



Introduction and Research Questions

Many countries are facing aging societies meaning that the share of elderly has increased over the last decades. This development poses many challenges for social welfare systems. One of which is that alongside the increase in the share of elderly we see that public expenditures on elderly care has also increased tremendously. As such, there have been an emerging debate about:

1. What type of elderly care policies are (cost-)effective from the government's perspective?

- Not straightforward to answer! Many factors play a role:
 - Types of elderly care: **Formal care** (nursing homes + home care) vs. **informal care** (family-provided)
 - Individuals face trade-offs btw. formal and informal care:
 - Price: Fees of formal care vs. opportunity costs on the labor market for informal caregivers
 - Health: Effect of formal vs. informal care on the senior's health
 - Governments face similar trade-off:
 - Labor responses among informal caregivers translate into labor tax payments
 - Health of the elderly is a large share of public expenditure

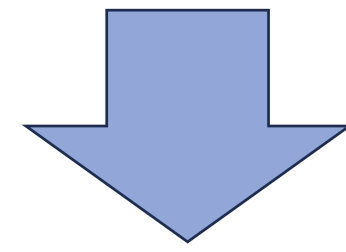
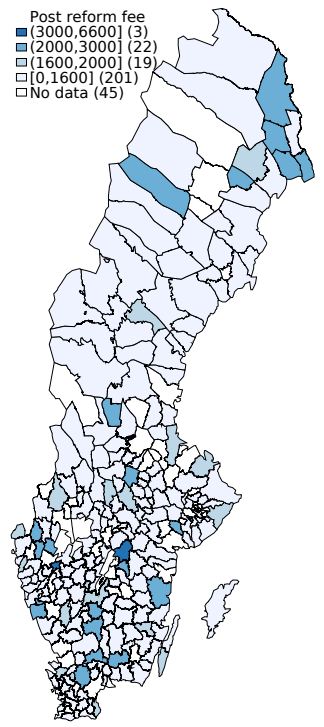
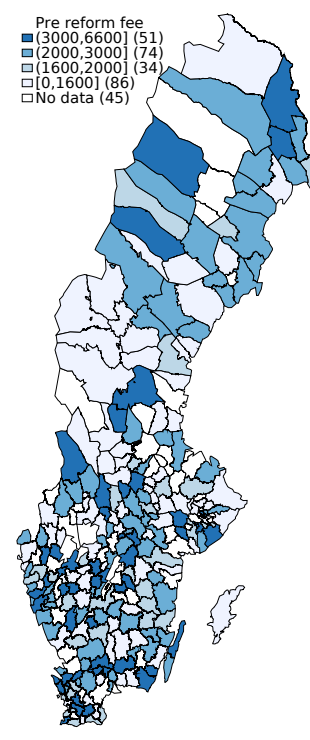
2. What is the optimal subsidy for formal elderly care?

- In our paper we estimate the effect of a change in the price of formal elderly care on
 - Formal care utilization
 - Seniors' health outcomes
 - Children's labor supply
- We then evaluate welfare implications using the Marginal Value of Public Funds framework

How do we answer this Question?

Institutional Setting "High-cost" Protection Reform in Sweden

Before the reform: 290 municipalities of Sweden are in charge of offering formal care (home care + nursing homes), allocating care, and setting the fee schedule. As a result of that, formal care fees vary up to 10k SEK per month between municipalities.



After the reform: Variation in fee schedule is considered as unfair by Swedish government ⇒ Introduce unification of fee schedule in 2002. Fees are capped at a maximum of 1,544 SEK per month which forced many municipalities to reduced fees for formal elderly care.

Data Combine Swedish register data with survey data

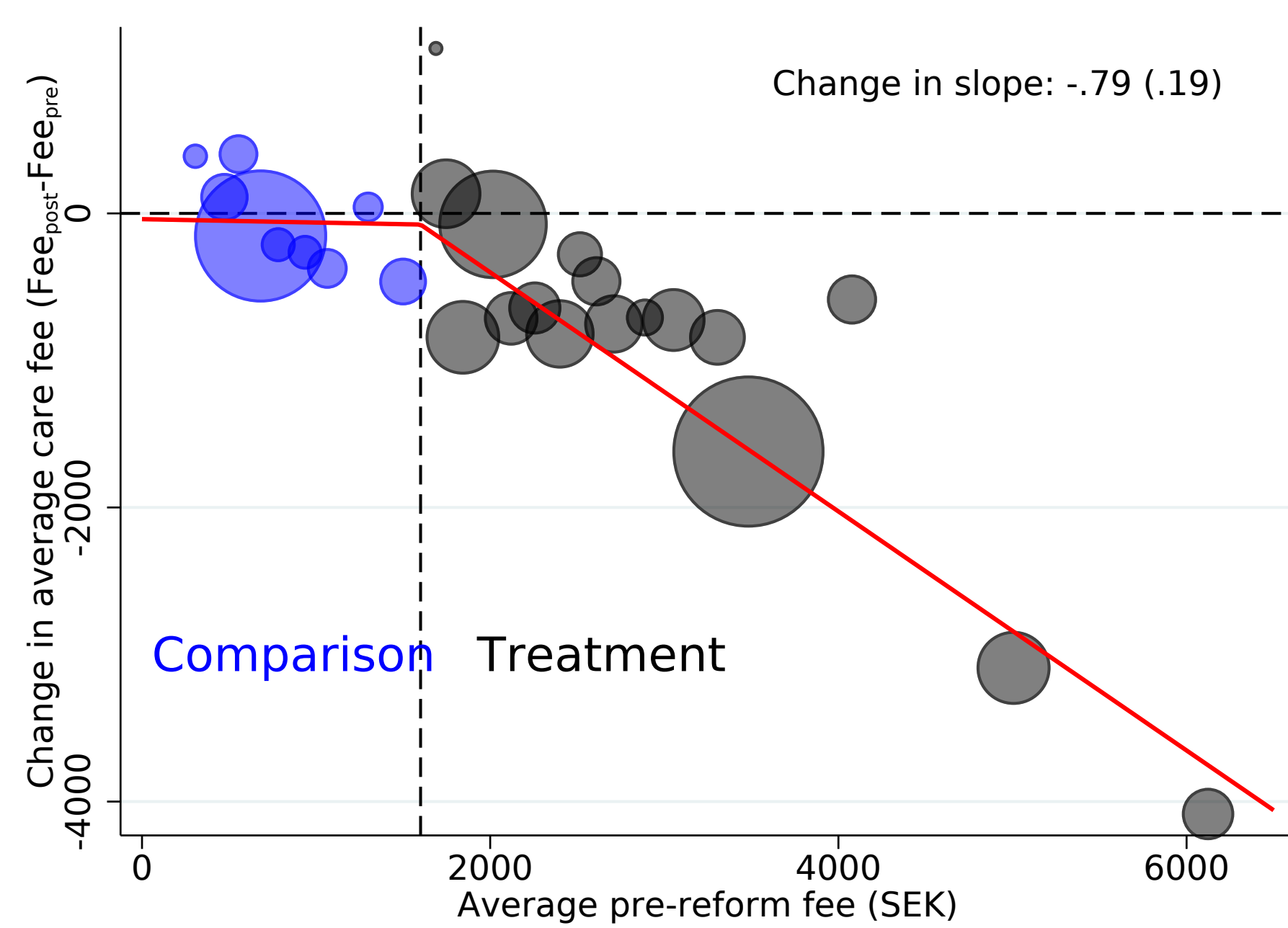
- Fee measure: $Care - Fee_{mt} = \frac{\text{Revenue Special Housing}_{mt}}{\# \text{Individuals in Special Housing}_{mt}}$ in municipality m in year t
- Municipality level data (1998-2010): Fees in formal elderly care (home care + nursing homes), number of individuals in home care and nursing homes, hour brackets in home care
- Individual level data (1996-2010): Health outcomes, employment history, family links

Empirical Strategy: Dynamic Difference-in-Differences

$$Y_{it} = \beta_0 + \beta_1 P_t + \beta_2 D_{m(i)} + \sum_{t=1996}^{2010} \beta_t P_t \cdot D_{m(i)} + \beta_4 X_{it} + \underbrace{(\theta_i)}_{\text{Individual FE}} + \epsilon_{it} \quad (1)$$

Health of senior
Labor supply of child

Figure 1. Treatment Definition



- Treated if senior lives in a municipality with average pre-reform fee > 1,544 SEK/month.
- We find that fees for formal care drop on average by 1400 SEK/month in treated municipalities.

Sample: Balanced sample of seniors and their children

- Seniors: Individuals aged 80+ in 2001 (allowing for attrition due to death)
- Children: Individuals with parent aged 80+ in 2001 ⇒ Select main parent per individual (alive, older parent)

Conclusion

Subsidizing fees in elderly care lead to

- Increased utilization of formal elderly care (nursing homes and home care)
- Decrease in hospitalizations for affected seniors
- Increases in labor supply of children

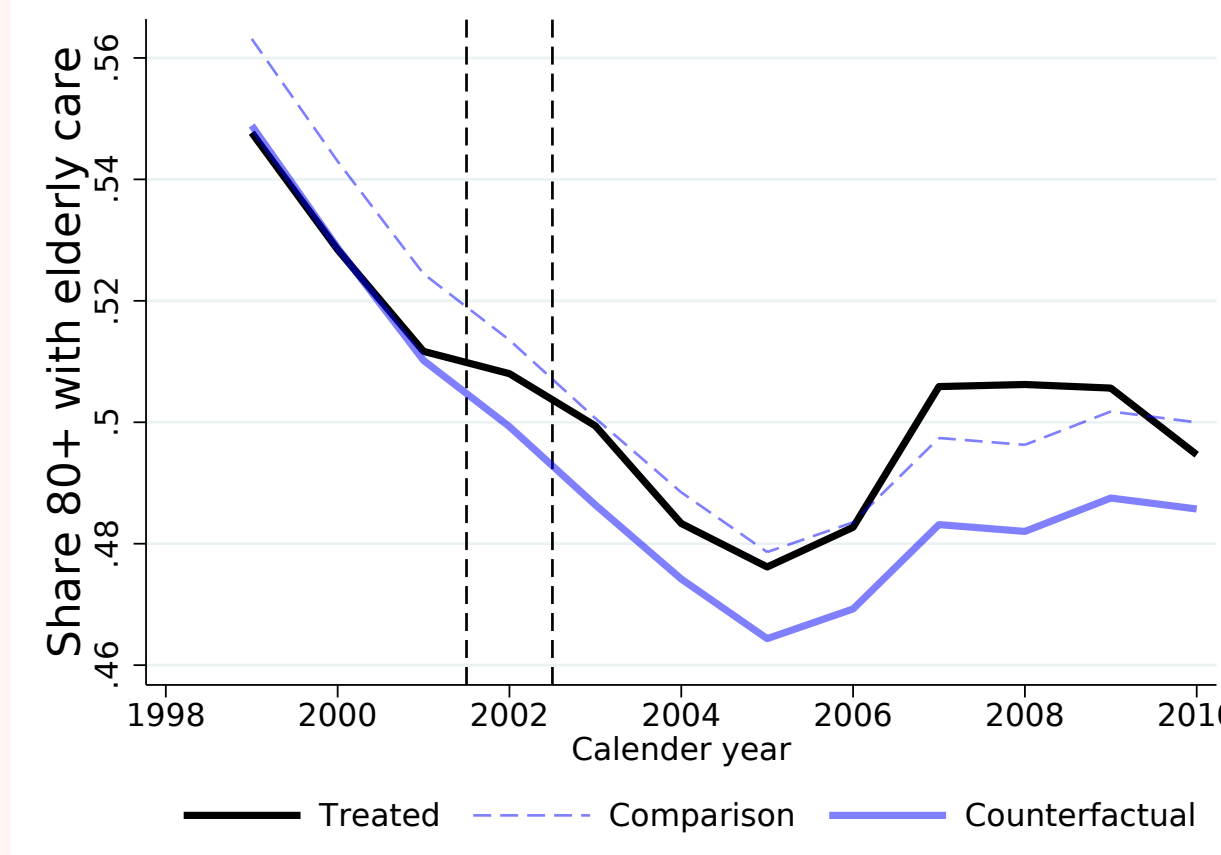
Cost-benefit analysis:

- Costly in the short-run
- Self-funding in the long run due to positive labor supply responses among affected children

Results

1. Does subsidizing elderly care increase the take-up of formal elderly care?

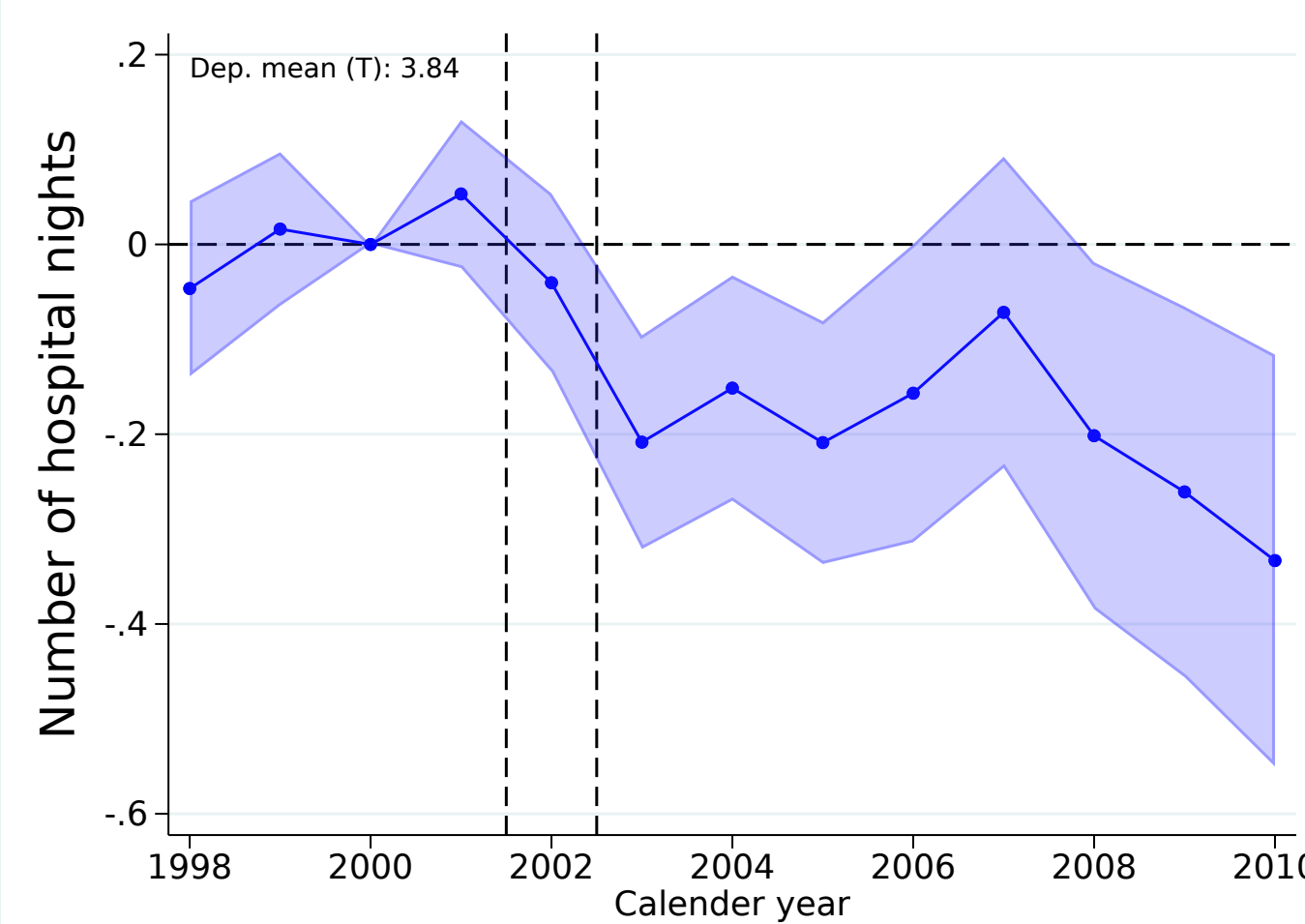
Figure 2. Share of elderly in any type of care by treatment status



- Yes! We find that the share of elderly above the age of 80 in formal care increases by 3.5% relative to the comparison group when facing the reduction in fees.
- This is driven by 3.8% increase in the share of 80+ in nursing homes, no response on home care along the extensive margin, but a 3.7% increase in the hours of home care conditional on having home care.

2. Does subsidizing elderly care affect seniors' health outcomes?

Figure 3. Effect on hospitalizations



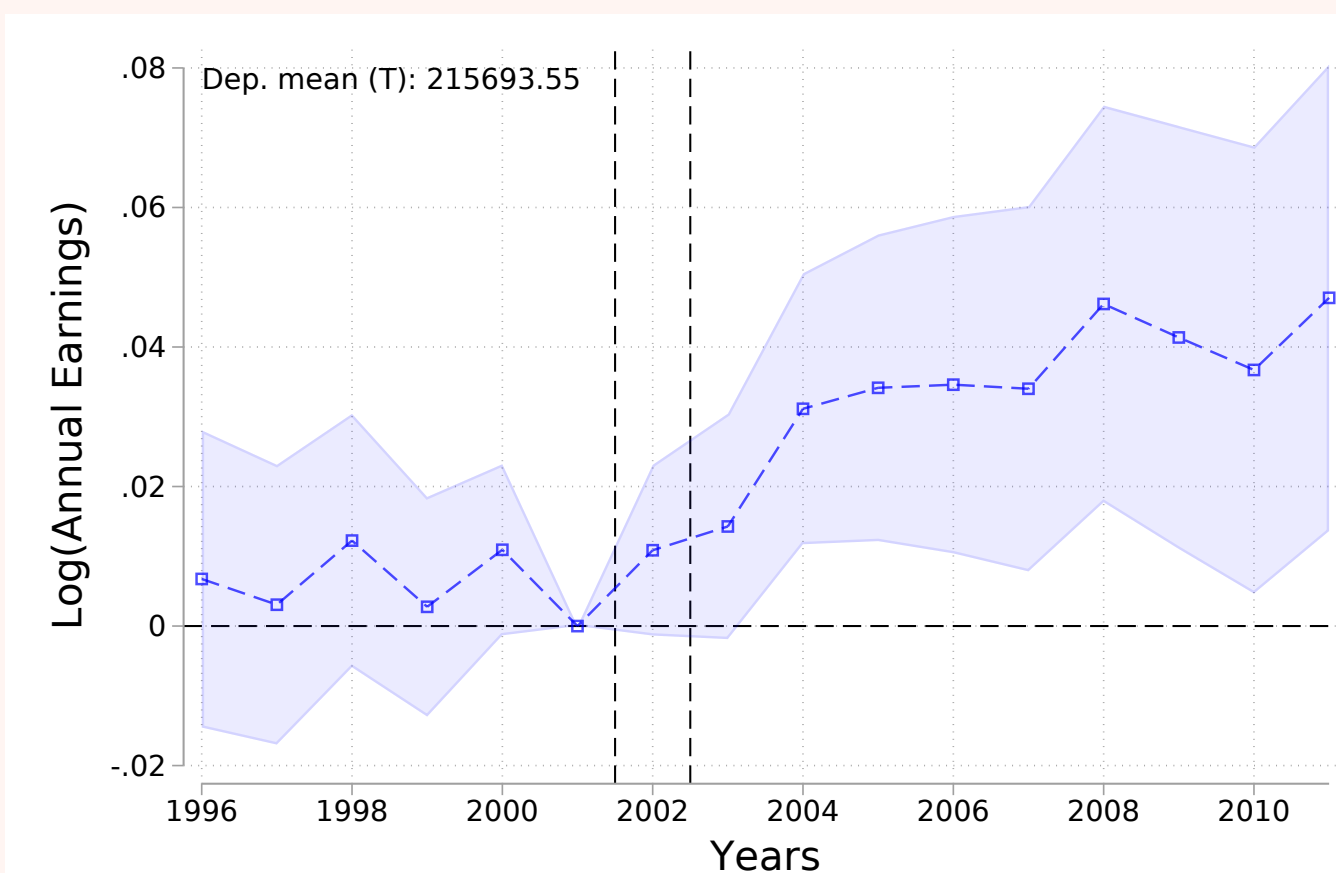
- Yes, treated seniors experience 4% less hospitalizations that require at least one overnight stay at the hospital.
- We find larger responses for conditions such as injuries, infectious diseases, and mental disorders, suggesting that the drop in hospitalizations is driven by preventable causes.
- But we do not find an effect on mortality.

Who are the price-sensitive seniors?

- Heterogeneity analysis reveals that seniors respond more to the price change if they are (i) in poor health, (ii) have children or (iii) have a spouse, suggesting that those responding are those that would have access to informal care otherwise.

3. Does subsidizing elderly care affect children's labor supply?

Figure 4. Effect on annual children's earnings



- Yes, we estimate that children whose parents are affected by the reform increase annual earnings by 3%.
 - Extensive margin: 0.6% more likely to be gainfully employed.
 - Intensive margin: 1.7% higher earnings conditional on positive earnings.

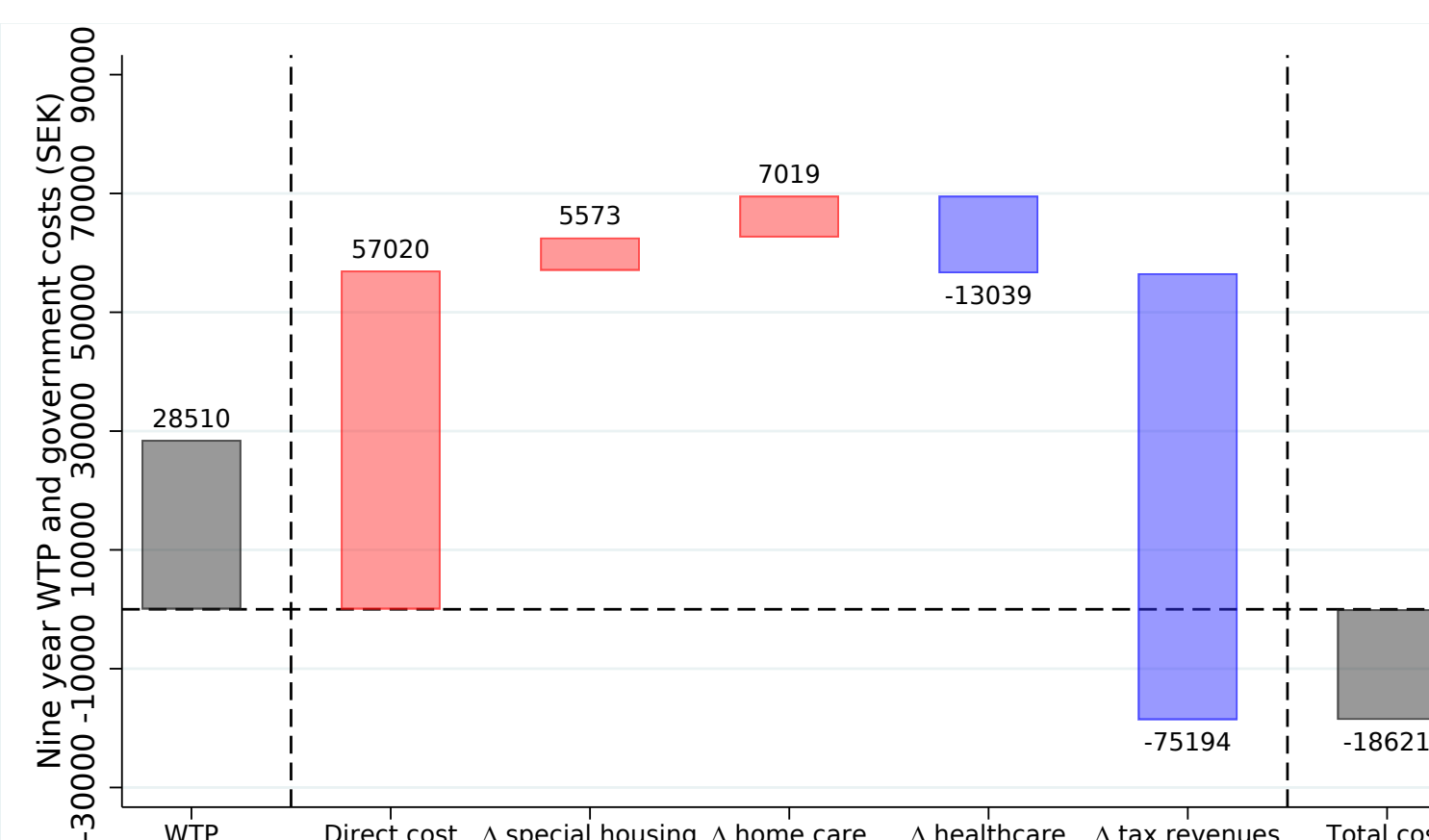
- Mechanism:
 - Daughters delay (partial) retirement
 - Sons work in higher-paying firms

Who are the price-sensitive children?

- We find larger responses for (i) only children, (ii) children with parents in poor health, and (iii) high-income children.
- Interestingly, the average long-term earnings effect is similar for both sons and daughters, challenging the conventional view that only daughters take responsibility for the informal long-term care of parents. However, sons are more likely to respond when being an only-child or in families with no sisters.

4. Is subsidizing elderly care cost-effective?

Figure 5. Government's cost of the subsidy after 9 years (MVPF components)



- Not in the short-run, but yes, the policy becomes self-funding¹ after nine years.
- Why do the costs turn negative? Behavioral changes in hospitalizations and labor supply lead to governmental savings from reduced public spending on healthcare and additional tax revenue from labor earnings. These increases outweigh the direct cost of the subsidy to the infra-marginal care recipients and the additional costs of behavioral changes in increased elderly care take-up.

1 Definition: MVPF is calculated as: (Hendren and Sprung-Keyser, 2020)

$$MVPF = \frac{\text{Beneficiaries' WTP}}{\text{Net cost to the Government}} = \frac{\Delta W}{\Delta E + \Delta C}$$

where

- ΔW is the benefits to its recipients measured as the willingness to pay (WTP)
- ΔE captures the government's direct expenditure on individuals affected by the policy change
- ΔC denotes the indirect costs stemming from behavioral changes due to the policy

⇒ If $\Delta E + \Delta C < 0$ and $\Delta W > 0$, then MVPF is defined as infinite ⇒ self-funding policy