

Home Production and Retirement in Couples: A Panel Data Analysis

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Overview

- Motivation
- GSOEP data on time use
- Retirement and time use in couples
- Panel data models
- Estimation Results
- Does home production compensate for the loss of income at retirement?
- Conclusions

Existing studies

- Retirement consumption puzzle: Consumption expenditures fall at retirement (Banks, Blundell, Tanner 1998)
- Possible solution: Increase in home production at retirement (Hamermesh 1984; Aguiar & Hurst 2005, 2007; Hurd & Rohwedder 2008; Battistin et al. 2009)
- Effect of retirement on time use of the spouse (Szinovacz 2000; Stancaelli & van Soest 2012)
- Endogeneity of retirement can be tackled using regression discontinuity (Battistin et al. 2009; Stancaelli & van Soest 2012)

This paper

- Panel data on time use in couples (German SOEP, 1993 – 2009)
- Can study changes at the household level when one of the partners retires
- Can look at time use 1, 2, 3, ... years before and after retirement
- Mitigates endogeneity problem using fixed effects models explaining from retirement and other variables
- Alternative identification strategy where regression discontinuity does not give enough power


Data: German Socio-Economic Panel

- Data from 1993 to 2009 (9 waves: 1993, 1995, 1997, 1999, 2001, 2003, 2005, 2007, 2009)
- Individuals living in heterosexual couple (cohabiting or married) and between 45 and 75 year-old.
- Exclude special sample of high income households and of foreigners.
- Select couples where both partners are working in first wave
- Drop couples with reverse retirement (Retired = not working for pay)
- Drop observations with missing or unreliable values on time use
- 6,172 observations on 1,571 couples (unbalanced panel)

Data: The measure of home production

2. What is a typical day like for you?

How many hours do you spend on the following activities on a typical weekday, Saturday, and Sunday?

 Please give only whole hours.
Use zero if the activity does not apply!

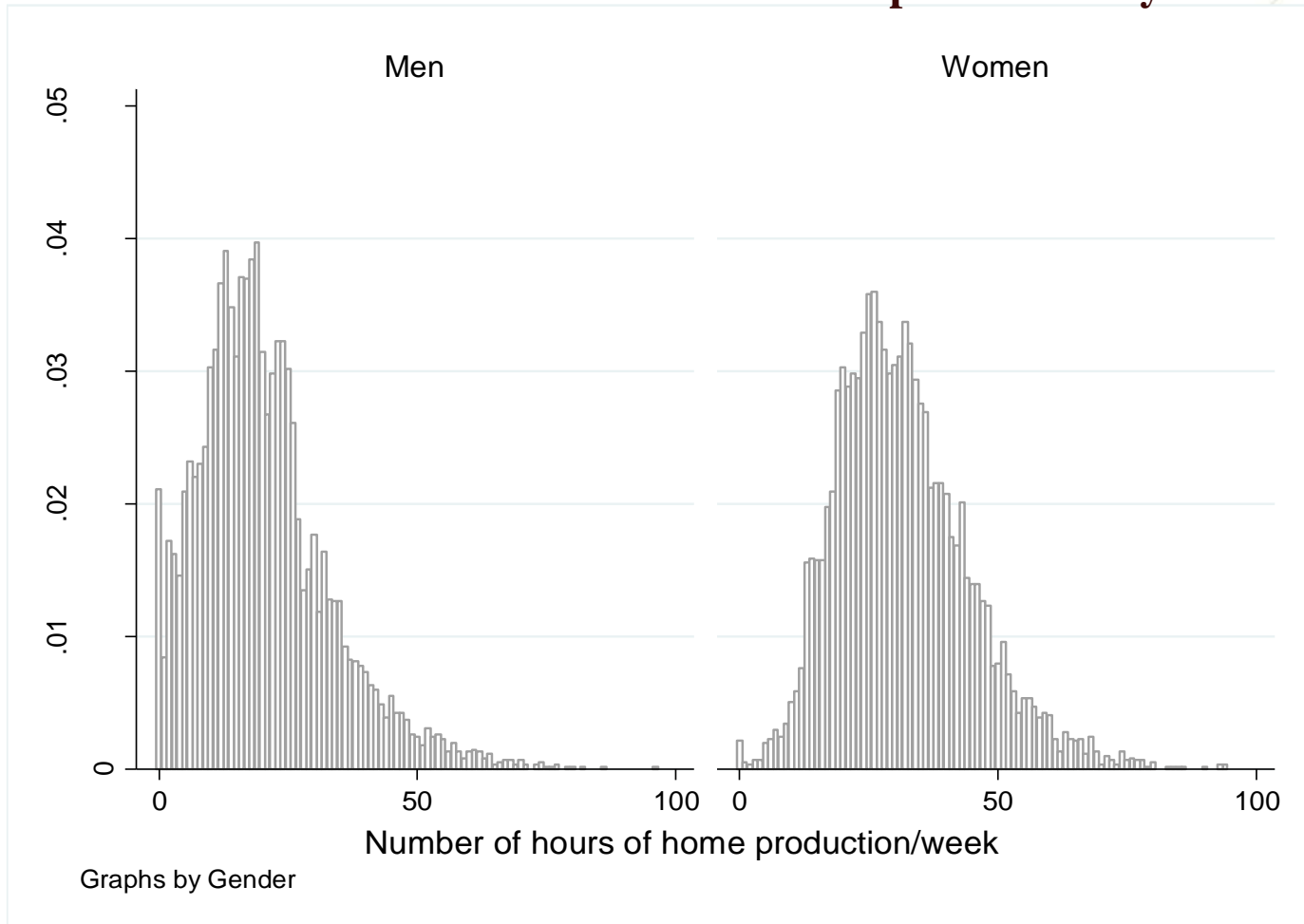
	Typical weekday Number of hours	Typical Saturday Number of hours	Typical Sunday Number of hours
Job, apprenticeship, second job (including travel time to and from work)	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
Errands (shopping, trips to government agencies, etc.)	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
Housework (washing, cooking, cleaning)	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
Child care	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
Care and support for persons in need of care	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
Education or further training (also school, university)	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
Repairs on and around the house, car repairs, garden work	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
Hobbies and other free-time activities	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>

Data: The measure of home production

- Home production: Errands, housework, and repairs on and around the house, including car repairs and garden work. (following Schwerdt (2005) and Frazis and Steward (2011))
- Exclusion of care and support to persons in need for care, and child care.
- Home production per week: 5 x home prod. on a normal weekday+home prod. on a normal Saturday+home prod. on a normal Sunday.

Data: The measure of home production

Distribution of the number of hours of home production by week.

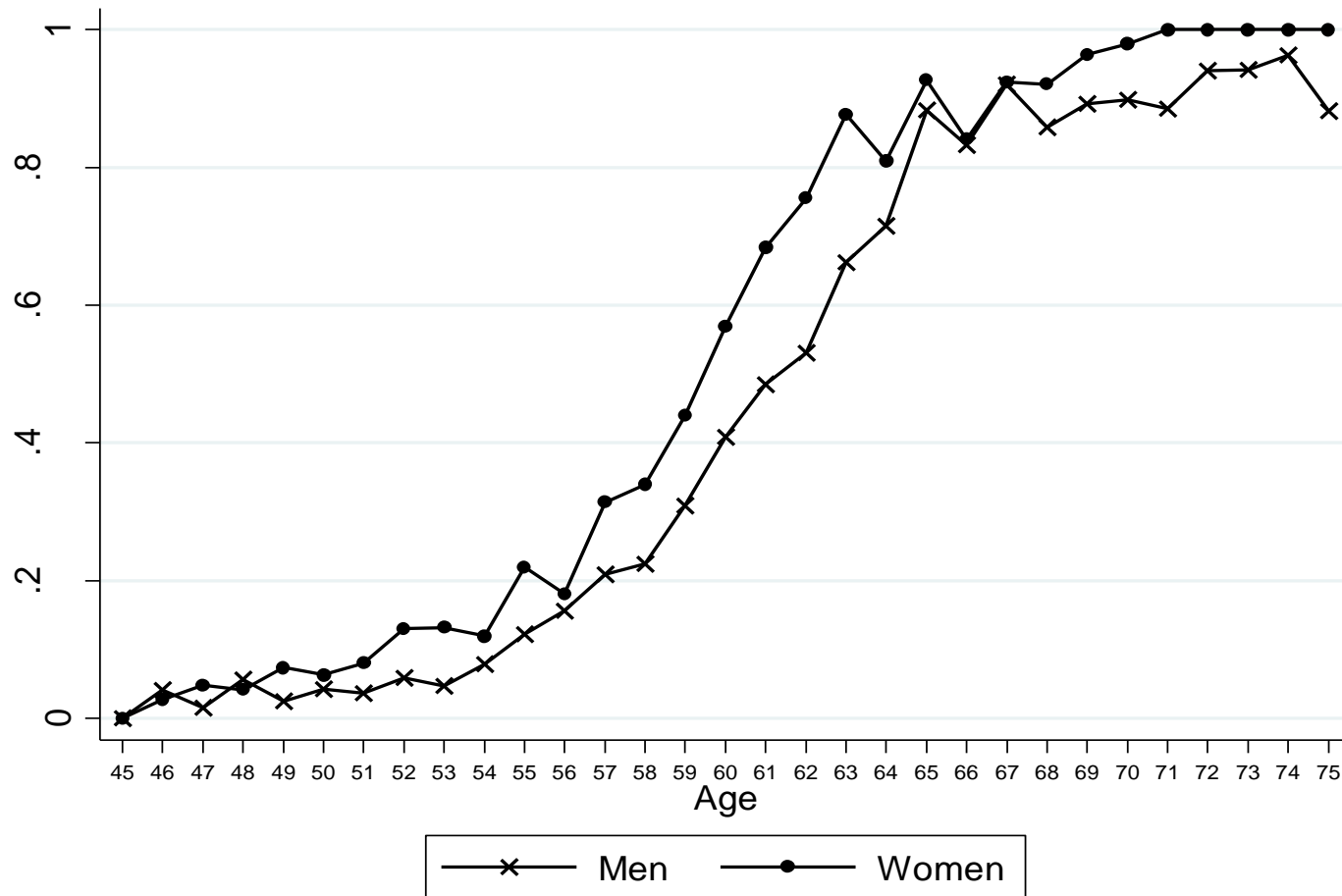


Data: The measure of retirement

- Definition of retirement: Retired if definitively out of the labour force (Lazear, 1986).
- An individual is defined as “Working” if he/she claims working for pay and “Retired” if he/she reports not working. (following Bonsang, Adam, and Perelman (2012), Bonsang and Klein (2012), Coe and Zamarro (2011), Mazzonna and Peracchi (2012), and Rohwedder and Willis (2010)).
- Exclusion of observations for individuals who are not working but observed going back to work in later waves.

Data: The measure of retirement

Proportion of individuals being retired by age.



Data: Control variables

- Third order polynomial in age of the individual and the age of the partner.
- Self-assessed general health for each partner.
- Number of adults and number of children in the household.

Table 1. Means of the control variables.

	Men				Women			
	Working	Working	Retired	Retired	Working	Working	Retired	Retired
Individual:								
Partner:	Working	Retired	Working	Retired	Working	Retired	Working	Retired
Age	53.6	58.1	60.7	65.3	51.1	55.6	57.1	63.2
Health satisfaction	6.5	6.2	5.7	5.7	6.7	6.5	5.8	5.8
Spouse health satisfaction	6.7	5.8	6.5	5.8	6.5	5.7	6.2	5.7
Number of adults in the household	2.7	2.4	2.3	2.2	2.7	2.3	2.4	2.2
Number of children in the household	0.2	0.1	0.1	0.0	0.2	0.1	0.1	0.0
N	3,575	603	764	1,230	3,575	764	603	1,230

Descriptive statistics

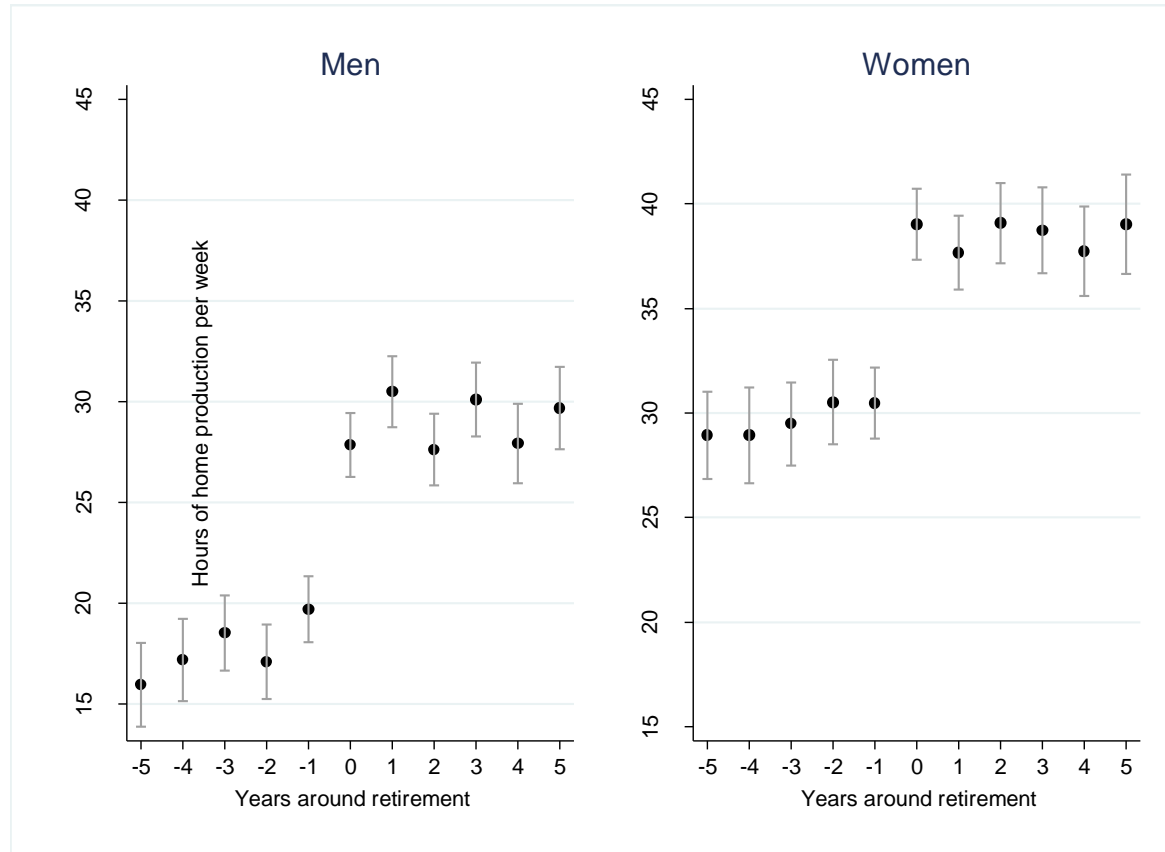
Table 2. Average number of hours of home production per week.

	Men				Women			
	Working	Working	Retired	Retired	Working	Working	Retired	Retired
Individual:	Working	Working	Retired	Retired	Working	Working	Retired	Retired
Partner:	Working	Retired	Working	Retired	Working	Retired	Working	Retired
Home production	16.4 (9.4)	15.9 (10.9)	30.7 (15.3)	26.9 (13.9)	29.0 (10.8)	26.5 (11.5)	39.3 (15.0)	37.8 (14.0)
N	3,575	603	764	1,230	3,575	764	603	1,230

Note: Standard errors in parentheses.

Descriptive statistics

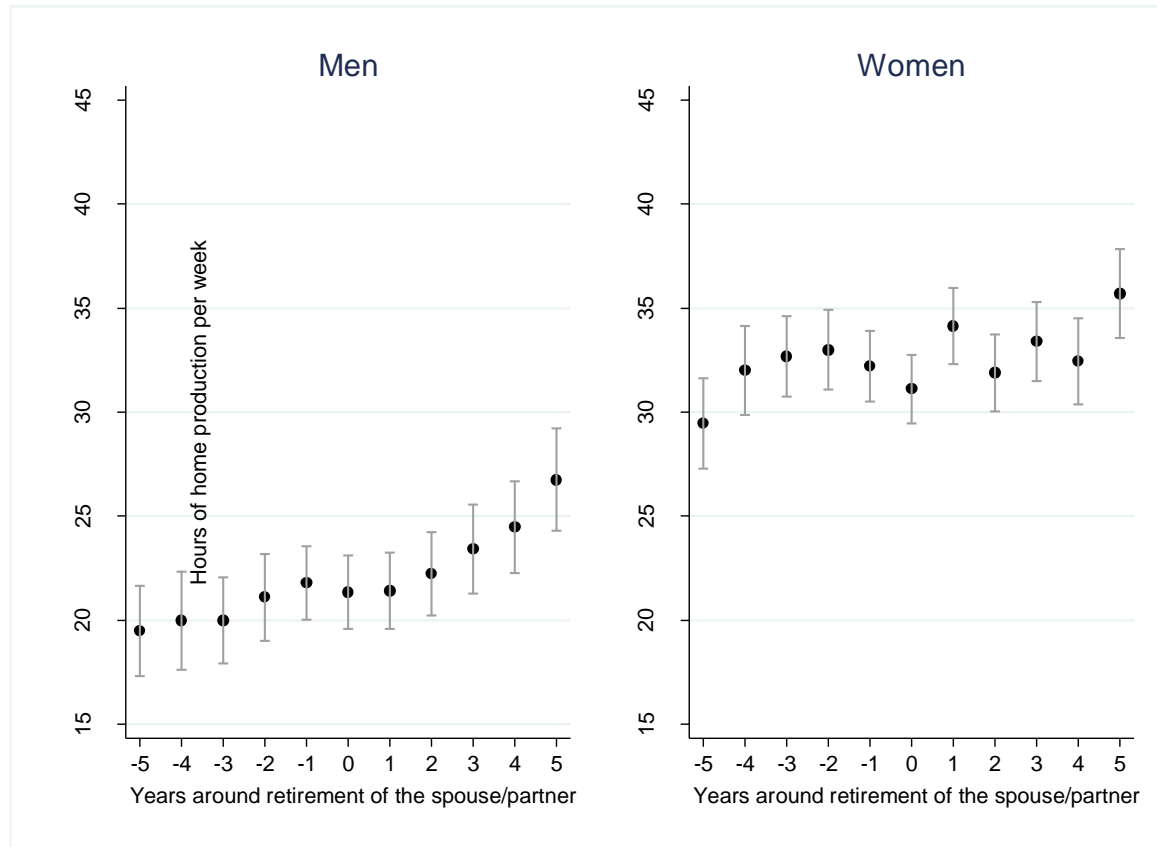
Figure 4. Average number of hours of home production by week around own retirement



Note: The dots represent the average number of hours of home production per week and the vertical lines represent the 95% confidence interval.

Descriptive statistics

Figure 5. Average number of hours of home production by week around retirement of the spouse.



Note: The dots represent the average number of hours of home production per week and the vertical lines represent the 95% confidence interval.

The empirical model

- The model for home production:

$$h_{it}^m = \beta_1^m R_{it}^m + \beta_2^m R_{it}^f + X_{it} \beta^m + \alpha_i^m + v_{it}^m$$

$$h_{it}^f = \beta_1^f R_{it}^f + \beta_2^f R_{it}^m + X_{it} \beta^f + \alpha_i^f + v_{it}^f$$

h_{it}^j Home production by either the man or woman

R_{it}^m and R_{it}^f Retirement dummies for the man and woman

X_{it} Control variables

v_{it}^j iid and independent of all $R_{it}^m, R_{it}^f, X_{it}$

α_i^j fixed (no assumption)

or

α_i^j random ($\sim N(0, \sigma_\alpha^{j2})$) and independent of all $R_{it}^m, R_{it}^f, X_{it}, v_{it}^j$)

The empirical model

- The model for home production using instrumental variable approach:

$$h_{it}^m = \mu^m + \beta_1^m R_{it}^m + \beta_2^m R_{it}^f + X_{it} \beta^m + \varepsilon_{it}^m$$

$$h_{it}^f = \mu^f + \beta_1^f R_{it}^f + \beta_2^f R_{it}^m + X_{it} \beta^f + \varepsilon_{it}^f$$

$$R_{it}^m = \mu_R^m + X_{it} \gamma_0 + \gamma_1 1[\text{age}_{it}^m \geq 60] + \gamma_2 1[\text{age}_{it}^m \geq 63] + \gamma_3 1[\text{age}_{it}^m \geq 65] \\ + \gamma_4 1[\text{age}_{it}^f \geq 60] + \gamma_5 1[\text{age}_{it}^f \geq 63] + \gamma_6 1[\text{age}_{it}^f \geq 65] + \eta_{it}^m$$

$$R_{it}^f = \mu_R^f + X_{it} \gamma_0 + \gamma_1 1[\text{age}_{it}^f \geq 60] + \gamma_2 1[\text{age}_{it}^f \geq 63] + \gamma_3 1[\text{age}_{it}^f \geq 65] \\ + \gamma_4 1[\text{age}_{it}^m \geq 60] + \gamma_5 1[\text{age}_{it}^m \geq 63] + \gamma_6 1[\text{age}_{it}^m \geq 65] + \eta_{it}^f$$

The equations are jointly estimated allowing for correlations between the error terms using simulated maximum likelihood. Retirement equations are defined as probit models.

*Results

Retirement and home production of couples: Linear models

	Men			Women		
	RE model	FE model	IV-MLE	RE model	FE model	IV-MLE
Retired	11.884*** (0.409)	10.731*** (0.461)	12.260*** (0.850)	9.176*** (0.424)	8.404*** (0.468)	10.383*** (0.957)
Spouse retired	-1.383*** (0.411)	-1.316*** (0.450)	-1.318 (1.042)	-2.079*** (0.422)	-2.211*** (0.461)	-1.859* (1.058)
Controls	yes	yes	yes	yes	yes	yes
Hausman test	$\chi^2(9) = 31.00$			$\chi^2(9) = 35.94$		
N	6,172	6,172	6,172	6,172	6,172	6,172

Note: IV-MLE is the estimation by simulated maximum likelihood and where retirement equations are specified as a probit model. The standard error of the IV-MLE are clustered at the individual level.

*** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

Results

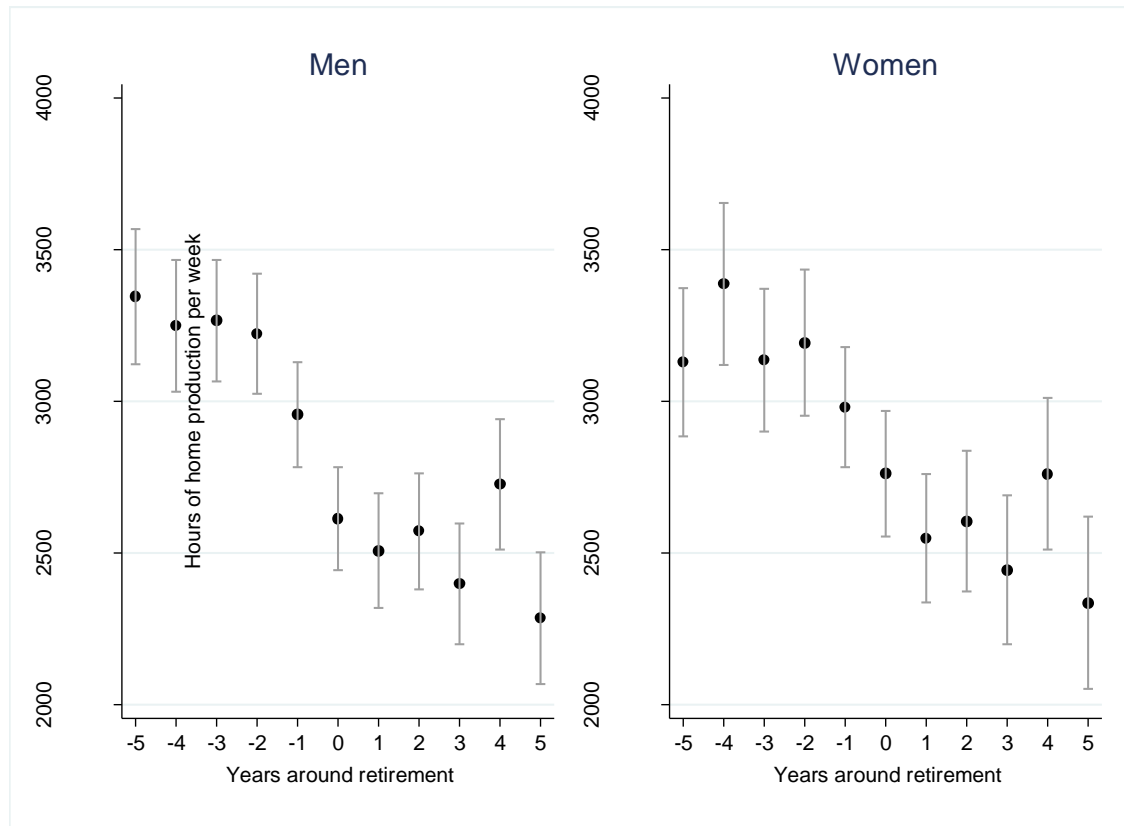
Retirement and components of home production of couples: Fixed effects linear models

	Men			Women		
	FE model			FE model		
	Housework	Errand	Repair/Garden	Housework	Errand	Repair/Garden
Retired	4.017*** (0.236)	2.595*** (0.177)	4.119*** (0.302)	4.586*** (0.311)	1.928*** (0.174)	1.891*** (0.219)
Spouse retired	-1.573*** (0.230)	-0.144 (0.173)	0.402 (0.294)	-1.717*** (0.306)	-0.406** (0.172)	-0.087 (0.216)
N	6,172	6,172	6,172	6,172	6,172	6,172

Note: *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses.

Does home production compensate for the income loss due to retirement?

Average monthly net household income around retirement.



Note: The dots represent the average monthly net household income and the vertical lines represent the 95% confidence interval.

Does home production compensate for the income loss due to retirement?

- Following Frazis and Steward (2011) and Frick et al. (2012), we use the replacement cost approach to value home production.
- Simple and transparent method: uniform imputed wage for home production.
- Following Frick et al. (2012), we impute a wage of 4 Euros/hour to approximate the hourly wage for informal employment in the private sector.
- We also use an alternative measure of 8.5 Euros/hour corresponding to the minimum wage just approved by the German parliament.

Does home production compensate for the income loss due to retirement?

Retirement and (logged) household resources of the household. Fixed effects models

	Fixed effects model		
	No home production	Home production valued at 4/hour	Home production valued at 8.50/hour
He retired	-0.139*** (0.012)	-0.054*** (0.009)	-0.008 (0.009)
She retired	-0.101*** (0.012)	-0.031*** (0.009)	0.007 (0.009)
N	5,660	5,660	5,660

*** p<0.01, ** p<0.05, * p<0.1

Standard errors in parentheses.

Preliminary conclusions

- Substantial effects of own retirement on home production.
- Significant but smaller effects of partner's retirement.
- FE and RE models often give similar results.
- IV results usually go in the same direction but are less precise.
- Despite spillover effect of spouses, home production compensates for the loss of income at retirement.

*First stage results

	Man Retired	Woman retired
1[Age>=60]	0.189** (0.082)	0.025 (0.088)
1[Age>=63]	0.214*** (0.080)	0.118 (0.081)
1[Age>=65]	0.300*** (0.099)	-0.083 (0.098)
1[woman's Age>=60]	0.033 (0.088)	0.413*** (0.083)
1[woman's Age>=63]	0.078 (0.106)	0.173* (0.100)
1[woman's Age>=65]	-0.197 (0.126)	-0.123 (0.127)
