



Empirical Analysis on the Effects of Unemployment Benefits



Empirical Aspects of Labour Markets

- We cover two empirical aspects:
 - 1) Unemployment duration and the effect of unemployment benefits
 - 2) Causality issues on benefits and duration
 - 3) Clusters of behavior in the effects of benefits



Unemployment Duration

- What are the determinants of unemployment duration?
- How unemployment benefits affect duration?
- Do households wealth affect duration?
- We use survival analysis (cox regression)



Job Finding and Hazard Rate

- We are observing unemployed individuals
- At any time t he has a probability $h(t)$ of finding a job. $h(t)$ is called hazard rate. Finding a job is called failure!

We assume that this probability is given by:

$$h(t) = h_0(t) \cdot e^{(\beta \cdot X)}$$

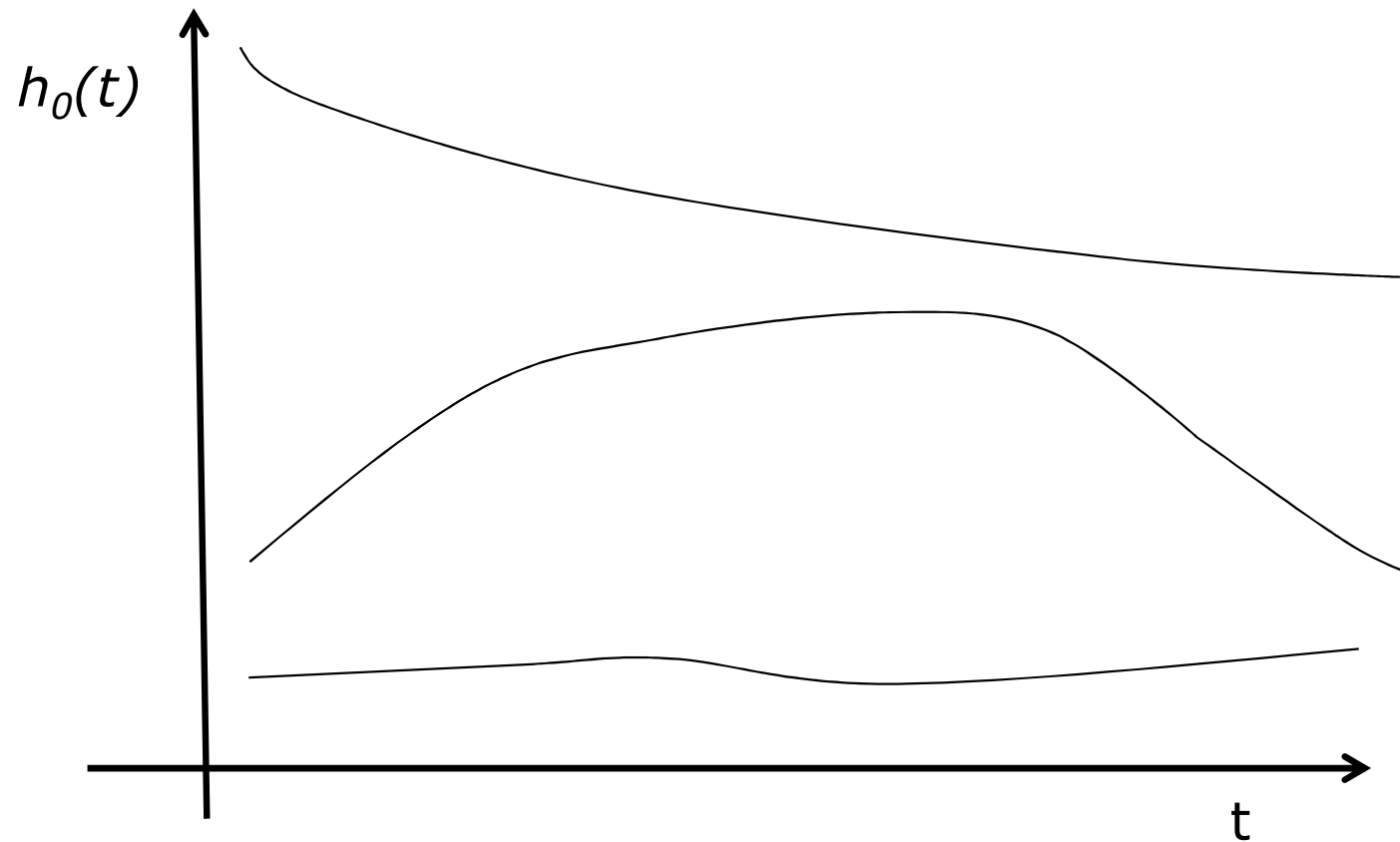
Where $h_0(t)$ is the baseline hazard and capture the effect of time.

X represents all the covariates and β their effect

Given that we can only observe individuals for a given period, we do not observe the failure event for all individuals: those individuals are called right censored.

If we do not observe the time of beginning of the spell we also have left censoring.

Baseline Hazard Rates

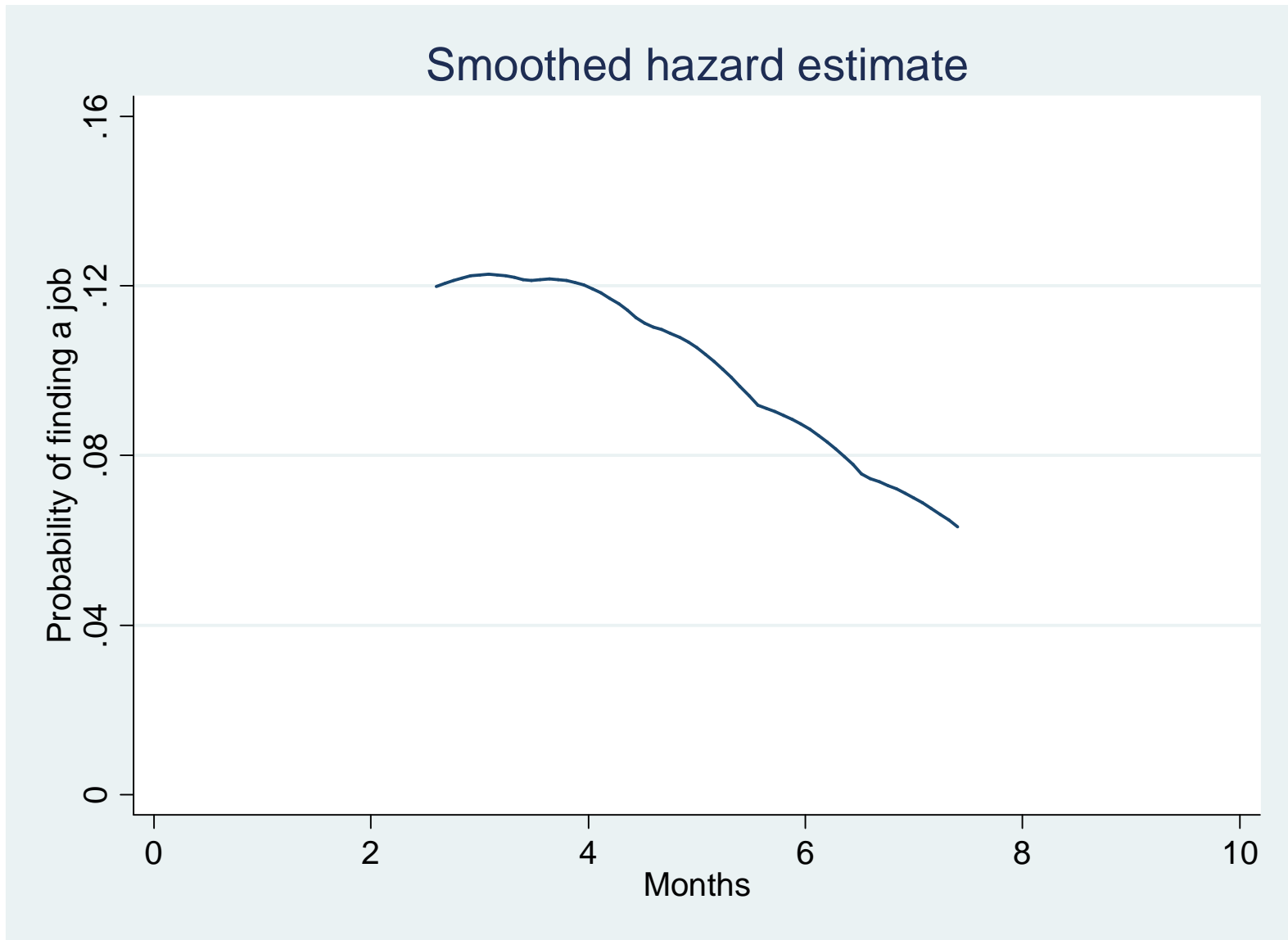




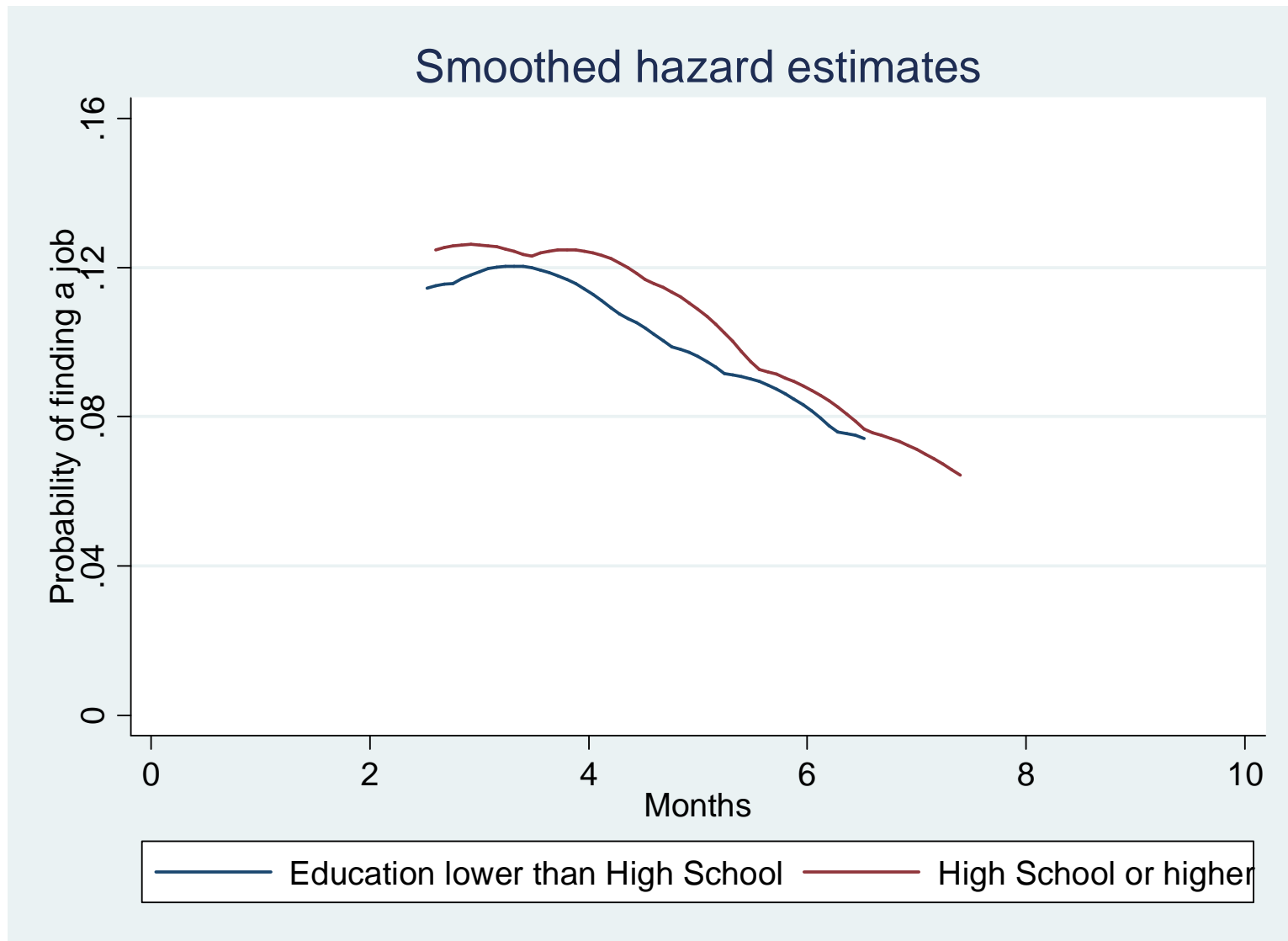
Unemployment Benefit for Italy: Data

- Data for 2007 from EU-SILC. Quite rich dataset with information on demographics, income, employment status and some information on wealth and financial condition.
- We focus on newly unemployed, that is on worker that lost their job in 2007.
- We follow them for the 2007 year and check after how many months they find a new job. Part of them do not find any job within 2007 (censored).
- In total we have data on 527 newly unemployed. 230 of them find a job within 2007, the rest of them are censored.
- No left censoring!

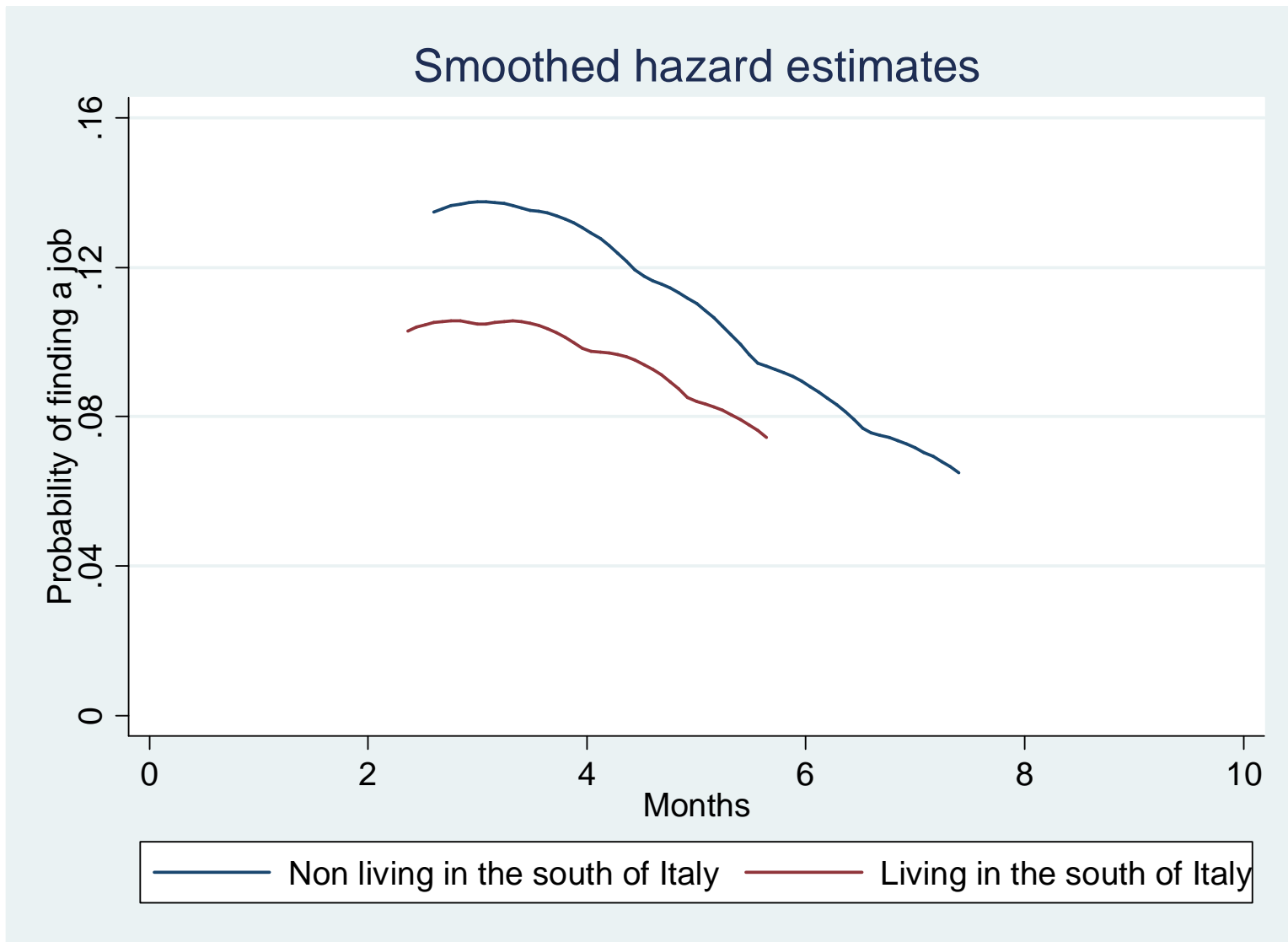
Hazard: overall data



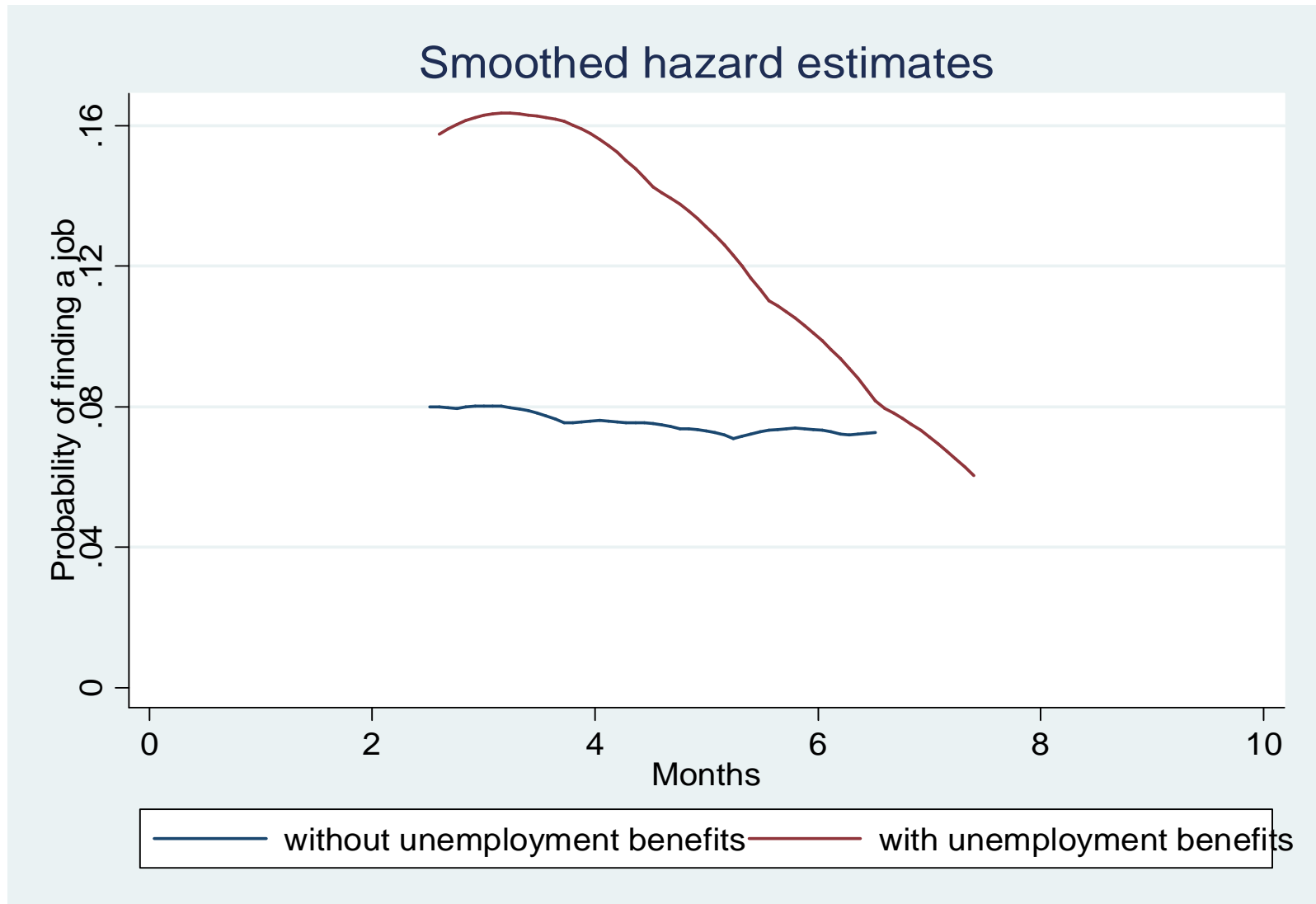
Hazard: Education



Hazard: Region of dwelling



Hazard: the role of benefits





Why benefits affect unemployment duration - I

There are (at least) two reasons why benefits affect duration: a liquidity constraint argument and a moral hazard argument.

- **Liquidity Constraints:** unemployed workers are usually liquidity constrained and have to largely cut their consumption: this greatly reduces their welfare (utility) and forces them to actively search for a job and to accept any offer they receive. Benefits mitigate the liquidity constraints and thus reduce their reservation wage and their search effort. Clearly, duration increases.
- **Moral Hazard:** individuals on benefits are paid for being idle and thus they may postpone search and refuse job offers to obtain as much money as possible. Search is reduced and duration increases.



Liquidity constraints and moral hazard

- If the increased duration is due to liquidity constraints, then to give benefits can be optimal because they effectively allow a better consumption smoothing (though at the cost of increased unemployment duration)
- If increased duration is due to moral hazard, benefits policies are not optimal and actually socially harmful.



Why benefits affect unemployment duration - II

- Among the eligibility criteria to obtain benefits there are search requirements: workers on benefits should respect them and thus should search more actively and have a lower unemployed duration.
- Together with benefits, individuals receive some employment services: if they are effective, their duration should be lower.
- To receive benefits, an individual need to have worked before: thus benefits may generate incentives to accept any offer is received, so they might be eligible again in the future.

Estimation Results (Corsini 2013)

	(i) Semi-parametric	(ii) Parametric regression with Weibull distribution
Unemployment benefits	1.0094*** (0.0023)	1.0125*** (0.0021)
Interaction of benefits with time	0.9949** (0.0025)	0.9910*** (0.0022)
Age	1.0810** (0.0419)	1.0797* (0.0438)
Age squared	0.9991* (0.0005)	0.9992* (0.0005)
Education below upper secondary	0.6884* (0.1362)	0.5764** (0.1348)
Education above upper secondary	1.2845 (0.2287)	1.2894 (0.2742)
Living in a southern region	0.7931 (0.1332)	0.7808 (0.1588)



The role of wealth on duration: Data

- We use the following variables to assess the effect of the role of Households wealth:
- **Amount paid for mortgage:** effective amount paid.
- **Taxes paid on wealth:** “registered” proxy for effective wealth.
- **Ability “to make ends meet”:** self-assessed perception of the overall economic and financial situation.
- **Previous Personal income as a share of household income**
- All the above refer to the Households where the unemployed individuals live.



The role of wealth (Corsini 2013)

Payments for mortgage	1.0085** (0.0043)	1.0092* (0.0052)
Wealth	0.9290* (0.0411)	0.9298 (0.0457)
Problems in making ends meet	1.3013 (0.2231)	1.4500* (0.3065)
Income in 2006 as a share of household income	2.5374*** (0.6864)	3.0834*** (1.0260)

Results: interaction between benefits and wealth

	(i) Group 1: individuals from households in the fourth quartile of wealth distributions (wealthier) Group 2: rest of individuals	(ii) Group 1: individuals from households not having problems making ends meet Group 2: rest of individuals
Unemployment benefits for individuals from Group 1	1.0127** (0.0052)	1.0111*** (0.0019)
Unemployment benefits for individuals from Group 2	1.0088*** (0.0026)	1.0067 (0.0043)
Interaction of benefits with time for individuals from Group 1	0.9982 (0.0056)	1.0025 (0.0063)
Interaction of benefits with time for individuals from Group 2	0.9930*** (0.0027)	0.9931*** (0.0025)



The problem of causality and self selection

- According to our analysis, individuals receiving benefits are more likely to find a job
- This may be due to the fact that receiving benefits increases the probability of finding a job
- It may be due to the fact that only “better” individuals access benefits



In econometrics terms

- We want to assess the effect of a treatment (receiving benefits)
- The regressor (participation to the treatment) is endogenous and is correlated with the unobserved error
- The results are biased



The problem of self-selection

- In some cases we observe only self-selected individuals (ex. Wage offers to women)

Two stage Heckman correction:

First stage: we estimate the determinant of being in the treatment (accepting the offer)

Second stage: we use this auxiliary regression in the main regression to correct it.



The problem of self-selection

- In some cases, sub-groups of the population have differences in the treatment mechanism (ex. Benefits are more generous for some age groups).

Difference in differences:

we compare the changes in the differences between treated and untreated in the different sub-groups.



The problem of self-selection

- In some cases, selection to treatment may be determined by some thresholds (ex. 52 weeks of previous work)

Regression discontinuity:

Comparing individuals just below and just above that threshold (ex. Comparing individuals with 52 weeks of previous work with individuals with 51 weeks of previous work)



The problem of self-selection

- In general, we would like to compare treated and untreated individuals that are similar in terms of the probability of being selected for the treatment

Propensity Score Matching:

We assess similarities of individuals and compare treated and untreated “similar” individuals



Propensity Score Matching

- 1) we estimate a probit/logit regression on the participation to the treatment.
- 2) given the characteristics of each individual we use the probit regression to compute their probability to participate to the treatment: this probability is called Propensity Score.
- 3) we compare the outcome of each treated individual with the outcome of “similar” untreated individual(s) (“similar” means with a similar propensity score).

Comparison means computing the difference in the outcomes. The estimation of the effect of the treatment is given by the average of all these differences.



Propensity Score Matching

- Several ways to implement the comparison:
 - 1) **Nearest neighbour:** a comparison with the individual with the nearest propensity score.
 - 2) **Radius matching:** a comparison with all the individuals within a certain distance in terms of score.
 - 3) **Stratification matching:** we create some blocks of individuals using propensity score intervals and compute the differences in outcome of treated and untreated individuals within each block.



Application to Italy

- Outcome variable for immediate effects: having found a job within 2 months
- Treatment: receiving benefits
- Selection into treatment variables: all the rest (education, gender, region, wealth...)
- Outcome variable for effects at later stage: having found a job within 4 months (only for those individuals still unemployed after two months)

Propensity Score Matching Estimation

Effect on Re-employment probabilities	Nearest Neighbour		Radius Matching		Stratification Matching	
	Avg. Difference	Std. Error	Avg. Difference	Std. Error	Avg. Difference	Std. Error
Immediate Effect	0.117	0.054**	0.106	0.040***	0.118	0.039 ***
Effect at later stages	0.104	0.080	0.138	0.060 **	0.096	0.083



The next step: endogenous clusters

- This far, we use some a-priori knowledge to assume the existence of clusters, whose relevance was then tested.
- Next step: no a-priori clustering and we obtain the clusters directly from the estimation
- We still have to assume the number of clusters, which we can then test.