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WIFO (Austria)
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MicroWELT: Distributional effects along the lifecycle

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Oultine

1. The microWELT dynamic micro simulation model and main results
2. A relevant input: NTAs by family type and education level
3. Next Steps

1. MicroWELT.... Context Weltransim Project

- Weltransim project – Joint Programming Initiative “More Years, Better Lives” – Horizon 2020
 - Who pays for longer lives?
 - Comparative analysis of welfare transfers in 4 welfare state regimes (ES, AT, FI, UK) in the context of
 - - Population **ageing**
 - - Longer lives and **life expectancy differentials** by education
- Project duration: 2017-2020
- University Barcelona (UB) – Coordinator
Austrian Institute of Economic Research (WIFO)
Finish Institute for Economic Research (VATT)
Finnish Centre for Pensions (FCP) - NTA Finland

microWELT – Design & Development Steps

- Design:
 - Highly modular and refineable modeling platform
 - Fully (self-) documented step-wise implementation
 - Builds on existing tools in EU:
 - Starts from EUROMOD (SILC data) static tax-benefit model
 - Applies dynamic microsimulation tool to make EUROMOD **dynamic** in a styled way
- **MicroWELT-POP:** Detailed socio-demographic projections including:
 - Family histories
 - Fertility by education, focus on concentration of reproduction: 1st child (or childless), 2nd...
 - Partnerships: realistic careers reproducing observed patterns by education, age of youngest child, and education. Matching
 - School enrolment + intergenerational transmission of education.
 - Mortality by education: life expectancy differences
- **MicroWELT-NTA:**
 - Input parameter: Disaggregated longitudinal NTA accounts by education and family type
 - Macro module: Reproduces available macro projections with NTA accounts and indicators (Lee and Mason, 2017 Agenta Keynote WP and Lee et al. 2017 PDR on Full Generational Accounts)

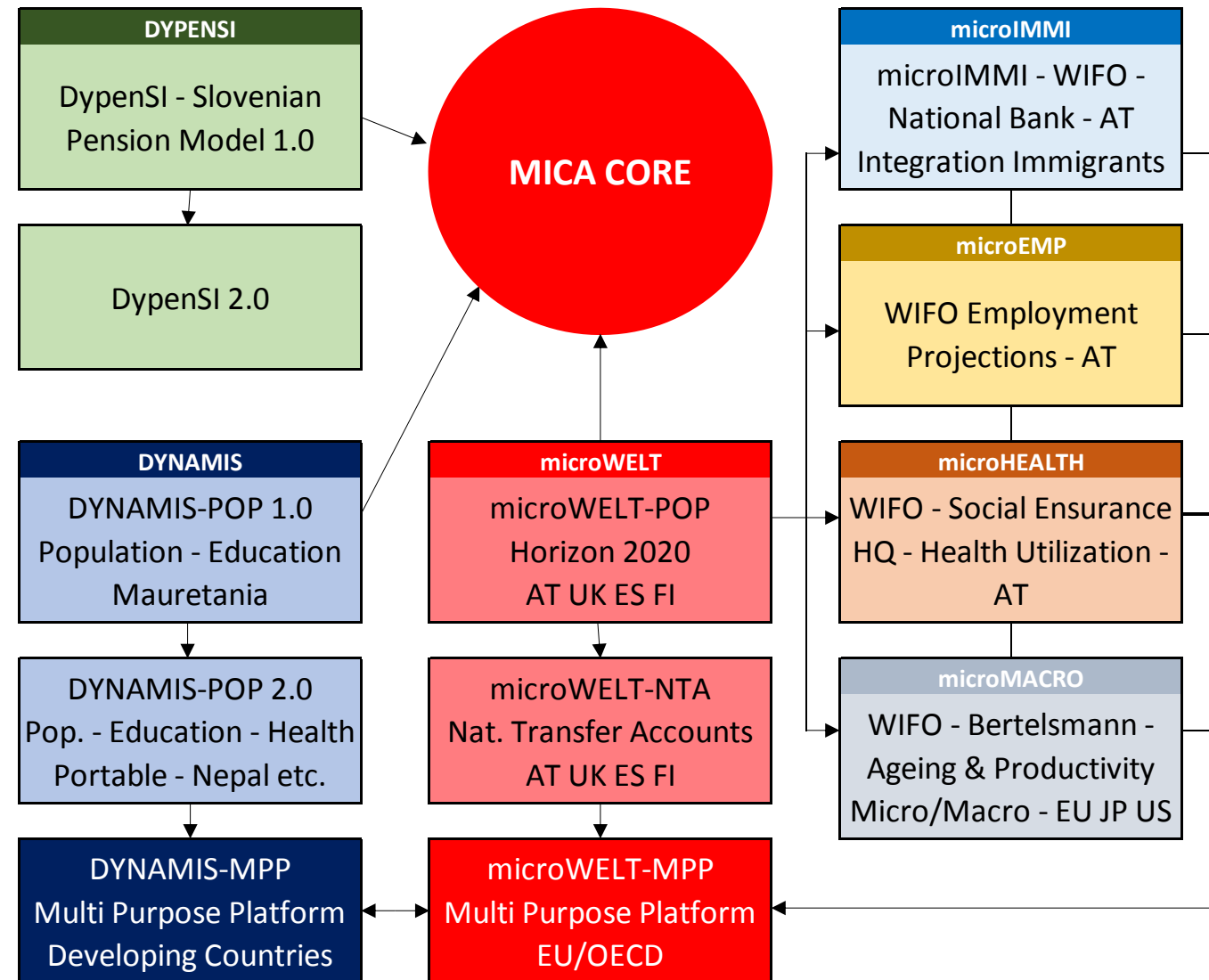
microWELT - Architecture

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- MicroWELT is a **MICA** model
 - **M**odgen / openM++
 - **I**nteracting Population
 - **C**ontinuous Time
 - **A**ignable
- Cross-fertilization & synergies within **MICA** family
 - Common core
 - Shared modules
- Intended to become a multi-purpose **modeling platform**



microWELT – some more details

MicroWELT-POP:

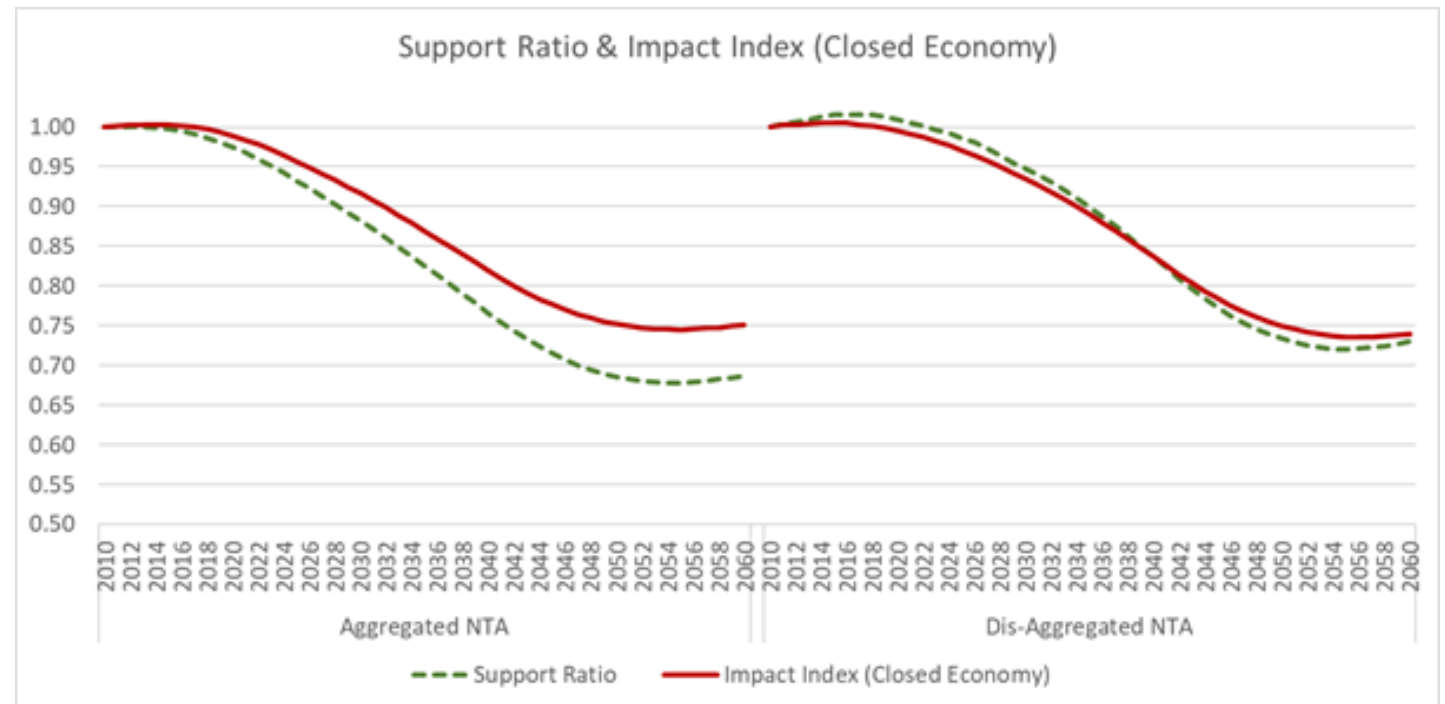
- **Education:** primary, secondary, post-secondary
- **Family/education groups**
 - Children 0-16 by parents education
 - Students 17-25 by parents education
 - Non-Students 17-25 by sex, education, partner, presence/age children
 - Adults 26-59 by sex, education, partnership, presence/age children
 - Adults 60+ by sex, education, childlessness

MicroWELT-NTA: Lee & Mason 2017

- Simple Cobb Douglas economy without innovation
- Fixed capital stock and saving rates by age as today
- Two versions: open economy, closed economy
- Adjusting/not taxes and/or benefits to balance budget
- Support Ratio and Impact Index

microWELT-NTA – Outcomes (Spain)

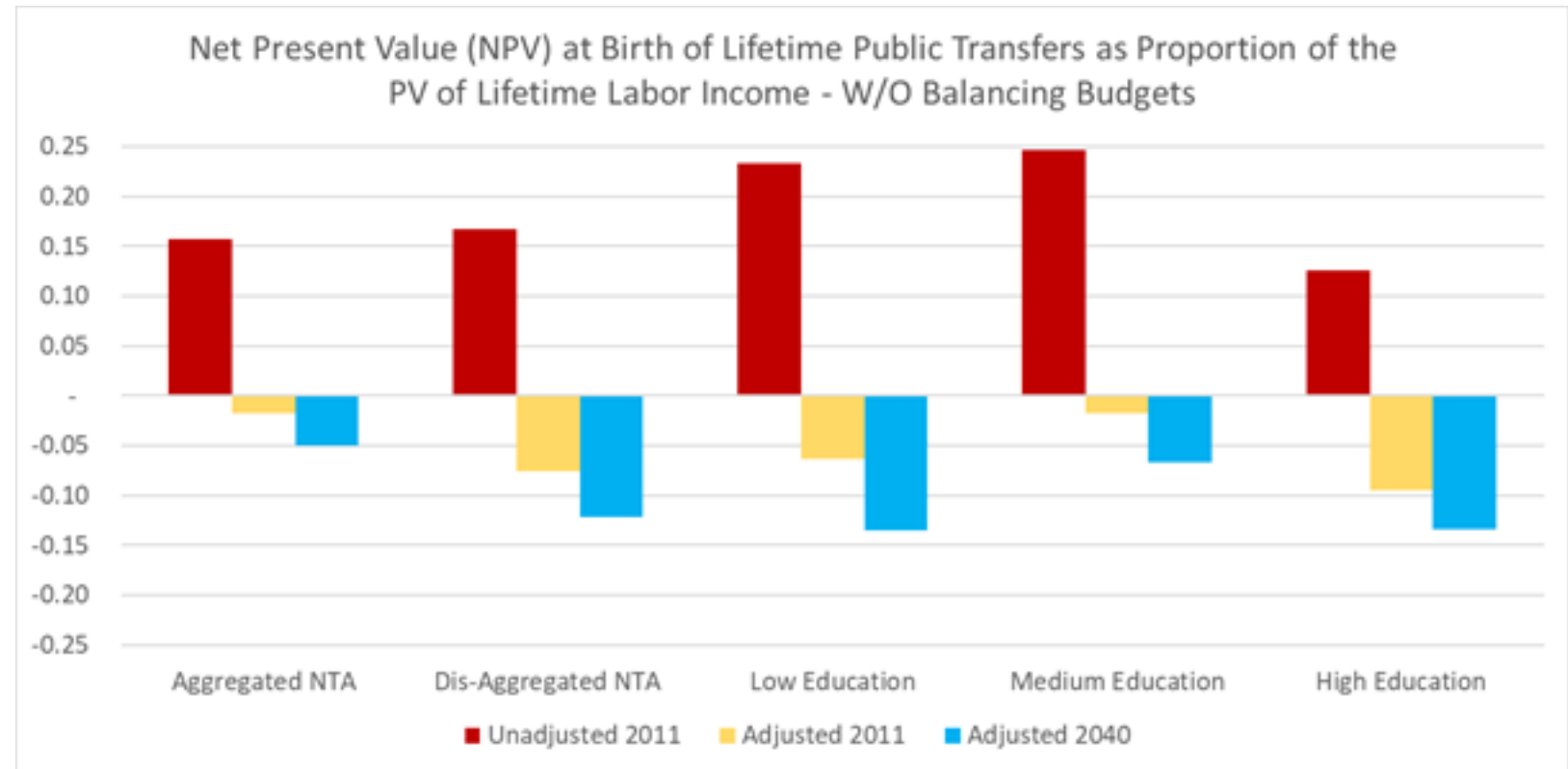
- Base Scenario (aggregated NTA)
 - Support Ratio (Labor input / Effective Consumers) drops by 1/3
 - Impact Index (Consumption / Effective Consumers) drops by 1/4
 - Difference due to changing wages
- Disaggregated NTA Scenario: Support ratio drops less and Impact index drops more



microWELT-NTA – Outcomes (Spain)

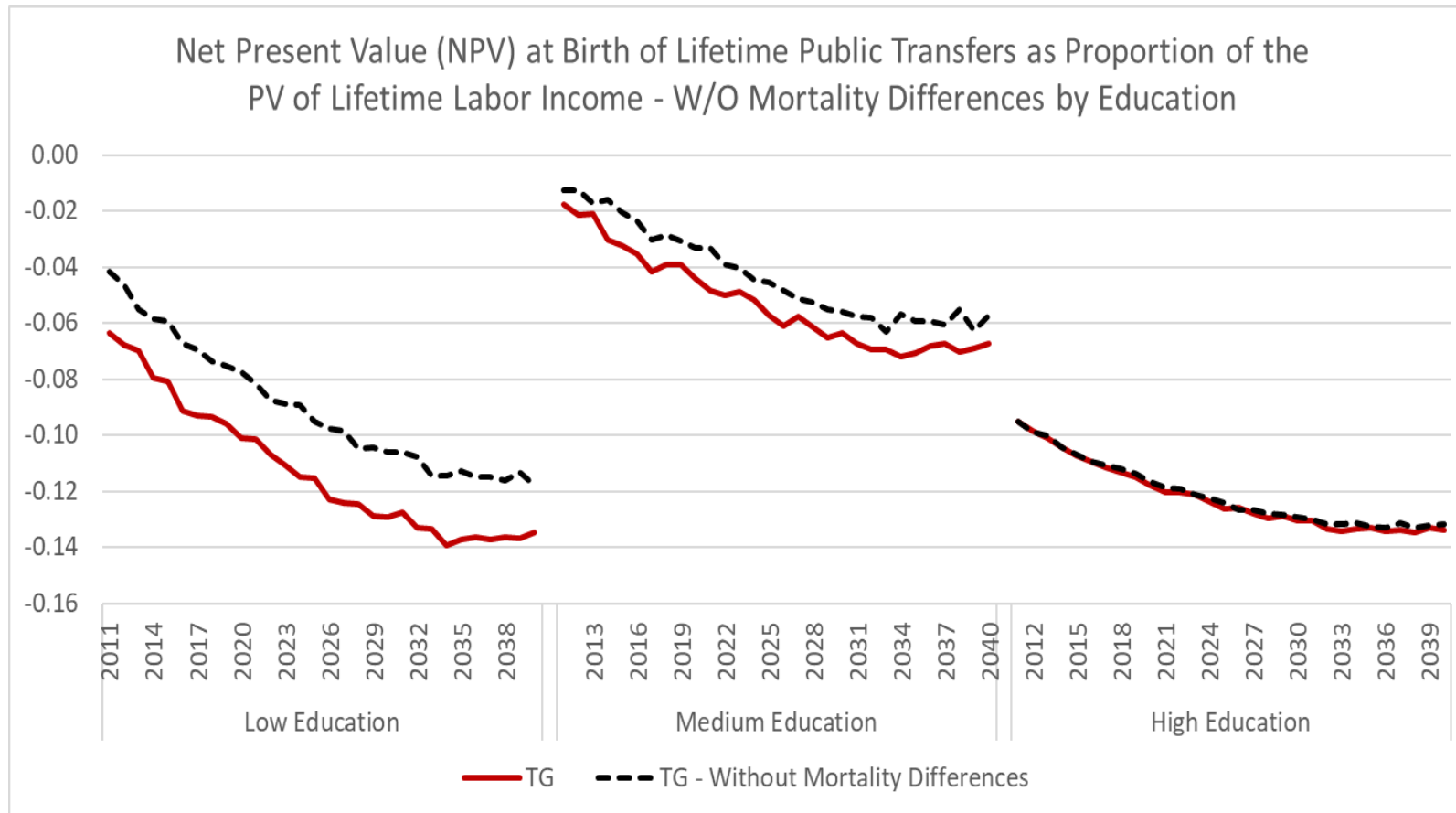
Full Generational Accounts (Lee et al. 2017) – assuming $g=1,5$ $r=3\%$

- Unadjusted: NPV of public transfers 15% of NPV of labor income
- Disaggregation of NTAs only a small effect? NPV by education group very different.
- Adjust all taxes&transfers to balance the budget each year. NPV turns negative: 2011 birth cohort still close to 0 but quite negative for 2040 birth cohort.
- Using dis-aggregated NTA data, the effect is more dramatic



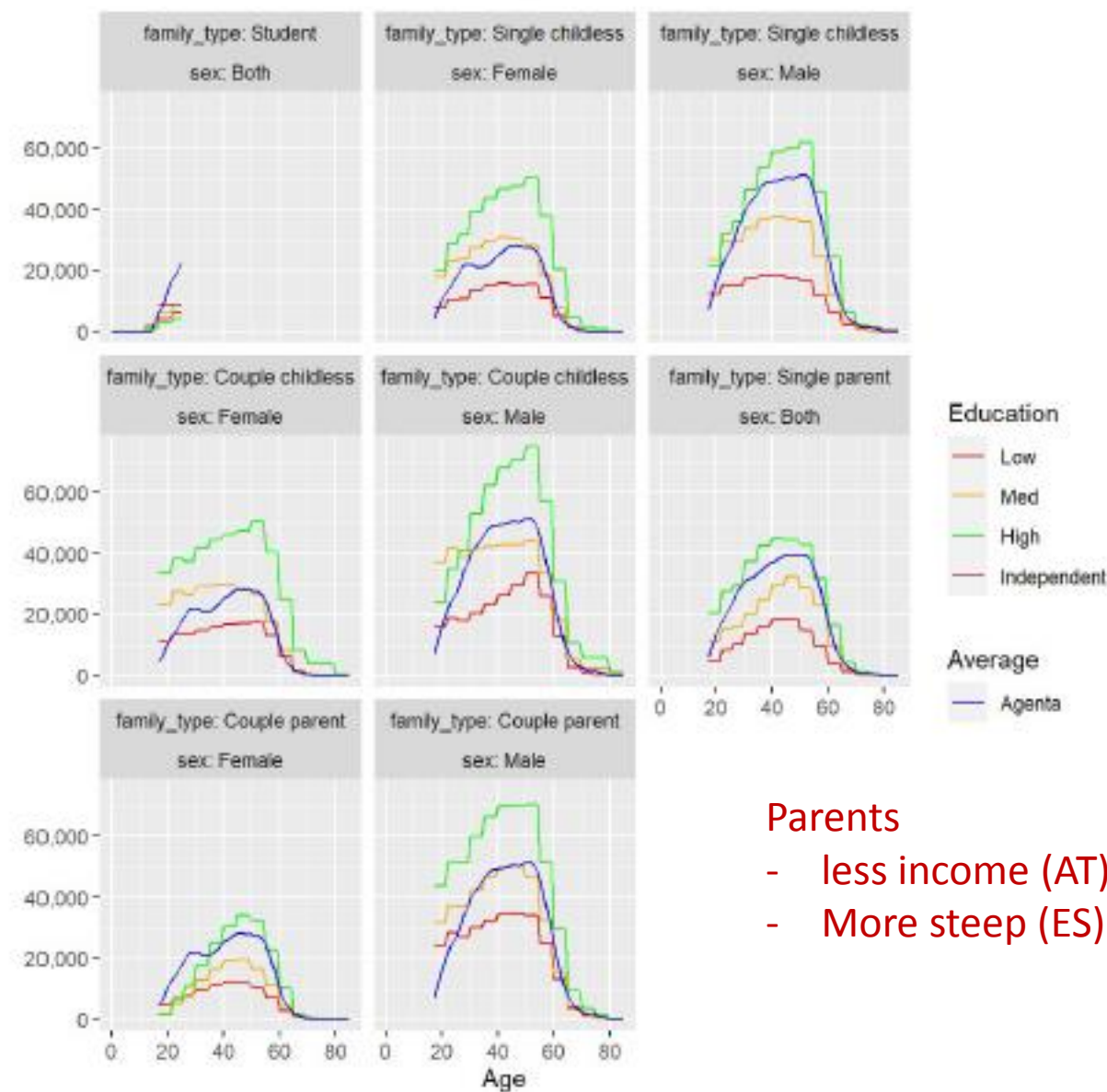
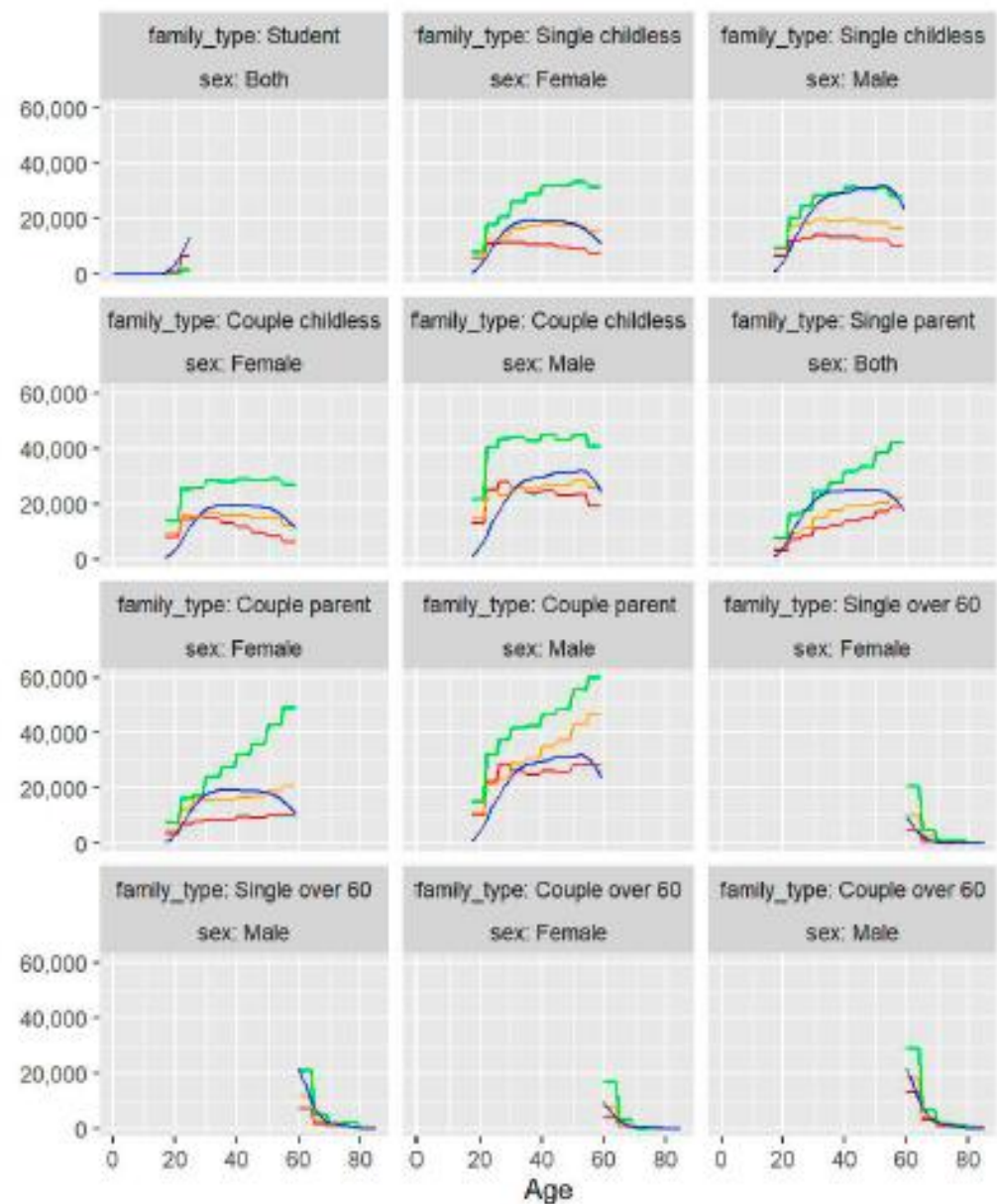
microWELT-NTA – Outcomes (Spain)

Figure 4: The effect of mortality differences by education on the NPV of public transfers

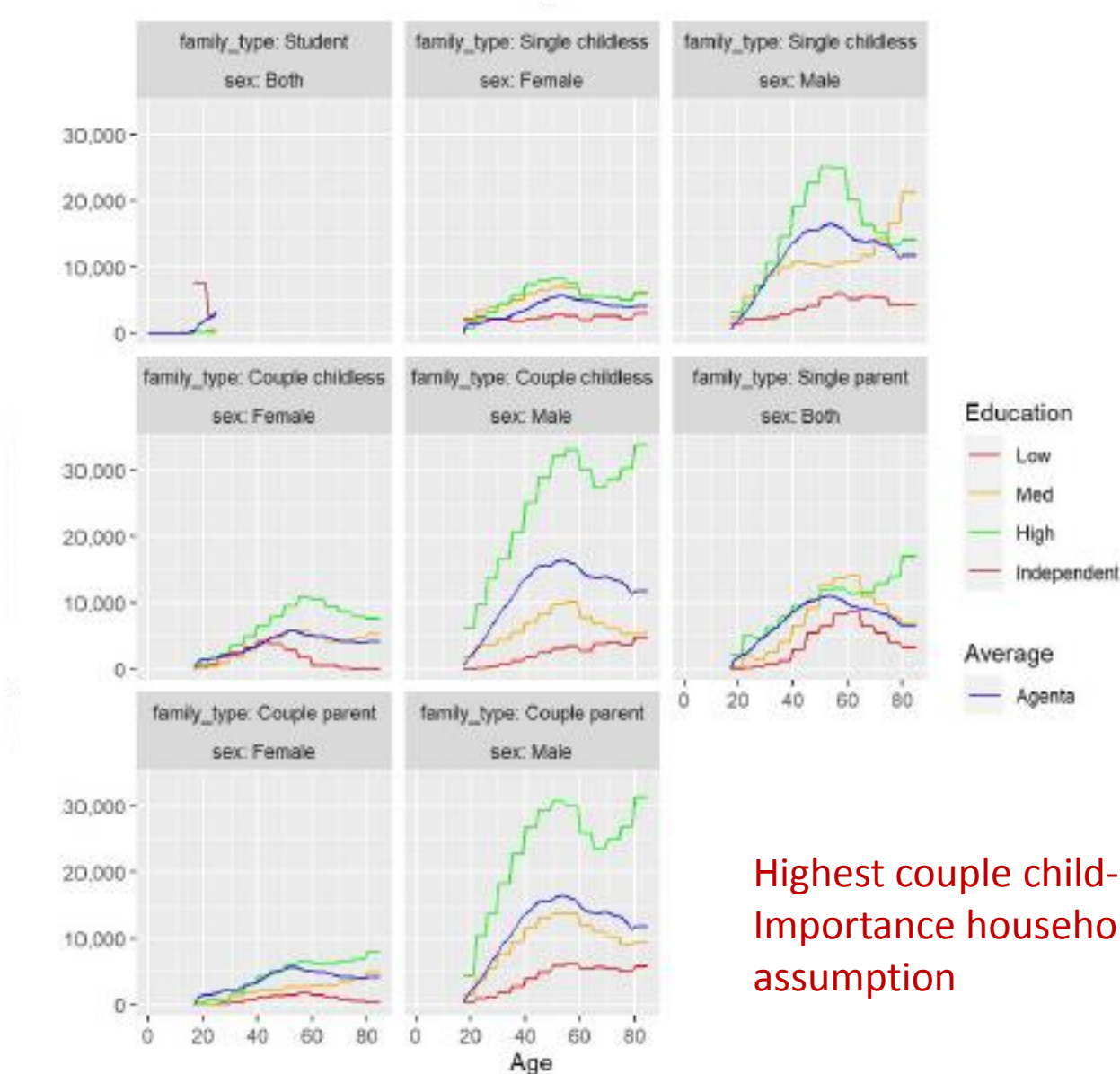
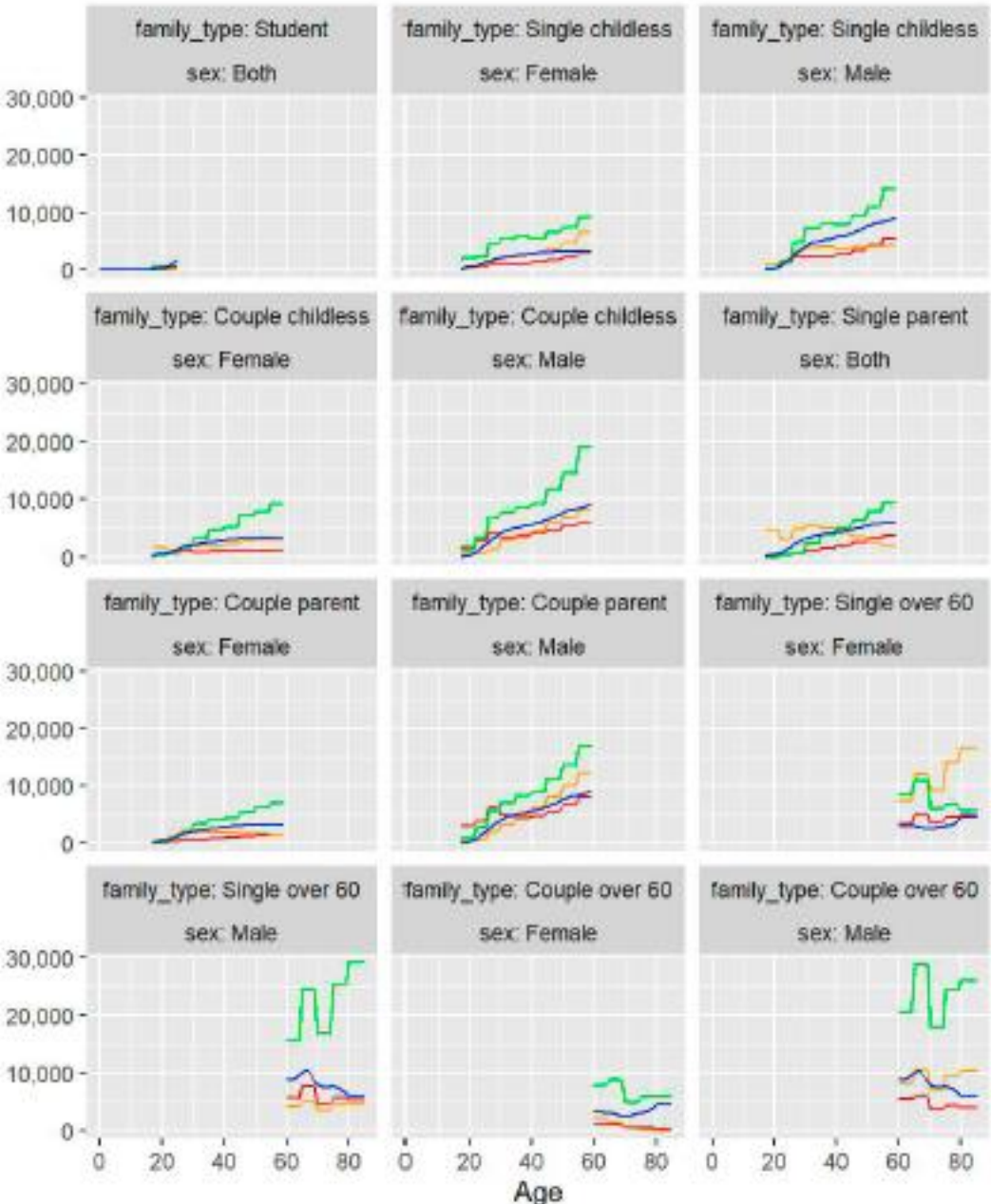


2. Building NTA both by education and family type

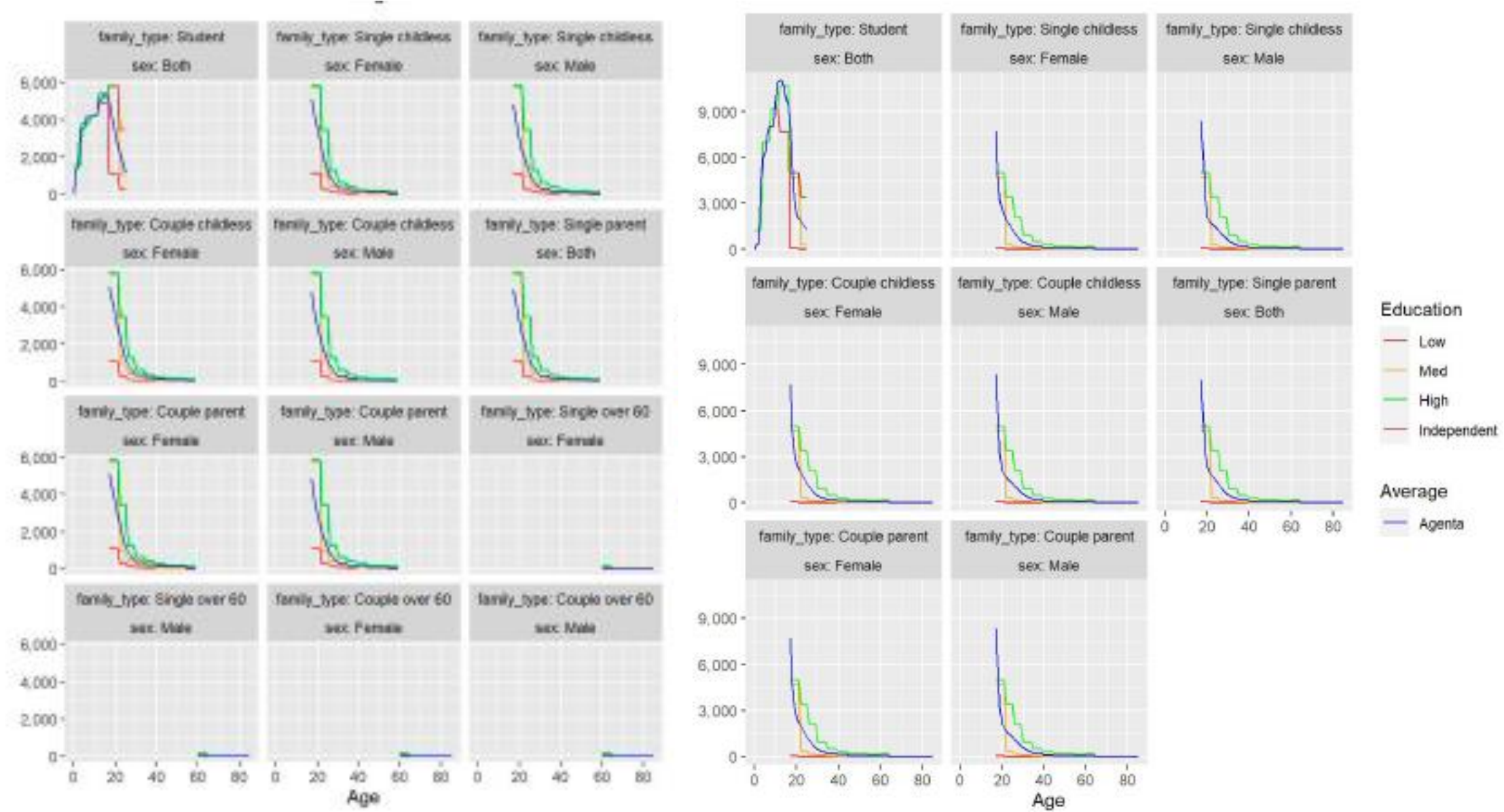
- Problems: Outliers, representativeness => 5 year age group
 - Smooth or not to smooth
 - Supsmoother not working for 17 (instead of 90) age groups
 - Smooth only types, no the average
- Parents no cohabiting, cohabiting no parents? We consider cohabiting
- 60+ parents? Impute it using SHARE (done in AT results)
- “Dependent” children: For the moment survey definition (change it)
- Extended households: Ignored in the model

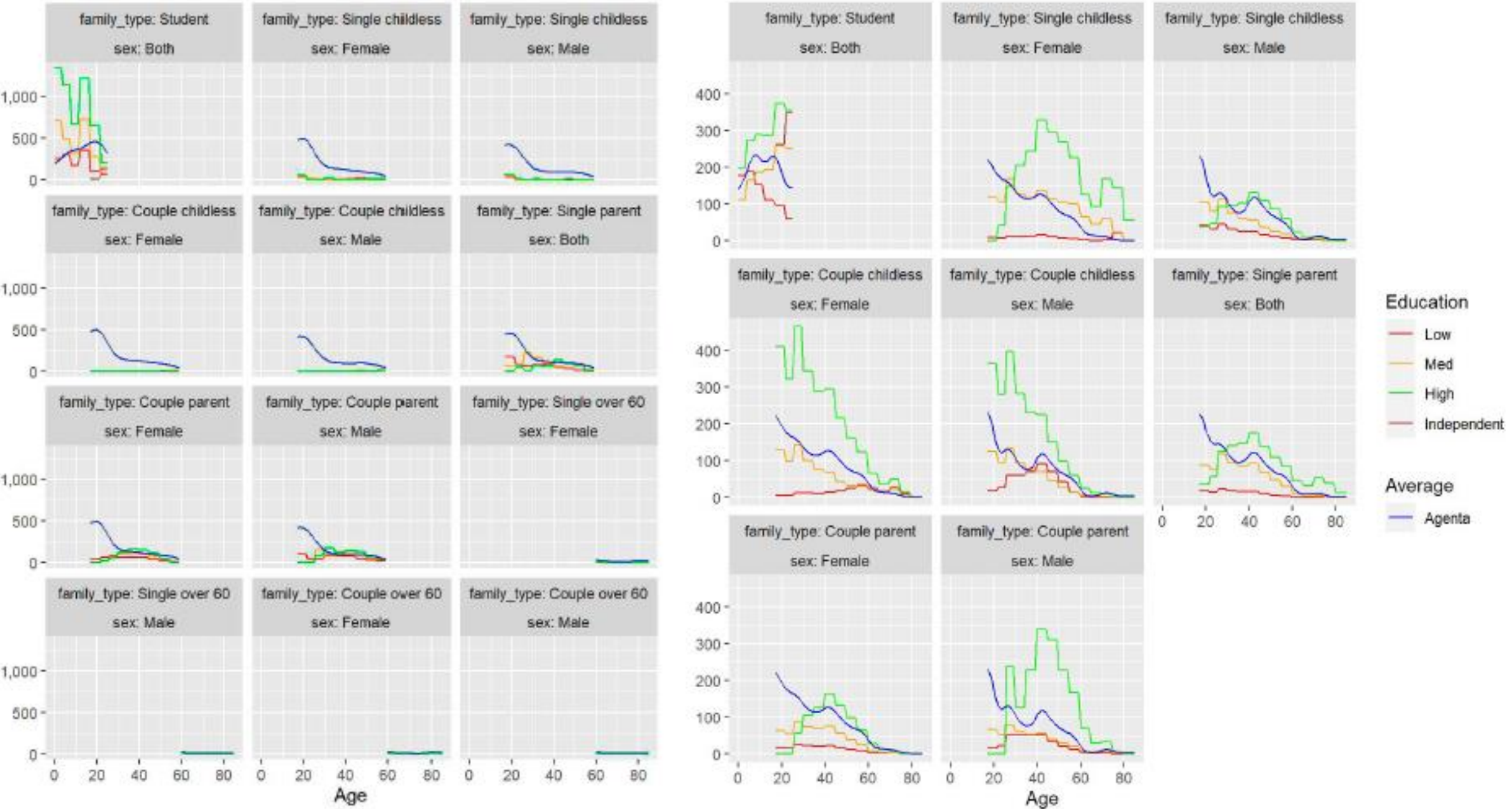


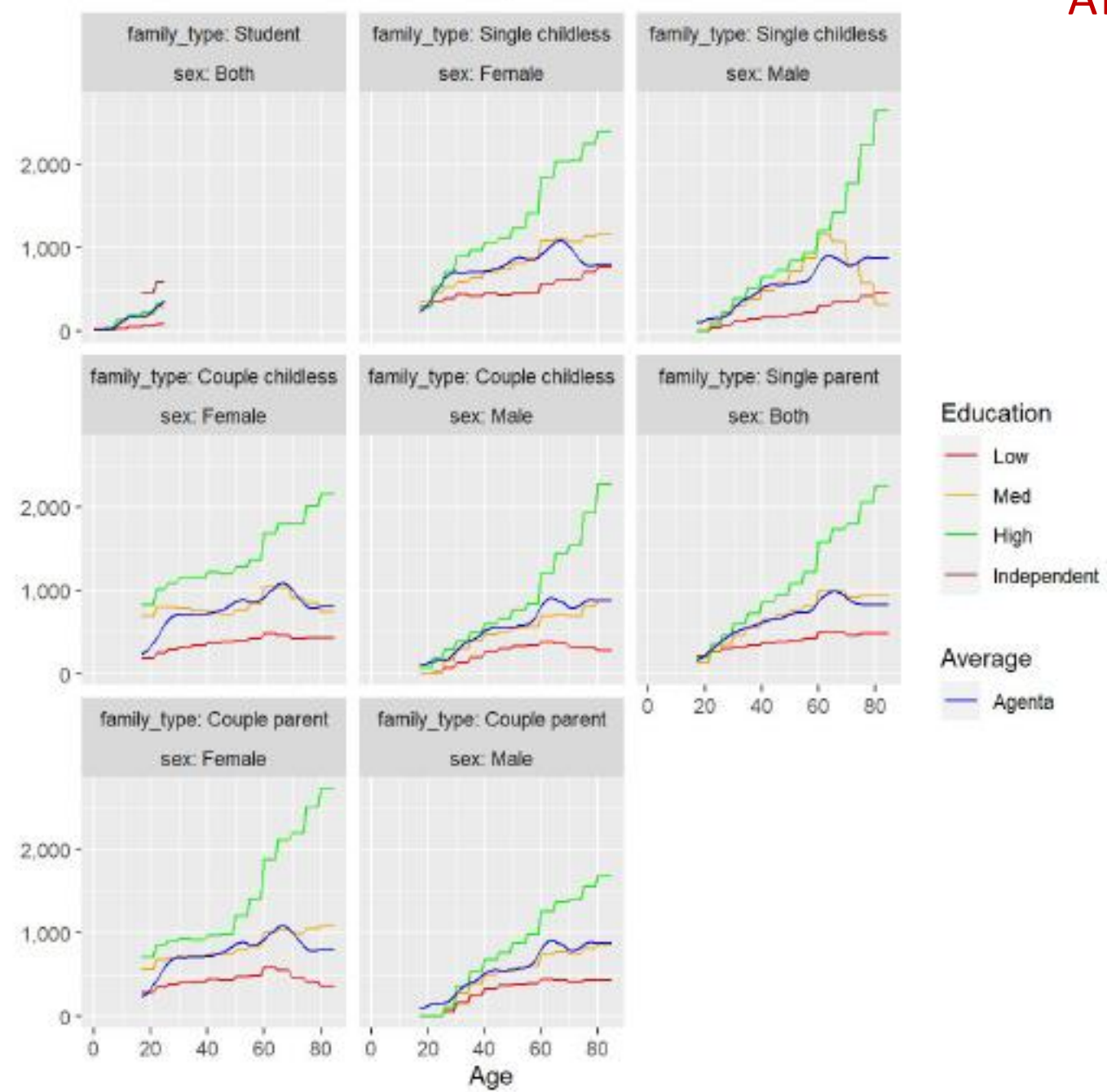
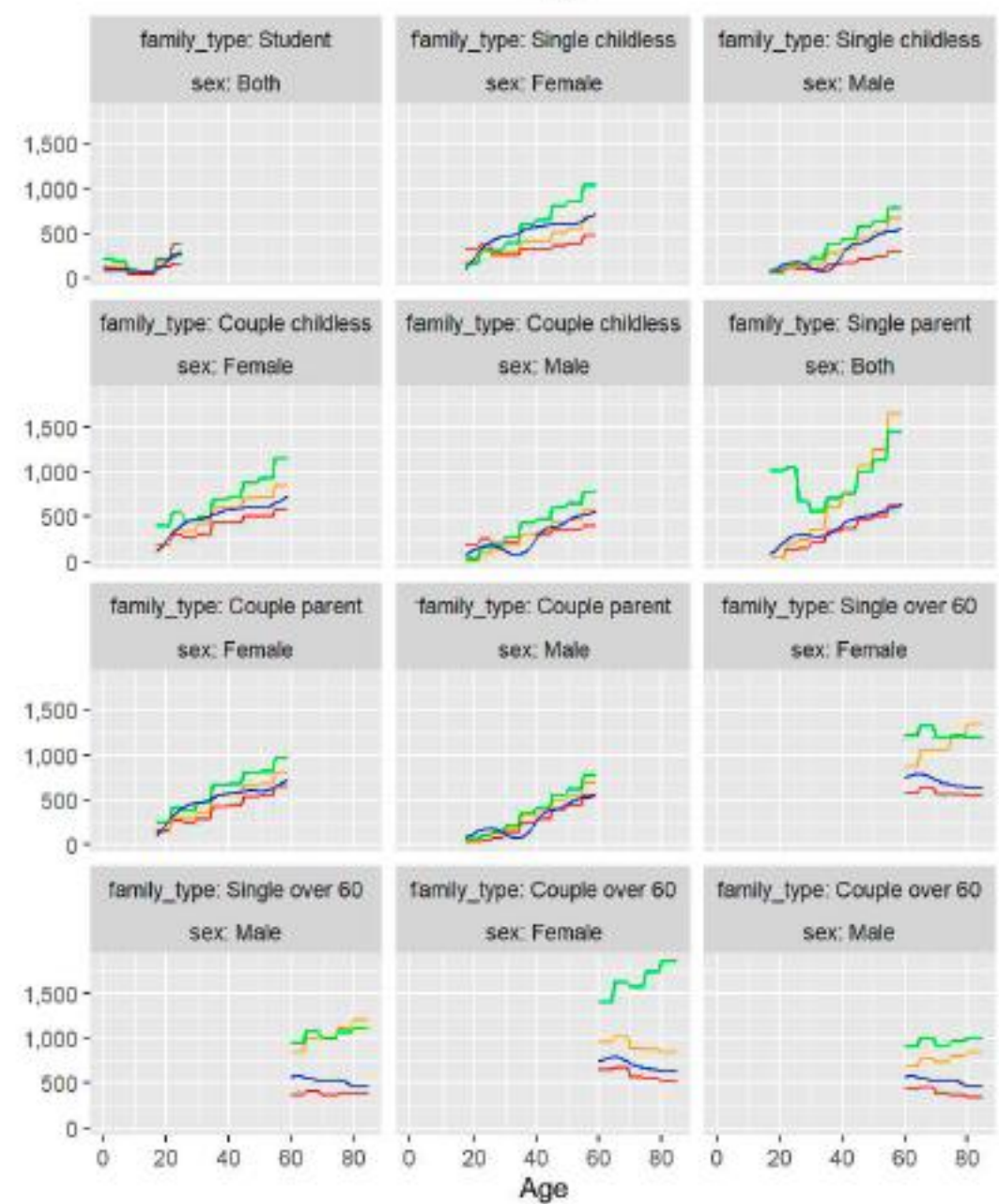
- Parents
- less income (AT)
 - More steep (ES)

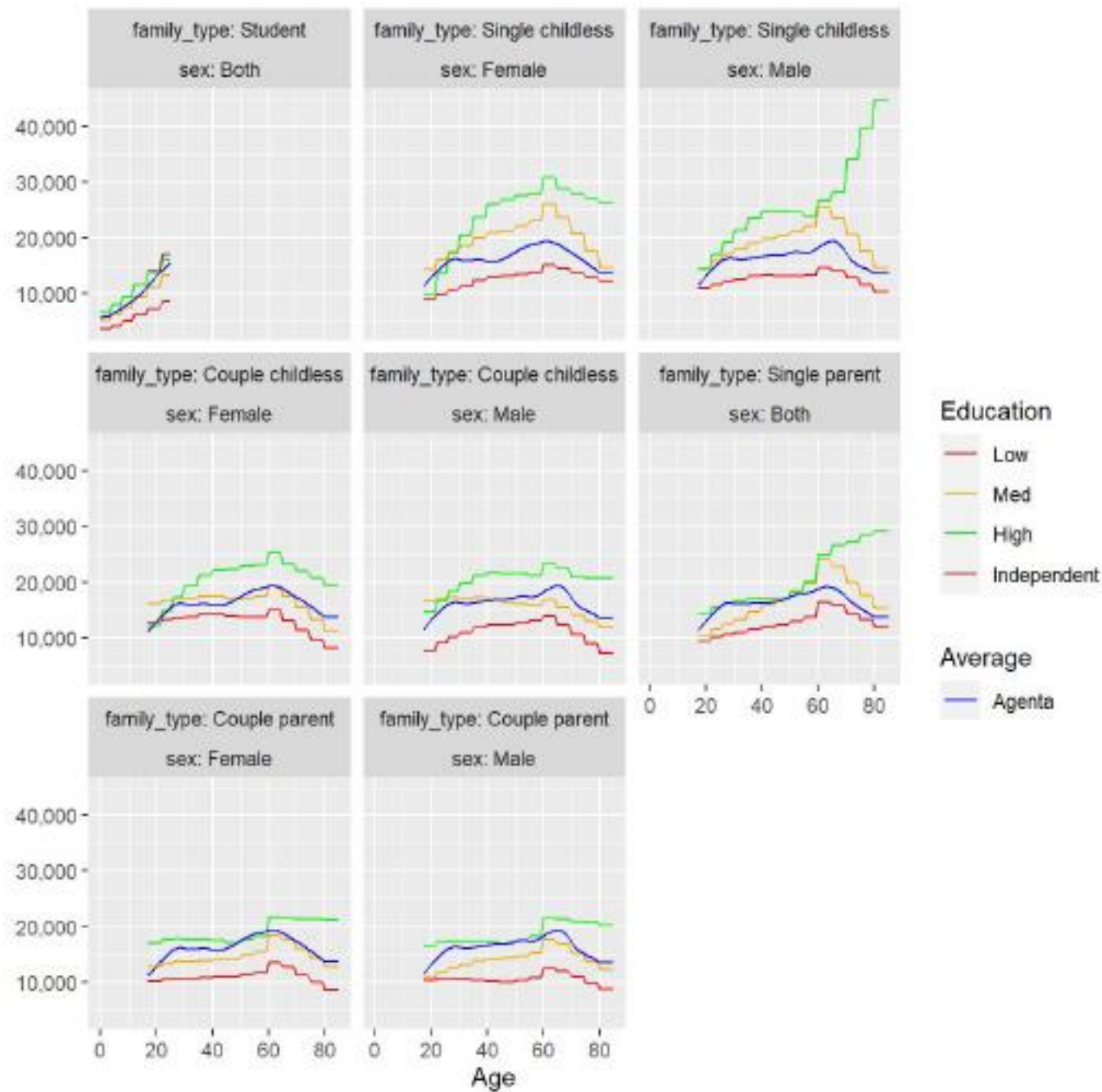
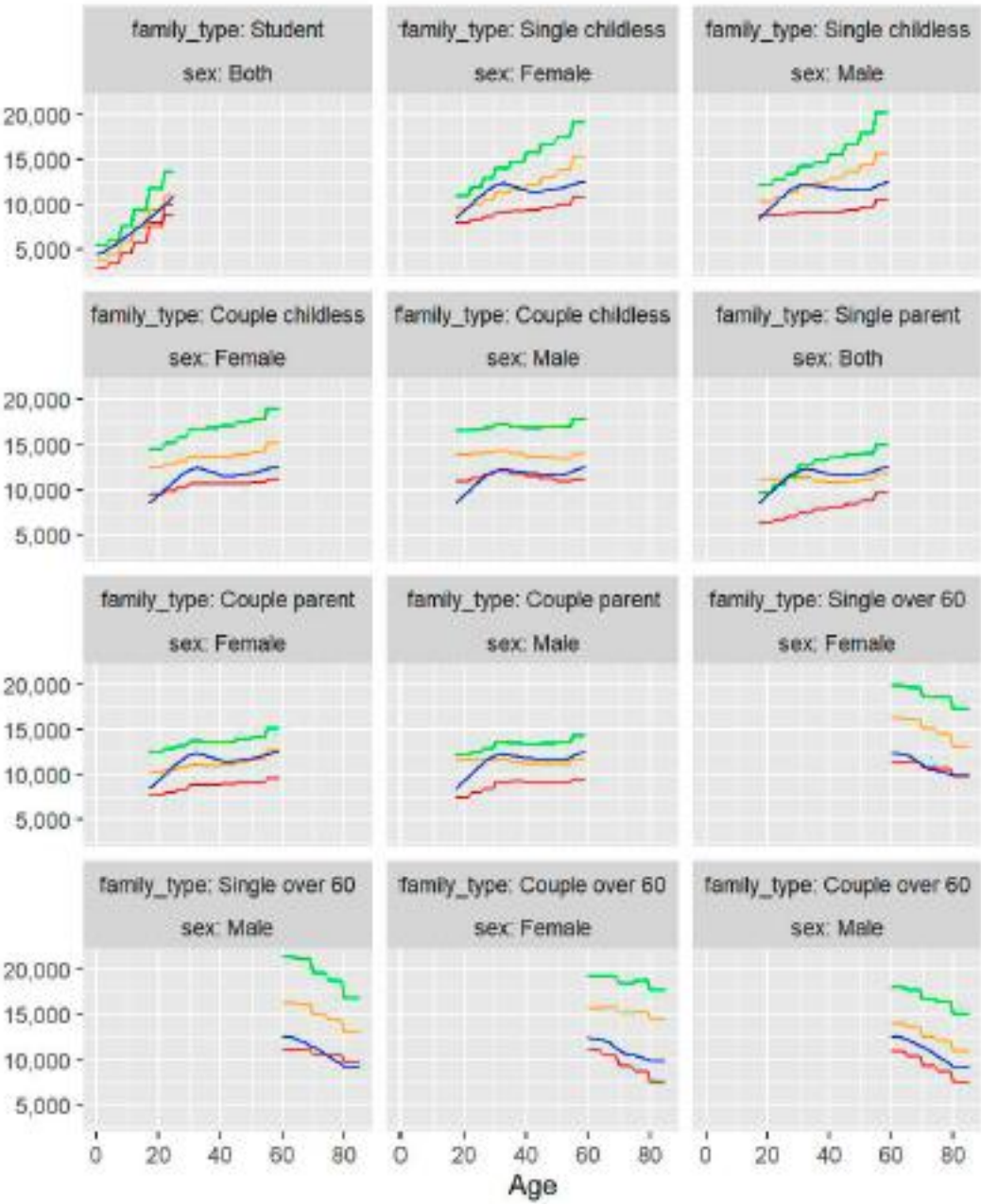


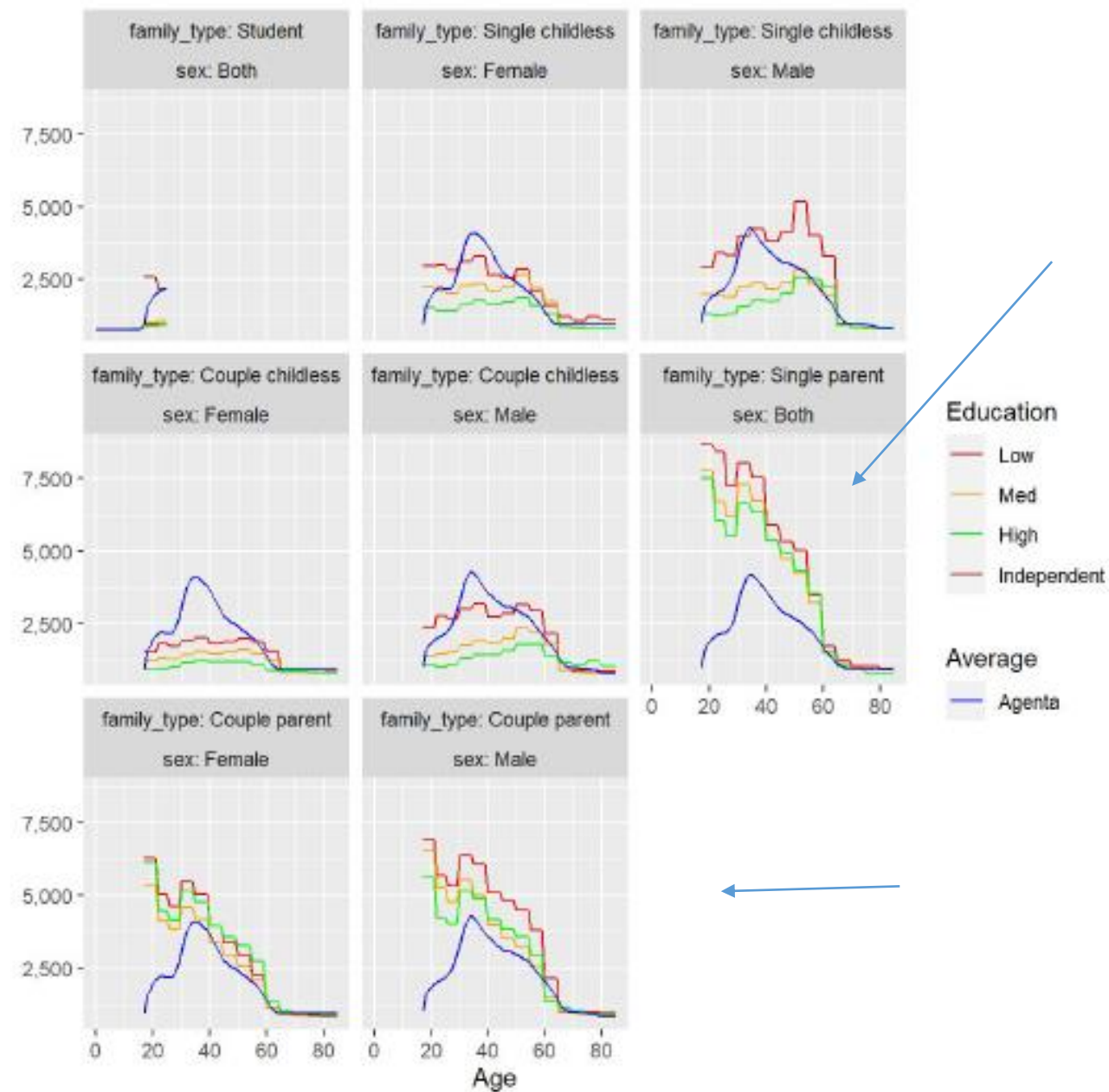
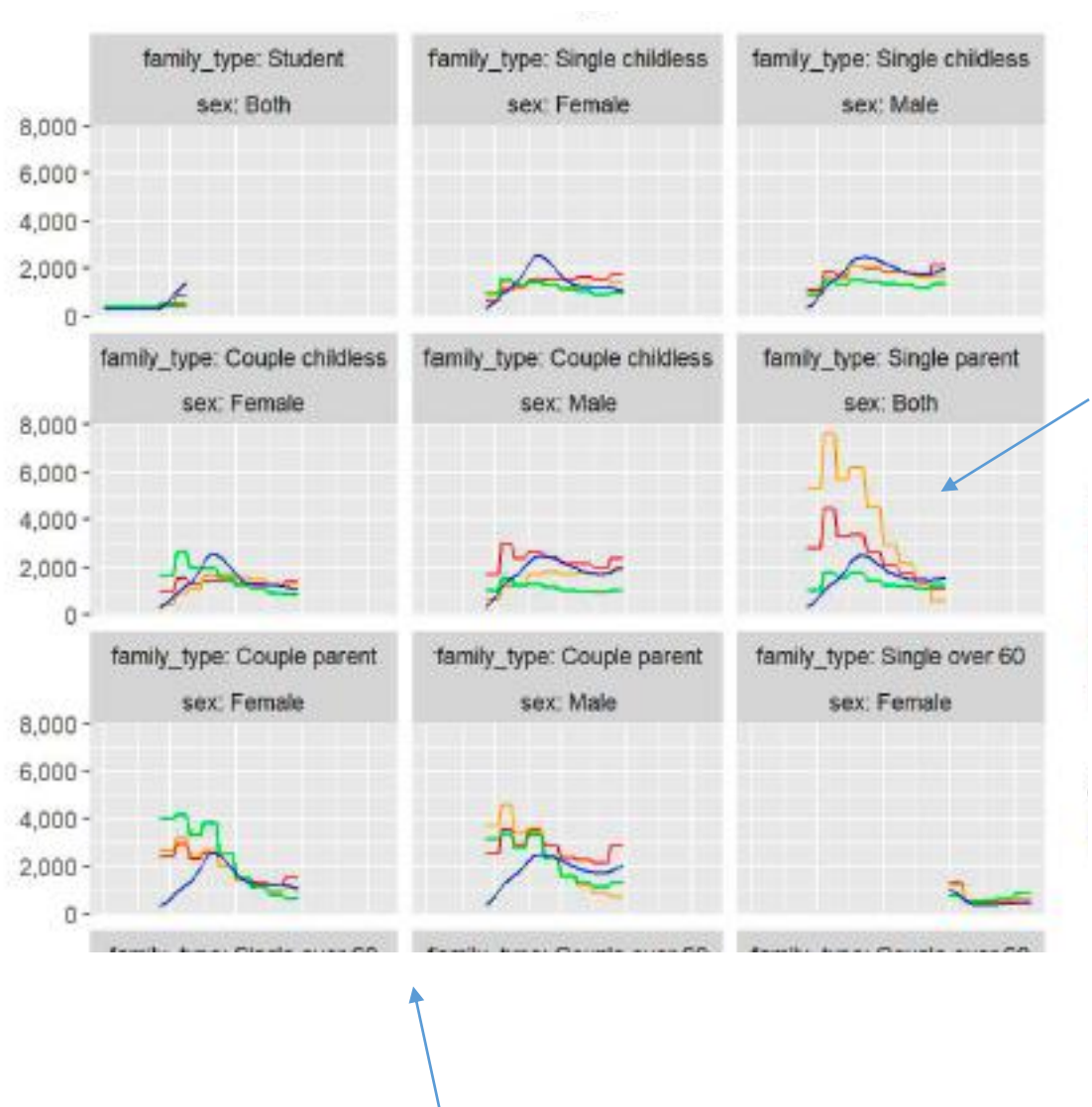
Highest couple child-less
Importance household head
assumption

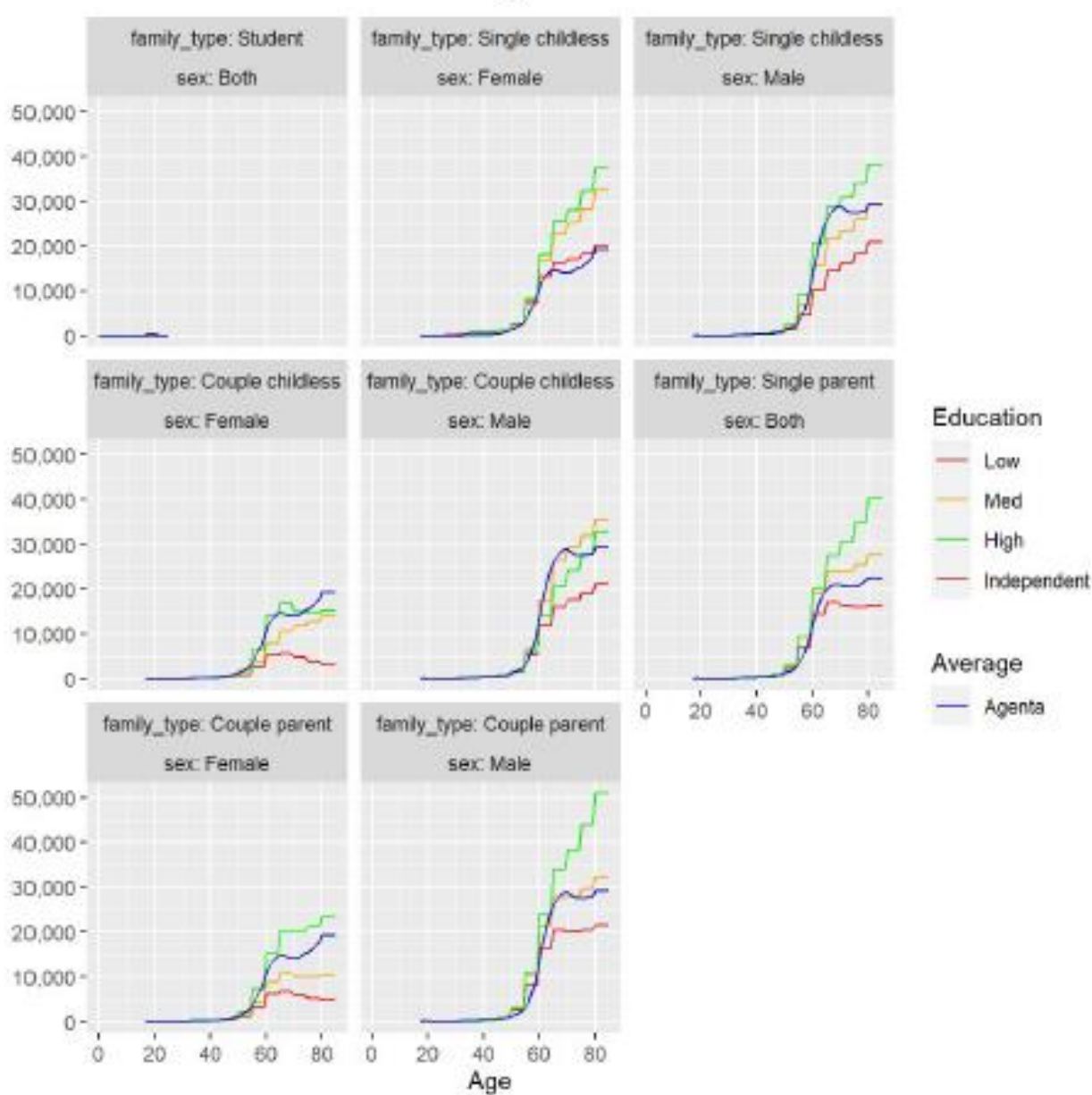
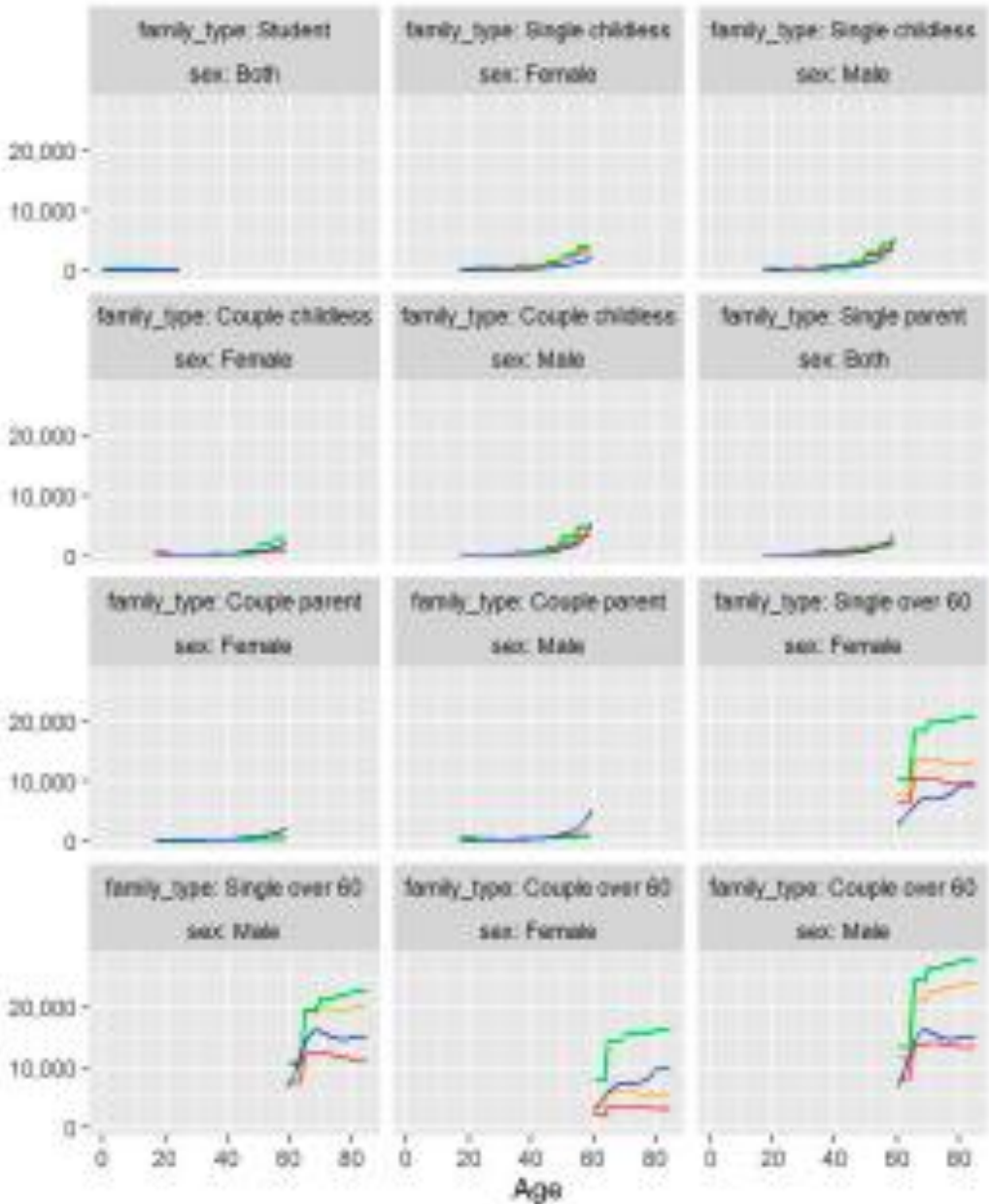


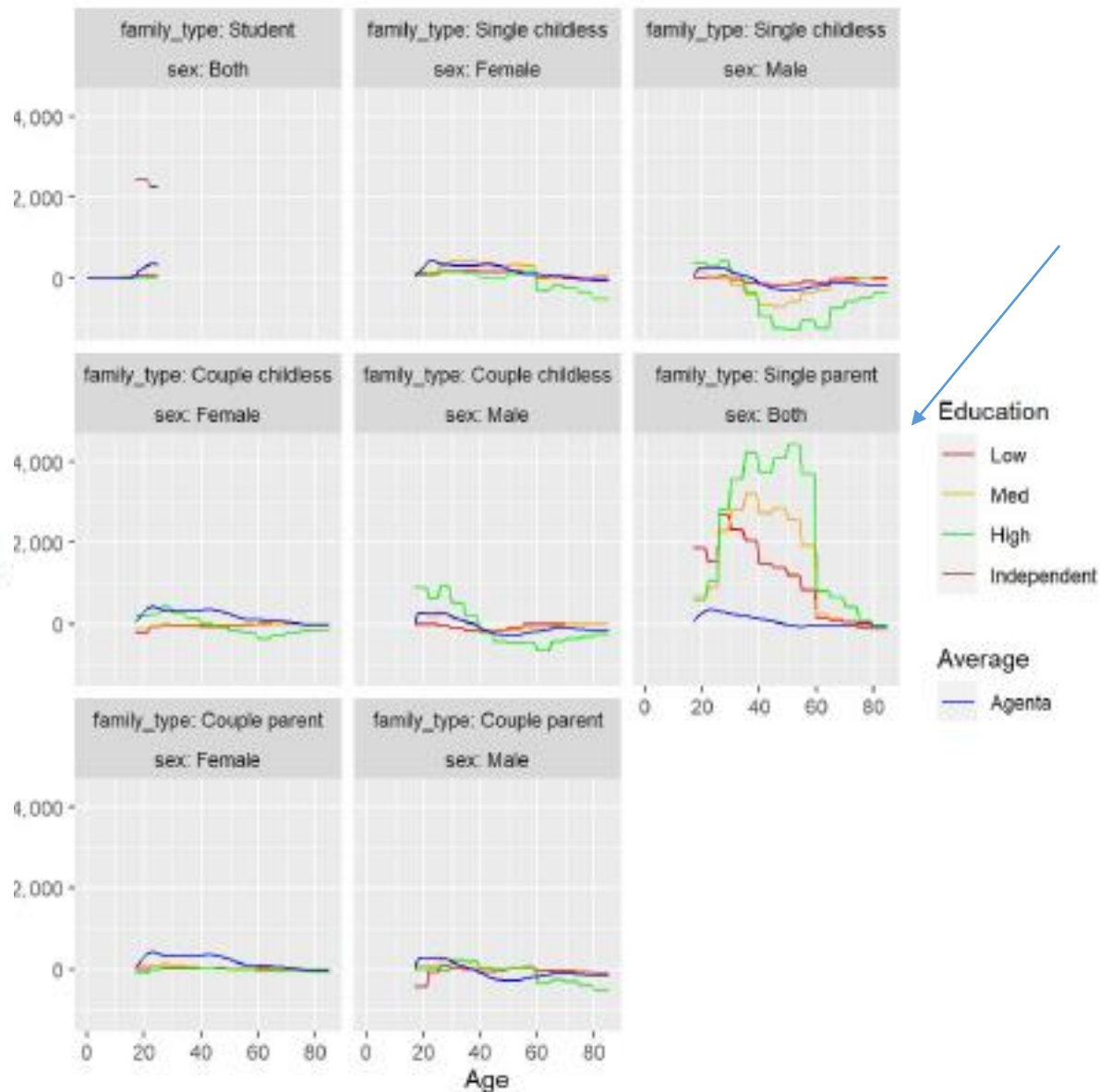
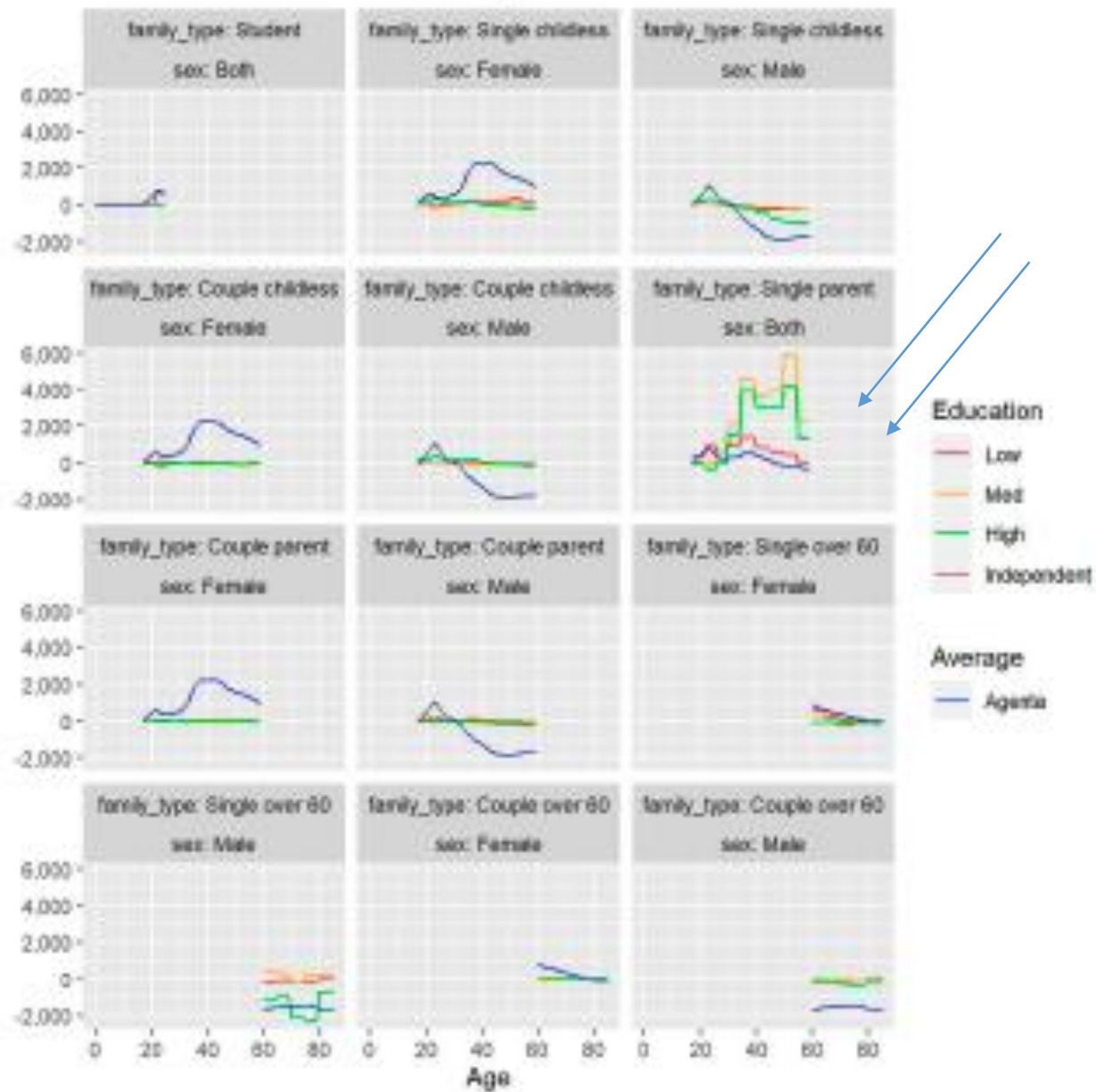


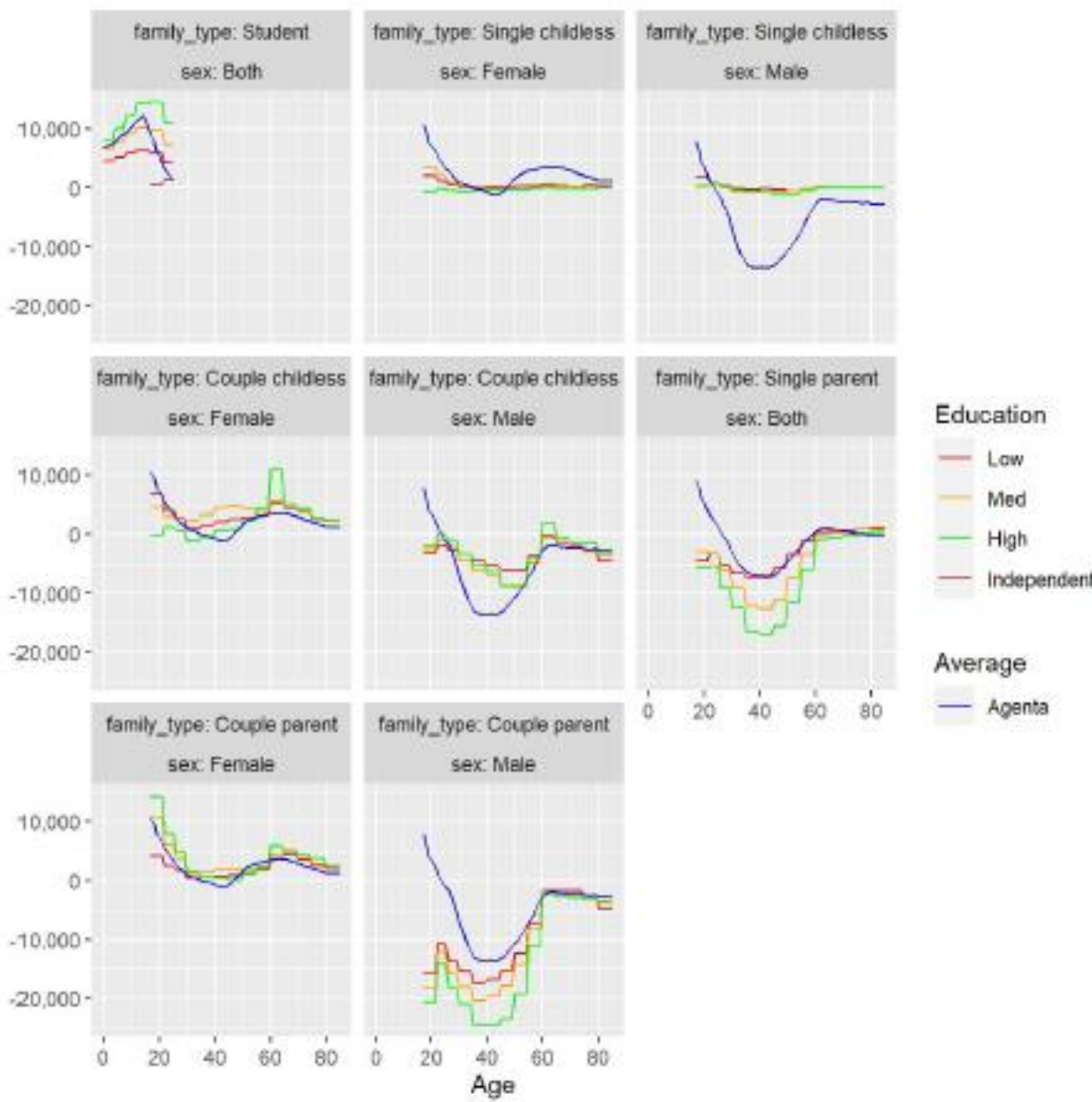
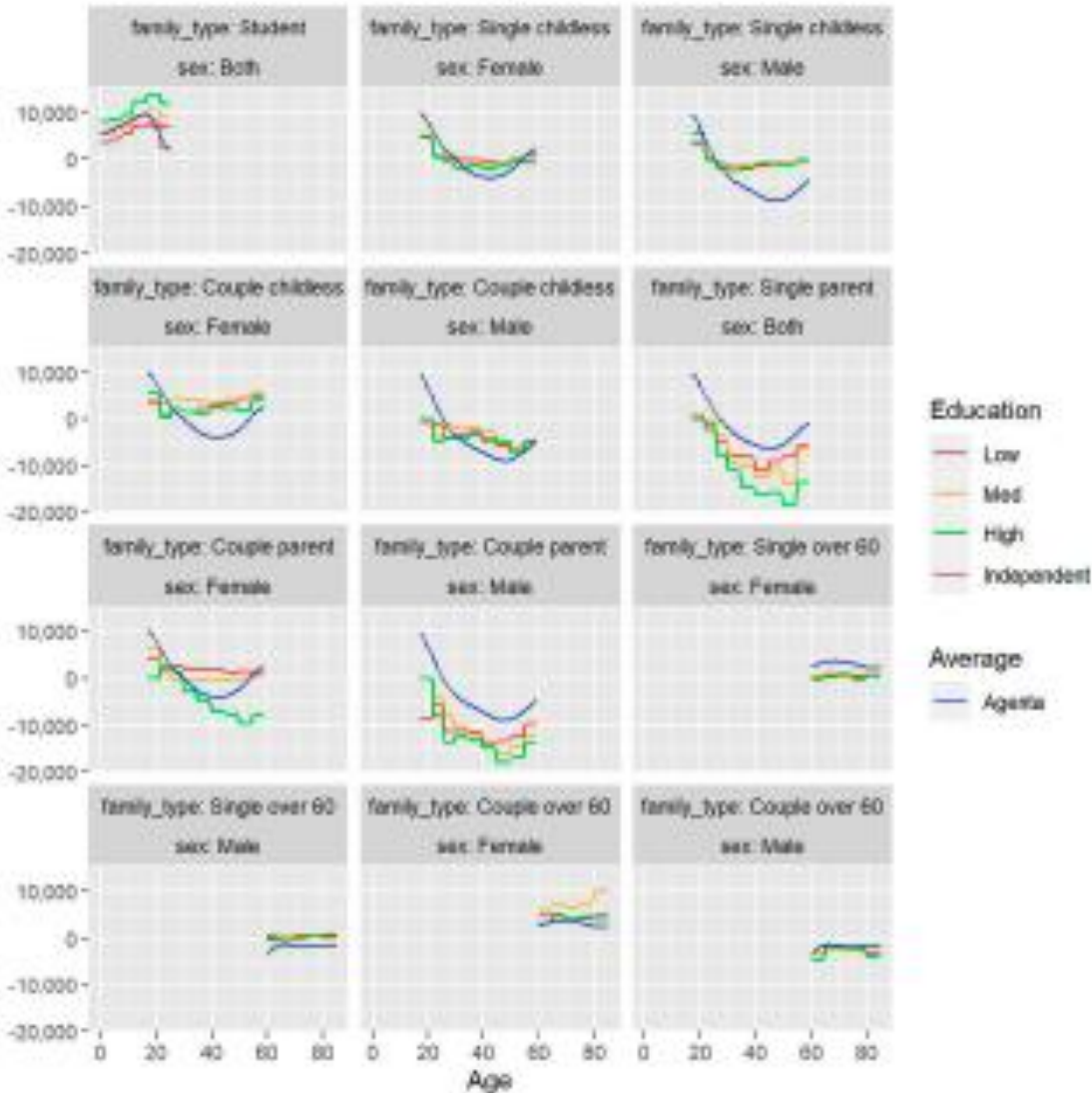












Next steps

- Built NTA both by education and family type
- Immediate future:
 - Adapt the household head assumption: Combine share in earnings + being adult --- [comments welcome](#)
- Future
 - Aiming to micro model main variables (YI, C, Taxes, Transfers) it to project it to the future
 - Add NTTA into the model

Thank you