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

John Eric Humphries

May 1, 2019

Yale University

James J. Heckman
Econ 312, Spring 2021

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

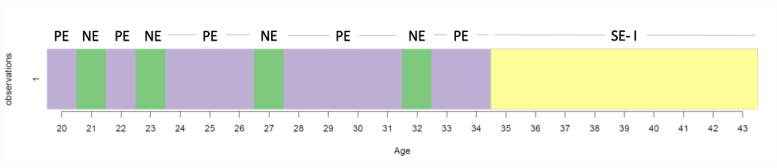
Several papers have argued that the self-employed are heterogeneous.

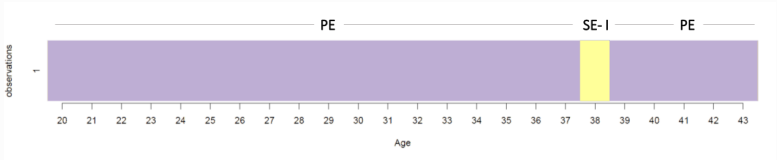
I take a new approach by documenting the heterogeneous ways self-employment spells fit into people's life cycles.

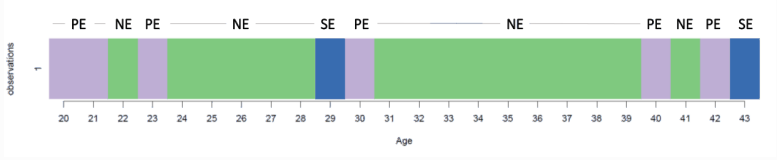
- In each period a person can be:
  1. self-employment (SE),
  2. incorporated self-employment (SE-I),
  3. paid employment (PE),
  4. in school (SCH),
  5. or non-employed (NE).
- An example five-period employment profile: PE-NE-PE-PE-SE.

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

Consider three example profiles:

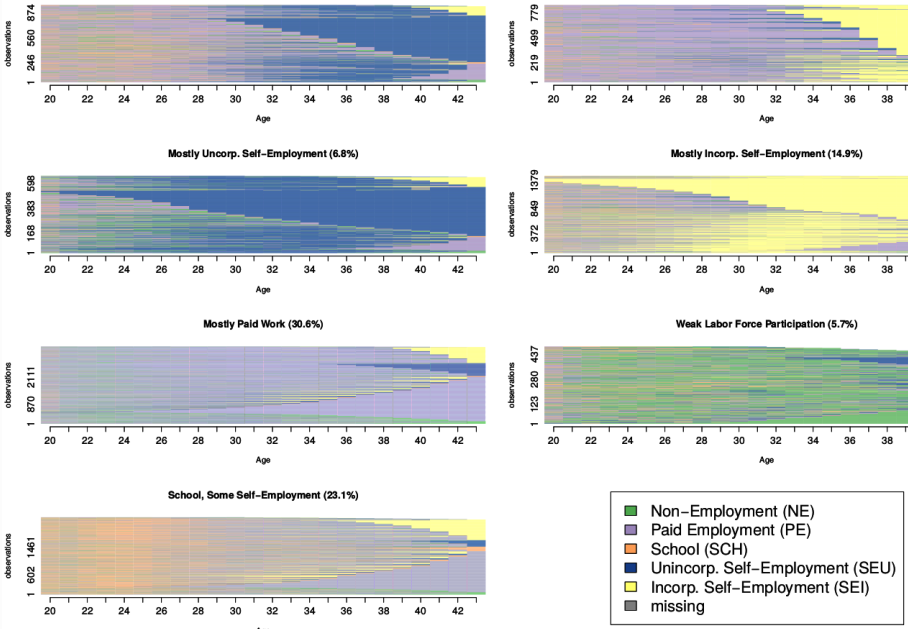




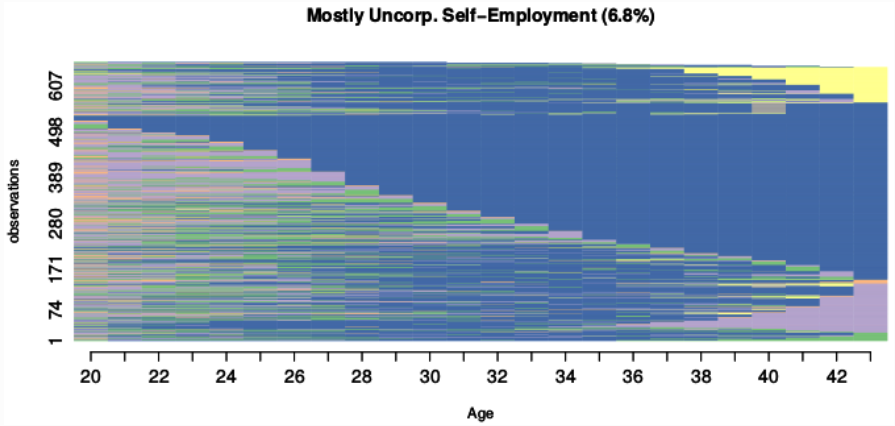


Machine-learning algorithm for clustering discrete time series:

- 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.**

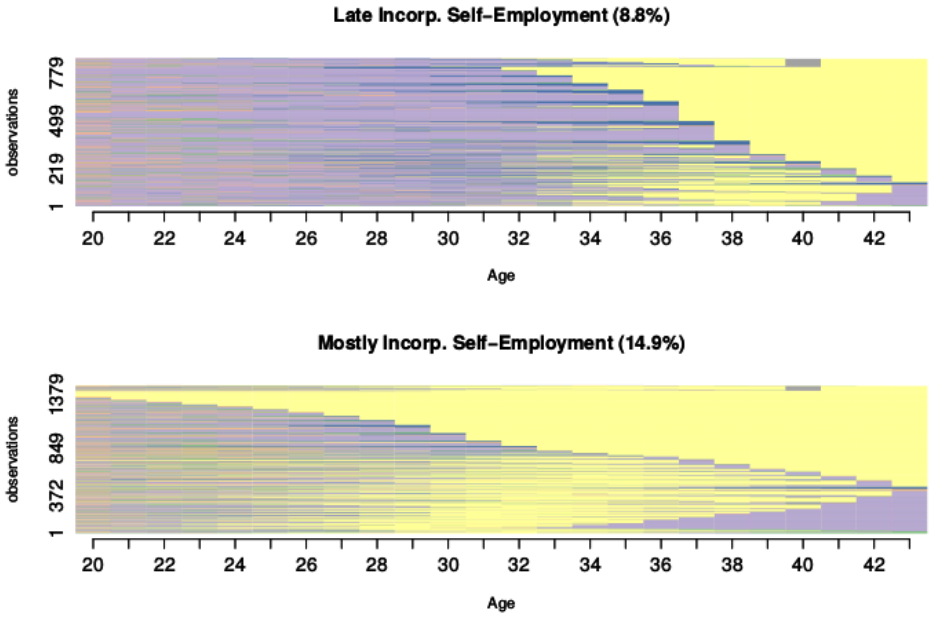

Late Unincorp. Self−Employment (10.1%)
Late Incorp. Self−Employment (8.8%)
Mostly Uncorp. Self−Employment (6.8%)
Mostly Incorp. Self−Employment (14.9%)
Mostly Paid Work (30.6%)
Weak Labor Force Participation (5.7%)
School, Some Self−Employment (23.1%)
observations
Age
Non−Employment (NE)
Paid Employment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

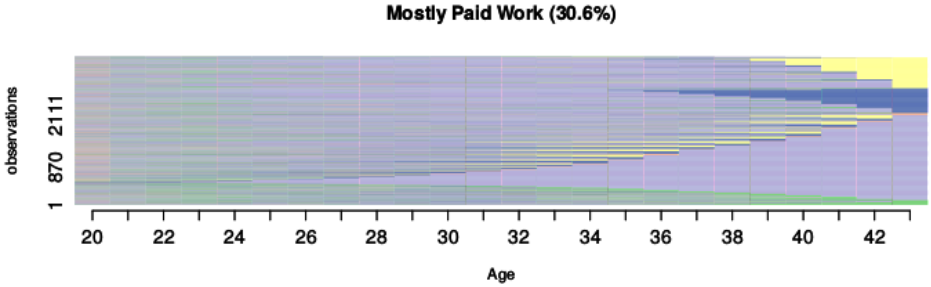
ZOOMING IN ON ONE GROUP

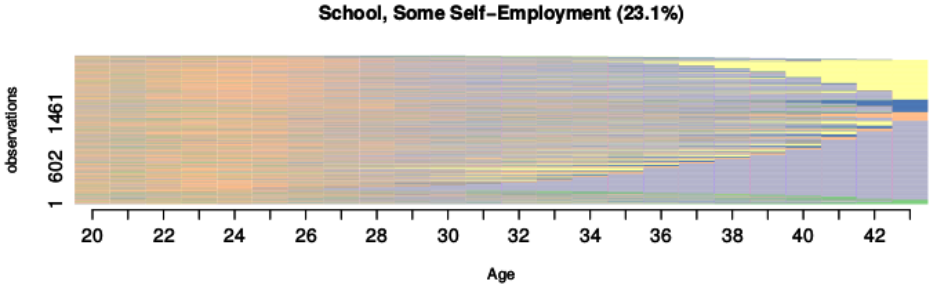


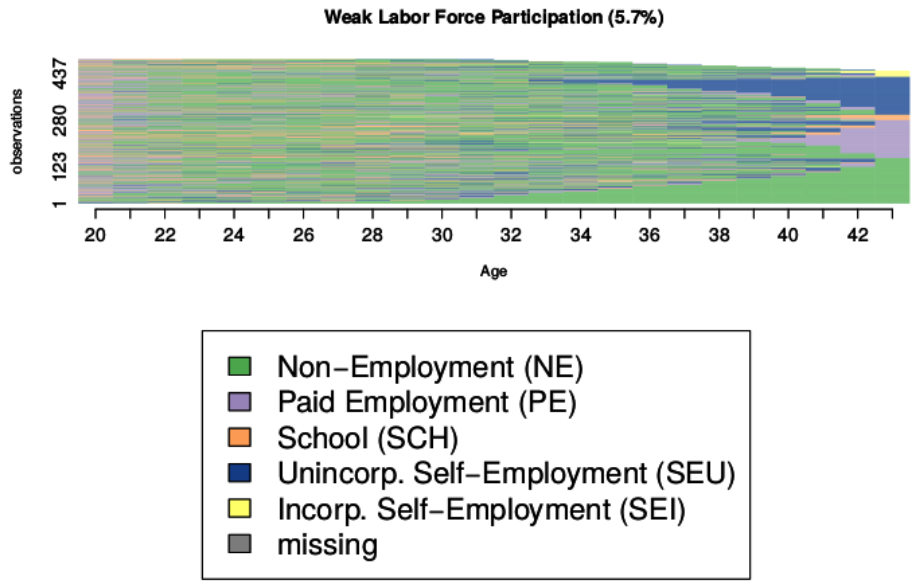

Late Unincorp. Self−Employment (10.1%)
observations
1
246
560
874
20
22
24
26
28
30
32
34
36
38
40
42
Age

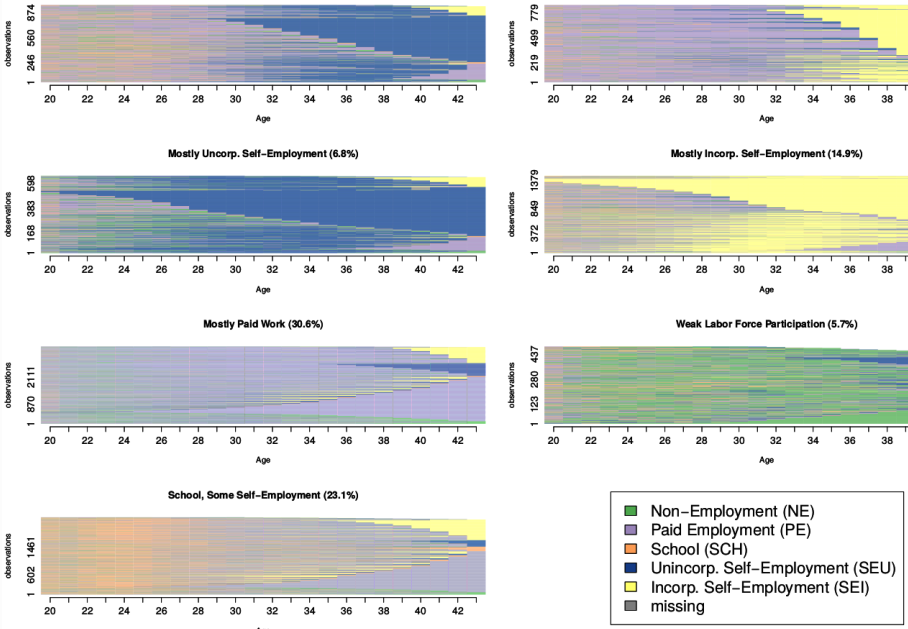

Mostly Uncorp. Self−Employment (6.8%)
observations
1
168
383
598
20
22
24
26
28
30
32
34
36
38
40
42
Age


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

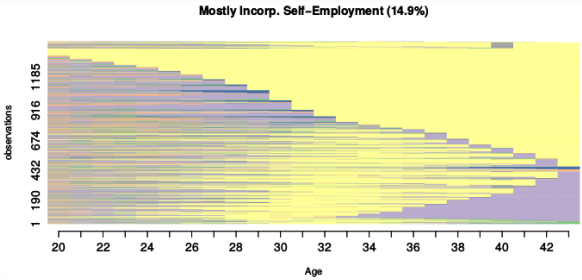

Weak Labor Force Participation (5.7%)
observations
1
123
280
437
20
22
24
26
28
30
32
34
36
38
40
42
Age
Non−Employment (NE)
Paid Employment (PE)
School (SCH)
Unincorp. Self−Employment (SEU)
Incorp. Self−Employment (SEI)
missing


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

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).



SUMMARY OF SELF-EMPLOYMENT GROUPS

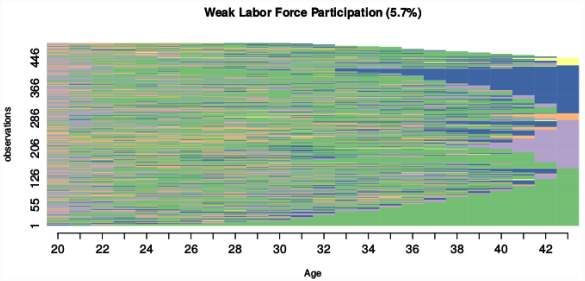
	Mostly SE Incorp	Mostly SE Unincorp	Mostly Paid Work	Weak LFP
Non-cog Ability	0.20	-0.14	0.00	-0.50
Cog Ability	0.12	-0.15	-0.10	-0.31
Self-Emp Parents	0.67	0.66	0.51	0.51
Med Fixed Assets (1st yr)	$44,133	$6,552	$6,974	$2,410

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

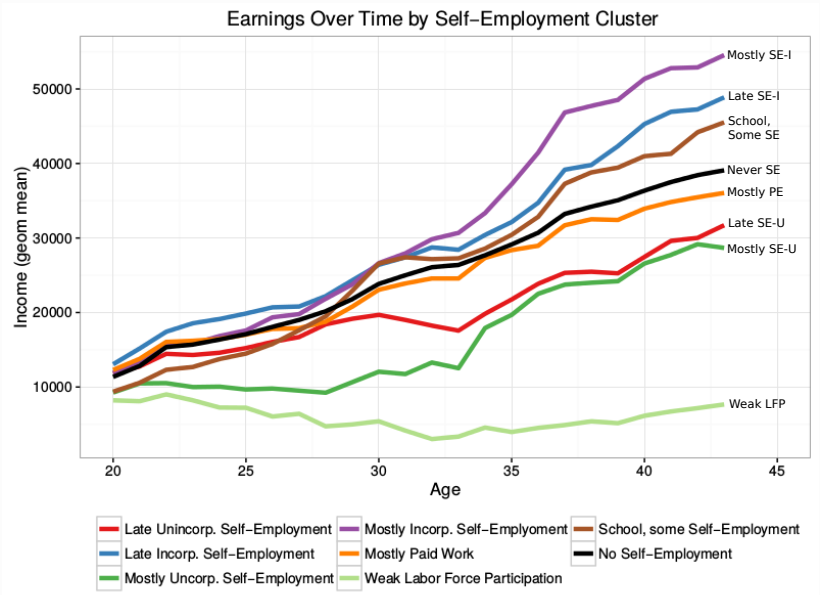
SUMMARY OF SELF-EMPLOYMENT GROUPS

	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).



AVG EARNINGS PROFILES BY CLUSTER



AVG EARNINGS PROFILES BY CLUSTER

EARNINGS PROFILES AND INITIAL CAPITAL

EARNINGS PROFILES BY SE SPELL LENGTH: I

EARNINGS PROFILES BY SE SPELL LENGTH: II

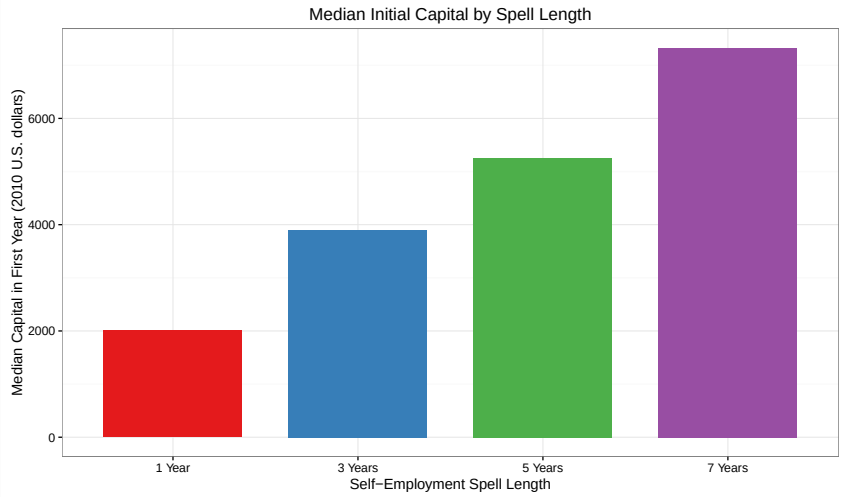
EARNINGS PROFILES BY SE SPELL LENGTH: III

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