Long-term working career dynamics and contribution accumulation in the Italian NDC pension system: empirical evidence and policy implications

Michele Raitano (Sapienza University of Rome)

Francesca Subioli (University of Roma Tre)

Workshop «La questione salariale in Italia»

Tor Vergata, 28 Gennaio 2026

Background and main research questions

- Clear evidence of wage stagnation in Italy and increasing earnings inequality (Bavaro and Raitano 2024, Depalo and Lattanzio 2024), but studies based on snapshots of the income distribution. Using panel data, evidence of an age wage gap (Bianchi and Paradisi 2024) and persistent inequalities among prime-aged workers (Subioli and Raitano 2025)
- What happens when longitudinal careers – i.e. from the entry up to the most recent years – are the focus? Do career patters improve over time? How do inequalities within workers evolve along the career?
- How are career patterns evolving across workers' cohorts?
- How to summarise multi-year career patterns?
- Cohort comparisons crucial to get rid of age effects
- *N.B. Understanding career patterns crucial to assess persistency of wage gaps and expected adequacy of NDC pensions (wholly depending on career outcomes)*

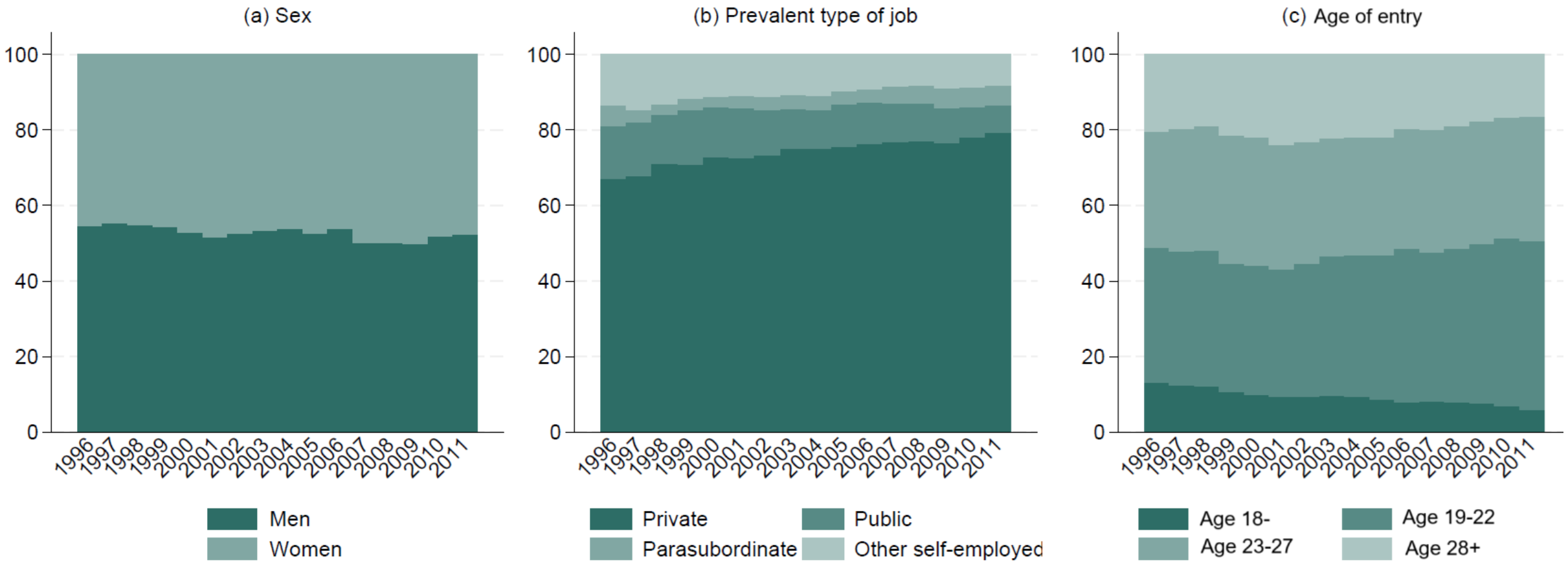
Our data

- Analyses based on an ongoing VisitINPS research project
- *Estratti Conto* archive longitudinal sample (15% of the universe), tracking all workers, in all types of jobs (i.e. employees and self-employed), when working or receiving allowances paying notional contributions
- We exclude from the analyses those without the Italian citizenship and those with prevalent working status as a liberal professional, a farmer or a show-business worker
- We also exclude those who entered the labour market after age 35 (entry year as the first year with at least 13 worked weeks)
- For all remaining workers – i.e. 1,131,487 individuals – we compute, year by year, worked and contribution weeks (also FTE), annual earnings and contributions paid to the NDC scheme, also including notional contributions for allowances
- We thus compute, for each year from the entry, the accumulated capital in the NDC scheme, which future pensions will be entirely based on => P=**M(g, t rate, Wt)***CT

Our focus

- Comparisons of career patterns from the entry year up to the end of 2021
- Comparisons of 16 entry cohorts (1996-2011) followed for at least 10 years after the entry => career patterns distinguished by entry cohort and distance from the entry year
- We also distinguish individuals by gender and prevalent type of job (as captured by the pension fund where they are enrolled in, also differing according to the contribution rate)
- Inequality subgroup decompositions to show the role of individuals' characteristics in inequality trends
- Simulations on counterfactual working careers based on assumptions on Gdp growth rate, work intensity and minimum wage to disentangle the role played by the determinants of a limited contribution accumulation in the NDC scheme
- *N.B. We aim to provide a general picture of career trends across many cohorts rather identifying a possible causal effect of a single factor on few cohorts*

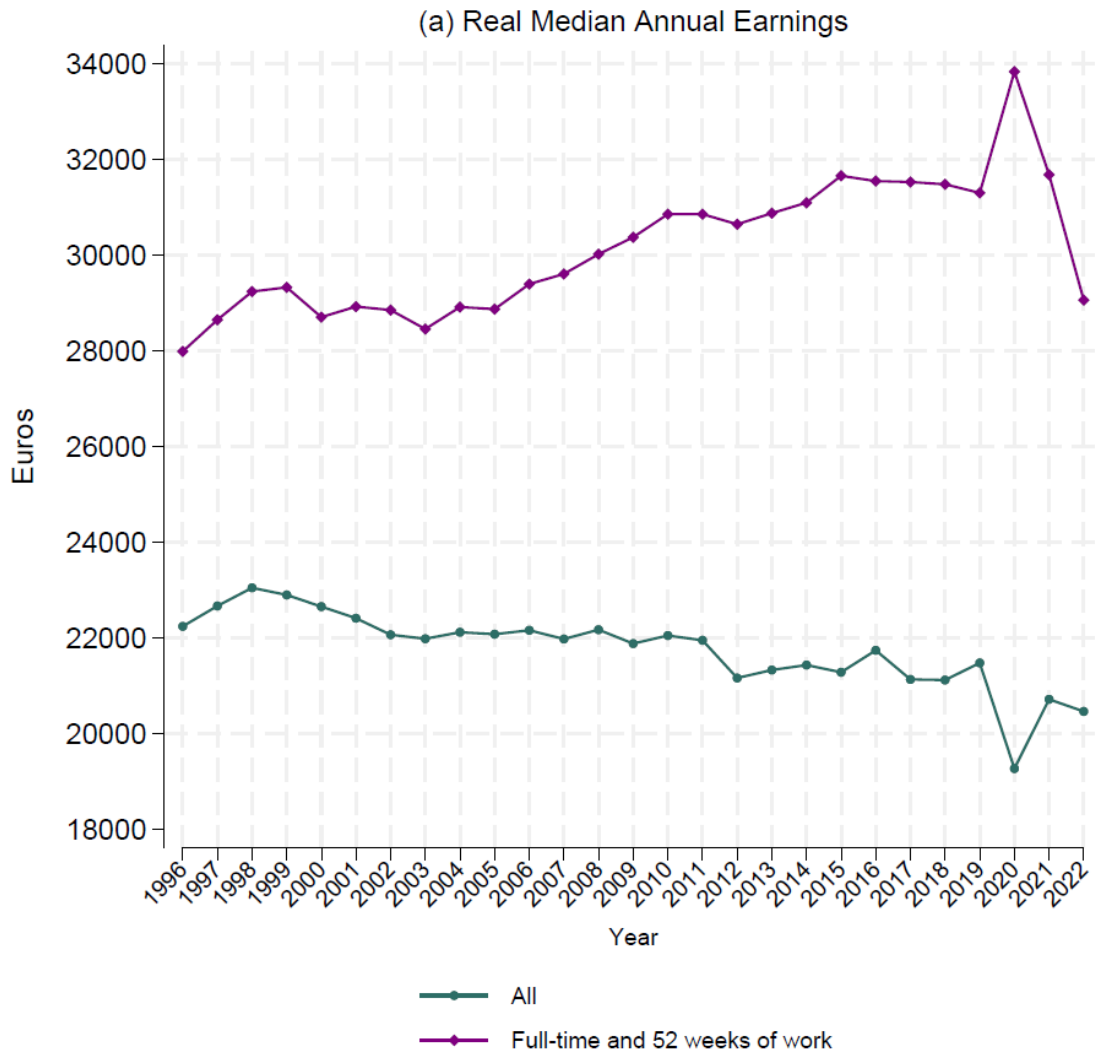
Workers composition by cohort

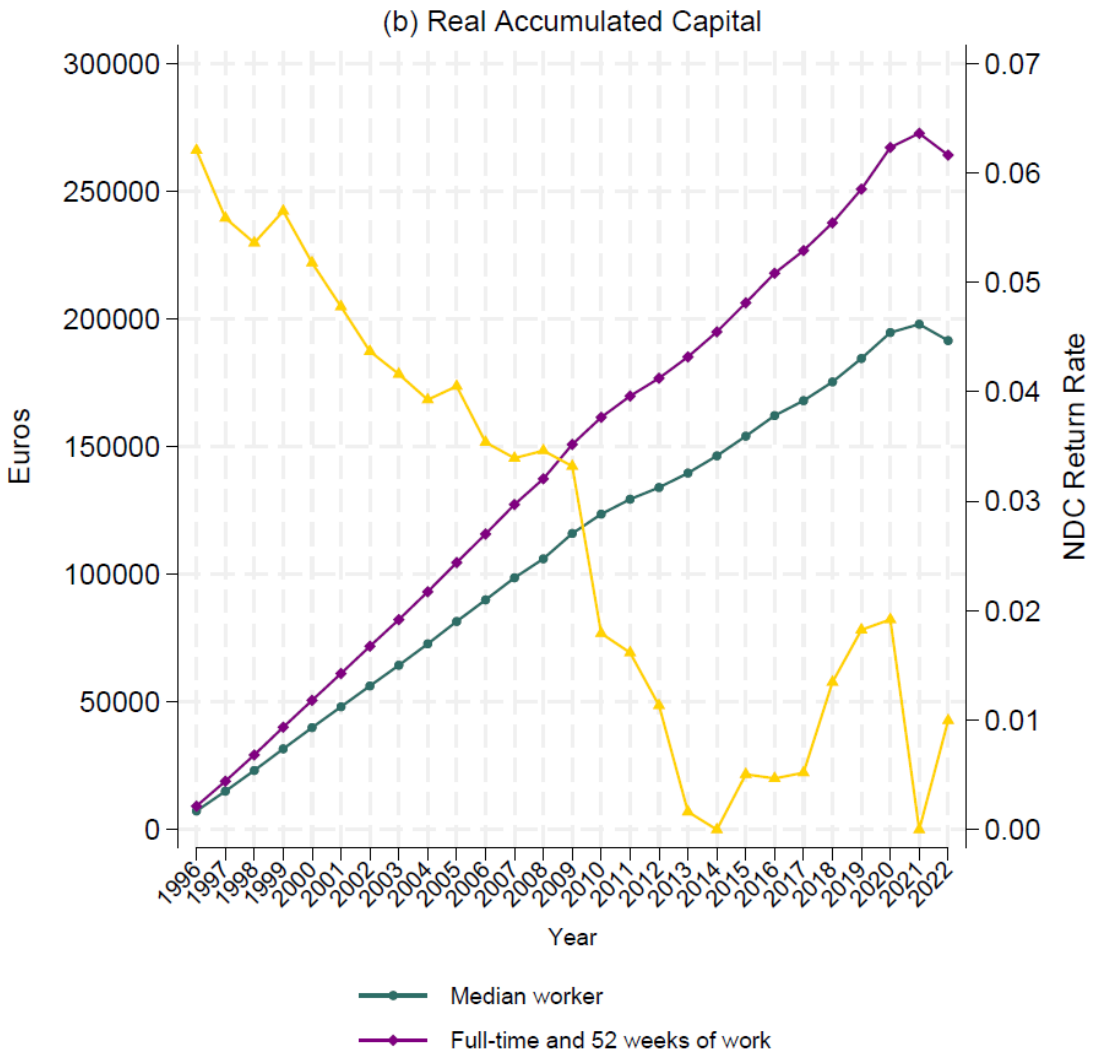


Our indicators

- Various multi-year indicators to summarise career patterns:
  A. Frequency of years with at least a working spell
  B. Ratio between worked weeks and FTE worked weeks over the potential (52 weeks per year), also including weeks spent receiving an allowance
  C. Ratio between the accumulated amount (based on time series of NDC return rates) and the amount accumulated by ‘representative median employees’, i.e. those always earning annual median wages or annual median wages of full-time full-year employment earnings
- For all indicators we focus on: i) mean values, ii) poverty (lower than 60% of the reference) and iii) inequality indices (as well as on the distribution of the indicator)
- Indicators by cohorts and ‘distance’ and predicted values by subgroups

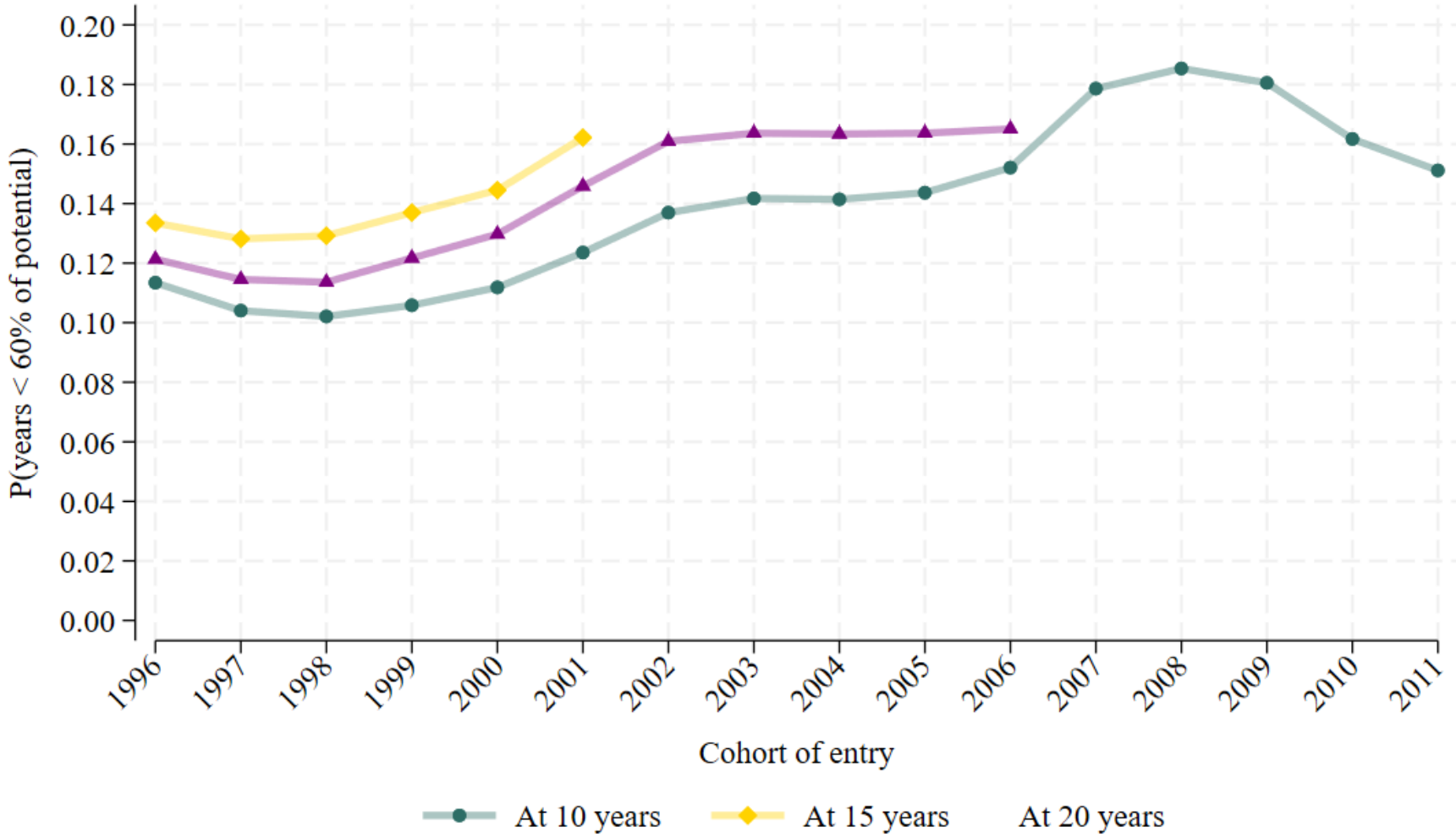
Reference median employees



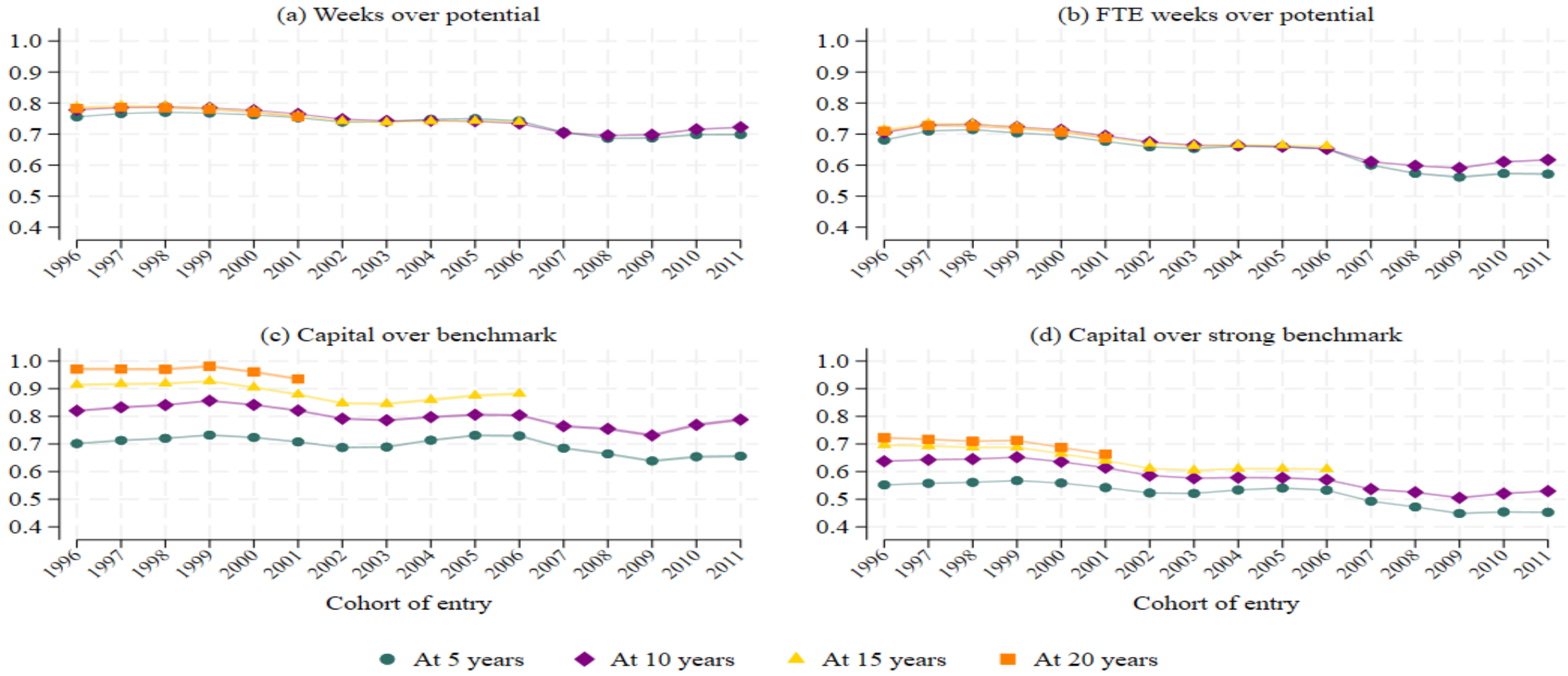


MAIN RESULTS

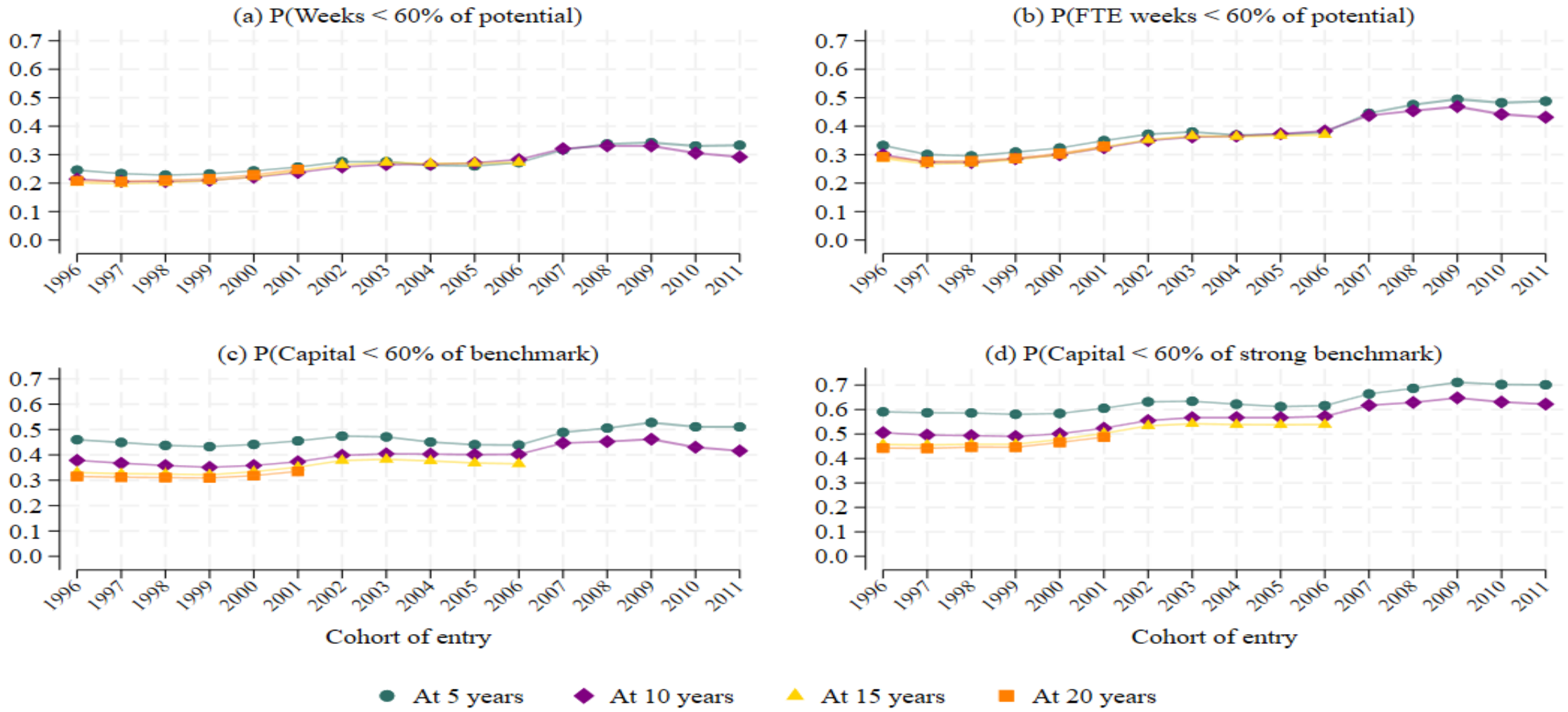
‘Years’ poverty’ by cohort after 10, 15 and 20 years from the entry



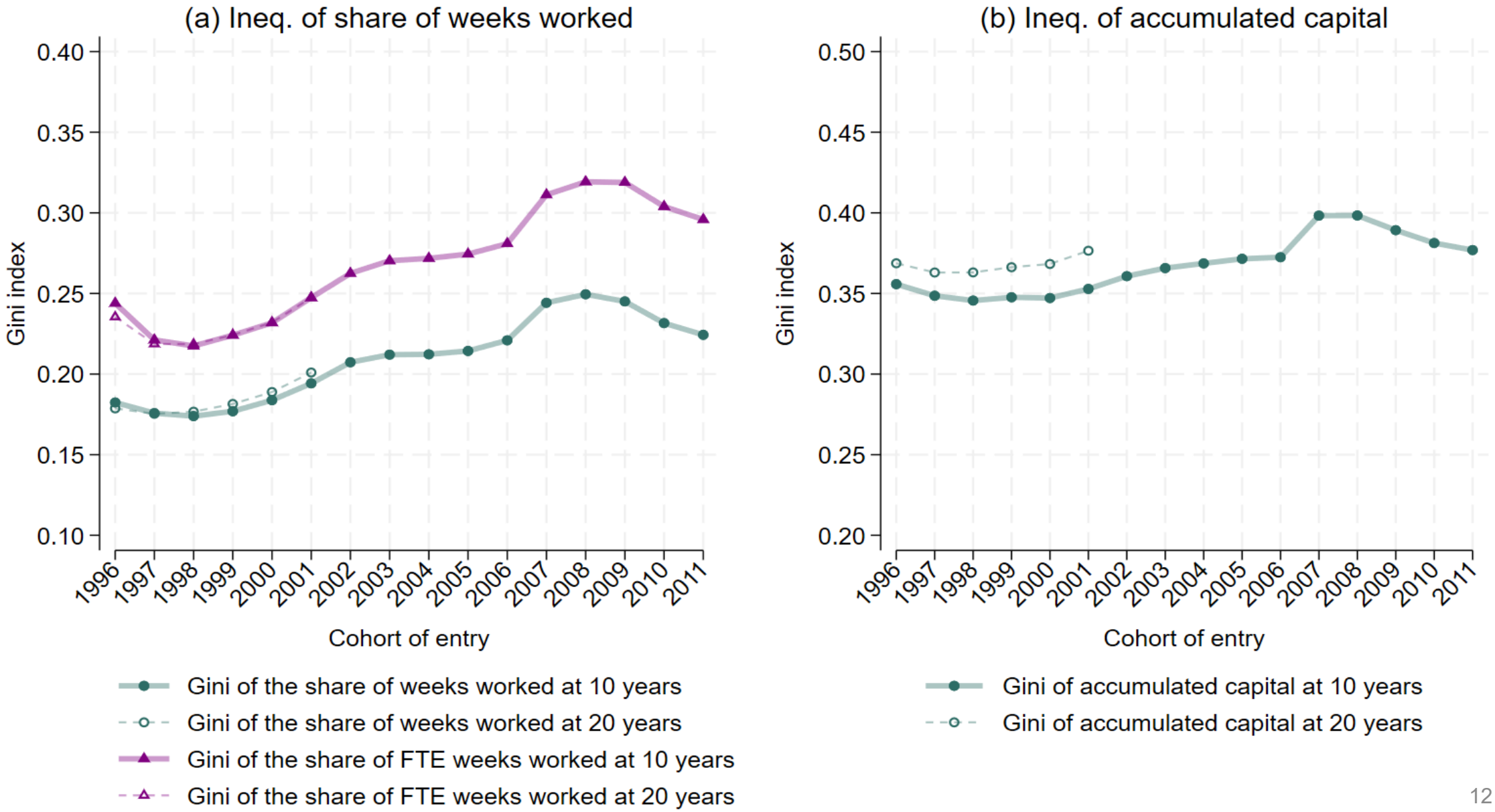
Mean values of cumulated weeks and capital by cohort at certain distances



Poverty indices about weeks and capital by cohort at certain distances

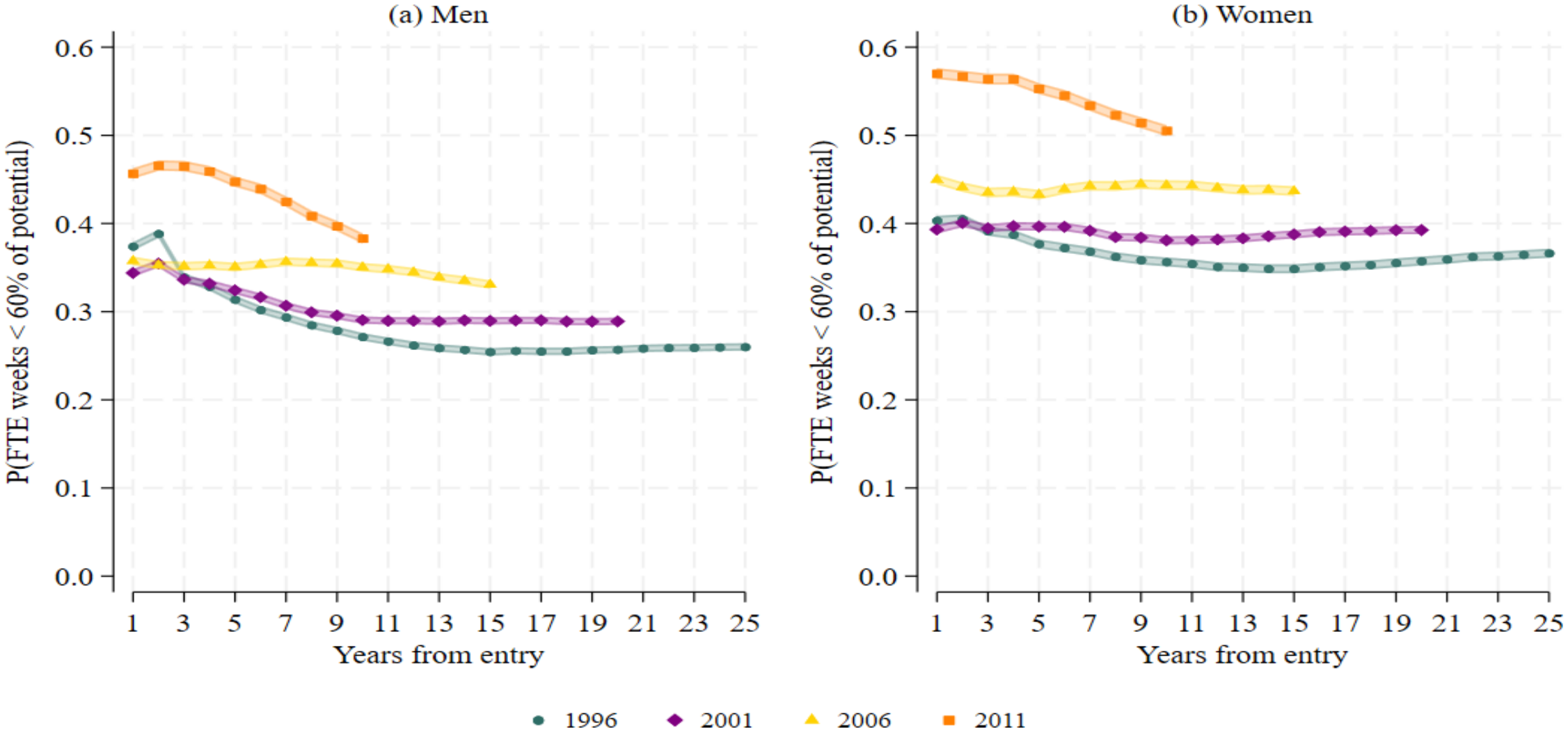


Within cohorts inequality in career patterns

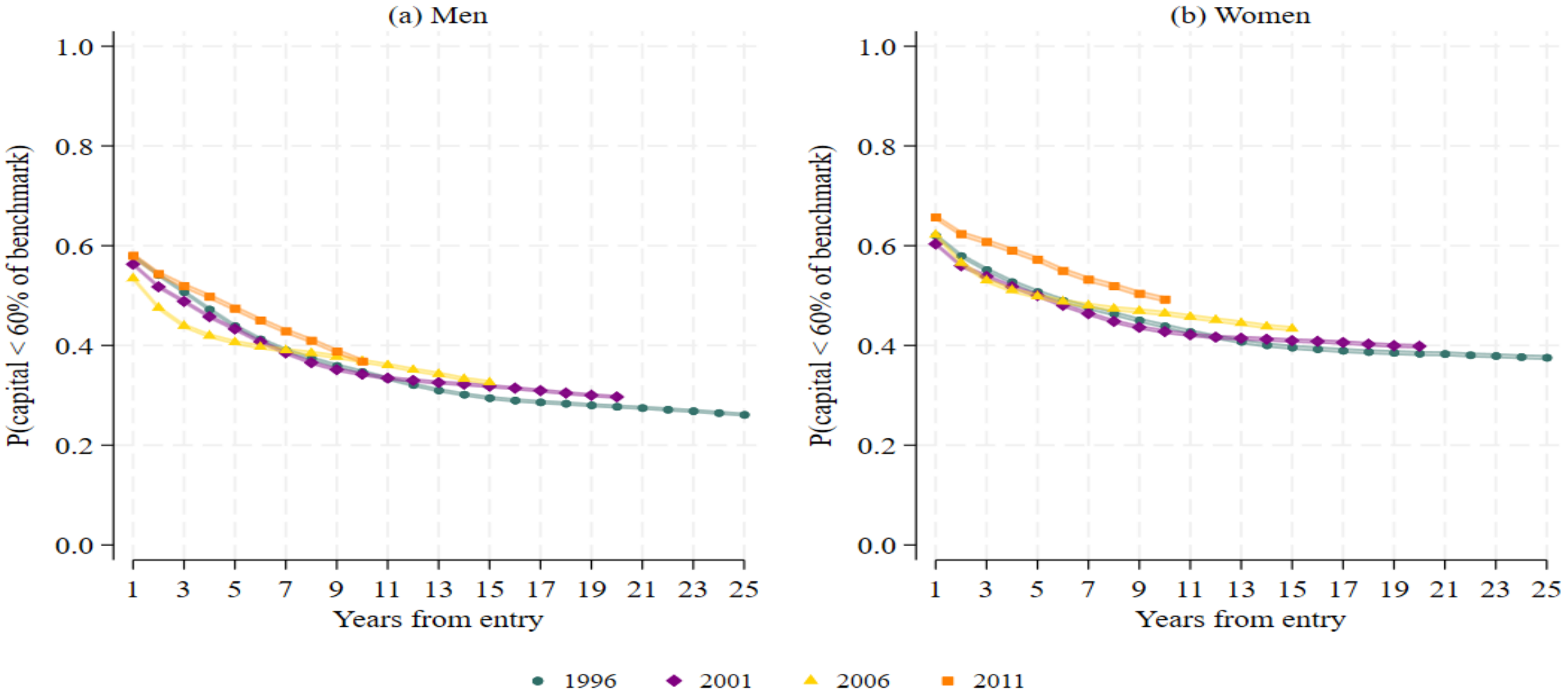


HETEROGENEITY

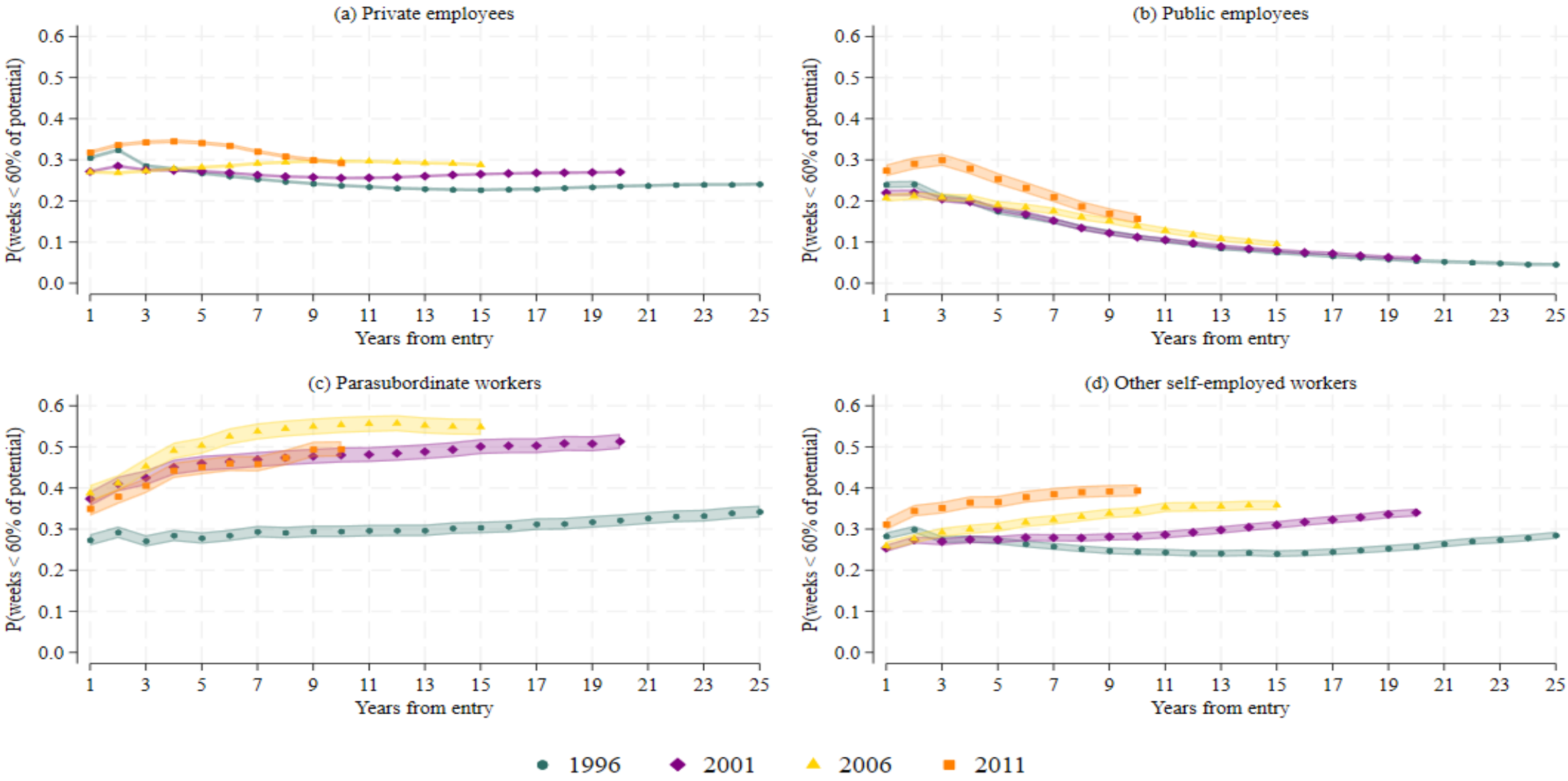
FTE weeks poverty by distance and cohort, by gender



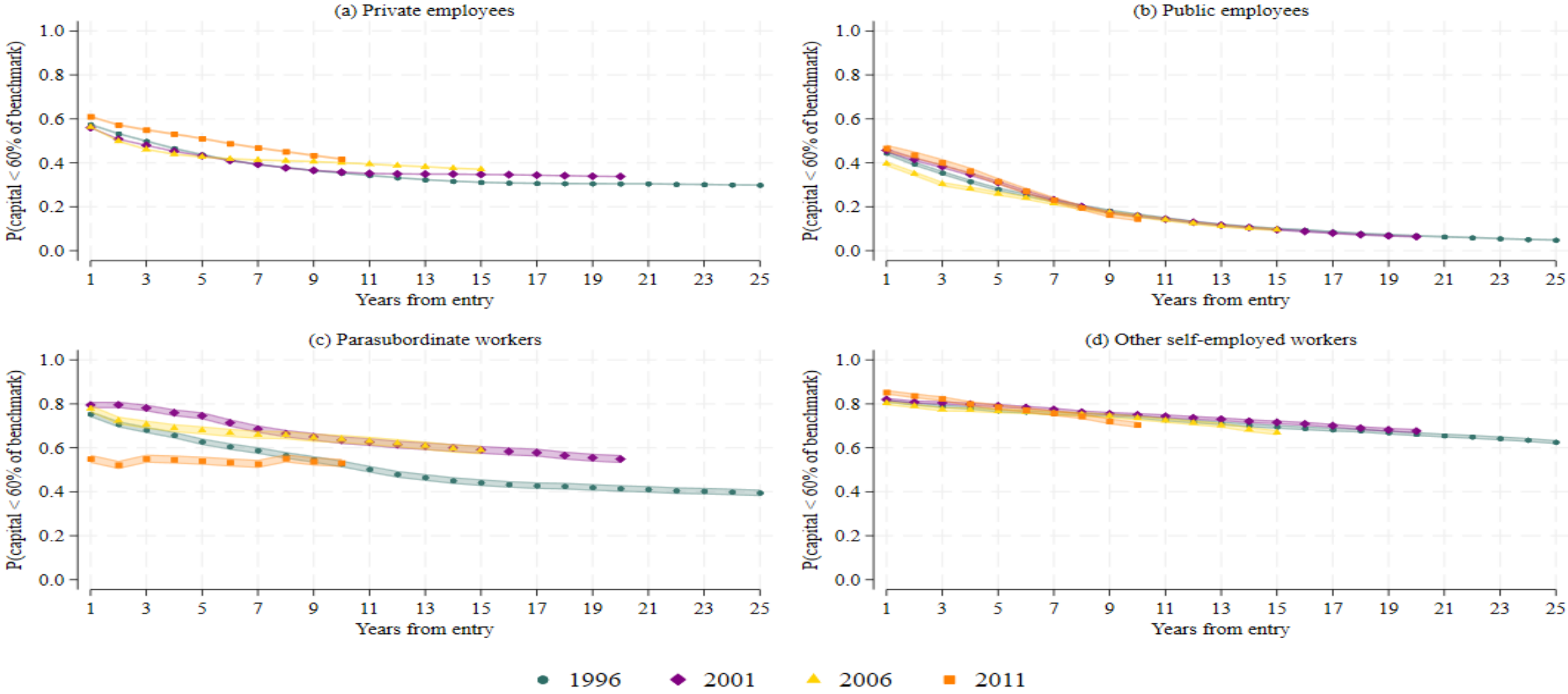
Capital poverty by distance and cohort, by gender (wrt median employee)



Weeks poverty by distance and cohort, by type of work

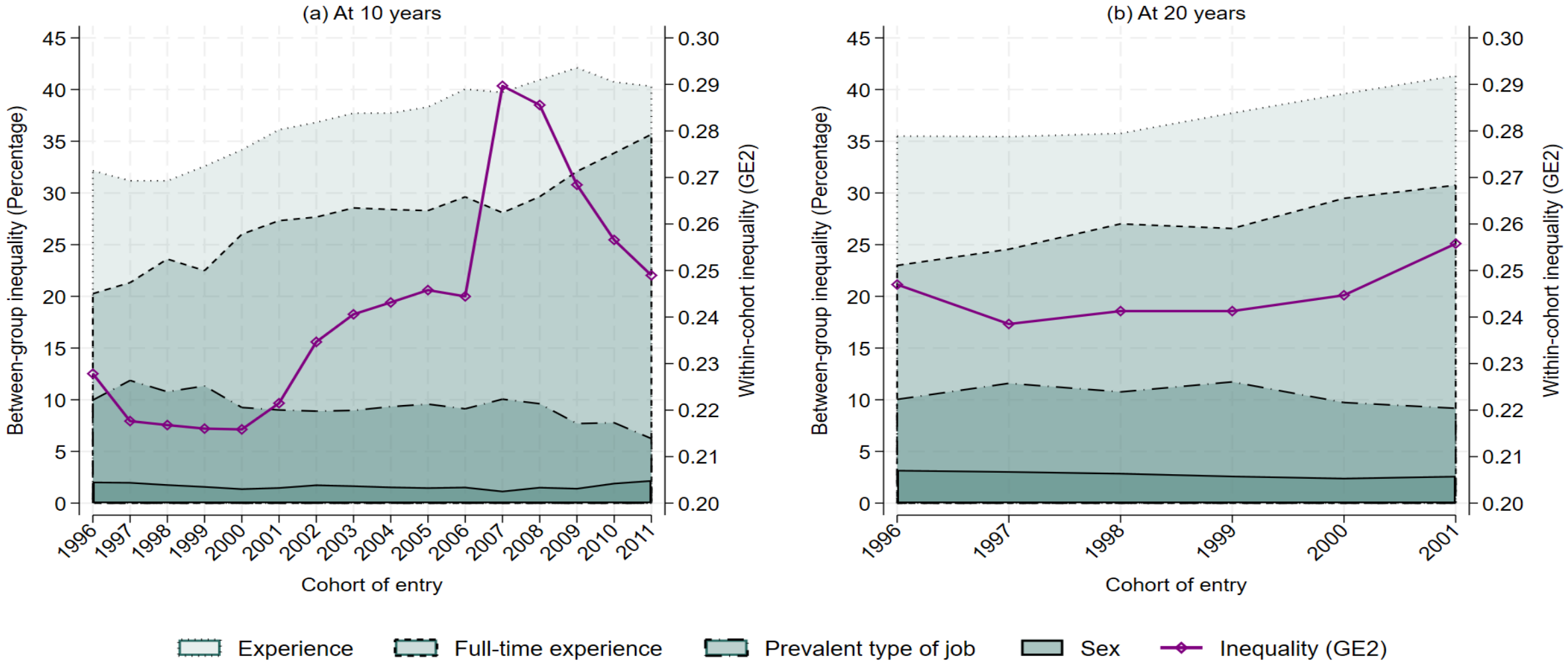


Capital poverty by distance and cohort, by type of work (wrt median employee)



SUBGROUP DECOMPOSITION OF INEQUALITY TRENDS

Decomposition of accumulated capital inequality by subgroup



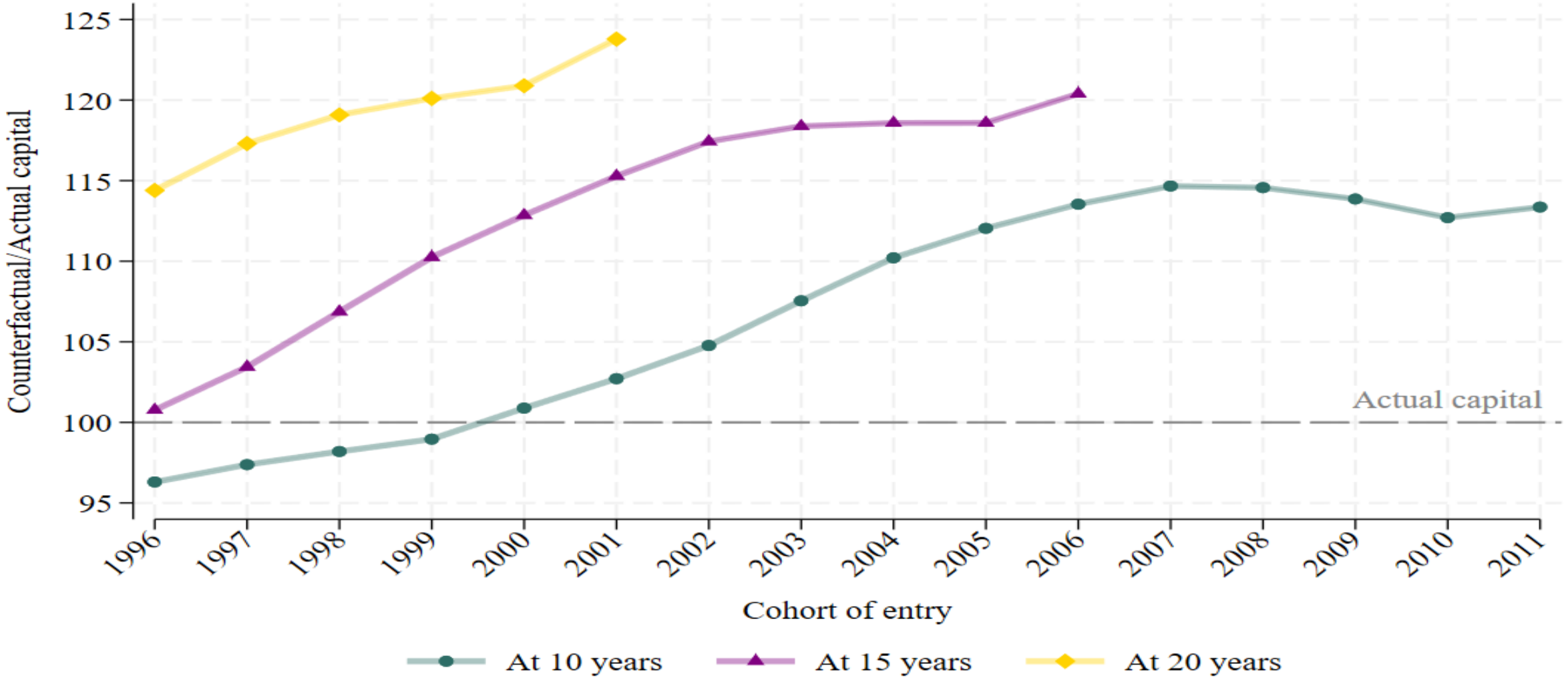
DETERMINANTS OF UNSUCCESFUL CAREER TRENDS

Counterfactual scenarios

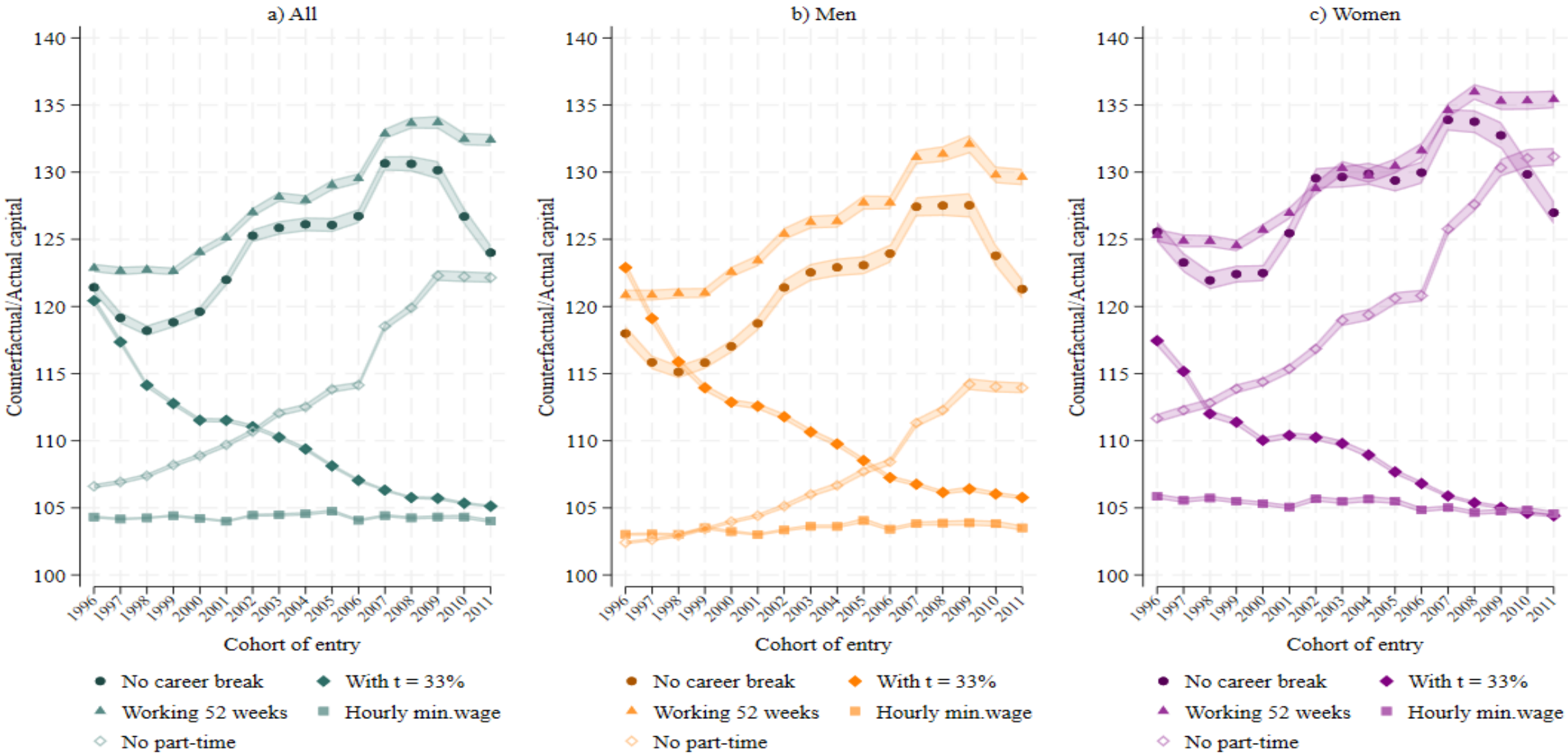
- To uncover possible mechanism underlying accumulated capital trends (e.g. macroeconomic conditions, working time, hourly wage), we employ counterfactual capital distributions built by changing one capital determinant at a time
- Aggregate macroeconomic risk: GDP growth, common to the generation => we assume a 3.5% yearly nominal GDP growth rate
- Individual risks:

Capital determinant	Counterfactual
Years of work in the career	Full career, using contributions from previous year for holes
Weeks of work in the year	Annual earnings adjusted as if working 52 weeks
Social contribution rate applied	t = 0.33 for all
Low hourly wage	Weekly earnings adjusted on a 'minimum wage' based on the 60% of the median weekly wage of those working full time full year (~8.40€ per hour in 2022)
Part-time work	Annual earnings adjusted as if working full time during the weeks of PT work

Counterfactual scenarios: GDP growh at 3.5%



Counterfactual scenarios at 10 years from entry



Next steps

- Further investigate within the heterogeneity in the capital accumulation within cohorts
- Further investigate mechanisms behind differences between cohorts, i.e. adding controls about individuals' demographic characteristics (gender, age of entry, region of birth) and labour market statuses (e.g. share of the working life spent in different sector of activity, firm's size, region of work, contractual arrangement) to test what variables may explain between cohorts' differences

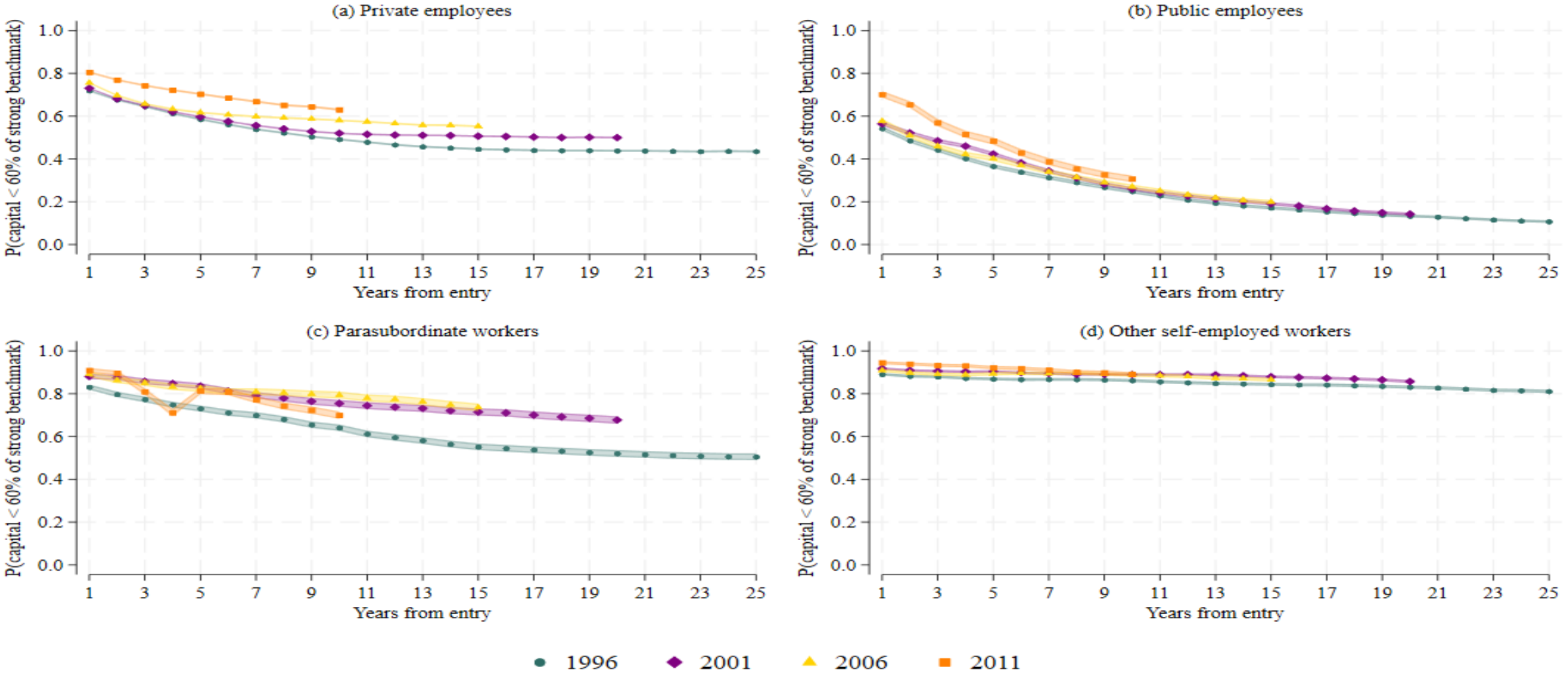
Policy implications

- Worsening trends across cohorts and ‘risk indicators’ which do not highly improve from a certain career phase onwards => may we be optimist about ‘mechanic’ improvements due to future career developments?
- An individual always earnings 60% of median gross earnings will retire at 69 with 45 years of activity (i.e. after a very long career…) with a real net pension amounting approximately 800 euros per month (700 euros if retiring at 66+42)
- Will weak workers be able to work (and match labour demand) at older ages?
- Policy strategy based on both predistributive measures acting on labour market equilibria, but – at least for older cohorts – urgency of a ‘guaranteed NDC pension’ to deal with the most unacceptable expected low pension (Raitano 2023)

Thanks for your attention!!!☺

FTE weeks poverty by distance and cohort, by type of work

Capital poverty by distance and cohort, by type of work (wrt 'strong' median employee)



Counterfactual scenarios at 20 years from entry