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Dynamics of Income Associations in Brazilian Couples: A Gender Approach*

Dinámicas de ingresos laborales en parejas brasileñas: una aproximación de género

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Abstract

The paper investigates the evolving dynamics of labor income associations within Brazilian couples from 1995 to 2019, identifying possible trends and changes along the income distribution. Descriptive analyses of the relative income gap, rank association curves, and quantile regressions are used to find patterns in the context of shifting gender roles, non-linear income associations, and the influence of socio-demographic factors. Overall, a general trend towards greater income equality is observed. However, this equality trend seems to be capped when women start earning more than their husbands, with a persistent asymmetry in income associations between genders. Non-linearities are also present in the income dynamics. Income matches are more varied among poorer couples, suggesting higher economic diversity in these relationships. Notably, there is more flexibilization of this norm among the poorest individuals, suggesting that this bigger share of wives that are the primary earners rises from economic necessity rather than evolving gender attitudes.

Keywords

Earnings Inequality
Gender Pay Gap
Marriage
Rank Associations
Brazil

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Resumen

Este estudio investiga las dinámicas de los ingresos laborales en parejas brasileñas de 1995 a 2019, e identifica tendencias y cambios en la distribución de ingresos. Se emplean análisis descriptivos de la brecha salarial relativa, curvas de asociación de *ranks* y regresiones cuantílicas para encontrar patrones en los roles de género, asociaciones de ingresos no lineales e influencia de factores sociodemográficos. En general, se observa una tendencia hacia una mayor igualdad de ingresos. Sin embargo, esta tendencia parece limitarse cuando las mujeres ganan más que sus maridos, persistiendo una asimetría en las asociaciones de ingresos entre géneros. Además, están presentes las no linealidades en las dinámicas de ingresos. Las parejas más pobres exhiben distribuciones de ingresos más diversas, con mayor diversidad económica en estas relaciones. Esta flexibilización de normas es más común entre los individuos más pobres, lo que sugiere que la mayor proporción de esposas como principales proveedoras surge por necesidad económica más que por cambios en las actitudes de género.

Palabras clave

Desigualdad de ingresos

Brecha salarial de género

Matrimonio

Asociaciones de *rank*

Brasil

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Introduction

Recent literature identifies a trend toward equal earnings among spouses worldwide (Esping-Andersen, 2007; Gonalons-Pons & Schwartz, 2017; Schwartz, 2010). The increase in "positive sorting in earnings" is closely linked to the rise in female labor force participation and other social and demographic changes, such as postponing unions, falling fertility, and increasing educational attainment levels (Greenwood et al., 2014; Pestel, 2017; Shen, 2021).

In Brazil, the process of accentuating female participation in the labor market began in the 1970s, when social, cultural, and economic factors, especially urbanization and economic growth, triggered significant shifts in women's involvement in the labor market (Bruschini, 2007). Education, new aspirations, transformations in the family structure, and the development of new gender roles boosted and sustained these transformations. The increase in female participation in the labor market has changed the economic dimension within and between families, as well as behavior in the marriage market (Yonzan, 2020).

The educational gender gap that traditionally favored men has been reversed in several countries (Esteve et al., 2016). Although the wage gap did not simultaneously follow this change, there is a discernible shift towards income equality within couples. According to Schwartz (2010), husbands and wives have become more equal over the past several decades in several ways: They share the same educational background, have similar wages and hours worked, and divide housework and childcare more equally.

These events are integral components of the Gender Revolution, a broader and connected set of systematic changes that have been taking place since the 1960s. Despite being notable, these changes in the gender system have been uneven, occurring more significantly in some groups and life domains than in others and affecting women's roles more than men's (England, 2010). Some even propose a two-phased Gender Revolution, with the first part relating to women entering the public sphere by taking on new roles in the labor market and the second half encompassing increased male involvement in the domestic sphere (Esping-Andersen & Billari, 2015; Goldscheider et al., 2015).

These multiple phases represent an incentive for the relative incomes among partners to adapt to the roles of women and men (England, 2010). In a potential future gender-egalitarian society, partners would be exchangeable into both breadwinning and caregiving responsibilities, and the likelihood of a man outearning his wife would be the same as the wife earning more. This would depend more on their individual productive characteristics than their gender roles. In this context, the pattern of relative income between partners and its changes over time serve as valuable indicators of a society's progress in the Gender Revolution.

Research on the association between spouse's income typically focuses on correlation measures across the entire income distribution to assess this trend's impact on inequality across families (Gonalons-Pons & Schwartz, 2017; Hyslop, 2001; Pestel, 2017; Schwartz, 2010). However, the question of whether economic homogamy has uniformly behaved across different income levels remains somewhat unexplored, although several recent studies have observed an increase in high-earning dual-career couples in many countries, pointing out that economic homogamy has increased more among high-income individuals (Shen, 2021).

Some mechanisms, such as the sharing of resources like social capital, presumably operate less among couples at the lower end of the income distribution, reinforcing the low earning potential of both partners.

The couple formation process has two effects on inequality: the positive assortative mating, which tends to increase inequality, and the income sharing effect, which reduces it. Positive assortative mating increases inequality since high-income or highly educated individuals tend to marry similar partners, concentrating wealth and resources within certain households. The income sharing effect reduces inequality by redistributing resources within households since with the paring of two individuals with different income levels in a household, their combined income is shared, which can help to smooth out disparities between them.

On average, the resource-sharing effect outweighs the assortative mating effect and pairing has a general inequality-reducing effect. However, these effects are not constant across the income distribution. The income-concentrating effect of assortative mating is most prominent in the distribution's tails. In contrast, the formation of couples in the middle of the distribution tends to occur more randomly. The intensification of pairing between the richest and poorest is associated with inequality within countries. Assortative mating among high-income couples is typical of countries with high inequality, such as Latin American countries, the USA, Spain, and Italy, whereas, among low-income couples, it is typical of less unequal countries like those in Northern Europe (Aaberge et al., 2019).

Much of the literature on this subject is based on developed countries, mainly the United States and Europe, but Brazil provides a good background for studies on partners' earnings patterns. The country not only presents high levels of inequality, but these have changed in recent years, first decreasing but then reverting the pattern (Scalon et al., 2021). These changes are mainly related to a reinforcement of the trends of general income inequality, originating in overall wage increases, but at a faster rate in the bottom of the income distribution (Firpo & Portella, 2019). Brazil also has a large informal labor market, where women are overrepresented, especially in low-paying and unstable jobs. This mirrors global trends but stands out because of the scale of informal work in the

country. Women in Brazil are often concentrated in sectors like domestic work and caregiving, which are undervalued and poorly regulated, highlighting broader international patterns where gender norms confine women to low-paid, low-prestige jobs.

While the country experienced this uneven pattern of changes in inequality, transformations in the family structures and partnering patterns continued to unfold; for example, "Brazilians are increasingly marrying partners who have similar socioeconomic characteristics" (Pereira & Santos, 2017, p. 373). The growing prevalence of dual-earner families, instead of the traditional male breadwinner, especially among younger cohorts, for example, constitutes a limiting factor of income inequality decline (Machado & Ribeiro, 2021). The crucial role of the increased labor force participation of married women in the inequality pattern is connected to a more significant decline in inequality among women and an increasing proportion of household income that the women's income represents (Hoffmann, 2019). Even during the period of inequality reduction, the concentration of income among the richest did not decline (Medeiros et al., 2015), further highlighting the need for an approach that considers the differences across the income distribution.

Thus, this study aims to investigate the income association patterns within couples across the income distribution in Brazil from 1995 to 2020. Specifically: i) identify trends of economic homogamy in Brazil over the period; ii) determine how the degree of income association changes along the income distribution; and iii) understand the role of educational and age assortative mating in the trend towards economic homogamy.

To do so, two nationwide surveys developed by the Brazilian Institute of Geography and Statistics (IBGE) are used: the Continuous National Household Sample Survey (PNADc) and the National Household Sample Survey (PNAD). Couples selected from 1995 to 2019 provide the data for investigating patterns of relative income and their changes over the period and across the income distribution. Our empirical strategy includes analyzing the distribution of the relative income gap, creating contingency tables of each spouse's marginal and joint income distributions, applying rank dependence curves, and conducting quantile regressions of one member of the couple relative to the other.

This study contributes to the broader literature on changes within families and gender-related behavior, offering a Brazilian perspective alongside novel theoretical and empirical framing of the phenomenon. The investigation of the distribution of the income gap within couples goes beyond commonly used central metrics, shedding light on patterns between genders and across the income distribution. That can be effective not only for new empirical results but also for theoretical developments. Furthermore, the spouse's income association patterns are drawn, considering changes in the country as part of the Gender Revolution over the last decades.

Besides this introduction, this paper presents a theoretical background regarding assortative mating and income association, along with a depiction of the Brazilian literature. Then, the surveys used are characterized, along with the empirical strategy. The results presentation follows, including some descriptive analysis of relative income in Brazil, the rank association curves, and finally, the results from the quantile regressions. Those also include some other characteristics of the couple that influence their income association. The paper concludes with some final remarks.

Spouses' income association

Assortative mating, or marital selectivity (Altonji & Dunn, 1991), explores patterns of couple formation under the assumption that individuals with similar characteristics are more likely to be in a union than expected in a random mating pattern. Patterns of union with income similarity can arise from a greater tendency for individuals with similar income levels before marriage to pair up or other characteristics, such as education. It can also originate from behavioral changes after marriage or union, in response to the partner's income, as well as based on the division of household and paid labor between husbands and wives (Gonalons-Pons & Schwartz, 2017; Schwartz, 2010).

In recent years, there has been an increase in educational assortative mating (Eika et al., 2019; Greenwood et al., 2014; Schwartz & Mare, 2005), indirectly contributing to the rise of economic homogamy since income is directly related to educational attainment. Furthermore, this phenomenon can originate from individuals' increased scrutiny of potential

spouses based on their current or potential earnings (Gonalons-Pons & Schwartz, 2017), and the trend toward delayed first unions facilitates the evaluation of observed and potential earnings of the partners (Billari, 2005).

Greater economic homogamy can also result from changes in family organization. Among the reasons for gender wage disparities, besides gender segregation in occupational fields and labor market segmentation, are the gender differences in allocating domestic work, care, and other family responsibilities. An individual's earnings reflect both individual productivity and the joint and endogenous decision-making regarding labor supply made at the couple level. Thus, when the shift from breadwinner to dual-earner families is accompanied by a more equal division of domestic labor, women gain time to "climb the occupational ladder". In the same way, reducing the number of children per family implies less time away from the labor market, positively affecting earnings according to the human capital theory, as less experience is sacrificed. Additionally, the theory of social capital predicts that each partner in a union can take advantage of the labor market resources of the other, such as connections, business opportunities, and economic resources, further intensifying economic homogamy (Verbakel et al., 2008).

Age is another dimension of assortative mating that influences women's outcomes in the labor market. Women tend to marry older men (Gustafson & Fransson, 2015), and the age gap between partners can influence a woman's entire career trajectory, as well as income both absolute and relative to her husband. Since earnings tend to increase with age, the male partner contributes more to the family's economic resources simply because he is in another career stage. Thus, the short-term strategy to maximize family income tends to prioritize the career of the older male partner, who has accumulated more experience. Consequently, decisions that may seem optimal at the family level, such as specialization in household and caregiving tasks, may not be optimal for each partner. Therefore, the age difference can affect the bargaining power over resources, especially regarding negotiations about specialization. Nevertheless, the nature of this association appears to be complex and not constant across the income distribution and the level of age difference (Carollo et al., 2019).

Finally, it is important to consider the non-linearity of economic homogamy across the distribution since socioeconomic processes are not equal at different levels of the income distribution (Shen, 2021). This issue directly affects income inequality between couples and, contrary to the traditional dimensions targeted by analyses of homogamy patterns (for example, education and age), earnings follow a highly skewed distribution to the right. Suppose economic homogamy increases equally at each income level. In that case, greater equality among high-income people produces greater inequality between couples than a similar increase among middle- or low-income people (Shen, 2021).

An increase in the positive association of earnings between spouses has been documented since the 1970s in the United States (Gonalons-Pons & Schwartz, 2017; Schwartz, 2010). Beyond the American context, some European countries also show evidence of this phenomenon, including Switzerland (Nakosteen et al., 2004), Germany (Eika et al., 2019; Pestel, 2017), the United Kingdom (Eika et al., 2019), and France (Frémeaux & Lefranc, 2020). The methods used in these works include log-linear models, correlation decomposition, quantile regression, and counterfactual decomposition.

In Brazil, a significant research agenda explores the presence of marital assortative mating patterns. Part of this literature approaching the educational assortative mating includes Silva (2003), Neri (2005), Ribeiro and Silva (2009), Longo and Miranda-Ribeiro (2012), Pereira and Santos (2017), Hakak and Firpo (2017), and Hoffmann (2019). Most results show decreasing educational homogeneity over time, but the results depend on the methodology employed (decomposition, variation coefficients, log linear models etc.) and whether changes in marginal distributions, particularly concerning female labor force participation, are considered.

Important contributions concerning racial assortative mating come from Ribeiro and Silva (2009), Longo and Miranda-Ribeiro (2012), and Gullickson and Torche (2014), suggesting an increase in interracial marriages in Brazil over time. Furthermore, Longo and Miranda-Ribeiro (2012) incorporate the dimension of religion into the analysis. Lena and Oliveira (2015) compare marital assortative mating patterns between heterosexual and homosexual couples based on factors like education, race, and age.

Melo (2007) explores combinations of occupational and non-occupational characteristics of the head of the household and their respective spouse in the São Paulo Metropolitan Area, revealing substantial heterogeneity of marriages. Age, education, and economic strategies of spouses, particularly regarding the wife's labor force participation, are determining factors in distinguishing couples. The author points out that very poor wives need to reach a minimum level of family conditions to make themselves available for the labor market, whether due to the difficulty of obtaining paid employment or obtaining an income that covers the costs of being away from home and not performing household tasks. Another interesting finding is the lower correlation between years of education for younger couples and a higher correlation between the head and spouse for older couples.

Lastly, some studies for Brazil show evidence of the existence of non-linearity in assortative mating processes, although they do not directly address this issue. For example, Sedlacek and Santos (1991), using data from 1984, investigated the relationship between husband's income and women's participation in the labor market and found higher participation rates for wives of husbands at both ends of the income distribution. Hakak and Firpo (2017) find, in the last 20 years, a reduction in the pairing of the spouses' education but an increase in the pairing in couples with higher education. Furthermore, assortative mating and its effect on inequality are greater at the tail of the distribution for several countries investigated by Aaberge et al. (2019), except for South Africa and Brazil. According to the authors, observations at the bottom of the income distribution in these countries may not be representative since informal employment is difficult to measure adequately.

Data, variables, and methods

Database and variables

Data used in this work comes from the Pesquisa Nacional por Amostra de Domicílios *(*PNAD*)* from 1995 to 2015 and from the Pesquisa Nacional por Amostra de Domicílios Continua (PNADc) from 2012 to 2019, both available through the Brazilian Institute of Geography and Statistics (IBGE) for the national territory. The transition from the former dataset to the latter

involved an intersection period during which both surveys were conducted, serving as a compatibility measure for these datasets. The PNAD series is available for periods before 1995. However, due to the significant inflation experienced during that time, which resulted in distortions in income-related data, our analysis will be made from 1995. Similarly, although PNADc data is available post-2019, that period is not considered due to labor market distortions caused by the COVID-19 pandemic.

The unit of analyses includes heterosexual couples living in urban areas where both partners are between 25 and 49 years old, considering most of the working time span of one's lifecycle. Only couples in which one of the partners was identified as the reference for the survey interview are included to ensure the accurate identification of couples. Also, same-sex couples are excluded due to differing gender dynamics and limitations in the available database. Finally, married couples or in unions are included indistinctly as these unions are often considered almost indistinguishable in Brazilian society (Cunha & Verona, 2022).[1]

Although both the PNAD and the PNADc provide information on different sources of income, such as capital gains, social benefits, and retirement, the primary focus of this work is on income derived from work.[2] Therefore, the monthly income from the partners' main job is the principal variable obtained from the databases.

Additionally, we incorporate other individual variables to characterize and control for factors influencing relative income. Both partners' ages are considered to test the hypothesis that life cycle factors play a role in this phenomenon. Furthermore, we investigate the relationship between age homogamy and income disparity, so the age gap between spouses is also included (specifically in the format of the husband's age minus the wife's age). The individual's age is a discrete variable in five-year intervals (25 to 29, 30 to 34, etc.). This format already accounts for non-linearity, eliminating the need for adding quadratic terms.

1 The terms "partners", "spouses", and "wives/husbands" are used interchangeably.

2 Rather than considering all employments, the use of the primary occupation is to encompass aspects of social status associated with the main occupation. Similarly, monthly wages are analyzed rather than hourly wages.

Similarly, education is integrated into the analysis both as a gap and at the individual level for women. The education gap is represented as a continuous variable in years of study. In contrast, the individual's level of education is categorized to capture the highest level completed: Complete Elementary Education 1 (up to 7 years of study), Complete Elementary Education 2 (8 to 10 years of study), Complete High School (11 to 14 years of study), or Complete Higher Education (15 or more years of study).

Including variables that capture education and the life cycle of the partners is crucial, as these factors are intertwined with both individual and family demographic processes and labor market determinants. Work experience, often proxied by age, and skills or human capital, proxied by years of schooling, are fundamental in determining the returns to the labor of husbands and wives. Additionally, age is correlated with significant life events, particularly for women, that influence labor supply and potential remuneration, such as parenthood (Bianchi et al., 1999).

Empirical strategy

The first part of the work employs a descriptive methodology, including the relative income gap. The subsequent analyses have a rank-based approach, starting with the contingency table of the marginals and joint distributions of each of the spouses' work incomes. Using rank-based measures enables comparisons between individuals located in different income distributions. Additionally, respective rank dependence curves are obtained. Finally, a quantile regression of the rank of one member of the couple to the other is applied to isolate other influence factors. The analysis includes only couples where both partners earn positive wages, that is, non-zero, unless otherwise specified. The scope of this analysis encompasses the first and last years of the sample, 1995 and 2019, and the omission of the intermediate period is found not to harm the arguments to be made.

Distribution of the relative income gap

The initial analysis focuses on the relationship between the wages received by the partners. An index is employed to determine the magnitude of the gap relative to the couple's combined income, referred to as the relative income gap.

$$Relative\ income\ gap = \frac{W_m - W_w}{W_m + W_w} \quad (1)$$

Where is the male income and is the female income. The index also can be interpreted as the difference between the husband's and wife's relative contributions to the total earnings of the couple (Bianchi et al., 1999).

This measure of income association is continuous and can assume values in the -1 to 1 range. A value of 0 represents equality between the husband and wife in earnings, while a negative value means that the woman earns more than the man, and a positive one indicates an advantage in male earnings. Examining the distribution of the relative income index provides valuable insights into the income dynamics within dual-earning Brazilian couples. It is important to view the gap as a fraction of the income since the same nominal difference can represent different levels of asymmetry.

Rank-based association

An income-based measure is susceptible to income levels, which can change over the years of analysis. Additionally, comparing the income levels of husbands and wives can be misleading, given the inherent differences in the income distributions of men and women (with men typically earning more on average). In that case, an income gap can result from this phenomenon and not characterize a difference in positions on the social scheme. Using ranked labor income is beneficial to address these issues, as it captures the relative positions within the income distribution.

This rank-based income is applied to a contingency table showing the association between the marginal distribution of each spouse and the joint distribution and between both marginal distributions. Both men and women are classified into deciles based on their labor income ranks, allowing for the tracking and matching of individual's marginal and joint deciles. This approach enables the identification of the proportion of individuals, by income decile, who remain in the same decile, move up, or move down the income distribution concerning the joint distribution, i.e., considering the shared income among partners. That could be understood as a proxy for "mobility" due to marriage (Yonzan, 2020). On the other hand, the contingency table of the marginal distribution of males versus females illustrates the relative income positions of couples.

This approach allows for non-linearities in the income distribution to be observed, and the bigger such mobility is in a decile, the less homogeneous the spouses' earnings are within that income bracket.

Rank association curve

Another way to identify how earnings association in couples varies along men's and women's distribution of earnings is through rank dependence curves. These curves show how a wife positioned at a given percentile of her earnings rank distribution is correlated to their husband's rank in a non-linear way and vice-versa, according to Grossbard et al. (2022) who also applies this methodology.[3]

The methodology is based on a binning technique, and for each bin based on a wife's (or husband's) income ranks, the average income rank of their spouse is calculated. Binned means are useful to capture non-linearities, which may not be adequately addressed by the more commonly applied method of correlation coefficients. If the average rank of a wife (husband) varies non-linearly with the husband's rank, to have a visual representation, within each bin, a non-linear function of the spouse's income rank is plotted, consisting of a continuous and smooth way of displaying the information.

The rank association structure of the spouse's income is estimated using a continuous mean function of the wife's (husband) rank, applying a polynomial function of the partner's rank:

$$r_{w,i} = \alpha + \sum_{k=1}^{K} \beta_k r_{h,i}^k + e_i \quad (2)$$

The element $r_{w,1}$ represents the wife's (husband) income rank for the i^{th} family, and $r_{h,i}$ is her husband's (his wife's) rank. This equation produces a continuous mean function. Plotting the function, using the estimated ranks and coefficients, has flexibility introduced by the polynomial functional form, allowing the visualization of a possible non-linear association pattern along the income rank distribution.

3 The set of male and female rank association curves are presented for 1995 and 2019. Besides that, they are also calculated for 2012 using two datasets, PNAD and PNADc, to ensure the compatibility between them.

Quantile regressions of marginal ranked income

In addition to descriptive analyses and the distribution of the gap between couples, it is important to apply methods that isolate the factors that influence the income ratio within couples. Quantile regressions (Koenker & Basset, 1978) are estimated to provide measurements of the impact of the explanatory variables on the different points of the conditional distribution of the dependent variable, like understanding the role of educational and age assortative mating in the trend towards economic homogamy.

The choice of applying quantile regressions is justified by the possibility of characterizing the entire conditional distribution of the response variable, given a set of regressors. Moreover, quantile regression estimators can be more efficient than least squares when errors do not follow the normal distribution. Also, different solutions at different values can be interpreted as differences in the response of the dependent variable to changes in the regressors at various points in the conditional distribution of the dependent variable.

Quantile regressions are used to model the relationship among the independent variable, the male position in the income rank, and the control ones in different points of the conditional distribution of the dependent variable , the female income rank. Nine deciles were estimated. The control variables included in the estimation are the meant to account for the possible educational and age assortative mating: age of the female partner, age gap between partners, educational attainment of the women and difference in years of schooling.

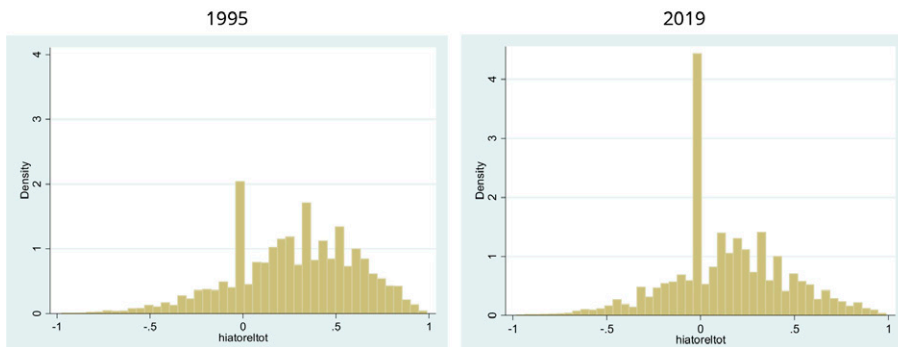
Results and discussions

Spouses relative income gap

The investigation of the association of labor earnings within couples starts by examining the concept of the relative income gap: that is, the share of the income that the difference of the partner's labor income represents in favor of the male partner. Figure 1 displays the distribution of this index for the years 1995 and 2019. The right skew indicates that, more frequently, the husband is the higher earner within the couple.

In addition to its asymmetric concentration in positive differences, the partners' income gap distribution is centered around zero. The mode is the zero-difference bin, where the partners earn the same income. This outcome is nearly twice as frequent in 2019 compared to 1995. Furthermore, there is also a change in the format on the positive side of the distribution, with the secondary frequency peak getting closer to the center. Over almost two and a half decades that separate the first histogram from the second, more significant changes occur on the positive side of the spouse's relative income gap, specifically in cases where men earn more than women. It is evident that there is a trend towards equalizing the relative income of partners, but primarily when wives still earn less than their husbands. Similar patterns have been noted in other contexts, such as the United States (Bertrand et al., 2015).

Figure 1. Distribution of the relative income gap among dual earners couples, Brazil, 1995 and 2019.



[1a] [1b]

Source: Authors' calculation using PNAD and PNADc.

To identify variations in the association of spouses' income across different earnings levels, Figure 2 illustrates the mean relative income gap index by deciles of earnings, considering three reference points: couples, husbands', and wives' deciles of income. This index also can be interpreted as the difference between the contribution of each partner to the total earnings of the couple, in which a value of 0 represents equality between the husband and wife in earnings, a negative value means that the woman earn more than the man, and a positive one indicates an advantage in male earnings.

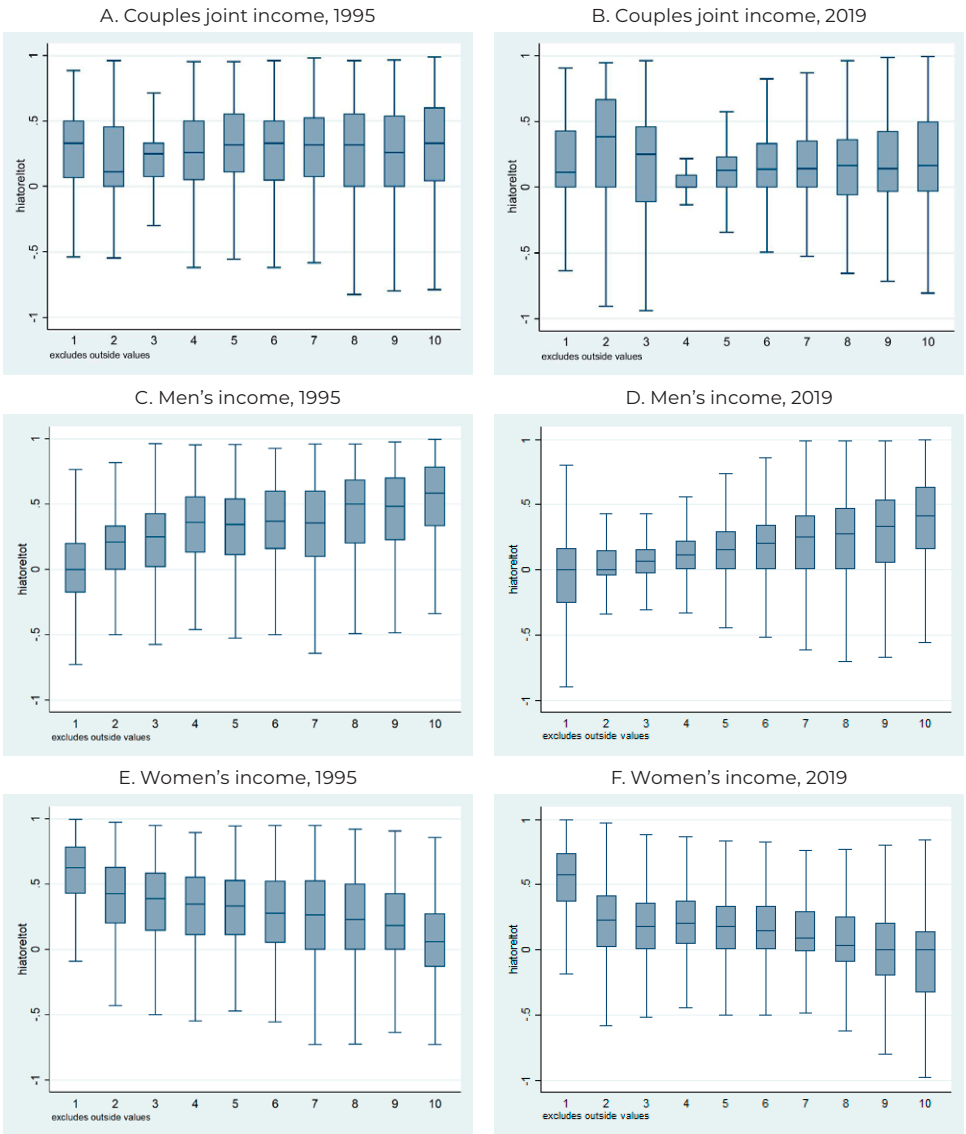
Some non-linearity is present when observing the mean relative wage gap by decile of joint labor income (Figure 2A and B). The most significant gap in 2019 is observed within the second decile, after which the gap average decreases and remains relatively consistent from the middle to the upper end of the distribution. Notably, the second decile is the only one where there is not a decrease in the median relative income gap between the two years. Another important feature is the median, which has a value of 0 in decile 4.

The distribution of the relative income gap by the men's income decile (Figures 2C and D) shows a linear and positive relationship between the income gap index and the income decile, i.e., the higher the husband's income, the greater the gap. Between the two periods of analyses, the median in all the deciles decreased, and there was also less dispersion in the second year. The first decile, specially, has a negative mean, with the woman earning more than the man and with greater variability. This suggests that in couples where the husbands have the lowest labor income, a greater degree of "equality" in the partnership is achieved, even reaching a level of income asymmetry in favor of women, likely driven more by economic precarity than attitude shifts. This "flexibilization of the norm" in poorer couples, where women become primary earners out of economic necessity rather than changing gender attitudes, is in line of findings like Antman et al. (2021) that concludes that in the presence of gender conflict, low-skilled individuals are more likely than high-skilled ones to stay married as a result of unbalanced outside options.

On the other hand, when considering the income gap binned by women's income (Figure 2E and F), an inverse association is observed: the higher the wife's wage, the smaller the income gap. From 1995 to 2019, the median in all the deciles has also decreased, along with reduced dispersion. In the last decile, representing the top 10 % of married women in terms of labor income, the median relative income gap is negative, indicating that these women earn more than their husbands.

In all three points of viewing the spouse's relative income, there is still a more frequent positive difference in income in favor of the male partner, even if that difference has reduced from 1995 to 2019. The improvement during this period is more about reducing the income disparity towards the husband than an increase in cases where women earn more than men.

Figure 2. Box plot representation of relative income gap among dual earners by decile of marginal male and female income and joint income, Brazil, 1995 and 2019.



Note: The box represents the values from the 25th to the 75th percentile, and the central line of the box is the median. The whiskers show the index's upper and lower adjacent values of the relative income gap.

Source: Authors' calculation using PNAD and PNADc.

The results indicate increasing equality in the relationship, reflected by a shrinking wage gap, although women continue to earn less than their husbands. Also in Brazil, "women are bringing personal glass ceilings from home to the workplace" (Bertrand et al., 2015, p. 574).

It appears that another strategy couples use to ensure the desired gender income balance is by creating or maintaining the unions only if the partners have some balance of earning potential. In that sense, this attitude towards gender traditionalism, like the belief that "a man should earn more than his wife", influences not only the distribution of relative income within households but the patterns of marriage and divorce, women's labor force participation, and the division of household activities among husbands and wives (Bertrand et al., 2015; Fortin, 2005).

Analysis based on gender-specific earnings rank and joint income rank

Income-based measures of association can be susceptible to changes in income levels and may be misleading when dealing with different marginal income distributions. In such cases, ranked measures of labor income are useful as they allow the measurement of the association between partners' income, capturing the positional correlations.

Tables 1 and 2 show the marginal distributions of women and men, respectively, versus the joint income decile for 1995 and 2019. These display the income "mobility" that occurs through marriage. Individuals and couples are ranked from the poorest to the richest, dividing them into ten bins based on income and then determining the frequency of each match. The diagonals of the tables indicate immobility, i.e., the men and women that stay in the same income decile considering both their individual and couple incomes.

Among women, there is a prevalence of situations where the individual income decile is higher than when considering the couple's combined income. Take the example of the fifth decile of female income distribution: in 2019, 24 % of women in this decile belong to the fourth decile when we consider the income of both partners, the higher share. Similarly, approximately 21 % of women remain in the same income category when viewed from both perspectives.

Table 1. Match between marginal and joint incomes ranks of women, Brazil, 1995 and 2019 (%).

Women - 1995										
Couple	1	2	3	4	5	6	7	8	9	10
1	51.45	27.45	15.3	5.2	0.46	0	0	0	0	0
2	17.25	21.74	28.38	18.33	7.49	1.95	0.12	0	0	0
3	11.13	18.66	18.87	21.19	17.64	8.37	1.52	0	0	0
4	8.91	12.51	13.37	18.17	22.2	18.7	5.25	0.07	0	0
5	5.13	7.08	8.92	17.87	17.25	24.96	17.33	2.69	0	0
6	2.91	5.03	6.09	7.77	16.86	19.51	23.75	11.43	0.62	0
7	1.98	4.1	5.79	6.18	8.14	13.9	24.45	25.93	7.46	0
8	0.56	1.61	2.08	4.07	6.18	7.4	15.87	31.46	31.69	4.31
9	0.43	1.22	1.04	1.06	2.6	4.23	7.82	19.08	39.15	26
10	0.25	0.59	0.15	0.15	1.17	0.98	3.91	9.32	21.08	69.7
	100	100	100	100	100	100	100	100	100	100
Women - 2019										
Couple	1	2	3	4	5	6	7	8	9	10
1	63.75	15	4.07	2.69	0.96	0.37	0.01	0	0	0
2	12.34	33.25	30.91	16.13	3.25	1.22	0.24	0	0	0
3	8.16	17.33	21.8	25.2	18.29	6.13	1.24	0.14	0	0
4	4.74	12.52	16.63	19.38	24.9	15.97	6.65	0.68	0.01	0
5	4.02	8.1	8.93	14.42	20.97	28.61	16.92	5.18	0.2	0
6	2.44	5.62	7.45	9.37	12.55	18.29	27.47	14.45	1.96	0
7	1.92	3.31	3.82	5.91	9.44	14.25	21.58	28.86	10.79	0.05
8	1.18	2.27	3.41	4.01	5.32	8.44	14.24	27.25	29.95	3.33
9	0.93	1.36	1.92	2.06	3.13	4.85	8.1	16.4	40.24	25.27
10	0.52	0.6	1.05	0.83	1.19	1.88	3.56	7.04	16.87	71.36
	100	100	100	100	100	100	100	100	100	100

Notes: This table shows the "mobility-by-marriage" frequencies of women moving from their respective labor income decile to the couple's. The deciles are ranked from the lowest, 1st, to the highest, 10th. In bold are those with the same rank individually and when considered with their partner.

Source: Authors' calculation using PNAD and PNADc.

The first and last deciles are the ones that exhibit the highest matches between the woman's and the couple's income decile. Remarkably, this occurrence is more frequent at the last decile. In 2019, 96 % of women in the top 10 % income bracket remained within the top 20 % when considering the couple's combined income. On the other hand, among women with lower individual incomes, it is observed a more diverse distribution

Table 2. Match between marginal and joint income ranks of men, Brazil, 1995 and 2019 (%).

Men - 1995										
Casal	1	2	3	4	5	6	7	8	9	10
1	76.74	25.13	0.87	0	0	0	0	0	0	0
2	14.65	40.41	26.06	3.13	0.24	0	0	0	0	0
3	3.91	21.24	35.14	33.68	7.2	0	0	0	0	0
4	1.92	5.96	23.07	32	33.69	3.83	0	0	0	0
5	1.14	3.01	9.56	18.44	32.56	33.85	4.78	0	0	0
6	0.71	2.38	2.7	7.22	16.07	35.89	33.96	0.83	0	0
7	0.43	1.3	1.25	2.97	6.96	19.17	39.03	29.61	0.23	0
8	0.28	0.26	0.58	1.68	2.74	5.95	18.75	48.07	27.47	0
9	0.14	0.26	0.77	0.8	0.54	1.22	3.11	19.56	57.12	18.52
10	0.07	0.05	0	0.08	0	0.08	0.36	1.93	15.18	81.48
	100	100	100	100	100	100	100	100	100	100
Men - 2019										
Casal	1	2	3	4	5	6	7	8	9	10
1	55.14	20.33	8.25	1.72	0	0	0	0	0	0
2	31.17	42.82	12.87	8.55	2.36	0.05	0	0	0	0
3	5.46	20.45	43.21	20.2	7.46	2.17	0.07	0	0	0
4	3.06	6.82	19.77	34.74	24.82	6.71	1.44	0	0	0
5	1.77	4.05	7.36	21.14	30.54	30.98	8.21	0.61	0	0
6	1.39	2.3	4.05	6.06	20.45	27.15	30.36	6.79	0.04	0
7	0.9	1.64	2.26	3.79	7.93	21.23	30.46	32.07	2.97	0
8	0.59	0.92	1.47	2.35	3.96	7.62	21.19	35.86	28.87	0.04
9	0.38	0.42	0.62	1.15	2.02	3.27	6.96	21.3	52.37	18.49
10	0.14	0.25	0.15	0.31	0.45	0.82	1.31	3.37	15.75	81.47
	100	100	100	100	100	100	100	100	100	100

Notes: This table shows the "mobility-by-marriage" frequencies of men moving from their respective labor income decile to the couple's. The deciles are ranked from the lowest, 1st, to the highest, 10th. In bold are those with the same rank individually and when considered with their partner.

Source: Authors' calculation using PNAD and PNADc.

across various income levels within the couple, and in 2019, 7 % of women in the lowest income decile found themselves in the more privileged half of the couple's income distribution.

There has been an increase in the likelihood that women stay in the same decile of their marginal distribution between 1995 and 2019, especially at

the distribution's tails. For the poorest women, this value went from approximately 51 % to 64 % in the period, 17 % to 21 % in the fifth decile, and decreased between the sixth and eighth deciles. This pattern of decreasing mobility after marriage among the poorest women is similar to what Yonzan (2020) documented for the United States.

Men exhibit a large correspondence between their individual and couples' income ranks. Except for the sixth decile of 2019 and the fourth of 1995, the most frequent category is the equivalence between the individual and joint classification. In the male case, the top income decile also stands out for its higher level of correspondence. In 2019, 81 % of the men with the best incomes were also in couples with the best incomes; this figure is 55 % of men with lower incomes.

The trend over time in the matching between individual and couples' income rank differs for men and women. Except for the third and fourth deciles, there was a decrease in the male's likelihood of staying in the same decile of the marginal and joint distributions between 1995 and 2019, especially on the lower end of the distribution. For the first decile, this likelihood decreased from approximately 77 % to 55 % in the period, 32.5 % to 30.5 % in the fifth decile, and stayed stable at the 10th, 81.5 %.

The larger correspondence between the income rank of the individual and that of the couples for men is expected, as they earn more on average than women, and male income usually represents a larger share of the family income. This is especially true for the 10 % higher income men, as approximately 81 % are also in the 10th percentile of the couple's income, which remained more or less constant between 1995 and 2019. The first lower decile presents a different pattern; it is the only one where the immobility rate is higher for women (63 %) than for men (55 %), and upward mobility through marriage is more frequent for the poorest man than for the poorest women in 2019.

To better understand the pattern of matches, we can examine the distribution of both husbands' and wives' marginal incomes (Table 3). A match in the male and female ranks is most frequent only at the beginning and end of the income distributions of 2019 (deciles 2, 9, and 10), but not among the 10 % lowest income men. In this decile, it is more common to pair with women from the second decile, a difference of almost seven

percentage points. In the other deciles, the highest frequency lies near the diagonal, with lower maximum frequency values and the wives occupying higher income ranks. It is important to clarify that this does not mean the woman is earning more than the husband in absolute terms, only that she occupies a higher position in the income ranking of all married women in a double-earner couple than he does in the men's rank.

Table 3. Match between marginal income ranks of women and men, Brazil, 1995 and 2019 (%).

Men - 1995										
Women	1	2	3	4	5	6	7	8	9	10
1	31.17	21.13	13.59	15.52	7.71	6.02	4.08	3.65	2.19	2.37
2	28.99	25.3	19.2	15.85	13.2	8.52	6.24	5.41	3.22	2.93
3	17.87	17.86	18.41	18.2	12.75	13.37	7.77	4.75	4.1	1.62
4	3.94	6.7	6.14	5.57	5.54	5.01	1.92	2.41	2.41	1.31
5	7.34	13.84	13.94	12.74	16.96	10.03	9.02	7.53	5.93	2.43
6	3.94	5.95	14.56	11.99	15.42	17.13	13.76	11.48	7.02	5.23
7	3.19	5.06	6.58	11.35	11.47	16.46	13.96	15.13	7.46	8.84
8	1.6	2.23	4.3	4.93	9.99	13.37	16.93	13.89	17.41	9.53
9	1.54	1.49	2.15	3	4.5	7.18	20	18.35	22.38	20.98
10	0.43	0.45	1.14	0.86	2.47	2.92	6.33	17.4	27.87	44.77
	100	100	100	100	100	100	100	100	100	100
Men - 2019										
Women	1	2	3	4	5	6	7	8	9	10
1	33.42	15.72	9.92	10.23	7.32	5.96	4.5	3.58	2.9	1.84
2	40.77	24.24	18.52	15.8	13.23	11.25	9.5	6.81	4.87	1.41
3	3.05	17.67	8.16	5.31	6.58	5.29	5.31	3.7	3.38	2.71
4	5.79	17.13	12.27	14.9	9.99	9.86	6.12	5.99	4.48	1.63
5	5.72	9.38	28.24	19.17	16.43	18.71	14.61	11.39	7.99	4.12
6	2.52	4.08	5.31	15.16	9.88	8.85	7.33	6.46	4.26	1.74
7	3.52	4.58	6.17	7.51	19.21	10.41	13.95	13.68	10.54	6.78
8	2.63	3.99	5.98	6.61	9	19.1	23.71	17.26	17.3	12.37
9	1.92	2.13	4.1	3.5	5.94	8.02	9.45	22.37	26.95	20.56
10	0.67	1.09	1.33	1.81	2.43	2.56	5.51	8.75	17.34	46.83
	100	100	100	100	100	100	100	100	100	100

Notes: Deciles are ranked from the lowest, 1st, to the highest, 10th. In bold are those with the same rank as their partner.

Source: Authors' calculation using PNAD and PNADc.

There appears to be an asymmetry in the partners' income association by gender. Men more frequently match with a woman in a "distant" income decile, i.e., they form couples with more diverse ranked women. That diversity, however, happens more frequently in the top, or right, triangle of the contingency table, where are the cases of the husband outranks the women. From the female perspective, there is less frequency of matching with lower ranked men, or, in other words, they are less prone to matching in greater inferior distances.[4]

Some changes can be identified between the years of analyses. The first one is a bigger frequency spread, indicating less concentration. Also, apart from the extremity income deciles, the middle deciles (5,6,7) previously had the highest frequency of rank matches by decile. Also, in 1995, the decile rank homogamy was more frequent in the top decile, 44.7 %, than at the bottom, 31.2 %. Finally, the asymmetry in the association of partners' income by gender, where it is more common for a man to partner with a woman from a distant decile than a woman, especially in situations favoring women's income, was also present in this first year of analysis.

Overall, these results suggest greater diversity in pairing in the middle of the distribution, with the top being more uniform than the bottom. The match probability of a man in the last decile with a woman who outranks him is increasing. There is also a tendency for less homogeneity in unions from the men's point of view but not from the women's, a result similar to what Yonzan (2020) found for the United States.

Rank association curves

Figures 3 and 4 illustrate the rank association structure of wives and husbands as a function of their respective spouses' ranks for 1995 and 2019. Figure 3 includes all couples, while Figure 4 considers only couples with dual incomes. The y-axis shows the woman's rank in a global sense in charts B and D (man's rank in A and C), i.e., her (his) position in

4 This behavior is also part of the reason for the biggest frequencies in the middle of the rank distribution to be in the women outranking the husbands. It is a feature that comes from the ranking methodology.

the distribution of all female (male) spouses employed in that year. The curves represent the local rank position; each curve is a decile.

An example of interpretation can be useful for a clear understanding of these curves. On the graphic that shows the women's rank association as a function of male's rank for 2019 (D), the curve labeled 4 takes men that are locally at the fourth decile of men's earning distribution for a specific woman's rank. Looking at a woman with a women's rank of 90 (on the x-axis), we know that his spouse is locally in decile 75, i.e., has a rank of 75 among the subset of spouses married to women ranked around 90. The wife who is locally at decile 9 (earning more than 90 % of other women also married with man at 40 %) is globally around the decile 80.

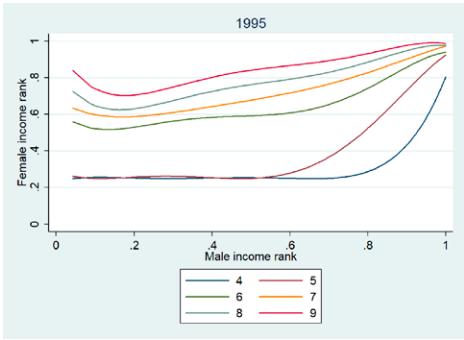
Also, it is important to clarify that the rank of women at the bottom 30 % (deciles 1 to 3) for 1995 and 1 and 2 for 2019 are not correlated with their husband's rank, as they are out of the labor market and have zero earnings. This lack of income is also why there is a lack of observation points in Figures 3B and D since the poorest women married to men in all deciles have zero income.

The slope of the curves can assess the association between earnings: locally positive slopes indicate a local positive earnings association, flat curves suggest no correlation, and negative slopes signify a local negative earnings association (Grossbard et al., 2022).

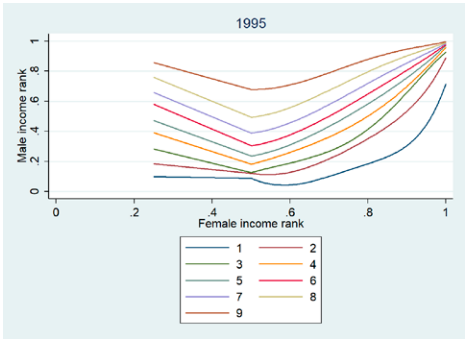
The curves show high levels of non-linearity in spouses' income association in both periods. A slope analysis shows that for wealthier men, there is a positive association between spouses' earnings, while for the poorest ones, the association is negative (Figure 3A and C). This sorting is more pronounced for men with high local earnings rank, with the biggest negative correlation. In the other extremity, the lower the local rank position, the bigger the positive correlation (decile 3 is the steepest slope). This positive association characterizes all couples with rich women but is least pronounced for rich women married to the wealthiest men (e.g., men in decile 9). The curves were flatter in 1995, indicating that the association between incomes increased.

Figure 3. Rank association curves of spouses' income, including spouses with zero income, Brazil, 1995 and 2019.

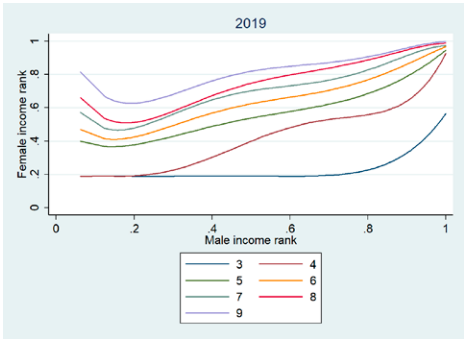
A. By male rank, 1995



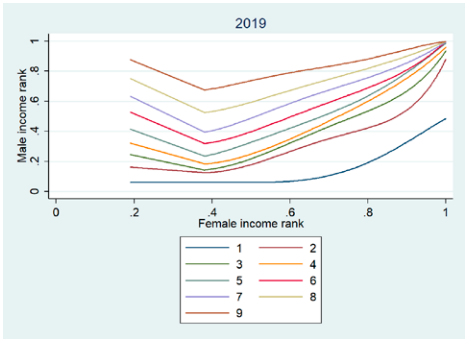
B. By female rank, 1995



C. By male rank, 2019



D. By female rank, 2019



Source: Authors' calculation using PNAD and PNADc.

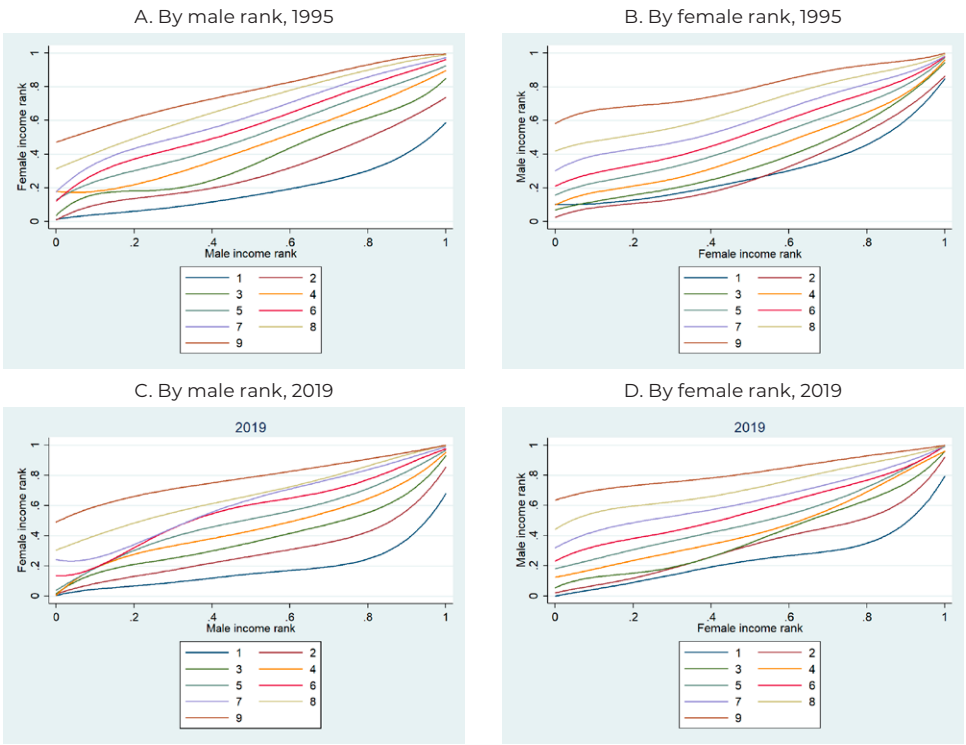
A similar analysis can be conducted by changing the axis, as in Figures 3B and D, which use female rank as the starting point on the horizontal axis. The slope analysis shows a similar pattern to the male case, with a positive association between spouses' earnings for wealthier women and a negative association for the poorest women. A positive association characterizes all couples with high-income men but is least pronounced for rich men married to the wealthiest women (e.g., women in decile 9). In contrast, for poor men, especially those in the bottom 20 % of the distribution, the slopes of the rank association curves are negative, indicating negative sorting. In this case, there is little change between the years, with the main difference being the lower inflection point on the income distribution in the last year: those in the bottom 50 % in 1995 and 40 % in 2019 of the distribution had negative sorting of their spouse's income rank.

This discontinuity pattern among the poorest individuals is in line with those found in the previous sections (Figure 3, for example). When both spouses are less educated, the need for income is confronted with low earnings expectations and low opportunity costs, as well as the costs associated with outsourcing care and household work. These act as opposing forces on the probability of employment (Klesment & van Bavel, 2017). The opportunity cost effect usually predominates for women, while the income effect prevails for men (England, 2010). England states, "There is no monotonic relationship between a partner's earnings and a woman's employment; at top levels of his income, her employment is deterred. However, women whose male partners are at middle-income levels are more likely to be employed than women whose partners have very low or no earnings, the opposite of what the 'need for income' principle suggests" (England, 2010, p. 153). In a recent work investigating the Brazilian case, Machado and Ribeiro (2021) also found the employment levels for partnered women to have a non-linear association across the husbands' earnings distributions.

Notably, there are significant differences in the association curves when considering only couples with dual positive incomes (Figure 4) as opposed to all couples from the sample. Firstly, no negative association is found when considering double-earner couples. It appears that the previous negative association was related to the income effect of pooling income from a partnership, which could lead to an exit from the labor market. However, more pronounced income associations still exist at the extremes of the distributions, but in this case, it only represents a positive income association. Finally, there is less change in this subset of couples over the analyzed period.

Additionally, it is important to highlight that the lower the local rank of both men and women in the wealthiest part of the distribution, the steeper the curve and the greater the positive correlation. The behavior on the poorest side of the distribution is less clear, with some local curves almost indistinct from others. Spouses at the highest local rank curve, i.e., men or women locally at the highest decile of earning distribution for a specific spouse's decile ran, present almost constant earnings association, regardless of their partner's global income position.

Figure 4. Rank association curves of spouses' income, including only spouses with positive income, Brazil, 1995 and 2019.



Source: Authors' calculation using PNAD and PNADc.

An increase in the positive income sorting among partners is more clearly found in the analyzed period, also documented by Schwartz (2010), Gonalons-Pons and Schwartz (2017), and Eika et al. (2019), when couples including a zero-income spouse are considered. In that case, an important negative association of income is also observed, particularly when one of the partners has a low rank. In that case, as also found in the U.S. by Grossbard et al. (2022), the negative association happens independently of the spouse's gender with a high or low earning rank, whether the husband or the wife. These authors point out that this means that "while specialization within the household [...] is still present in some families, it has become gender neutral, almost completely overriding the traditional family model of the male breadwinner [...]" (Grossbard et al. 2022, p. 622).

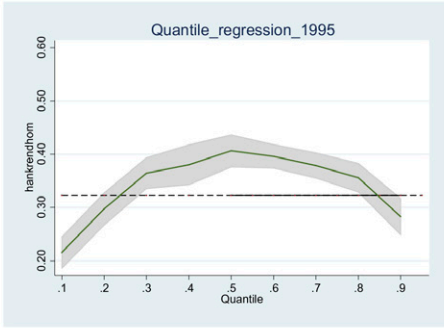
Quantile regressions of the spouses` income-based rank

Some characteristics of the couples are influential in the spouse's income association. For example, age and educational assortative mating are well documented in the literature as impacting the labor market offer and results (Eika et al., 2019; Greenwood et al., 2014). To isolate this influence in the relative income of partners and maintain a non-linear approach, a quintile regression of women's income rank is applied. In addition to the husband's income rank, the woman's age, the age gap between partners, her schooling, and the schooling gap are used as covariates. Figure 5 presents a plot of the obtained coefficients for the influence of the husband's income rank on the wife.

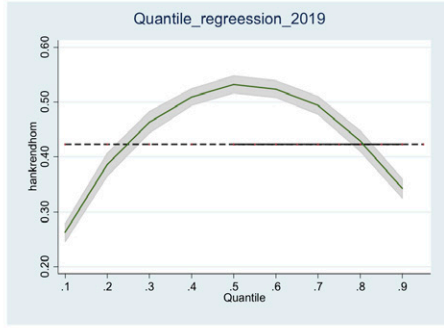
First, the association between women's and men's rank position is statistically significant and positive in all the deciles estimated. This finding corroborates the ones from the other methods, stating a positive association among partners' income. Also, it has a very distinct U-inverted shape along the income distribution. In both years, until the fifth decile, the higher the husband's income ranks, the higher the association, and, from that point on, the association remains positive but with a smaller coefficient. However, this U-inverted is not symmetrical, and in both years, the association is weaker at the beginning of the distribution, i.e., for the poorest women, the association is weaker than the association on the richest women side of the distribution. Approximately between the 25th percentile and the 80th, the association is above average, reaching a maximum in the fifth decile. The results found for 1995 and 2019 are very similar in shape, with a slight increase in the coefficients in the latter year, indicating a greater relative income association at all income levels.

Table 4 presents the results for selected quintiles of the regressions. The age gap has a negative impact on women's income rank. While the effect is not large, it is statistically significant and consistent across all deciles in 2019 and more pronounced for the first half of the distribution in 1995. Each additional year that the husband is older than the wife has a negative impact on her income. This effect, however, seems to have decreased from one year to the other. The woman's age also positively affects income in terms of the human capital theory (except for the first quintile of 1995).

Figure 5. Quantile regression coefficients of the husband's income rank on the wife's income rank, Brazil, 1995 and 2019.



[5a]



[5b]

Source: Authors' calculation using PNAD and PNADc.

Table 4. Quantile regression coefficient of the female income rank, Brazil, 1995 and 1995.

	1995			2019		
	q10	q50	q90	q10	q50	q90
Rank men	0.190 ***	0.431 ***	0.327 ***	0.262 ***	0.533 ***	0.342 ***
Age gr 7	-0.007	0.008	0.005	0.020 **	0.018 ***	0.019 ***
Age gr 8	0.003	0.026 **	0.016 *	0.032 ***	0.026 ***	0.035 ***
Age gr 9	0.015 **	0.030 **	0.018	0.030 ***	0.034 ***	0.044 ***
Age gr 10	-0.001	0.038 ***	0.037 ***	0.046 ***	0.053 ***	0.059 ***
Age gr 11	-0.028 *	0.030 *	0.038 **	0.033 **	0.049 ***	0.067 ***
Age diff.	-0.002 *	-0.002 ***	-0.002 ***	-0.001 **	-0.001 **	-0.001 ***
Educ. gr 2	0.029 ***	0.067 ***	0.086 ***	0.011	0.050 ***	0.070 **
Educ. gr 3	0.047 ***	0.140 ***	0.181 ***	0.027 ***	0.081 ***	0.122 ***
Educ. gr 4	0.149 ***	0.275 ***	0.231 ***	0.063 ***	0.163 ***	0.210 ***
Educ. gr 5	0.482 ***	0.406 ***	0.276 ***	0.287 ***	0.371 ***	0.321 ***
Educ. diff.	0.002 **	0.003 ***	0.001	0.003 ***	0.002 ***	0.001
Const.	0.004	0.105 ***	0.415 ***	-0.061 ***	0.022 **	0.337

Source: Authors' calculation using PNAD and PNADc.

Overall, the educational gap positively correlates with women's income rank position. In 1995, the first and the intermediate deciles were significant, indicating that women in couples formed by men with more

education are in higher income ranks, all else staying the same. In 2019, this pattern changed, and a positive and significant association was only found in the first half of the income distribution. That change can be linked to the changes in educational assortative mating documented in the country (Hakak & Firpo, 2017; Ribeiro & Silva, 2009). Despite an overall decrease in educational assortative mating in Brazil has decreased in the period, the assortative mating in Brazil between higher educated couples increased (Hakak & Firpo, 2017).

The relationship between the individual's education and rank position is positively linear at almost every educational level, except for college-educated women. For this group, education has a growing impact on wages until the third decile, after which the effect starts to decline.

Concluding remarks

This paper investigates Brazil's changes between 1995 and 2019 in the spouses' earnings association and the resulting asymmetries in partners' wage-gap distribution. Its contributions to the existing research agenda on gender inequality among partners are twofold: first, by assessing changes in gender patterns in spouses' earnings associations, and second, by extending this analysis to different points along the income distribution. These are especially important in identifying the constraints in the path of gender inequality.

Over the last three decades, there has been a significant rise in cases of equal earnings among spouses. Furthermore, the relative income gap mode got closer to this point of equality. Both movements represent progress toward income equality regarding partners' relative income. However, this change is still more related to reducing the income gap in favor of men, with few changes observed in the frequency of women outearning their partners. It is expected in the following stages towards gender equality that not only will the gender wage gap decrease but also an increase in the arrangements that have women as the biggest household earners.

Changes are going toward equality, but with a limit; women are still supposed to earn less than their male partners. Bertrand et al. (2015, p. 574) state that "women are bringing personal glass ceilings from home to the

workplace". That can be understood in the context of the gender role beliefs about how people understand how "men" or "women" are supposed to behave, such as "a man should earn more than his wife" (Bertrand et al., 2015; Klesment & Van Bavel, 2017). This limiting behavior is only not identified among the men in the poorest decile of income, who earn less in the median than their wives. In that case, the need to obtain basic resources overlaps gender and societal norms that prevent a husband from earning less than his wife.

There appears to be an asymmetry in the partners' income association by gender. Men more frequently form couples with women in different income deciles, particularly when men are the primary earners. In contrast, women tend to marry closer to their income level. Couples at the upper and lower extremes of the income distribution present several differences in relative income behavior. On the mobility income through marriage, for example, the first decile is the only one where the immobility rate is bigger for women (63 %) than men (55 %), and the upward mobility through marriage is more frequent for the poorest man than for the poorest women in 2019. Overall, these results point to greater diversity in the pairing in the middle of the distribution, and, considering the extremes, the top is more uniform than the bottom.

The rank association curves show non-linear patterns in both years, 1995 and 2019, with minor changes over this period. When all couples are considered, including the single-earnings, there is a positive and negative association in both years, the positive being more common among the highest-income spouses and the negative among the poorest. Also, the poorest, the other extreme of the income distribution, presents a more gender-neutral pattern of relative income. Considering only double-positive income couples, more pronounced associations are still present at the extremes of the distributions, but now they represent only positive associations of income.

In conclusion, our findings suggest that while relationships are moving towards greater equality in reducing the wage gap, a limit remains: women are still expected to earn less than their partners. The norm of the man as the household's primary breadwinner limits the equalizing change in the families, sometimes by shaping the labor offer of women. This pattern is one of the constitutes of the country's gender revolution,

indicating that it also can be described as uneven and stalled, with intrinsic limits to gender equality.

Examining these results through the lens of income inequality is also crucial. In Brazil, the partnering of couples has generally contributed to increasing household income inequality in recent decades (Hakak & Firpo, 2017). However, as shown by Machado and Ribeiro (2021), this overall trend is driven by the unequalizing effect of wives' employment patterns and the rise in dual-earner couples. Despite this, the income association within two-earner households tends to reduce inequality.

As a future development of this work, more characteristics of the partner's family should be considered, especially related to parenthood and fertility. They are believed to play a big role in shaping couples' division of employment and earnings. In that sense, politics that alleviate the burden of care on families, especially on women, who usually bear the most of it, can help reduce the income gap between partners. Another future development is the implementation of simulation exercises that compare a theoretical random pattern of income association with the existent one. That can be useful to isolate statistical and numerical limitations and determinations from the social and demographic patterns.

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