Eckstein-Keane-Wolpin models

An invitation for transdisciplinary collaboration

March 10, 2020

Roadmap

- Setup
- Example
- Improvements
- Nonstandard expectations

Setup

Example

Figure: Choices over the life cycle

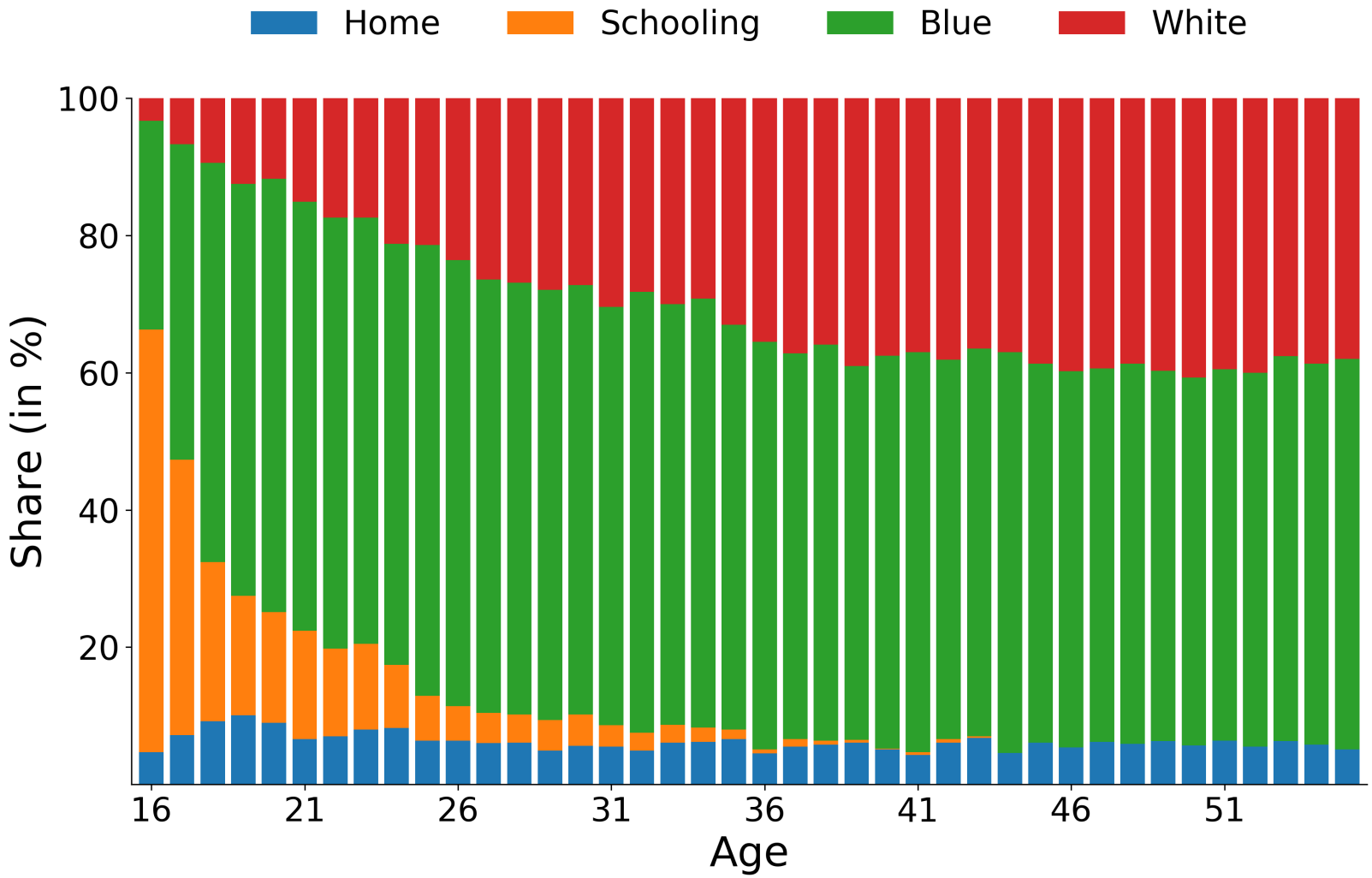
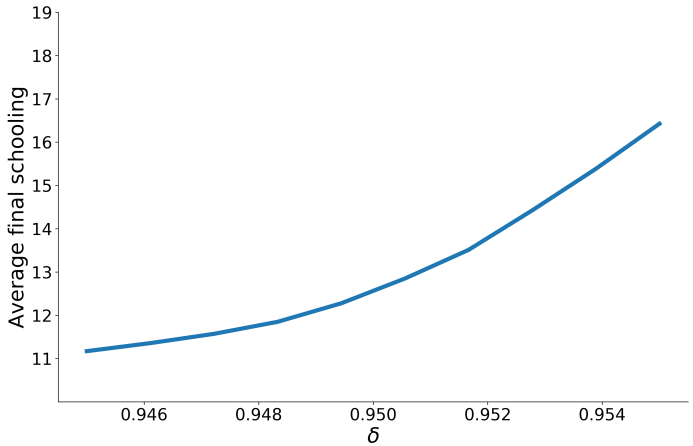
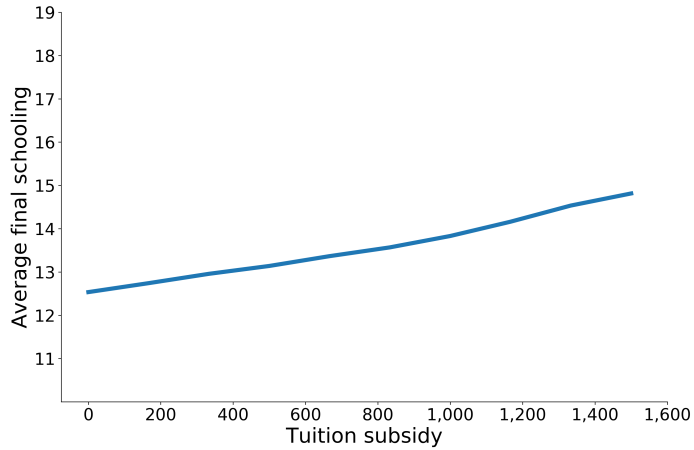


Figure: Economic mechanism and policy forecast



Time preference



Tuition subsidy

respy & estimagic

... missing workflow figure

Figure: Model specification

kw_94_two.csv

```
category,name,value,comment
delta,delta,0.95,discount factor
wage_a,constant,9.21,log of rental price
wage_a,exp_edu,0.04,return to an additional year of schooling
wage_a,exp_a,0.033,return to same sector experience
wage_a,exp_a_square,-0.0005,"return to same sector, quadratic experience"
wage_a,exp_b,0,return to other sector experience
wage_a,exp_b_square,0,"return to other sector, quadratic experience"
wage_b,constant,8.2,log of rental price
wage_b,exp_edu,0.08,return to an additional year of schooling
wage_b,exp_b,0.067,return to same sector experience
wage_b,exp_b_square,-0.001,"return to same sector, quadratic experience"
wage_b,exp_a,0.022,return to other sector experience
wage_b,exp_a_square,-0.0005,"return to other sector, quadratic experience"
nonpec_edu,constant,5000,constant reward for choosing education
nonpec_edu,at_least_twelve_exp_edu,-5000,"reward for going to college (tuition, etc.)"
nonpec_edu,not_edu_last_period,-15000,reward for going back to school
nonpec_home,constant,14500,constant reward of non-market alternative
shocks_sdcorr,sd_a,0.4,"Element 1,1 of standard-deviation/correlation matrix"
shocks_sdcorr,sd_b,0.5,"Element 2,2 of standard-deviation/correlation matrix"
shocks_sdcorr,sd_edu,6000,"Element 3,3 of standard-deviation/correlation matrix"
shocks_sdcorr,sd_home,6000,"Element 4,4 of standard-deviation/correlation matrix"
shocks_sdcorr,corr_b_a,0,"Element 2,1 of standard-deviation/correlation matrix"
shocks_sdcorr,corr_edu_a,0,"Element 3,1 of standard-deviation/correlation matrix"
shocks_sdcorr,corr_edu_b,0,"Element 3,2 of standard-deviation/correlation matrix"
shocks_sdcorr,corr_home_a,0,"Element 4,1 of standard-deviation/correlation matrix"
shocks_sdcorr,corr_home_b,0,"Element 4,2 of standard-deviation/correlation matrix"
shocks_sdcorr,corr_home_edu,0,"Element 4,3 of standard-deviation/correlation matrix"
lagged_choice_1_edu,probability,1,Probability that the first lagged choice is education
initial_exp_edu_10,probability,1,Probability that the initial level of education is 10
```

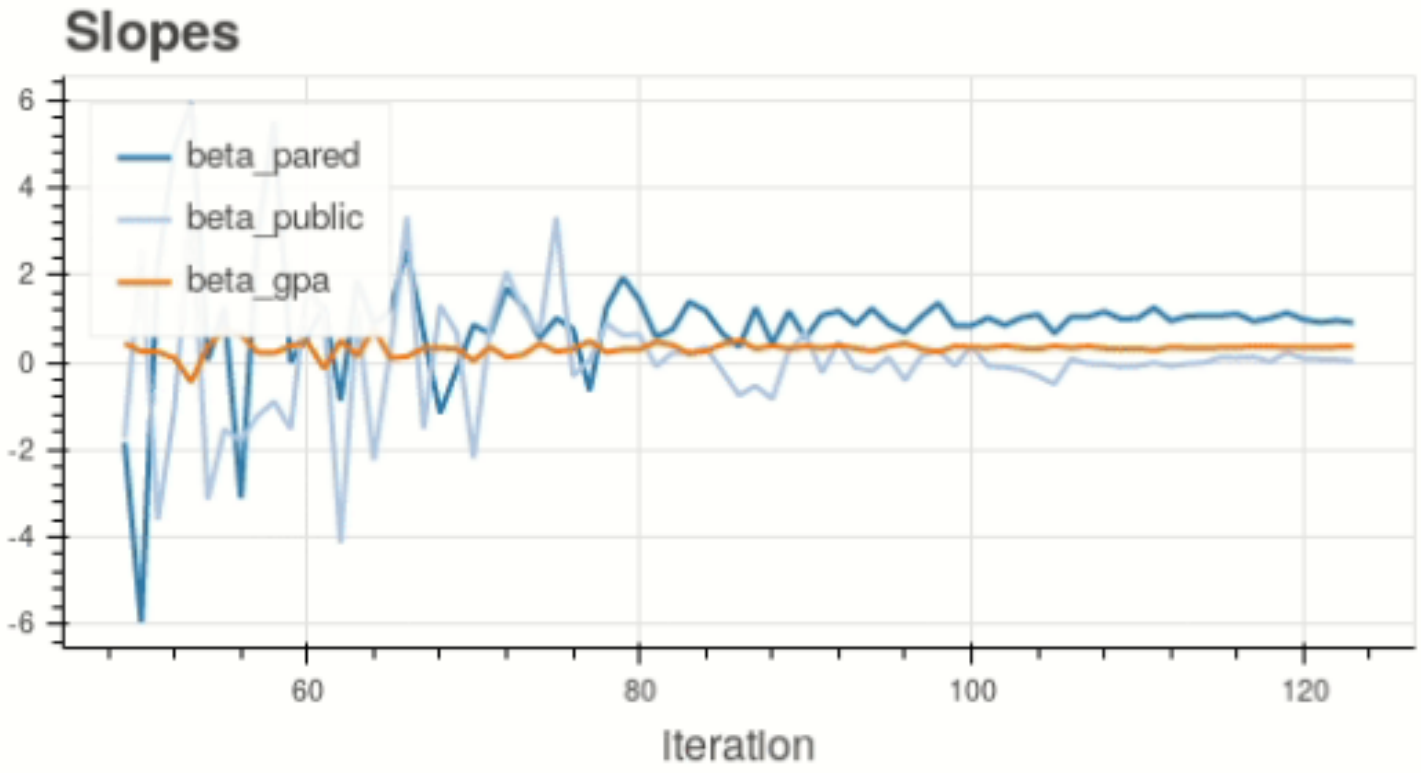
Parameterization

kw_94_two.yaml

```yaml
estimation_draws: 200
estimation_seed: 500
estimation_tau: 500
interpolation_points: -1
n_periods: 40
simulation_agents: 1000
simulation_seed: 132
solution_draws: 500
solution_seed: 456
monte_carlo_sequence: random
core_state_space_filters:
  # In periods > 0, if agents accumulated experience only in one choice, lagged choice
  # cannot be different.
  - "period > 0 and exp_{i} == period and lagged_choice_1 != '{i}'"
  # In periods > 0, if agents always accumulated experience, lagged choice cannot be
  # non-experience choice.
  - "period > 0 and exp_a + exp_b + exp_edu == period and lagged_choice_1 == '{j}'"
  # In periods > 0, if agents accumulated no years of schooling, lagged choice cannot
  # be school.
  - "period > 0 and lagged_choice_1 == 'edu' and exp_edu == 0"
  # If experience in choice 0 and 1 are zero, lagged choice cannot be this choice.
  - "lagged_choice_1 == '{k}' and exp_{k} == 0"
  # In period 0, agents cannot choose occupation a or b or mil.
  - "period == 0 and lagged_choice_1 == '{k}'"
covariates:
  constant: "1"
  exp_a_square: exp_a ** 2
  exp_b_square: exp_b ** 2
  at_least_twelve_exp_edu: exp_edu >= 12
  not_edu_last_period: lagged_choice_1 != 'edu'
```

Options

Figure: Dashboard



Improvements

Improvements

- Numerical integration 

- Global optimization 

- Function approximation 

- High-performance computing 

Extensions

Extensions

- Robust decision-making repo status Active
- Uncertainty quantification repo status Active
- Model validation repo status Concept
- Nonstandard expectations repo status Concept

Join us!

GitHub	http://bit.ly/ose-github
Meetup	http://bit.ly/ose-meetup
Chat	http://bit.ly/ose-zulip

Appendix

Content

- Contact
- References

Contact

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References

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