Youth Unemployment and Employment Legislation Protection

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Introduction

- Youth unemployment is a concern in many countries
- In general young workers
  - find jobs at least as fast as prime age workers
  - but their job separations are much more frequent
- Young workers are exposed to higher risk of unemployment than prime age workers in large part because the job separation rate declines with age (Shimer, 1999)

Introduction

- Explanations for the high job separation rate of young workers
  - Decline in job separation rate with tenure (i.e. firm specific experience) (Mincer and Jovanovic, 1982).
  - Lower accumulated non-firm specific experience of young workers may also contribute to the instability of their jobs
  - Job protection: last in, first out, spread of temporary jobs

Introduction

- The aim of our paper is to provide a framework useful to evaluate the impact of employment protection legislation on youth unemployment.
  - we build and estimate a search and matching model that
    - reproduces the negative relation between job separation and tenure
    - identifies the red-tape layoff costs
  - The model is estimated for the labor market of unskilled workers in France over the period 2003-2012

Outline

1. Institutional background and identification of layoff costs
2. The model
3. The estimation
4. Counterfactual analysis

Institutional background

- In France, job protection becomes really stringent after two years of tenure:
  - After two years of tenure, the employers have to pay at least six months' salary to the employees in case of unfair dismissal on a permanent job
  - Before this threshold, no minimum amount is required. In practice, the severance is much lower: about 2 months's salary on average

Institutional background

- To avoid the cost of breach of permanent contracts, employers make an extensive use of temporary contracts:
  - In principle, temporary contracts may be used in special circumstances only:
    - to replace an employee who is absent
    - to cover changes in business activity
    - for seasonal work
  - Nevertheless, about 96% of hires are on temporary contracts
  - Employers use this strategy to avoid permanent contracts

Institutional background

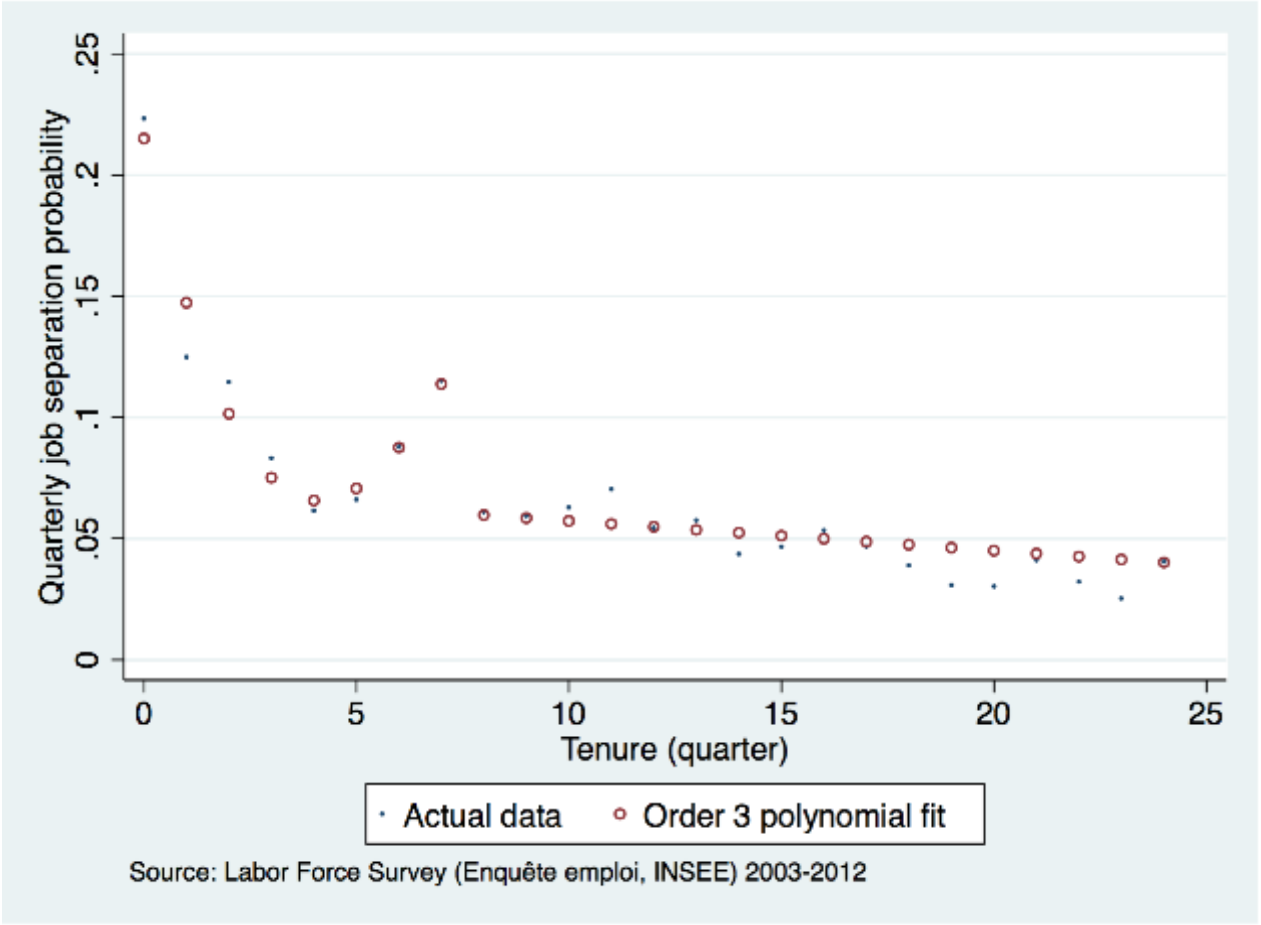
- However, this strategy becomes unprofitable to the employer when the tenure of the employee goes beyond two years
  - the employee whose temporary contract is not renewed can always go to court to ask a requalification of his temporary contract into a permanent contract
  - If the request of the employee is successful, the job separation induced by the non renewal of the temporary contract is interpreted as a layoff by the court
    - $\longrightarrow$ a severance of least six months' salary if the tenure is beyond two years
    - Before this threshold, the severance is about 2 months $\simeq$ the legal severance due at the end of a non renewed temporary contract, which equals 10% of all the wages paid to the employee

Institutional background

- Accordingly, after the two-year threshold, the employee has strong incentives to go to court if job separation is due to the termination of a temporary or permanent contract
- This context induces a strong potential increase in red-tape dismissal costs at the two-year threshold.

Institutional background

Job separation rates and job tenure



The model

- Model which reproduces the job separation tenure profile displayed on the previous figure
- Job search and matching model in which productivity is driven by a Brownian motion (Jovanovic 1979, Prat, 2010)
  - Why Brownian motion?
    - w.r.t. Mortensen and Pissarides (1994): good fit to the data (productivity, job separation rates, wage distribution, Prat, 2006, 2010)
    - w.r.t. models of learning match quality (Jovanovic, 1979, Moscarini, 2005), more parsimonious: less parameters to estimate (given the parametric assumptions)

The model

- Overlapping generations model in continuous time where people born and die at rate χ
- 2 goods: output (numéraire), labor, sole production factor
- Individuals are risk neutral and discount the future at rate r
- They are either employed or unemployed.
- Unemployed individuals sample job offers at exogenous rate λ

The model

Jobs

- Jobs produce x units of output per unit of time
- Output x starts at value $x_0 \sim H$, and follows a geometric Brownian motion defined by the stochastic differential equation

$$\frac{\mathrm{d}x}{x} = \mu \mathrm{d}t + \sigma \mathrm{d}z$$

  - μ : drift; σ^2: variance; $\mathrm{d}z$: standard normal random variable of zero mean and unit variance ($\mathrm{d}z = \varepsilon_t \sqrt{\mathrm{d}t}, \varepsilon_t \rightsquigarrow N(0,1)$)
- Starting from x_0 at $t = 0$

$$\mathbb{E}\left(x_t\right) = x_0 e^{\mu t}; V\left(x_t\right) = x_0^2 e^{2\mu t}\left(e^{\sigma^2 t} - 1\right)$$

- Jobs are also forced out of business when hit by random shocks which arrive at the Poisson rate δ

The model

Employment protection legislation

- Starting jobs are not covered by job protection, they can be destroyed at zero (red-tape) cost
  - trial period
  - temporary jobs at termination date
- They have to be transformed into protected jobs at tenure T
- At the instant when the job has to be transformed, it can be decided
  - either to destroy the non protected job at zero cost
  - or to continue and keep the job that becomes protected
- Protected jobs are destroyed at (red-tape) cost F

The model

Surplus of protected jobs

- When a job is destroyed,
  - the worker becomes unemployed; intertemporal expected utility U
  - the employer gets an expected value equal to zero, once the layoff costs have been paid
- Let us denote by
  - $J(x)$ the discounted profits of a protected job with current output x
  - $W(x)$ the discounted gains of the worker on that job
- The surplus of a protected job, detroyed at cost F, is

$$S(x) = J(x) + F + W(x) - U$$

The model

Protected jobs

- The surplus of a protected job with current output x, solves

$$(r+\delta)S(x) = x - r(U-F) + \frac{\mathbb{E}\left[\mathrm{d}S\left(x\right)\right]}{\mathrm{d}t} \qquad (1)$$

  where $r = \rho + \chi$ and $\mathbb{E}$ stands for the expectation operator.
- Efficient job destruction implies that jobs are destroyed when their surplus becomes negative
- This implies that protected jobs are destroyed when their output x falls below the reservation value denoted by R, which satisfies $S(R) = 0$.
- The values of R and of the surplus $S(x)$ are computed using this condition, the differential equation (1) and the smooth-pasting condition $\lim_{x \to R} \partial S(x)/\partial R = 0$.

The model

Protected jobs

- We get (see Prat, 2010):

$$S(x) = \frac{x}{r+\delta-\mu} - \frac{r(U-F)}{r+\delta} - \left[\frac{R}{r+\delta-\mu} - \frac{r(U-F)}{r+\delta}\right]\left(\frac{x}{R}\right)^{\alpha}$$

α : negative root of

$$\frac{\sigma^2}{2}\alpha^2 + \left(\mu - \frac{\sigma^2}{2}\right)\alpha - (r+\delta) = 0.$$

- The smooth-pasting condition implies:

$$R = \frac{\alpha}{\alpha - 1}\left(\frac{r+\delta-\mu}{r+\delta}\right) r\,(U-F) > 0$$

- The reservation output decreases with the firing costs

The model

Non protected jobs

- Non protected jobs
  - are destroyed at zero costs
  - at tenure T, non protected job have to be either transformed into protected jobs, or destroyed
- At date T, it is optimal to keep a job only if

$$J(x) + W(x) - U > 0$$

which is equivalent to $S(x) > F$

The model

Non protected jobs

- Thus, the surplus of non protected jobs with current output x, denoted by $S_n(x)$, solves

$$(r+\delta) S_n(x,t) = x - rU + \frac{\mathbb{E}\left[\mathrm{d}S_n(x,t)\right]}{\mathrm{d}t} \text{ for } t < T \tag{2}$$

with the boundary conditions:

$$\begin{array}{ll} S_n(R_n(t),t) = 0 \text{ and } \lim_{x \to R_n(t)} \frac{\partial S_n(x,t)}{\partial x} = 0 & \text{for } t < T \\ S_n(x,T) = \max\left[S(x) - F, 0\right] & \text{for } t = T \end{array}$$

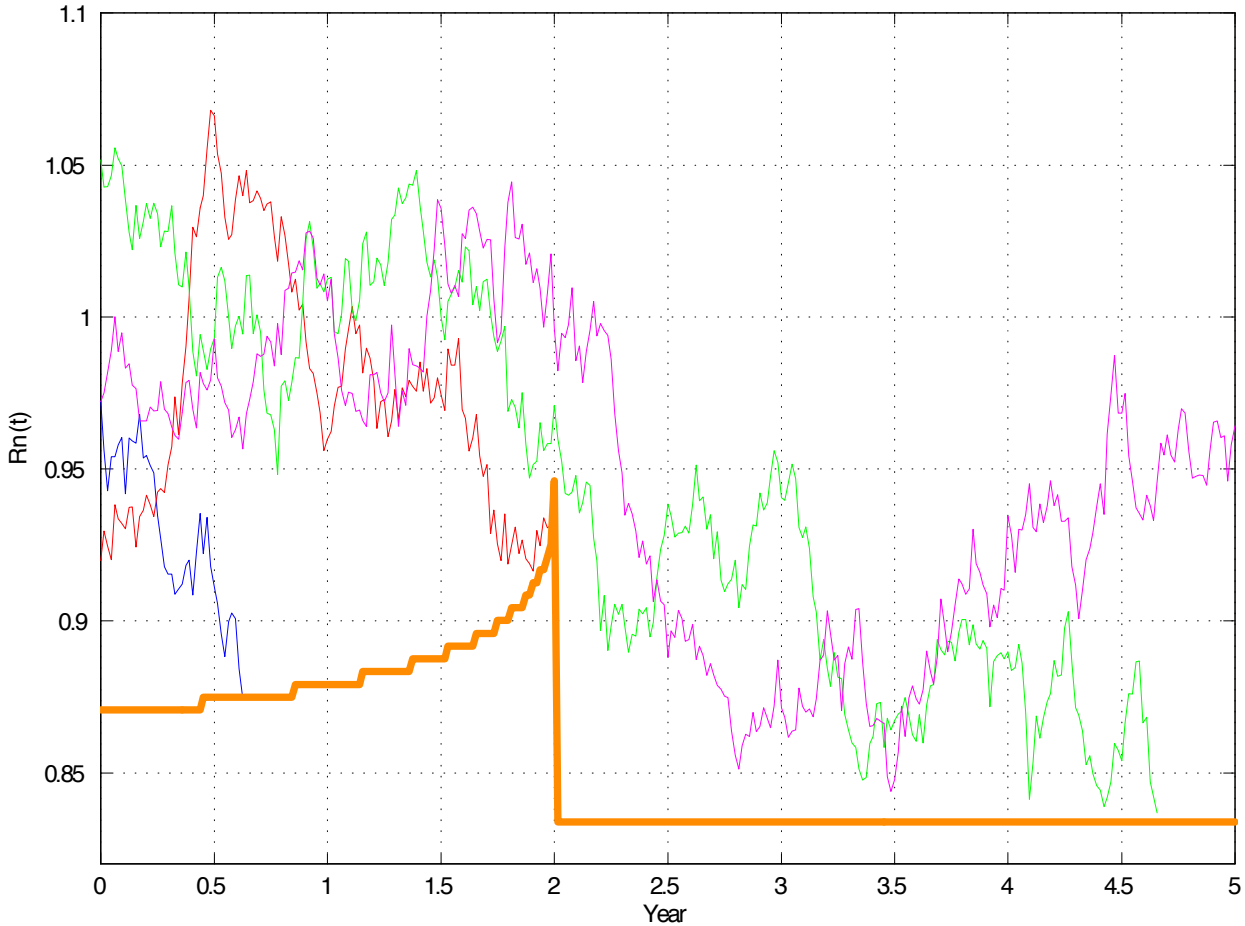
The model

Non protected jobs

- The reservation value for the transformation of non protected jobs into protected jobs, R_T, is strictly bigger than the reservation value, R, below which protected jobs are destroyed.
- The reservation value for the transformation of non protected jobs into protected jobs, R_T, increases with the firing cost F.
- The difference $R_T - R$ increases with the firing cost F.
- The job separation rate $\phi(t)$
  - Drops at the transformation date: $\lim_{t \to T^-} \phi(t) > \lim_{t \to T^+} \phi(t)$
  - The size of the drop at the transformation date increases with the dismissal cost.

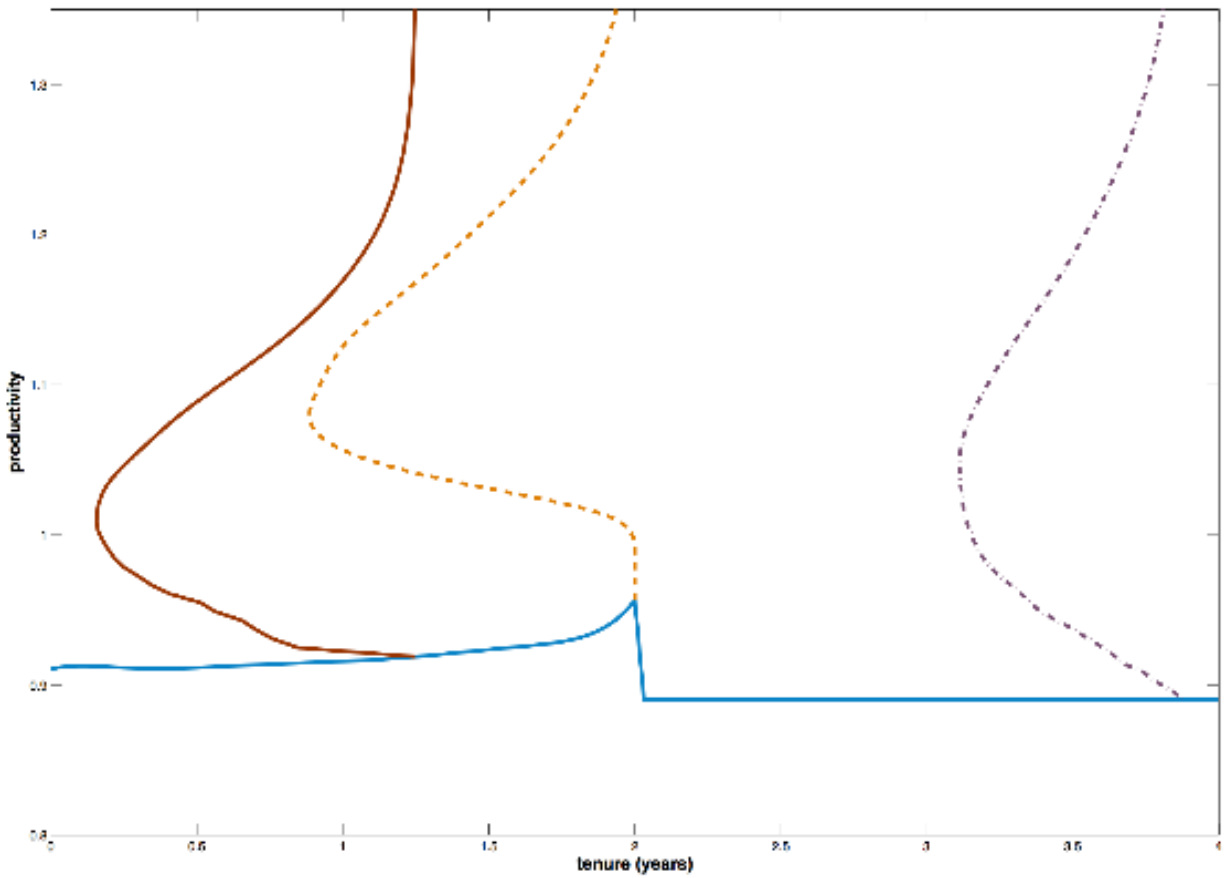
The model

Reservations output



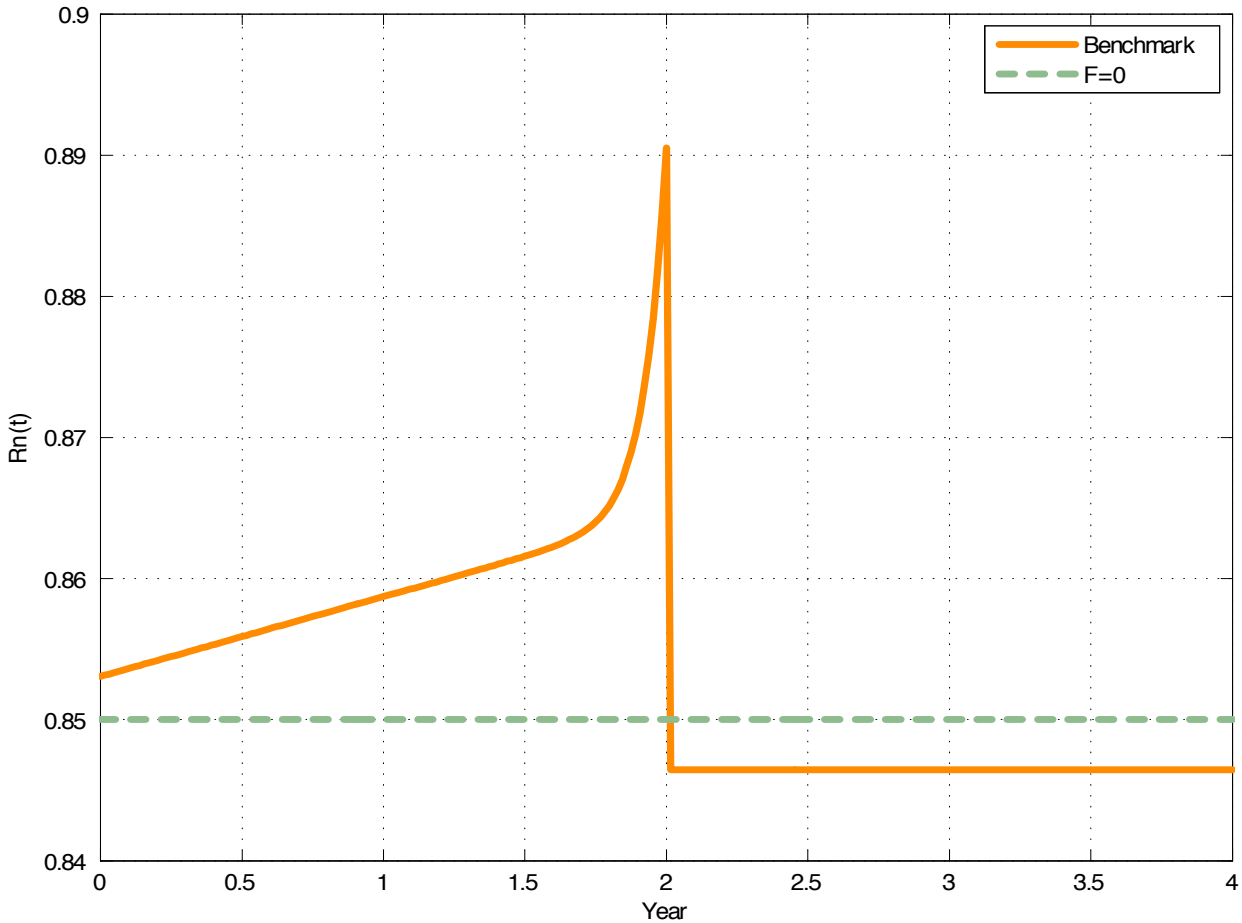
The model

Probability density function and tenure on protected and non protected jobs



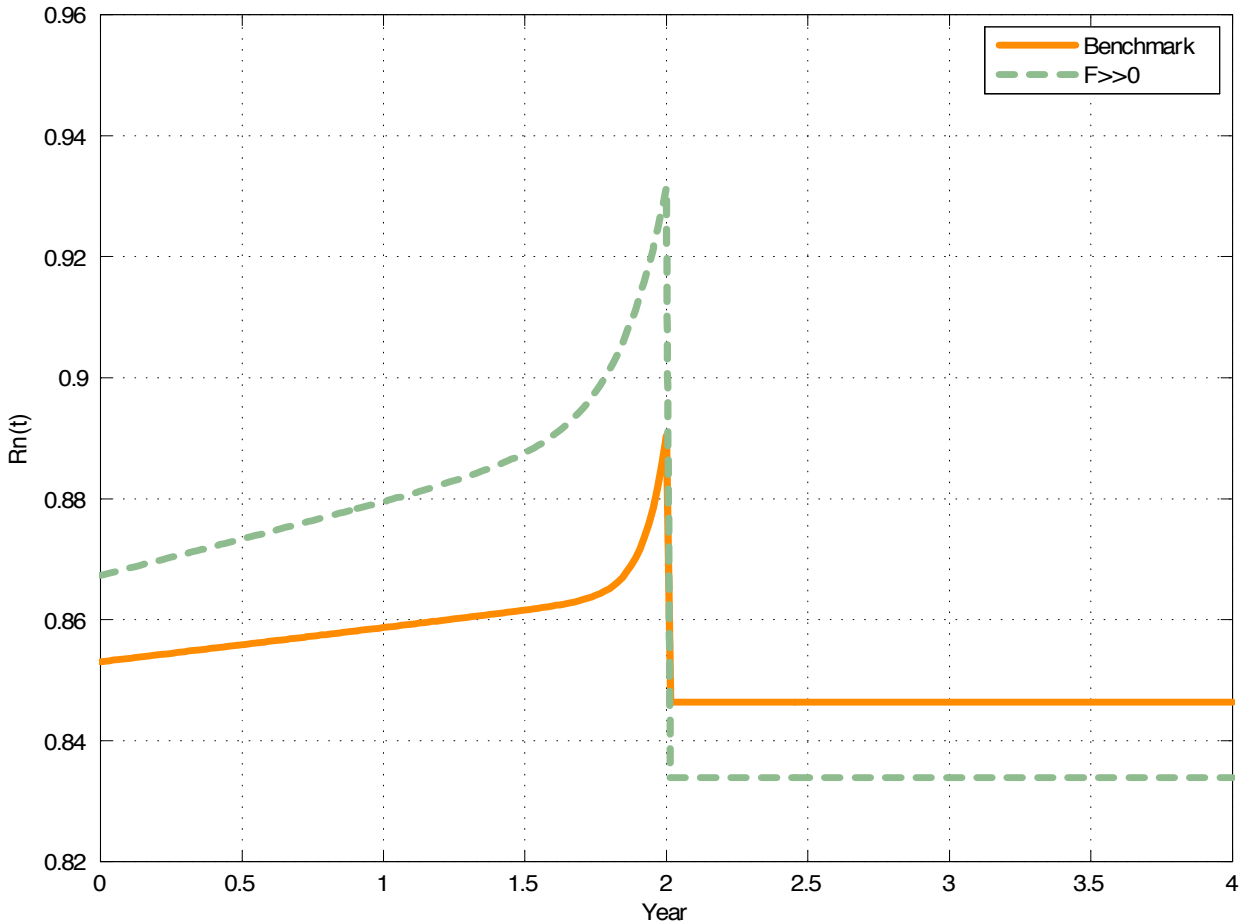
The model

The impact of increases in firing costs on reservation output



The model

The impact of increases in firing costs on reservation output



The model

Unemployment

- Unemployment rate as a function of age obeys a *Volterra integro-differential* equation

$$\frac{\mathrm{d}u(a)}{\mathrm{d}a} = \int_0^a \lambda u(s)\,\phi(a-s)\,\mathrm{d}s - (\lambda+\chi)u(a)$$

- $(\lambda+\chi)u(a)$: Flow *out* of the unemployment pool, i.e., mass of workers of age a (time since labor market entry) who find a job or die
- $\int_0^a \lambda u(s)\,\phi(a-s)\mathrm{d}s$: Flow *in* the unemployment pool, i.e., mass of workers of age a who lose their job. Why?
  - $\lambda u(s)$: Mass of workers who found a job at age s
  - $\phi(a-s)$: Probability that they lose that job at age a, implying that they reached seniority $a-s$

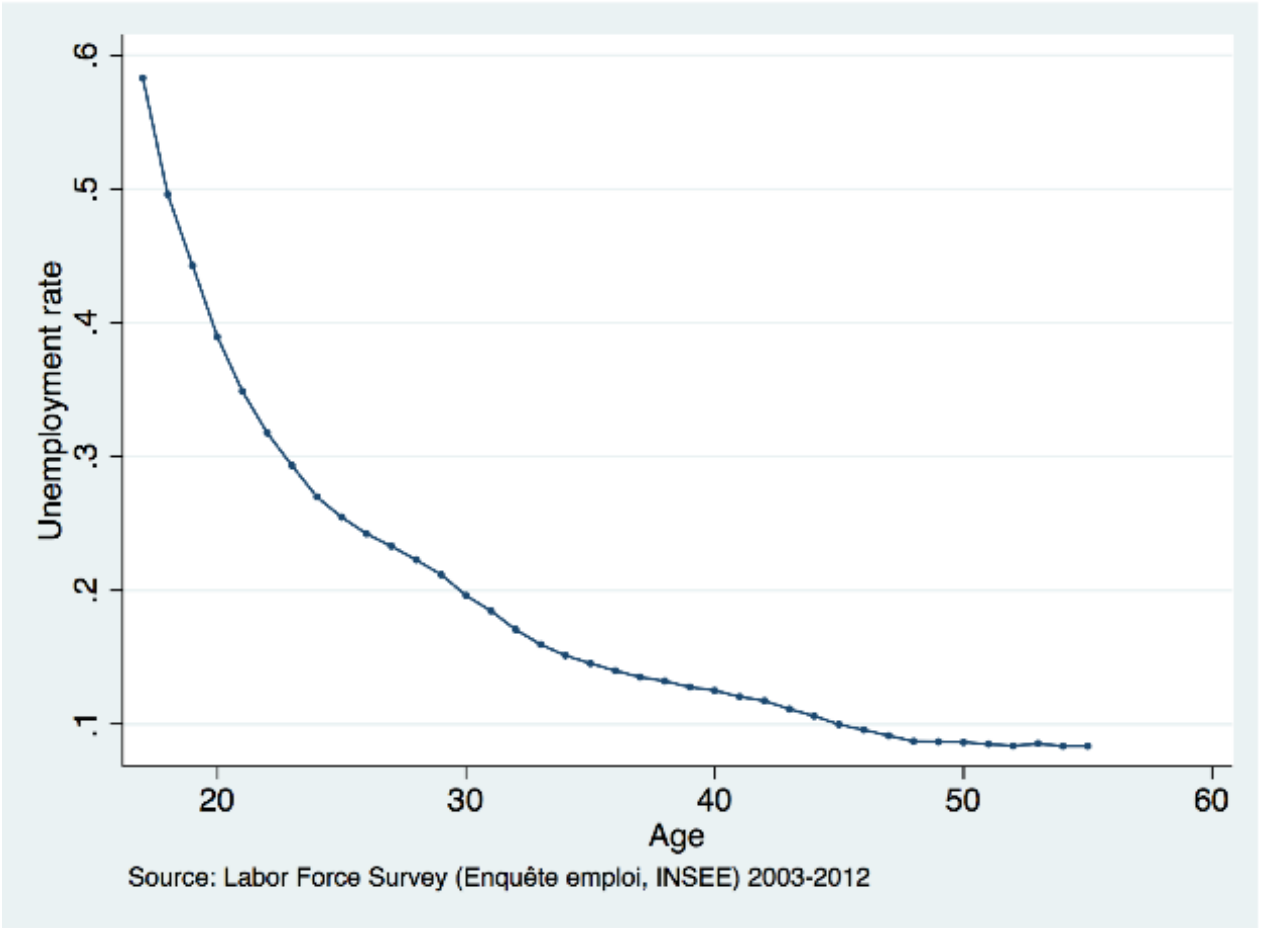
Estimation

Data

- French Labor Force Survey over the period 2003-2012
  - Rotative panel
  - Quarterly data: every individual is interviewed during 6 consecutive quarters
- Foscus on unskilled workers, who have not completed their high school degree and who have no vocational qualification

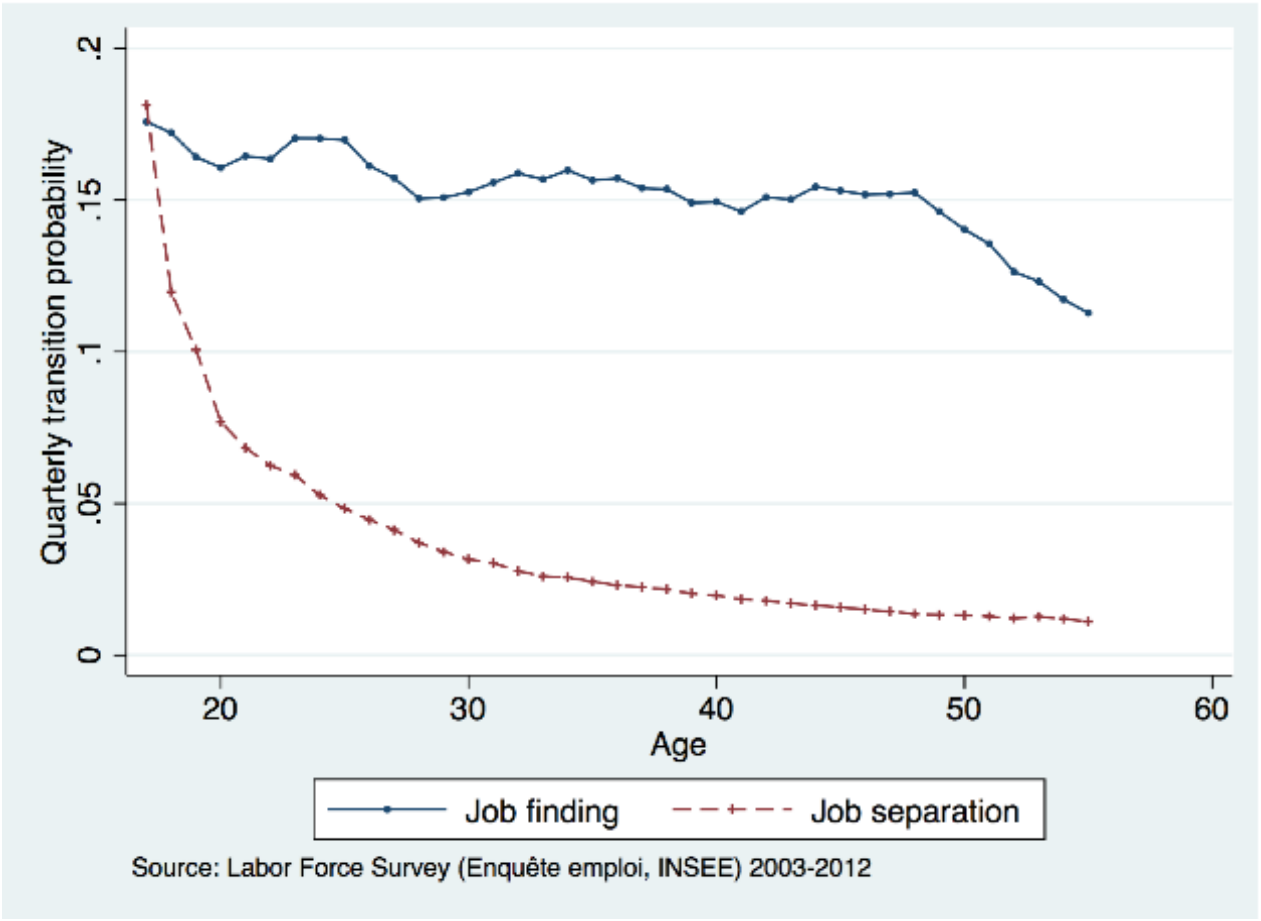
Estimation

Data: The relationship between unemployment and age



Estimation

Data: The relationship between labor market transitions and age



Estimation

The relationship between labor market transitions and age

- The model has 10 parameters:
  - the interest rate r,
  - the death rate χ
  - the job finding rate λ
  - the exogenous job separation rate δ
  - the drift μ and the variance σ^2 of the Brownian motion
  - the intertemporal utility of unemployed workers U
  - the firing cost F
  - the mean and the standard deviation of the distribution of the initial productivity $\longrightarrow$ Mean normalized to 1, variance γ^2 estimated

Estimation

First step parameters

Par.	Value	Interpretation	Moment
r	0.0125	Discount rate	Standard
μ	0.01	Drift Brownian motion	
χ	0	Death rate	Death rate
λ	0.165	Job finding rate	Unemp. duration
δ	0.007	Exogenous job sep. rate	Job sep rate for long tenure

Estimation

- Four parameters to estimate: U, F, σ, γ
- $\phi(t|U, F, \sigma, \gamma)$: value, predicted by the model, of the job separation rate as function of tenure conditional on these four parameters when the values of the other parameters are set as described above
- The estimated values of, U, F, σ, γ minimize the sum of squared distances

$$\min_{\{U,F,\sigma,\gamma\}} \sum_{t=1}^{30} \left[\phi(t|U, F, \sigma, \gamma) - \hat{\phi}_t\right]^2$$

where $\hat{\phi}_t$ stands for the empirical job separation rate at tenure t.

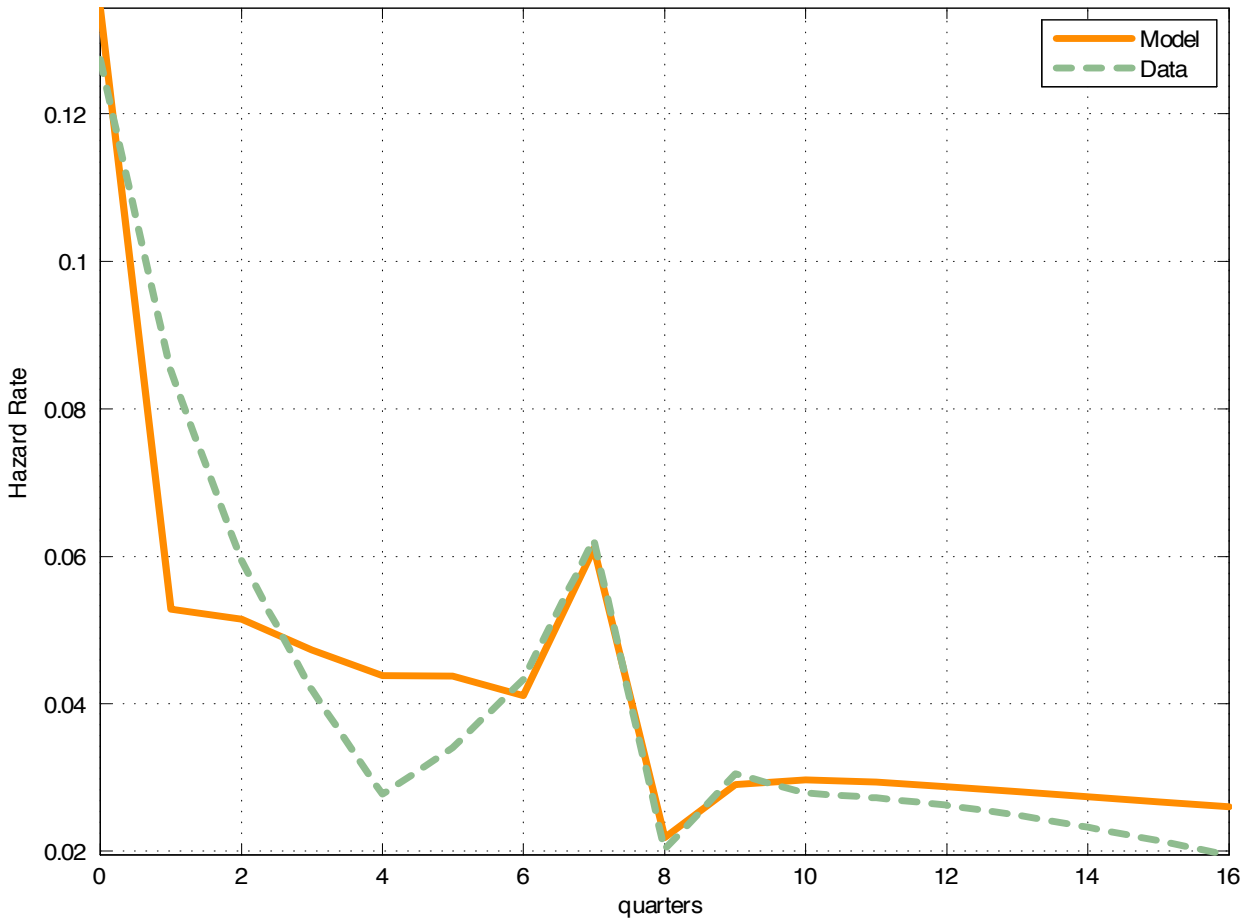
Estimation

Other parameters

Par.	Value	Interpretation
σ	0.14	Stand dev of the Brownian motion
γ	0.16	Stand dev of the Log Normal distribution
rU	1.25	Instantaneous value of unemployment
F	0.13	Firing costs

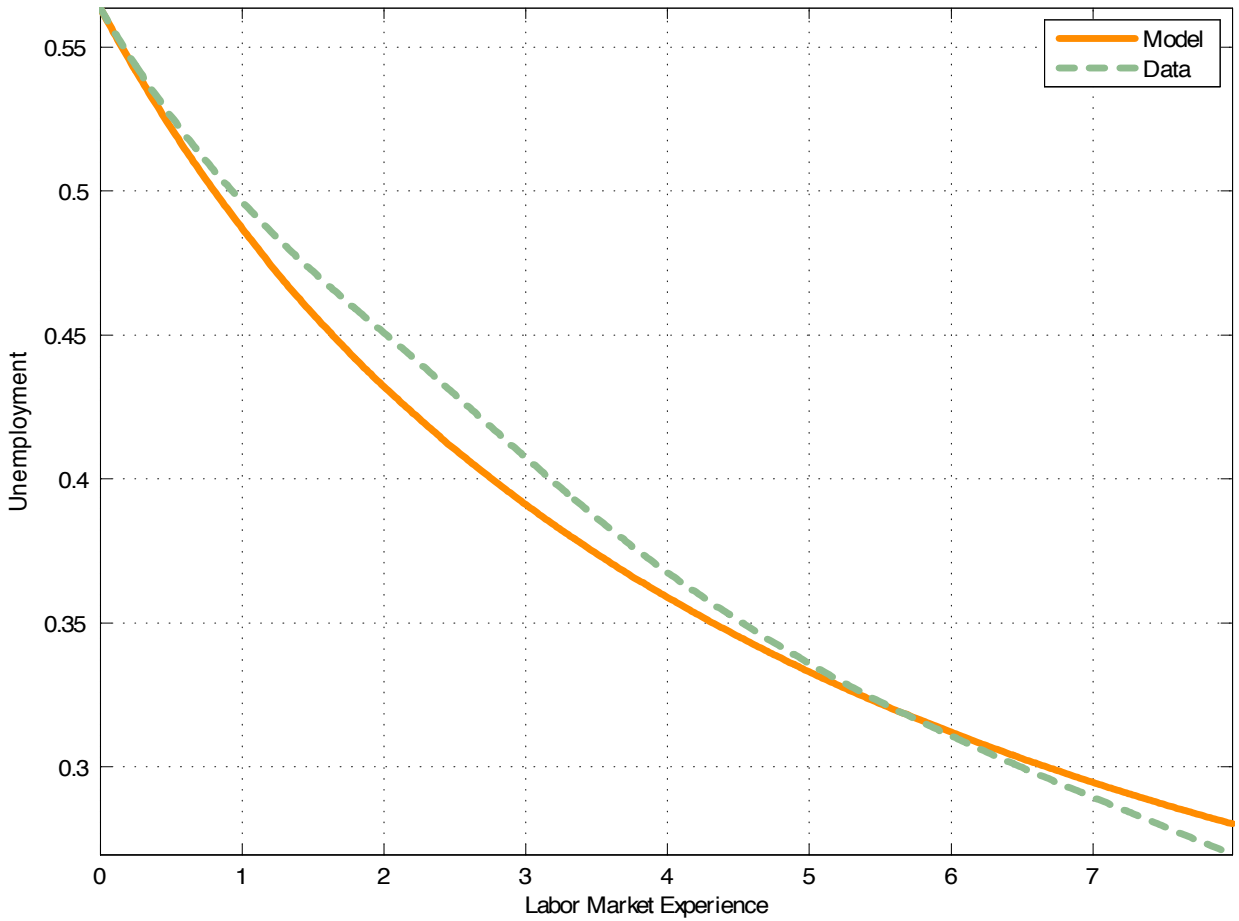
Estimation

Fit of the model: quarterly job separation probability and job tenure



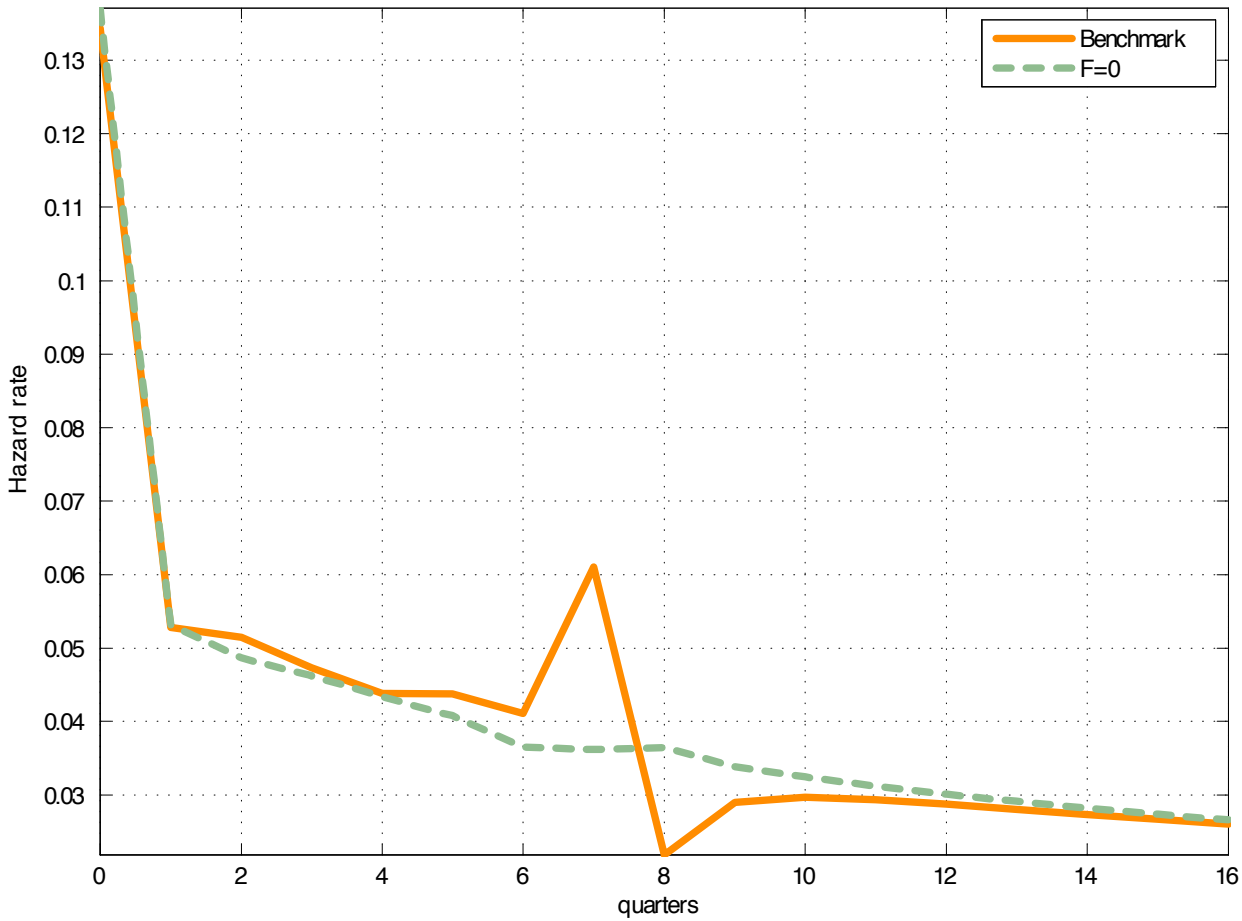
Estimation

Fit of the model: unemployment rate and labor market experience



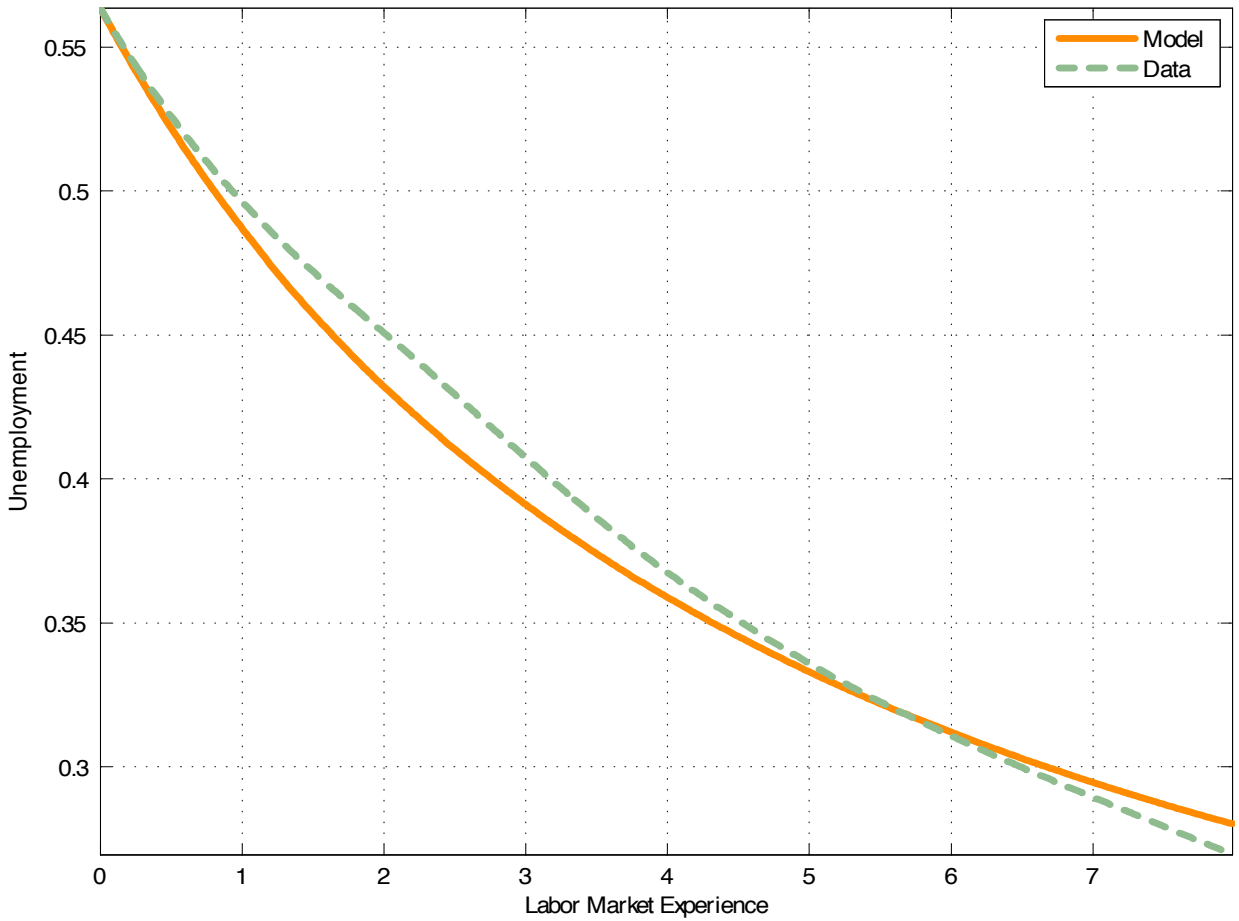
Counterfactuals

Impact of firing costs on quarterly job separation rates as a function of tenure



Counterfactuals

Impact of firing costs on unemployment



Conclusion

- Still much to do...
  - Production
  - Job creation effects
  - Look at other countries
- Not the sole factor
  - minimum wage
  - interactions between the minimum wage and job protection