

# How Do Labor Market Programs Affect Job Seekers' Earnings?

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# Motivation

*What are the effects of labor market policies and programs on medium-run earnings?*

Why we think this is interesting

- Unemployment rates are at exceptionally high levels in many OECD countries
- Wide-spread use of labor market programs (LMP)
  - up to one out of two job seekers gets affected
  - spend up to 3 % of GDP
- Policy effect: Intended intensity of use of program
- Participation effect: Actual participation in program

# What we do

We study *all* LMPs in Switzerland

- Comprehensive active labor market strategy
  - Supportive programs: job search assistance, training
  - Restrictive programs: workfare, benefit sanction
    - Can study participation or treatment effects
- Autonomous public employment service offices (PES)
  - PES use programs at different intensities
    - Can study ex-ante or policy effects
- Study employment earnings
  - important to understand and improve existing programs
  - outcome that covers the medium run (up to 42 months since UE entry)
  - distinction of earnings effects: (i) overall (ii) channels: duration vs post-unemployment earnings
- Use of (sub-)regional variation in strategy application

# Ex-ante Policy Effects & Ex-post Participation Effects

**Ex-ante effect** (*policy*): intended intensity of use of a certain type of program

⇒ applies to every unemployed individual

- Importance of ex-ante effects
  - information on PES strategy changes behavior
- Identification of ex-ante effects:
  - Public Employment Service units play crucial role in strategy implementation
  - Intensity of use varies

**Ex-post effect** (*treatment*): participation in a program

⇒ applies specifically to treated individual

⇒ Many evaluations ignore parallel presence of ex-ante & ex-post effects

# Literature

- Participation effects (ex-post): Evaluation literature (Card, Kluve and Weber, 2010)
- Policy effects: Ex-ante literature
  - Black, Smith, and Berger (2003)
  - Lalive, van Ours, and Zweimueller (2005); Arni, Lalive, van Ours (forthc. JAE)
  - Rosholm and Svarer (2008)
  - Van den Berg, Bergemann, Caliendo (2009)
  - Crépon, Duflo, Gurgand, Rathelot, Zamora (2012)
- Longer-run effects of training and sanctions:
  - Lechner, Miquel, Wunsch (2011); Crépon, Ferracci, Fougère (2007)
  - Arni, Lalive, Van Ours (forthc. JAE); Van den Berg, Vikström (2009)

# What's next?

- 1 Institutional Background
- 2 Data and Sample
- 3 Empirical Framework
- 4 Descriptive Analysis
- 5 Econometric Analysis
- 6 Preliminary Conclusions

# Swiss Unemployment Insurance

## Income support:

- benefit duration: normally 420 days (540 days for age 55+)
- replacement rate (RR): 70 or 80 % (family situation, income ceiling)
- median unemployment duration 4 to 6 months
- non-eligible individuals end up in social assistance

## Active labor market policy:

- 168 regional public employment service (PES) offices
- caseworkers hold monthly meetings to
  - support
    - discuss application strategies
    - assign job search assistance or training courses
  - monitor
    - sanctions (failed job search obligation, did not attend ALMP)
    - workfare programs (taxing time)

## Implementation Leeway

- Survey among heads of PES (Lechner, 2002)

*How free are you in setting the strategy for your PES?*

	N	Percent
I am free to do what I want	14	4.49
I get loose indications	139	44.55
I get detailed indications	105	33.65
I get very detailed indications	14	4.49
No answer	40	12.82
Total	312	100

- Federalist organization, big leeway for cantons and regional Public Employment Service (PES) agencies*



## Programmes We Analyze

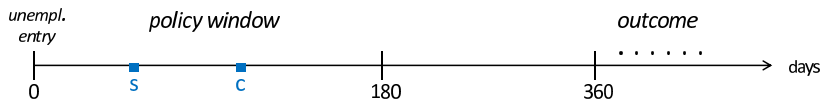
Type	Direct cost (CHF)	Participants (% of stock)
<i>A. Supportive programs (Carrots)</i>		
Job Search Assistance	–	–
Basic Training	–	–
Advanced Training	–	–
Total	121	23 %
<i>B. Punitive programs (Sticks)</i>		
Workfare	109	7 %
Benefit Sanction	- 120	5 %
Total		12 %

# Data Sources

## Swiss register data

- Unemployment insurance register
  - Unemployment spells that start between July 2000 to June 2005, age < 61.5 years
  - Unemployment duration and ALMP events in daily precision
  - Sanctions: Warnings (incomplete), Benefit Sanctions (complete)
  - Aggregate information: Municipality of residence, PES in charge
  - Individual information: socio-demographics, employability, occupation, benefit variables, household size, DI filer
- Social security register
  - 25 % random sample of all workers between 1982 to 2008
  - Employment earnings and employment status per month
  - Observe 5 years of pre-unemployment history
  - Dependent variable: Employment earnings, months 1-42 after unemployment entry (in real CHF).
- Matched based on person identifier

# Programmes vs. Policies



- Focus on events within the first 180 days
- Define individual treatments:

$$D^c = \mathbb{I}(t_c \leq 180) \quad D^s = \mathbb{I}(t_s \leq 180)$$

- Define policies as probability to attend program  $m$  in PES  $p$  within 180 days
  - Measuring policies as  $\hat{P}_p^m = \bar{D}_p^m$  is misleading
    - Individuals leave unemployment before intended strategy can be applied
    - Individuals react to Regime
- ⇒ Need to measure *intended strategy*

# Measuring Policies

## *Competing Risks Approach (CRA)*

- 3 possible events: carrot ( $c$ ), stick ( $s$ ), unemployment exit ( $ue$ )  
3 latent durations:  $t_c, t_s, t_{ue}$
- Observed duration to "carrot/stick event" is censored in the following way

$$\tau_c = \min(t_c, t_{ue}, 180)$$

$$\tau_s = \min(t_s, t_{ue}, 180)$$

- Assume independent risks conditional on a large set of  $x$

CRA deals with right censoring due to other events and anticipation effects

## Estimation, Stage 1: Intended Policies

Intended strategy  $m \in \{c, s\}$  in PES  $p$  is characterized by its hazard:

$$\theta_p^m(t_m|x, y^-, p)$$

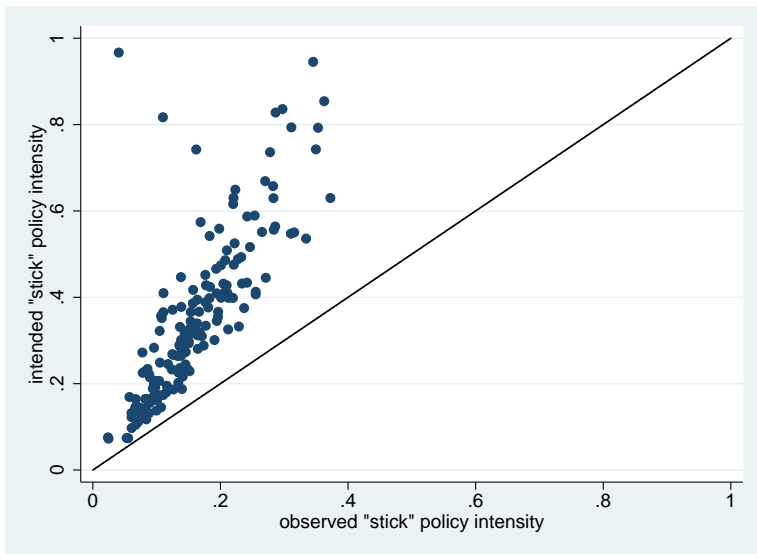
where  $x$  is a vector of individual characteristics, and  $y^-$  is information on pre-unemployment earnings

Estimation of intended policies:

- Estimate and predict hazards  $\theta^m$  using individual spells, by program type  $m$  and PES  $p$ , conditional on  $x$  and  $y^-$
- Predict program participation within 180 days:

$$\hat{P}_p^m \equiv \text{Prob}(t_m < 180|x, y^-, p) = 1 - \exp\left(-\int_0^{180} \theta_p^m(z|x, y^-, p) dz\right)$$

# Results, 1st stage: Observed vs Intended Policies



## Descriptive Statistics: Policies

		<i>policy intensities</i>	
		"carrot"	"stick"
<i>observed</i>	mean	0.213	0.162
	median	0.212	0.150
	s.d.	0.064	0.075
<i>intended</i>	mean	0.476	0.368
	median	0.401	0.324
	s.d.	0.297	0.240
PES		168	168

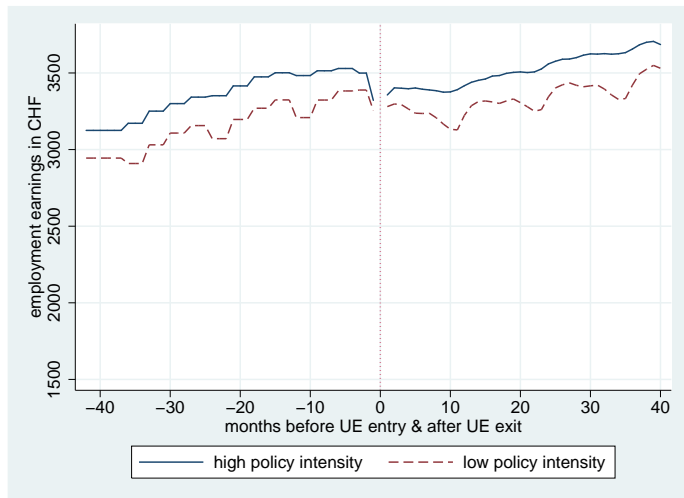
# Spells By Intensity of Use

	Carrots			Sticks		
	high	low	norm diff	high	low	norm diff
Carrot intensity	0.514	0.284	-	0.403	0.386	-
Stick intensity	0.298	0.311	-	0.432	0.199	-
Age	34.86	35.35	-0.031	34.97	35.24	-0.018
Female	0.3749	0.3646	0.015	0.3649	0.3741	-0.014
Nationality: non-swiss	0.3965	0.4258	-0.042	0.4118	0.4106	0.002
Household size	2.0609	2.1110	-0.027	2.0934	2.0797	0.007
No prof. certificate	0.3712	0.4042	-0.048	0.4011	0.3758	0.037
Low employability	0.1202	0.1699	-0.100	0.1602	0.1316	0.057
Replacement Ratio 80%	0.5420	0.5861	-0.063	0.5821	0.5480	0.049
pre-UE earnings (60mt)	3262.3	2989.8	0.066	2988.7	3249.0	-0.063

Notes: Sample restricted to spells with no program. High vs low intended policy intensity based on median split. 1 CHF = 1.10 USD = 0.829 EUR.

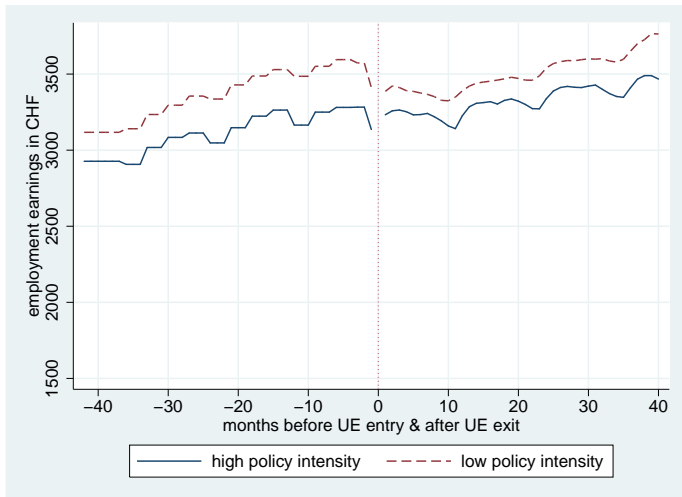


# Total Earnings, by Carrot Policy



Notes: High (low) policy intensity = intended probability of being assigned a "carrot" treatment is 0.514 (0.284). 1 CHF = 1.10 USD = 0.829 EUR.

# Total Earnings, by Stick Policy



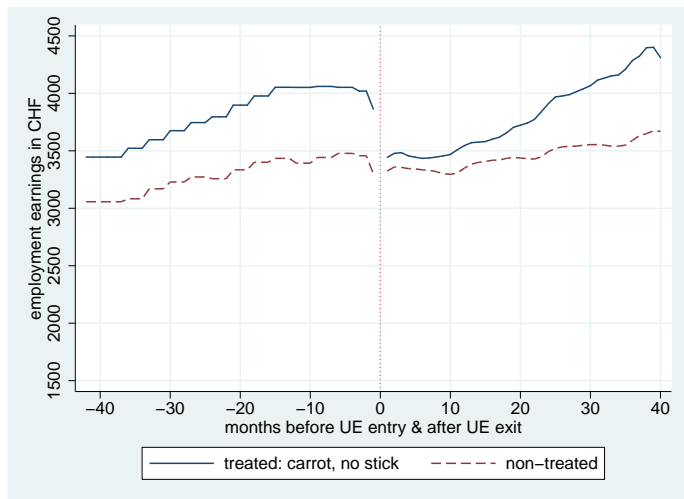
Notes: High (low) policy intensity = intended probability of being assigned a "stick" treatment is 0.432 (0.199). 1 CHF = 1.10 USD = 0.829 EUR.

# Spells By Program Participation

Statistic	mean				normalized difference		
	no	carrot	stick	c. & s.	1 vs 0	2 vs 0	3 vs 0
Column	0	1	2	3	4	5	6
Age	35.17	36.51	33.12	34.05	0.087	-0.134	-0.073
Female	0.3639	0.4294	0.3097	0.3884	0.095	-0.081	0.036
Nationality: non-swiss	0.4030	0.4030	0.4539	0.4505	0.000	0.073	0.068
Household size	2.0850	2.1629	1.9913	2.0481	0.042	-0.051	-0.020
No prof. certificate	0.3806	0.3423	0.4735	0.4397	-0.056	0.133	0.085
Low employability	0.1398	0.1389	0.1742	0.1701	-0.002	0.067	0.059
Replacement Ratio 80%	0.5318	0.6166	0.6302	0.6641	0.122	0.142	0.192
pre-UE earnings (60mt)	3122.2	3619.7	2523.4	2885.2	0.114	-0.164	-0.061

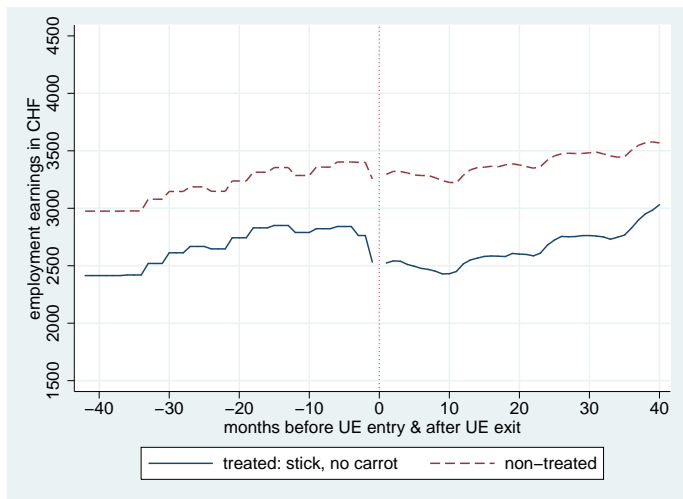
Notes: Table contrasts participant outcomes with non-participant outcomes re-weighted to reflect the distribution of participants across PES. 1 CHF = 1.10 USD = 0.829 EUR.

# Total Earnings, by Carrot Participation



Notes: Treated line is average earnings with treatment, non-treated is counterfactual earnings re-weighted to match the distribution of treated across PES. 1 CHF = 1.10 USD = 0.829 EUR.

# Total Earnings, by Stick Participation



Notes: Treated line is average earnings with treatment, non-treated is counterfactual earnings re-weighted to match the distribution of treated across PES. 1 CHF = 1.10 USD = 0.829 EUR.

## Estimation, Stage 2: Earnings Outcomes

- We estimate the following "flexible diff-in-diff" model

$$y_i = x_i' \beta + y_i^- \phi + \pi^c \hat{P}_\rho^c + \pi^s \hat{P}_\rho^s + \delta^c D_i^c + \delta^s D_i^s + \sum_k \gamma c_k + \varepsilon_i$$

whereby

- $y_i = \sum$  earnings in months 1-42 after unemployment entry
- $y_i^-$ : earnings & employment variables over 12mt before unemployment entry
- $c_k$ : controls for inflow calendar time,  $k$  half years
- Standard errors neither corrected for 1st stage estimation of  $(\hat{P}_\rho^m)$  nor clustered

# Sources of Policy Endogeneity

Assume that there is an unobserved  $v$  that is correlated with strategy  $P_i$  and individual's earnings  $y$ . What could be potential sources of  $v$ ?

- ① Political preferences, leisure preferences, culture, attitudes in PES region  $i$  which affect as well  $y$   
→ static in the shorter run (like 3-4 years)
  - ② Local labor market conditions in PES region  $i$ 
    - ① static structure like industry composition, UE level etc
    - ② local dynamics in UE rate, or shocks like plant closures
    - ③ past labor market conditions
- ⇒ *Municipality · year FE* capture these sources of policy endogeneity
- ⇒ What remains?: Organizational changes of PES <> municipality assignment; capacity overload; big cities with several PES

# Empirical Strategy

How far can we get with harmless econometrics ?

- Regression 1: Baseline from previous slide
- Regression 2: Add municipality fixed effects
  - Addresses sorting across PES in terms of time-invariant characteristics
- Regression 3: Add years 2 to 5 of pre-unemployment earnings
  - Are pre-unemployment trends in earnings similar?
- Regression 4: Add municipality · year fixed effects
  - Addresses municipality specific flexible time trends



## Results on Total Earnings

		(1)	(2)	(3)	(4)
Carrot Particip.	$\delta^c$	-434.5*** (11.51)	-428.7*** (14.96)	-423.0*** (14.81)	-423.7*** (12.13)
Stick Particip.	$\delta^s$	-511.6*** (10.88)	-503.0*** (12.10)	-486.8*** (11.95)	-485.4*** (11.67)
Carrot Policy	$\pi^c$	111.2*** (23.46)	472.9*** (141.7)	455.4*** (152.8)	616.8*** (147.2)
Stick Policy	$\pi^s$	-79.93*** (28.94)	-125.7 (86.83)	-117.4 (85.65)	-148.2 (115.7)
Past earnings		12 mt	12 mt	60 mt	60 mt
FE type		no	municipality	municipality	mun·year
Number of FE			2,724	2,724	13,240
Observations		211,616	211,616	211,616	211,616
$R^2$		0.329	0.320	0.341	0.341

## Duration vs Post-Unemployment Earnings

		(1)	(2)	(3)
		earn from t0	UE dur	post-ue earn
Carrot Particip.	$\delta^c$	-423.7*** (12.13)	165.4*** (1.330)	211.0*** (13.58)
Stick Particip.	$\delta^s$	-485.4*** (11.67)	70.35*** (1.426)	-300.0*** (13.21)
Carrot Policy	$\pi^c$	616.8*** (147.2)	-92.84*** (14.40)	413.7*** (154.6)
Stick Policy	$\pi^s$	-148.2 (115.7)	12.39 (10.06)	-146.2 (122.6)
Observations		211,616	211,616	211,616
$R^2$		0.341	0.223	0.358
Muni. x year FE		Yes	Yes	Yes

Notes: Total Earnings is average monthly earnings over the period 1 to 42 months after unemployment entry. Duration is unemployment duration in days. Post-unemployment earnings is average post-unemployment monthly earnings over the period 1 to 40 months after leaving unemployment.

# Post-unemployment Earnings Dynamics

		(1)	(2)	(3)	(4)
		1-6 mt	7-12 mt	13-24 mt	24-40 mt
Carrot Particip.	$\delta^c$	232.2*** (15.57)	245.3*** (15.57)	270.2*** (17.58)	149.5*** (54.87)
Stick Particip.	$\delta^s$	-278.8*** (14.32)	-295.9*** (14.51)	-327.0*** (15.60)	-317.0*** (37.96)
Carrot Policy	$\pi^c$	254.8 (176.5)	341.4** (164.1)	537.2*** (172.0)	509.1** (240.1)
Stick Policy	$\pi^s$	-62.37 (137.7)	-13.07 (139.0)	-211.0 (136.1)	-274.9 (205.2)
Observations		210,930	208,934	184,849	62,902
$R^2$		0.333	0.303	0.322	0.321
Muni. x year FE		Yes	Yes	Yes	Yes

## Summary of results

Outcome	total earnings	unemployment duration	post-unemployment earnings
<i>A. Regime effects</i>			
Carrot	+	-	+
Stick	(-)	(+)	(-)
<i>B. Programme effects</i>			
Carrot	-	+	+
Stick	-	+	-

# Tentative Insights

- Measuring intended policies is key
- Programme vs strategy effects
  - Regime effects are as important as programme effects
  - Regime effects need not be same as programme effects
- Supportive policies dominate punitive policies

Thank You

I Would Like To Thank You For  
Your Attention And Suggestions