Raising the Retirement Age for Women
Spillover Effects on Young Adults' Labor Supply in Brazil

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Abstract

Latin America is facing rapid population aging. To address the sustainability of contributory pension systems, many countries are considering increasing the retirement age. One such case is Brazil, where a pension reform in 2019 raised the retirement age from 60 to 62 for women. While the effects of such reforms on the labor force participation of older adults and their spouses have been widely analyzed, intergenerational spillover effects remain understudied, particularly in Latin America. Evidence from other contexts suggests that a mother's retirement can increase her young daughters' labor supply, particularly among households with young children. However, most of this evidence comes from European countries with broader access to formal sources of childcare. In this paper, I estimate the effect of grandmother's retirement on the labor force participation of young adults in Brazil. Using data from Brazil's Continuous National Household Sample Survey (PNADC) from 2023 and a fuzzy regression discontinuity design, I find that older women substantially reduce their working hours upon retirement. Moreover, adult women living with young children and an older woman who retires upon reaching the minimum retirement age increase their working hours by 0.5 for every hour the older woman stops working. No significant effects are observed for men, even when young children are present in the household. These findings suggest that, in contexts with limited access to formal childcare, grandmothers play a crucial role in supporting their daughters' labor supply, particularly when young children are involved.

Key words: retirement, retirement age, spillover effects, informal childcare, labor supply, labor force participation.

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1. Introduction

The age distribution in the global population has profoundly changed. In Latin America and the Caribbean, the proportion of older adults is expected to increase from approximately 10% in 2024 to 20% by 2054, effectively doubling in just 30 years (ECLAC, 2024). This accelerating demographic transition raises urgent concerns about financing the consumption and healthcare needs of aging populations. In response, many scholars and policymakers have emphasized the need for reforms that encourage and enable individuals to remain in the workforce beyond the early retirement age and, if possible, extend their working lives even further (Dubois et al., 2016).

In order to address the fiscal implications of population aging, several countries have implemented policy reforms aimed at reducing future public spending (Arza, 2017). A common measure involves raising the retirement age. While extensive research has examined the effects of such policies on labor supply among older adults and their spouses, much less attention has been paid to potential intergenerational spillover effects. In particular, understanding the implications for young parents is crucial. A growing body of literature highlights the role of grandparents as providers of informal childcare, a factor that has significantly influenced the participation of young parents, particularly mothers, in the labor market (Bratti et al., 2018; Del Boca et al., 2005; García-Morán and Kuehn, 2017; Zamarro, 2020).

Brazil is one of the countries facing important fiscal pressures because of the rapid population aging and declining labor force participation rates (Queiroz and Souza, 2017). The elevated number of beneficiaries and fiscal pressures stemming from the contributory pension system known as the General Social Security Regime (Regime Geral de Previdência Social, RGPS) were the main reasons behind the 2019 pension reform (Reforma da Previdência). This reform made eligibility rules more strict and gradually raised the minimum retirement age for women from 60 in 2019 to 62 by 2023, with increments of six months per year (Presidência da República, 2019; Zviniene and Tsukada, 2023).

In this paper, I examine the spillover effects of the retirement age increase in Brazil on the labor force participation of young adults. Unlike previous studies, I focus on a reform that increased the retirement age in a context where multigenerational households are still prevalent and formal childcare options are limited. To identify the effects, I exploit exogenous variation from Brazil's 2019 pension reform. Using data from the 2023 wave of the Continuous National Household Sample Survey (PNADC), I estimate the spillover effects of grandmother's retirement on the labor force participation of young

adults employing a fuzzy regression discontinuity design (RDD), with age as the running variable, and Difference-in-Discontinuities (DiDc).

2. Prior Findings

Although several studies investigate the effect of grandparents' childcare on young adults' labor supply (particularly among mothers with young children), only a few exploit changes in the statutory retirement age (SRA). This approach is preferred to others since, in the absence of an exogenous reform, assessing the effect of grandparental childcare would be challenging due to unobserved preferences. One of these studies is the one by Aparicio-Fenoll and Vidal-Fernandez (2015), which focuses on changes in the SRA in Italy to explore the relationship between mothers' and daughters' labor force participation and fertility choices. The authors find that grandmothers who remain in the labor force provide less childcare, while their daughters are more likely to have children and less likely to participate in the labor force.

Another relevant paper is by Bratti et al. (2018), who exploits a pension reform in Italy to study the role of grandparental childcare availability on the labor force participation of women with children under 15. He finds that only mothers whose own mothers are retirement eligible have an 11% higher probability of being in the labor force. In contrast, the retirement of maternal grandfathers and paternal grandparents has no effect on women's labor force participation. Furthermore, Kaufmann et al. (2022) provides evidence from the Netherlands. They investigated the impact of the 2006 Dutch pension reform, which made early retirement less attractive, on family members' labor supply. Their findings indicate that increases in grandmothers' working hours led to a reduction in the labor supply of adult daughters with young children. These results contrast with those of Ilciukas (2023), who exploits the same reform and shows that, while it reduced fertility in the subsequent generation by 1.4%, there were no effects on female labor market outcomes. He attributes this to the availability of extended sources of formal childcare in the Netherlands.

Lastly, Pinto (2023) offers evidence from a middle-income country, Argentina, by exploiting an exogenous pension reform that relaxed eligibility requirements and effectively lowered the retirement age for women. Her results indicate that mothers of young children living with a retirement-eligible woman are more likely to participate in the labor

market and to be employed. She suggests that the availability of grandmothers for informal childcare is the key mechanism driving these labor market participation effects, as retirement provides them with more time to care for their grandchildren.

3. Institutional Setting

The pension system in Brazil consists of three main segments: the Regime Geral de Previdência Social (RGPS), for private sector workers, the Regime Próprio de Previdência Social (RPPS) for public servants, and private pension funds (Queiroz and Alves, 2021). Moreover, the RGPS includes a sizeable non-contributory system with eligibility determined by the level of income (means-tested), which provides benefits to the low-income population. The RGPS operates under a pay-as-you-go system, implying an implicit social contract between different generations, as retirement benefits are financed by contributions from current workers.

Brazil's general pension system (RGPS) was initially conceived in a context where rapid population growth and low life expectancy allowed for the sustainability of the different schemes. Until 2019, Brazil was one of the few countries in Latin America without a strict minimum retirement age. After 15 years of contribution to the RGPS, individuals could retire at age 65 for men and 60 for women. However, with 35 years of contribution for men and 30 years for women, individuals were eligible to retire regardless of age. The popularity of this pathway, combined with population aging, led public pension expenditure to increase from 4.6% of GDP in 1980 to nearly 12% in 2010 (Queiroz and Bueno, 2011). To address the sustainability of the RGPS, the Presidency enacted the Emenda Constitucional No. 103 in 2019, known as the Reforma da Previdência.

Through this pension reform, more restrictive retirement rules were introduced. The minimum retirement age for women was raised by 2 years, with 6-month increments each year until the new age was fully implemented in 2023 (Table 1). The 2019 reform also linked the two eligibility requirements, age and years of contribution, and eliminated the pathway that allowed retirement based solely on years of contribution. Moreover, the minimum contribution period required for eligibility was increased to 20 years for men, while it remained at 15 years for women. Regarding the calculation of pension benefits, before the reform pensions amounted to 60% of the average of contributions made during the 36 months prior to retirement, with an additional 2% for each year beyond the minimum of 15. After the reform, the reference salary was redefined as the average of all contributions made by the worker to the system (Presidência da República,

2019; Queiroz and Alves, 2021). Overall, these changes sought to increase contributions and reduce the generosity of pension benefits in the RGPS.

Table 1: Minimum retirement age for women in Brazil by year

Year	Minimum retirement age	Date of policy change
2019 and before	No strict minimum age	-
2020	60 + 6 months	01/01/2020
2021	61	01/01/2021
2022	61 + 6 months	01/01/2022
2023	62	01/01/2023

Source: Emenda Constitucional 103.

4. Data and Variables

4.1. Data

In this study, I use data from the 2023 wave of Brazil's Continuous National Household Sample Survey (PNADC), conducted by the Brazilian Institute of Geography and Statistics (IBGE). The year 2023 is selected because it marks the first full implementation of the new minimum retirement age for women, providing a valuable context for analyzing the impacts of the pension reform (Zviniene and Tsukada, 2023). The PNADC offers nationally representative data on a wide range of individual and household characteristics, income sources (including pensions), socioeconomic status, household composition, age, employment, and education, with approximately 211,000 households interviewed each quarter.

The survey is conducted quarterly using a rotating panel design, tracking households over five consecutive quarters (IBGE, 2018). The pension receipt question is asked only during the first and fifth visits to each household, which is why this analysis uses data from these two visits. It is important to note that each dataset contains observations from all four quarters. Therefore, the survey trimester is included as a control variable in all regression models. Figure A1 illustrates the PNADC's rotating panel design.

4.2. Analytical sample

For this analysis, I use data from visits 1 and 5 of the PNADC in 2023. The original pooled dataset contains a total of 760,843 observations. The sample is constructed as follows. First, I retain only individuals living in urban areas, since those in rural areas may exhibit significantly different labor force characteristics and can access a separate retirement scheme. Next, I exclude individuals without information on their exact date of birth, as this variable is crucial for the identification strategy. Public sector employees are also excluded from the analysis, given that they have access to a different retirement pathway. Although the PNADC does not directly identify housewives, I exclude all women over age 50 who did not work in the past week, are not looking for a job, and report being unable to work because they must take care of household chores, children, or another relative.

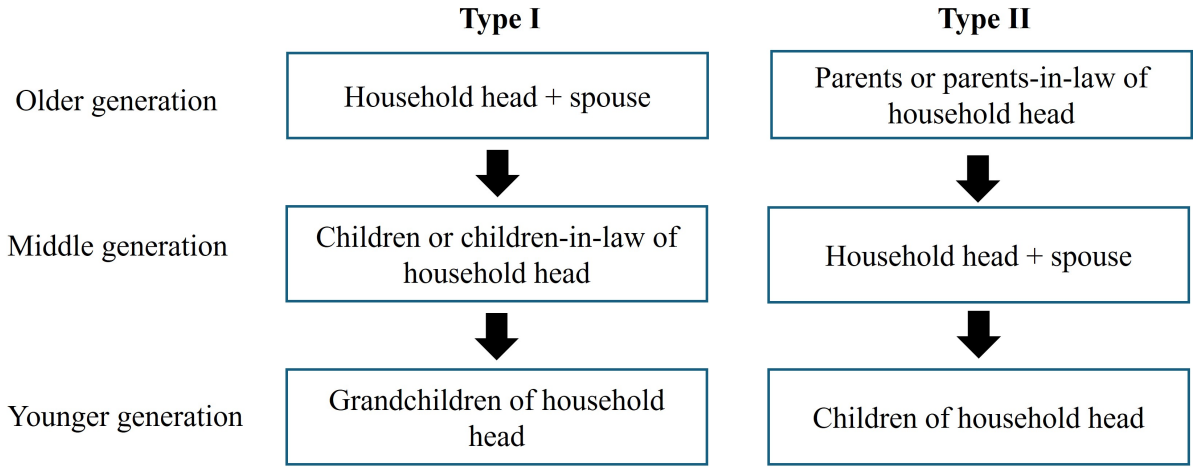
In the PNADC, each individual is assigned a value indicating their relationship to the household head. This variable is used to identify two types of families living in multi-generational households that can be included in the analysis. The first type consists of families in which the household head is an older adult living with a spouse or partner and at least one of their children.[2] This child may or may not have a partner and may have children of their own, recorded as the grandchildren of the household head. Since parenthood status cannot be directly established for families type 1, it is possible that a grandchild of the household head does not have a parent residing in the household; for example, the child's aunt or uncle may live there instead.

The second type of family is one in which the household head is a young adult who lives with their parents or parents-in-law, may have a partner, and may or may not have children. Figure 1 summarizes the characteristics of the selected family types. I exclude all households that do not fall into these two categories, as well as those with same-sex couples. I also omit other household members who may reside with either family type but are not relevant to the analysis, such as siblings of the household head or other relatives. Finally, I retain only households in which the oldest generation of women is aged between 57 and 67 and is either working without receiving a pension or not working and receiving a pension, while the middle generation is aged between 16 and 50 years old. When grandchildren are present, I construct a variable indicating whether they are young children (12 years or younger) or older.

[2] In households with more than one child of the household head, it is not possible to determine with certainty which child is the parent of the younger generation when grandchildren are also present. This represents a limitation of the study.

The sample selection process results in two working datasets: the first comprises 5,248 observations of older women living in eligible households; the second includes 6,958 young adults residing in households with an eligible woman. It is important to note that the variables required for the RDD are constructed at the individual level for the first sample and at the household level for the second one.

Figure 1: Selected family types



Own illustration

Table 2 and Table 3 present the summary statistics for the older women and young adults, respectively. For older women, Table 2 shows summary statistics by employment status and for the overall sample. Among the 2,013 employed older women, all report working in the week prior to the survey, with an average of 36 working hours. In contrast, retired women report no paid work in the week preceding the survey, with an average of 0 working hours. The employed group is younger than the retired group. Approximately half of the older women identify as white, and the average household size is 3.2. Regarding education, the majority of older women completed only preschool or primary education, around one third completed secondary school, and 21% attained higher education.

Table 3 shows summary statistic for young adults separated by the employment status of the older woman living in the household. The share of young adults working in a paid activity in the week prior to the survey is similar across both groups, with a slightly lower share among those living with a retired older woman. The same pattern holds for the total number of working hours. The overall sample has slightly more men than women, with an average age is 32. Almost half of the respondents identify as white, and the average household size is approximately 3.5. Concerning education, the majority of responds completed secondary school, with similar shares having completed preschool or

primary education and higher education. Finally, only 29% of respondents live with a child in the household, and only 22% have a young child (aged 12 or younger).

Table 2: Summary statistics for older women

	Employed	**Retired**	
Variable	N=2013	N=3235	**Overall**
Worked in paid activity	2,013 (100%)	0 (0%)	2,013 (38%)
Total number of working hours	36 (13)	0 (0)	14 (19)
Age	60.15 (2.42)	62.78 (2.76)	61.77 (2.93)
White	923 (46%)	1,436 (44%)	2,359 (45%)
Household size	3.27 (1.24)	3.22 (1.25)	3.24 (1.24)
Education level			
Preschool or Primary	909 (45%)	1,601 (50%)	2,510 (48%)
Secondary school	761 (38%)	898 (28%)	1,659 (32%)
Higher education	343 (17%)	735 (23%)	1,078 (21%)

Note: Mean (SD) for continuous variables; N (%) for categorical variables.

Table 3: Summary statistics for young adults

	Woman empl.	**Woman ret.**	
Variable	N=2706	N=4252	**Overall**
Worked in paid activity	1,807 (67%)	2,580 (61%)	4,387 (63%)
Working hours	27 (20)	24 (21)	25 (21)
Gender			
Female	1,235 (46%)	1,873 (44%)	3,108 (45%)
Male	1,471 (54%)	2,379 (56%)	3,850 (55%)
Age	30 (7)	33 (8)	32 (8)
White	1,210 (45%)	1,918 (45%)	3,128 (45%)
Household size	3.59 (1.44)	3.54 (1.46)	3.56 (1.45)
Education level			
Preschool or Primary	866 (32%)	1,361 (32%)	2,227 (32%)
Secondary school	1,170 (43%)	1,695 (40%)	2,865 (41%)
Higher education	670 (25%)	1,195 (28%)	1,865 (27%)
Lives with children	677 (25%)	1,361 (32%)	2,038 (29%)

Lives with young children	542 (20%)	993 (23%)	1,535 (22%)

Note: Mean (SD) for continuous variables; N (%) for categorical variables.

4.3. Retirement definition

In this paper, I define retirement as receiving a pension from Brazil's National Social Security Institute (INSS) and reporting no paid work in the week prior to the survey. The pension receipt definition is consistent with other studies analyzing retirement in Brazil using the PNADC (Queiroz and Souza, 2017). However, a limitation of using pension receipt alone is that the PNADC does not distinguish old-age pensions from other types of pensions provided by the INSS. To address this limitation and define retirement as a strict exit from the labor market, I combine the pension receipt indicator with the criterion of reporting no paid work. Even with this definition, a key limitation remains: Brazil faces a relatively high degree of labor informality, at around 42% of the labor force by 2016. This informal labor force includes not only workers in the informal sector, but also employees in formal enterprises whose employers are not in compliance with labor laws, as well as independent workers who do not make compulsory contributions to the RGPS. As a result, less than 50% of the labor force is covered by the contributory pension scheme (Figliuoli et al., 2018).

4.4. Dependent variables

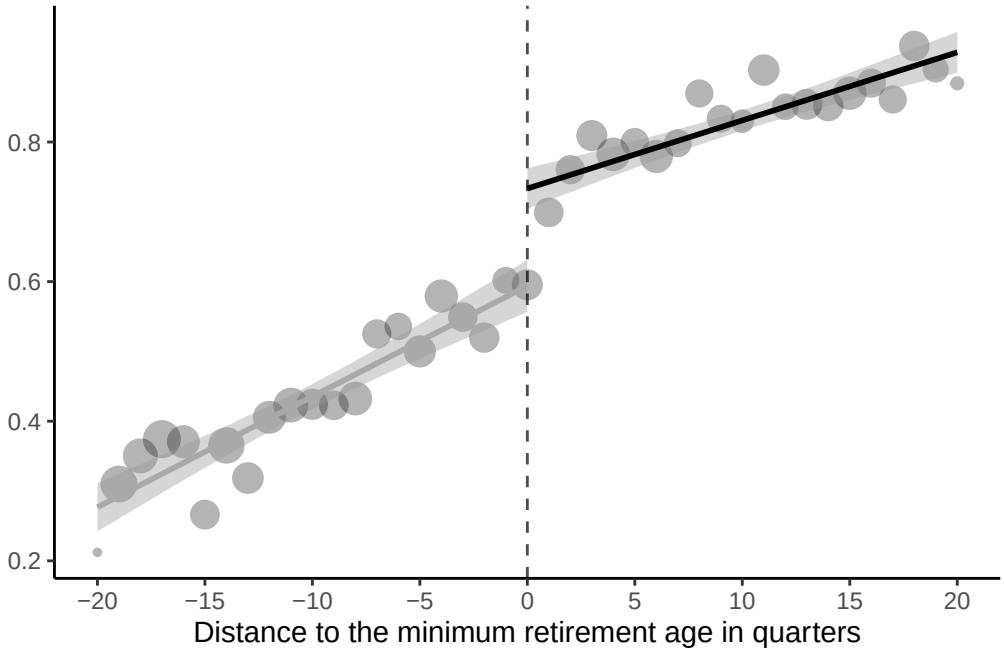
I focus on two dependent variables that capture different dimensions of labor force participation. The first is a binary indicator of whether the individual engaged in paid work during the week prior to the interview. The second measures the total number of hours worked in that week, coded as zero for individuals who reported no paid work.

5. Empirical Strategy

To estimate the Local Average Treatment Effect (LATE) of grandmother's retirement on young adults' labor supply, a fuzzy regression discontinuity design is utilized. As shown in Figure 2, the discontinuous increase in the probability of retirement at the statutory eligibility threshold (62 years for women) is approximately 14%, rather than

100%. This partial compliance is attributable to the high level of informality in Brazil's labor market, which limits access to social security benefits for many workers. Moreover, workers older than the statutory retirement age select themselves into retirement, with a significant fraction potentially continuing to work past the retirement age. For these reasons, estimating the effect of grandmother's retirement on young adult's labor supply using a sharp RDD would not be appropriate. Instead, the eligibility threshold is used as an instrumental variable (IV) for retirement. This instrument is used in the first stage of a two-stage least squares (2SLS) estimation. In the second stage, different measures of young adults' labor supply serve as the dependent variables. Because the eligibility threshold is exogenously determined, the instrument is both relevant and orthogonal, allowing the identification of a causal effect.

Figure 2: Probability of retirement for older women



Notes: 1/. The dots represent average values of the outcome, retirement, within small population bins determined by birth trimester. 2/. The lines show linear regression fits on each side of the eligibility threshold. 3/. The plots include observations within a bandwidth of five years before and after reaching the statutory retirement age. 4/. Observations to the right side of the cutoff line are eligible for retirement.
Source: PNADC 2023.

The estimation equations for the fuzzy RDD are the following:

$$P_i = \alpha + \beta D_i + \gamma D_i(Z_i - Z_0) + \theta(Z_i - Z_0) + \epsilon_i \tag{1}$$

$$Y_i = \mu + \lambda \hat{P}_i + \delta X_i + \gamma D_i(Z_i - Z_0) + \theta(Z_i - Z_0) + \eta_i \quad (2)$$

Equation 1 represents the first-stage of the LATE estimation. P_i is a dummy variable which takes the value of 1 if the ollder woman is retired and 0 otherwise. The running variable Z_i denotes the age in days, while the cutoff Z_0 is set to the statutory retirement age in days specific to the survey year (62 years). Therefore, the term $Z_i - Z_0$ represents the age in days centered around the cutoff. The variable D_i is a binary indicator which takes the value of 1 if the individual is eligible for retirement ($Z_i - Z_0 >= 0$), and 0 otherwise.

Equation 2 uses the results from the first-stage to estimate the LATE of grandmother's retirement on young adults' labor supply. The term Y_i represents the two main outcome variables: whether the individual is currently engaged in paid work and the total number of hours worked. The vector X_i includes individual-level sociodemographic control variables: gender, education level, ethnicity, and age; as well as trimester fixed-effects.

6. Results

6.1. Descriptive findings

Section in progress.

6.2. Preliminary results: Fuzzy RDD

In order to analyze the impact of older women's retirement on the labor force participation of young adults, it is important to verify whether older women actually reduce their labor supply upon reaching the minimum retirement age. Table 4 presents the impact of retirement on the labor outcomes of older women in the sample. In these initial regression discontinuity estimations, I consider only linear models with different slopes. The first column shows the jump in the probability of retirement upon reaching the corresponding SRA. The first stage indicates a 14% increase in the probability of being retired for women who are older than the SRA. Although this jump is relatively modest, likely due to the high degree of labor informality in Brazil, it is highly significant.

The second column indicates the decrease in the proportion of women engaged in paid work during the week prior to the survey upon reaching the SRA. This is a reduced-form estimate, since it does not distinguish whether individuals actually transitioned to retirement after becoming eligible; hence, it represents the intent-to-treat (ITT) effects. The results suggest that the proportion of older women reporting paid work decreases by an average of 0.14 upon reaching the SRA. This coefficient is statistically significant. The next column presents the results of the two-stage least squares (2SLS) model, in which the eligibility indicator serves as an instrumental variable (IV) for the first stage, and the predicted values from the initial estimation are used in the second stage. In this context, the estimates represent the local average treatment effect (LATE) for the subset of women who retired after reaching the SRA. In column 3, being older than the SRA and transitioning to retirement leads to an average decrease of 1 in the proportion of women reporting work in the previous week. Therefore, all women report not working. Regarding the total number of working hours, the sharp estimate shows a significant reduction of 5.1 hours, while the fuzzy coefficient indicates that women who retired reduced their working hours by 37, nearly a full-time workweek of 40 hours. All effects are statistically significant.

Table 4: Impact of retirement on labor supply of older women

	First stage	**Worked in paid activity**		**Working hours**	
Variable	Retired	Sharp	Fuzzy	Sharp	Fuzzy
Eligible	0.14***	-0.14***		-5.4***	
Retirement (IV)			-1.0***		-37***
Observations	5,247	5,247	5,247	5,247	5,247

Notes: 1/. Regression discontinuity estimates were constructed using linear regressions with different slopes. 2/. Sharp estimates represent intent-to-treat effects of retirement for women older than the SRA; while fuzzy estimates represent the local average treatment effects for the subset of compliers (women who reach the SRA and retire). 3/. All estimations control for ethnicity, household size, and education level. 4/. All estimations consider the default bandwidth of 5 years to the left and right sides of the cutoff. *p<0.1; **p<0.05; ***p<0.01.

Table 5 reports the impact of older women's retirement on the labor supply of young adults for the overall sample. The first column presents the first stage for young adults, where the eligibility variable indicates whether the older woman living in the household is eligible for retirement (older than 62). For this reason, the treatment is assigned at

the household level. The coefficient shows a 0.17 increase in the share of adults living with an older woman who retired upon reaching the minimum age. This estimate is highly significant. The sharp specifications, or ITT estimates, for both outcome variables suggest that living in a household with an older woman eligible for retirement reduces both the share of individuals engaged in paid work (-0.01) and the total number of hours worked (-0.63). However, both estimates are small in magnitude and not significant. The fuzzy specifications also show negative effects, which are slightly larger in size, but also not significant.

Table 5: Impact of older women's retirement on labor supply of young adults

	First stage	**Sharp**		**Fuzzy**	
Variable	Retired	P. activity	Hours	P. activity	Hours
Woman eligible	0.17***	-0.01	-0.63		
Woman retired				-0.04	-3.6
Observations	6,957	6,957	6,957	6,957	6,957

Notes: 1/. Regression discontinuity estimates were constructed using linear regressions with different slopes. 2/. Fuzzy estimates represent the local average treatment effects for the subset of compliers (adults living in households where women who reach the SRA retire). 3/. All estimations control for ethnicity, household size, education level, age, and gender. 4/. Fuzzy estimates use clusterized standard errors at the household level. 5/. All estimations consider the default bandwidth of 5 years to the left and right sides of the cutoff. *p<0.1; **p<0.05; ***p<0.01.

Based on prior research on the relationship between grandmother's retirement and young adults' labor force participation, a key moderator of this relationship is the parenthood status and gender of the individual. In the PNADC, parenthood status is not directly observed, but the number and ages of children residing in the household are available. Therefore, a categorical variable is created indicating the presence and age of children living in the multigenerational household: no children, children older than 12, and children 12 or younger. Table 6 and Table 7 present ITT and LATE estimates for women and men, respectively, including an interaction term between the treatment indicator and the categorical variable.

For women, the first two columns depict the results of the sharp specifications. Living with an older woman who is eligible for retirement does not have a statistically significant effect on either the share of adult women engaged in paid work or their total number of

working hours. However, when the treatment indicator is interacted with the categorical variable representing the presence and age of children in the household, adult women living with an eligible older woman in a household with children younger than 12 exhibit a positive impact on their labor force participation. Specifically, the share of women engaged in paid work increases by 0.14 in the reduced-form estimates relative to the reference category (younger women living with no children and an eligible older woman). Moreover, the number of working hours increases by 5.7 compared to the reference category. Notably, these effect sizes are practically identical to the reduced-form estimates for the sample of older women.

Table 6: Impact of older women's retirement on labor supply of adult women

	Sharp		**Fuzzy**	
Variable	P. activity	Hours	P. activity	Hours
Woman eligible	-0.05	-1.2		
Eligible X Children				
Woman eligible * Children (>12 years)	-0.05	-1.4		
Woman eligible * Children (<12 years)	0.14**	5.7**		
Woman retired			-0.25	-5.8
Retired X Children(>12)			-0.27	-7.1
Retired X Children(<12)			0.55**	21**
Observations	3,107	3,107	3,107	3,107

Notes: 1/. Regression discontinuity estimates were constructed using linear regressions with different slopes. 2/. Fuzzy estimates represent the local average treatment effects for the subset of compliers (women living in households where older women who reach the SRA retire). 3/. All estimations control for ethnicity, household size, education level, and age. 4/. The reference category for the children variable is living with no children. 5/. Fuzzy estimates use clusterized standard errors at the household level. 6/. All estimations consider the default bandwidth of 5 years to the left and right sides of the cutoff. *p<0.1; **p<0.05; ***p<0.01.

The last two column show the fuzzy specifications. In these models, the share of young women engaged in paid work living with an older woman who retired upon reaching the minimum age and with children aged 12 or younger increases by 0.55 compared to the reference category. The number of working hours for this subgroup increases by 21. Relative to the LATE estimates for the sample of older women, these effects are roughly half as large. This suggests that, for every hour older women stop working, adult

women living with young children increase their working hours by approximately 0.5. It is important to mention that the group of women living with children aged 12 or older show no significant differences compared to the reference category in any of the models.

Table 7 replicates the analysis for the sample of adult men living with older women. In the sharp models, the eligibility indicator shows a negative effect on the labor force participation of adult men. Nevertheless, these effects are neither sizable nor significant. Regarding the interaction term between the treatment and the presence and age of children in the household, both groups of men living with children and an eligible older woman exhibit positive estimates relative to the reference category (men living with an older woman and no children). The working hours increase by 4.4 for men living with children aged 12 and older and an eligible older woman, and by 1.4 for men living with children aged 12 or younger. However, none of these effects are statistically significant. The fuzzy specifications display effects in the same direction, slightly larger in magnitude, but still not significant.

Table 7: Impact of older women's retirement on labor supply of adult men

	Sharp		**Fuzzy**	
Variable	P. activity	Hours	P. activity	Hours
Woman eligible	-0.02	-1.9		
Eligible X Children				
Woman eligible * Children (>12 years)	0.11	4.4		
Woman eligible * Children (<12 years)	0.03	1.4		
Woman retired			-0.09	-9.9
Retired X Children(>12)			0.53	19
Retired X Children(<12)			0.12	4.1
Observations	3,850	3,850	3,850	3,850

Notes: 1/. Regression discontinuity estimates were constructed using linear regressions with different slopes. 2/. Fuzzy estimates represent the local average treatment effects for the subset of compliers (women living in households where older women who reach the SRA retire). 3/. All estimations control for ethnicity, household size, education level, and age. 4/. The reference category for the children variable is living with no children. 5/. Fuzzy estimates use clusterized standard errors at the household level. 6/. All estimations consider the default bandwidth of 5 years to the left and right sides of the cutoff. *p<0.1; **p<0.05; ***p<0.01.

6.3. Difference-in-Discontinuities

Section in progress.

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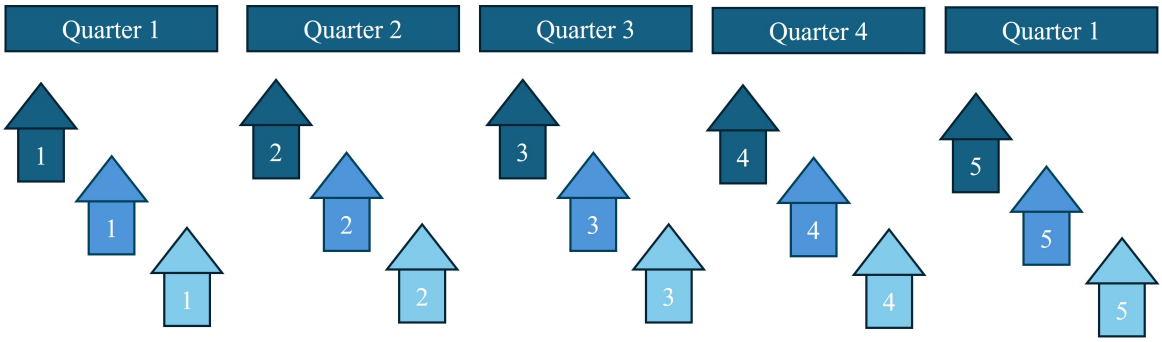
A. Appendix

Figure A1: PNADC Rotating Panel Design



Each household is visited five times, with an interval of two months between each visit. In other words, they are visited once per quarter.

After five visits, the household will be replaced with a new one.

Own illustration.