers when increasing their job flexibility. Although paternal labor supply still declines considerably (by 20.6 percent) compared to the baseline model predictions, the negative income effect on fathers originating from a weakened bargaining position moderates this decline relative to the case where Pareto weights are held fixed. For mothers, the opposite is true. The additional positive income effect on mothers implies a less stark increase in labor supply, allowing for increases in their leisure time instead. The result is almost full parity in market work between the parents with the gender gap in labor supply settling at –1.2 percent.

These countervailing income effects on mothers and fathers imply opposite additional effects on the parents' private consumption levels. Whereas private expenditure of fathers decreases further to a total decline of 7.1 percent relative to the baseline, private expenditure of mothers actually

increases by 2.6 percent, on average. Note the asymmetry in the magnitudes of the additional effects. Despite the fact that the size of the change in resource shares of mothers and fathers is the same, albeit of opposite sign, the resulting change in private expenditure levels will be different as preferences for private consumption (and leisure) are different between the parents.

The additional effects on parental time dedicated to domestic production as well as public expenditure depends on the relative preferences of the parents for each of the domestically produced public goods. As mothers and fathers care about equally for the well-being of their children, the change in bargaining power hardly influences the domestic production of this public good relative to the case where bargaining power was held constant. As a result, parental time dedicated to child care and expenditure on children remain stable. The gender gap in child care hours is unaffected. The weaker bargaining positions of fathers does imply fewer resources allocated to other public goods in the household. Nevertheless, the additional decline in time and money inputs in domestic production of the other public good is, again, only modest.

In the case of greater job flexibility for mothers, changes in bargaining power entail an additional negative income effect on mothers and a positive income effect on fathers. For mothers, this implies increased labor supply both relative to the scenario with fixed Pareto weights and relative to the baseline model predictions. This increase in maternal labor supply is primarily at the expense of leisure time, which declines by 7.1 percent (–1.9 hours). For fathers, the additional effect is to lower paternal labor supply, similar to the level in the baseline model predictions. Consequently, the gender gap in labor supply widens relative to the baseline scenario, but to a lesser extent than in the case where bargaining power is held constant.

The lower resource share obtained by mothers further translates into lower private expenditure. Conversely, fathers enjoy a level of private expenditure similar to the baseline model predictions following the increase in their share of private resources.

Again, the change in relative bargaining positions involves hardly any effect on the production of children's well-being in the household, which is reflected by only very minor changes in parental child care hours and expenditure on children. As fathers' bargaining positions improve following the increase in the job flexibility of mothers, more resources are devoted to other public goods in the household. This additional bargaining power effect is sufficient to compensate for the negative effect of lower female wages; although the input mix used to achieve this level is now different. Still, the magnitudes of the relative changes in parental time spent on household chores and in other public expenditure are small. As a consequence, the gender gaps in domestic work are largely unaffected and remain wide.

5 Conclusion

In this paper, we propose a rich collective model that allows for diverging preferences of mothers and fathers concerning the intrahousehold allocation of time and money. This allocation not only affects parents' welfare but also children's well-being. We explicitly model the role of job flexibility

in the household choices made, including those choices affecting the children's well-being. Our estimates imply that flexible jobs enable parents to better combine work and family. As it turns out, job flexibility of fathers is especially important in this respect.

Counterfactual simulations further show the potentially big impact on the allocation of time and money within the household of increased levels of parental job flexibility. Importantly, more job flexibility does not necessarily generate higher levels of children's well-being. This primarily stems from increased job flexibility often being associated with higher labor supply of mothers, but lower labor supply of fathers. Conversely, fathers dedicate more hours to domestic work, whereas mothers perform fewer hours. The changes in market responsibilities between parents negatively impact households' financial resources, implying in turn lower expenditure on children. The negative impact of the latter on children's well-being is often not sufficiently compensated by a changing division of child care duties in favor of the parent whose hours become relatively more productive.

Still, greater job flexibility is generally associated with a more equal division of market work and domestic work within the household. This is an important consideration in light of recent discussions about cutting back on remote work and bringing workers back to the office. Furthermore, to the extent that increased labor supply of mothers can improve their (relative) wages in the longer-run, and consequently, household resources, the effect on children's well-being may well be attenuated or even reversed. However, our static framework cannot capture the dynamic nature of such effects and this can therefore be an avenue of future research.

Tables

Table 1: Descriptive statistics – Joint sample

	Fathers		Mothers		Household	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Expenditures (EUR per month)						
Private expenditures	206.77	200.32	195.30	163.27		
Expenditures on children					812.31	533.28
Other household expenditures					2085.83	1029.63
Time use (hours per week)						
Market labor (incl. commuting)	43.40	9.15	31.91	9.93		
Child care	18.58	13.33	26.42	17.39		
Household chores	9.78	7.37	14.81	9.79		
Socioeconomic variables						
Age	41.94	8.03	39.58	7.36		
Education level (percentage)	48.26		53.23			
Gross wage rate (EUR per hour)	25.93	12.27	23.42	12.12		
Flexibility index	0.27	0.29	0.29	0.29		
Schedule flexibility	0.90	1.01	0.95	1.03		
Telecommuting possibilities	24.99	32.34	26.05	33.82		
Relative years of education					-0.37	3.51
Number of children					1.91	0.74
Age of youngest child					7.25	5.51
Number of households					464	

Notes: Descriptive statistics for joint Bilendi and LISS sample. Education level: Fraction with higher professional or university degree. Relative years of education: Absolute difference in male and female years of education. Schedule flexibility: Degree to which work schedules can be self-determined. Measured on a four point scale ranging from 0 (fully determined by employer) to 4 (completely determined by respondent). Telecommuting possibilities: Percentage of a typical workweek that can be performed from home.

Table 2: First stage regressions – Joint sample

	Father		Mother	
	Coef. Est.	Std. Err.	Coef. Est.	Std. Err.
Explanatory variables				
Education	**0.124**	0.057	0.056	0.057
Age	0.001	0.003	-0.001	0.003
Hourly wage	0.001	0.001	0.000	0.001
Partner education	0.030	0.054	0.079	0.061
Partner age	-0.004	0.003	0.003	0.003
Partner hourly wage	0.001	0.001	-0.001	0.001
Relative years of education	0.001	0.009	-0.007	0.010
Age youngest	0.004	0.003	-0.001	0.003
No. children	0.023	0.015	-0.022	0.015
Sample dummy	**0.113**	0.028	**0.071**	0.029
Instrumental variables				
Reaction employer	**0.106**	0.010	**0.121**	0.010
Partner reaction employer	-0.004	0.009	-0.016	0.010
Child care substitutes	0.006	0.012	-0.006	0.013
Number of observations	464		464	

Notes: Regression of flexibility index on explanatory variables and instruments by gender. Results for joint Bilendi and LISS sample. Education: Fraction with higher professional or university degree. Age youngest: Age of youngest child in the household. No. children: Number of children in the household. Reaction employer: Individual's perception about employer's openness towards more flexible work arrangements. Child care substitutes: Difficulty of finding child care substitutes on short notice. Bold estimates indicate that $p < 0.10$.

Table 3: Estimation results – Preference parameters

	(1)		(2)	
	Coef. Est.	Std. Err.	Coef. Est.	Std. Err.
Mothers				
$\tilde{\alpha}^m_{l0}$	**2.305**	0.375	**2.297**	0.386
$\tilde{\alpha}^m_{l1}$[age]	**0.020**	0.009	**0.020**	0.010
$\tilde{\alpha}^m_{l2}$[education]	0.055	0.084	0.060	0.085
$\tilde{\alpha}^m_{c0}$	**3.226**	0.462	**3.284**	0.456
$\tilde{\alpha}^m_{c1}$[age]	**-0.024**	0.012	**-0.023**	0.011
$\tilde{\alpha}^m_{c2}$[education]	0.052	0.137	0.018	0.138
$\tilde{\alpha}^m_{h0}$	0.475	1.099	0.465	1.237
$\tilde{\alpha}^m_{h1}$[age]	**0.026**	0.015	**0.027**	0.016
$\tilde{\alpha}^m_{h2}$[education]	0.205	0.505	0.145	0.635
Fathers				
$\tilde{\alpha}^f_{l0}$	**2.622**	0.380	**2.620**	0.367
$\tilde{\alpha}^f_{l1}$[age]	0.011	0.009	0.011	0.008
$\tilde{\alpha}^f_{l2}$[education]	**0.211**	0.107	**0.196**	0.103
$\tilde{\alpha}^f_{c0}$	3.285	0.369	**3.258**	0.357
$\tilde{\alpha}^f_{c1}$[age]	-0.012	0.008	-0.013	0.008
$\tilde{\alpha}^f_{c2}$[education]	**0.305**	0.126	**0.374**	0.127
$\tilde{\alpha}^f_{h0}$	2.726	0.293	**2.740**	0.293
$\tilde{\alpha}^f_{h1}$[age]	0.004	0.007	0.003	0.007
$\tilde{\alpha}^f_{h2}$[education]	0.144	0.110	0.170	0.106

Notes: Estimates and standard errors for preference parameters (joint Bilendi and LISS sample). Coefficient estimates have been obtained by means of maximum likelihood. Column (1): Estimates without accounting for endogeneity of flexibility. Column (2): Estimates accounting for endogeneity of flexibility. Expressions in brackets refer to the objects associated with the respective parameters. Education: Fraction of men or women with higher professional or university degree, respectively. Standard errors obtained by bootstrap. Bold estimates indicate that $p < 0.10$.

Table 4: Marginal effects – Preference parameters

	Leisure		Consumption		Children's well-being		Other public goods	
	Est.	Std. Err.	Est.	Std. Err.	Est.	Std. Err.	Est.	Std. Err.
Mother								
Mean	**0.569**	0.078	**0.025**	0.004	**0.276**	0.047	**0.129**	0.063
Age	**0.006**	0.002	-0.000	0.000	**-0.009**	0.002	0.002	0.002
Education	0.001	0.050	-0.001	0.003	-0.011	0.034	0.011	0.067
Father								
Mean	**0.387**	0.034	**0.016**	0.001	**0.288**	0.032	**0.310**	0.017
Age	**0.004**	0.001	-0.000	0.000	**-0.004**	0.001	0.001	0.001
Education	-0.016	0.015	**-0.004**	0.002	**0.040**	0.017	-0.020	0.013

Notes: Marginal effects of taste shifters on preference parameters of mothers and fathers at the mean. Taste shifters include the age of mother (resp. father) and a dummy for university or higher vocational degree. Standard errors obtained by bootstrap and Delta method. Bold estimates indicate that $p < 0.10$.

Table 5: Estimation results – Domestic technology parameters

	(1)		(2)	
	Coef. Est.	Std. Err.	Coef. Est.	Std. Err.
Children's well-being u^c				
$\tilde{\beta}^c_{m0}$	**1.677**	0.113	**1.649**	0.124
$\tilde{\beta}^c_{m1}$[age youngest]	-0.010	0.008	-0.011	0.008
$\tilde{\beta}^2_{m2}$[no. children]	**-0.217**	0.052	**-0.218**	0.054
$\tilde{\beta}^c_{m3}[a^m]$	**-0.216**	0.086	-0.110	0.190
$\tilde{\beta}^c_{m4}$[residual]			-0.186	0.226
$\tilde{\beta}^c_{m5}$[sample]	**0.325**	0.111	**0.318**	0.120
$\tilde{\beta}^c_{f0}$	**1.362**	0.111	**1.218**	0.122
$\tilde{\beta}^c_{f1}$[age youngest]	**-0.016**	0.008	**-0.015**	0.008
$\tilde{\beta}^c_{f2}$[no. children]	**-0.219**	0.054	**-0.227**	0.054
$\tilde{\beta}^c_{f3}[a^f]$	0.052	0.094	**0.612**	0.198
$\tilde{\beta}^c_{f4}$[residual]			**-0.775**	0.214
$\tilde{\beta}^c_{f5}$[sample]	**0.227**	0.113	0.164	0.114
Other public goods u^h				
$\tilde{\beta}^h_{m0}$	**-0.613**	0.140	**-0.511**	0.161
$\tilde{\beta}^h_{m1}$[age youngest]	0.012	0.008	0.012	0.007
$\tilde{\beta}^h_{m2}$[no. children]	0.041	0.055	0.029	0.056
$\tilde{\beta}^h_{m3}[a^m]$	0.032	0.117	-0.262	0.215
$\tilde{\beta}^h_{m4}$[residual]			0.413	0.266
$\tilde{\beta}^h_{m5}$[sample]	**0.265**	0.119	**0.301**	0.119
$\tilde{\beta}^h_{f0}$	**-0.663**	0.130	**-0.938**	0.150
$\tilde{\beta}^h_{f1}$[age youngest]	0.003	0.008	0.007	0.008
$\tilde{\beta}^h_{f2}$[no. children]	**-0.107**	0.055	**-0.133**	0.058
$\tilde{\beta}^h_{f3}[a^f]$	0.213	0.133	**1.307**	0.285
$\tilde{\beta}^h_{f4}$[residual]			**-1.590**	0.331
$\tilde{\beta}^h_{f5}$[sample]	**0.508**	0.124	**0.386**	0.131

Notes: Estimates and standard errors for technology parameters (joint Bilendi and LISS sample). Coefficient estimates have been obtained by means of maximum likelihood. Column (1): Estimates without accounting for endogeneity of flexibility. Column (2): Estimates accounting for endogeneity of flexibility. Expressions in brackets refer to the objects associated with the respective parameters. Age youngest: Age of youngest child in the household. No. children: Number of children in the household. Residual: Residual of regression of flexibility on other explanatory variables and instruments (reaction of employer, child care substitutes). Sample: Dummy indicating the origin sample of the household.s Standard errors obtained by bootstrap. Bold estimates indicate that $p < 0.10$.

Table 6: Marginal effects – Domestic production technologies

	Expenditure		Mother time input		Father time input	
	Est.	Std. Err.	Est.	Std. Err.	Est.	Std. Err.
Children's well-being u^c						
Mean	**0.149**	0.005	**0.491**	0.008	**0.360**	0.008
Age youngest child	0.002	0.001	0.000	0.002	-0.002	0.001
No. of children	**0.028**	0.006	-0.014	0.009	-0.014	0.009
Mother flexibility	0.008	0.014	-0.027	0.047	0.019	0.034
Father flexibility	**-0.033**	0.011	**-0.108**	0.035	**0.141**	0.046
Sample dummy	**-0.032**	0.013	**0.051**	0.024	-0.018	0.022
Other public goods u^h						
Mean	**0.459**	0.009	**0.312**	0.007	**0.229**	0.008
Age youngest child	-0.002	0.002	0.002	0.001	0.000	0.001
No. of children	0.010	0.012	0.016	0.011	**-0.025**	0.009
Mother flexibility	0.038	0.031	-0.056	0.046	0.019	0.015
Father flexibility	**-0.137**	0.030	**-0.093**	0.021	**0.230**	0.050
Sample dummy	**-0.084**	0.025	0.037	0.025	**0.047**	0.022

Notes: Marginal effects of production shifters (excl. residuals) on technology parameters of domestic production processes for children's well-being and other public goods at the mean. Production shifters include the age of the youngest child, number of children in the household, job flexibility level of mothers and fathers, and a sample dummy indicating whether the household is from the LISS subset. Standard errors obtained by bootstrap and Delta method. Bold estimates indicate that $p < 0.10$.

Table 7: Estimation results – Pareto weight parameters

	(1)		(2)	
	Coef. Est.	Std. Err.	Coef. Est.	Std. Err.
γ_0	**-1.081**	0.195	**-1.094**	0.195
$\gamma_1[\frac{w^f}{w^m}]$	**1.466**	0.101	**1.463**	0.103
$\gamma_2[y]$	0.000	0.000	0.000	0.000
$\gamma_3[z]$	-0.002	0.007	-0.005	0.007

Notes: Estimates and standard errors for Pareto weight parameters (joint Bilendi and LISS sample). Coefficient estimates have been obtained by means of maximum likelihood. Column (1): Estimates without accounting for endogeneity of flexibility. Column (2): Estimates accounting for endogeneity of flexibility. Expressions in brackets refer to the objects associated with the respective parameters. y: Household nonlabor income (consumption-based). z: Distribution factor: Relative years of education between father and mother. Standard errors obtained by bootstrap. Bold estimates indicate that $p < 0.10$.

Table 8: Distribution Pareto weights

	Value
Moments	
Mean	0.630
Standard deviation	0.141
Quantiles	
10%	0.464
25%	0.525
75%	0.712
90%	0.826

Notes: Moments and quantiles of distribution of father's Pareto weight. Moments include the mean and standard deviation. Quantiles include the 10%, 25%, 75%, and 90% quantile values.

Table 9: Marginal effects – Domestic goods production

	Est.	Std. Err.
Children's well-being u^c		
Mean	**30.382**	1.068
Age youngest child	**0.113**	0.064
No. of children	**1.853**	0.437
Mother flexibility	0.242	0.415
Father flexibility	**-3.708**	1.232
Sample dummy	**-1.694**	0.871
Other public goods u^h		
Mean	**65.657**	4.909
Age youngest child	-0.581	0.405
No. of children	2.980	3.001
Mother flexibility	8.254	6.860
Father flexibility	**-38.117**	8.567
Sample dummy	**-20.720**	6.397

Notes: Marginal effects of production shifters (excl. residuals) on level of domestic production for children's well-being and other public goods at the mean. Production shifters include the age of the youngest child, number of children in the household, job flexibility level of mothers and fathers, and a sample dummy indicating whether the household is from the LISS subset. Standard errors obtained by bootstrap and Delta method. Bold estimates indicate that $p < 0.10$.

Table 10: Counterfactual effects of increasing job flexibility

	Mother flexibility			Father flexibility		
	Mother	Father	Household	Mother	Father	Household
(A) Fixed wages and bargaining power						
Time use						
Market labor (ℓ^i)	5.58	-1.12		15.88	-17.00	
Child care (t_c^i)	-1.62	1.63		-6.86	12.65	
Household chores (t_h^i)	-5.24	2.36		-10.18	36.72	
Expenditure						
Child (e^c)			1.63			-6.86
Other (e^h)			2.36			-10.18
Domestic goods						
Children's well-being (u^c)			0.20			-3.09
Other goods (u^h)			3.74			-12.35
(B) Varying wages and fixed bargaining power						
Time use						
Market labor (ℓ^i)	-8.38	4.72		28.72	-25.88	
Leisure (l^i)	3.30	-3.52		-3.87	2.76	
Child care (t_c^i)	1.59	-1.98		-10.33	15.96	
Household chores (t_h^i)	-2.21	-1.29		-13.45	41.09	
Expenditure						
Private (e^i)	-3.52	-3.52		-3.87	-3.87	
Child (e^c)			-1.98			-10.33
Other (e^h)			-1.29			-13.45
Domestic goods						
Children's well-being (u^c)			-0.09			-4.20
Other goods (u^h)			1.98			-16.29
(C) Varying wages and bargaining power						
Time use						
Market labor (ℓ^i)	4.84	0.84		19.23	-20.63	
Leisure (l^i)	-7.09	-0.18		2.58	-0.91	
Child care (t_c^i)	1.67	-1.91		-10.36	15.92	
Household chores (t_h^i)	-0.55	0.37		-14.72	38.41	
Expenditure						
Private (e^i)	-12.52	-0.18		2.58	-7.13	
Child (e^c)			-1.91			-10.36
Other (e^h)			0.37			-14.72
Domestic goods						
Children's well-being (u^c)			-0.02			-4.23
Other goods (u^h)			3.73			-17.52

Notes: Percentage changes in Marshallian demands and level of public goods following an increase in mother's (resp. father's) job flexibility level. Flexibility levels for bottom 80% of mothers (resp. fathers) flexibility distribution are increased to 80% quantile value. This corresponds to an average increase of approximately one standard deviation. Panel (A) shows the standalone effects. Panel (B) shows the effects allowing for an ad-hoc wage-flexibility trade-off, but keeping bargaining weights fixed. A one standard deviation increase in flexibility is assumed to be compensated in the market with a 10% of a standard deviation reduction in hourly wages. Panel (C) shows the effects allowing for the same wage-flexibility trade-off and resulting changes in bargaining power.

Table 11: Counterfactual effects of increasing job flexibility – Gender gaps

	Baseline	Mother flexibility		Father flexibility	
		Gap	**Difference**	Gap	**Difference**
(A) Fixed wages and bargaining power					
Market labor (ℓ)	-0.270	-0.229	**0.041**	-0.054	**0.216**
Child care (t_c)	0.510	0.462	**-0.058**	0.252	**-0.258**
Household chores (t_h)	0.571	0.454	**-0.117**	0.047	**-0.524**
(B) Varying wages and fixed bargaining power					
Market labor (ℓ)	-0.270	-0.338	**-0.068**	0.102	**0.372**
Child care (t_c)	0.510	0.573	**0.063**	0.167	**-0.343**
Household chores (t_h)	0.571	0.568	**-0.003**	-0.024	**-0.595**
(C) Varying wages and bargaining power					
Market labor (ℓ)	-0.270	-0.300	**-0.030**	-0.012	**0.258**
Child care (t_c)	0.510	0.574	**0.064**	0.167	**-0.343**
Household chores (t_h)	0.571	0.571	**0.000**	-0.020	**-0.591**

Notes: Changes in female-male gender gaps in time use as a fraction of male time use following an increase in mother's (resp. father's) job flexibility level. Flexibility levels for bottom 80% of mothers (resp. fathers) flexibility distribution are increased to 80% quantile value. This corresponds to an average increase of approximately on standard deviation. Panel (A) shows the standalone effects. Panel (B) shows the effects allowing for an ad-hoc wage-flexibility trade-off, but keeping bargaining weights fixed. A one standard deviation increase in flexibility is assumed to be compensated in the market with a 10% of a standard deviation reduction in hourly wages. Panel (C) shows the effects allowing for the same wage-flexibility trade-off and resulting changes in bargaining power.

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Appendix

A Derivation of model solution

In this section, we provide a step-by-step solution to the household's optimization program (P). An interior solution to this program will satisfy the following set of first-order conditions, where $\mathcal{L}$ denotes the associated Lagrangian and λ the Lagrange multiplier on the budget constraint:

$$\frac{\partial \mathcal{L}}{\partial l^m} = (1-\mu)\frac{\partial u^m}{\partial l^m} - \lambda w^m = 0 \tag{21}$$

$$\frac{\partial \mathcal{L}}{\partial l^f} = \mu\frac{\partial u^f}{\partial l^f} - \lambda w^f = 0 \tag{22}$$

$$\frac{\partial \mathcal{L}}{\partial e^m} = (1-\mu)\frac{\partial u^m}{\partial e^m} - \lambda = 0 \tag{23}$$

$$\frac{\partial \mathcal{L}}{\partial e^f} = \mu\frac{\partial u^f}{\partial e^f} - \lambda = 0 \tag{24}$$

$$\frac{\partial \mathcal{L}}{\partial t_c^m} = \left((1-\mu)\frac{\partial u^m}{\partial u^k} + \mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial t_c^m} - \lambda w^m = 0 \tag{25}$$

$$\frac{\partial \mathcal{L}}{\partial t_c^f} = \left((1-\mu)\frac{\partial u^m}{\partial u^k} + \mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial t_c^f} - \lambda w^f = 0 \tag{26}$$

$$\frac{\partial \mathcal{L}}{\partial e^c} = \left((1-\mu)\frac{\partial u^m}{\partial u^k} + \mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial e^c} - \lambda = 0 \tag{27}$$

$$\frac{\partial \mathcal{L}}{\partial t_h^m} = \left((1-\mu)\frac{\partial u^m}{\partial u^k} + \mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial t_h^m} - \lambda w^m = 0 \tag{28}$$

$$\frac{\partial \mathcal{L}}{\partial t_h^f} = \left((1-\mu)\frac{\partial u^m}{\partial u^k} + \mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial t_h^f} - \lambda w^f = 0 \tag{29}$$

$$\frac{\partial \mathcal{L}}{\partial e^h} = \left((1-\mu)\frac{\partial u^m}{\partial u^k} + \mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial e^h} - \lambda = 0 \tag{30}$$

$$\frac{\partial \mathcal{L}}{\partial \lambda} = w^m\left(T - l^m - t_c^m - t_h^m\right) + w^f\left(T - l^f - t_c^f - t_h^f\right) + y - e^m - e^f - e^c - e^h = 0. \tag{31}$$

We can rewrite these expressions to obtain the following set of intuitive first-order conditions:

$$\frac{\partial u^m}{\partial l^m} = w^m\frac{\partial u^m}{\partial e^m} \tag{32}$$

$$\mu\frac{\partial u^f}{\partial l^f} = w^f(1-\mu)\frac{\partial u^m}{\partial e^m} \tag{33}$$

$$\mu\frac{\partial u^f}{\partial e^f} = (1-\mu)\frac{\partial u^m}{\partial e^m} \tag{34}$$

$$\left((1-\mu)\frac{\partial u^m}{\partial u^k}+\mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial t_c^m}=w^m(1-\mu)\frac{\partial u^m}{\partial e^m} \tag{35}$$

$$\left((1-\mu)\frac{\partial u^m}{\partial u^k}+\mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial t_c^f}=w^f(1-\mu)\frac{\partial u^m}{\partial e^m} \tag{36}$$

$$\left((1-\mu)\frac{\partial u^m}{\partial u^k}+\mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial e^c}=(1-\mu)\frac{\partial u^m}{\partial e^m} \tag{37}$$

$$\left((1-\mu)\frac{\partial u^m}{\partial u^k}+\mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial t_h^m}=w^m(1-\mu)\frac{\partial u^m}{\partial e^m} \tag{38}$$

$$\left((1-\mu)\frac{\partial u^m}{\partial u^k}+\mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial t_h^f}=w^f(1-\mu)\frac{\partial u^m}{\partial e^m} \tag{39}$$

$$\left((1-\mu)\frac{\partial u^m}{\partial u^k}+\mu\frac{\partial u^f}{\partial u^k}\right)\frac{\partial u^k}{\partial e^h}=(1-\mu)\frac{\partial u^m}{\partial e^m} \tag{40}$$

$$e^m+e^f+e^c+e^h+w^m\left(l^m+t_c^m+t_h^m\right)+w^f\left(l^f+t_c^f+t_h^f\right)=w^mT+w^fT+y. \tag{41}$$

Under the proposed parametric specifications for the individual utility functions (u^m and u^f) and the domestic technologies (u^c and u^h) presented in Section 3.2, conditions (32)-(40) provide us with the following expressions:

$$l^m=\frac{\alpha_l^m(\boldsymbol{d}^m)}{\alpha_e^m(\boldsymbol{d}^m)}\frac{e^m}{w^m} \tag{42}$$

$$l^f=\frac{\mu}{(1-\mu)}\frac{\alpha_l^f(\boldsymbol{d}^f)}{\alpha_e^m(\boldsymbol{d}^m)}\frac{e^m}{w^f} \tag{43}$$

$$e^f=\frac{\mu}{(1-\mu)}\frac{\alpha_e^f(\boldsymbol{d}^f)}{\alpha_e^m(\boldsymbol{d}^m)}e^m \tag{44}$$

$$t_c^m=\frac{\beta_m^c(\boldsymbol{s^c},\boldsymbol{a})\left((1-\mu)\alpha_c^m(\boldsymbol{d}^m)+\mu\alpha_c^f(\boldsymbol{d}^f)\right)}{(1-\mu)\alpha_e^m(\boldsymbol{d}^m)}\frac{e^m}{w^m} \tag{45}$$

$$t_c^f=\frac{\beta_f^c(\boldsymbol{s^c},\boldsymbol{a})\left((1-\mu)\alpha_c^m(\boldsymbol{d}^m)+\mu\alpha_c^f(\boldsymbol{d}^f)\right)}{(1-\mu)\alpha_e^m(\boldsymbol{d}^m)}\frac{e^m}{w^f} \tag{46}$$

$$e^c=\frac{\beta_e^c(\boldsymbol{s^c},\boldsymbol{a})\left((1-\mu)\alpha_c^m(\boldsymbol{d}^m)+\mu\alpha_c^f(\boldsymbol{d}^f)\right)}{(1-\mu)\alpha_e^m(\boldsymbol{d}^m)}e^m \tag{47}$$

$$t_h^m=\frac{\beta_m^h(\boldsymbol{s^h},\boldsymbol{a})\left((1-\mu)\alpha_h^m(\boldsymbol{d}^m)+\mu\alpha_h^f(\boldsymbol{d}^f)\right)}{(1-\mu)\alpha_e^m(\boldsymbol{d}^m)}\frac{e^m}{w^m} \tag{48}$$

$$t_h^f=\frac{\beta_f^h(\boldsymbol{s^h},\boldsymbol{a})\left((1-\mu)\alpha_h^m(\boldsymbol{d}^m)+\mu\alpha_h^f(\boldsymbol{d}^f)\right)}{(1-\mu)\alpha_e^m(\boldsymbol{d}^m)}\frac{e^m}{w^f} \tag{49}$$

$$e^h=\frac{\beta_e^h(\boldsymbol{s^h},\boldsymbol{a})\left((1-\mu)\alpha_h^m(\boldsymbol{d}^m)+\mu\alpha_h^f(\boldsymbol{d}^f)\right)}{(1-\mu)\alpha_e^m(\boldsymbol{d}^m)}e^m. \tag{50}$$

Plugging these expression into the budget constraint (41), we can obtain an expression for the mother's private expenditure e^m in terms of the observables $(w^m, w^f, \boldsymbol{d}^m, \boldsymbol{d}^f, y, z, \boldsymbol{a}, \boldsymbol{s^c}, \boldsymbol{s^h})$. Subsequently, we can substitute the obtained expression for e^m into the right-hand sides of (42)-(50) to derive closed-form expressions for the other choice variables:

$$l^m = \mu^m \alpha_l^m(\boldsymbol{d}^m) \frac{\left(w^m T + w^f T + y\right)}{w^m} \tag{51}$$

$$l^f = \mu^f \alpha_l^f(\boldsymbol{d}^f) \frac{\left(w^m T + w^f T + y\right)}{w^f} \tag{52}$$

$$t_c^m = \beta_m^c(\boldsymbol{s^c}, \boldsymbol{a})\left[\mu^m \alpha_c^m(\boldsymbol{d}^m) + \mu^f \alpha_c^f(\boldsymbol{d}^f)\right] \frac{\left(w^m T + w^f T + y\right)}{w^m} \tag{53}$$

$$t_c^f = \beta_f^c(\boldsymbol{s^c}, \boldsymbol{a})\left[\mu^m \alpha_c^m(\boldsymbol{d}^m) + \mu^f \alpha_c^f(\boldsymbol{d}^f)\right] \frac{\left(w^m T + w^f T + y\right)}{w^f} \tag{54}$$

$$t_h^m = \beta_m^h(\boldsymbol{s^h}, \boldsymbol{a})\left[\mu^m \alpha_h^m(\boldsymbol{d}^m) + \mu^f \alpha_h^f(\boldsymbol{d}^f)\right] \frac{\left(w^m T + w^f T + y\right)}{w^m} \tag{55}$$

$$t_h^f = \beta_f^h(\boldsymbol{s^h}, \boldsymbol{a})\left[\mu^m \alpha_h^m(\boldsymbol{d}^m) + \mu^f \alpha_h^f(\boldsymbol{d}^f)\right] \frac{\left(w^m T + w^f T + y\right)}{w^f} \tag{56}$$

$$e^m = \mu^m \alpha_e^m(\boldsymbol{d}^m)\left(w^m T + w^f T + y\right) \tag{57}$$

$$e^f = \mu^f \alpha_e^f(\boldsymbol{d}^f)\left(w^m T + w^f T + y\right) \tag{58}$$

$$e^c = \beta_e^c(\boldsymbol{s^c}, \boldsymbol{a})\left[\mu^m \alpha_c^m(\boldsymbol{d}^m) + \mu^f \alpha_c^f(\boldsymbol{d}^f)\right]\left(w^m T + w^f T + y\right) \tag{59}$$

$$e^h = \beta_e^h(\boldsymbol{s^h}, \boldsymbol{a})\left[\mu^m \alpha_h^m(\boldsymbol{d}^m) + \mu^f \alpha_h^f(\boldsymbol{d}^f)\right]\left(w^m T + w^f T + y\right) \tag{60}$$

where

$$\mu^m = 1 - \mu\left(w^m, w^f, y, \boldsymbol{z}\right) \tag{61}$$

$$\mu^f = \mu\left(w^m, w^f, y, \boldsymbol{z}\right). \tag{62}$$

Now, let ω_j denote the budget share for commodity $j \in \{l^m, l^f, t_c^m, t_c^f, t_h^m, t_h^f, e^m, e^f, e^c, e^h\}$. It is then straightforward to show that

$$\omega_{l^m} = \mu^m \alpha_l^m(\boldsymbol{d}^m) \tag{63}$$

$$\omega_{l^f} = \mu^f \alpha_l^f(\boldsymbol{d}^f) \tag{64}$$

$$\omega_{t_c^m} = \beta_m^c(\boldsymbol{s^c}, \boldsymbol{a})\left[\mu^m \alpha_c^m(\boldsymbol{d}^m) + \mu^f \alpha_c^f(\boldsymbol{d}^f)\right] \tag{65}$$

$$\omega_{t_c^f} = \beta_f^c(\boldsymbol{s^c}, \boldsymbol{a})\left[\mu^m \alpha_c^m(\boldsymbol{d}^m) + \mu^f \alpha_c^f(\boldsymbol{d}^f)\right] \tag{66}$$

$$\omega_{t_h^m} = \beta_m^h(\boldsymbol{s^h}, \boldsymbol{a})\left[\mu^m \alpha_h^m(\boldsymbol{d}^m) + \mu^f \alpha_h^f(\boldsymbol{d}^f)\right] \tag{67}$$

$$\omega_{t_h^f} = \beta_f^h(\boldsymbol{s^h}, \boldsymbol{a})\left[\mu^m \alpha_h^m(\boldsymbol{d}^m) + \mu^f \alpha_h^f(\boldsymbol{d}^f)\right] \tag{68}$$

$$\omega_{e^m} = \mu^m \alpha_e^m(\boldsymbol{d}^m) \tag{69}$$

$$\omega_{e^f} = \mu^f \alpha_e^f(\boldsymbol{d}^f) \tag{70}$$

$$\omega_{e^c} = \beta_e^c(\boldsymbol{s^c}, \boldsymbol{a})\left[\mu^m \alpha_c^m(\boldsymbol{d}^m) + \mu^f \alpha_c^f(\boldsymbol{d}^f)\right] \tag{71}$$

$$\omega_{e^h} = \beta_e^h(\boldsymbol{s^h}, \boldsymbol{a})\left[\mu^m \alpha_h^m(\boldsymbol{d}^m) + \mu^f \alpha_h^f(\boldsymbol{d}^f)\right]. \tag{72}$$

B Maximum likelihood estimation

To estimate the model parameters, we take the system of budget share equations (63)–(72) to the data. In doing so, we allow for unobserved heterogeneity across households by adding additive errors to the equations. Estimation then proceeds by means of maximum likelihood.

Let $\boldsymbol{y}_n$ denote household n's vector of budget shares ω_j for $j \in \{l^i, t_c^i, t_h^i, e^i, e^c, e^h;\ i = 1,2\}$. Similarly, let $\boldsymbol{x}_n$ denote the vector of explanatory variables $(w^m, w^f, \boldsymbol{d}^m, \boldsymbol{d}^f, y, \boldsymbol{z}, \boldsymbol{a}, \boldsymbol{s}^c, \boldsymbol{s}^h)$ for household n. Moreover, let $\boldsymbol{u}_n$ be the vector of household-specific first-stage residuals; we define them separately for clarity of exposition. Finally, let $\boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta})$ be the vector-valued function mapping the explanatory variables, first-stage residuals, and the model parameters (collected in the vector $\boldsymbol{\theta}$) into the right-hand side of equations (63)-(72). We can then write this system of equations compactly as follows:

$$\boldsymbol{y}_n = \boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta}) + \boldsymbol{\varepsilon}_n, \qquad n = 1, \ldots, N \tag{73}$$

where we have introduced a vector of error terms $\boldsymbol{\varepsilon}_n$ for household n. We will assume that, for a given household n, the individual error terms can be correlated across equations. However, the errors terms are assumed to be uncorrelated across households. Additionally, we assume that:

$$\boldsymbol{\varepsilon}_n \overset{i.i.d.}{\sim} \mathcal{N}(\boldsymbol{0}, \boldsymbol{\Sigma}). \tag{74}$$

That is, the error terms are independent and identically distributed across households n according to a normal distribution with mean zero and contemporaneous covariance matrix $\boldsymbol{\Sigma}$. Given this distributional assumption, it follows that:

$$\boldsymbol{y}_n | \boldsymbol{x}_n, \boldsymbol{u}_n \overset{i.i.d.}{\sim} \mathcal{N}(\boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta}), \boldsymbol{\Sigma}). \tag{75}$$

Hence, we can derive the sample conditional loglikehood:

$$\begin{aligned} \log L(\boldsymbol{\theta}, \boldsymbol{\Sigma}) &= \sum_{n=1}^{N} -\frac{M}{2}\log(2\pi) - \frac{1}{2}\log(|\boldsymbol{\Sigma}|) - \frac{1}{2}\big(\boldsymbol{y}_n - \boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta})\big)'\boldsymbol{\Sigma}^{-1}\big(\boldsymbol{y}_n - \boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta})\big) \\ &= -\frac{NM}{2}\log(2\pi) - \frac{N}{2}\log(|\boldsymbol{\Sigma}|) - \frac{1}{2}\sum_{n=1}^{N}\big(\boldsymbol{y}_n - \boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta})\big)'\boldsymbol{\Sigma}^{-1}\big(\boldsymbol{y}_n - \boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta})\big) \end{aligned} \tag{76}$$

where M equals the number of choice variables (i.e., the dimension of $\boldsymbol{y}_n$). It is a well-known result that for any given value of the model parameters $\boldsymbol{\theta}$, the loglikelihood is maximized with respect to $\boldsymbol{\Sigma}$ whenever $\boldsymbol{\Sigma} = \hat{\boldsymbol{\Sigma}}(\boldsymbol{\theta})$, where

$$\hat{\boldsymbol{\Sigma}}(\boldsymbol{\theta}) = \frac{1}{N}\sum_{n=1}^{N}\big(\boldsymbol{y}_n - \boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta})\big)'\big(\boldsymbol{y}_n - \boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta})\big). \tag{77}$$

Consequently, maximizing the loglikelihood is equivalent to maximizing the concentrated (or

profile) loglikelihood

$$\log L_c(\boldsymbol{\theta}) = -\frac{NM}{2}\log(2\pi) - \frac{N}{2}\log(|\hat{\boldsymbol{\Sigma}}(\boldsymbol{\theta})|) - \frac{NM}{2} \tag{78}$$

which allows us to obtain estimates for the model parameters $\boldsymbol{\theta}$.[20]

By construction, the household budget shares (i.e., the components of $\boldsymbol{y}_n$) sum to one. Similarly, under the assumptions of the model, the elements of $\boldsymbol{g}(\boldsymbol{x}_n, \boldsymbol{u}_n, \boldsymbol{\theta})$ sum to one, which can readily be verified from equations (63)-(72). As a result, the error terms for each household n add up to zero, which, in turn, implies that the covariance matrix $\boldsymbol{\Sigma}$ (as well as its sample counterpart) is singular. To overcome this singularity problem, we can simply drop one of the budget share equations and estimate the model parameters by applying the strategy outlined above to the reduced system of equations (Barten, 1969). In the empirical application, we remove the equation on other public expenditure (ω_{e^h}); maximum likelihood is invariant to the equation that is excluded from the system.

To compute standard errors, we perform 1000 bootstrap replications. In each iteration, we first compute the first-stage residuals on the bootstrapped sample. Subsequently, we re-optimize and calculate the new variance-covariance matrix for that iteration. The bootstrapped standard errors are then obtained as the simple average across all bootstrap replications.

[20] See, for example, Hayashi (2000) or Greene (2017).

C Construction of job flexibility index

Job flexibility is a multidimensional concept. The ability to adjust own working schedules, the ability to work from home, not having to work evenings, nights, or weekends are all aspects of a worker's job that are commonly understood in relation to job flexibility. Therefore, in the Bilendi and LISS surveys, questions were included aimed at measuring which of these aspects are present in the respondent's job and to what extent.[21] For reasons of tractability, we use a single measure of job flexibility in the empirical application. To reconcile the information in each of the different variables into this measure of job flexibility, we resort to principal component analysis (PCA).

Our main measure of job flexibility relies on variation in two variables. The first variable relates to schedule flexibility. It aims to measure the extent to which the respondent is able to adjust his or her own working schedule. The second variable relates to telecommuting possibilities. It measures the fraction of the respondent's work week she or he is able to work from home. As such, this variable captures that a worker who can work a single day per week at home but only works part-time may have relatively more telecommuting opportunities than a worker who can also work a single day at home per week but works full-time.

We create an index of job flexibility by extracting the first principal component of these two variables.[22] To ease interpretation, we further scale the index to the unit interval. Descriptive information on this index of job flexibility and its distribution, both across and within households, is provided in Section 3.1.

[21] See Online Appendix O.A for more details on the relevant survey questions.

[22] Using principal component analysis on the correlation matrix of only two variables implies that the component loadings on the included variables are the same. This follows from the fact that the eigenvectors of any two-dimensional correlation matrix identical. We therefore omit presenting these component loadings here. Qualitatively, all results would remain if we would standardize each of the variables and define our index as the simple average of the two.

Online Appendix

O.A Survey questions

O.A.1 Bilendi

In this appendix, we present the main survey questions in the Bilendi questionnaire. A first set of questions ask the respondents to provide some background characteristics. Next, we inquire about individual time use and household expenditure. Finally, we ask the respondents about characteristics of their current jobs. On top of this, we explicitly indicate which survey questions were included in the partner supplement. All of these questions are close to identical to those asked to the respondent; minor differences in spelling or grammar may be possible.

Table O.A.1: Survey questions – Bilendi

Questions	**Answers**
Section I: General	
Employment. Are you currently gainfully employed, or have you been gainfully employed in the past?	– No, I have never done any paid work. – Yes, I have done paid work in the past, but do not currently have a paid job. – Yes, I currently have a paid job.
Province. In which province do you live?	– List of twelve provinces. – URL: https://www.ipo.nl.
Age. How old are you?	– Integer: 0 – 999.
Gender. What is your gender?	– Man. – Woman. – Other.
Education. What is the highest degree or level of schooling you have completed?	– Primary education. – Havo/Vwo. – Mbo. – Hbo. – Wo. – Other. – No education completed. – Is not (yet) pursuing education.

Questions	Answers
Family situation. What best reflects your current family situation?	– Single without children. – Single with children. – Married or unmarried cohabiting without children. – Married or unmarried cohabiting with children.
Number of children. How many resident children do you have?	– Integer: 0 – 999.
Age of children. What are the ages of your resident children?	– For each child, Integer: 0 – 999.
Participation partner survey. Before you can proceed with the survey, we would draw your attention to the following. In the remainder of this survey, you will be asked questions relating to your partner Because these questions may not be as easy to complete as those pertaining to yourself, as well as to maintain the quality of the answers, we offer the opportunity for your partner to complete an abbreviated survey. Does your partner wish to participate, possibly at a later date?	– No. – Yes.
Section II: Employment and Income	
Primary occupation. What is your primary occupation?	– Paid employment. – Works or assists in family business. – Autonomous professional, freelancer, or self-employed. – Job seeker following job loss. – First-time job seeker. – Exempted from job seeking following job loss. – Attends school or is studying. – Takes care of the housekeeping. – Is pensioner (voluntary or involuntary early retirement, old age pension scheme). – Has (partial) work disability. – First-time job seeker. – Performs unpaid work while retaining unemployment benefits. – Performs voluntary work. – Does something else.
Hours of work. On average, how many hours per week do you work in your main job? The main job is the job for which your perform the most hours. If you currently do not have a paid job, please enter 0 where applicable.	– Integer: 0 – 168.

Questions	Answers
Earnings and benefits. How much is your average monthly salary in your main job or benefits? Benefits refer to the monthly amount received in euro based on WW, AOW, Wajong, and so on. Can you please further indicate whether this amount is gross or net?	– **Double: 0 – 999.999.** – Gross. – Net.
Other income. Can you indicate in the following table how many euro you receive on average each month for each of the listed items?	– **Double: 0 – 999.999.** – Healthcare supplement. – Child support (child allowance and child budget). – Student finance (scholarship, interest-bearing loan). – Alimony. – Income from real estate including rental income. – Income from financial products (dividends on stocks, securities, investment accounts or mutual funds). – Interests on savings accounts, receivables, securities, bonds, pledges, or investment accounts.
Section III: Time Use	
Time use. On the following screen, you will see several activities, each with a few examples. Could you please indicate how many hours you spend on each of these activities in a typical week? Please allocate 168 hours (= 1 week) between the different activities. If, for example, you spend only half an hour on a particular activity, enter 0.5 under "hours". If you do not know exactly how much time you spend on a given activity, an estimate will suffice.	– **Double: 0 – 168.** – Paid work (employed or self-employed; do count overtime hours). – Commuting. – Household tasks (cleaning, laundry, grocery shopping, cooking for the family, gardening, ...). – Sleeping and resting. – Caring for resident children (homeschooling, washing, dressing, playing, reading, going to the doctor, babysitting, ...). – Leisure activities (watching television, reading, sport activities, hobbies, walking the dog, gaming, browsing online, communicating with family or friends, hiking, biking, vacationing, ...). – Other activities not listed here.
Section IV: Expenditure	

Questions	Answers
Common expenditure. On average, how many euro does your household spend per month on common expenses? For example, on mortgage, rent, general utilities, transportation and vehicles, insurance, financial support for children not living at home, debts and loans, family excursions and vacations, expenses for cleaning the house or maintaining the garden, eating at home, …	– Double: 0 – 999.999.
Child expenditure. On average, how many euro does your household spend per month on your resident children? Please allocate these expenses to the following expenditure items.	**– Double: 0 – 999.999.** – Food and drinks. – Clothing. – Non-reimbursed medical expenses (medicines, physical therapy, dentist, hospital expenses, eyeglasses, hearing aids, …). – Specific care products (powdered milk, diapers, …). – Child care (daycare, out-of-school care, guest parent care). – Schooling (registration fees, class materials, …). – Leisure activities (sports, hobbies, magazine subscriptions, …). – Pocket money and gifts.
Personal expenditure. On average, how many euro do you spend per month on personal expenses? For example, on food and drinks outside the home, clothing, non-reimbursed medical expenses, personal care, transportation and means of transportation, leisure activities outside of the family, …	– Double: 0 – 999.999.
Section V: Amenities and Working Conditions	
Schedule flexibility. This question is about the extent to which you can adjust your work schedule in your current job. The question is about the ability to decide when to work, not the number of hours. Can you choose your own working hours?[a]	– My working hours are determined by my employer with no ability to change that. – I can partly choose when I work, but must let my employer know at least a week in advance. – I can partly choose when I work, and I can decide this at very short notice. – I can completely determine my own working hours.
Telecommuting possibilities (1). What percentage of your normal workweek can you work from home in your current job?	– Integer: 0 – 100.

Questions	Answers
Telecommuting possibilities (2). In a typical workweek, how many days can you work form home? By this we mean that you do not work at the workplace, but rather at home. Moreover, this is not about whether this opportunity is actually used.	– 0 to 1 day. – 2 days. – 3 days. – 4 days. – 5 days.
Evening and night work. How often does your current job require you to work evenings or nights? By this we mean normal work, not overtime. It also does not include working from home, where, for example, you work a few hours in the evening in order to have more time for other activities during the day.	– Never. – Occasionally. – Often, but not every week. – Every week.
Weekend work. How often does your current job require you to work weekends? By this we mean normal work, not overtime. It also does not include working from home, where, for example, you work a few hours in the weekend in order to have more time for other activities during the normal workweek.	– Never. – Occasionally. – Often, but not every week. – Every week.
Personal contact. How much personal contact with customers and colleagues (or patients, student, ...) is required in your current job?	– No contact is required. – Some contact is required, less than one day a week. – Contact is required occasionally, about one day a week. – Frequent contact is required, more than one day a week. – Contact is required all the time.
Computer use. How much time, in percent, of an average workday do you spend working on a computer?	– Integer in 0 – 100.
Perception boss flexible work. Suppose you or one of your colleagues asks your superior for the opportunity to choose own working hours. How do you think your supervisor would respond to this? This question is about the possibility to decide own working hours, not the number of hours to work.	– Negatively. – Somewhat negatively. – Neutral. – Somewhat positively. – Positively.
Child care alternatives (1). Suppose that your child or one of your children requires your immediate attention during you and your partner's working hours. For example, because your child is ill or due to a school-related problem. How difficult is it for you and your partner find someone (parent, relative, friend, ...) to help with this on short notice?	– Easy. – Somewhat easy. – Somewhat difficult. – Difficult.

Questions	Answers
Child care alternatives (2). Suppose that you or your partner needs to stay longer at work on a particular day to complete daily tasks or because of a meeting. How difficult is it for you and your partner find someone (parent, relative, friend, ...) to pick up your child or children from daycare or school on short notice?	– Easy. – Somewhat easy. – Somewhat difficult. – Difficult.
Child care alternatives (3). Suppose that you or your partner needs to stay longer at work on a particular day to complete daily tasks or because of a meeting. How easy is it for you and your partner to allow your child or children to stay longer in daycare or after-school care?	– Difficult. – Somewhat difficult. – Somewhat easy. – Easy.

Notes: Survey questions included in Bilendi survey; fielded online between November 2022 and January 2023. Tagged questions are included in the Partner supplement.

[a] Included in Partner supplement.

O.A.2 LISS

The LISS panel gathers yearly data on a true probability sample of the Dutch population. We appended a module to the June 2022 wave to obtain additional information on respondents that are not present in the LISS Core Study, mainly focusing on job flexibility and its instruments.

In general, the questions in the LISS module align fairly closely to those in the Bilendi survey (see Table O.A.1). This is especially true for the questions relating to amenities and working conditions. Although the survey questions in the LISS module are not presented here, they may be obtained upon request.

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