AARHUS UNIVERSITY

Coversheet

This is the accepted manuscript (post-print version) of the article.

Contentwise, the accepted manuscript version is identical to the final published version, but there may be differences in typography and layout.

How to cite this publication

Please cite the final published version:

Sørensen, K. L. (2017). Active labour market programmes and reservation wages: it is a hazard. Applied Economics Letters, 24(9), 589-593. <https://doi.org/10.1080/13504851.2016.1213358>

Publication metadata

Title:	Active labour market programmes and reservation wages: it is a hazard
Author(s):	Sørensen, Kenneth Lykke
Journal:	Applied Economics Letters
DOI/Link:	10.1080/13504851.2016.1213358
Document version:	Accepted manuscript

General Rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognize and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

If the document is published under a Creative Commons license, this applies instead of the general rights.

Active Labor Market Programs and Reservation Wages: It is a Hazard

Kenneth Lykke Sørensen*

Aarhus University

June 21, 2016

Abstract

This paper uses a randomized controlled trial, to show that positive earnings effects of a labor market program can be caused by either a faster return to employment together with a lowering of reservation wages, or a more moderate return to employment together with an increase in reservation wages. I model wages and unemployment duration simultaneously in a hazard framework allowing for unobserved heterogeneity.

Keywords: Active labor market programs, randomized controlled trial, hourly wages, mixed proportional hazard models.

JEL codes: C41, J31, J64

*I wish to thank Michael Svarer, Henning Bunzel, Rune Vejlin, and Lars Skipper for valuable comments. Additionally, I thank seminar participants at Aarhus University, the CAFÉ workshop, Børkop 2014, the Nordic Summer Institute in Labor Economics, Helsinki 2014, and at the RWI (Rheinisch-Westfälisches Institut für Wirtschaftsforschung), Essen 2015 for comments and suggestions. I further thank the Cycles, Adjustment, and Policy research unit, CAP, Department of Economics and Business Economics, Aarhus University sponsored by the Danish National Research Foundation for support and for providing the data. I also greatly acknowledge financial support from the Danish Council for Independent Research | Social Sciences (grant no. FSE 4182-00281). Correspondence to; Kenneth Lykke Sørensen, email: ksoerensen@econ.au.dk, Department of Economics and Business Economics, Aarhus University, Fuglesangs Allé 4, DK-8210, Denmark.

1 Introduction

Often when evaluating impacts on job quality from participation in an Active Labor Market Program (ALMP) we investigate labor market earnings. Despite being an obvious objective of output, it also leaves interesting questions unanswered. Two programs both found to have positive impacts on earnings might be driven by two different mechanisms - the extensive or intensive margin. An impact on the extensive margin is seen if the program shortened unemployment duration enabling the worker to spend extra weeks accumulating earnings. Instead, the mechanism would be on the intensive margin if the wage increases due to him having been given better qualities by the program, thus also summing up to higher earnings. For society as such, earnings might be the main objective for evaluating programs, but to gain full knowledge of the impacts of programs we need to be able to distinguish effects between the intensive and extensive margins. The main contribution of this paper is show how positive earnings effects can be attributed to either the intensive or extensive margin.

Using a randomized controlled trial (RCT) Sørensen (2016) shows that advancing and intensifying the use of a Danish ALMP delivered positive short-term (one year after entering unemployment) impacts on earnings for men. I use the same RCT conducted in two Danish counties (Storstroem and Southern Jutland) during the winter of 2005/2006 lasting for the first 30 weeks of unemployment. There were two main institutional differences between the two counties; the intensity of the ALMP was slightly higher in Storstroem than in Southern Jutland, and in Southern Jutland, the public employment services contracted out part of the program to private providers.¹ I showed that the earnings effect is short lived for men in the high-intense county and persistent for men in the less intense. Now, an interesting question arises; why do we observe differences in the persistence of effects between counties participating in roughly the same experiment? In Sørensen (2016) I argue that effects in the high-intense county are driven by a theory of taxing leisure time (see e.g. Black, Smith, Berger, and Noel (2003)) understood as that the utility cost for the unemployed worker to spend time participating in the program is so high, that he accepts whatever job he can find. The program thus lowered the duration of unemployment without delivering longer-term abilities in securing better worker-firm matches. In the less intense county, I argue that the participants experience actual gains from the program in terms of job search abilities securing better worker-firm matches and thus delivering

¹Unemployed workers had to meet with a caseworker every week in the high-intense county and every other week in the less intense. Rosholm (2008) shows that the practical execution of the program did not entail all the required meetings, so the difference in the number of meetings between Storstroem and Southern Jutland was not two to one, but three to two-and-a-half. I continue to denote Storstroem as the high-intense county and Southern Jutland as the less-intense because the intended meeting structure was mailed directly to the treated individuals, so they had the opportunity to act on the knowledge of the intended meeting structure. It was the sequence of meetings with a caseworker that the less intense county contracted out to private providers.

long-term effects by removing labor market frictions. A way to test this hypothesis is to look at the hourly wages for workers after entering the trial. This paper uses a sequential mixed proportional hazard framework (Abbring and van den Berg (2003)) to simultaneously model the transition from unemployment to employment and the selection into an hourly wage level allowing for correlation in the transition patterns. Support towards taxing leisure time would be that treatment lowered unemployment duration (positive program and lock-in effects) and lowered reservation wages utilized in lower hourly wages (positive effect on the wage hazard).² On the contrary, if I find treatment to have positive out-of-unemployment effects and increased reservation wages - i.e. higher hourly wages - then the evidence points towards the removal of labor market frictions.

The remainder of this paper is laid out as follows: Section 2 briefly states the data and institutional settings. The methodology is presented in section 3, while I present the results in section 4, and section 5 concludes.

2 Data and Institutional Settings of the RCT

In this section, I give a brief overview of the data and institutional settings; for a thorough description see Sørensen (2016).

The RCT used in this paper was carried out in Southern Jutland and Storstroem county in Denmark with take-up between November 2005 and February 2006. All workers entering unemployment without any unemployment spells within the previous six months were randomly split between a treatment and a control group based on birthdays. If born between the 1st and 15th of any given month the worker was allocated to the treatment group. Employment is defined as entering a paid un-subsidized job. Hourly wages are earnings within a year of entering unemployment normalized by the number of hours worked.

In contrast to the non-treated - assigned to the contemporary system - treated individuals were exposed to: (i) a two-week job search assistance program, (ii) frequent meetings with a case worker, and (iii) earlier entry into labor market training. Graversen and van Ours (2008a,b) show that overall, the trial increased the hazard into self support (the absence of public transfers) and lowered average unemployment duration by approximately two weeks.

3 Methodology

I use a sequential mixed proportional hazard framework to capture the effects of early ALMP on hourly wages while explicitly controlling for selection into employment (see

²Note that a positive lock-in effect means that there is no lock-in, but instead that the hazard rate increased during participation.

Abbring and van den Berg (2003)). For simplicity, transitions into other benefits, self support (i.e. no earnings), or out of the labor force are right-censored. I model the transition into employment simultaneously with the *transition* into an hourly wage level. In total, more than 93% of the sample transit to employment within a year. The selection from unemployment to employment is modelled explicitly, and I can therefore estimate revealed reservation wages, even though a small fraction of the sample did not realize a wage level.

The choice of a hazard framework for modeling hourly wages is attractive for two main reasons; (a) effects on the wage hazard can be interpreted as effects on reservation wages, and (b) in a perfect data world, estimating wages as a hazard ensures estimating the complete wage distribution. Regarding (a), think of a situation in which a worker faces an employer negotiating for wages to form a worker-firm match. First, the employer presents the worker with an offer. If high enough, the worker accepts, if not then either the employer quits the negotiations or raises the offer. The wage hazard offers the econometrician the probability that a worker accepts an offer given that he has not accepted any offers below the current. I.e. a negative effect on the wage hazard implies that the worker refuses more offers before accepting a wage, and thus that his reservation wage has increased. Estimating wages as a hazard goes back to Donald, Green, and Paarsch (2000). Later, Arni, Lalive, and Ours (2013) used wage hazards to show how sanctions during unemployment affected post-unemployment wages.

Clearly, since treatment was randomly allocated, the effects of treatment are trivially identified. I thus need only to rely on two assumptions for identification (see Abbring and van den Berg (2003)); (i) variation within observed regressors, and (ii) a finite tail in the distribution of unobserved heterogeneity. I satisfy the first by including individual information of labor market experience, former wages, occupational level, education, nationality, age, and marriage in the conditioning set. I also model duration and wage dependence with baseline hazards. The second assumption is standard in the literature using hazard models with single-spells.

Let t denote time until leaving unemployment and w the observed wage level. The instantaneous hazards from unemployment to employment and into a wage level are then

$$\theta_e(t \mid x_e, d_1, d_2, \nu_e) = \lambda_e(t) \exp(x_e' \beta_e + d_{e,1} \delta_{e,1} + d_{e,2} \delta_{e,2} + \nu_e) \quad (1)$$

$$\theta_w(\omega \mid x_w, d, \nu_w) = \lambda_w(\omega) \exp(x_w' \beta_w + d_w \delta_w + \nu_w), \quad (2)$$

where $\delta_{e,1}$ and $\delta_{e,2}$ capture treatment effects within and after the first 30 weeks of unemployment, respectively. This distinction is included to estimate pseudo lock-in and program effects in the transition from unemployment to employment. In the wage hazard, treatment effects are captured by treatment or no treatment. The duration and wage

dependence parameters, $\lambda_e(t)$ and $\lambda_w(t)$ are modelled as step functions

$$\lambda_h(\gamma) = \exp \left(\sum_{k_h} \lambda_{h,k_h} \mathbb{1}(\gamma \in k_h) \right), \quad h \in \{e, w\}, \quad (3)$$

with k_e and k_w specifying the number of baseline hazards. The likelihood function thus becomes (suppressing parameters for simplicity)

$$\mathcal{L} = \prod_{i=1}^I \int_{\nu} \theta_e(t)^{c_e} S_e(t) [\theta_w(\omega) S_w(\omega)]^{c_e} dG(\nu), \quad (4)$$

where $c_e = 1$ if the individual enters employment and zero otherwise. $S_e(t)$ is the time-to-transition specific survivor function for employment, i.e. it measures the fraction present at time t who could potentially transit to employment. Likewise, $S_w(\omega)$ is the fraction of individuals that have transited to employment, but have not accepted a wage level below ω . $G(\nu)$ is the cumulative joint distribution of the unobserved heterogeneity modelled by two mass-points in each transition.

4 Results

Table 1 shows the estimated effects of treatment on the hazards of transition to employment and into wage levels.³ Overall, I find that treatment increased the probability to transit to employment during the trial and after, in line with Graversen and van Ours (2008a,b) and Blasco and Rosholm (2011), who also use this particular trial to investigate unemployment exit and re-entry rates.

It is interesting that I find treated workers to increase their hazard out of unemployment by 25 percent in Storstroem and only 10 percent in Southern Jutland during the trial (the pseudo lock-in effect) while the program effect is 12 percent in Storstroem and 38 percent in Southern Jutland. This support the hypothesis, that treatment lowered unemployment overall, but in Southern Jutland, treated workers were more likely to go through the entire treatment compared to treated workers in Storstroem. Given this structure, it is more likely that treated individuals in Southern Jutland experienced a formal gain from the program than treated individuals from Storstroem, simply because one should think that in order to gain the full effect you need to stay to complete the program.

Turning to treatment effects on the wage hazard, Table 1 shows that treatment had a statistically significant negative impact on the wage hazard in Southern Jutland while it had a significant positive impact on the corresponding hazard in Storstroem. Remember

³Table 2 and 3 in the working paper version of this paper present all estimation results. See Sørensen (2015).

the definition of a hazard - the probability of *exiting* a state, given that you have not exited before. I.e. a negative effect on a wage hazard implies that you are more likely to achieve a higher wage level. Thus, treated individuals in Southern Jutland gained higher wages than non-treated, and treated individuals in Storstroem ended up accepting lower wages than their non-treated counterparts. This finding supports the conjecture that the high-intense scheme lowered reservation wages while the less intense scheme with meetings being handled by private providers raised reservation wages.

Sørensen (2016) found positive earnings effects for both counties, which can be the result of an effect on either or both the intensive margin (higher wages) or the extensive margin (higher employment rate). Since the model estimates effects into employment simultaneously with effects into a wage level, I can compose a combined effect. With the results presented in Table 1, I have evidence supporting that the positive earnings effect in Southern Jutland is driven primarily by the intensive margin and secondarily the extensive margin. This is seen since treated left unemployment for employment slightly faster than non-treated, and they increased their reservation wage in the process. In Storstroem county, treated left unemployment systematically during the program and lowered their reservation wage for the jobs they accepted. This amounts to explaining the positive earnings effect as an effect on the extensive margin primarily. It is furthermore interesting, that Sørensen (2016) found the earnings effect in Southern Jutland to be persistent and the effect in Storstroem only significant in the short term. For an effect to be persistent, we need the program to have actually contributed positively to the productivity of the worker or his ability to search for jobs. In both cases we would also expect an increase in the reservation wage, which is exactly what I find for Southern Jutland.

[Insert Table 1 here]

5 Conclusions

In some cases, active labor market programs might help unemployed workers by removing frictions or building upon human capital. Instead, they might solely work in the short term by taxing away the leisure time of the unemployed worker, inducing him to exit unemployment as fast as possible at a possibly lower wage level. The results of this paper show how both seem to be the driving force behind an otherwise comparable experiment that was conducted in two Danish counties. In Storstroem - the county with a relative high-intense scheme - treated individuals left unemployment faster, but at a lower wage level than non-treated, and treated individuals from Southern Jutland - the county with a relative less intense scheme and private providers - benefitted by receiving higher wages

after leaving unemployment than non-treated individuals.

References

- Abbring, Jaap H. and Gerard J. van den Berg (2003), The Identifiability of the Mixed Proportional Hazards Competing Risks Model, *Journal of the Royal Statistical Society Series B* 65, no. Part 3:701–710.
- Arni, Patrick, Rafael Lalive, and Jan C. Van Ours (2013), How Effective Are Unemployment Benefit Sanctions? Looking Beyond Unemployment Exit, *Journal of Applied Econometrics* 28, no. 7:1153–1178.
- Black, Dan A., Jeffrey A. Smith, Mark C. Berger, and Brett J. Noel (2003), Is the Threat of Reemployment Services More Effective Than the Services Themselves? Evidence from Random Assignment in the UI System, *American Economic Review* 93, no. 4:1313–1327.
- Blasco, Sylvie and Michael Rosholm (2011), The Impact of Active Labour Market Policy on Post-Unemployment Outcomes: Evidence from a Social Experiment in Denmark, IZA Discussion Paper No. 5631.
- Donald, Stephen G., David A. Green, and Harry J. Paarsch (2000), Differences in Wage Distributions between Canada and the United States: An Application of a Flexible Estimator of Distribution Functions in the Presence of Covariates, *The Review of Economic Studies* 67, no. 4:609–633.
- Graversen, Brian and Jan C. van Ours (2008a), Activating Unemployed Workers Work: Experimental Evidence from Denmark, *Economics Letters* 100:308–310.
- (2008b), How to Help Unemployed Find Jobs Quickly: Evidence from a Mandatory Activation Programme, *Journal of Public Economics* 92:2020–2035.
- Rosholm, Michael (2008), Experimental Evidence on the Nature of the Danish Employment Miracle, IZA Discussion Paper No. 3620.
- Sørensen, Kenneth Lykke (2015), Active Labor Market Programs and Reservation Wages: It is a Hazard, economics Working Paper Series 2015-27, Aarhus University.
- (2016), Heterogeneous Impacts on Earnings from an Early Effort in Labor Market Programs, *Labour Economics* forthcoming.

A Tables

Table 1: Parameters of interest from the estimation of treatment effects on the hazard into employment and into a specific wage level.

	Southern Jutland	Storstroem
Unemployment to employment		
Pseudo lock-in effects ($\delta_{e,1}$)	0.100*** (0.001)	0.229*** (0.002)
Pseudo program effects ($\delta_{e,2}$)	0.324*** (0.008)	0.119*** (0.002)
Treatment effects on the wage hazard (δ_w)	-0.032*** (0.002)	0.019*** (0.001)
Observed heterogeneity	Yes	Yes
Unobserved heterogeneity	Yes	Yes
Log Likelihood	-14,227,150	-20,387,862
Individuals	1,337	1,596

Notes: *** indicates statistical significance at the 1% level. Standard errors are displayed in parentheses. The full set of parameter estimates can be found in Table 2 and 3 in Sørensen (2015).