Informal care, work and retirement- choices in conflict?

A structural model

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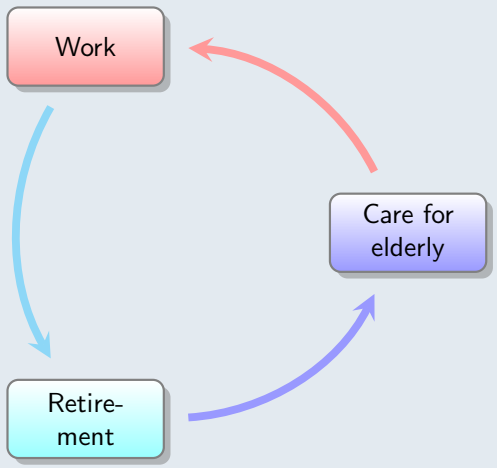
Motivation

Demographic change: problems from two directions

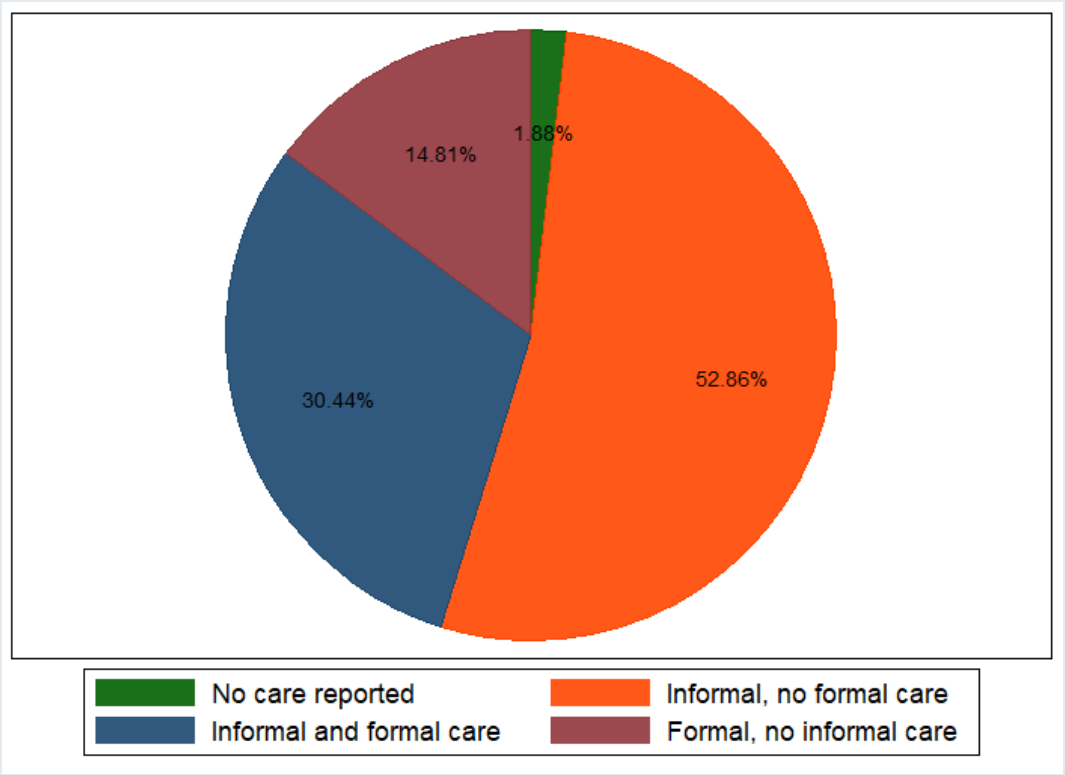
- Societal Aging: number of care dependent is rising
- 48% of care dependent are cared for informally
- Two thirds of informal care is provided by women
- Labor force participation in the elder population is rising

Connection between retirement and informal care and work



Care mix in Germany

- 75% of LTC costs in Germany were spend on formal support, while 52% are supported only informally.



Research question

Research questions

- Does rising labor supply participation crowd out the supply of informal care giving?
- Consequences of changes in the retirement ages?
- What is the role of incentive structure of the LTC system?
- How is the care mix influenced?

Empirical strategy

- Estimate dynamic structural DC model using SHARE data
- Agents (women) simultaneously choose to work, provide care (informal and/or formal to parents) and retire

Literature review

- Mainly research on the effect of care provision on labor supply (Van Houtven et al. (2013); Jacobs et al. (2017); Heitmueller (2007); Carmichael and Charles (2003) etc.)
- Several studies show mild effects, also of informal care provision on retirement behavior
- Literature started to focus on the care provision decision (Stern (1995); Jacobs et al. (2017); He and McHenry (2016); Doty et al. (1998); Fischer and Müller (2020); Bergeot and Fontaine (2020)) showing that there is a causal relationship between of retirement policy on care policy
- In order to recover underlying behavioral parameters (Skira, 2015; Geyer and Korfhage, 2015; Korfhage, 2019) have worked with structural models

Institutional system

Retirement system

- Later retirement benefits are reduced through part-time work
- Informal carers can collect pension points in times of care provision
- Early retirement reduces retirement benefits

Informal care system

- Care dependent can collect benefits and pass through to informal care takers
- Care system favours informal care
- Formal care options can be combined with informal care and benefits are granted accordingly
- LTCS does not fully cover costs

Behavioural Model

Discrete number of state dependent choices $D(s_t)$

Retirement ($R_t \in \{0, 1\}$) is an absorbing state, $H_t \in \{0, 1040, 2080\}$
$C_t \in \{nc, lic, hic\}$, with $Ch_t \in \{0, 364, 1092\}$, $FC_t \in \{nfc, fc\}$

Constraints:

$L_t = L_{max} - C_t - H_t$
$Y_t = H_t w_t + A_t + SI_t + pension_t + UB_t - Tax_t - SSC_t + CB_t - Cfc_t$

Flow utility

$$u_t(s_t; d_t; m; \theta) = u_t^1(s_t; d_t; m; \theta) + \mathbb{1}(C_t \notin \{nc\}) u_t^2(s_t; d_t; m; \theta) + \epsilon_t(d_t)$$

Flow utility

Income and leisure

$$u_t^1(s_t; d_t; m; \theta) = \theta_1 ln(aY_t) + (\theta_L + \theta_3(age_t - 55))ln(L_t)$$

Caring

$$\begin{aligned} u_t^2(s_t; d_t; m; \theta) = & \\ & (\theta_{C1})\mathbb{1}(C_t \in \{lic\}) + \\ & (\theta_{C2})\mathbb{1}(C_t \in \{hic\}) + \\ & \theta_{fc}\mathbb{1}(C_t = fc) - \\ & \theta_{cc}\mathbb{1}(C_t = fc \& C_t = ic) \end{aligned}$$

Agents maximize current and expected future utility

Bellman equation

$$\max_{d_t \in D(s_t)} E_d \left\{ \sum_{j=t}^{T} \rho_t \beta^{j-t} u_j(s_j, d_j, \theta, \epsilon_j) | d_{t-1}, s_t, m, \epsilon_t \right\}$$

Transition probabilities / income processes

- Constant: education, spouse, region, type, distance to parents, siblings
- Deterministic: age, work experience, care years
- Estimated outside model: wage, care demand, job offer (latent variables), spouse's income, non-labor income,
- Estimated inside the likelihood function: Utility parameters

s = state space vector ρ = survival probability β = discount factor θ = parameter vector

Figure: Care mix by health; unconditional left, conditional on outside care received right (SHARE data)

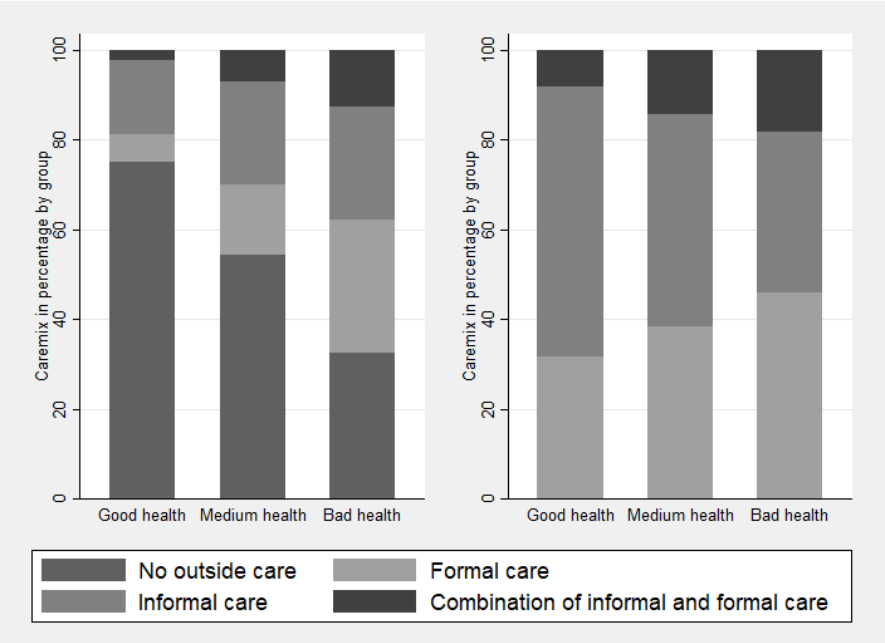
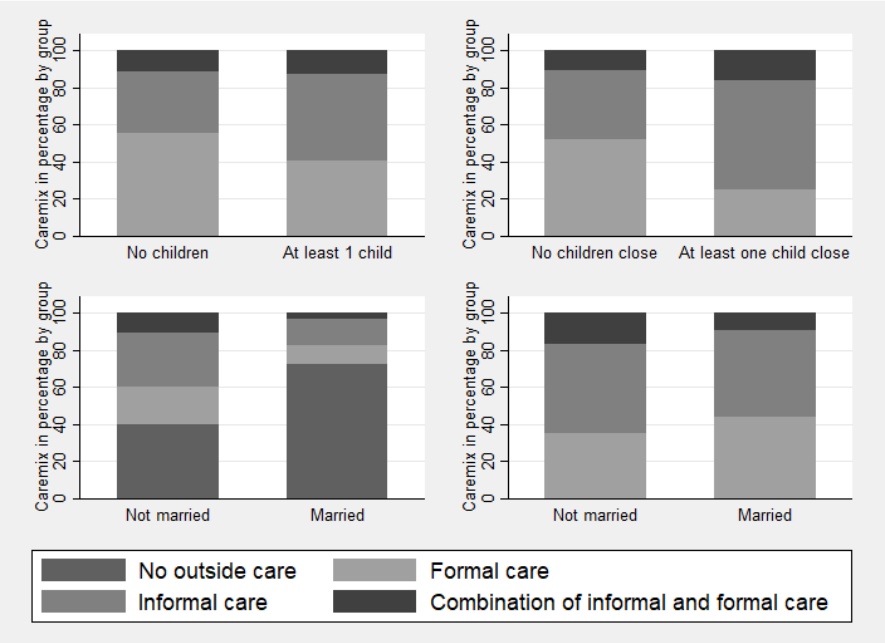


Figure: Care mix by children, child distance and marriage status (SHARE data)



Formal Care demand- a two step process

Step 1:$P(ADL)$ estimated in SHARE data

$$P(ADL_p|health_p; age_p)$$

Step 2: Care demand estimated in SHARE data- outcome: formal care used in the household

$$CD_{fc,t} = CD_{fc,t}(P(ADL_m); P(ADL_f); malive\&falive; \lambda)$$

Informal Care demand

Care demand estimated in SHARE data- outcome: informal care used in the household

$$CD_{ic,t} = CD_{ic,t}(fhealth, mhealth, fage, mage, sibl, pdist; malive\&falive; \lambda_1)$$

SHARE data

- SHARE respondents inform about labour supply, retirement and many socio-economic variables
- SHARE data incorporates information on informal care to different groups
- Respondents give information on parent's health and age
- Construct estimation data-set on women aged 55-68
- Construct parental data-set on all aged 69 and older

▸ Table

Estimation

- Estimate probability of a ADL at elder generation including health and age
- SHARE does not provide information on formal care for parents at children's side; need to estimate this on the side of parents and impute
- Estimate probability of formal care at elder population including health, age, existence of children and distance to children, labor market status of children for prediction/imputation
- Use SHARE data to estimate utility parameters applying Maximum Likelihood

Care demand in the sample

- Elder population information on problems with ADLs and IADLs are used to estimate care demand probability parameters

Care mix in SHARE

Figure: Care mix for elder generation in SHARE

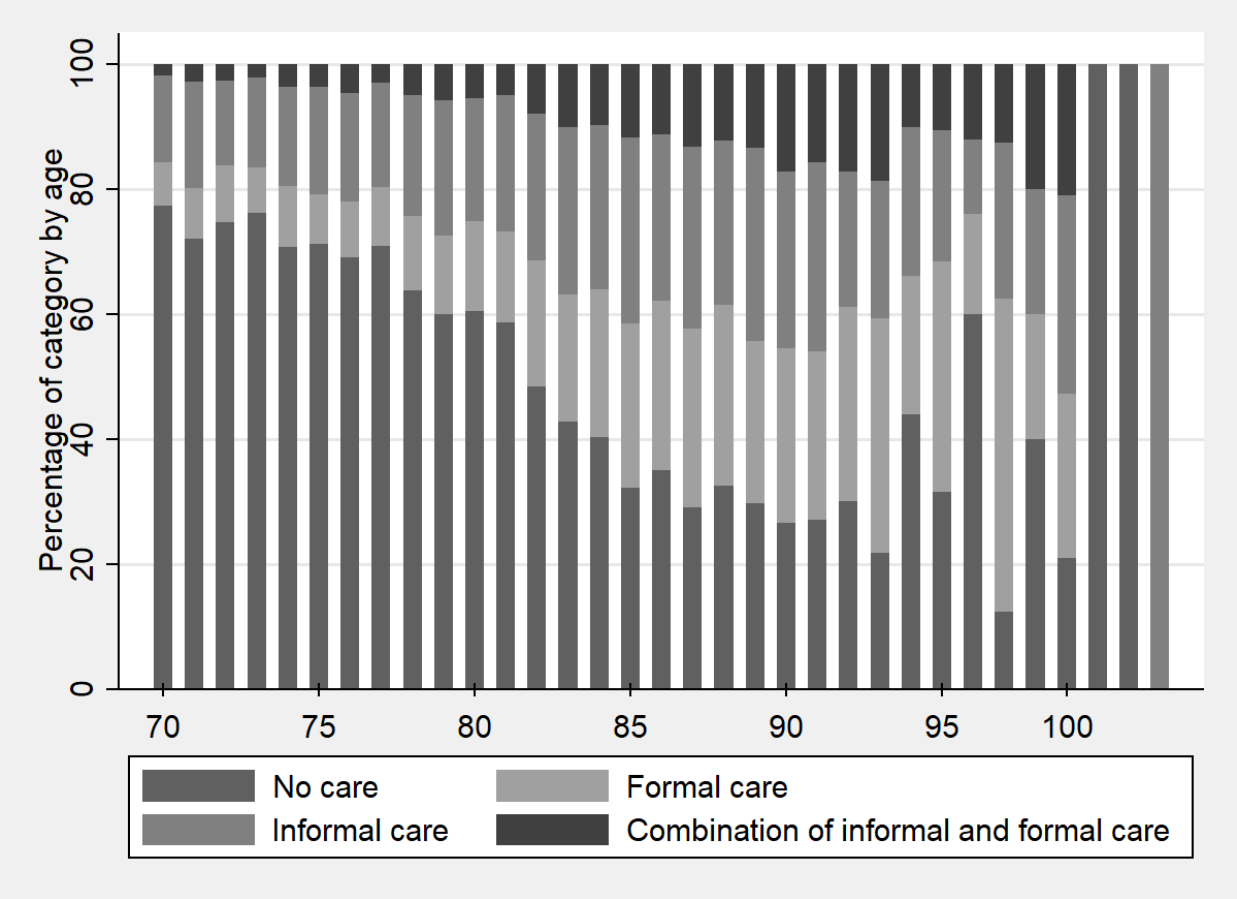


Figure: Care mix in estimation data by age of agent

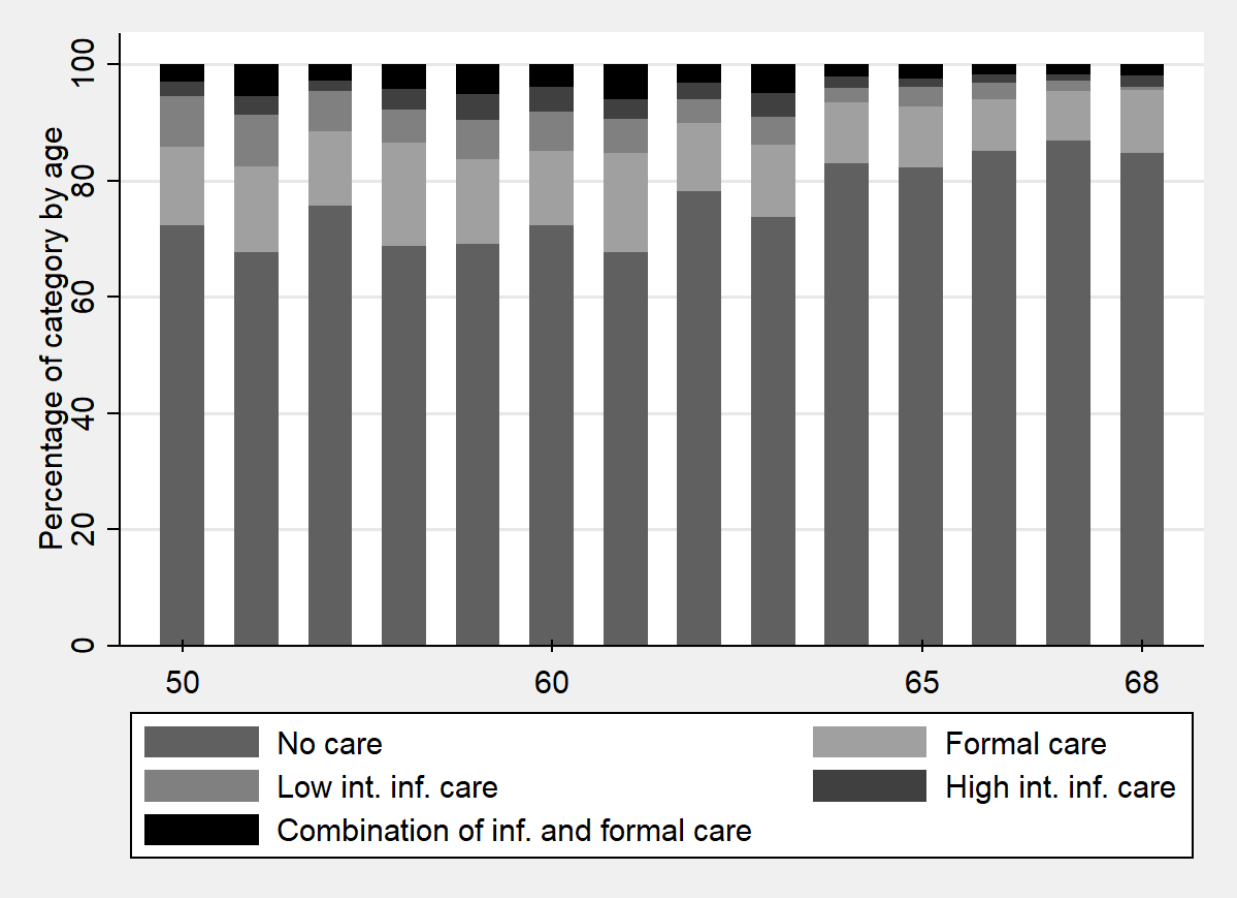


Figure: Main choices

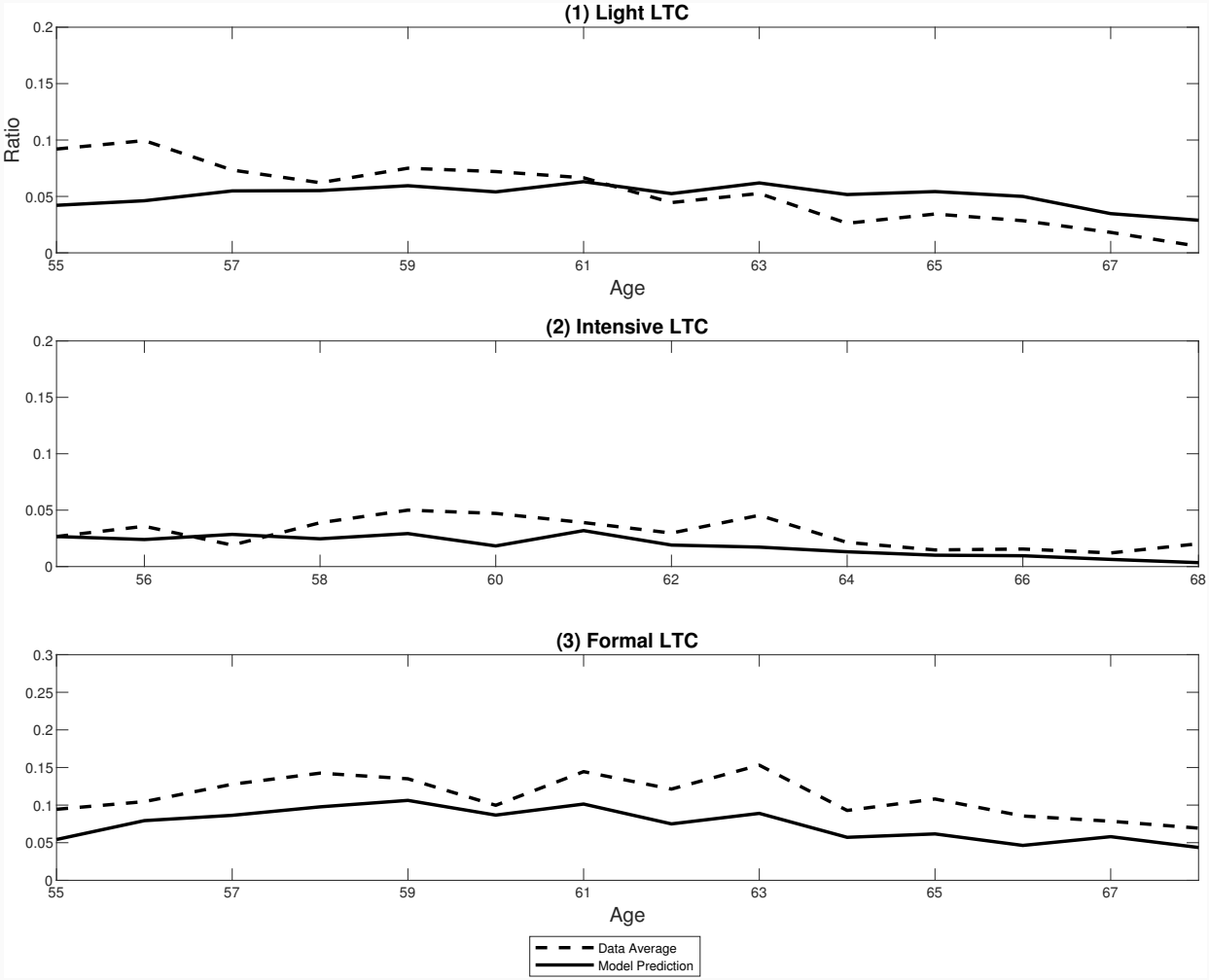
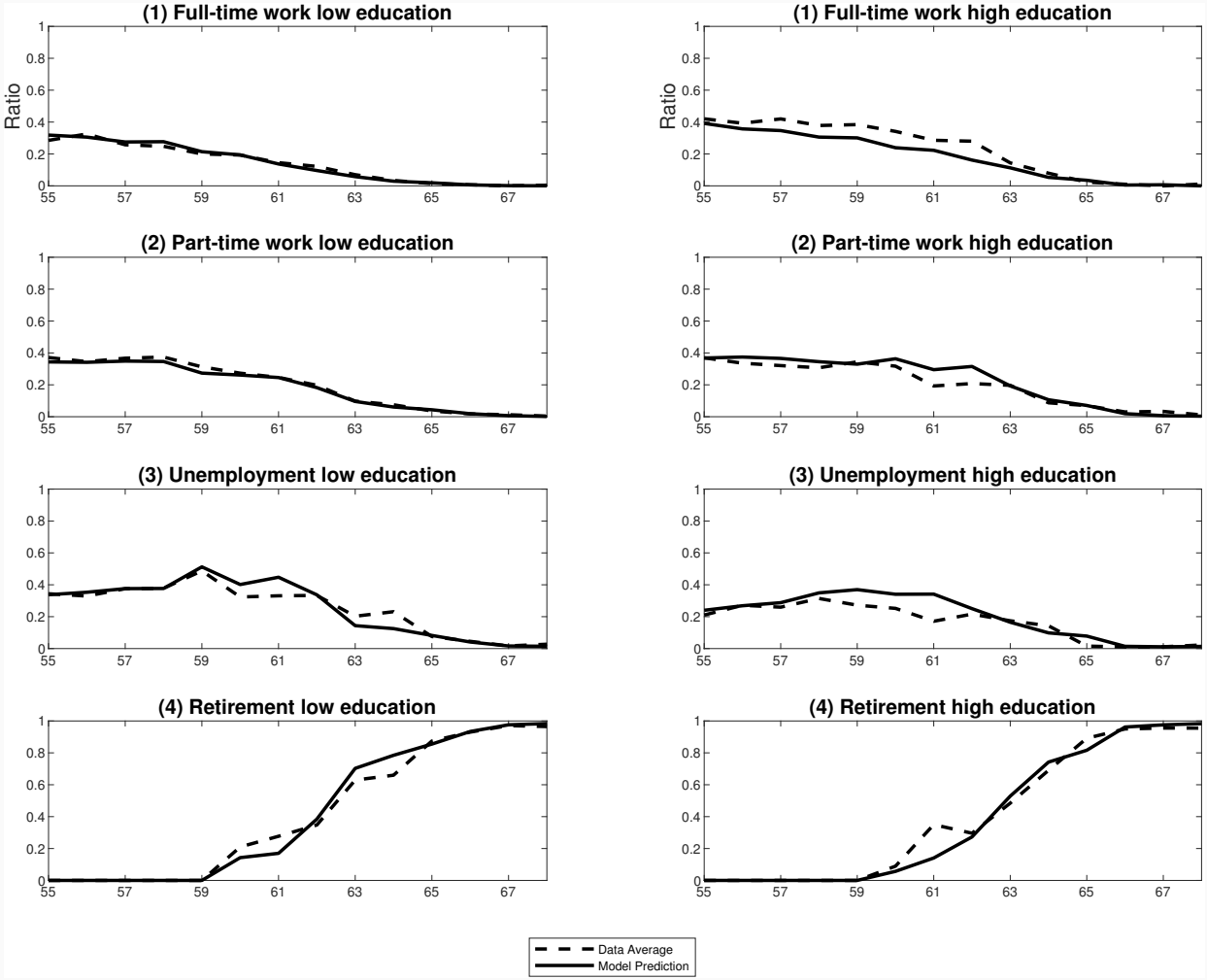
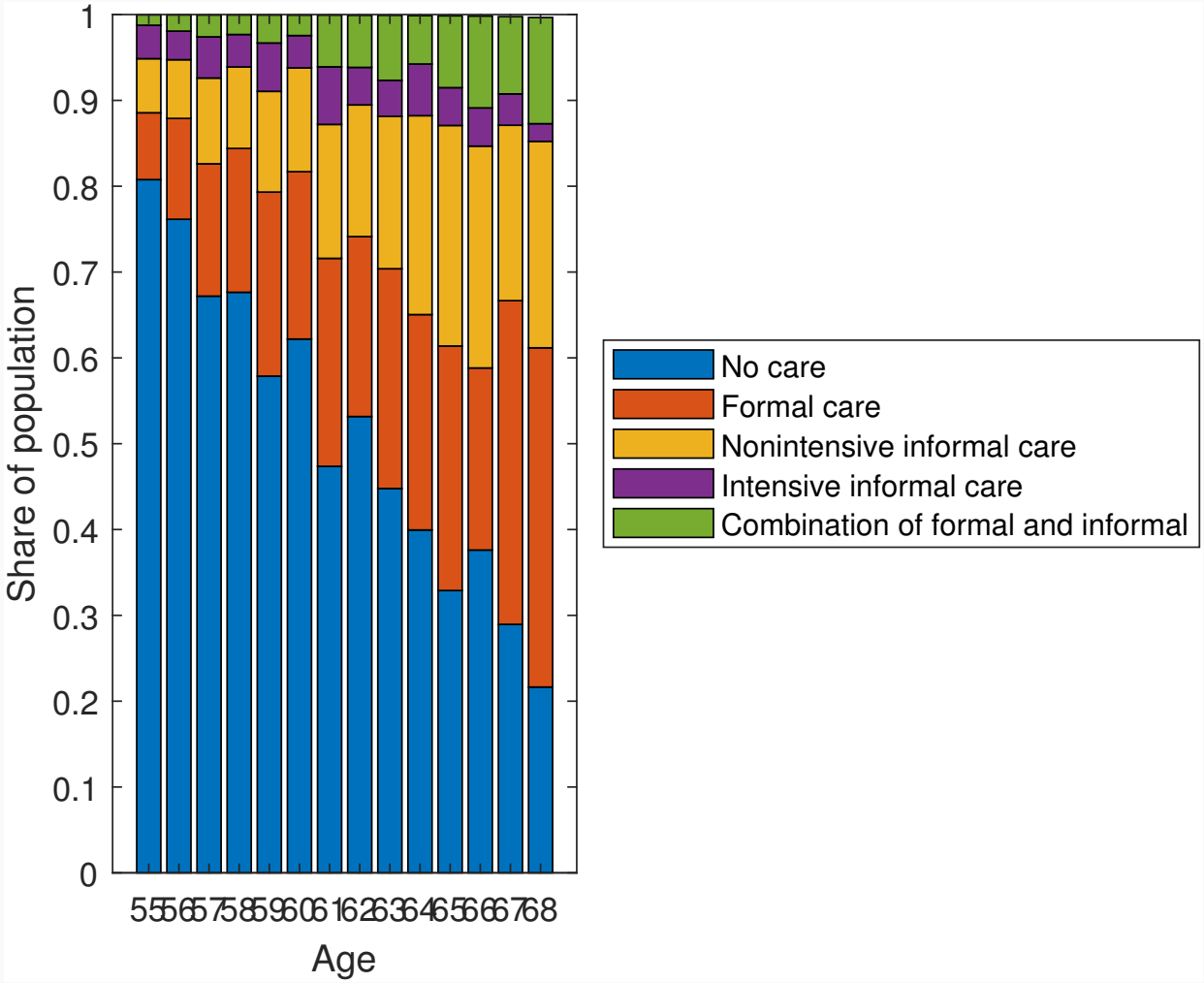


Figure: Labour choices



Model fit

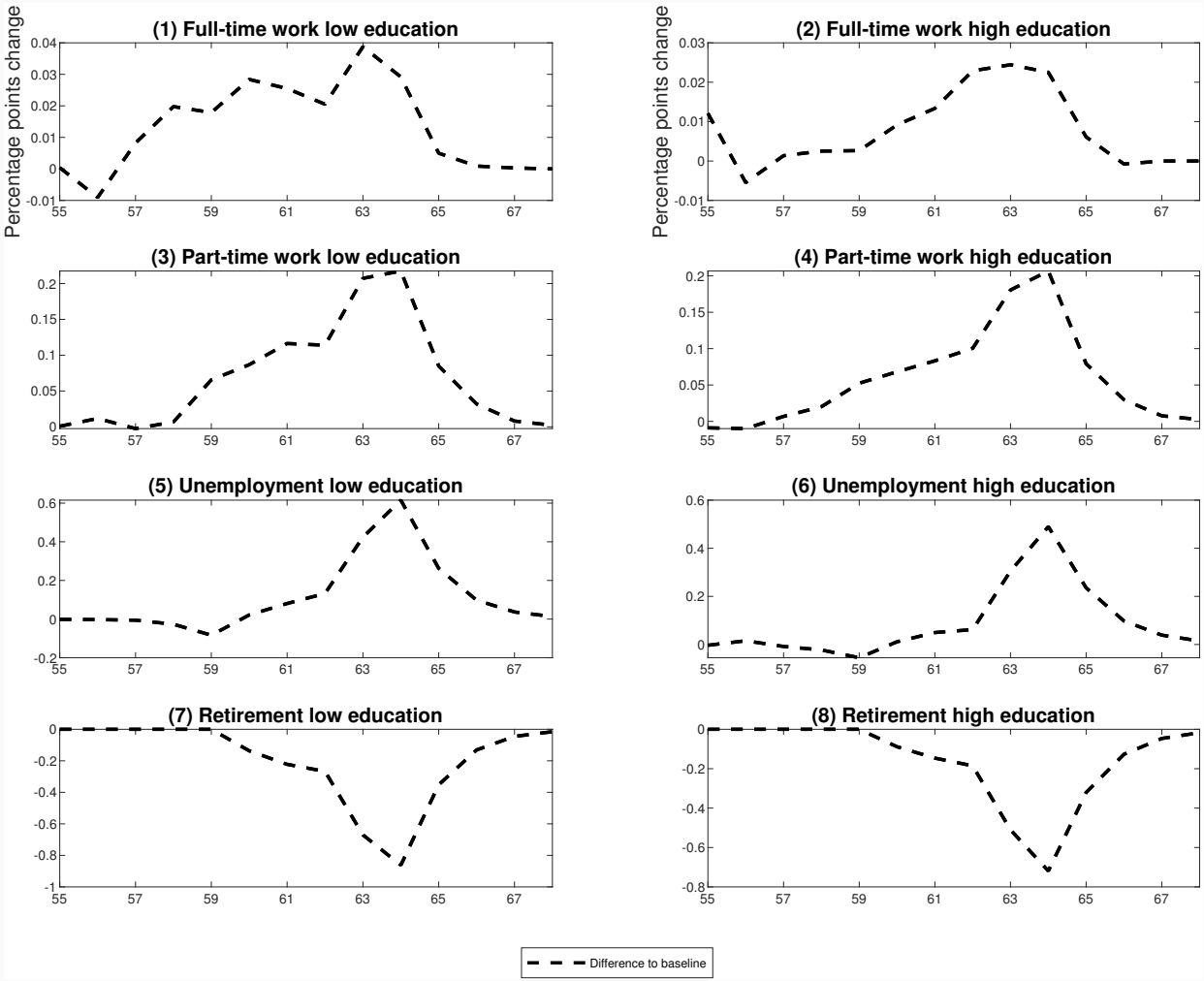
Figure: Care choices



Simulations

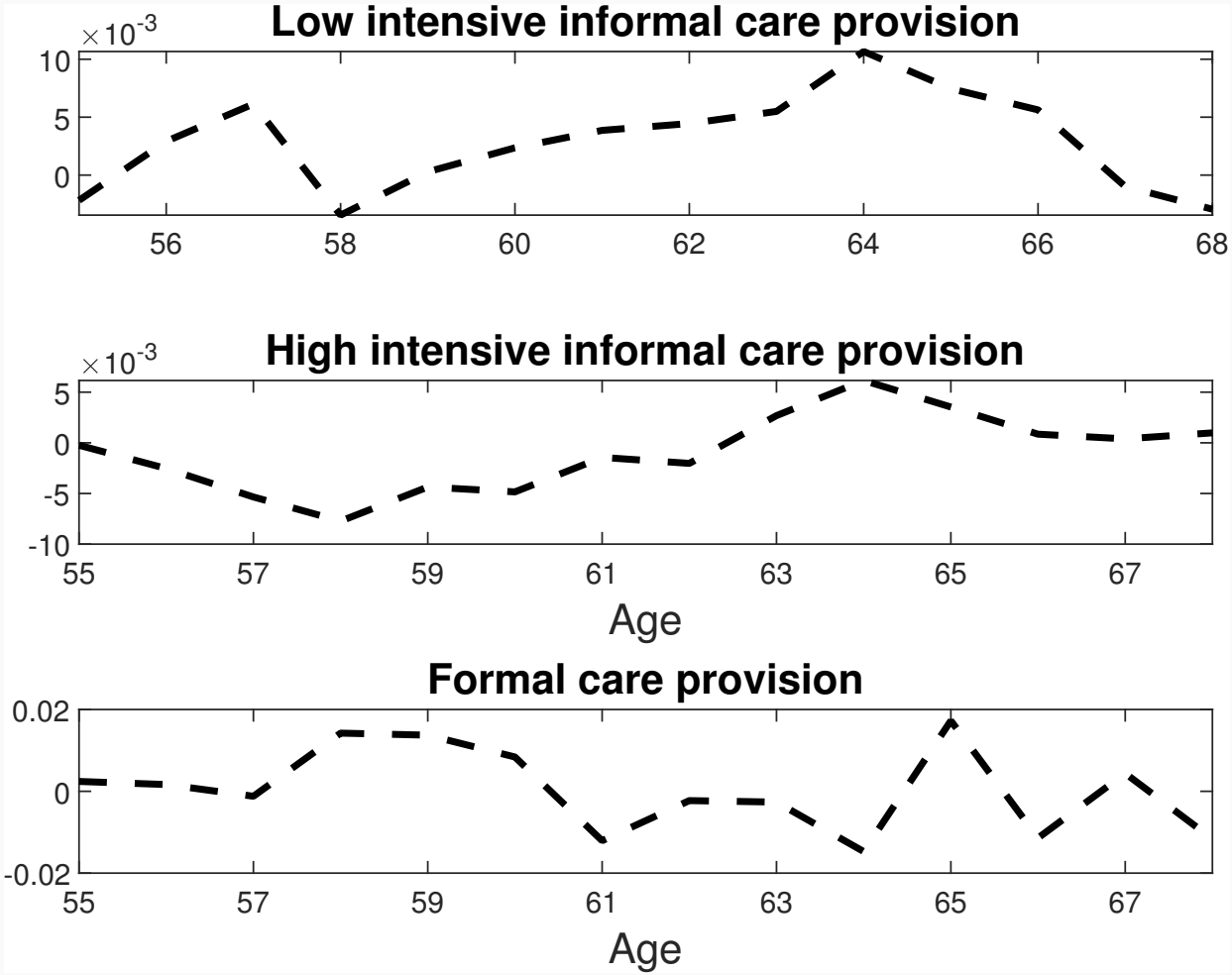
- ERA is set to age 65 (NRA to 67 for all)

Figure: Work choices



- Informal care hours are reduced by 10%

Figure: Care choices



Conclusion and outlook

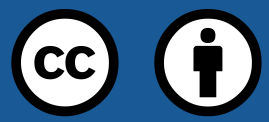
Conclusion

- Retirement and care system are connected through institutional setting already
- Changes in retirement system can impact care provision
- The care mix can be impacted
- Labour market frictions matter

Outlook

- Calculate fiscal effects
- Calculate NPV effects
- Calculate welfare effects

Thanks for your attention.



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