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Despite advances in women's education and labor-market access, a growing liter-ature shows gender norms shaping household behavior. This paper investigates the evolution of Brazil's male-breadwinner norm by applying bunching methods to quar-terly National Household Sample Survey microdata spanning Q1 2012 to Q1 2025. We first estimate female labor supply elasticities using the Heckman–MaCurdy and Blun-dell–Duncan–Meghir frameworks, and then use the elasticities to translate observed bunching in wives' income shares at the 50 percent threshold into an implicit "tax" on women's earnings. Our results document a marked strengthening of this implicit tax: from 18–25 percent during 2012–2015 to a sustained 30–35 percent after 2016, peaking above 40 percent at the height of the COVID-19 crisis. Counterfactual re-matching of men and women across households—holding age, education, region, and family size constant—yields a positive but flat implicit tax over the same period, indicating that evolving intra-household dynamics and gendered norms, rather than assortative mating alone, drive the rising penalty on women's earnings. We further show that education modestly reduces penalties but does not eliminate them, and that women with greater economic autonomy (older or formally designated household heads) face even higher implicit taxes.

Keywords: female earnings, bunching, gender norms, male-breadwinner norm, Brazil.

JEL Codes: J16, J22, D13

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Abstract

Despite advances in women's education and labor-market access, a growing literature shows gender norms shaping household behavior. This paper investigates the evolution of Brazil's male-breadwinner norm by applying bunching methods to quarterly National Household Sample Survey microdata spanning Q1 2012 to Q1 2025. We first estimate female labor supply elasticities using the Heckman–MaCurdy and Blundell–Duncan–Meghir frameworks, and then use the elasticities to translate observed bunching in wives' income shares at the 50 percent threshold into an implicit "tax" on women's earnings. Our results document a marked strengthening of this implicit tax: from 18–25 percent during 2012–2015 to a sustained 30–35 percent after 2016, peaking above 40 percent at the height of the COVID-19 crisis. Counterfactual re-matching of men and women across households—holding age, education, region, and family size constant—yields a positive but flat implicit tax over the same period, indicating that evolving intra-household dynamics and gendered norms, rather than assortative mating alone, drive the rising penalty on women's earnings. We further show that education modestly reduces penalties but does not eliminate them, and that women with greater economic autonomy (older or formally designated household heads) face even higher implicit taxes.

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1 Introduction

Regardless notable progress in gender equality across education and labor market access, deep-rooted social expectations continue to shape economic outcomes (Mulligan and Rubinstein, 2008, Rossin-Slater et al., 2013, Rossin-Slater, 2017, Kleven et al., 2019, Bertrand et al., 2015). While formal barriers to female employment have declined, informal norms remain powerful forces that influence individual behavior and household dynamics. Among these, the idea that men should serve as primary breadwinners continues to persist, shaping how couples negotiate earnings, work participation, and even marital stability (Killewald, 2016).

According to the World Values Survey (2020), 35.5% of Brazilians agree that "it is a problem if a woman earns more than her husband". Moreover, 31% agree with statements such as "men have more right to a job than women" or "men make better business decisions than women". Such views operate as powerful non-market constraints, affecting behavior in ways comparable to policy or price signals (Fortin, 2015).

These pervasive beliefs can be formalized as an implicit "male-breadwinner norm", which discourages couples from deviating too far from traditional income hierarchies. Such constraints are difficult to observe directly but can be inferred through discontinuities in observed behavior. For instance, if couples systematically avoid scenarios where wives out-earn their husbands, this will generate distortions in the earnings distribution that resemble those produced by formal tax notches (Bertrand et al., 2015).

This paper examines how that norm has evolved in Brazil—a country where gender gaps have narrowed in many domains (Martinez et al., 2025)—by analyzing how couples respond as women approach or exceed their husbands' earnings. We detect behavioral distortions in the distribution of spousal income shares using bunching methods (Kleven, 2016, Saez, 2010) applied to rich Continuous National Household Sample Survey (PNAD-C[1]) microdata. This approach allows us to quantify the magnitude, and temporal evolution of this norm on

[1]From portuguese: Pesquisa Nacional por Amostra de Domicílios Contínua

women's relative earnings.

Our results reveal a steady rise in the implicit tax on women's earnings from 2012 to 2025, underscoring growing disincentives within households. Although education provides some relief—more-educated women face marginally lower penalties, they still bunch their earnings just below parity. To separate normative pressures from assortative matching (Binder and Lam, 2018), we construct counterfactual couples by re-matching individuals on key attributes. In this artificial sample, the implicit tax remains positive and flat over time, but is markedly smaller than in the real data (Bertrand et al., 2015, Binder and Lam, 2018). This divergence indicates that evolving intra-household dynamics and gender norms—not partner selection alone—have increasingly amplified the penalty on women's earnings.

Our study contributes to the literature on male-breadwinner norms in two main ways. First, we engage with the labor supply elasticity estimation literature by testing alternative bunching specifications, addressing concerns about the sensitivity of norm measurements to modeling choices (Souza et al., 2023). Second, we leverage an extensive and up-to-date dataset—from the first quarter of 2012 through the first quarter of 2025—using Brazilian quarterly PNAD-C microdata. This long span and recent coverage allow us to trace the norm's evolution across diverse economic conditions and capture its response to the latest labor-market shocks.

The article is organized into four sections, in addition to this introduction. Section 2 discusses the related literature. Section 3 develops the theoretical framework and empirical strategy. Section 4 presents the results and discusses the main findings. Section 5 concludes with a discussion off key contributions.

2 Related Literature

Gender norms play a crucial role in shaping economic behavior and outcomes, influencing both individual choices and broader patterns in labor markets and household dynamics

(Akerlof and Kranton, 2000). Traditional gender role attitudes are strongly associated with lower female labor force participation and wider gender wage gaps (Fortin, 2015, 2005). Peer environments also matter: mothers surrounded by individuals with gender-egalitarian views are more likely to engage in paid work and to share household labor more equitably with their partners (Cavapozzi et al., 2021). Additionally, gender norms are transmitted across generations. Fernández et al. (2004) demonstrate that women are more likely to participate in the labor force if their mother-in-law was employed, suggesting that male partners' attitudes—shaped by early family experiences—significantly influence household labor decisions.

The male-breadwinner model refers to a family arrangement in which the husband serves as the primary or sole income earner, while the wife usually assumes responsibility for domestic labor and childcare. Within this framework, heterosexual relationships are often shaped by normative gender role expectations within marriage. Bittman et al. (2003) and Bertrand et al. (2015) demonstrate that women may engage in compensatory behaviors to conform to traditional marital norms. Although women generally reduce their time spent on housework as their income increases, this pattern often reverses when they earn more than their husbands, suggesting an effort to offset norm violations. Similarly, Cooke (2006) finds that higher-earning wives face an increased risk of divorce unless they maintain conventional domestic roles, such as assuming a greater share of household responsibilities.

Despite significative progress in women's educational attainment and labor force participation, earnings parity within marriage remains expressive. Even highly qualified women are less likely to out-earn their husbands, and when they do, they often face social sanctions (Bertrand et al., 2015, Killewald, 2016). This paradox remains central to understanding contemporary gender disparities. Cross-national studies show that in societies with strong male-breadwinner norms, the social meaning of male unemployment significantly increase the risk of separation (Gonalons-Pons and Gangl, 2021).

Building on this literature, recent studies explore how individuals adjust their behavior

in response to the social norms. The bunching methodology, originally developed to analyze behavioral responses to tax schedule discontinuities in public finance, has been increasingly adopted to examine social norms' influence on economic decisions (Saez, 2010, Kleven and Waseem, 2013, Kleven, 2016). This approach offers a powerful empirical strategy to identify norm-driven behavioral adjustments.

A seminal investigation of the male-breadwinner norm in the United States is provided by Bertrand et al. (2015). Using a density discontinuity test, they identify a sharp drop in the distribution of spousal income shares at the 50% threshold, consistent with couples avoiding situations in which the wife earns more than the husband due to identity costs. Building on this foundation, subsequent literature has applied bunching techniques to model this behavioral response as a notch in household preferences, interpreting the social norm as an implicit tax that constrains female earnings within household decision-making (Kleven, 2016).

Following Bertrand et al. (2015), subsequent studies have investigated this distributional discontinuity in diverse contexts. Using the natural experiment of German reunification, Sprengholz et al. (2022) shows that traditional male-breadwinner norms suppressed wives' labor market outcomes in West Germany, but have weakened over time, converging toward the more gender-egalitarian norms of East Germany. Dongcheng et al. (2021) shows that married women in China who out-earn their husbands tend to reduce their future incomes and working hours.

In Brazil, Codazzi et al. (2018) use a demographic proxy—the probability of wives out-earning husbands—to show that women in regions with higher probabilities exhibit lower labor force participation, higher informal employment, and reduced earnings, suggesting preemptive adjustments to avoid norm violations. Similarly, Gupta (2022) document for India that women reduce labor force attachment when likely to outearn their husbands, particularly in conservative regions and male-dominated households. Furthermore, Gupta (2022) formally models the norm as a notch, finding significant bunching responses below

the parity threshold.

However, the causal link between income discontinuities and gender norms has been contested. Binder and Lam (2018) demonstrate that the sharp drop in spousal income distributions may reflect assortative mating rather than normative constraints, while Zinovyeva and Tverdostup (2021) attribute Finland's discontinuity to income equalization among dual-earner couples. Slotwinski and Roth (2020) further show that discontinuities observed in survey data may overstate norms' role due to reporting biases. These findings complicate causal inferences but do not negate norm-driven behaviors, which emerge even pre-marriage. Bursztyn et al. (2017) find that single women downplay career ambitions when interacting with potential partners, signaling anticipatory conformity.

Advancing this literature methodologically, Souza et al. (2023) applies bunching estimators to Brazilian microdata from the 1991, 2000, and 2010 decennial censuses. The analysis reveals a significant excess mass just below the spousal income threshold, with particularly pronounced effects among older and religious couples. The paper contributes to the understanding of behavioral responses to income inequalities within couples. Our paper dialogue with this paper and explore literature critiques of bunching estimates' reliability by testing alternative specifications to ensure robustness. Moreover, we leverage the rich, longitudinal PNAD-C data (2012 Q1–2025 Q1) to trace how the male-breadwinner norm has evolved over time.

3 Empirical Strategy

To quantify the male-breadwinner norm, we first estimate labor supply elasticities and then use these estimates to compute the implicit tax within a bunching framework. The following subsections detail these methods along with data construction procedures.

3.1 Data and Sample Construction

We use quarterly microdata from PNAD-C, conducted by the Instituto Brasileiro de Geografia e Estatística (IBGE, 2025), covering the period from the first quarter of 2012 (Q1 2012) to Q1 2025 [2]. Our analysis focuses on private-sector women aged 16-65 in heterosexual marriages where both spouses report positive labor earnings (dual-earner couples)

The wife's relative hourly income serves as our key variable, measured as her individual labor earnings divided by the couple's total labor income. [3]

3.2 Estimating Labor Supply Elasticities

To estimate female labor supply elasticities, we draw on the approaches of Heckman and MaCurdy (1980) and Blundell et al. (1998) within intertemporal labor supply theory. Within this framework, a convenient representation of the labor supply function can be written as:

$$\ln(\bar{L} - h(t)) = \begin{cases} \frac{1}{\alpha - 1}\left[\ln \lambda(0) - \ln \alpha + (\rho - r)t - \ln A(t) + \ln W(t)\right], & \text{if the woman works} \\ \ln \bar{L}, & \text{otherwise} \end{cases} \tag{1}$$

where $h(t)$ denotes hours worked at time t, $\bar{L}$ is the total time endowment, ρ is the rate of time preference, r is the interest rate, $W(t)$ is the wage rate, $A(t)$ captures time-varying preferences or household production shifters, and $\lambda(0)$ is the marginal utility of wealth in the initial period—that is, the Lagrange multiplier associated with the household budget constraint, as defined by Heckman and MaCurdy (1980).

We estimate the model using a two-step Heckman selection procedure to account for non-random labor market participation among women (Heckman, 1979). First, we estimate

[2] Following IBGE's (2025) guidelines, we construct household identifiers using UPA (Primary Sampling Unit), V1008 (Household ID), and V1014 (Panel). All estimations apply sampling weights to account for PNAD-C's complex survey design, and values are inflation-adjusted to 2025 BRL.

[3] We calculate hourly wages by dividing monthly earnings from her primary job by usual weekly hours worked, then multiplying by 4.33 (approximate weeks per month).

a probit model for labor force participation probability using data from unemployed and employed women in the private sector. The specification is as follows:

$$
\begin{aligned}
P(\text{LFP}_i = 1) = \Phi\Big(&\gamma_0 + \gamma_1 \,\text{age}_i + \gamma_2 \,\text{age}_i^2 + \sum_e \gamma_{3e}\, \mathbf{1}\{\text{education} = e\}_i \\
&+ \sum_r \gamma_{4r}\, \mathbf{1}\{\text{region} = r\}_i + \gamma_5 \,\text{race}_i + \gamma_6 \,\text{responsible}_i \\
&+ \gamma_7 \,\text{num\_children}_i + \gamma_8 \,\text{urban}_i\Big),
\end{aligned} \tag{2}
$$

where LFP_i is a dummy equal to 1 if individual i participates in the labor force and $\Phi(\cdot)$ is the standard normal cumulative distribution function. The controls include education dummies ($\mathbf{1}\{\text{education} = e\}_i$), with no education or incomplete primary as the reference group, and categories for complete primary, complete secondary, and complete higher education; regional dummies ($\mathbf{1}\{\text{region} = r\}_i$), with North as the reference, and Northeast, Southeast, South, and Central-West as alternatives; a race dummy race_i for Black, Brown (Pardo), or Indigenous individuals; responsible_i indicating whether the person is the household head; num_children_i for the number of children under ten years old in the household; and urban_i equal to 1 if the household is located in an urban area. From this regression, we recover the inverse Mills ratio $\hat{\lambda}_i = \frac{\phi(\mathbf{Z}_i\hat{\boldsymbol{\beta}})}{\Phi(\mathbf{Z}_i\hat{\boldsymbol{\beta}})}$ for each observation, where $\phi(\cdot)$ is the standard normal probability density function.

Then, we estimate the labor supply equation conditional on participation (i.e., using only employed women) through three alternative specifications, all following a two-stage procedure to address wage endogeneity. The first stage consists of estimating a reduced-form wage equation using exogenous characteristics and extracting the residuals. These residuals, along with the inverse Mills ratio, are included as controls in the second stage, which regresses hours worked on observed wages.

The first specification follows the structural approach of Heckman and MaCurdy (1980) using *log hourly earnings* as the wage measure. The estimation proceeds in two stages. In the first stage, we regress log hourly wage on individual characteristics:

$$\ln(\text{wage}_i) = \gamma_0 + \gamma_1 \,\text{age}_i + \gamma_2 \,\text{age}_i^2 + \sum_e \gamma_{3e}\, \mathbf{1}\{\text{education} = e\} + \sum_r \gamma_{4r}\, \mathbf{1}\{\text{region} = r\} + \gamma_5 \,\text{race}_{i,t-1} + \gamma_6 \,\text{tenure}_t + \nu_i, \tag{3}$$

where tenure_t is the time worked at the current job (measured in years), and ν_i is the residual capturing unobserved productivity.

The residuals from this model are saved and included in the second stage for estimating the labor supply equation:

$$\ln(\text{hours}_i) = \beta_0 + \beta_1 \ln(\text{wage}_i) + \beta_2 \,\text{age}_i + \beta_3 \,\text{age}_i^2 + \sum_e \beta_{4e}\, \mathbf{1}\{\text{education} = e\} + \sum_r \beta_{5r}\, \mathbf{1}\{\text{region} = r\} + \zeta\, \hat{\nu}_i + \delta\, \lambda_i + \varepsilon_i, \tag{4}$$

where $\hat{\nu}_i$ is the first-stage residual and λ_i is the inverse Mills ratio. The coefficient β_1 is interpreted as the uncompensated elasticity of labor supply with respect to the hourly wage.

The second specification adapts the Heckman–MaCurdy framework, replacing hourly earnings with total labor income. This alternative specification tests the robustness of our results to different wage measures, where the coefficient β_1 now represents the hours elasticity with respect to total labor income.

The third specification is based on the approach of Blundell et al. (1998), which separates substitution and income effects. We include both the woman's own wage and the household income (excluding her earnings) in the regression (fam_income_i). The first stage consists of estimating a reduced-form equation for log family income:

$$\ln(fam\_income_i) = \gamma_0 + \gamma_1 \,\text{age}_i + \gamma_2 \,\text{age}_i^2 + \sum_e \gamma_{3e}\, \mathbf{1}\{\text{education} = e\} + \sum_r \gamma_{4r}\, \mathbf{1}\{\text{region} = r\} + \gamma_5 \,\text{race}_{i,t-1} + \nu_i, \tag{5}$$

and computing the residual $\hat{\nu}_i^{fam}$. The second stage is specified as:

$$\begin{aligned}\ln(hours_i) = \beta_0 + \beta_1 \ln(wage_i) + \beta_2 \ln(fam\_income_i) + \beta_3 \,\text{age}_i + \beta_4 \,\text{age}_i^2 \\ + \sum_e \beta_{5e} \,\mathbf{1}\{\text{education} = e\} + \sum_r \beta_{6r} \,\mathbf{1}\{\text{region} = r\} + \beta_7 \hat{\nu}_i^{wage} \\ + \beta_8 \hat{\nu}_i^{fam} + \delta \,\lambda_i + \varepsilon_i,\end{aligned} \tag{6}$$

where $\hat{\nu}_i^{wage}$ and $\hat{\nu}_i^{fam}$ are the residuals from the wage and family income first-stage regressions, respectively. This approach yields β_1 as the compensated labor supply elasticity (net of income effects) with respect to wages.

We implement all estimations separately for each quarter, which allows us to analyze how labor supply responsiveness has evolved over time. These estimated elasticities then serve as calibration parameters for the next stage of our empirical analysis.

Overall, the specifications differ along three main dimensions: (i) the baseline Heckman–MaCurdy specification focuses on the relationship between hours worked and hourly wages, providing an estimate of the uncompensated labor supply elasticity while controlling for selection into employment and wage endogeneity; (ii) the alternative specification using total labor income tests the sensitivity of the results to a broader measure of earnings, capturing income variations that may affect labor supply decisions; and (iii) the Blundell et al. (1998) approach explicitly separates substitution and income effects by including both own wages and non-labor household income, allowing for the estimation of compensated elasticities. These methodological differences may lead to distinct elasticity estimates and allow us to assess whether the implicit tax results are sensitive to these alternative specifications.

3.3 Identifying Bunching Evidence of the Male-Breadwinner Norm

To estimate the implicit tax imposed by the male-breadwinner norm on wives' earnings, we adapt the bunching methodology from public finance literature (e.g., Chetty et al. (2011); Kleven (2016)). In our context, the norm imposes a discrete disutility (or implicit "tax")

on a wife's earnings whenever her income exceeds her husband's. Formally, let z^w and z^m denote wife's and husband's gross earnings, respectively. We model the wife's utility as

$$u^w(z^w) = z^w - v(z^w; n, e) - \tau(z^w) \cdot \mathbf{1}[\frac{z^w}{z^m}] > 1, \tag{7}$$

where $v(z^w; n, e)$ is the effort disutility of labor, n is an ability shifter, e is the compensated labor supply elasticity, and $\tau \in [0, 1)$ captures the proportional penalty (norm "tax") on earnings beyond the husband's income (see Kleven and Waseem (2013)). Following Kleven and Waseem (2013), we specify an isoelastic effort function

$$v(z^w; n, e) = \frac{n}{1 + 1/e} \Big(\frac{z^w}{n}\Big)^{1+1/e}, \tag{8}$$

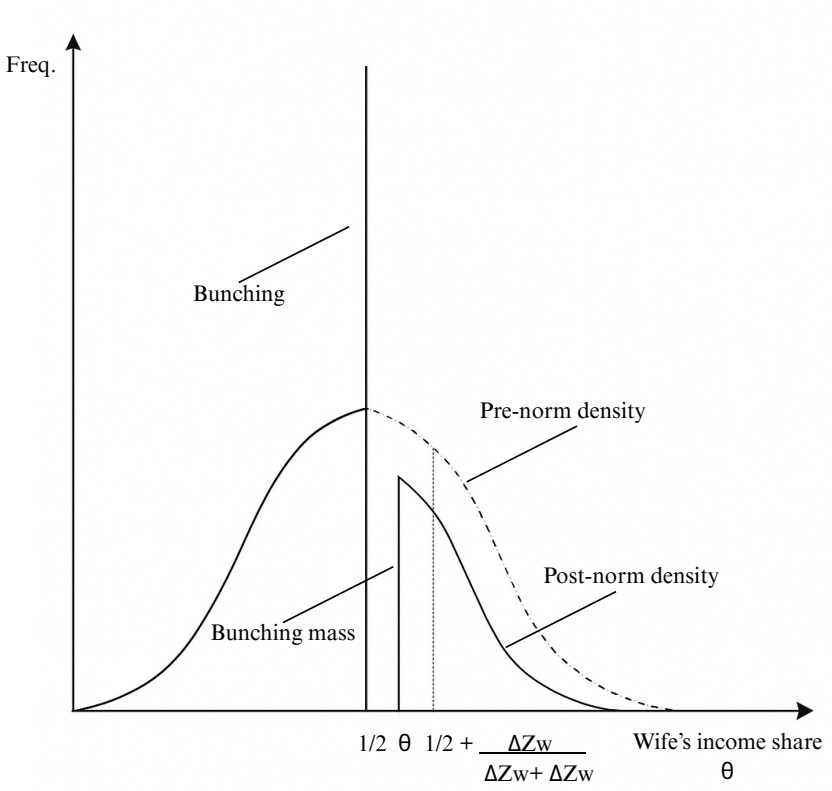
so that income effects from a change in τ are absent.

Before the threshold generated by the norm ($\tau = 0$), wives' share of household earnings $\theta = z^w/(z^w + z^m)$ has a smooth density $h_0(\theta)$. Imposing $\tau > 0$ creates a *notch* at $\theta = 0.5$. Any wife whose unconstrained optimum $z^w > z^m$ will optimally reduce her earnings down to z^m (the kink point), generating a spike in the observed distribution of θ at 0.5 (see Kleven (2016)).

Formally, let $h(\theta)$ be the density of wives' relative hour income θ after the threshold generated by the norm. The "bunching mass" at the notch is the excess number of couples at $\theta = 0.5$ compared to a smooth counterfactual density. Suppose that without the norm, the marginal buncher would earn $z^w = z^m + \Delta z^w$, but with the norm she reduces to z^m[4] (Figure 1)

[4]So her income share drops from $(z^m + \Delta z^w)/(z^m + z^m + \Delta z^w)$ down to 0.5)

Figure 1: Relative income density distribution diagram



In the counterfactual density h_0, the number of couples with share between 0.5 and $0.5 + \Delta z^w/z^m$ is approximately:

$$B \approx \int_{1/2}^{1/2+\frac{\Delta z^w}{z^w+z^m}} h_0(\theta)d\theta \approx h_0(\frac{1}{2})\frac{\Delta z^w}{z^m}. \tag{9}$$

Thus B (the total "excess mass") is proportional to $\Delta z^w/z^m$, and one can define the normalized bunching parameter $b = B/h_0(0.5) \approx \frac{\Delta z^w}{z^m}$.

To link this bunching to the norm's strength τ, we use the wife's indifference condition between bunching at $z^w = z^m$ and taking her interior solution $z^w = z^m + \Delta z^w$. By equating utility before and after gives a relationship between $\Delta z^w/z^m$, τ and e. After algebraic rearrangement (as in Kleven and Waseem (2013), Kleven (2016)), we arrive at the equation:

$$\frac{1}{1+\frac{\Delta z^w}{z^m}} - \frac{1}{1+1/e}\Big(\frac{1}{1+\frac{\Delta z^w}{z^m}}\Big)^{1+1/e} - \frac{1}{1+e}(1-\tau)^{1+e} = 0. \tag{10}$$

Given an estimated $\Delta z^w/z^m$ (approximately equal to the bunching measure b) and an assumed elasticity e, this equation can be solved for the implicit norm tax τ. In effect, the observed spike in wives' income shares at 0.5 is translated into an equivalent proportional disutility on incomes above equality.

To implement our empirical strategy—following Chetty et al. (2011)—we tabulate the distribution of the wife's share (θ_i) in our sample of married couples, exclude an interval $[\theta^-, \theta^+]$ near 0.5 (which contains the bunching spike), and fit a smooth polynomial to the remaining histogram counts. Specifically, we estimate the regression:

$$c_j = \sum_{i=1}^{q} \beta_i . \theta_j^i + \sum_{i=\theta^-}^{\theta^+} \delta_i . \mathbf{1}[\theta^j = i] + \nu_i, \tag{11}$$

where c_j is the number of observations in bin j (centered at θ_j), and the dummy terms drop out the excluded window $\theta \in [\theta^-, \theta^+]$.

The polynomial order q and window width are chosen to balance fit and robustness (as recommended in Chetty et al. (2011) and Kleven (2016)). The fitted polynomial yields an estimate of the counterfactual density: for any bin j in the excluded window, $\hat{c}_j = \sum_{i=1}^{q} \hat{\beta}_i . \theta_i$ is the predicted count in absence of bunching.

Next, we compute the total excess mass at the threshold as the sum of the differences between actual and predicted counts over the excluded bins:

$$\hat{B} = \sum_{i=\theta^-}^{\theta^+} \big(c_j - \hat{c}_j\big). \tag{12}$$

We then form the normalized bunching parameter:

$$\hat{b} = \frac{\hat{B}}{\sum_{i=\theta^-}^{\theta^+} \hat{c}_j}, \tag{13}$$

which represents the fractional increase in density at the notch relative to the smooth counterfactual.[5]

[5]This "normalized excess mass" is the analogue of the measure used in Chetty et al. (2011) and others.

For a given value of the labor supply elasticity e, we solve equation (13) for the unique $\tau \in [0, 1)$ consistent with the observed drop b. Specifically, we use the elasticities calculated under the approaches of Heckman–MaCurdy and Blundell–Duncan–Meghir to compute the corresponding τ–our measure of the "gender-norm tax", which quantifies the social cost imposed by male-breadwinner expectations.

Following the bunching literature, we adopt three key assumptions. First, we work in partial equilibrium, taking husbands' incomes and overall labor market conditions as given—thus isolating wives' intensive-margin responses to the notched incentive. Second, we do not explicitly model wife's labor force participation or feedback effects, following the "partial counterfactual" approach of Kleven and Waseem (2013). Third, our isoelastic utility specification guarantees that changes in τ produce only substitution effects, eliminating income effects (Kleven and Waseem, 2013). Under this framework, our excess-mass estimate $\hat{b}$ captures wives' wage-minimizing adjustments at the kink[6].

4 Results

The following subsections characterize the study sample and present results on female labor supply elasticities and the implicit tax associated with the male-breadwinner norm.

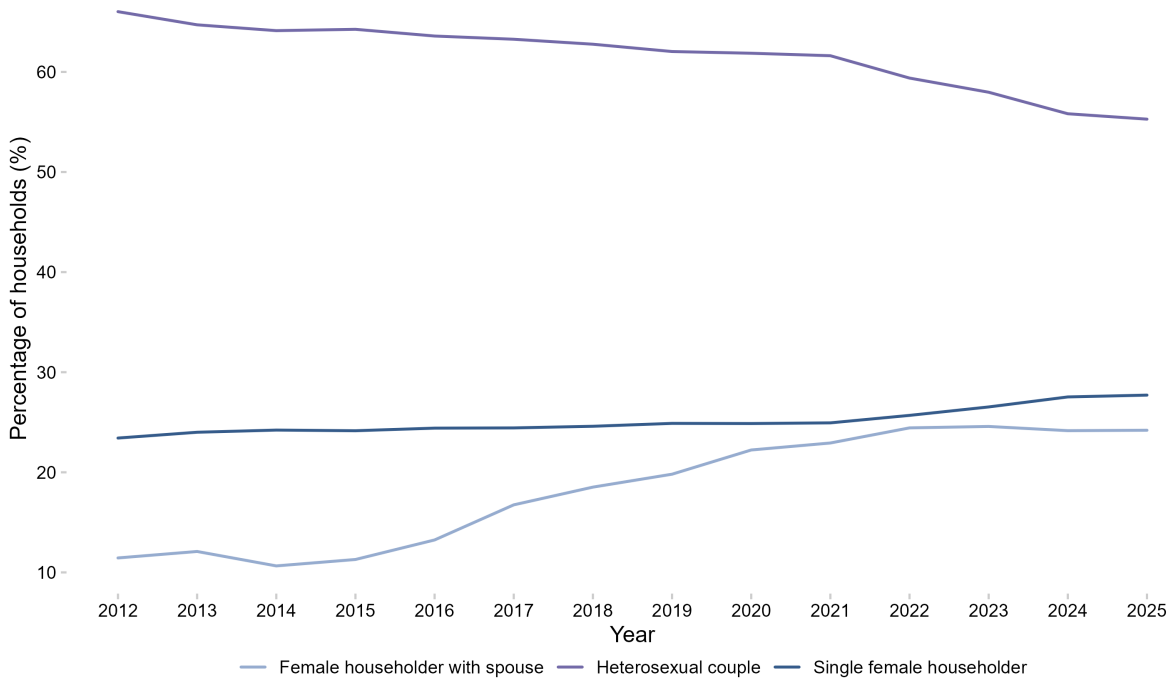
4.1 Descriptive Statistics

Between 2012 and 2025, Brazilian household structures and women's income shares shifted in ways that could both reflect and reshape the traditional male-breadwinner norm. In 2012, roughly two-thirds of households consisted of heterosexual couples—defined as households with a male–female pair, regardless of which partner is identified as the household head—but by 2025 that share had fallen to about 55 percent. Over the same period, the proportion of

[6]While alternative explanations (e.g., reporting errors or strategic complementarities) could influence the distribution around $\theta = 0.5$ (see Zinovyeva and Tverdostup (2021)), we interpret any persistent spike as evidence of the male-breadwinner norm.

households in which the female householder lives with a spouse—i.e., couples in which the woman is identified as the household head—increased from around 12 percent to 27 percent (Figure 2).

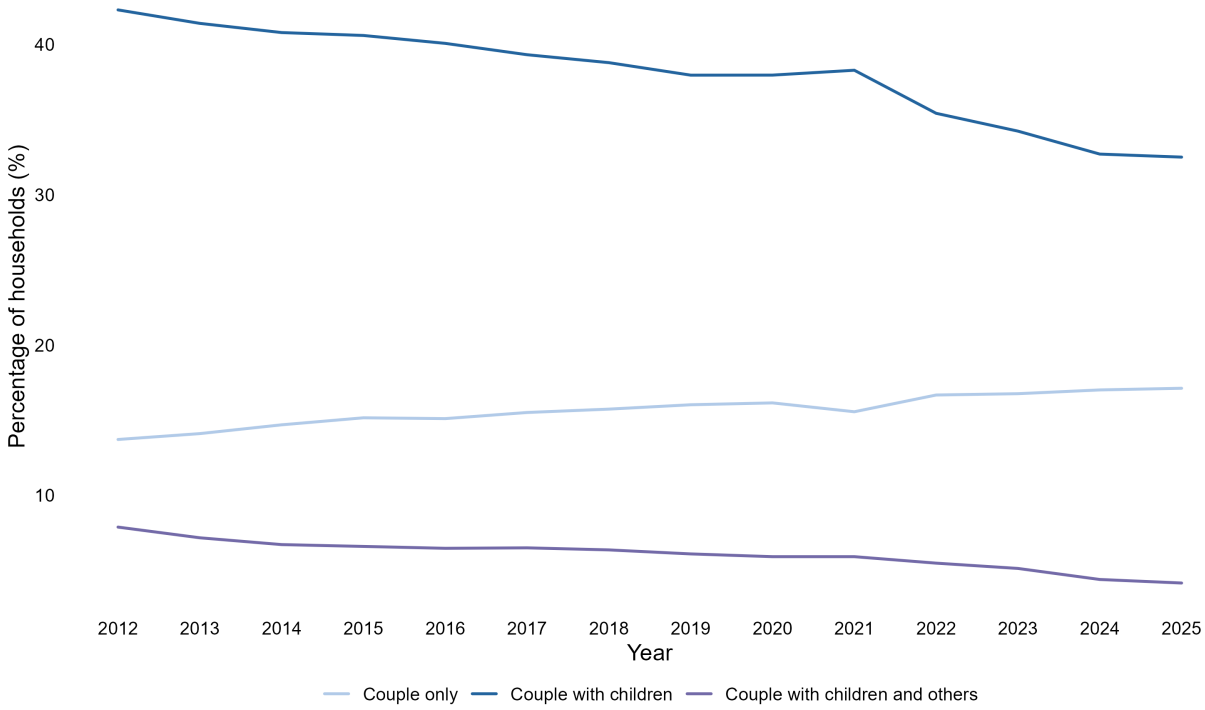
Figure 2: Household Composition Trends: Female Householder with Spouse, Heterossexual Couples, and Single Female Householder (2012–2025)



Source: Authors' calculations based on PNAD Contínua (IBGE).

Concurrently, the demographic make-up of couple households has become less child-centric. Between 2012 and 2025, couples without children rose modestly from 14 percent to 17 percent of all partnerships, while couples with children (with or without other relatives) declined from just over 50 percent to under 36 percent. This retreat from child-rearing responsibilities may have helped ease traditional constraints on women's working hours and career advancement, potentially weakening the breadwinner ideal (Figure 3).

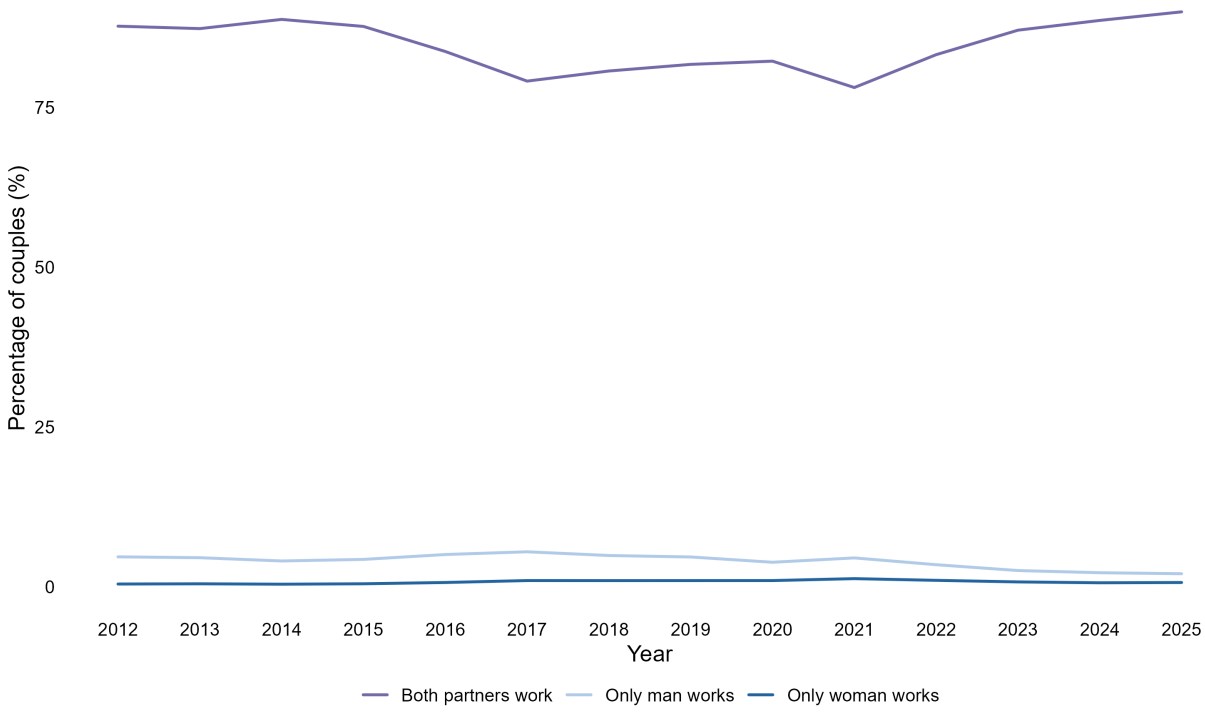
Figure 3: Household Composition Trends: Couple only, Couple with Children, and Couple with Children and Others (2012–2025)



Source: Authors' calculations based on PNAD Contínua (IBGE).

Focusing now only on households with a couple, labor force participation patterns tell a similar story of gradual change. These statistics describe the distribution of labor income within couples, distinguishing between households in which only the woman works, only the man works, or both partners are employed. As such, they do not include couples in which neither partner reports labor earnings. The data show that households in which only the woman works remain extremely rare, at around 1%. In contrast, dual-earner couples consistently account for more than 80% throughout the period, with slight declines during economic downturns, as recessions tend to increase job losses. This shift toward shared financial responsibility is further underscored by the decline in male sole-earner couples, which fell from 5% to just 3% (Figure 4).

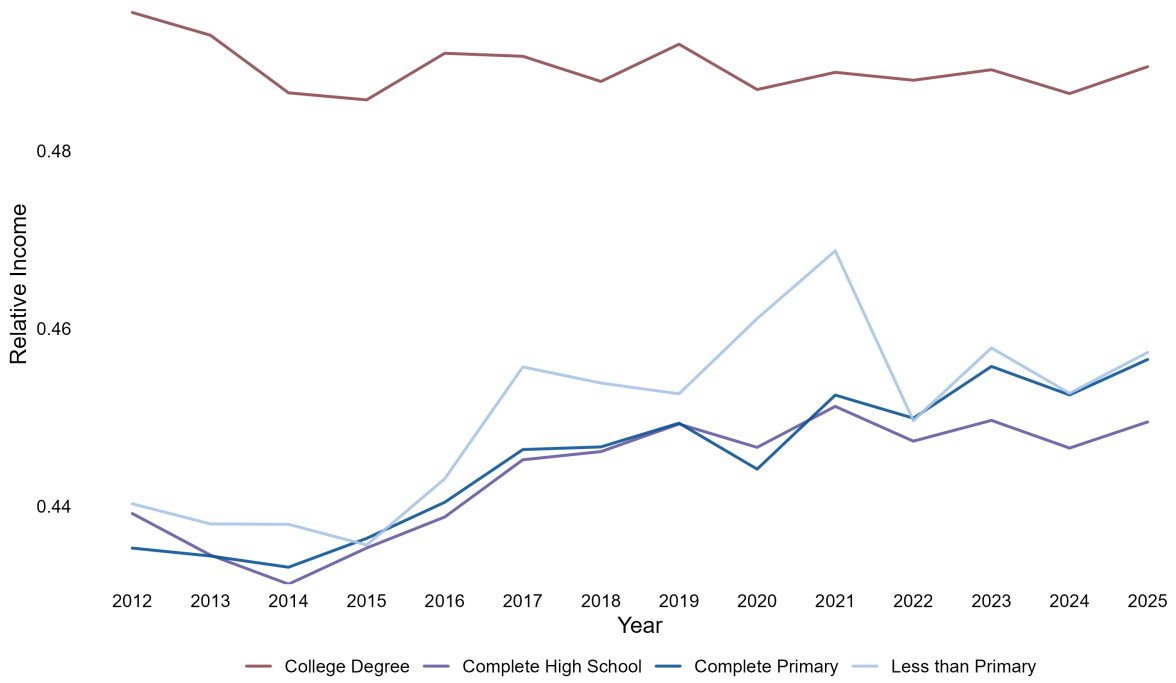
Figure 4: Household Composition Trends: Couples' Labor Force Participation (2012–2025)



Source: Authors' calculations based on PNAD Contínua (IBGE).

Among all education groups analyzed, women with higher education consistently account for the largest share of household income from labor, defined as the woman's earnings from her main job relative to the combined earnings from the main jobs of both partners. Less-educated women followed a similar but consistently lower trajectory. They began the period in 2012 with approximately 44% of household income, which gradually increased to nearly 46% by the end. This convergence suggests that rising educational levels among women lead to a narrowing of the income-share gap (Figure 5).

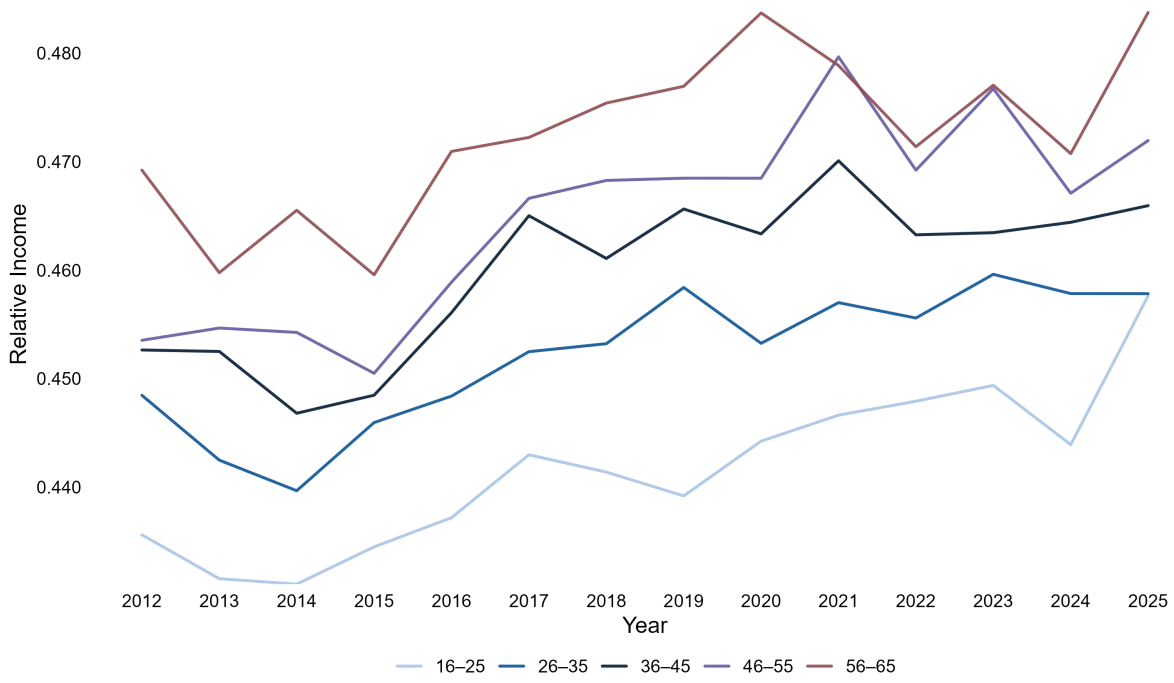
Figure 5: Trends in Women's Relative Income by Educational Attainment (2012–2025)



Source: Authors' calculations based on PNAD Contínua (IBGE).

Age-based patterns reveal a similar upward trajectory in women's relative earnings across all cohorts. However, significant differences persist across age groups: women aged 46-65 consistently maintain the highest income shares, likely reflecting accumulated job tenure and seniority advantages. Conversely, the youngest cohort (16-25 years) demonstrates the lowest shares, a possible indicative of persistent age-normative expectations regarding male provision during early adulthood (Figure 6).

Figure 6: Trends in Women's Relative Income by Age Group (2012–2025)



Source: Authors' calculations based on PNAD Contínua (IBGE).

Table 1 presents descriptive statistics for two samples of women: those included in the elasticity calculations (all working women) and those included in the implicit tax calculations (working women whose spouses are also employed). The statistics refer to the first quarters of 2012, 2018, and 2025, representing the beginning, middle, and end of the analysis period. Notably, women in the "Implicit tax data" sample (married with working spouses) consistently earned higher average hourly wages than those in the broader "Elasticities data" sample (all working women), with this wage gap widening slightly over time. They also exhibited distinct demographic profiles: women in the general sample (Elasticities data) were younger and less likely to live in urban areas compared to their counterparts in the Implicit tax group.

Table 1: Characteristics of women workers and those with working husbands for 2012, 2018, and 2025

Variable	**Elasticities data**			**Implicit tax data**		
	2012	2018	2025	2012	2018	2025
Hourly wage (R$)	14.93	15.47	17.41	15.56	16.33	18.96
	(33.04)	(41.72)	(42.23)	(34.18)	(41.48)	(50.23)
Age	36.29	38.12	39.21	34.38	35.78	37.33
	(11.84)	(11.93)	(12.19)	(11.88)	(12.20)	(12.37)
Less than primary education (%)	32.01	25.13	16.57	32.67	24.44	15.61
	(46.65)	(43.38)	(37.18)	(46.90)	(42.97)	(36.30)
Complete primary education (%)	16.96	14.31	11.80	19.98	17.37	14.70
	(37.53)	(35.02)	(32.26)	(39.98)	(37.89)	(35.41)
Complete high school (%)	38.01	41.48	46.16	36.49	41.40	45.29
	(48.54)	(49.27)	(49.85)	(48.14)	(49.26)	(49.78)
College degree (%)	13.02	19.08	25.47	10.87	16.78	24.39
	(33.65)	(39.29)	(43.57)	(31.12)	(37.37)	(42.95)
Black/brown/indigenous (%)	52.95	56.70	57.22	51.36	54.58	54.78
	(49.91)	(49.55)	(49.48)	(49.98)	(49.79)	(49.77)
Number of children in household	0.60	0.50	0.43	0.66	0.56	0.50
	(0.87)	(0.77)	(0.71)	(0.88)	(0.79)	(0.73)
Urban area (%)	80.34	81.13	82.55	74.97	76.04	77.75
	(39.74)	(39.13)	(37.95)	(43.32)	(42.68)	(41.59)
Tenure (Years)	6.31	6.47	6.28	6.70	6.98	6.83
	(8.29)	(8.09)	(8.04)	(8.41)	(8.38)	(8.31)
Number of observations	86,377	84,672	77,693	53,650	51,793	44,706

Note: Standard deviations are reported in parentheses.

Source: Authors' calculations based on PNAD Contínua (IBGE).

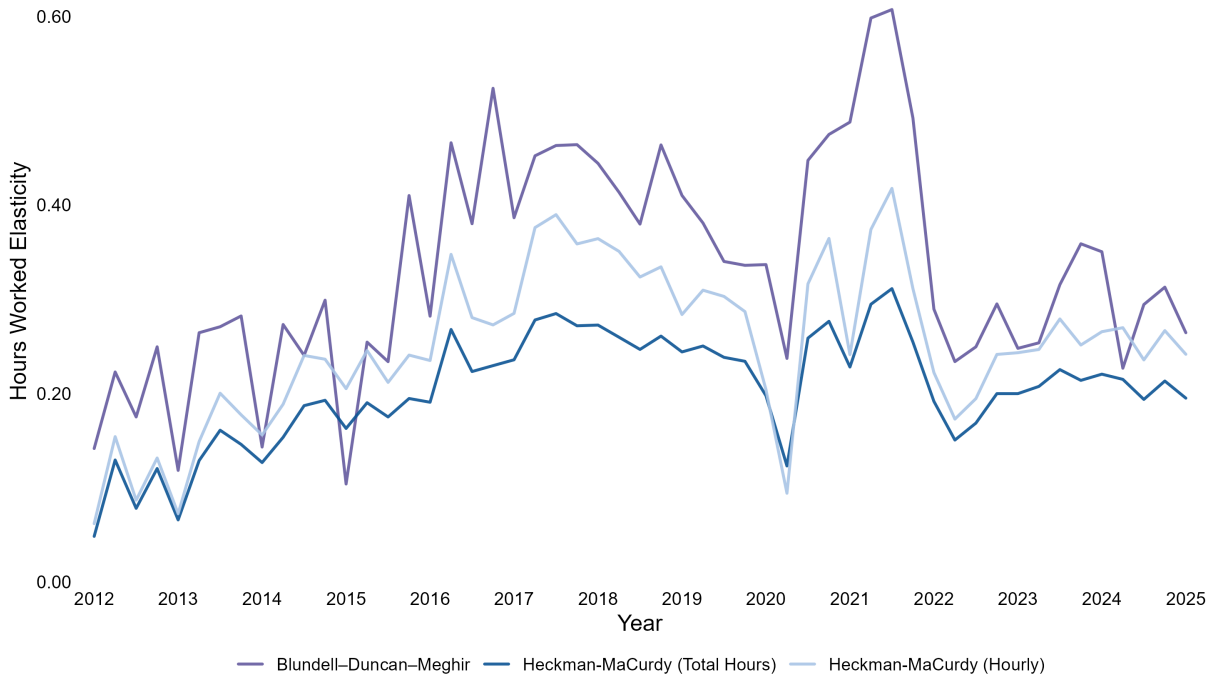
Throughout the period, both groups showed consistent growth in average hourly wages, workforce aging, and significant educational improvements. They also experienced reductions in the number of children, increased urbanization, and stable proportions of women identifying as Black, Brown, or Indigenous.

In sum, the trends show couples increasingly sharing economic responsibilities, seen in rising both the proportion of dual-earner couples and women's relative income. Nevertheless, persistent plateaus near income parity indicate ongoing challenges when wives' earnings approach or surpass their husbands'.

4.2 Labor Supply Elasticities

Figure 7 presents women's labor supply elasticities estimated using both Heckman-MaCurdy (HM) and Blundell-Duncan-Meghir (BDM) methods (2012-2025). The gradual rise across all series suggests increasing wage sensitivity over time. The BDM estimates remain consistently higher than the HM results, demonstrating that when we account for household and unobserved heterogeneity, women exhibit a stronger substitution between leisure and labor.

Figure 7: Labor Supply Elasticities (2012–2025)



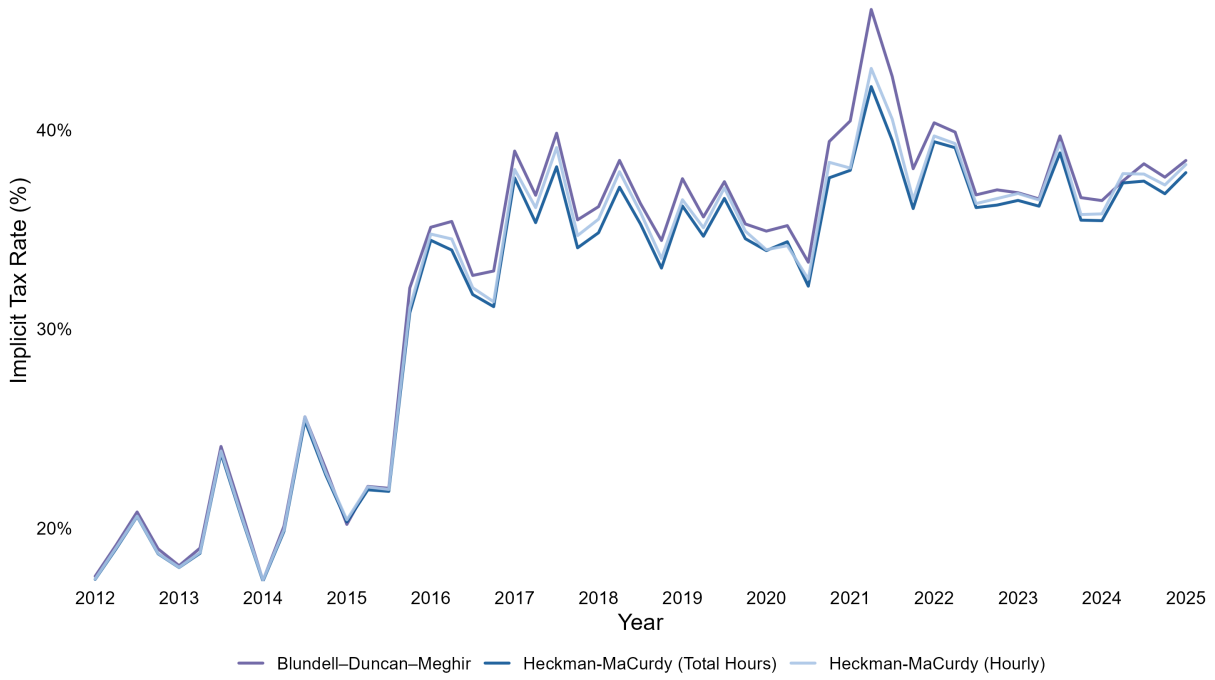
The sharp decline in BDM elasticity around 2015—absent in Heckman-MaCurdy esti-

mates, reflects its accounting for household heterogeneity and non-participation decisions, capturing how Brazil's recession increased women's responsiveness to non-wage factors, e.g., household risk-sharing and informal work. The 2020 COVID-19 shock depressed all elasticity estimates as women exited the labor force or cut back on hours due to school closures and caregiving demands. By 2021–2022, elasticities rebounded, stabilizing, by 2023, at levels modestly lower than the pre-pandemic.

4.3 Bunching Evidence of the Male-Breadwinner Norm

Figure 8 shows the evolution of the estimated implicit tax on female labor supply in Brazil from the first quarter of 2012 to the first quarter of 2025. This implicit tax captures the behavioral disincentives associated with the share of household income earned by women, derived from the excess bunching observed at the 50% income share threshold within couples.

Figure 8: Implicit Tax Rate on Female Earnings (2012–2025)



Across the entire period, the implicit tax calculated from the three elasticity models reveals consistent upward trends[7]. Between 2012 and 2015, the estimates suggest that, influenced by the male-breadwinner norm, women adjusted their earnings to avoid crossing the threshold of out-earning their husbands, effectively limiting their income by roughly 18–25%. Beginning in 2016, however, there is a sharp and sustained rise in the implicit tax, with estimates stabilizing at higher levels, around 30–35%.

The most notable peak occurs around 2021, when the implicit tax temporarily exceeds 40%. This spike coincides with the COVID-19 pandemic, a period marked by school and daycare closures that forced many women to balance full-time caregiving with paid work. As a result, many reduced their working hours, left the labor market altogether, or limited their earnings—reinforcing the norm-driven disincentive effect. Although the implicit tax declines slightly afterward, it remains elevated compared to the pre-2016 period, suggesting that the disincentive effects embedded in the intra-household income distribution have become more pronounced over time.

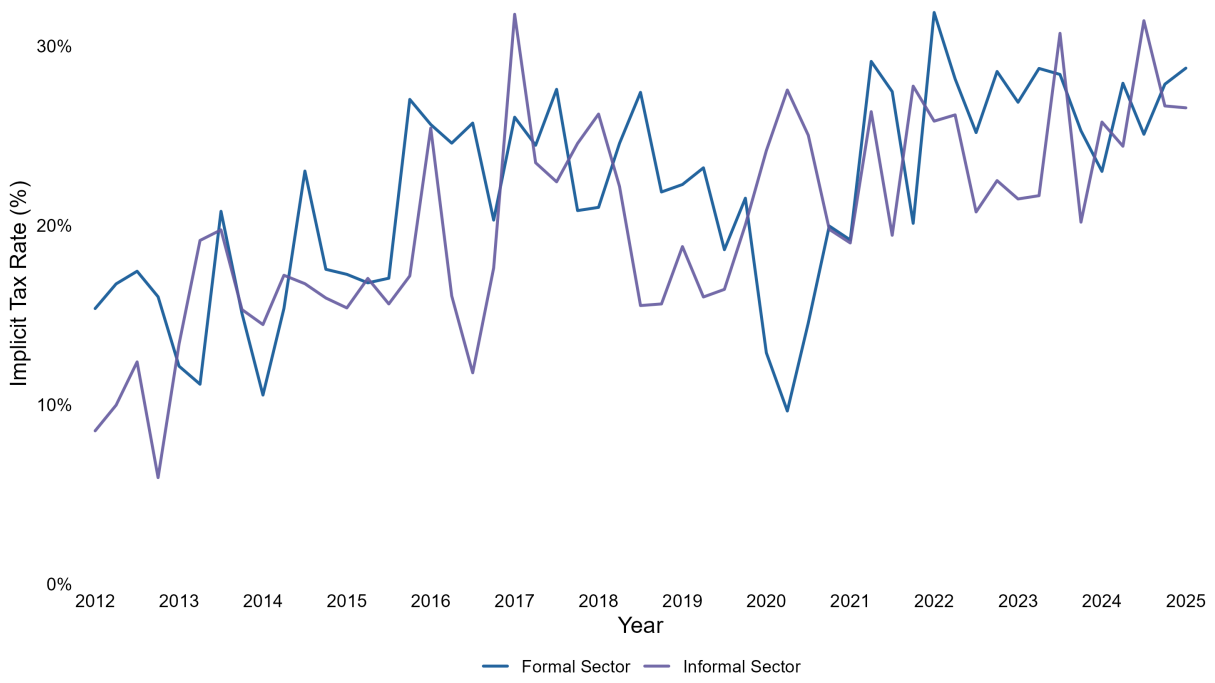
Given the similar trajectories of the implicit tax rates across the three elasticity models, we rely on the Heckman-MaCurdy (Total Hours) specification for the subsequent analysis, which captures adjustments along both the extensive (participation) and intensive (hours) margins, which is critical for Brazil's high-informality labor market. The models' similar estimates validate this choice without compromising robustness.

4.4 Heterogeneity Analysis

From 2012 to 2015, implicit tax rates in both the formal and informal sectors rose gradually from around 13% to 23%, with no major disruptions. Starting in late 2015, both series experience a sharp and persistent increase, stabilizing between 23% and 30% throughout 2016–2019 (Figure 9).

[7]The growing bunching was first identified in the McCrary test: estimates started near –10 in early 2012, reached –80 by 2019, and remained within a –70 to –80 range through 2025, indicating a gradual intensification of the bunching pattern (Figure A1).

Figure 9: Implicit Tax Rate on Female Earnings by Formal vs. Informal Sector (2012–2025)

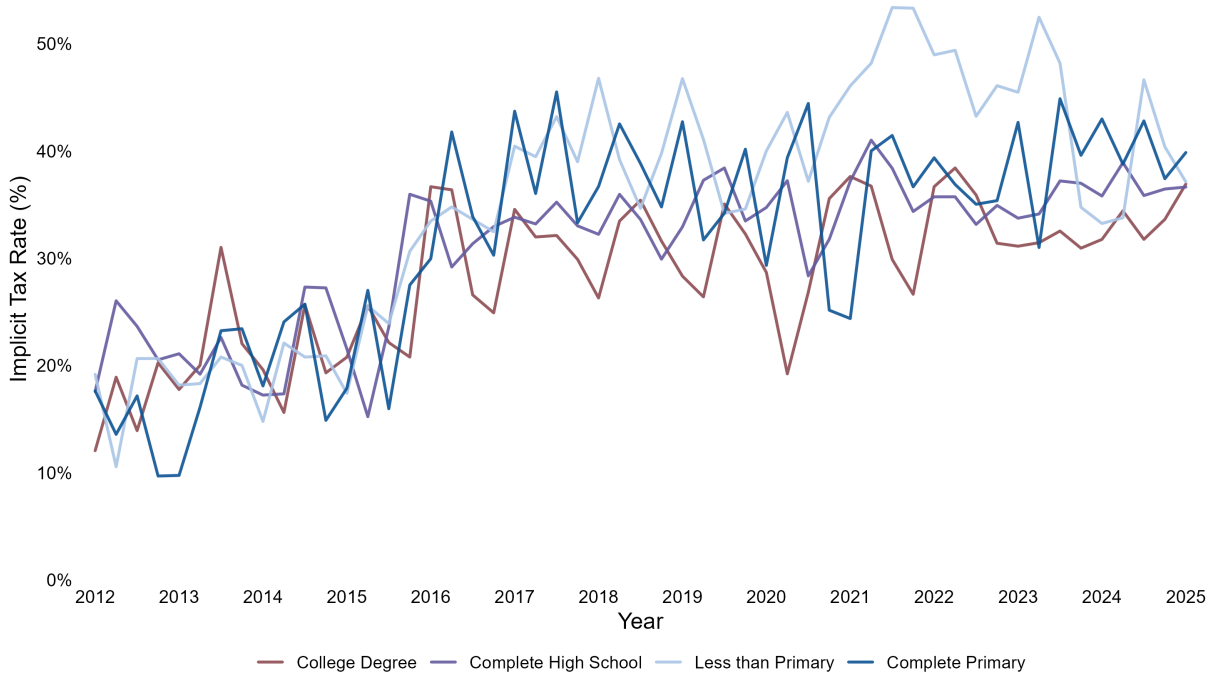


In 2020, the trends diverged: while the formal sector experienced a decline in the implicit tax, the informal sector saw an increase. This divergence is consistent with the way underlying social norms interact with labor market conditions. In particular, the observed decline in dual-earner households during this period—driven by disproportionate job losses among women—likely altered the distribution of relative income within households, thereby affecting the measured implicit tax. In the informal sector, where employment is more precarious and adjustment margins are more limited, these changes appear to have translated into higher implicit taxes, suggesting a stronger manifestation of the traditional male-breadwinner norm under adverse conditions. From 2021 onward, a slight convergence between sectors is observed, although both continue to exhibit rising implicit taxes through 2025.

The implicit tax rates by education level initially show parallel growth trends across all groups. However, from mid-2020 through 2023, the line for less-educated women di-

verged markedly from other groups, exhibiting significantly higher implicit tax rates. While trends remained closely clustered before this period, the results align with the relative income patterns observed in descriptive statistics: more educated women consistently exhibit lower implicit tax rates compared to less educated counterparts (Figure 10). This inverse relationship between educational attainment and implicit taxation strengthened during the pandemic years, suggesting that human capital accumulation became increasingly crucial for mitigating gender-based labor market distortions during economic shocks.

Figure 10: Implicit Tax Rate on Female Earnings by Education Level (2012–2025)



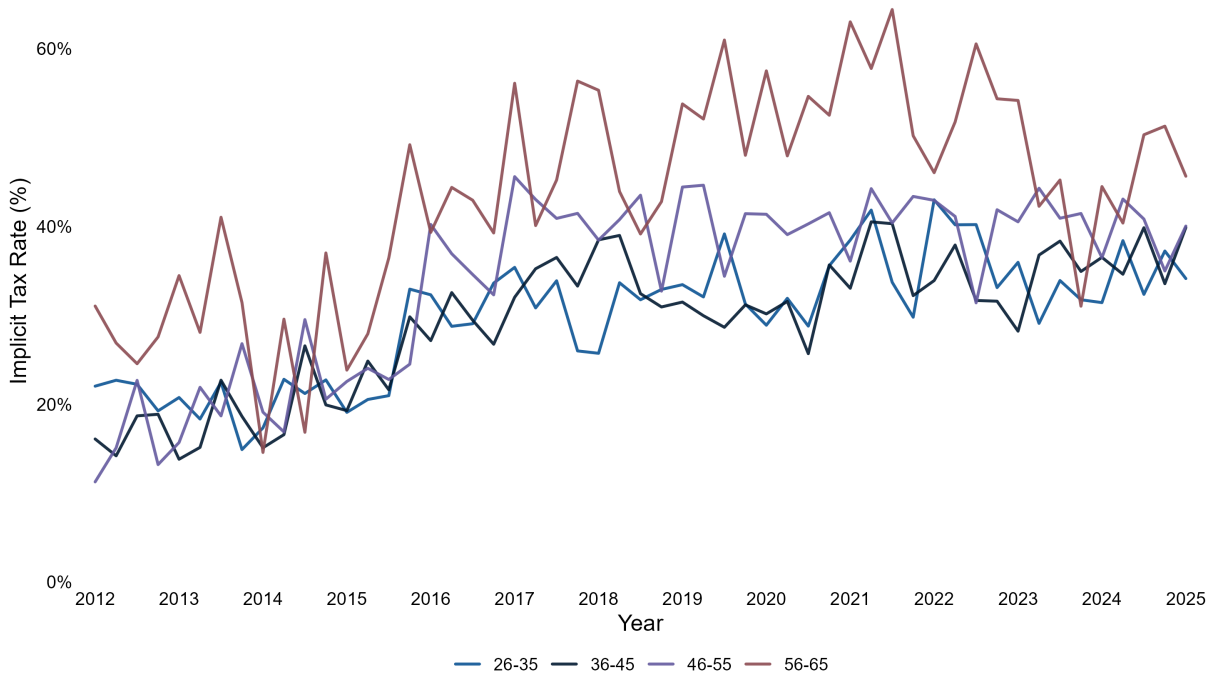
The age-group analysis reveals a consistent temporal pattern across all cohorts: stable implicit tax rates before 2016, followed by a sharp increase and persistently elevated rates thereafter (Figure 11).

Descriptive statistics presented previously suggest that women's relative household income tends to increase with age, which may be associated with accumulated labor market

experience and, potentially, higher educational attainment. At the same time, the bunching estimates indicate that older women (aged 56–65) tend to exhibit higher implicit tax rates than younger cohorts.[8]

These patterns do not necessarily imply a contradiction. Rather, they may be consistent with cohort-based differences in exposure to social norms. In particular, older cohorts may have been more likely to internalize traditional male-breadwinner norms, which could be associated with stronger behavioral responses around the threshold where women's earnings approach or exceed those of their partners, as documented in Bertrand et al. (2015). Under this interpretation, even if older women have a greater potential to out-earn their partners, they may also be more likely to adjust labor supply at this margin, which could contribute to the higher implicit tax rates observed for this group.

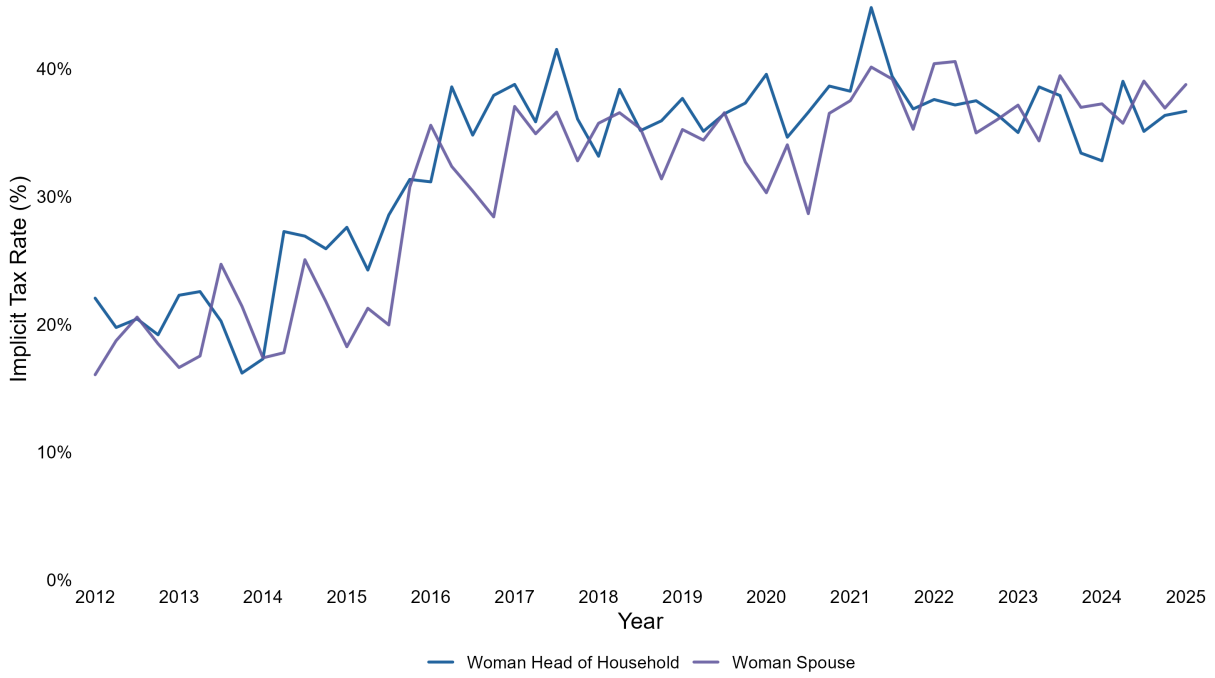
Figure 11: Implicit Tax Rate by Age Group (2012–2025)



[8]We omitted the 16–25 age group from the analysis because its sample size, already limited in the original data, proved insufficient for reliable estimation under the bunching approach.

When comparing female household heads to spouses in male-headed households, we observe that heads of household face a slightly higher implicit tax rate, though this varies over time. This finding appears counterintuitive, as one might expect the primary earner status to correlate with lower penalties. However, in Brazil, the formal designation of 'household head' (as recorded in surveys like PNAD) may not fully capture economic primacy, as the title can be nominal rather than reflective of actual earning dominance or intra-household bargaining power.

Figure 12: Implicit Tax Rate on Female Earnings by Household Position (2012–2025)



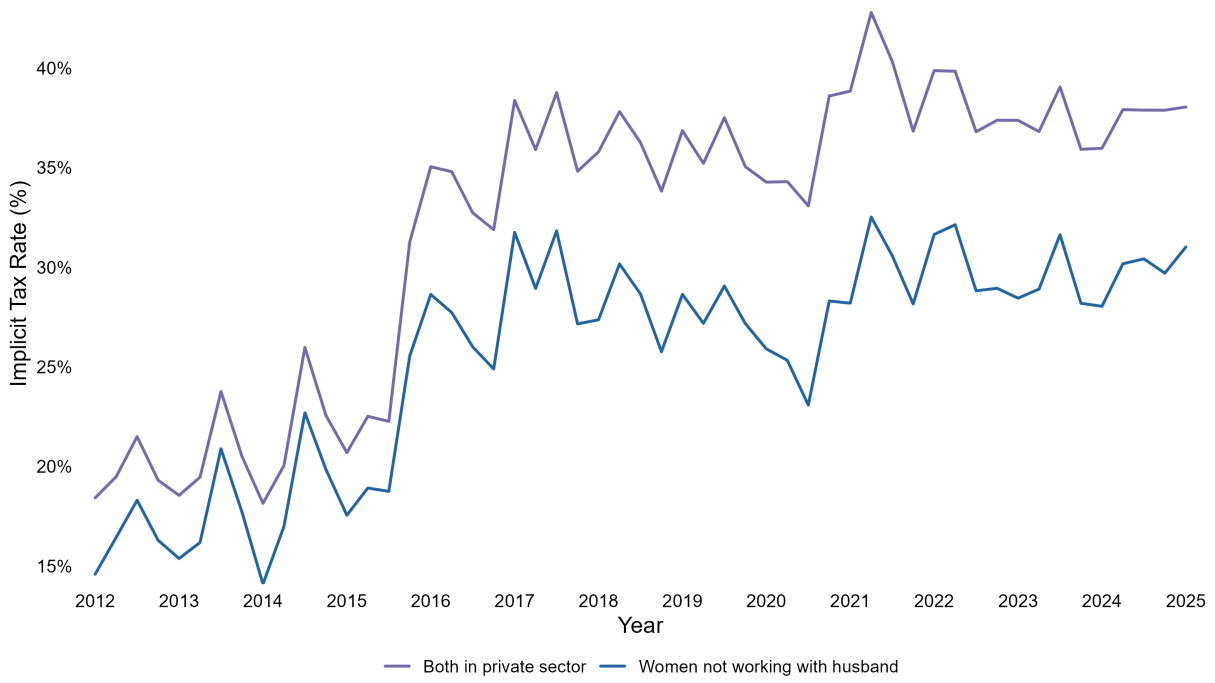
In sum, the persistently elevated implicit tax rates post-2016—and their amplification during crises like the COVID-19 pandemic—reveal a troubling paradox in intra-household bargaining dynamics: despite women's incremental gains in relative income, the cost of disrupting the male-breadwinner norm has intensified. Notably, the inverse relationship between women's education levels and implicit taxation suggests that human capital shields

against—but does not dismantle—gender-driven distortions, as even highly educated women actively curtail earnings near the 50% threshold. More critically, the steeper penalties for older women and female heads of household imply that traditional norms exert stronger pressure on those expected to have greater autonomy, hinting at deeply internalized social constraints rather than purely rational bargaining.

4.5 Robustness Checks

To test robustness, we conduct two sub-analyses shown in Figure 13. The first exclusion—inspired by Souza et al. (2023)'s approach—removes self-employed women working alongside their husbands in the same sector and occupation, isolating the implicit tax effect from distortions caused by shared income sources. This addresses Zinovyeva and Tverdostup (2021)'s concern that income equalization among dual-earner couples could drive observed discontinuities. Second, we analyze private-sector-only to control for institutional differences in wage-setting.

Figure 13: Implicit Tax Rate on Female Earnings by Partner Matching Criteria (2012–2025)

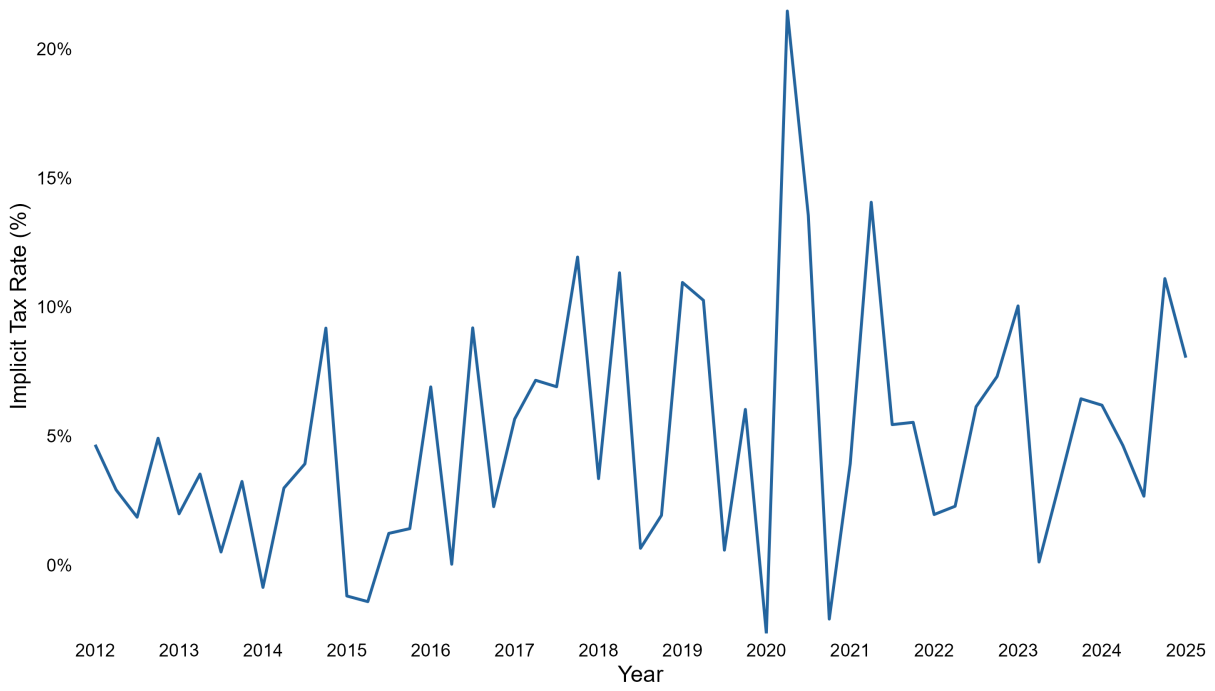


Both approaches consistently showed quantitatively similar implicit tax rates and identical upward trends. The lines for same-education couples and private-sector-only couples exhibited very similar magnitudes compared to the general estimates. The women-not-working-with-husband subsample yielded a lower—though still substantial—implicit tax rate, corroborating the male-breadwinner norm's persistence across alternative specifications.

In addition, the private-sector results may be informative about the role of adjustment margins. Compared to the public sector, private-sector employment is typically characterized by greater flexibility in hours, job assignments, and career progression. This suggests more scope for adjustments along the intensive margin (hours worked, effort) as well as along the extensive margin (employment status, job transitions, or occupational mobility). This institutional context may facilitate adjustments in labor supply or occupational positioning around the relevant income thresholds.

Since Binder and Lam (2018) demonstrate that spousal income bunching may reflect assortative mating rather than normative constraints, we verify whether the observed clustering in women's relative earnings stems from active behavioral adjustments or simply from the tendency for individuals to select partners with certain relative attributes. To test this, we create counterfactual couples by re-matching each man with a woman from a different household who shares similar observable characteristics—including age group, educational attainment, geographic region (state and urban/rural), and number of children (a proxy for family-size preferences). We further restrict matches to individuals with complementary household roles (responsible person and spouse/partner). Finally, we compute the woman's relative earnings in each simulated couple as her individual labor earnings divided by the pair's total earnings (Figure 14).

Figure 14: Implicit Tax Rate on Female Earnings in Simulated Couples (2012–2025)



Even after randomly re-matching individuals across households, the estimated implicit

tax on women's relative earnings remains positive—albeit lower than in the real distribution [9].

This comparison suggests that assortative matching accounts for a non-negligible, but relatively limited, share of the bunching observed when women begin to out-earn their male partners. At the same time, the persistence of a positive implicit tax under random matching indicates that a substantial portion of the effect cannot be attributed to couple-level sorting alone. Rather, it may reflect broader structural and behavioral forces that continue to shape women's relative earnings, even in the absence of observed matching patterns[10].

Additionally, as the implicit tax in the counterfactual (re-matched) sample remains virtually flat from 2012 to 2025, while climbing steadily in actual couples, this suggests that intra-household dynamics have increasingly amplified the penalty on women's earnings over time. In other words, while structural inequalities in the broader labor market establish a steady baseline disadvantage, evolving gendered norms and bargaining processes within households appear to have intensified the gap faced by women in real marriages.

5 Final Considerations

This paper examines how the male-breadwinner norm has evolved in Brazil. Applying a bunching approach to PNAD-C microdata, we find not only persistence but a strengthening of implicit disincentives: the "tax" on women's earnings climbed from 18–25 percent to a sustained 30–35 percent, peaking above 40 percent during the COVID-19 crisis.

Education offers some relief but fails to dismantle the norm—more-educated women face slightly lower penalties, yet still bunch their earnings just below parity. Moreover, an "autonomy trap" emerges: women who appear most independent (older or officially household heads) incur even steeper penalties, indicating that internalized social pressures—not just

[9]The McCrary test on the re-matched sample's distribution of women's earnings share also indicates a small negative discontinuity at the 50% threshold) (Figure A2).

[10]These forces—rooted in labor market structures such as occupational segregation and discriminatory practices—sustain persistent disadvantages for women, regardless of marital status.

bargaining—sustain the breadwinner norm as women near economic primacy.

Methodologically, despite the limits of cross-sectional data and the challenge of isolating causal channels, our robustness checks yield a consistent signal. From 2012 to 2025, the implicit tax in the counterfactual (re-matched) sample remains virtually flat, while the tax in actual couples rises sharply—suggesting that intra-household dynamics have increasingly amplified the penalty on women's earnings over time.

These patterns show that apparent gains in aggregate metrics conceal deepening behavioral rigidities within households. As women's economic potential expands, the invisible tax on their earnings intensifies—transforming individual progress into normative enforcement. This calls for a two-pronged policy strategy: addressing structural barriers through labor-market reforms and overhauling household-level supports to prevent marriage from turning external inequalities into private economic penalties.

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Appendices

Figure A1: McCrary Test for Women's Relative Income (2012–2025)

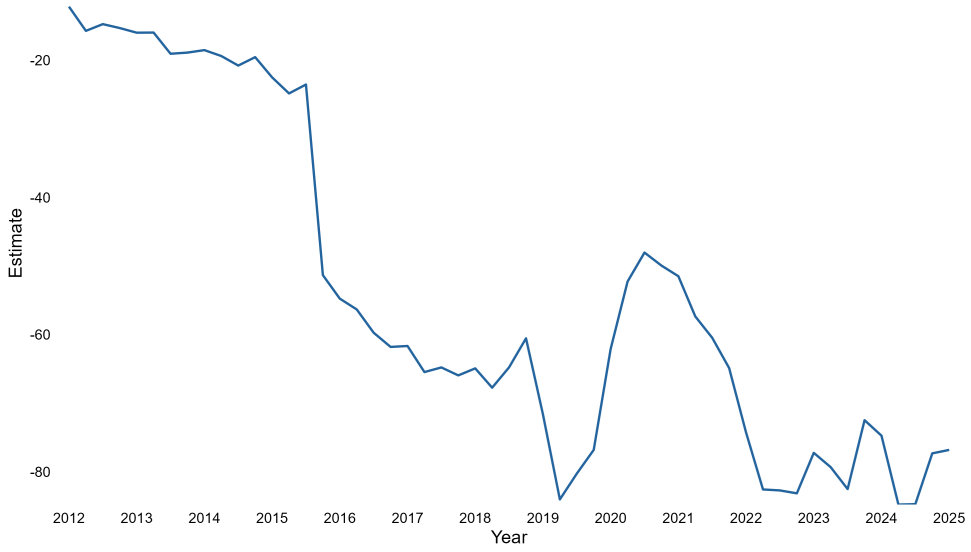

Figure A2: McCrary Test for Women's Relative Income in Simulated Couples (2012–2025)

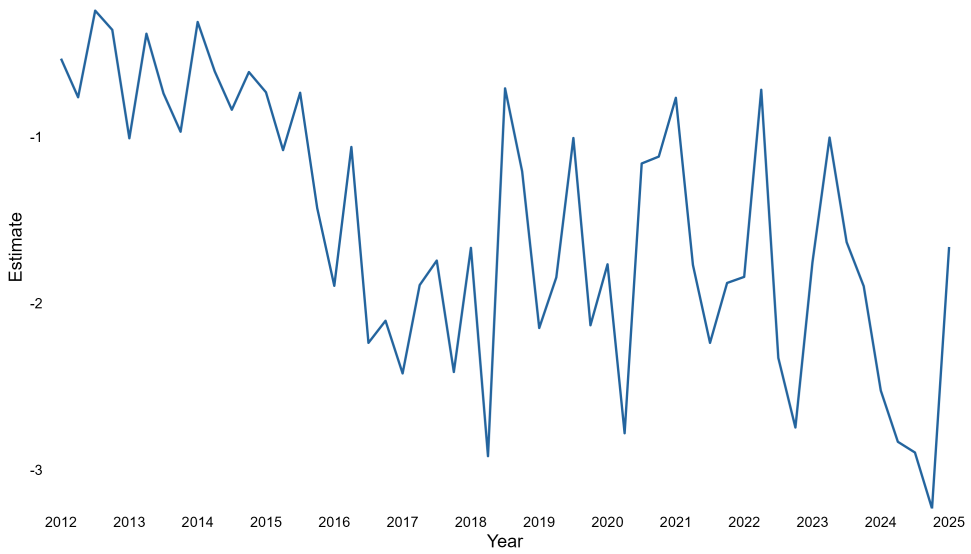

Figure B1: Observed vs. Counterfactual Income Distribution (2012Q1–2015Q3)

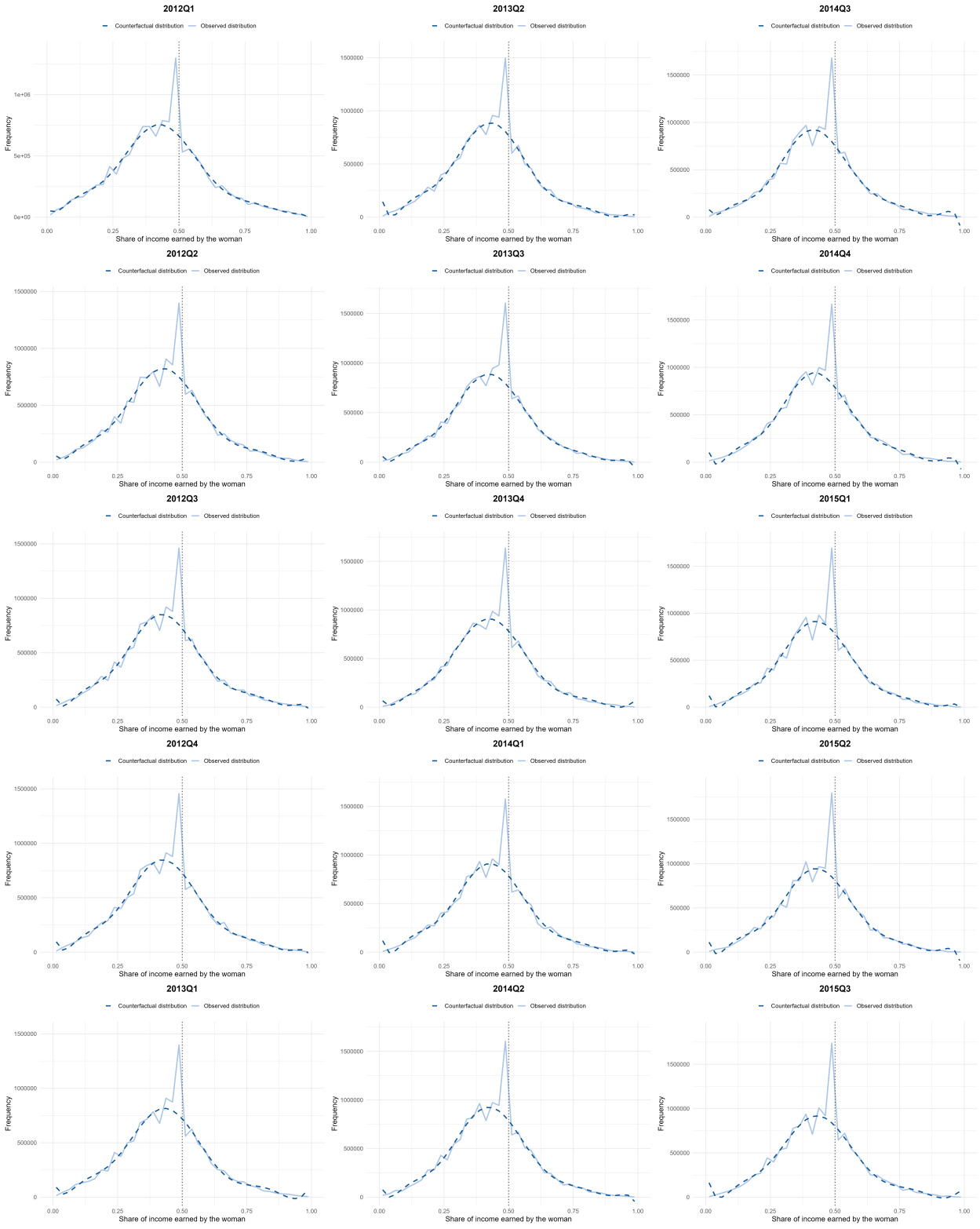

Figure B2: Observed vs. Counterfactual Income Distribution (2015Q4–2019Q2)

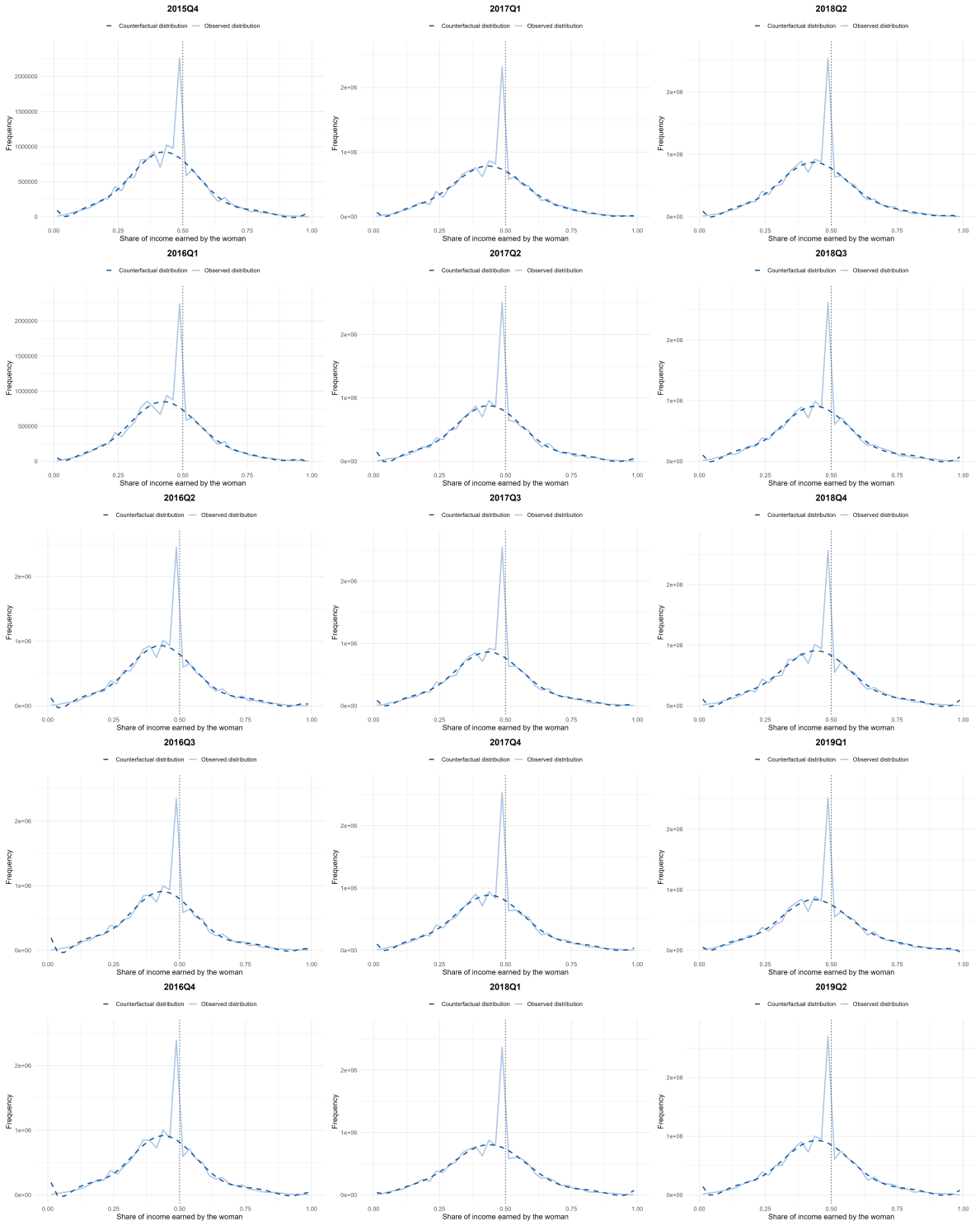

Figure B3: Observed vs. Counterfactual Income Distribution (2019Q3–2023Q1)

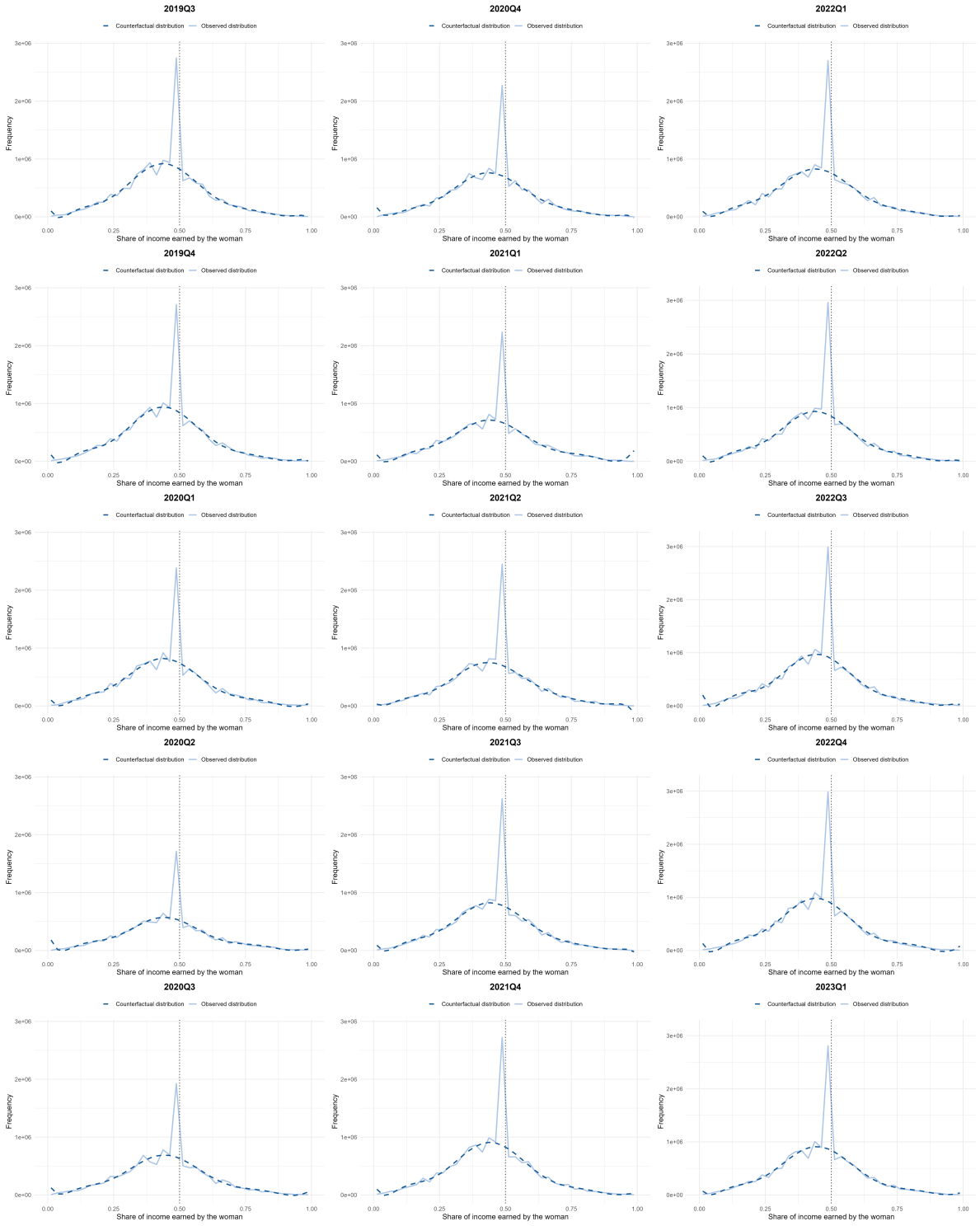

Figure B4: Observed vs. Counterfactual Income Distribution (2023Q2–2025Q1)