Market Externalities of Large Unemployment Insurance Extensions

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Motivation:

What is the effect of increasing generosity of UI on labor market outcomes?

- We \approx know what micro effect ϵ^m is
 - In *theory*, increase in UI unambiguously increase U duration
 - Empirically, large number of well-identified micro estimates
- What about macro effect ϵ^{M} ?
 - ▶ In *theory*, large literature on equilibrium search & matching, but anything goes: $\epsilon^m \ge \epsilon^M$
 - Empirically, difficulty of estimating G-E effects of UI and to analyze how micro and macro estimates differ

Market externalities of UI:

Market externality:

- UI induced variations in the search effort of some unemployed affect job finding probability of other unemployed in the same labor market
- Such spillover effects = first-order welfare effects if Hosios condition does not hold
- Market externality $\approx \epsilon^m \epsilon^M$
- Sign and size of $\epsilon^m \epsilon^M$ critical:
 - To determine optimal UI level (LMS ['13])
 - To understand labor market fluctuations

This paper:

 Regional Extended Benefit Progam (REBP): Large extensions of UI in Austria

- Increase from 52 to 209 weeks for eligible 50+ in specific regions
- Unique quasi-experimental setting to identify externalities
- Strong evidence of positive effects of REBP on untreated workers in treated labor markets
- Discuss how evidence relates to search & matching models:
 - Evidence refutes large "wage externality" effects
 - Evidence in line with job-rationing models

Related literature:

- Empirical literature on identification of spillovers of policy interventions
 - ▶ General literature on spillovers: Duflo & Saez (2003)
 - Spillovers of active labor market policies: Crepon & al. (2012), Ferracci & al. (2010), Blundell, & al. (2004).
 - Spillovers of UI: Levine (1993)
- Literature on job-rationing in matching models:
 - Michaillat (2012)
- Literature on optimal UI:
 - Direct continuity of LMS (2012)

Introduction

- Onceptual framework
- Institutional background
- Empirical strategy
- 6 Results
- Policy Implications

Labor Market with Matching Frictions

- *u* unemployed workers:
 - Exert search effort e
 - e function of UI benefits B
- v vacancies.
- Number of matches: $m(e \cdot u, v) = \omega_m \cdot (e \cdot u)^{\eta} \cdot v^{1-\eta}$
- Labor market tightness: $\theta \equiv v/(e \cdot u)$
- Job-finding proba: $e \cdot f(\theta) = e \cdot m(1, \theta)$.
- Vacancy-filling proba: $q(\theta) = m(1/\theta, 1)$.

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■ Vacancy-filling proba: $q(\theta) = m(1/\theta, 1)$. $\Rightarrow \frac{\partial q(\theta)}{\partial \theta} < 0$

Externalities of UI extensions

- Two types of unemployed, $i \in a, b$ with effort $e_i = e(B_i)$
- Externalities:

$$\frac{d(e_b \cdot f(\theta))}{dB_a} = e_b \cdot f'(\theta) \cdot \frac{\partial \theta}{\partial B_a}$$
(1)

- Congestion externality:
 ↑ B_a ⇒↓ e_a ⇒ for given level of v, proba of finding a job ↑ for type b...
- Wage externality:

 $\uparrow B_a \Rightarrow \uparrow w \Rightarrow \downarrow$ firms' profits $\Rightarrow \downarrow v \Rightarrow \downarrow$ proba to find job for type *b*

Externalities in matching models (1)

- In models with flexible wages and ≈ linear technology:
 - $\bullet \uparrow B_{a} \Rightarrow \uparrow w \Rightarrow \downarrow v \Rightarrow \downarrow \theta$
 - Negative externality on untreated unemployed
 - Macro effect larger than micro effect
 - Well suited for :
 - Long run
 - Presence of close substitutes to labor
 - Labor market with high informality

Figure 1 : Externalities with flexible wages and pprox linear technology



Externalities in matching models (2)

In models with rigid wages & diminishing returns:

- $\uparrow B_a \Rightarrow \uparrow (f' w) \Rightarrow \uparrow v \Rightarrow \uparrow \theta$
- Positive externality on untreated unemployed
- Macro effect smaller than micro effect
 - Short run
 - Absence of close substitutes to labor
 - Labor market with low informality

Figure 2 : Externalities with rigid wages and diminishing returns



Introduction

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- Empirical strategy
- 6 Results

Policy Implications

REBP reform in Austria

- Large UI benefit extension program enacted in Austria
 - 209 weeks instead of 52 weeks
- Eligibility requirements:
 - Age: more than 50
 - Residence (at least 6 months before becoming unemployed) + last job in selected regions
 - At least 15 years of continuous work history in the past 25 years
 - Spell beginning between June 1988 and Aug 1993

Figure 3 : Austrian regions by REBP treatment status



- Universe of UI spells in Austria from 1980 to 2010:
 - Info on age, residence, education, marital status, etc...
- Universe of social security data in Austria from 1949 to 2010:
 - Info on each employment spell
 - Compute experience in past 25 years
 - Merge with UI data to determine REBP eligibility
 - Info on wages, industry, tenure,

Empirical strategy:

ATET:

Compare eligible workers in REBP regions and non-REBP regions *before/during/after*

- Average externality on non-eligible: Compare non-eligible workers in REBP and non-REBP regions *before/during/after*
- Diff-in-diff identification requirements:
 - REBP and non-REBP regions are isolated
 - No region-specific shocks at the time of REBP
 - No change in unobservables for non-eligible (selection)

Sample selection:

• Endogeneity of choice of REBP regions:

- Regions are not selected at random: restructuring of steel sector
- Remove all steel sector workers (at most 15% of unemployed in treated regions), and all workers in related industries
- Geographical spillovers:
 - We exclude non-treated counties that are highly integrated to REBP counties

Figure 4 : Local labor markets integration: Fraction of new hires from REBP regions in total number of new hires by county



Sample: male 50-54 in non-steel industries, 1980-1987 & 1998-2010.

Table 1 : SUMMARY STATISTICS (1)

	(1)	(2)	(3)	(4)
	A. REBP vs	non-REBP	counties bef	ore 1988
	Non-REBP	REBP		
	counties	counties	Difference	p-value
Labor market outcomes				
Fraction in the steel sector	.07	.13	06	0
Monthly 50-54 unemployment	.0787	.0793	.0006	.69
rate				
Unemployed in estimation sample Fraction with work history > 15	.907	.921	014	.004
yrs				
Age	51.9	51.9	0	.596
Unemployment duration	21	22.6	-1.6	.028
Non employment duration	26.9	27.5	6	.558
Fraction spells $>$ 52 wk	.056	.062	006	.132
Wage before U spell (€2000)	11,735	12,313	-578	0
Wage after U spell (€2000)	11,512	12,164	-6,511	0

	(1)	(2)	(3)	(4)				
	B. REBP-eligible vs non-eligible unemployed in REBP counties before 1988							
	Non-eligible	Eligible						
	unemployed	unemployed	Difference	p-value				
Unemployed in estimation sample								
Age	51.8	51.9	1	.095				
Unemployment duration	20.5	25.1	-4.6	.118				
Non employment duration	30	28.8	1.3	.715				
Fraction spells $>$ 52 wks	.032	.064	032	.011				
Wage before U spell (€2000)	10,403	12,476	-2,072	0				
Wage after U spell (€2000)	10,3733	12,318	-1,945	0				
Fraction with compulsory educa- tion	.705	.659	.046	.066				
Fraction married	.832	.811	.021	.321				

Figure 5 : Difference in U duration between REBP and non REBP regions: male 50-54 with <u>more</u> than 15 years of experience



Figure 6 : Difference in U duration between REBP and non REBP regions: male 50-54 with less than 15 years of experience













Baseline specifications:

$$Y_{it} = \alpha + \overbrace{\beta_0 \cdot \mathbb{H} \cdot M \cdot \tilde{T}_t}^{\text{Effect of REBP on treated}} + \overbrace{\gamma_0 \cdot (1 - \mathbb{H}) \cdot M \cdot T_t}^{\text{Effect of REBP on non-treated}} + \eta_0 \cdot M + \sum \nu_t + \eta_1 \cdot \mathbb{H} + \eta_2 \cdot M \cdot \mathbb{H} + \sum \iota_t \cdot \mathbb{H} + X'_{it}\rho + \varepsilon_{it}$$

- M: indicator for residing in REBP region
- *T_t*: indicator for spell starting btw June 1988 and Aug 1997
- $\mathbb{H} = \mathbb{1}[H > 15]$: indicator for more than 15 yrs of exp

Table 2 : BASELINE ESTIMATES OF THE EFFECTS OF REBPON ELIGIBLE AND NON-ELIGIBLE UNEMPLOYED

	(1) (2) (3) Unemployment duration		(4) Non-empl. duration	(5) Spell >100 wks	(6) Spell >26 wks	
β_0 (ATET)	47.4*** (5.66)	41.5*** (4.86)	40.6*** (4.60)	28.3*** (5.13)	0.22*** (0.026)	0.22*** (0.021)
γ_0 (externality)	-6.9*** (1.69)	-6.6*** (1.66)	-10.8*** (1.70)	-10.2*** (1.73)	-0.03*** (0.0067)	-0.04*** (0.012)
Educ., married, industry, citizenship		×	×	×	×	×
Preexisting trends by region×exp			×	×	×	×
Ν	127802	126091	126091	106164	126091	126091
S.e. clustered at the y	/ear×region	level in pa	rentheses. *	p<0.10, ** p	o<0.05, *** p	<0.010.

Potential confounders:

Confounder 1: region-specific shocks

- REBP regions experience differential shock on labor market conditions at the time REBP was implemented
- If anything, we expect negative shock if REBP regions endogenously selected

Confounder 2: selection

- Self-selection into unemployment affected by the reform for non-treated group in treated counties
- If anything, bias likely to attenuate estimate of spillover effect on non-treated

Table 3 :Externalities of REBP on different ageGROUPS IN REBP COUNTIES

	(1) (2) (3) Unemployment duration Age group 50-54 vs		(4) Non-er Age	(5) mployment du e group 50-54	(6) uration vs	
	45-49	40-44	35-39	45-49	40-44	35-39
β_0 (ATET)	47.43*** (5.659)	47.43*** (5.659)	47.43*** (5.659)	30.27*** (5.866) 2.464***	30.27*** (5.866) 2.150***	30.27*** (5.866)
γ_0 (externality)	-1.936** (0.745)	(0.332)	-0.0384 (0.323)	-2.464*** (0.685)	-2.159*** (0.523)	-0.771 (0.607)
N	269310	283458	283266	237836	254961	257631

Table 4 :Externalities on non-eligible aged 50 to 54USING 30 to 39 in REBP counties as control

	(1)	(1) (2) (3)		(4)	(5)	(6)
	Unemple	Unemployment Non-e		empl.	Sp	eell
	dura	duration dura		tion	>26	wks
β_0 (ATET)	54.32***	51.04***	30.30***	30.17***	0.31***	0.274***
	(7.48)	(6.85)	(7.63)	(7.16)	(0.043)	(0.036)
γ_0 (externality)	-7.89**	-6.71*	-7.64***	-6.17**	-0.07***	-0.05**
	(3.88)	(3.57)	(2.15)	(2.42)	(0.02)	(0.02)
Educ., married, industry, citizenship		×		×		×
Ν	182689	180098	170388	168163	182689	180098

Table 5 :TESTING FOR SELECTION: INFLOW RATE INTOUNEMPLOYMENT AND LOG REAL WAGE IN PREVIOUS JOB

	(1) log separation rate	(2) (3) log real wage in previous job	
eligible	0.287*** (0.0355)		
non-eligible	-0.0346 (0.0306)		
β_0 (REBP effect on eligible)		0.0604 (0.0600)	0.0346 (0.0573)
γ_0 (REBP effect on non-eligible)		0.00728 (0.0418)	-0.00588 (0.0410)
Ν	1733	114770	112242

Standard errors in parentheses, * p<0.10, ** p<0.05, *** p<0.010

Figure 8 : **Treatment intensity**: Fraction of new hires from non-REBP regions in total number of new hires by county



Sample: male 50-54 in non-steel industries, 1980-1987 & 1998-2010.

Figure 9 : Effects of REBP on non-eligible workers by treatment intensity



Table 6 : EXTERNALITIES ON NON-ELIGIBLE UNEMPLOYED BY REBP-TREATMENT INTENSITY (1)

REBP effect on non-treated	(1) Unemployment duration	(2) Non-empl. duration	(3) Spell >100 wks	(4) Spell >26 wks				
	Treatment intensity measure: County share of hires from non-REBP counties							
γ_0^L (non-REBP hires $>$.05)	-2.943 (2.043)	-5.128** (2.050)	-0.00166 (0.00689)	-0.0153 (0.0145)				
γ^{H}_{0} (non-REBP hires \leq .05)	-11.93*** (2.570)	-7.924*** (2.579)	-0.0286*** (0.00726)	-0.0756*** (0.0234)				
F-Test $\gamma_0^L = \gamma_0^H$	[0.00267]	[0.298]	[0.00928]	[0.0388]				
Educ., marital status, industry, citizenship	×	×	×	×				
Ν	167920	143922	167920	167920				
C. Landais, LSE	UI externali	ties		32				

40

Table 6 : EXTERNALITIES ON NON-ELIGIBLE UNEMPLOYED BY REBP-TREATMENT INTENSITY (2)

REBP effect on non-treated	(1) Unemployment duration	(2) Non-empl. duration	(3) Spell >100 wks	(4) Spell >26 wks				
	Treatment intensity measure: Fraction treated in region×education×industry cell							
γ_0^L (fraction treated \leq .9)	-3.633 (2.339)	-4.723** (1.810)	-0.00292 (0.00734)	-0.0400*** (0.0125)				
γ_0^H (fraction treated $>.9$)	-8.319*** (1.939)	-7.680*** (2.287)	-0.0188*** (0.00574)	-0.0264 (0.0262)				
F-Test $\gamma_0^L = \gamma_0^H$	[0.0505]	[0.0732]	[0.0485]	[0.668]				
Educ., marital status, industry, citizenship	×	×	×	×				
Ν	167920	143922	167920	167920				
C. Landais. LSE	UI externalities			32				

40

(1) (2)	(3)	(4)	(5)
Ur	nemployment	Non-empl.	Spell	Spell
	duration	duration	$>\!\!100 \text{ wks}$	$>\!\!26~{\rm wks}$

	Labor market integration - Measure 1: Fraction of hires coming from REBP regions in county cell					
γ_0 (geographical spillovers)	-4.3 (3.6)	-4.6 (3.4)	-3.2 (2.4)	-0.01 (0.01)	-0.03* (0.01)	
Educ., marital status, industry, citizenship		×	×	×	×	
Ν	104881	102840	88702	102840	102840	

((1)	(2)	(3)	(4)	(5)
l	Unemployment		Non-empl.	Spell	Spell
	duration		duration	$>\!\!100 \ {\rm wks}$	$>\!\!26~{\rm wks}$

	Labor market integration - Measure 2: Fraction of hires coming from REBP regions in county×industry×education cell						
γ_0 (geographical spillovers)	-5.9*** (1.0)	-4.7*** (0.9)	-2.2*** (0.6)	-0.01*** (0.003)	-0.01** (0.005)		
Educ., marital status, industry, citizenship		×	×	×	×		
Ν	104881	102840	88702	102840	102840		

Table 8 : Effects of REBP on wages

	(1)	(2)	(3)
	log re	employment w	vage
β_0 (REBP effect on eligible)	-0.0491***	-0.0477***	-0.0225
	(0.0176)	(0.0156)	(0.0148)
γ_0 (REBP effect on non-eligible)	0.0190	0.0786**	0.0410
	(0.0448)	(0.0340)	(0.0301)
Educ., marital status, industry, citizenship	()	×	×
Set of dummies for duration of U spell			×
N	89290	88691	88610

Figure 10 : Relationship between age and reemployment wages conditional on unemployment duration 1981-1988



Figure 10 : Relationship between age and reemployment wages conditional on unemployment duration 1988-1990



Figure 10 : Relationship between age and reemployment wages conditional on unemployment duration 1991-1993



Figure 10 : Relationship between age and reemployment wages conditional on unemployment duration 1994-1998



Figure 10 : Relationship between age and reemployment wages conditional on unemployment duration 1998-2005



Figure 10 : Relationship between age and reemployment wages conditional on unemployment duration 2006-2010



Backing out ϵ^M and ϵ^m :

Relationship between externalities, ϵ^M and ϵ^m



β₀ ≈ ϵ^M: around 85% treated in REBP regions
 β₀ − γ₀ ≈ ϵ^m: effect of treatment net of spillovers

$$\Rightarrow \epsilon^m / \epsilon^M \approx 1.35$$

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 β₀ − γ₀ ≈ ϵ^m: effect of treatment net of spillovers

$$\Rightarrow \epsilon^m / \epsilon^M \approx 1.35$$

Policy implications:

- Extensions less distortionary than previously thought using only ϵ^m
- In the long run, wages adjust, but very little
- In the long run, reversal of sign of $\epsilon^m \epsilon^M$ possible if substitution away from eligible workers
- Explains difference between small reform-based and large cross-country estimates of ϵ^M

Conclusion:

- Identification of positive effects of increasing UI on untreated workers in the same labor market
- Externalities matter in the labor market and must be taken into account for optimal UI

Figure 11 : Difference in in hazard rates between REBP and non REBP regions: male 50-54 with **more** than 15 years of experience



Figure 12 : Difference in hazard rates between REBP and non REBP regions: male 50-54

