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The payroll tax contribution limit and women's labor market outcomes

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Abstract

Objective: To examine the effect of the male partner's entry into payroll tax-exempt earnings on the female partner's labor market outcomes.

Background: Employees only pay payroll taxes up to a specific limit, which results in a comparatively greater increase in the take-home pay of individuals who earn labor incomes above this threshold. We argue that returns from payroll-exempt labor are gendered: That is, because men are more likely high earners than women, they will more often benefit from the payroll tax ceiling. This increases the labor market returns of men and sets substantial incentives within couples to reduce the paid labor of the secondary earner.

Method: We use panel data from the United States (PSID) to examine changes in women's annual work hours, hourly wages, and earnings over the partner's entry into payroll tax-exempt labor (treatment) using fixed-effect models with individual slopes. The models enable us to assess women's labor market outcomes while adjusting for heterogeneous within-couple earnings differential slopes before treatment in addition to any time-constant heterogeneity. Our sample contains 7297 women providing 65,811 observations.

Results: Women's earnings on average diminished by 4% after the partner breaks through the payroll tax contribution threshold. This was mostly explained by changes in annual work hours, which on average decreased by 4%. We did not find reduced hourly wages in the short run.

Conclusion: We conclude that payroll exemptions for high earners reinforce gender inequality within upper-income couples, which is a link hitherto missed in the literature.

KEYWORDS

gender, inequalities, marriage, policy, work

INTRODUCTION

Since the 1970s, women have increased their hours in paid work, which in turn has strengthened their economic self-reliance (Blau & Kahn, 2007; Bloome et al., 2019; Haupt & Strauß, 2022). However, women did not witness a parallel reduction in the number of hours spent in unpaid care and household labor, resulting in a stressful double burden (Dugan & Barnes-Farrell, 2020). Family researchers discuss how couples, and parents in particular, handle family and employment responsibilities and which norms and institutions contribute to changes in employment behavior within couples (Becker & Moen, 1999; Daminger, 2020; Díaz, 2022). On the one hand, for instance, we might expect the expansion of public childcare facilities to facilitate work opportunities for women and help increase hours in paid work (Zoch & Hondralis, 2017). On the other hand, persistent gender norms around caregiving continue to strengthen steep reductions in women's employment and income after childbirth, in cases of long-term sickness of children, or when providing elderly care (Baxter et al., 2015; Gonalons-Pons & Schwartz, 2017; Musick et al., 2020).

Depending on their family and economic circumstances, couples decide whether to increase or reduce the investment into paid or unpaid work. Following Becker and Moen (1999), we refer to this behavior as *scaling*. The scholarly focus on scaling views the couple as a joint unit, which seeks to maximize (economic) well-being by balancing their work-family life. Scaling decisions are therefore highly dependent on the characteristics of the spouse, the family, and social institutions (Boeckmann et al., 2015). At the same time, scaling shows strongly gendered patterns: Women react to increases in men's income by decreasing investment in paid work, but men typically do not adjust their labor supply to their wives' income gains (Amarante et al., 2024).

A conceptual advantage of this theoretical framework is that it helps scholars to focus on gradual changes within family lives. Couples can scale up or scale down investments in employment or family life across almost all employment constellations between partners (Becker et al., 1999). They need not adapt to changing circumstances with categorical changes, such as switching from full-time to part-time work. In some cases, these adaptations may be much more gradual in nature, like taking half of the Friday off. As we will discuss, such gradual changes are of interest for family research and inequality scholars alike.

Scaling strategies do not necessarily need to focus on work hours. They can also include changing expectations for family planning, leisure time, or norms regarding the distribution of household chores. Consequently, scaling can lead to reduced investment in paid work, which in turn might result in less opportunities for promotion and lower wage growth. In this article, we mostly focus on changes in labor supply because they can have fundamental consequences for lifetime earnings and economic dependency (Bloome et al., 2019).

An important stream within the debate on couples' employment decisions is the role of tax schemes for scaling strategies. A common finding is that tax schemes that address couples' income jointly favor the labor market income of the main earner and create a higher tax burden for the secondary earner (Bick & Fuchs-Schündeln, 2017). Couples typically scale back the work hours of the secondary earner (Becker & Moen, 1999). Because men are more often the main earners, such family-oriented income tax schemes have gendered consequences for scaling strategies (Borella, De Nardi, & Yang, 2023).

We argue that payroll taxes play an important part in scaling strategies. Unlike income taxes, almost all employees in the United States have to pay social security contributions (FICA). Yet employees only pay payroll taxes up to a specific limit. Each dollar earned above the limit is no longer subject to contributions. This is called a payroll tax contribution "ceiling," "threshold," or "limit" (in the U.S. often also "wage base limit," "tax cap," or "withholding limit"). Payroll tax caps increase labor market returns for high earners, who are overwhelmingly men (Haupt & Nollmann, 2022). Within couples, this sets strong incentives to scale back the

hours of paid work for secondary earners. Previous scholarship emphasizes that scaling back strategies are more prominent for couples in the upper part of the income distribution (Triebe, 2013; Yavorsky et al., 2023; Zhou & Kan, 2023).

A central claim of this paper is that payroll-exempt earnings can yield a stable household income even if the labor supply of the secondary earner decreases, because couples could balance unpaid care work with the main earner's benefit from payroll tax-exempt labor income. Such a reduction can be a viable strategy for a high-income couple. However, a reduced labor supply might in turn result in hampered careers and lower wage growth for the secondary earner. This can lead to higher economic dependency and vulnerability of women. Thus, our overarching research question is: *what happens to the labor market outcomes of the female partner when their male partner starts to earn payroll tax-exempt labor income?*

To examine how the payroll tax contribution limit changes the labor market outcomes of partnered women, we draw on long-running panel data from the Panel Study of Income Dynamics (PSID). We use fixed-effects regression models with individual slopes (FEIS) and estimate changes in women's labor income, working hours, and hourly wages after their partner earns payroll tax-exempt labor income for the first time. FEIS models with individual slopes of within-couple income differentials allow us to account for selection into treatment (i.e., exposure to a payroll tax-exempt partner) based on pre-treatment trends in within-couple specialization. We contrast our estimates to results from a placebo threshold, i.e., changes in women's labor market outcomes when their male partner starts to earn above the 70th percentile of the PSID income distribution.

Our results show that women's labor market outcomes decreased when their partners earned payroll-exempt labor income but remained unchanged after the placebo treatment. Women's earnings on average diminished by about 4% after their partner breaks through the payroll tax contribution threshold. More specifically, women reduced annual work hours in paid employment by roughly 4%. We show that this did not lead to a decrease in hourly wages in the short run. We did not observe any similar pattern when using the placebo threshold instead.

SCALING BEHAVIOR WITHIN COUPLES

Employment decisions of partners are interwoven (Aisenbrey & Fasang, 2017; Carvalho et al., 2023; Nutz & Gritti, 2021). Classic economic thinking placed these decisions within a theory of maximization of family utility, in which paid and unpaid labor had to be distributed between family members. Because of constraints in time, partners would specialize in either paid or care work. As a result, the couple as a joint unit is understood to benefit from each spouse's specialization (Becker, 1985, 1993).

A key challenge of contemporary family life is to balance different demands from employment and the family. High investments in both spheres over long time periods might be unsustainable for most couples. The anticipation of such a situation can result in childlessness or lower levels of cohabitation, a phenomenon many countries witnessed over the past decades (Lesthaeghe, 2014). Another response to balancing work and family demands is to scale back employment. Becker and Moen (1999) show that dual-income earners use different strategies for scaling back: placing limits on work hours, adopting a job vs. career framework, or a trading-off of these strategies over the life course.

Most couples in the study of Becker and Moen (1999) followed a job vs. career framework, where one partner pursues a career (i.e., a sequence of jobs progressing towards a long-term goal) and the other views their employment as a job (i.e., performing a task in exchange for money). The partner with the job can flexibly react to changing family circumstances. That is, couples can change the career vs. job distribution if opportunities present themselves or if one partner reaches a satisfactory career stage (Langner, 2015). In general, couples use scaling in iterative processes, including family planning, their attitude toward their employment, and their

work hours. We assume that in typical settings, decisions on family planning and careers precede decisions regarding work hours.

The job vs. career distribution within couples is strongly gendered. Typically, men do not react to changes induced by women, but women react to changes induced by men. For instance, the birth of the first child often rapidly leads to the prioritization of men's paid work over women's careers (Baxter et al., 2015; Gonalons-Pons & Schwartz, 2017; Musick et al., 2020). Women reduce employment and work hours and experience lower wage growth after childbirth, whereas men's economic outcomes are not affected by fatherhood (Mari, 2019). The same is true if children suffer from health problems (Eriksen et al., 2021) or when individuals take care of elderly parents (Glauber, 2019). Women pull back on their work hours and career opportunities while men do not.

The upshot of this line of research is that most couples use strategies of scaling back work hours for family time if they are susceptible to changes *and* their circumstances allow it. In the long run, scaling back work time and emotional investment in paid work will likely decrease promotion prospects and contribute to stalled wage growth. If both partners view themselves as being on a career track, they will likely not react to changes in incentives. Because scaling back work hours can have economic costs for the household and the family, upper-income couples are more prone to scale back employment conditional on changing incentives (Langner, 2015).

This claim is primarily evidenced in analyses of taxation on employment: Tax schemes favoring large income differences between spouses set strong incentives for the secondary earner to reduce employment (Bick & Fuchs-Schündeln, 2018; McCaffery, 2009). In the US, for instance, most married couples file income taxes jointly. By doing so, both partners' incomes are added together to determine the couple's tax burden. Because the income tax schedule is progressive (i.e., higher tax rates at higher incomes), the couple benefits more when income differences between both partners are large (e.g., income is split between both partners in a single-earner couple, thereby avoiding higher marginal tax rates on the provider's income). Because women are more likely to be the secondary earner, reforms of tax schemes favoring such income differentials even more lead to reductions in women's work hours (Bick & Fuchs-Schündeln, 2017; Guner et al., 2012; Immervoll et al., 2011; Muroga, 2020).

What is more, the economic literature underscores that wives have more elastic work participation and earnings than husbands (Lin & Tong, 2017). More specifically, recent studies suggest that women with otherwise similar characteristics work, or prefer to work, lower hours if the spouse has higher earnings (Schalembier et al., 2019). This behavior is more pronounced in the upper half of the income distribution (Triebe, 2013). In other words, scaling back on paid work is highly gendered, thus contributing to gender earnings differentials within couples.

Our key take-away is that individual employment trajectories are embedded in the context of their partnerships (Muller et al., 2020). Decisions on how to balance employment and family demands are gendered and depend on the couple's economic circumstances (Zhou & Kan, 2023). We, therefore, expect that exempting parts of the labor incomes of high-earning men from payroll tax will negatively affect their partner's paid working hours, hourly wages, and labor incomes.

THE CONTRIBUTION OF PAYROLL TAX THRESHOLDS TO WOMEN'S LABOR MARKET OUTCOMES

Taxation plays an important role in how the income of the primary earner influences the labor market behavior of the secondary earner. Previous studies showed this link by analyzing differences in joint versus individual income taxation of main and secondary earners (Bick & Fuchs-Schündeln, 2018). The combination of a high earner and a moderate earning secondary one can be a lucrative combination in income tax systems with joint taxation, as is the case in the

United States (Schechtl, 2023; Schwarz, 2012). This sets strong incentives for the secondary earner to reduce working hours (Bick & Fuchs-Schündeln, 2017). Gender-specific income differences within couples in combination with joint taxation will therefore most likely decrease the labor force participation of women married to high-earning men regardless of payroll-exempt labor income.

Here, we analyze the *additional* influence of payroll tax-exempt labor income of the male partner on the female partner's labor market outcomes. We assume that we can best describe its influence as a *further* reduction of her labor market outcomes, adding to other possible negative influences, such as motherhood or being the secondary earner in a joint taxation scheme. These factors might be particularly prevalent when the male partner earns payroll-exempt labor income for the first time.

Figure 1 illustrates the stylized pattern. In this simplified model, the secondary earner's work hours decrease with every marginal increase in the primary earner's labor income. Yet once the primary earner breaks through the payroll contribution limit, that is, starts to earn payroll tax-exempt labor income, every additional dollar generated from the primary earner yields a higher decrease in labor market participation of the secondary earner.

The exposure to a partner earning payroll-exempted labor income is selective due to assortative mating and the structure of the earnings distribution. It is more likely for highly educated men to earn labor incomes above the payroll tax contribution limit, as is for White and Asian men in comparison to Black or Latinx (Manduca, 2018). Assortative mating within educational and racial groups then likely leads to different chances of being partnered to a man earning above the payroll tax contribution limit.

Yet not all partnered women will equally decrease their labor market activity with each rise in their partner's income. Especially, highly educated women with substantive earnings might see little reason to reduce hours in paid work simply because their partner gets a wage raise. Any change in an individual's labor market behavior—once the partner earns payroll-exempt labor income—depends on the own, partner's, and couple's characteristics. Secondary earners

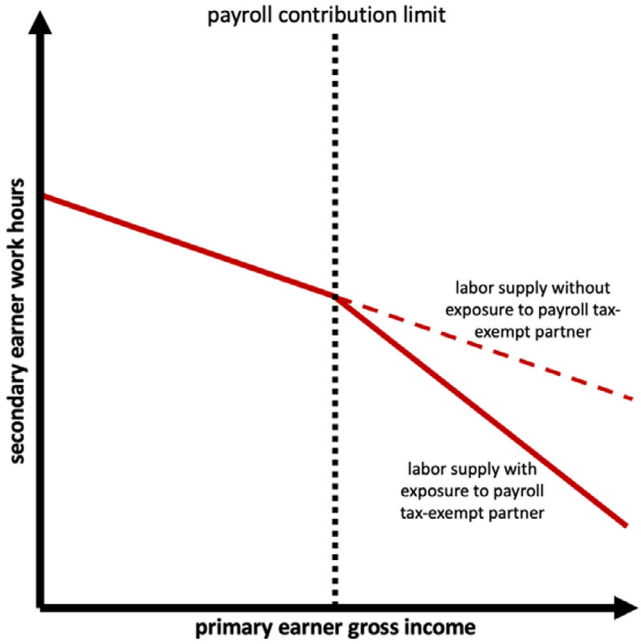

FIGURE 1 Conceptual model of the payroll contribution limit and partner's work hours.

with lower labor market potential will most likely reduce their paid activity way before the main earner starts to earn payroll-exempt labor income. That is, the presence of childbearing responsibilities, differences in education, or work experience will be implicated in the decision to reduce time in paid work. The upshot here is that women's earnings trajectories prior to the partner breaking through the payroll tax ceiling are most likely heterogeneous and select into treatment based on within-couple income differences.

THE US PAYROLL TAX SYSTEM

Payroll tax contribution ceilings exist in many countries. Yet the US is a particularly intriguing case because of its high level of income inequality. Most European countries are less unequal in terms of labor incomes when compared to the US (Blanchet et al., 2022). Much of the growth in income inequality during the past decades accrued due to increasing incomes at the top of the distribution (Piketty et al., 2018). The US witnessed especially strong increases in top incomes. When labor incomes increase strongly at the top, contribution thresholds do not hold pace. Therefore, a growing volume of labor income becomes payroll tax-exempt.

Payroll taxes are based on a flat rate, that is, the percentage of earnings spent on social security contributions does not vary with labor income. In the United States, employees and employers each pay half of the social security tax of 12.4%. Yet the social security tax is only one of two federal payroll taxes. Employers and employees also pay 1.45% each in Medicare tax. Unlike the Social Security tax, no contribution limit exists for the Medicare tax. However, the social security tax is substantively higher and therefore more decisive for individual labor market decisions. Except for Medicare tax, labor income earned above a certain threshold (*contribution limit*) is exempt from payroll tax. Although payroll taxes are levied on a flat rate, they are therefore regressive by design: with every additional dollar in earnings, those above the contribution limit will pay a lower share of their labor income in tax.

The income threshold above which no social security tax payments accrue is tied to the National Wage Index and changes every year. However, governments can also adjust thresholds irrespective of wage and inflation rates. In the United States, the contribution limit is set at $147,000 in 2022 (see Appendix Figure A1 for the evolution of contribution limits in the United States during our observation period). Every dollar in annual labor income above this threshold is exempt from social security tax.

Figure 2 shows a simplified marginal tax structure for married couples in 2022. The dashed, blue line indicates the structure of the federal income tax, and the solid, red line represents the joint marginal tax structure of the federal income tax and the social security tax. While the system is overall progressive (i.e., higher incomes are taxed at higher rates), the payroll tax contribution limit clearly benefits high earners: An additional dollar at an income of $100,000 is taxed higher than an additional dollar at $400,000. What is more, the very first earned dollar is taxed higher than an additional dollar at $150,000 (22.4% vs. 22%), right above the payroll contribution limit.

What does this mean for a couple's labor market returns? Let's imagine a hypothetical couple making a combined salary of $200,000, with a primary earner receiving $150,000 and a secondary earner making $50,000. A marginal increase in the primary earner's labor income will be subject to a 24% federal income tax because the couple's joint income falls into the bracket between $178,151 and $340,100. However, the primary earner's own labor income is above the payroll tax contribution limit of $147,000. A marginal increase in earnings will therefore not be subject to any social security tax. Like the primary earner, a marginal rise in the secondary earner's labor income will also be taxed at a 24% federal income tax rate. Yet the secondary earner additionally faces a 12.4% social security tax due to his or her personal earnings not being payroll tax-exempt. For this exemplary couple, a marginal increase in the primary

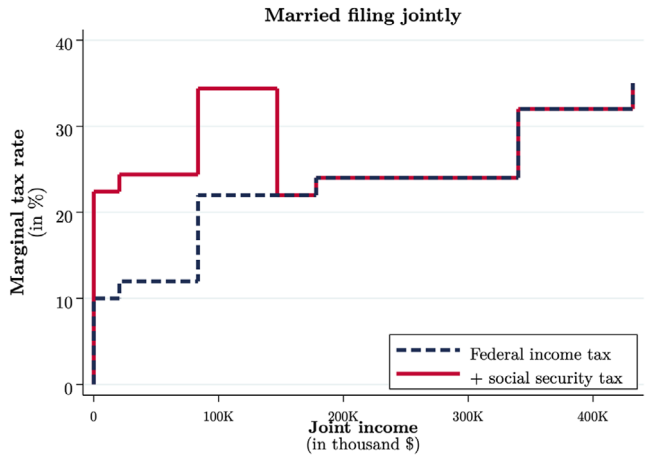

FIGURE 2 Married couples' marginal tax structure.

earner's labor income is more valuable than a marginal increase in the secondary earner's labor income. Importantly, additional labor income of the primary earner is slightly more valuable than a marginal increase in the secondary earner's labor income, even in a scenario in which this exemplary couple is not married.

Imagine our exemplary primary earner receives a 25% wage hike. On top of the wage gain, the additional *net* salary gain exclusively through the payroll tax exemption is worth $200 per month. This equals 10 h of paid work each month for the average female partner in our data. In other words, the gain in household income exclusively attributed to the payroll tax exemption is worth more than 2 h of the woman's paid work each week. Facing these incentives, couples might rethink their preferred division of paid work and home production.

It is worth noting that the payroll tax exemption essentially subsidizes the home production of the secondary earner by potentially keeping family income stable when the secondary earner increases unpaid labor at the expense of hours in paid work. Therefore, the payroll tax limit provides a double bonus to traditional, high-income households: the benefits of payroll tax-free earnings *and* the advantage of replacing less home production (i.e., lower costs).

EXPECTATIONS

Payroll tax contribution limits are not *explicitly* designed to strengthen inequality within couples. Yet, considering persistent differences in opportunities to earn similar incomes across genders, their design might *implicitly* set incentives to reduce paid work for the secondary earner—more often the female partner. Whenever one partner earns labor income above the contribution threshold, their take-home income becomes even higher because earnings above the limit are exempt from payroll taxes. In terms of household pocketbooks, this effectively results in a higher net income.

We expect that payroll tax contribution limits incentivize main earners to increase investments in paid work and secondary earners to decrease investments in paid work. We do not expect that payroll tax exemptions change the current distribution of who has a job versus career. Given the level of the payroll tax ceiling, it is plausible to assume that men are already on a career path when they reach the payroll tax cap. It is likely that many women with such a partner perceive their employment as a job rather than a career, especially after childbirth. Such

a career/job distribution in combination with a high disposable income provides ideal circumstances for scaling down women's hours in paid work.

Hypothesis 1. *Women reduce their working hours after their partner earns payroll tax-exempt labor income for the first time.*

Having a partner earning above the cap could make it less likely that women invest more in their jobs or change to a career perspective overall. Pursuing promotions typically means adhering to ideal worker norms, which usually translate into long work hours (Cha & Weeden, 2014; Deschacht, 2017; Goldin & Katz, 2000). If women opt out of organizational norms in favor of more unpaid work or leisure time, they violate this norm, and their career chances can diminish. A second reason might be reduced job mobility of women: a job change typically induces temporary stress for the family and women could try to avoid such additional stress if their own job is seen as secondary to the male partner's career. Yet job changes enable employees to strive and bargain for better wages (Hirsch & Schnabel, 2012). Untaken chances therefore hamper career progress. Hence we expect the below:

Hypothesis 2. *Women's wage progression is reduced after the partner earns payroll tax-exempt labor income for the first time.*

There is little reason to believe individuals are unaware of this incentive because the gain in take-home pay can be substantial. Parker (1999) shows that couples consume more non-durable goods in the months after one earner within a family exceeded the payroll tax cap, which indicates that couples make very conscious choices based on the economic surplus of payroll-exempted incomes. Moreover, earnings above the contribution threshold are also relevant for the employer: Labor income above the limit is exempt from the employer's share of the social security tax payment. Therefore, employees with high hourly wages working additional hours are effectively cheaper for the employer when compared to part-time employees with similarly high hourly wages. Similarly, additional pay raises for employees above the threshold become marginally cheaper for employers. Hence, the payroll tax contribution limit incentivizes employers *and* employees to prioritize the careers of high earners.

Male employees should break through the contribution limit more often because they outearn their female partners more often or are ahead in their careers because they are relatively older than their partners. Therefore, men are more likely to benefit from payroll-exempt labor income, providing strong incentives for the couple to prioritize his paid work and reducing the volume of hers. Therefore, in summary, here is what we expect:

Hypothesis 3. *Women's labor income is reduced after the partner earns payroll tax-exempt labor income for the first time.*

DATA AND METHODS

Data

We rely on high-quality panel data from the Panel Study of Income Dynamics (PSID, 1977–2017). The PSID is among the most long-running panel surveys in the world and therefore well suited for our research interest. The survey covers a wide range of topics, including information relevant to the current study, such as detailed measures of respondents' and partners' income and annual work hours. Moreover, the PSID forms part of the Cross-National Equivalent File (CNEF), making critical demographic and economic information harmonized and available, thus enhancing future comparability across countries.

TABLE 1 Sample restrictions.

	Individuals	Person-years
Partnered women aged 19–64	11,834 (100%)	93,910 (100%)
Missing values	584	4214
Missing partner's info	407	5942
Not in paid labor	2435	19,620
At least 3 observations	2994	4265
Estimation sample	7297 (61.7%)	65,811 (70.1%)

Sample

Our analytical sample contains women in different-sex couples (both married and partnered) aged 19–64, either if they are not treated or not yet treated, and up to 4 years after treatment. We restrict our sample to observations without missing values on our analytical variables as well as without missing information on the partner. We exclude person-years when women are not in paid work, such as housewives or women in employment breaks. Most importantly, we exclude women observed in less than three survey waves because of data requirements for our fixed-effects analyses with individual slopes (FEIS). The final sample includes 7297 women providing 65,811 person-years (see Table 1).

Variables

Our three main outcome variables are women's (a) work hours, (b) gross hourly wage, and (c) gross income. Income and working hours represent annual information. Labor income includes all earnings from employment and self-employment, including bonuses and overtime. We divide annual labor income by annual hours worked to obtain the hourly wage. All financial information is top and bottom coded at the 0.1 and 99.9 percentile and adjusted using the Consumer Price Index (CPI). Labor income, work hours, and wages are transformed using the natural logarithm.

Our treatment variable is a time-varying binary indicator of the partner's *payroll tax status*. The indicator equals one in any year after the partner breaks through the payroll tax ceiling for the first time. We rely on self-reported information on men's annual labor income to generate this variable.

Our goal is to estimate the *additional* influence of a specific source of income growth (i.e., payroll tax-exempt income) of the husband on women's labor market outcomes. To do so, we track women and estimate changes in their labor market outcomes over time. This allows us to study whether partnered women exposed to a man earning payroll-exempt labor income react differently compared to women who are not exposed. We compare changes over time within women but do not estimate relative differences between different women. Therefore, we only need to control for typical changes within the biography of couples that are associated with a change in women's labor market outcomes.

Since we want to single out the influence of an additional income due to a specific income source (i.e., payroll tax-exempt labor income) but not the influence of higher income overall, we adjust for the couple's joint labor income. In doing so, we compare women exposed to the same amount of overall family income change but with different sources of this change.

Because our individual-level fixed-effects models account for any observed and unobserved time-constant heterogeneity, we only include a parsimonious set of time-varying covariates. We

control for major biographic events affecting both men and women: starting to earn payroll tax-exempt labor income might happen during years of family formation, where men invest strongly in their careers and women face double burdens due to increased demands for unpaid work. Therefore, we include changes in the number of dependent children in the household (none[ref], one, two, three, four) to account for any childcare-related changes in female labor market participation. To address behavioral changes of women once their partner experiences a significant change in working activity, we include the time-varying annual working hours of the male partner (log). The idea here is that women might adjust their labor market activity if the husband experiences a particularly time-consuming job change.

In addition, we control for respondents' years in education to address changes in educational attainment. We note, however, that for the most part education will be captured by the individual-level fixed-effects. We added a binary indicator to capture whether respondents are currently in their first marriage (yes, no [ref]) or cohabiting. Finally, we add indicators of the survey year to capture the period effects of national income trends.

Analytical strategy

We apply FEIS models to study the effect of a partner's payroll-exempt labor on women's economic outcomes. Like conventional FE models, FEIS models estimate the effect of the treatment solely from within individual variation while removing any between-individual variation. The fixed effects therefore account for any time-constant heterogeneity between individuals. However, unlike FE models, the FEIS approach also accounts for individual-specific trends before the treatment. We argue that this is a superior model for our interest as FE models rely on the assumption of parallel trends before the treatment.

Given that men dictate the occurrence of our treatment variable, it is implausible that all women have a parallel trend in their economic outcomes before the treatment. To model individual trends, FEIS estimation requires $j + 1$ person-years per individual, where j refers to the number of trend parameters plus the individual intercept (Ludwig & Brüderl, 2018; Rüttenauer & Ludwig, 2020). We therefore only include women who are observed in at least three survey years.

We use the couple's labor income differential (log) as our trend parameter to account for (negative) pre-treatment trends. If the couple's labor income differential is generally increasing prior to the treatment, female partners who end up being treated represent a selective sample, and the treatment effect would mainly capture this selection effect. Conventionally, researchers select employment tenure or work experience as a trend parameter when estimating FEIS models (Ludwig & Brüderl, 2018). However, we argue that selection on women's characteristics is less consequential for our strategy given that the male partner dictates the occurrence of our treatment. Allowing for individual-level trends of labor income differentials within couples enables us to identify the influence of being exposed to payroll tax-exempt labor incomes net of trends, which started already before being exposed. We contend this to be the most conservative estimation strategy for our research interest because it very likely controls away a part of the treatment effect. Thus, our results may be seen as a lower-bound estimate. We estimate FEIS models using Stata's xtfeis routine (Ludwig, 2015). Standard errors are clustered at the individual level.

To provide further support in identifying the effect of the payroll tax contribution limit, we contrast our estimates against similar models using a placebo treatment. In short, we generate a random threshold that does not imply institutionalized benefits for the partner to create a placebo treatment whenever the male partner starts to earn above this random threshold. For the main results, we use the 70th income percentile in the PSID and estimate FEIS models on this artificial treatment. Our selection of the placebo threshold needs to fulfill two conditions: First,

the placebo should be sufficiently high not to capture exposure to incentives in the structure of transfers (e.g., EITC). Second, we need the placebo threshold to be sufficiently distant from the payroll tax threshold so that partnered men in our sample do not break through both thresholds (i.e., the payroll tax limit and the placebo) at the same time. If we were to choose a placebo threshold too close to the payroll exemption threshold (such as the 90th percentile), we would be unable to distinguish the effect of breaking through both ceilings from each other. Appendix Figure A1 indicates the evolution of threshold levels over time. We note our results are robust to selecting a different placebo threshold (see, e.g., Appendix Figure A3 for a replication of the main analysis using the 80th percentile as our placebo treatment).

RESULTS

What happens to the labor market outcomes of the female partner when the male partner starts to earn payroll-exempt labor income? We present our findings in two steps. First, we provide descriptive statistics of women in our sample and their economic outcomes before and after treatment. Second, we present results from FEIS models. Here, we show the effect of the partner breaking through the payroll ceiling on three dimensions of women's economic outcomes: (a) work hours, (b) hourly wage, and (c) labor income.

Descriptive patterns

We argued that men are more likely to benefit from payroll tax-exempt labor income because they are more likely to be the primary earners. Indeed, previous research highlighted persistent gender inequality, especially among top-income earners (Blom & Cooke, 2023; Fortin et al., 2017). All our gendered expectations rely on this general assumption—that the female partner is more often the lower-earning partner, even so before the male partner earns payroll tax-exempt labor income. In our data, in almost two-thirds of couple-observations, the male partner earned more than 60% of the couple's combined labor income. This number jumped to above 80% for those couple-years when the male partner earned above the payroll tax ceiling.

Thus, before we dive into detailed sample statistics, we plot the age-specific median within-couple income share, separately for women who received treatment at some point in our observation window (ever-treated) and those who did not (never-treated).

Figure 3 clearly demonstrates that men persistently outearned their female partners. More specifically, on average, partnered women had substantively less labor income than their male counterparts throughout their prime working age. Hence, we believe it is warranted to expect a gendered distribution of the benefits that payroll tax exemptions entail. In addition, the visual pattern also underscores fundamental differences in the evolution of within-couple labor income shares. In their early twenties, women whose partner will eventually earn payroll tax-exempt labor income indicated roughly similar income shares when compared to women with a partner who will never earn payroll tax-exempt labor income. In their 30s, however, the former on average indicated a within-couple income share of roughly 30%, while the latter earned almost 40% of the couple's labor income. This descriptive pattern clearly underscores how high-income men drive up earnings differentials within couples.

Twenty-five percent of partnered women in our US sample have a male partner who will eventually earn above the contribution limit at some point while she does not. This number is consistent with statistics provided by the Social Security Administration (2021). Work incentives implemented in payroll taxation are therefore not a peculiar, neglectable arena of inequality. They might be at the center of lifetime gender inequality (de Castro Galvao, 2022), particularly for the upper-income strata.

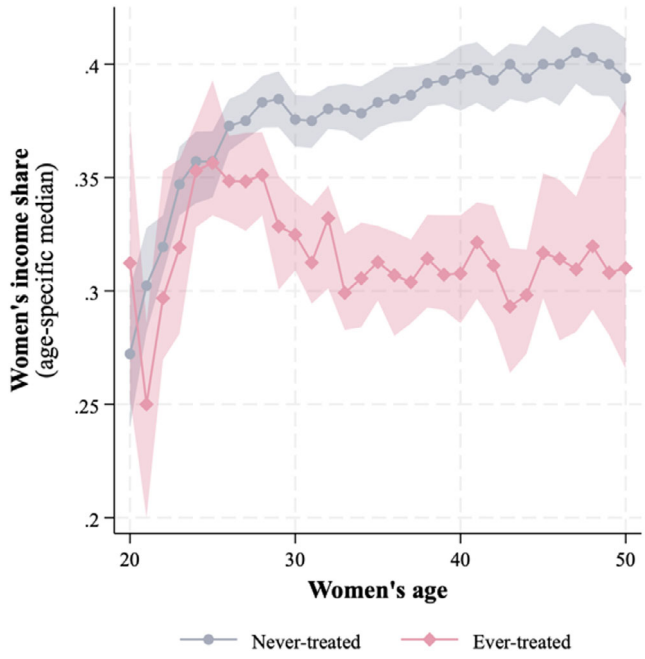

FIGURE 3 Within-couple labor income shares (never-treated vs. ever-treated). Because our sample is restricted to women in paid work, this figure will understate the true earnings inequality within couples whenever women are less likely to be employed compared to men.

Table 2 provides a short overview of mean values for the outcome variables and covariates in our models, separately for not-treated women, not-yet-treated women, and treated women. On average, not-treated women reported a lower labor income and hourly wage when compared to not-yet-treated and treated women. At the same time, ever-treated women indicated fewer hours of paid work. However, descriptive statistics among the entire sample cannot inform us about the decisiveness of the payroll tax ceiling.

What are the labor market outcomes of female partners right before and after treatment? Figure 4 depicts women's annual working hours, hourly wages, and labor incomes before and after the partner hits the ceiling. Annual working hours were higher before and lower after the treatment. On average, working hours were down by roughly 10 h a month. Yet it is also worth noting that working hours were already at low levels before the treatment, at below 30 h a week. Irrespective of that, we still observed increases in hourly wages after the treatment. On average, women's labor income was unchanged 4 years before the partner earned above the ceiling when compared to the year before. In other words, labor incomes did not seem to increase after treatment. This is worth noting because women at t_{+4} were also older and, hence, more experienced, which would lead us to expect higher earnings. Crucially, however, this visual representation underscores that the upward trend in hourly wages and labor income in the years before treatment attenuated in the years after the treatment.

Women in our sample were on average 36 years old when their partner hits the payroll tax ceiling for the first time (see Appendix Figure A2 for women's age distribution for both the payroll and placebo treatment). Hence, unsurprisingly, 3 out of 4 women had children by the time the partner started to earn payroll tax-exempt labor income. What is more, prior to the treatment, every second woman had two or more children. Family formation and payroll tax-exempt labor are therefore not occurring simultaneously for all women.

TABLE 2 Descriptive statistics of person-years from not-treated women, not-yet-treated women, and treated women (mean values).

	Not treated	Not-yet treated	Treated
Labor income (log)	9.86	10.01	10.08
Work hours (annual)	1614	1612	1554
Hourly wage (log)	2.75	2.89	3.02
Couple income (log)	11.05	11.36	11.61
Years of education	13.01	13.88	14.04
Annual work hours (husband)	7.32	7.64	7.71
Number of children in household	1.15	1.25	1.34
First marriage	0.70	0.73	0.74
Black	0.26	0.17	0.17
White	0.66	0.78	0.77
Age	38.43	33.82	38.67
Person-years	55,603	7334	2874

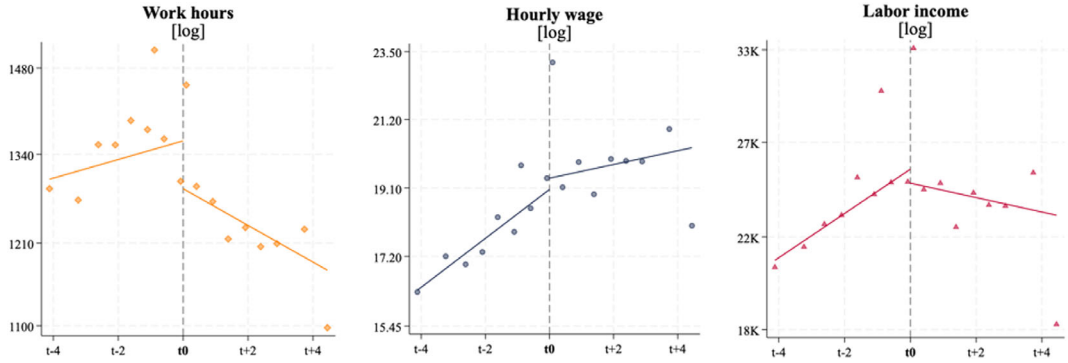

FIGURE 4 Women's labor market outcomes before and after the partner earns above the payroll tax contribution limit. Figure shows binned, bivariate scatterplots with individual-level fixed-effects and regression discontinuity at t_0.

In summary, descriptive patterns provided some support for our expectations of reduced labor market activity when the partner earns above the payroll tax ceiling. Yet these statistics cannot guide whether the observed averages result from the payroll tax cap or other time-varying changes. We therefore now turn to our FEIS models.

Estimation results

We expected couples to de-prioritize women's labor market outcomes once the partner earned above the contribution threshold. We estimated the effect of the partner earning above the payroll threshold on a set of three different economic outcomes: (a) women's working hours, (b) women's hourly wage, and (c) women's labor income. We apply FEIS models that allow for individual slopes of income differentials within couples. We estimate models for all outcomes separately for the payroll treatment (i.e., exposure to a partner earning payroll tax-exempt labor income for the first time) and our placebo treatment (i.e., exposure to a partner starting to earn above the 70th income percentile for the first time).

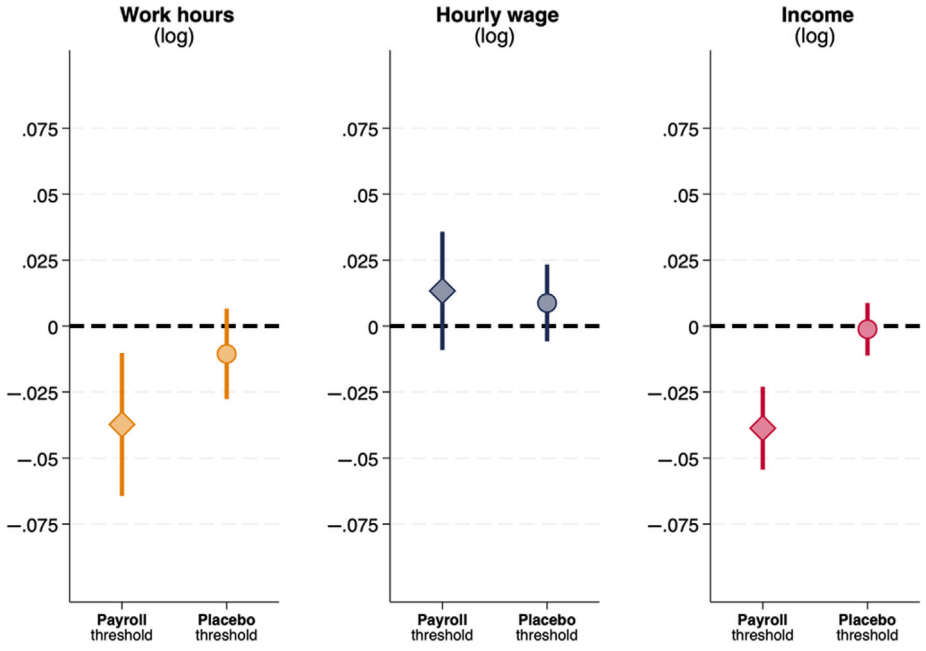

FIGURE 5 The effect of the partner's payroll tax-exempt status on women's labor market outcomes (FEIS models).

Figure 5 depicts coefficients from our models on the three outcomes. The models control for any time-constant individual heterogeneity as well as individual-level pre-treatment trends in income differentials and a set of time-varying demographics. Most importantly, the models indicate the change in outcome holding the couple's joint labor income constant. Any decrease in women's labor income could result either from reduced working hours or diminished hourly pay or a combination of both. Total labor income therefore gives us an overall picture of women's economic standing.

The left panel gives us the estimated effect on women's annual work hours. Women partnered with a man exposed to the treatment of payroll tax-exempt labor income reduced their time in paid work by about 4% ($(\exp(-0.04) - 1) \times 100$). In other words, women became increasingly detached from paid work due to the partner's payroll-exempt labor. We find no effect when using the placebo treatment.

Women spent less time in paid employment when their partner earned payroll-exempt labor income simply because an additional hour of *his* work is now more valuable for the couple than an additional hour of *her* paid labor. This underpins the re-traditionalizing force of the payroll tax ceiling. At the time of treatment, most women had dependent children and were often working in part-time arrangements. The gender gap in labor market activity was already wide open when men hit the payroll contribution threshold. In other words, payroll-exempt labor is not the beginning of earnings inequality within couples but another brick in cementing women's status as a caretaker.

Yet does this mean that the payroll tax ceiling also exerts its power on women's hourly wages? In the end, scaling back from the labor market should lead to hampered careers through slowed growth in work experience and missed promotion opportunities. The central panel in Figure 5 shows coefficients from our FEIS models for women's hourly wages after the partner earned payroll tax-exempt labor income vs. the placebo treatment. Here, we do not estimate the effect of being exposed to a payroll tax-exempt man, nor do we see differences in effect size between the payroll tax treatment and the placebo treatment.

On the right panel, we see a negative effect of the treatment on women's labor income. That is, women's annual labor income was reduced by about 4% after the partner earned payroll tax-exempt labor for the first time (see Appendix Table A1 for full results). As expected, we do not observe a negative or substantive effect when using our placebo treatment instead.

Taken together, these results provide strong support for a decreased labor market attachment due to the payroll tax ceiling. Our findings suggest that women reduced their time in paid labor, which in turn diminished incomes. Overall, payroll tax-exempt labor enables couples to reduce the labor supply of the secondary earner while maintaining (or increasing) their total, joint labor income. We cannot identify any negative effect on women's hourly wage. We speculate that the hampered growth in labor market experience and human capital might become visible only in the long run. After all, it takes time for slower growth in work experience to translate into productivity, career chances, and reduced wages relative to their non-treated peers. However, due to sample restrictions, we do not have the statistical power to estimate the outcomes for a more extended period.

Do men's economic outcomes face a similar drop if the female partner starts to earn above the payroll tax threshold? Unfortunately, earnings differentials within couples are so hefty that we cannot measure such an intuitively intriguing puzzle: Women were highly unlikely to earn payroll-exempt labor income. In only 1.7% of all female person-years in our sample, their labor income was above the threshold. Yet even when women earned payroll tax-exempt labor income, they were still often not the sole and main provider: in only 0.9% of all female person-years wives benefitted from payroll tax-exempt labor *and* had a partner with earnings *below* the threshold. The benefit of payroll-exempt work almost exclusively exists in a rich *man's* world.

Robustness checks

Our results are robust to a range of supplementary checks. Because many US states levy their own income taxes, we additionally adjust for couples that move across state borders during our observation window (Appendix Figure A4). Next, we examine whether our treatment causes female partners to drop out of the labor market altogether (Appendix Table A2). Looking at treatment heterogeneity, we report findings when restricting the sample to white women (Appendix Figure A5). We further replicate our main FEIS models looking at women with versus without children (Appendix Table A3) as well as women born before versus after 1956 (Appendix Table A4). Our results remain unchanged when adjusting for women's age (Appendix Table A5), excluding cohabitors (Appendix Table A6), or accounting for the presence of an infant child (Appendix Table A7).

We apply FEIS models because we argue the parallel-trend assumption of conventional fixed-effects (FE) models is unlikely to hold if the partner dictates the occurrence of the treatment. To further gauge the robustness of our models, we replicate our findings applying conventional FE estimation (Appendix Figure A6). Following recent advances in the econometrics literature (de Chaisemartin & D'Haultfœuille, 2022), we replicate our main analysis with the recently implemented Stata ado xtevent (Freyaldenhoven et al., 2023). These models allow for the estimation of heterogeneous treatment effects, as proposed by Sun and Abraham (2021). These models provide even stronger support for our theoretical expectations (Appendix Figure A7).

DISCUSSION

Payroll tax-exempt labor strengthens the (re-)production of gender inequality among upper-income couples. Although key contributions to gender inequality scholarship have focused on

how policies and benefits modify women's economic prospects (Gonalons-Pons, 2022), little attention has been paid to the re-traditionalizing effects of payroll tax design. We build on the idea of scaling (Becker & Moen, 1999) and the life course framework (Elder et al., 2003) to argue that payroll regulations targeting the primary earner have severe implications for women in opposite-sex couples. Following a job versus career framework, we assumed that one partner pursues a career while the other views their employment as a job (i.e., performing a task in exchange for money). The partner with the job can flexibly react to changing family circumstances by scaling back personal investment in their job. Because scaling strategies are gendered, women might reduce their hours in paid work in response to their partner's income regardless of how they perceive their own job or career. Therefore, we expected female partners to scale back their labor supply as soon as their partner benefits from payroll tax-exempt labor income.

Drawing on high-quality panel data from the United States, we applied fixed effects regression with individual slopes to estimate the impact of the male partner starting to earn labor income above the contribution threshold on the female partner's labor market outcomes. We showed that women spent less time in paid employment when their partner's labor became more valuable due to his payroll tax-exempt status. Partnered women's labor income diminished by 4% because their paid annual work hours are reduced by roughly 4%. We showed that women's hourly wages were not affected when the partner crushed through the payroll tax contribution threshold for the first time. We speculated that scaling back strategies impact hourly wage trajectories only in the long run. Our findings highlight the hidden role of payroll tax regulations in reducing women's economic outcomes and thereby reinforcing a gendered distribution of labor.

As noted above, our results indicated a 4% drop in women's earnings in the four years after treatment. This is equal to a decrease of about 1 hour in paid work per week. While this might not seem like much, decreased labor supply in the short run can lead to stark differences in lifetime earnings, thereby substantively contributing to gender inequality (de Castro Galvao, 2022). What is more, even gradual adjustments to employment, accumulated over adulthood, will entail major consequences for financial security at old age (König et al., 2019).

In more general terms, this paper examined how couples balance employment and family demands when exposed to a specific policy incentive. To this end, we relied on the scaling framework proposed by Becker and Moen (1999). This conceptual perspective allowed us to understand couple's adjustments of paid and unpaid work more gradually (Langner, 2015), rather than as a reaction to major life events. Thereby, we contribute to the family literature that overwhelmingly focuses on impactful changes in couple's lives, such as marriage or parenthood, and their effect on men's and women's outcomes and gender inequality (Baxter et al., 2015; Mari, 2019; Musick et al., 2020).

We showed that payroll taxation can incentivize scaling down the paid work hours of the secondary earner. Thereby, we showed that couples react gradually to changing family circumstances. We believe future research can explore other conditions of couple-level behavior that facilitate gradual adjustments in the division of labor and thereby strengthen gender inequality within couples. In other words, family lives are full of gradually changing circumstances (Bianchi et al., 2006). For instance, children grow older, commuting distances change, or the health status of family members decreases or increases over time. Admittedly, these changes were and are hard to study in available surveys because they produce small variance. This study showed that we can leverage these data to shed light on understudied family processes, complementing the study of major life-course events.

Future research can make use of administrative data and the payroll tax ceiling to study heterogeneity in couple's responses to such major life-course events. That is, individual-level reactions to marriage, parenthood, or unemployment might vary by the earnings constellation of partners. For instance, a decision to become a stay-at-home parent after childbirth could

crucially hinge on the expected take-home pay of the partner—and payroll tax-exempt income can make a substantial contribution if earnings are high.

As our study demonstrated, payroll tax-exempt labor is a policy dimension that is largely overlooked by family research. For partnered women, the impact of the male partner's payroll tax-exempt labor income on household pocketbooks is salient and relevant. Especially, women in high-income couples with a traditional division of labor might be most susceptible to further scaling down their employment. That is, partnered women may be more likely to decline higher-paying opportunities compared to their current jobs due to their spouses' payroll tax-free income gains. In sum, scaling down employment based on payroll tax exemptions very likely reinforces conservative gender roles and power asymmetries within couples in the long run.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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