Labor Supply and Well-being among Older Adults: The Separate Effects of Pension Access and Statutory Retirement Age

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Motivation

- To maintain the sustainability of the social security system in an aging society, one way is to increase labor supply of older adults
- Important to understand how labor supply and well-being of the older population is affected by different factors
  - Financial incentives (liquidity effect)
  - Reference point
  - Employers' labor demand

$\rightarrow$ Singapore provides a unique setting to examine the effects of different policies related to retirement ages and pension access

Research Question

- How does pension access and the statutory retirement ages separately affect labor supply of older adults?
  - Minimum retirement age (MRA, age 62)
  - Pension payout eligibility age (PEA, age 64/65)
  - Maximum re-employment age (REA, age 65/67)
- What are the consequences for older individuals' income, savings, and consumption?

* Monthly panel data

Preview of Findings

- MRA: Reduction in labor supply (extensive margin), household income and savings, but little change of consumption
- PEA: Reduction in working hours (intensive margin), but little change of household income, savings, and consumption
- REA: Reduction in labor supply (both extensive and intensive margin), household income, and consumption
- Heterogenous effects (based on an individual's pension wealth):
  Low-wealth men respond to financial incentives;
  high-wealth men respond to the reference point and are most affected by demand-side barriers

**Our main analysis focuses on men only. Results for women are moderately different: Women reduce labor supply upon pension access, but not in response to the MRA and REA.*

Contribution

- Providing and extending the re-employment age is the most useful way to increase labor supply and is welfare-improving
- Labor supply of older men is more responsive to the retirement ages than pension access (while women are more responsive to pension access)
- Low-wealth people respond to liquidity effect, while high-wealth people respond to the reference point and are more negatively affected by demand-side barriers

Outline

Related Literature

- Mechanisms affecting the retirement timing
  - Pension access: Staubli and Sweimüller (2013), Geyer and Welteke (2019), Giesecke and Jäger (2021)
  - Reference point: Hairault et al. (2010), Behaghel and Blau (2012), Cribb et al. (2016), Lalive et al. (2020), Seibold (2021), Gruber et al. (2022), Reck and Seibold (2022)
  - Demand-side factors: Nuemark et al. (2019), Ameriks et al. (2020), Deshpande et al. (2021)
- Labor supply and well-being of older people: French (2005), Maestas (2010), Blundell et al. (2016ab), Clark and Newhouse (2021)
- Self-employment among older people: Abraham et al. (2019), Munell et al. (2021), Ramnath et al. (2021)

Pension Scheme and Retirement Policies in Singapore

- Central Provident Fund (CPF)
  - Mandatory savings account → Defined contribution scheme
  - Monthly pension payouts starting from the PEA
    For each year postponement, monthly payouts will increase by up to 7%. The latest age to start payouts is 70.

- Retirement and Re-employment Act
  - MRA: 1999–June 2022: 62; From July 2022: 63
    Companies cannot ask one to retire before this age.
  - REA: 2012–June 2017: 65; July 2017 –June 2022: 67; From July 2022: 68
    Employers must offer annually re-employment contracts to eligible employees who turn 62, up to the REA. If not, employers must offer a one-off compensation package to dismissed employees.

Unique Institutional Setting

1. Pension access and retirement ages in Singapore are separate.
2. Labor earnings are not affected by pension access.
   $\rightarrow$ No substitution effect from tax penalties.
3. Monthly pension payouts are actuarially fair.
   $\rightarrow$ No wealth effect.

How do pension access and the statutory retirement age affect labor supply and well-being?

- Reaching the MRA $\rightarrow$ Reference point + Employers' demand for labor
- Normal pension access at the PEA $\rightarrow$ Liquidity effect
- Reaching the REA $\rightarrow$ Reference point + Employers' demand for labor
  – In our fielded questions: 74% know the correct MRA; only 20% know the correct REA

Hypotheses

1. Positive liquidity shocks at the PEA reduce labor supply.
   - Two mechanisms at play: (i) treatment intensity (how much pension wealth is accessed) (ii) liquidity constraints
   - The effect on people with low pension wealth is ambiguous: (i) small (ii) more constrained
   - The effect on people with adequate pension wealth: driven by (i)

2. The MRA and REA serve as a reference point for workers and ease the liability of employers and thus may both voluntarily and involuntarily reduce labor supply.
   - The reference point should only matter for people with adequate retirement preparedness.
   - The demand-side barriers should matter more for those with higher wages.

Data

Singapore Life Panel (SLP): A nationally representative sample aged 50+.

- Monthly panel data
- Sep 2015 – Feb 2023
- About 8,000 respondents in each wave.
- Various outcome variables: Labor market outcomes, household financial conditions, consumption, subjective well-being measures, wealth, demographic characteristics (we also fielded questions in November 2021 and January 2022.)

Regression Discontinuity Design

$$y_i = \rho_0 + \rho_p f(age_i - c) + \tau T_i + \gamma X_i + \epsilon_i,$$

$T = 1(age \geq c)$; c is the threshold age. Parameter of interest is τ.
Term $(age - c)$ refers to the distance in months from the cutoff age c. We allow $f(age - c)$ to vary on either side of c .
Control variables: race, marital status, the number of children, education level, year fixed effects, month fixed effects, and birth year fixed effects.
24 months on each side of c.
Standard errors are clustered at the monthly level.

- Our main specification uses the linear control of $(age - c)$
- Robustness checks
  1. Sample appearing on both sides of c
  2. Second order polynomial of $(age - c)$
  3. Donut-hole estimations: excluding 1, 2, 3 months close to c

Sample

- Analysis sample for the MRA/PEA/REA

Birth cohort	MRA	PEA	REA
1950 Oct – 1951	62	63	65
1952 Jan – 1952 June	62	64	65
1952 July – 1953	62	64	67
1954 – 1955 June	62	65	67
1955 July – 1960 Jun	62	65	68

*** Keep the cohorts that in principle should appear at least one month before and after turning the MRA/PEA/REA.

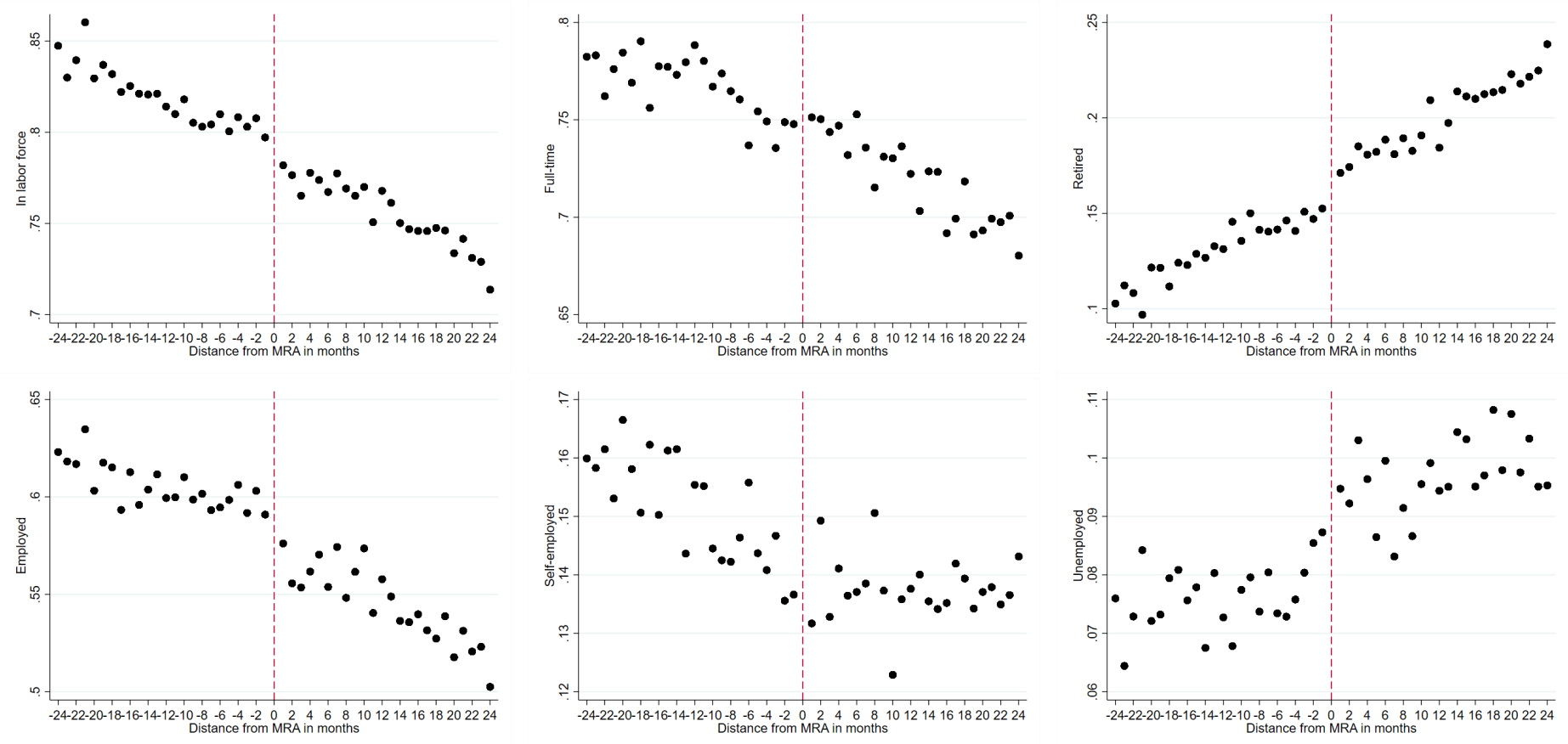
Summary Statistics

	MRA		PEA		REA	
	Men	Women	Men	Women	Men	Women
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
In labor force	0.79	0.57	0.69	0.47	0.58	0.39
	(0.41)	(0.49)	(0.46)	(0.50)	(0.49)	(0.49)
Employed	0.58	0.48	0.50	0.38	0.42	0.33
	(0.49)	(0.50)	(0.50)	(0.49)	(0.49)	(0.47)
Self-employed	0.14	0.05	0.14	0.05	0.11	0.04
	(0.35)	(0.22)	(0.34)	(0.22)	(0.32)	(0.19)
Full-time	0.74	0.63	0.66	0.56	0.61	0.53
	(0.44)	(0.48)	(0.47)	(0.50)	(0.49)	(0.50)
Unemployed	0.09	0.07	0.08	0.08	0.08	0.07
	(0.28)	(0.25)	(0.27)	(0.28)	(0.27)	(0.26)
Retired	0.17	0.13	0.27	0.21	0.38	0.28
	(0.37)	(0.33)	(0.44)	(0.40)	(0.49)	(0.45)
Disabled	0.01	0.01	0.01	0.00	0.01	0.01
	(0.10)	(0.08)	(0.09)	(0.06)	(0.08)	(0.07)
Homemaker	0.01	0.27	0.02	0.29	0.02	0.30
	(0.11)	(0.44)	(0.13)	(0.46)	(0.14)	(0.46)
Household monthly income	5,735	4,207	5,042	3,573	4,391	3,252
	(5,924)	(4,571)	(5,446)	(4,184)	(4,688)	(4,219)
Household monthly savings	2,028	1,283	1,688	1,016	1,233	1,039
	(4,900)	(3,918)	(4,655)	(3,611)	(4,044)	(3,486)
Household total consumption	3,250	2,556	2,943	2,237	2,784	1,954
	(3,573)	(3,102)	(3,182)	(2,772)	(3,164)	(2,523)
Household basic consumption	2,674	2,057	2,447	1,823	2,315	1,611
	(2,971)	(2,520)	(2,660)	(2,290)	(2,663)	(2,095)
Household food consumption	732	609	728	579	708	560
	(565)	(522)	(562)	(499)	(540)	(495)

Summary Statistics (Cont.)

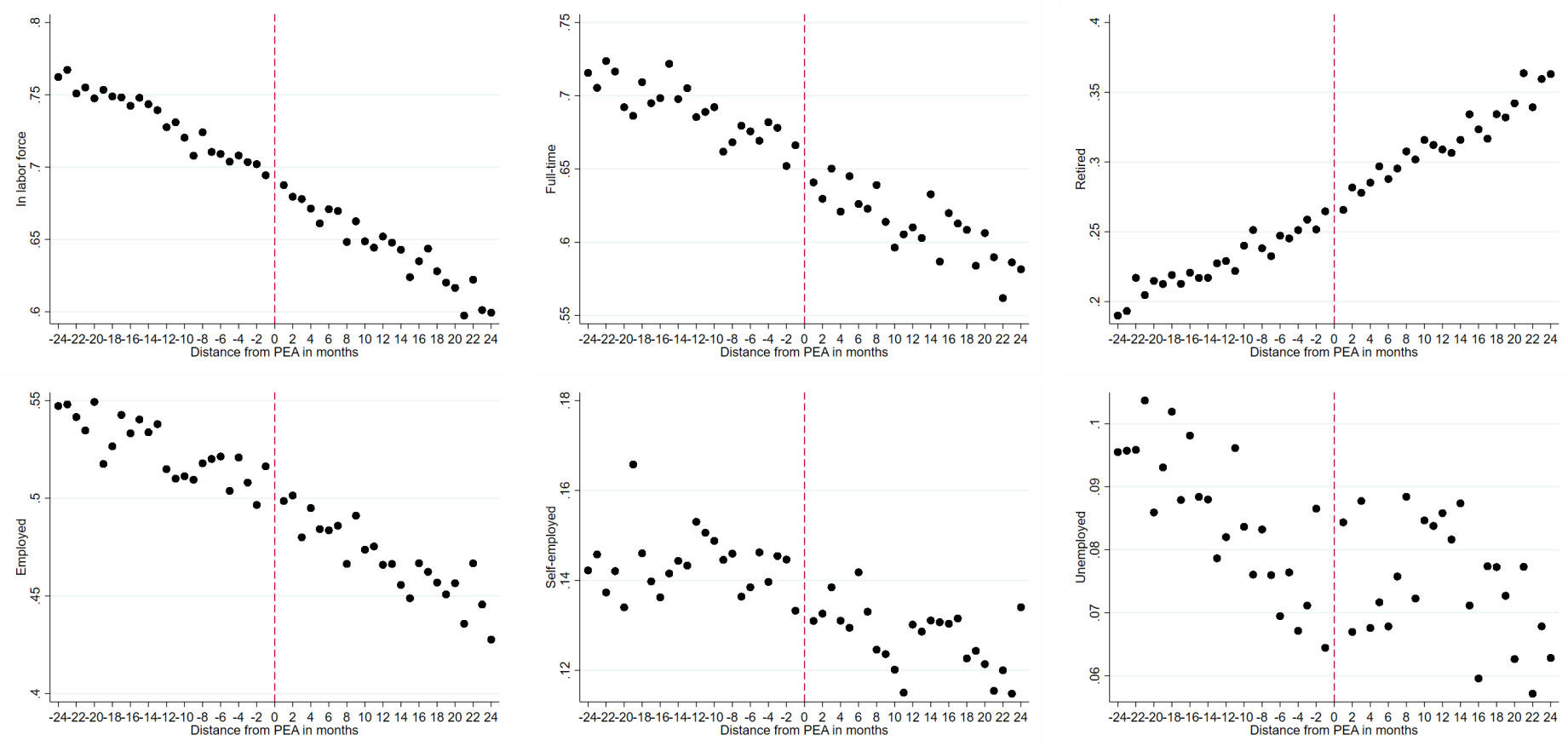
	MRA		PEA		REA	
	Men	Women	Men	Women	Men	Women
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Chinese	0.88	0.87	0.89	0.88	0.90	0.88
	(0.32)	(0.34)	(0.32)	(0.33)	(0.30)	(0.32)
Malay	0.05	0.06	0.04	0.05	0.04	0.05
	(0.22)	(0.24)	(0.20)	(0.22)	(0.18)	(0.22)
Indian	0.05	0.05	0.05	0.06	0.05	0.05
	(0.21)	(0.22)	(0.22)	(0.23)	(0.22)	(0.22)
Other race	0.02	0.02	0.02	0.01	0.01	0.01
	(0.14)	(0.13)	(0.14)	(0.12)	(0.12)	(0.11)
Married	0.90	0.71	0.91	0.68	0.91	0.66
	(0.31)	(0.45)	(0.29)	(0.47)	(0.29)	(0.47)
Number of living children	4.00	3.90	4.09	3.90	4.14	3.90
	(1.22)	(1.27)	(1.23)	(1.27)	(1.22)	(1.29)
Primary education	0.17	0.25	0.19	0.27	0.18	0.30
	(0.38)	(0.43)	(0.39)	(0.44)	(0.39)	(0.46)
Secondary education	0.39	0.47	0.38	0.46	0.38	0.47
	(0.49)	(0.50)	(0.48)	(0.50)	(0.49)	(0.50)
Tertiary education	0.43	0.28	0.44	0.27	0.44	0.23
	(0.50)	(0.45)	(0.50)	(0.44)	(0.50)	(0.42)
CPF	161,163	112,372	164,370	119,913	145,937	111,661
	(190,634)	(145,517)	(195,992)	(166,568)	(184,249)	(171,462)
Deposits	108,070	89,773	109,978	102,774	117,686	106,157
	(221,354)	(198,602)	(219,893)	(232,148)	(241,005)	(245,005)
Household net worth	637,256	459,155	617,138	472,006	591,723	443,223
	(1,026,557)	(687,128)	(810,950)	(782,717)	(824,895)	(752,161)
Total household assets	1,406,011	1,181,021	1,409,881	1,170,892	1,397,011	1,122,152
	(3,521,847)	(3,336,506)	(1,764,251)	(1,754,433)	(1,886,289)	(1,738,614)
N	52105	56323	43731	47356	28988	30337

RD Graphs for the MRA – Men, Labor Supply



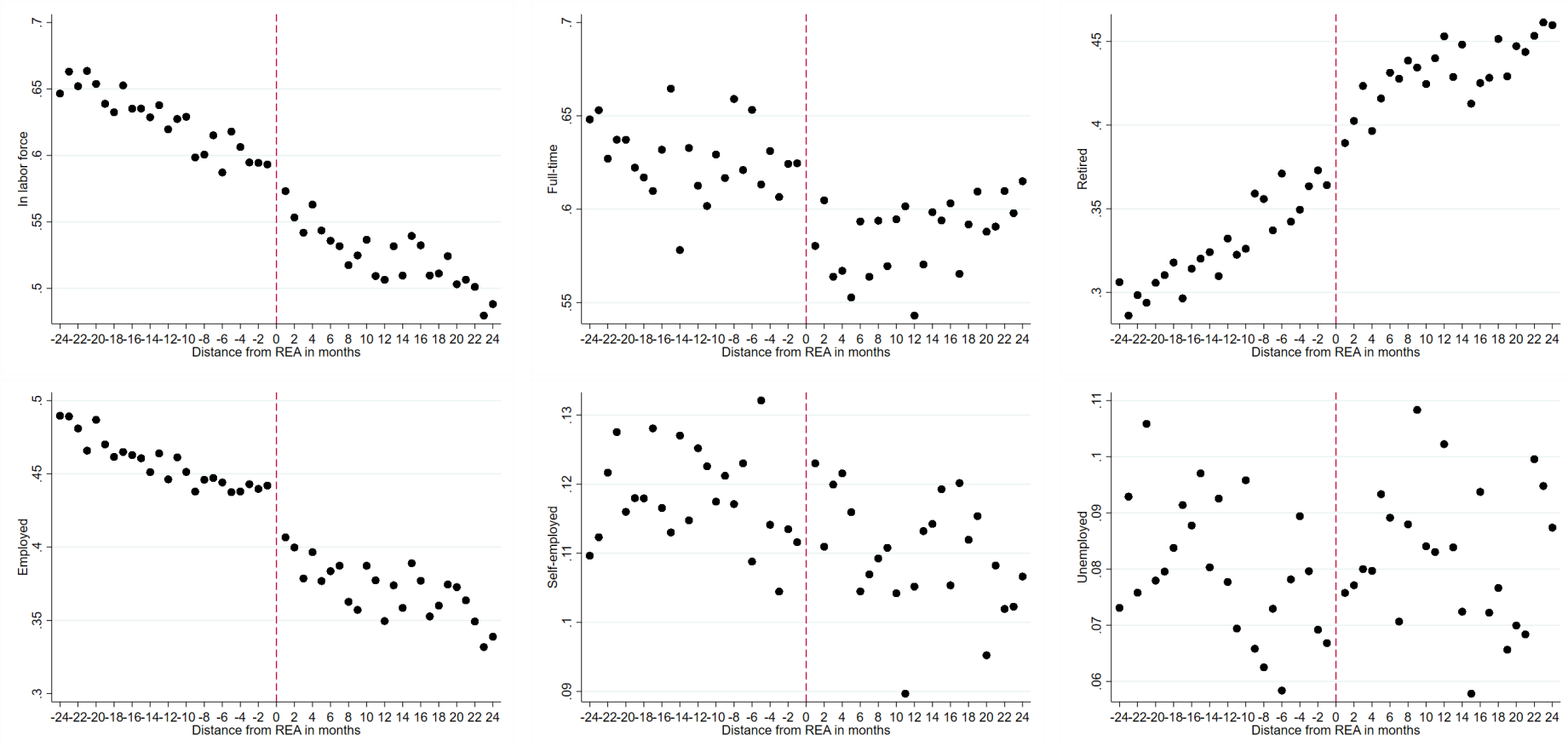
▸ More ▸ Women ▸ Balance checks

RD Graphs for the PEA – Men, Labor Supply



▸ More ▸ Women ▸ Balance checks

RD Graphs for REA – Men, Labor Supply



▸ More ▸ Women ▸ Balance checks

Average Effects for Men

▸ Women

	MRA	PEA	REA
In labor force	-0.011***	-0.007**	-0.032***
	(0.004)	(0.004)	(0.007)
Employed	-0.018***	-0.005	-0.034***
	(0.005)	(0.005)	(0.005)
Self-employed	-0.001	-0.008**	-0.000
	(0.004)	(0.003)	(0.004)
Full-time	0.007	-0.017***	-0.041***
	(0.005)	(0.006)	(0.010)
Unemployed	0.011***	0.011**	0.008
	(0.004)	(0.005)	(0.006)
Retired	0.014***	0.010**	0.032***
	(0.003)	(0.004)	(0.007)
ln(Household monthly income)	-0.044***	0.001	-0.060***
	0.010	(0.012)	(0.015)
ln(Household monthly savings)	-0.054***	-0.005	-0.037
	(0.017)	(0.025)	(0.026)
ln(Total consumption)	-0.007	0.016	-0.035
	(0.014)	(0.013)	(0.021)
ln(Basic consumption)	-0.008	0.008	-0.039*
	(0.013)	(0.013)	(0.019)
ln(Food consumption)	-0.005	0.009	-0.023
	(0.019)	(0.014)	(0.021)
N	52105	43731	28988

Men with Low Pension Wealth

▸ Women

	MRA	PEA	REA
In labor force	0.008	-0.014**	-0.031***
	0.007	(0.005)	(0.009)
Employed	0.012	-0.018**	-0.034***
	(0.009)	(0.009)	(0.010)
Self-employed	-0.006	-0.017**	0.001
	(0.009)	(0.007)	(0.008)
Full-time	0.039**	-0.020	-0.045**
	(0.015)	(0.014)	(0.017)
Unemployed	0.003	0.030***	0.009
	(0.005)	(0.006)	(0.010)
Retired	-0.001	0.017**	0.028***
	(0.007)	(0.006)	(0.009)
ln(Household monthly income)	-0.020	-0.009	-0.059**
	(0.016)	(0.019)	(0.025)
ln(Household monthly savings)	0.011	-0.010	0.012
	(0.027)	(0.034)	(0.050)
ln(Total consumption)	-0.066**	0.054	-0.072*
	(0.029)	(0.035)	(0.041)
ln(Basic consumption)	-0.059**	0.053	-0.087**
	(0.028)	(0.035)	(0.039)
ln(Food consumption)	-0.042	0.02	-0.045
	(0.036)	(0.032)	(0.039)
N	18175	15948	11454

Men with Meidum Pension Wealth

▸ Women

	MRA	PEA	REA
In labor force	-0.010	-0.001	-0.033***
	(0.006)	(0.006)	(0.011)
Employed	-0.017**	0.001	-0.045***
	(0.007)	(0.007)	(0.011)
Self-employed	0.002	0.007	0.007
	(0.004)	(0.005)	(0.005)
Full-time	-0.006	0.003	-0.046***
	(0.008)	(0.010)	(0.013)
Unemployed	0.008	-0.011	0.017**
	(0.005)	(0.007)	(0.008)
Retired	0.013**	0.005	0.031**
	(0.006)	(0.007)	(0.013)
ln(Household monthly income)	-0.044***	-0.006	-0.076**
	(0.015)	(0.018)	(0.029)
ln(Household monthly savings)	-0.088***	-0.001	-0.079*
	(0.027)	(0.036)	(0.046)
ln(Total consumption)	0.026*	0.014	-0.039
	(0.014)	(0.019)	(0.024)
ln(Basic consumption)	0.028*	-0.003	-0.028
	(0.014)	(0.018)	(0.025)
ln(Food consumption)	0.002	-0.013	0.007
	(0.018)	(0.02)	(0.035)
N	26047	16241	8691

Men with High Pension Wealth

▸ Women

	MRA	PEA	REA
In labor force	-0.045***	-0.009	-0.039***
	(0.012)	0.010	(0.012)
Employed	-0.079***	0.001	-0.032***
	(0.008)	(0.010)	(0.010)
Self-employed	0.006	-0.016**	-0.005
	(0.008)	(0.008)	(0.007)
Full-time	0.004	-0.056***	-0.045**
	(0.012)	(0.015)	(0.020)
Unemployed	0.042***	0.012	-0.004
	(0.008)	(0.008)	(0.009)
Retired	0.040***	0.008	0.043***
	0.010	(0.011)	(0.011)
ln(Household monthly income)	-0.088***	0.016	-0.066**
	(0.025)	(0.024)	(0.033)
ln(Household monthly savings)	-0.063	-0.015	-0.077
	(0.038)	(0.044)	(0.047)
ln(Total consumption)	0.036	-0.017	0.006
	(0.022)	(0.019)	(0.022)
ln(Basic consumption)	0.016	-0.026	0.001
	(0.024)	(0.022)	(0.024)
ln(Food consumption)	0.086**	0.041*	-0.039
	(0.037)	(0.021)	(0.029)
N	7883	11542	8843

Summary of Findings

- At the aggregate level:
  - At the MRA, the employment rate decreases by 1.8 pp (3%). The reduction in labor supply is both voluntary and involuntary.
  - Access to pension reduces working hours and self-employment.
  - At the REA, labor force participation rate decreases by 3.2 pp (6%) and employment rate decreases by 3.4 pp (8%).
  - Decline in household income after the MRA and the REA, but savings only decline after the MRA. Consumption is generally smooth.

Summary of Findings (Cont.)

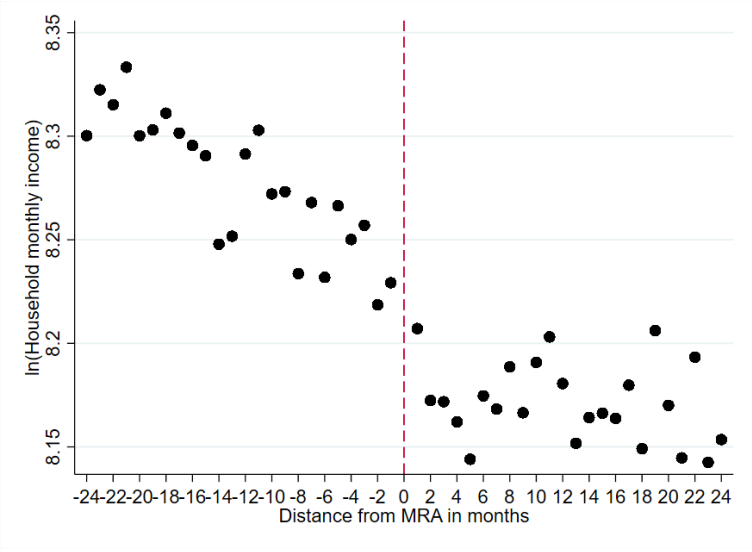
- By individuals' pension wealth:
  - All groups reduce labor supply and experience income decline after the REA.
    Additionally,
  - Low-wealth men reduce labor supply after the pension access.
  - Medium-wealth men reduce labor supply after the MRA.
  - High-wealth men reduce labor supply upon reaching both the MRA (extensive margin) and the PEA (intensive margin).
    – The involuntary separation from job is most prevalent among high-wealth men at the MRA.
  - Medium- and high-wealth groups experience a decline in household income after the MRA.
  - Low-wealth men reduce consumption after turning the MRA and the REA.

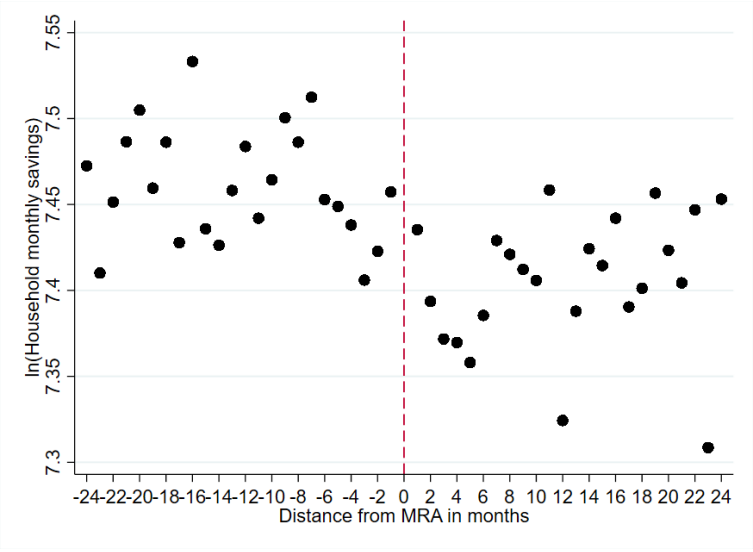
Conclusion

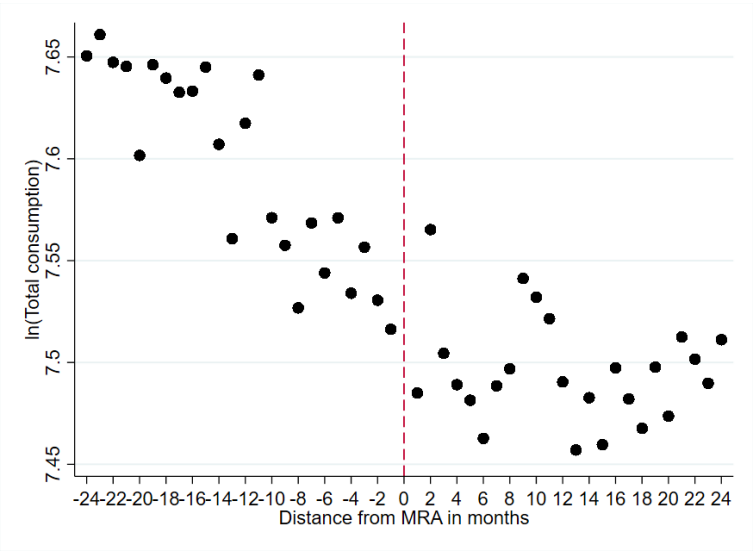
- The MRA serves as a reference point to retire for men with adequate retirement savings; workers also face demand-side barriers upon turning the MRA, especially men with high wages (pension wealth).
- Compared to the statutory retirement ages, pension access has a limited impact on labor supply, except for low-wealth men at the extensive margin and high-wealth men at the intensive margin.
- All groups reduce labor supply similarly at the REA. $\rightarrow$ Extending the maximum re-employment age is an effective policy to retain older men in the labor market.
- Household income decreases after the MRA and the REA, but consumption is generally smooth, except for the low-wealth group.

Thank you!

RD Graphs for the MRA – Men (Cont.)







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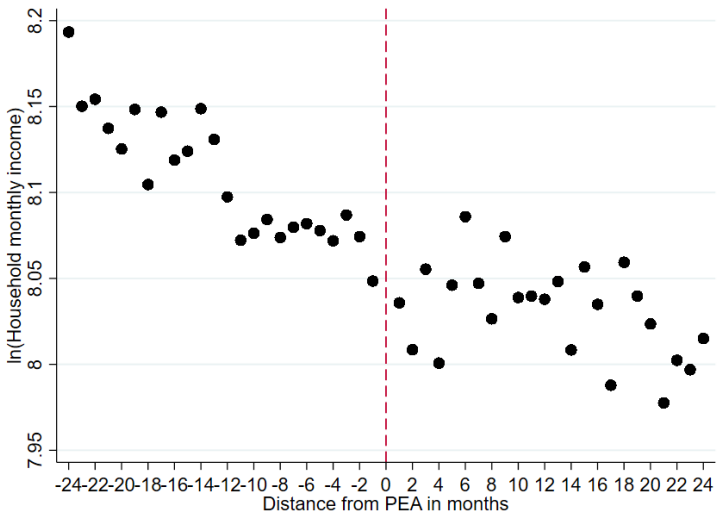
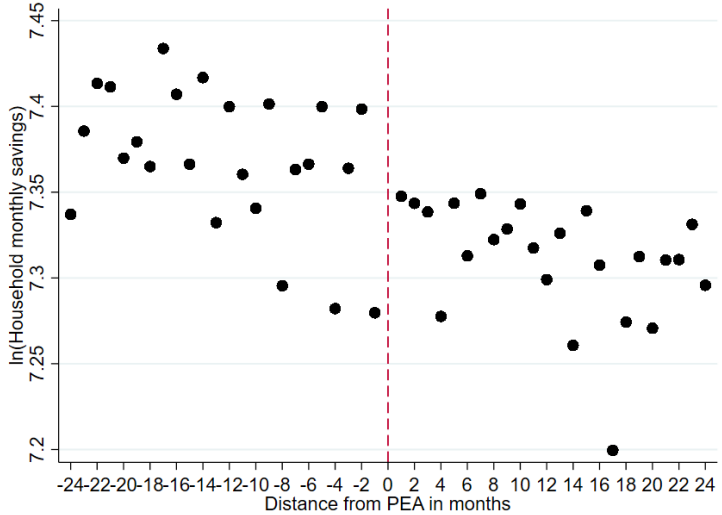
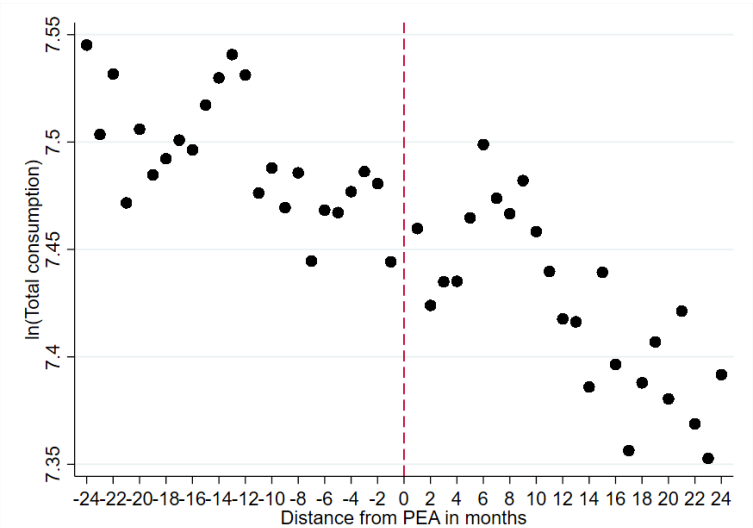
RD Graphs for the PEA – Men (Cont.)







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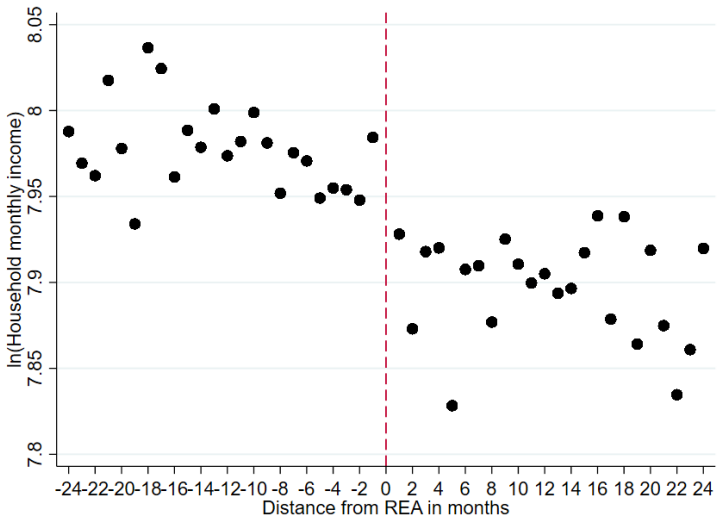
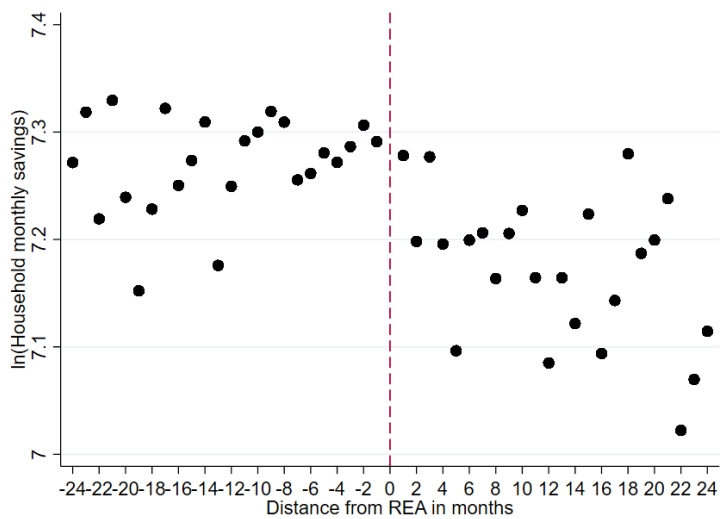
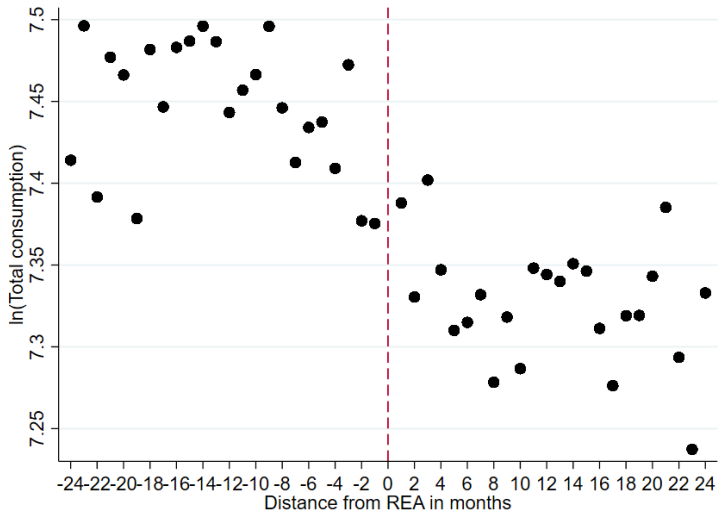
RD Graphs for the REA – Men (Cont.)







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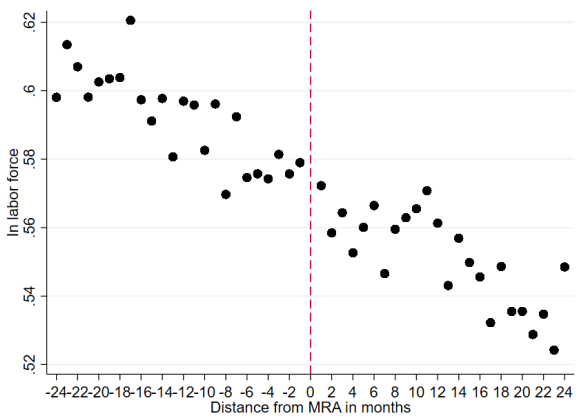
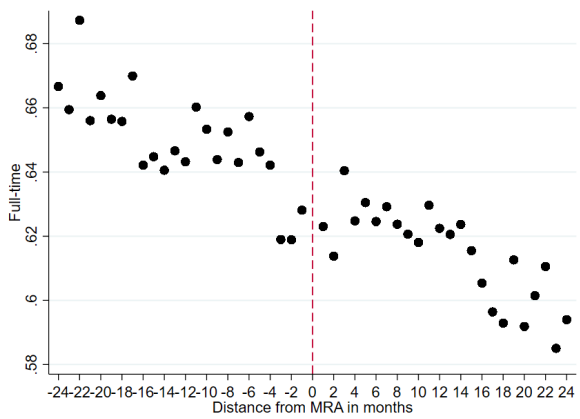
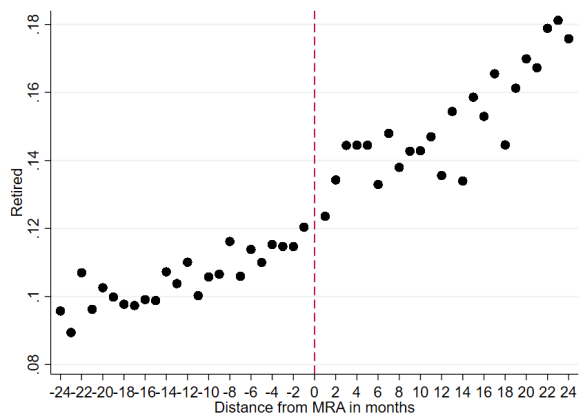
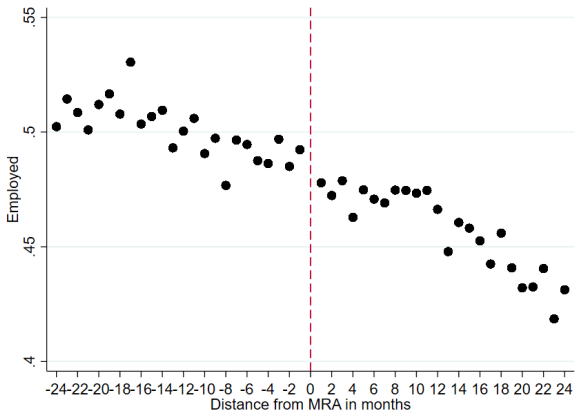
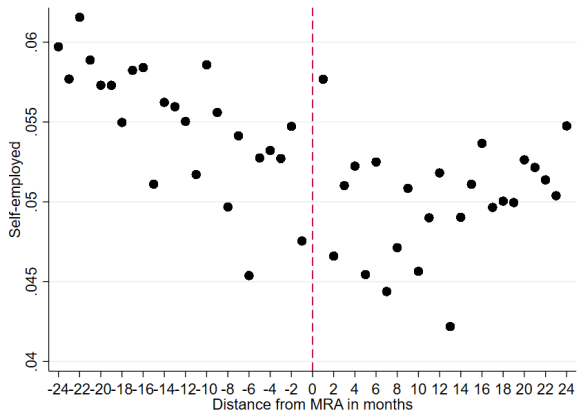
RD Graphs for MRA – Women, Labor Supply

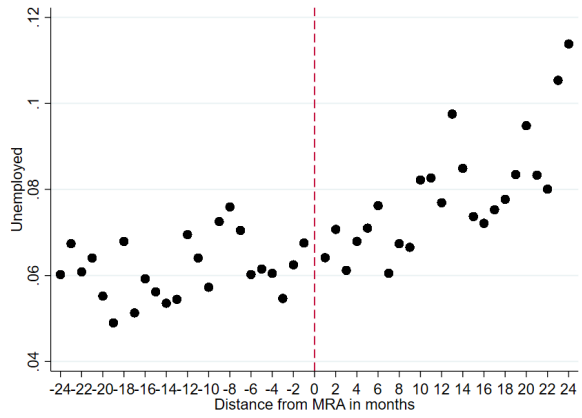












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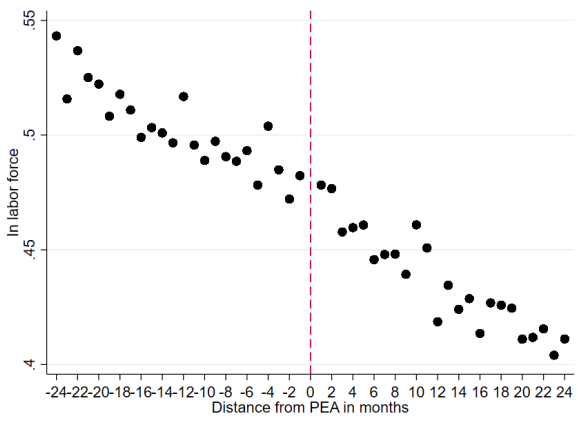
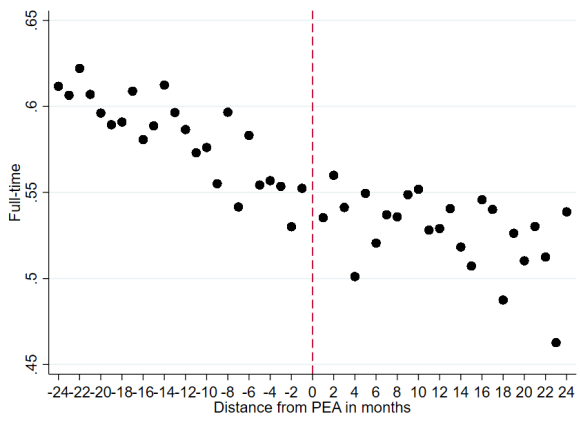
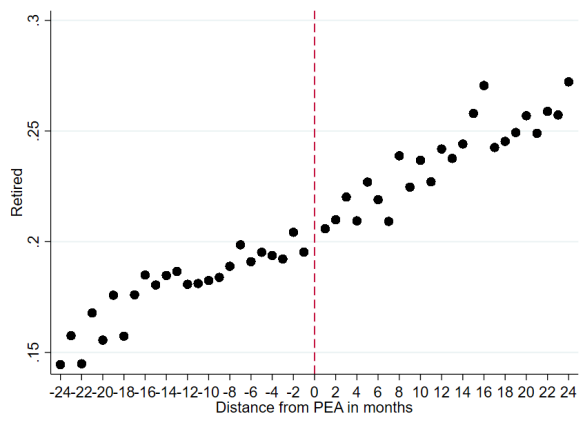
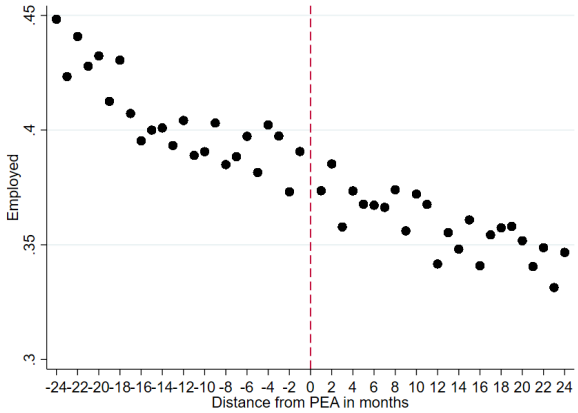
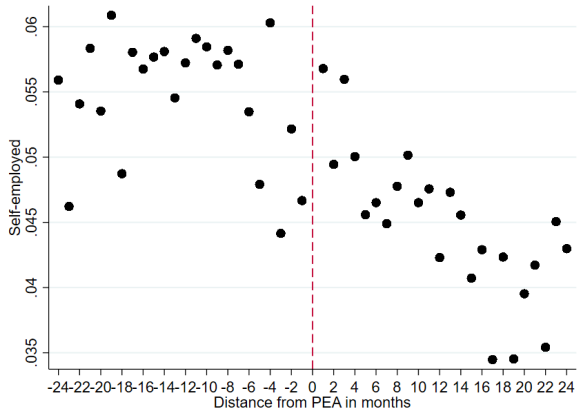
RD Graphs for PEA – Women, Labor Supply

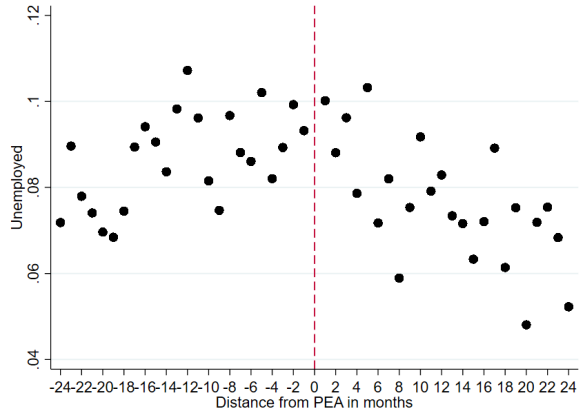












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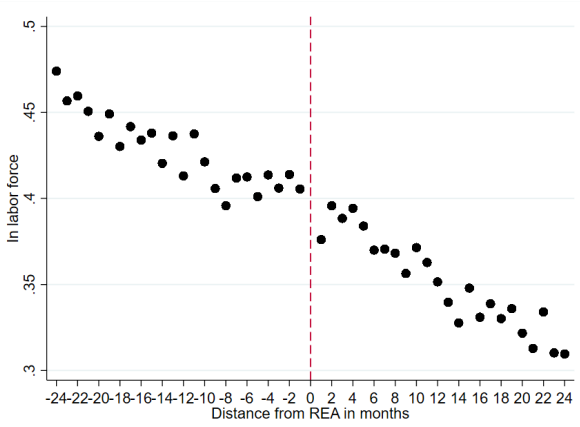
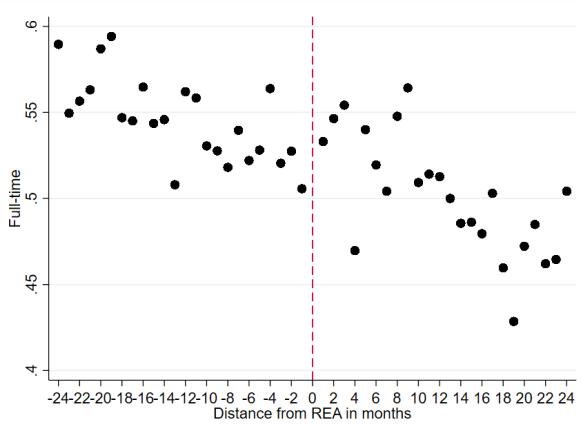
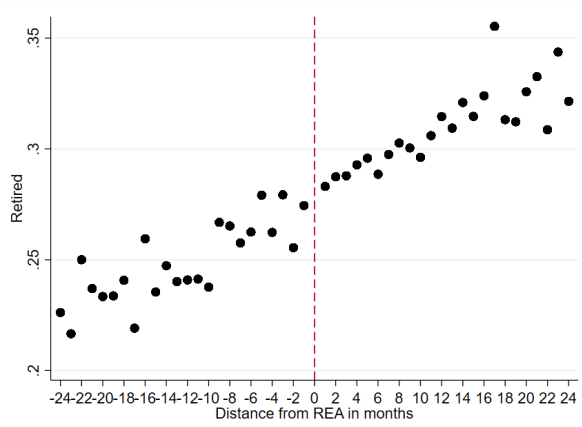
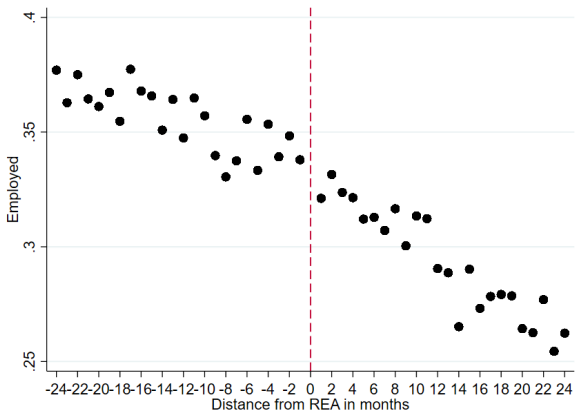
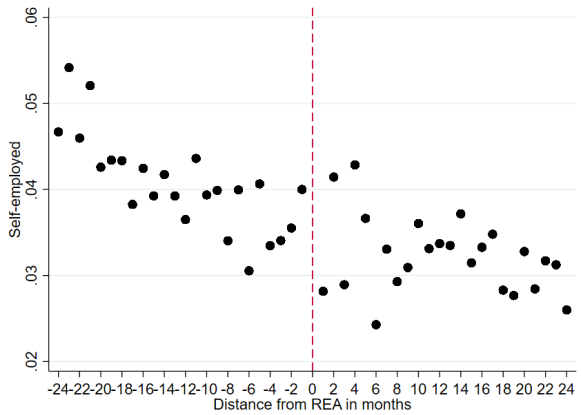
RD Graphs for REA – Women, Labor Supply

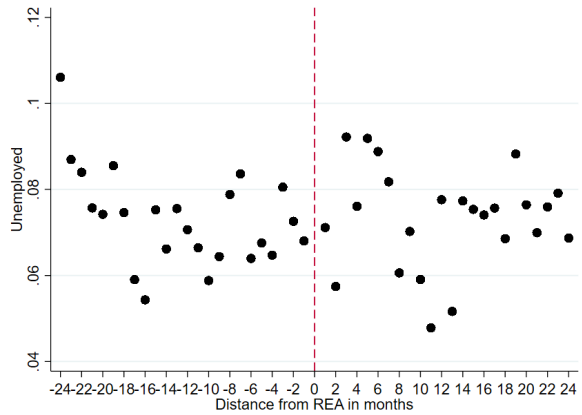












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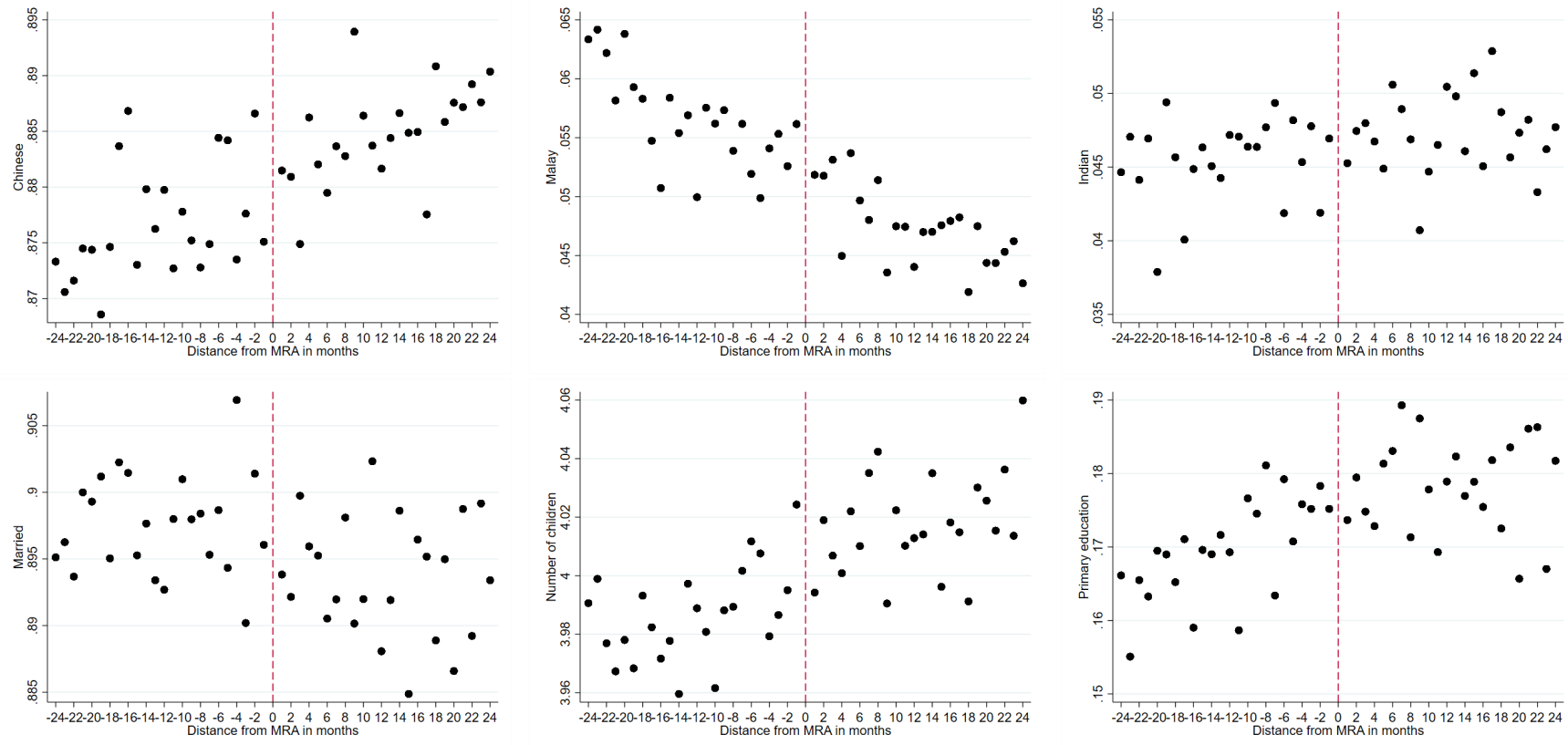
RD Graphs for MRA – Men, Balance Checks



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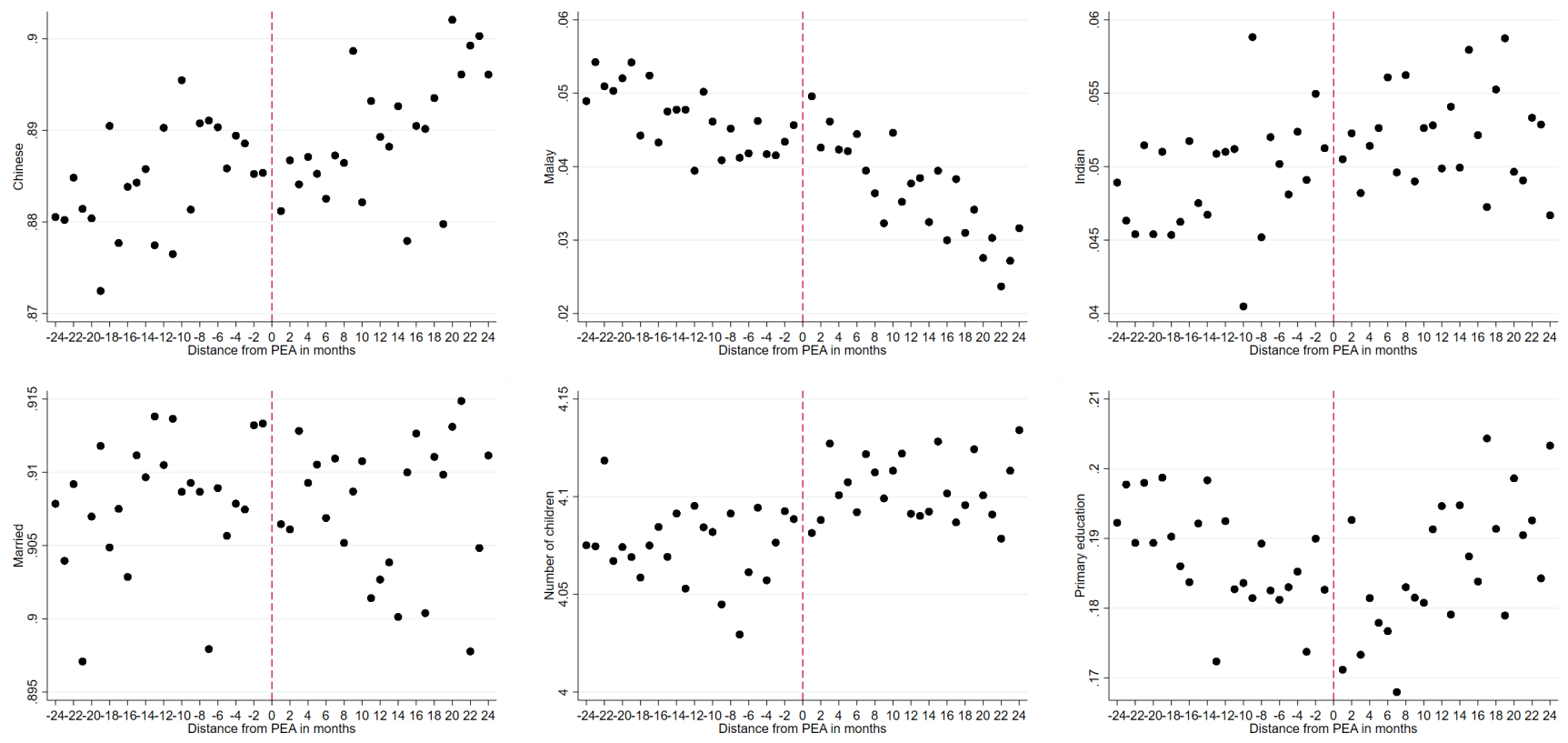
RD Graphs for PEA – Men, Balance Checks



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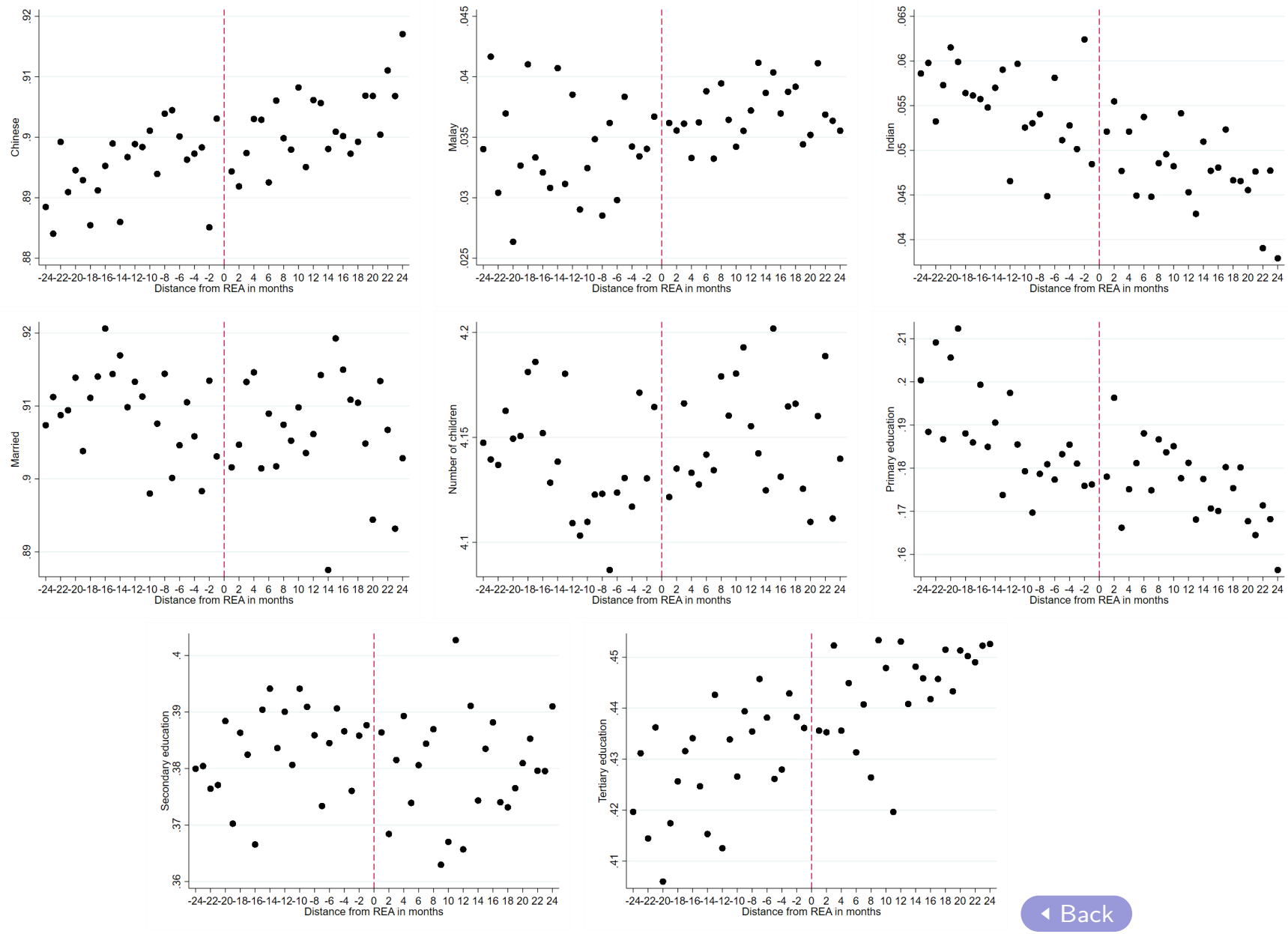
RD Graphs for REA – Men, Balance Checks



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Average Effects for Women

◂ Men

	MRA	PEA	REA
In labor force	0.001	-0.013***	-0.007
	(0.005)	(0.005)	(0.006)
Employed	0.002	-0.006	-0.010*
	(0.004)	(0.005)	(0.005)
Self-employed	-0.000	-0.002	0.000
	(0.002)	(0.003)	(0.003)
Full-time	0.004	0.004	0.028*
	(0.006)	(0.010)	(0.015)
Unemployed	-0.002	-0.006	0.008
	(0.004)	(0.006)	(0.007)
Retired	0.008**	0.007	0.007
	(0.004)	(0.004)	(0.005)
ln(Household monthly income)	-0.003	0.002	0.020
	(0.009)	0.010	(0.014)
ln(Household monthly savings)	-0.043***	-0.004	0.020
	(0.015)	(0.024)	(0.023)
ln(Total consumption)	-0.005	0.035**	0.033
	(0.013)	(0.017)	(0.027)
ln(Basic consumption)	-0.001	0.038**	0.038
	(0.013)	(0.017)	(0.025)
ln(Food consumption)	0.009	0.037	0.025
	(0.013)	(0.022)	(0.024)
N	56276	47269	30290

Women with Low Pension Wealth

◂ Men

	MRA	PEA	REA
In labor force	0.003	-0.002	0.012*
	(0.007)	(0.006)	(0.007)
Employed	0.008	0.004	0.014*
	(0.006)	(0.006)	(0.007)
Self-employed	-0.001	-0.000	-0.000
	(0.003)	(0.003)	(0.004)
Full-time	-0.008	0.016	0.029
	(0.009)	(0.012)	(0.018)
Unemployed	-0.01	-0.014	-0.010
	(0.007)	(0.010)	(0.009)
Retired	0.003	0.002	-0.010
	(0.005)	(0.006)	(0.010)
ln(Household monthly income)	-0.000	0.031*	0.058***
	(0.013)	(0.016)	(0.019)
ln(Household monthly savings)	-0.045	0.001	0.069**
	(0.028)	(0.040)	(0.030)
ln(Total consumption)	0.031	0.047	0.094***
	(0.023)	(0.032)	(0.033)
ln(Basic consumption)	0.036	0.050	0.102***
	(0.023)	(0.031)	(0.035)
ln(Food consumption)	0.041	0.035	0.104**
	(0.027)	(0.042)	(0.041)

Women with Medium Pension Wealth

Men

	MRA	PEA	REA
In labor force	0.001	-0.033***	-0.028**
	(0.005)	(0.008)	(0.012)
Employed	0.004	-0.026***	-0.038***
	(0.006)	(0.007)	(0.013)
Self-employed	-0.005	-0.012**	-0.002
	(0.004)	(0.004)	(0.003)
Full-time	0.023**	-0.011	-0.006
	(0.009)	(0.011)	(0.029)
Unemployed	0.005	0.013	0.032*
	(0.004)	(0.008)	(0.017)
Retired	0.009	0.007	0.026**
	(0.006)	(0.008)	(0.012)
ln(Household monthly income)	0.013	-0.063***	-0.003
	(0.016)	(0.021)	(0.031)
ln(Household monthly savings)	0.002	-0.020	0.018
	(0.031)	(0.032)	(0.063)
ln(Total consumption)	-0.047**	-0.010	-0.101**
	(0.019)	(0.023)	(0.039)
ln(Basic consumption)	-0.038**	-0.002	-0.086**
	(0.019)	(0.024)	(0.034)
ln(Food consumption)	-0.012	0.014	-0.150***
	(0.018)	(0.027)	(0.033)
N	23141	13229	6622

Women with High Pension Wealth

Men

	MRA	PEA	REA
In labor force	-0.017	-0.004	-0.021*
	(0.013)	(0.012)	(0.012)
Employed	-0.031***	-0.005	-0.031***
	(0.011)	(0.013)	(0.010)
Self-employed	0.014***	0.009*	0.006
	(0.005)	(0.005)	(0.005)
Full-time	-0.028*	-0.005	0.047*
	(0.015)	(0.020)	(0.025)
Unemployed	0.002	-0.012	0.016
	(0.006)	(0.008)	(0.010)
Retired	0.029***	0.010	0.027***
	(0.011)	(0.010)	(0.009)
ln(Household monthly income)	-0.036	0.024	-0.024
	(0.041)	(0.023)	(0.033)
ln(Household monthly savings)	-0.109**	0.007	-0.059
	(0.047)	(0.047)	(0.058)
ln(Total consumption)	-0.013	0.062**	0.016
	0.030	(0.027)	(0.031)
ln(Basic consumption)	-0.025	0.057**	0.007
	(0.029)	(0.028)	(0.030)
ln(Food consumption)	-0.044*	0.083***	0.009
	(0.026)	(0.023)	(0.033)
N	6875	9248	7033