Analyzing the Anticipation of Treatments using Data on Notification Dates

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Outline

In this paper we focus on the evaluation of training programs for the unemployed

Nothing guarantees that a program can be consistently estimated

Specific case of randomized experiment (burgeoning in France)

Otherwise always assumptions to identify the causal effect of program participation

This paper is about the "Timing Of Event" (TOE) model (Abbring and van den Berg, 2003), a popular model to evaluate the effect programs like training program for unemployed

The main interest of these duration models is that they allow to solve the selectivity bias due to unobserved heterogeneity

There are however assumptions associated with this framework

Among them is the No Anticipation (NA) assumption : the behavior of unemployed is not affected by future entry into the program

The first purpose of this paper is to use unique information about the assignment process to training to test this assumption

Outline

We are also interested in estimating threat effects of ALMP

Idea that participation in an ALMP has an opportunity cost for unemployed

When assigned to an ALMP unemployed may intensify their search effort so as to exit unemployment before entering the program

Could be also a reason for poor results in the evaluation of most ALMP

Because usual estimation methods used in evaluation of ALMP either TOE or matching methods fail to account for this threat effects their results would be biased

The second purpose of this paper is to use our information about the assignment process to test this explanation of limited effect found for ALMP

Outline

The additional information that we have in our dataset is the date when individuals are informed by caseworkers that they shall eventually enter a training program : a notification date

We extend the standard "timing-of-events" (TOE) model to account for this type of information shocks individuals can receive prior to being treated.

We estimate the model using registered data on unemployed workers in France.

The results rule out the NA assumption, and go against a "threat effect" of training policies.

The "no anticipation" assumption

Let Y be the individual duration in a state of interest and Z the duration before treatment.

The duration Y is always observed but Z is observed only if $Z < Y$.

The issue is what is the inform content of Y when $Y < Z$

The No Anticipation assumption amount to assume that these Y reveal information about what would be the exit process if there were no available treatment

This means that although some of these individuals were about to be assigned to treatment, their probability to exit is the same as if their scheduled entry was postponed

Intuitively this assumption means that "future events have no effect today"

The standard evaluation framework

The typical duration model assumes the following for the hazard rates of Y and Z:

$$h_Z(t|X,V) \;=\; \lambda_Z(t) \cdot \phi_Z(X) \cdot V_Z,$$

$$h_Y(t|Z,X,V) \;=\; \lambda_Y(t) \cdot \phi_Y(X) \cdot V_Y \cdot [\delta(t,Z,X)]^{\mathbf{1}\{Z<t\}},$$

where X and V account for observed and unobserved heterogeneity respectively.

The jump function in the hazard rate δ is the causal program effect and the parameter of interest

The key result in Abbring and van den Berg, 2003b is to find the conditions under which this model is identified

One important condition is the NA assumption to hold

Related literature (1)

Large literature using the TOE approach to evaluate ALMPs

⇒ Van den Berg and Van der Klaauw (2004) find that unemployment insurance sanctions have positive and significant effects on the transition to work.

⇒ Richardson and Van den Berg (2008) evaluate the impact of Swedish vocational training programs and find significantly large and positive effects on exit to work.

⇒ Crepon, Ferracci and Fougere (2007) find that training programs in France have no significant *ex-post* effect on unemployment durations, but positive effects on subsequent employment duration.

Related literature (2)

Other papers provide evidence of some "*threat effect*" of ALMPs

⇒ Policy-makers are interested in estimating *ex-ante* effects of ALMPs that could help solve the moral hazard problem of unemployment insurance schemes (OECD Employment Outlook, 2005).

⇒ Black, Smith, Berger and Noel (2003) show that many unemployed find jobs immediately after receiving written notification that they have been selected for participation in an ALMP.

⇒ Rosholm and Svarer (2008) estimate that the *threat effect* of ALMPs in Denmark reduces average unemployment duration by approximately three weeks.

⇒ Results may be driven by different institutional settings (e.g. sanctions if individuals refuse training in Denmark).

Introducing notification dates in the evaluation framework

If individuals receive notification of future treatment at a random date P <u>and act on</u> this information, the NA assumption is violated.

We assume that the distribution of P, Z, Y follows:

$$
\begin{aligned}
h_P(t|X,V) &= \lambda_P(t) \cdot \phi_P(X) \cdot V_P, \\
h_Z(t|P,X,V) &= \lambda_Z(t) \cdot \phi_Z(X) \cdot V_Z \cdot [\gamma(t,P,X)]^{\mathbf{1}\{P<t\}}, \\
h_Y(t|Z,P,X,V) &= \lambda_Y(t) \cdot \phi_Y(X) \cdot V_Y \cdot [\delta_P(t,P,X)]^{\mathbf{1}\{P<t\leq Z\}} \\
&\qquad \cdot [\delta_Z(t,Z,X)]^{\mathbf{1}\{Z\leq P\}\cdot\mathbf{1}\{Z<t\}} \\
&\qquad \cdot [\delta_{PZ}(t,P,Z,X)]^{\mathbf{1}\{P<Z<t\}}.
\end{aligned}
$$

Issues potentially arising from notification

- Direct effect on the outcome.

If not-yet-treated individuals behave differently before and after they receive notification of treatment, the NA assumption is violated.

$$\rightarrow \delta_P(t, P, X) = 1 \quad ?$$

- Does the treatment effect depend on notification?

$$\rightarrow \delta_Z(t, z, X) = \delta_{PZ}(t, p, z, X) \quad ?$$

- (How) does notification affect the probability of being treated?

$$\rightarrow \gamma(t, p, X) = 1? \quad > 1? \quad < 1?$$

Application to training programs for unemployed workers in France

Principle of regular meetings between the unemployed worker and caseworkers since the unemployment benefit system reform in July 2001 (PARE reform).

The purpose of these meetings is to assess the worker's needs in terms of job search assistance and/or training.

Some time after a meeting, the caseworkers can contact the job seeker and inform her/him that she/he shall eventually enter a training program.

Job seekers can refuse (or postpone) training and/or they can find a training program by themselves (and thus enter training without prior notification from the caseworker).

The data

We have register data (FHS) from the national unemployment agency (ANPE).

10% of all unemployment spells starting in 2003 or 2004 in the greater Paris area (Ile-de-France) and follow them up to their end or to the 1st of January 2008 (159 599 unemployment spells).

In addition to individual individual characteristics, we observe the starting and ending dates of the unemployment spell and (if it occurs) of the training spell.

Key additional information : we observe the date when the job seeker is notified of the caseworker's decision and whether this decision consists of a future entry into a training program.

$\rightarrow$ We can thus compute the durations Y (censored if spell not finished in January 2008), Z (censored if $Y \leq Z$) and P (censored if min$(Y, Z) \leq P$).

Notification: the nature of the "information shock"

Principles

In our data, notification is reported when an ANPE caseworker puts the jobseeker in relation to either a private or public training provider.

In practice, notification implies no mandatory training action:

→ When training is proposed by the caseworker to a jobseeker eligible to unemployment benefits, a refusal from the latter can lead to a cut in UB. In practice, though, sanctions are almost never taken if people refuse to get trained when notified.

→ No possible sanctions for non-eligible individuals.

Timing

Theoretically, notification occurs during one of the regular meetings of the unemployment spell. But it can also occur during an early meeting, or even through a phone, mail or web contact between the caseworker and the jobseeker.

Even if both parts agree on the necessity of a training program, notification does not always/immediately lead to training, because of training resources and funding shortage.

Distribution of some durations of interest (in days)

	Mean	Q10	Q25	Q50	Q75	Q90
P if notified	181	9	28	107	250	454
Z if treated	247	46	98	196	350	526
Z if treated and not notified	236	35	88	182	336	515
Z if treated and notified	263	63	117	217	369	539
$Z - P$ if treated and notified	82	5	13	43	98	209
Y	342	29	68	211	495	865
Y if not notified and not treated	292	26	54	168	386	780
Y if notified and not treated	513	89	207	403	753	1120
$Y - P$ if notified and not treated	331	38	98	225	468	782
Y if treated	657	264	402	641	853	1088
Y if not treated	308	27	59	182	415	808
Y if treated and not notified	648	251	391	629	853	1085
Y if treated and notified	670	285	423	657	852	1090

Estimation results: effect of notification on unemployment duration

	Estimates of δ_P	
	if $t \leq P + 183$	*if* $t > P + 183$
partial-info model	$.71^{***}$	$.94(ns)$
full-info model	$.65^{***}$	$.96(ns)$

$\rightarrow$ The hazard rate of Y decreases significantly during the six months following notification.

$\rightarrow$ The no-anticipation assumption is violated in our data.

Estimation results: effect of notification on treatment participation

	Estimates of γ_P	
	if $t \leq P + 92$	*if* $t > P + 92$
partial-info model	91.0^{***}	32.3^{***}
full-info model	107^{***}	33^{***}

$\rightarrow$ The hazard rate of Z increases dramatically once notification is received.

$\rightarrow$ The estimates of δ_P and γ rule out a "threat effect" of the treatment through notification.

Estimation results: treatment effects

Estimates of δ_Z and δ_{PZ}

	if $t \leq Z + 123$	*if* $t \in]Z + 123, Z + 365]$	*if* $t > Z + 365$
δ_Z	$.40^{***}$	$.97(ns)$	1.19^{***}
δ_{PZ}	$.30^{***}$	$.83^{***}$	1.08^{**}

$\rightarrow$ Training seems to lengthen unemployment duration (locking-in effect).

$\rightarrow$ The direct effect of training on unemployment duration does depend on notification.

Comparing the treatment effects with and without information on notification

Estimates of δ_Z and δ_{PZ}

	if $t \leq Z + 123$	*if* $t \in]Z + 123, Z + 365]$	*if* $t > Z + 365$
δ_Z	$.40^{***}$	$.97$	1.19^{***}
δ_{PZ}	$.30^{***}$	$.83^{***}$	1.08^{**}
	Estimates of δ_Z*, using the standard TOE model*		
δ_Z	$.36^{***}$	$.95^{*}$	1.24^{***}

Additional estimation results: the distribution of unobserved heterogeneity

	p_r	V_P	V_Z	V_Y
group 1	.42	.25	.16	.69
group 2	.08	.48	0	.20
group 3	.50	2.08	.0080	.89

Correlations

$\rho(V_P, V_Z) =$ -.37, $\rho(V_P, V_Y) =$ .44, $\rho(V_Z, V_Y) =$ .68

Additional estimation results: the effects of observed characteristics

	β_P	β_Z	β_Y		β_P	β_Z	β_Y
$\mathbf{1}\{$male$\}$	$-.16^*$	$.017$	$.027^*$	$\mathbf{1}\{$blue col.$\}$	$.27^*$	$-.18^*$	$.092^*$
age	$.21^*$	$.21^*$	$-.29^*$	$\mathbf{1}\{$white col, unsk.$\}$	$.41^*$	$-.29^*$	$.066^*$
age^2	$-.28^*$	$-.25^*$	$.21^*$	$\mathbf{1}\{$white col, sk.$\}$	$.27^*$	$-.12^*$	$.00029$
exp	$-.33^*$	$-.12^*$	$-.12^*$	$\mathbf{1}\{$technical $\}$	$.29^*$	$.0034$	$-.061^*$
exp^2	$.18^*$	$.015$	$.097^*$	$\mathbf{1}\{$supervisor$\}$	$.23^*$	$-.018$	$.01$
$\mathbf{1}\{$French$\}$	$-.17^*$	$.28^*$	$-.15^*$	$\mathbf{1}\{$jr hs drop out$\}$	$-.066^*$	$-.48^*$	$.13^*$
$\mathbf{1}\{$children$\}$	$.027$	$.095^*$	$-.03^*$	$\mathbf{1}\{$jr hs degree $\}$	$.11^*$	$.09^*$	$.022^*$
$\mathbf{1}\{$married$\}$	$-.0061$	$-.11^*$	$.013$	$\mathbf{1}\{$hs drop out$\}$	$.19^*$	$-.0098$	$.032^*$
$\mathbf{1}\{$dep. 77$\}$	$.14^*$	$.32^*$	$-.053^*$	$\mathbf{1}\{$hs degree$\}$	$.18^*$	$.019$	$-.03^*$
$\mathbf{1}\{$dep. 78$\}$	$-.071^*$	$.16^*$	$-.015$	$\mathbf{1}\{$coll. drop out$\}$	$.25^*$	$.13^*$	$-.041^*$
$\mathbf{1}\{$dep. 91$\}$	$-.039$	$.37^*$	$.026^*$	% treated last year	-3.2^*	$.87^*$	$.15$
$\mathbf{1}\{$dep. 92$\}$	$.25^*$	$-.014$	$.01$	growth of u. inflow	$-.032$	$-.093^*$	$-.38^*$
$\mathbf{1}\{$dep. 93$\}$	$-.23^*$	$.15^*$	$-.087^*$	# u. spells in $[t_0-2, t_0]$	$-.069^*$	$-.53^*$	$.24^*$
$\mathbf{1}\{$dep. 94$\}$	$.016$	$.24^*$	$-.0059$	time u. in $[t_0-2, t_0]$	$-.19^*$	$-.32^*$	$-.038^*$
$\mathbf{1}\{$dep. 95$\}$	$.35^*$	$.032$	$-.094^*$	# u. spells in $[t_0-5, t_0-2]$	$-.037^*$	$-.27^*$	$.072^*$
				time u. in $[t_0-5, t_0-2]$	$-.13^*$	$-.35^*$	$-.11^*$

Summary

We find that notification directly affects unemployment duration $\rightarrow$ the "no-anticipation" assumption is violated.

Yet our results go against a threat effect of training (Black, Smith, Berger and Noel 2003, Geerdsen, 2006, Rosholm and Svarer, 2008).

$\rightarrow$ The non mandatory nature of notification in the French institutional setting ?

We also find that notification has a huge impact on treatment participation but not on the actual treatment effect.