# THE CAUSES AND CONSEQUENCES OF SELF-EMPLOYMENT OVER THE LIFE CYCLE

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# INTRODUCTION

Many policies are designed to increase self-employment (SE).

Yet, the self-employed are a very heterogeneous group:

- Many SE businesses do not grow and may not intend to grow.
- Many spells are short and involve minimal capital investment.

Little is known about who may be induced into SE by these policies.

## Research Questions:

1. Why do people choose to self-employ?
2. How are these decisions influenced by skills and career dynamics?
3. How are these decisions influenced by policies that promote SE?

1. I document that careers involving SE fit into a **small number of economically distinct groups.**

- This suggests there are distinct reasons why people choose to enter SE:
  - Intent to start large lasting businesses.
  - Smoothing over labor market shocks.
  - Weak labor force attachment.

1. I document that careers involving SE fit into a **small number of economically distinct groups.**

2. I develop a **model of dynamic career choice** that includes SE decisions.

- **SE decisions depend on life-cycle factors:**
  - Pre-existing skills and characteristics.
  - Career history.
  - Future career prospects.

1. I document that careers involving SE fit into a **small number of economically distinct groups.**

2. I develop a **model of dynamic career choice** that includes SE decisions.

3. Use the model to **quantify the determinants of SE** behaviors.

- **Use model to estimate:**
  - Importance of baseline skills and characteristics.
  - Transferability of human capital between PE and SE.
  - Role of non-pecuniary benefits.
  - How expectations of returning to PE affect capital decisions.

1. I document that careers involving SE fit into a **small number of economically distinct groups.**

2. I develop a **model of dynamic career choice** that includes SE decisions.

3. Use the model to **quantify the determinants of SE** behaviors.

4. Use the model to **analyze counterfactual policies.**

- **For counterfactual policies, I can consider:**
  - The types of self-employment created.
  - The welfare and wage returns of those induced in.
  - How impacts the of policies vary by age and demographics.

## Quantifying the determinants of SE behaviors:

- Role of cognitive or non-cognitive skill in SE.
  - Both increase SE, but do so through very different mechanisms.
  - Cognitive skill increases white-collar SE and early SE.
  - Non-cog skill moves people out of non-employment and increases incorporation.

## Analyzing counterfactual policies:

- One-time subsidies to enter self-employment.
  - Subsidies produce mostly transient low-productivity SE.
    - 50% exit after one year, more than 80% exit within eight years.
  - Welfare and earnings gains are small for those induced in.

# ORGANIZATION OF THE TALK:

1. Introduction
2. Data and Swedish labor market details
3. Documenting SE behavior over the life cycle
4. Model
5. Results

# DATA AND SWEDISH LABOR MARKET DETAILS

## Longitudinal data on men born in Sweden between 1968 and 1977:

- Detailed earnings and employment data from tax returns.
- Detailed educational records.
- Measures of cognitive and non-cognitive ability from mandatory military enlistment exams.
- Detailed information on the self-employed and the businesses they create (assets, materials, employees, revenue, profits, legal structure).
- Linked information on parents (wealth, education, income).
- Limitation: little information on personal wealth.

# SELF-EMPLOYMENT OVER THE LIFE CYCLE

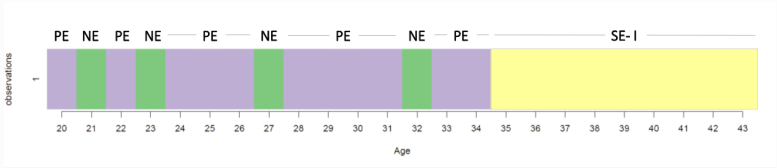
Several papers have argued that the self-employed are heterogeneous.

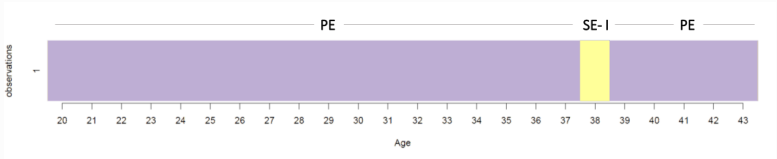
I take a new approach by documenting the heterogeneous ways self-employment spells fit into people's life cycles.

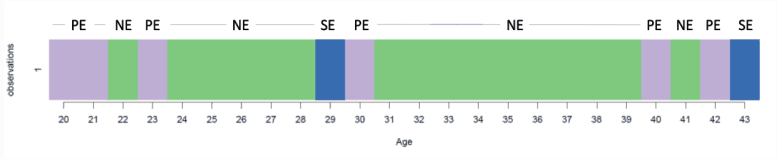
- In each period a person can be:
  1. self-employment (SE),
  2. incorporated self-employment (SE-I),
  3. paid employment (PE),
  4. in school (SCH),
  5. or non-employed (NE).
- An example five-period employment profile: PE-NE-PE-PE-SE.

Heterogeneous self-employment behaviors are clearly visible in the data.

## Consider three example profiles:



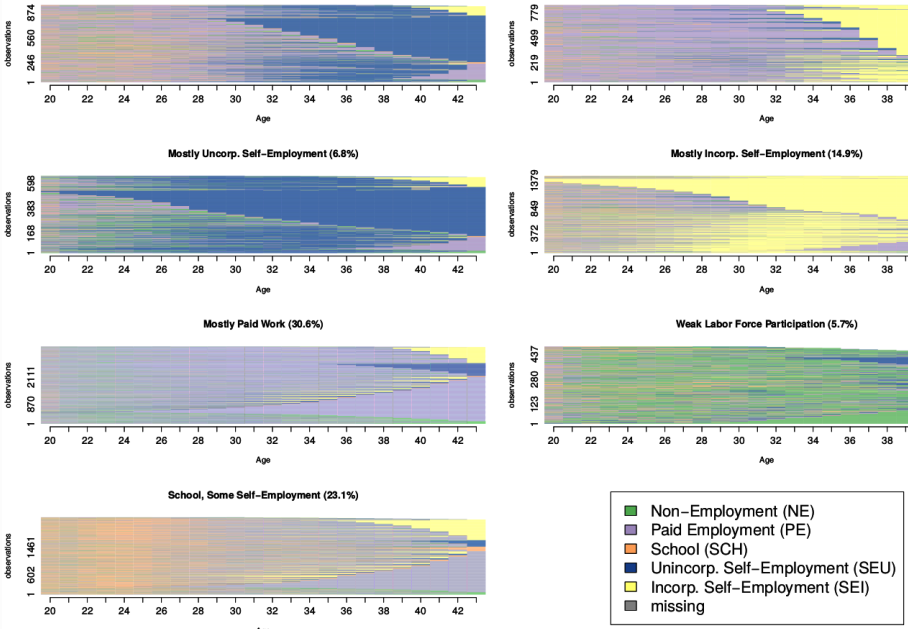



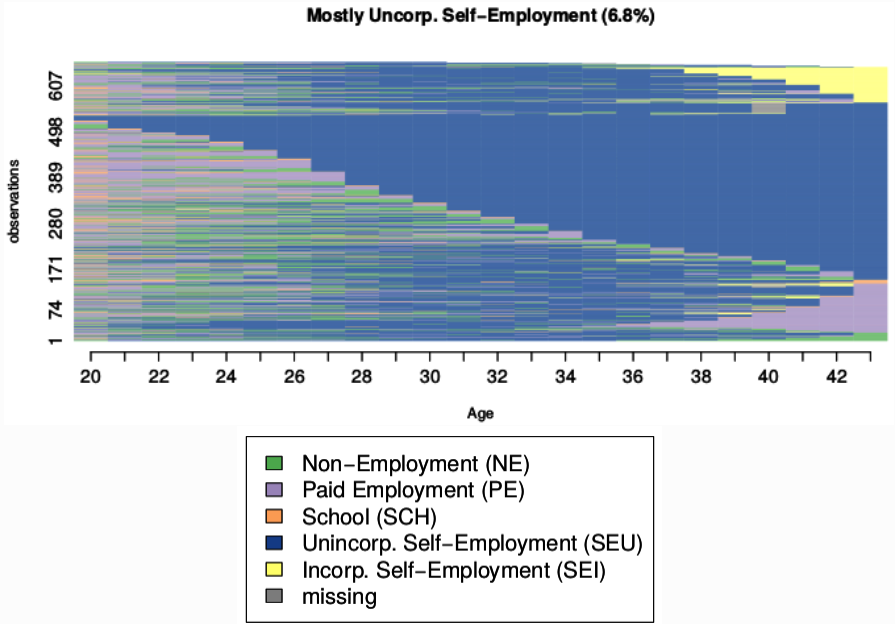



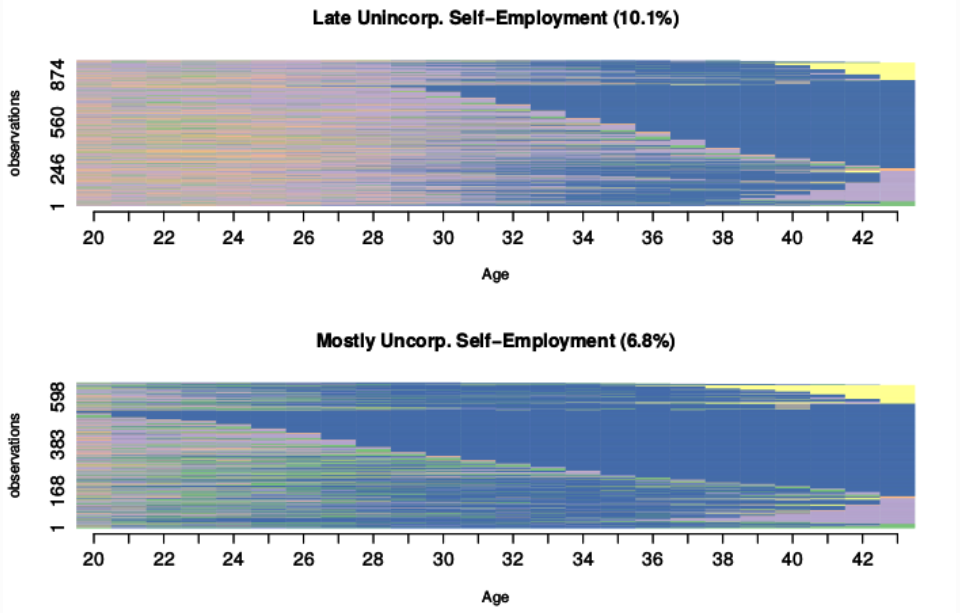
## Machine-learning algorithm for clustering discrete time series:

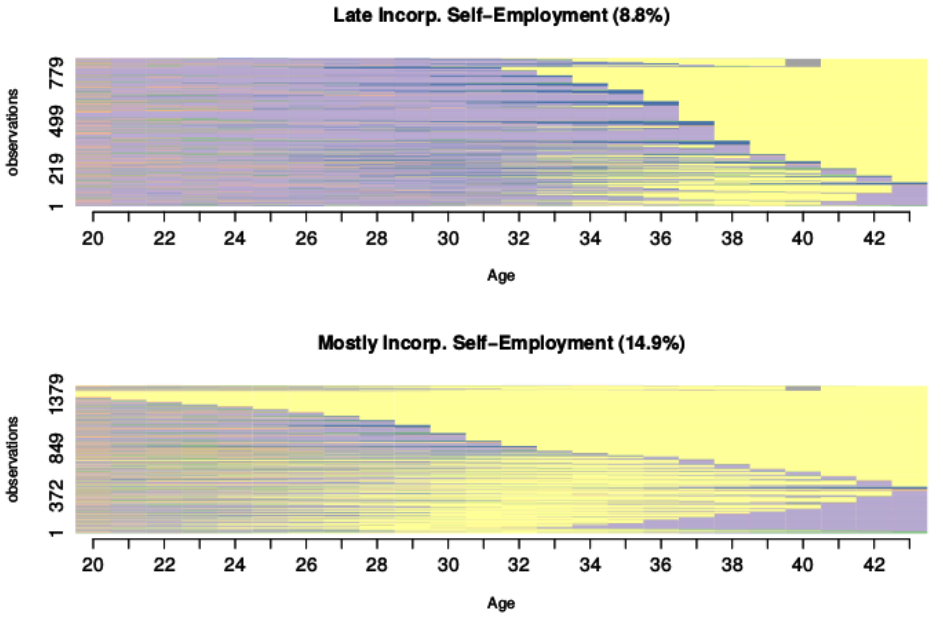
- I consider a model with five states: “PE”, “SE”, “SE-I”, “SCH”, and “NE” .
- Use “Optimal Matching” (OM) to construct a distance matrix.
  - Heuristic method for constructing distances between discrete strings.
  - Calculates the shortest path from one string to another using:
    1. substitution
    2. insertion
    3. deletion
  - Each action has an associated cost.
- Distance matrix can then be clustered with standard hierarchical clustering algorithms (Ward’s method).
- Applying OM to the life cycle profiles involving self-employment, I find **seven distinct groups.**

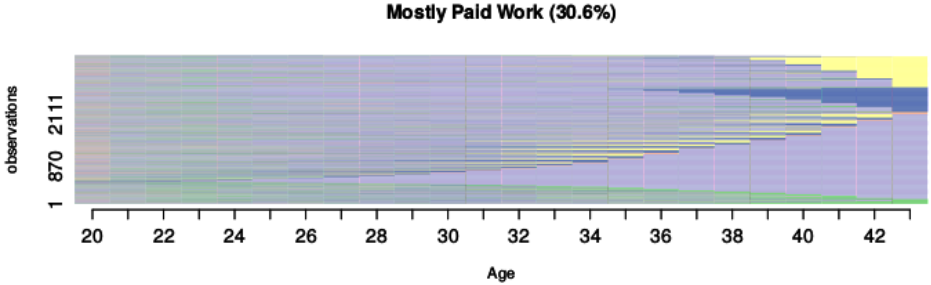
Details

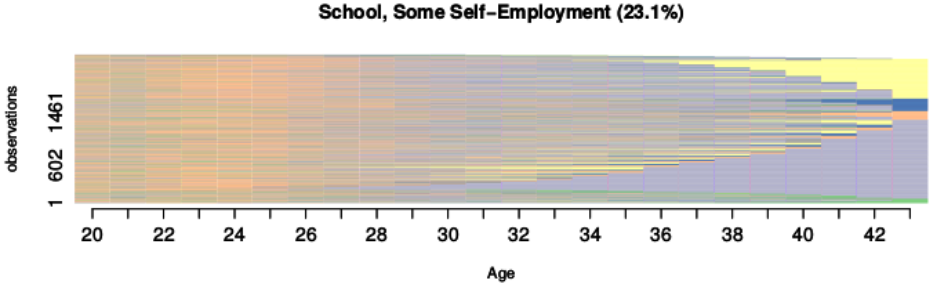

Late Unincorp. Self−Employment (10.1%)
Late Incorp. Self−Employment (8.8%)
Mostly Uncorp. Self−Employment (6.8%)
Mostly Incorp. Self−Employment (14.9%)
Mostly Paid Work (30.6%)
Weak Labor Force Participation (5.7%)
School, Some Self−Employment (23.1%)
observations
Age
Non−Employment (NE)
Paid Employment (PE)
School (SCH)
Unincorp. Self−Employment (SEU)
Incorp. Self−Employment (SEI)
missing

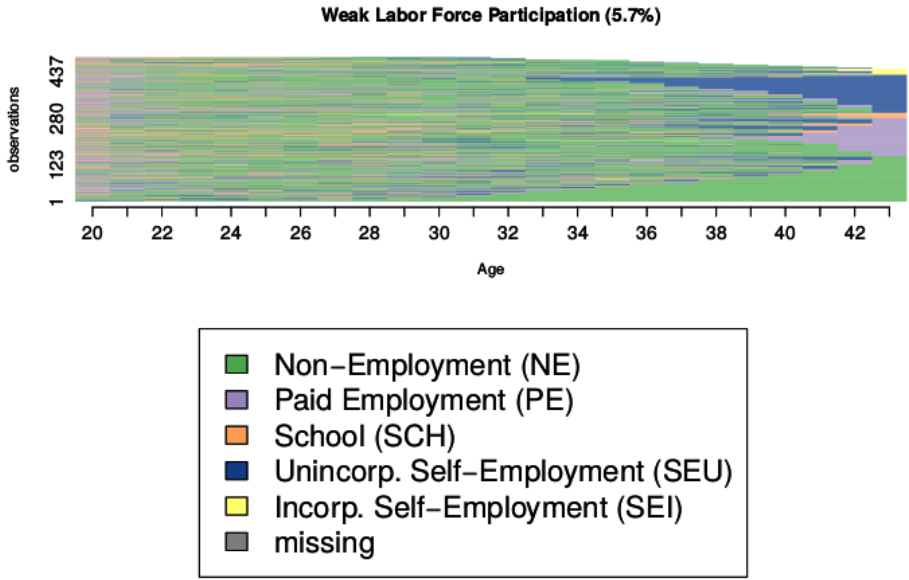

Mostly Uncorp. Self−Employment (6.8%)
observations
1
74
171
280
389
498
607
20
22
24
26
28
30
32
34
36
38
40
42
Age
Non−Employment (NE)
Paid Employment (PE)
School (SCH)
Unincorp. Self−Employment (SEU)
Incorp. Self−Employment (SEI)
missing

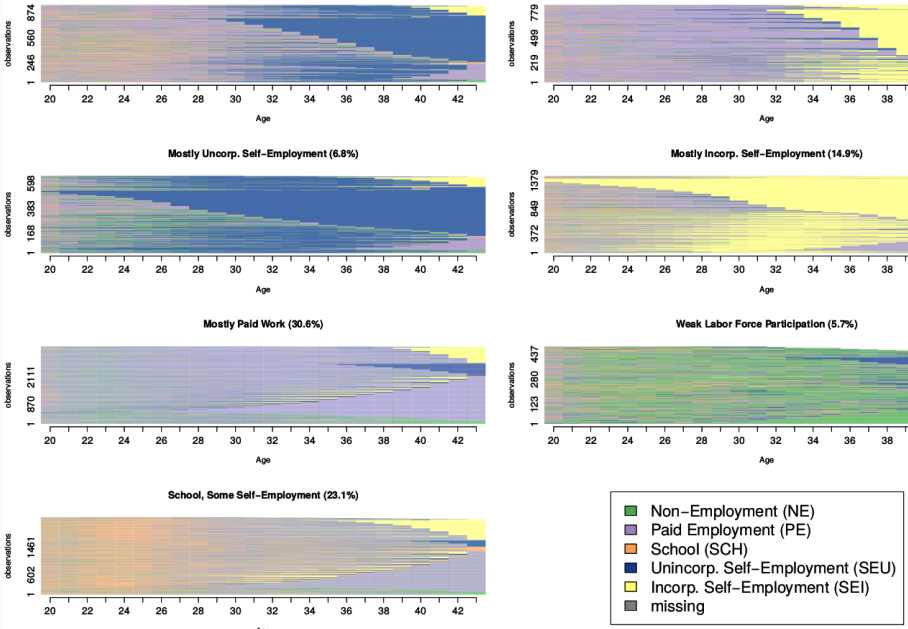

Late Unincorp. Self−Employment (10.1%)
observations
1
246
560
874
20
22
24
26
28
30
32
34
36
38
40
42
Age
Mostly Uncorp. Self−Employment (6.8%)
observations
1
168
383
598
20
22
24
26
28
30
32
34
36
38
40
42
Age


Late Incorp. Self-Employment (8.8%)
observations
1
219
499
779
20
22
24
26
28
30
32
34
36
38
40
42
Age
Mostly Incorp. Self-Employment (14.9%)
observations
1
372
849
1379
20
22
24
26
28
30
32
34
36
38
40
42
Age


Mostly Paid Work (30.6%)
observations
1
870
2111
20
22
24
26
28
30
32
34
36
38
40
42
Age


School, Some Self−Employment (23.1%)
observations
1
602
1461
20
22
24
26
28
30
32
34
36
38
40
42
Age


Weak Labor Force Participation (5.7%)
observations
1
123
280
437
20
22
24
26
28
30
32
34
36
38
40
42
Age
Non−Employment (NE)
Paid Employment (PE)
School (SCH)
Unincorp. Self−Employment (SEU)
Incorp. Self−Employment (SEI)
missing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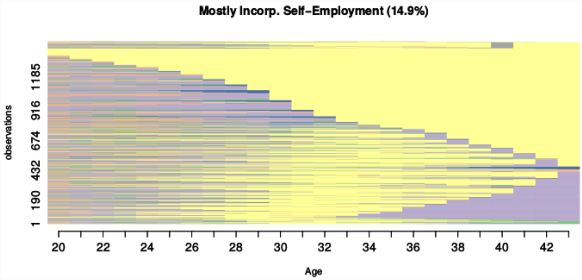
Incorp. Self−Employment (SEI)
missing

# SUMMARY OF SELF-EMPLOYMENT GROUPS

| | Mostly SE Incorp | Mostly SE Unincorp | Mostly Paid Work | Weak LFP |
|---|---|---|---|---|
| Non-cog Ability | 0.20 | -0.14 | 0.00 | -0.50 |
| Cog Ability | 0.12 | -0.15 | -0.10 | -0.31 |
| Self-Emp Parents | 0.67 | 0.66 | 0.51 | 0.51 |
| Med Fixed Assets (1st yr) | $44,133 | $6,552 | $6,974 | $2,410 |

Note: Cognitive and non-cognitive ability are standardized to be mean 0 and a s.d. 1.
All monetary amounts in 2010 (USD).



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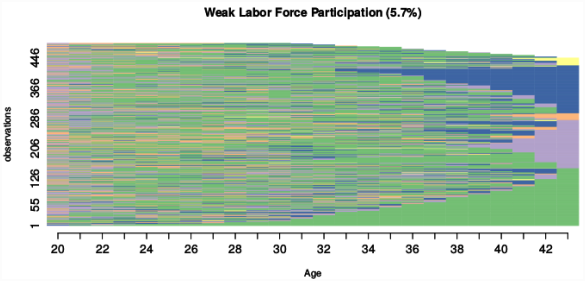
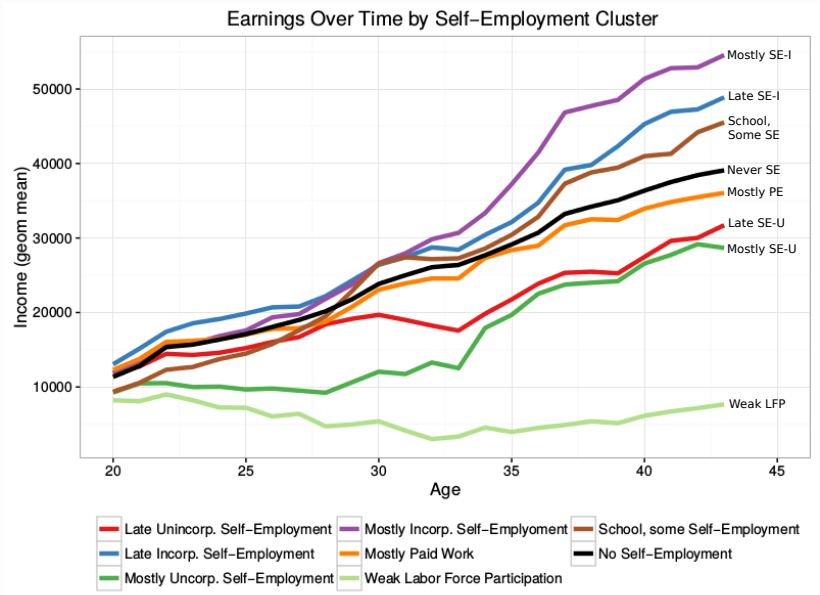


# AVG EARNINGS PROFILES BY CLUSTER



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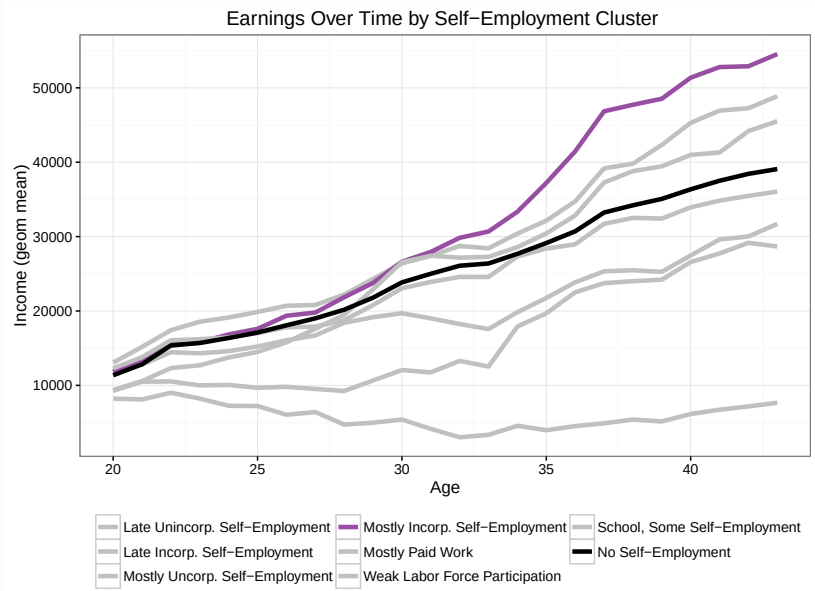
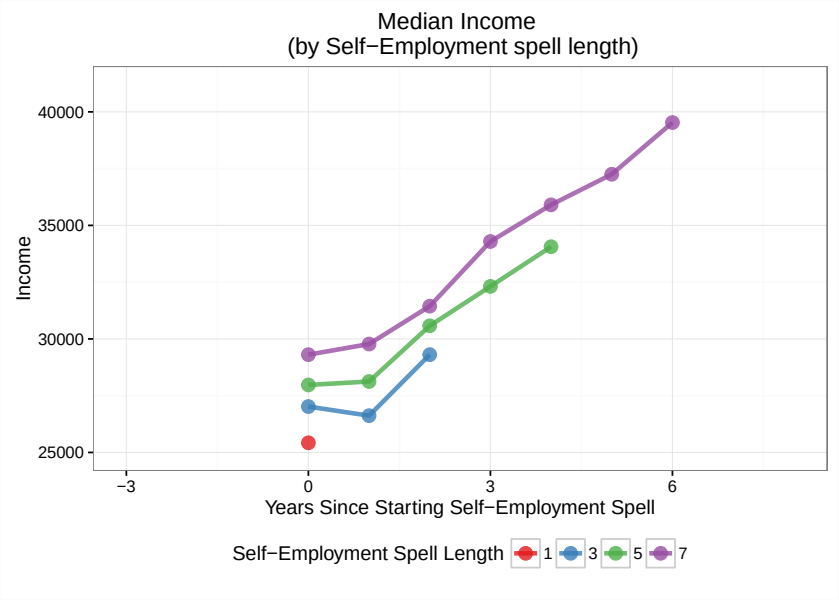


# EARNINGS PROFILES AND INITIAL CAPITAL

# EARNINGS PROFILES BY SE SPELL LENGTH: I



# EARNINGS PROFILES BY SE SPELL LENGTH: II

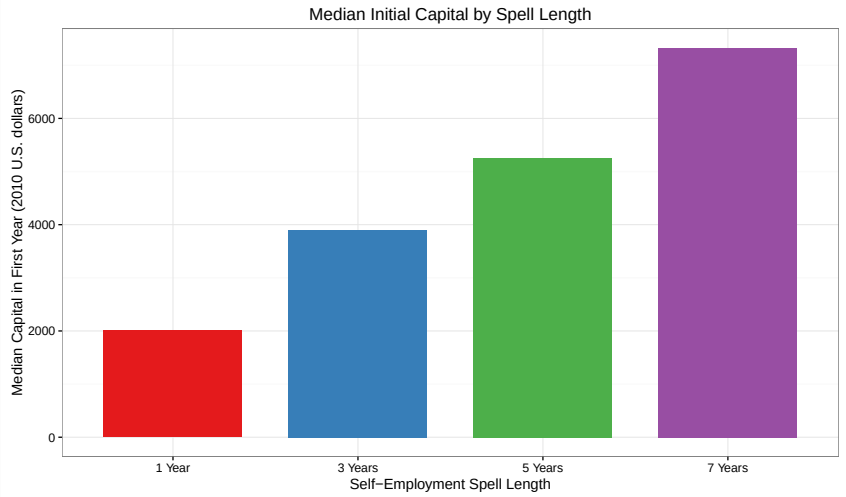
# EARNINGS PROFILES BY SE SPELL LENGTH: III

# EARNINGS PROFILES BY SE SPELL LENGTH: IV

# EARNINGS PROFILES BY SE SPELL LENGTH: V

Additional Years

**Figure:** Relationship between initial capital and survival



# STRUCTURAL MODEL

## SE decisions nested into a model of sequential career choice:

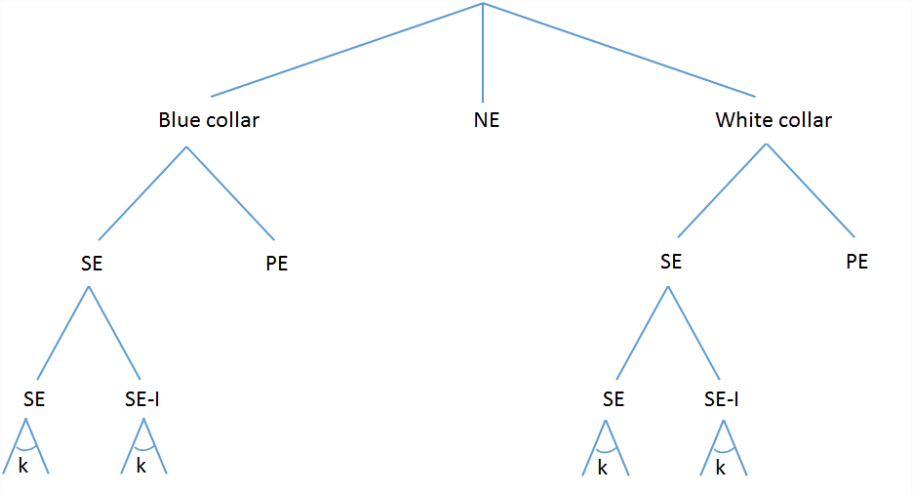
- Agents choose which sector to work in each period to maximize expected utility (blue-collar and white-collar).
- Conditional on sector, they choose to be in SE or PE.
- Agents acquire career-specific experience.

## When self-employed:

- Agents choose to incorporate or not.
- Agents choose how much capital to employ (spot market for capital, but with adjustment costs).
- Choice of capital depends on:
  - Absolute productivity (i.e. ability).
  - Relative productivity (i.e. how likely to quickly move back to PE).

In each period, the econometrician observes:

$$\{\mathbf{Z}_{i,t}, d_{i,t}, Y^d_{i,t,}, K^d_{i,t}\}$$

- $d_{i,t}$ - Career decision
- $Y^d_{i,t}$ - Labor-market income conditional on career choice $d_{i,t}$.
- $K^d_{i,t}$ - Amount of capital conditional on $d_{i,t}$.
- $\mathbf{Z}_{i,t} = \{\mathbf{x}_{i,t}, \mathbf{W}_{i,t}, s_i, \mathbf{E}_{i,t}, \mathbf{A}_i\}$ - Observable state variables.
  - $\mathbf{x}_{i,t}$ - covariates affecting earnings.
  - $\mathbf{W}_{i,t}$ - covariates affecting the rental price of capital.
  - $s_i$ - education.
  - $\mathbf{E}_{i,t}$ - vector of experience in each career.
  - $\mathbf{A}_i$ - cognitive and non-cognitive ability.

# WITHIN-PERIOD DECISION TREE