

**(VII) Employment  
Protection Legislation  
and Temporary Work**

Bocconi University, May 2009

# Outline

- EPL - Theory
  - Models with adjustment costs (positive)
  - Models with market imperfections (normative)
  - Models with insiders/outside (seen: positive)
- EPL - Empirical evidence
  - Cross-country
  - Within-country (Italy & US)
- Temporary work
  - Motivations (EPL and TW growth)
  - Consequences (two-tier labor markets)

# Definitions

- Set of norms and procedures followed in case of dismissal of redundant workers
- Ingredients:
  - Severance payment
  - Advance notice period
  - Job property
  - Nonstandard employment
  - Collective dismissals
- Rigid EPL means high firing costs

# Economically relevant distinction

- 2 components of EPL: Transfers (TR) from employers to employees and Tax (TX) paid to third parties, such as legal and procedural costs:  
 $F=TR+TX$  (In Italy TX estimated 20% of F)
- This distinction is relevant from economic point of view because:
  - TR can be negotiated, and hence incorporated (discounted) ex-ante in wage contracts
  - TX cannot

# Models with adjustment costs: A neutrality result (Lazear, 1990)

- Crucial assumptions:
  - EPL is only TR
  - competitive labor market
  - flexible wages (no wage floors)
  - risk-neutral agents,  $u(w)=w$
- Then:
  - EPL has **no effects** on labor market

# Wage contract neutralizes EPL

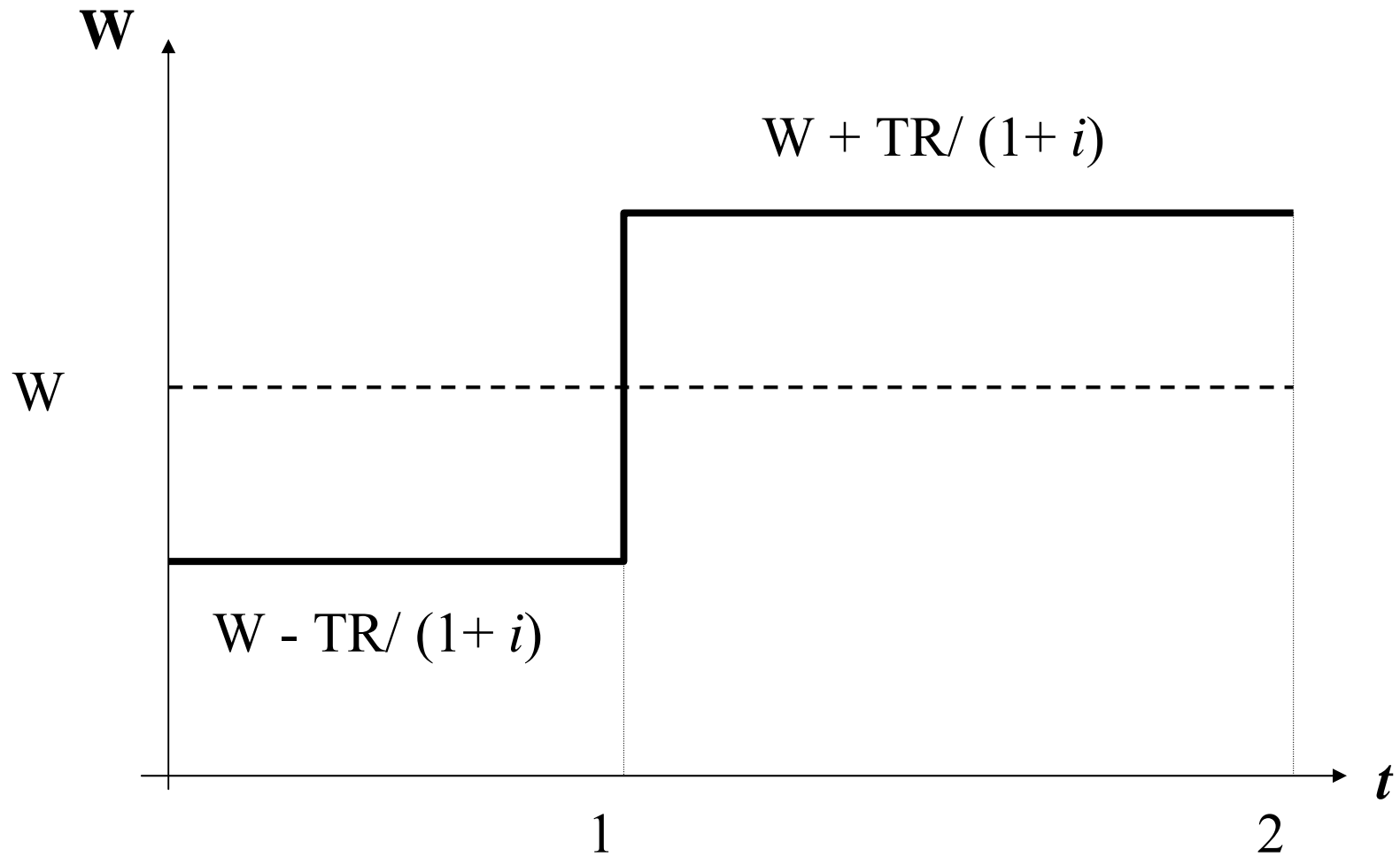
- Suppose jobs last 2 periods and have marginal productivities  $MP_1$  and  $MP_2$  respectively
- Without EPL in competitive labor market (with  $i$ =interest rate):

$$W_1 + \frac{W_2}{1+i} = MP_1 + \frac{MP_2}{1+i}$$

- Introducing  $F=TR$  at 2 (i.e.,  $W_2 = W_2 + TR$ ), this can be offset by lowering entry wage by an amount  $B$  such that the following condition is satisfied

$$W_1 - B + \frac{W_2 + TR}{1+i} = W_1 + \frac{W_2}{1+i} \text{ or } B = \frac{TR}{1+i}$$

# Graph of neutrality result



# Explanation

- In the first period, the worker transfers TR to the firm
- In the second period, the worker receives the transfer back
- **Bonding:**
  - wage contract as yield on bond TR;
  - initially the worker buys the bond, then firm pays to the worker interest on the bond;
  - at the end of the contract TR is given back to the worker

# Intuition

- Mandated transfer from the employer to the worker can be undone by a “voluntary” transfer of the same size from the worker to the employer
- Ex-ante same cost for the firm with and without EPL
- This works only if the employer succeed in extracting a payment from the worker when the contract begins

# Removing risk neutrality

- Risk averse workers would suffer a welfare loss from a bonding arrangement
- Utility losses associated with income fluctuations
- Workers will ask for monetary compensations for this loss
- Costs increase for the employers: i.e., neutrality result breaks down

# Removing wage flexibility

- Two countries both with rigid (fixed) wages, but EPL only in **Rigidland** (R), not in **Flexiland** (F)
- Same technologies:  $Y = A^i \log L$
- $A^i$  can be:  $A^h$  (good times)  $>$   $A^L$  (bad times)
- Probability  $p$  and  $(1-p)$  respectively
- Wages fixed at  $w$

# Flexiland

L maximizes  $\pi^F = A^i \log L - w L$

Implying  $w = A^i/L$  (thus, under good times  
higher employment)

Employment variations:

$\Delta L = (A^h - A^L)/w$  when from bad to good

$\Delta L = -(A^h - A^L)/w$  when from good to bad

On average  $E(L^F) = (pA^h + (1-p)A^L)/w$

# Rigidland

Too costly to adjust  $L$  to shocks. Firms choose average  $L$  and stick to it

$L$  maximizes  $\pi^R = (p A^h + (1-p)A^L) \log L - wL$

Implying  $L^R = (p A^h + (1-p) A^L)/w = L^F$

No employment fluctuations and **labor hoarding** (sub-optimal  $L$  in good times and over-optimal  $L$  in bad times)

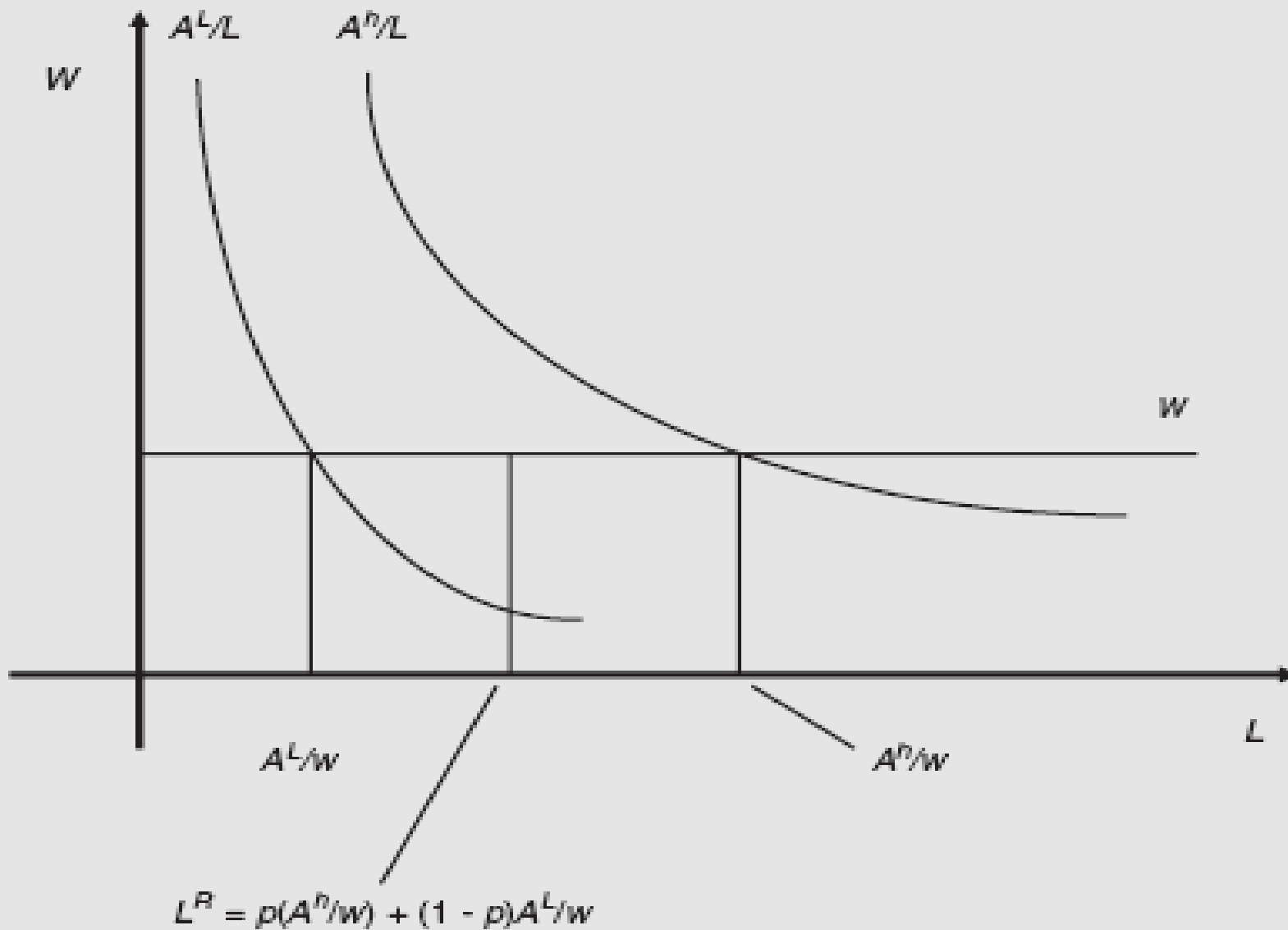


Figure 10.2 Employment in the Flexible and Rigid Regimes

# Positive implications

1. EPL has no effect on employment levels in the long run
2. Lower employment variability (and unemployment inflows/outflows) with EPL
3. Lower efficiency with EPL (in every period, profits higher in flexiland)

# Removing EPL as transfer ( $F=TR$ )

- Assume now EPL as tax component ( $F=TX$ ).  
Payment to a third party, say a lawyer
- Cannot be undone by bonding agreements
- Effects on both job creation and destruction as employers anticipate these costs when issuing a vacancy
- In general expected decline in both hiring and separations (*flows*) with ambiguous effects on employment/unemployment *levels*

# Models with market imperfections

1. **Insurance market failures** (e.g., moral hazard or aggregate risk) and workers' risk aversion:  
EPL as second best
2. Positive externality from **specific human capital** to **general human capital** (as firms choose turnover internalizing only the first)
3. Negative externality from variance in family income to children's human capital (if imperfect capital markets)

# Models with insiders/outside

- We have already seen this class of models!
- **Insiders:** incumbent workers (with/without given seniority) who benefit of favorable work conditions
- **Outsiders:** unemployed or workers employed in the secondary market (i.e., shadow, low-pay, temporary).
- **Key idea:** employed are more numerous and/or better organized than the unemployed. As a result, EPL is introduced as it responds to the interests of the former, although it harms the latter by reducing their re-employment probability

# Why does EPL exist?

- EPL is a strongly redistributive institution
- It protects those who already have a job, notably a permanent contract in the formal sector (INSIDERS)
- Unemployed individuals and workers with temporary contracts suffer in the presence of strict EPL for permanent contracts. The former experience longer unemployment spells, while the latter are caught in a secondary labor market of temporary contracts (OUTSIDERS)
- Employers suffer a loss in profits in the presence of EPL, notably when they do not succeed in making workers pay (through lower wages) for the costs of providing this insurance (EMPLOYERS)

# Empirical cross-country evidence: Measures

OECD index of strictness transforms into a scalar measure information on the following dimensions of EPL (methodology: **hierarchy of hierarchies**)

- definitions of “just cause” for *individual* dismissals (economic and disciplinary)
- *statutory* severance pay
- minimum notice period
- procedural obligations to be fulfilled *before* the dismissals
- additional regulations for *collective* dismissals

# Flexibility at the port of entry

- Also hiring restrictions are considered:
  - Length of the trial or probation period
  - Restrictions to the use of *temporary work* (e.g. agency work or fixed-term contracts)
- Rationale: insofar as hiring restrictions increase the costs of replacements, they deter dismissals

# How compiled?

Two-step OECD procedure:

1. Conversion of 18 indicators in 0-6 scores
2. Calculation of *weighted* averages of the scores in different areas (individual dismissals of regular workers, collective dismissals, temporary work) and overall

# Shortcomings of this index

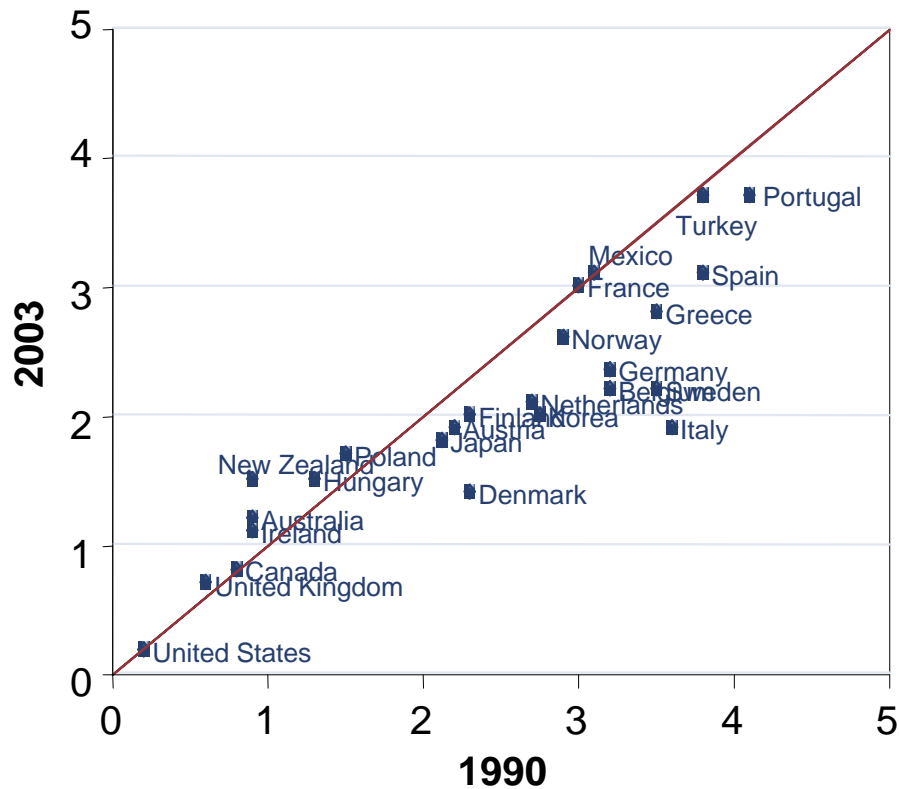
- Arbitrary weighting of the different components of employment protection (e.g., regulations on collective dismissals worth 40% of those on temporary contracts)
- Interactions among features: e.g., stricter EPL for “regular” contracts involves more use of temporary contracts
- Nothing on enforcement

**Table 10.1** Strictness of Employment Protection: OECD Index

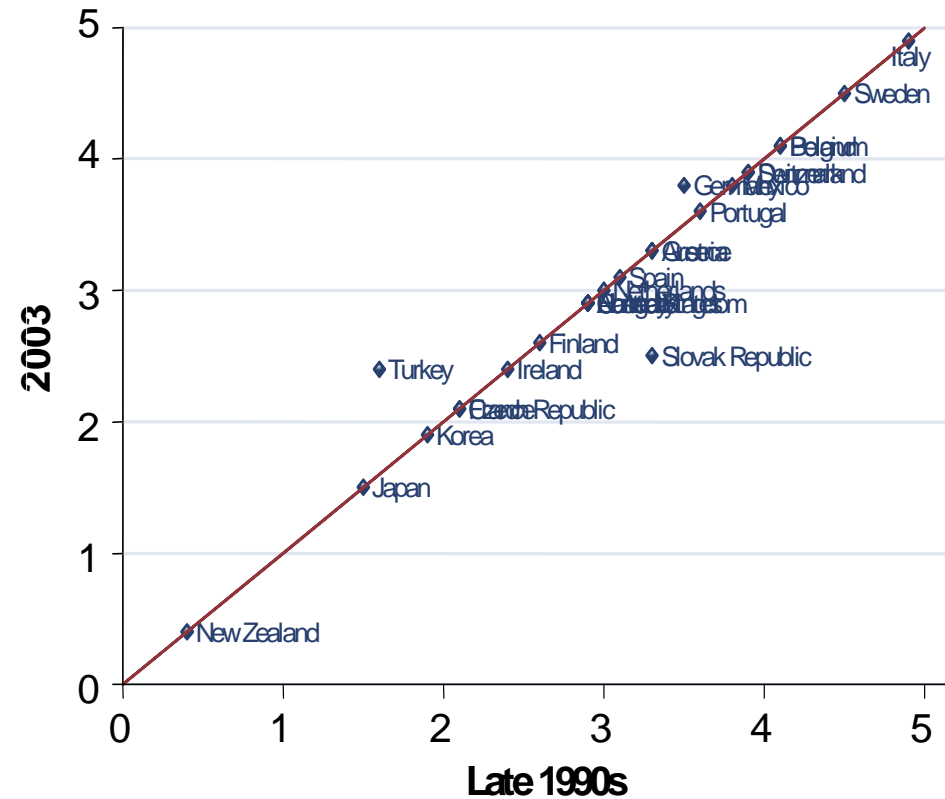
	Overall		Regular		Temporary		Collective	
	Late 1980s	2003	Late 1980s	2003	Late 1980s	2003	Late 1980s	2003
Australia	0.9	1.2	1.0	1.5	0.9	0.9	2.9	2.9
Austria	2.2	1.9	2.9	2.4	1.5	1.5	3.3	3.3
Belgium	3.2	2.2	1.7	1.7	4.6	2.6	4.1	4.1
Canada	0.8	0.8	1.3	1.3	0.3	0.3	2.9	2.9
Czech Republic	–	1.9	–	3.3	–	0.5	2.1	2.1
Denmark	2.3	1.4	1.5	1.5	3.1	1.4	3.9	3.9
Finland	2.3	2.0	2.8	2.2	1.9	1.9	2.6	2.6
France	2.7	3.0	2.3	2.5	3.1	3.6	2.1	2.1
Germany	3.2	2.2	2.6	2.7	3.8	1.8	3.5	3.8
Greece	3.6	2.8	2.5	2.4	4.8	3.3	3.3	3.3
Hungary	–	1.5	–	1.9	–	1.1	2.9	2.9
Ireland	0.9	1.1	1.6	1.6	0.3	0.6	2.4	2.4
Italy	3.6	1.9	1.8	1.8	5.4	2.1	4.9	4.9
Japan	2.1	1.8	2.4	2.4	1.8	1.3	1.5	1.5
Korea	–	2.0	–	2.4	–	1.7	1.9	1.9
Mexico	–	3.1	–	2.3	–	4.0	3.8	3.8
Netherlands	2.7	2.1	3.1	3.1	2.4	1.2	3.0	3.0
New Zealand	–	1.5	–	1.7	–	1.3	0.4	0.4
Norway	2.9	2.6	2.3	2.3	3.5	2.9	2.9	2.9
Poland	–	1.7	–	2.2	–	1.3	4.1	4.1
Portugal	4.1	3.5	4.8	4.3	3.4	2.8	3.6	3.6
Slovak Republic	–	1.9	–	3.5	–	0.4	3.3	2.5
Spain	3.8	3.1	3.9	2.6	3.8	3.5	3.1	3.1
Sweden	3.5	2.2	2.9	2.9	4.1	1.6	4.5	4.5
Switzerland	1.1	1.1	1.2	1.2	1.1	1.1	3.9	3.9
Turkey	–	3.7	–	2.6	–	4.9	1.6	2.4
United Kingdom	0.6	0.7	0.9	1.1	0.3	0.4	2.9	2.9
United States	0.2	0.2	0.2	0.2	0.3	0.3	2.9	2.9

# Country rankings and evolution

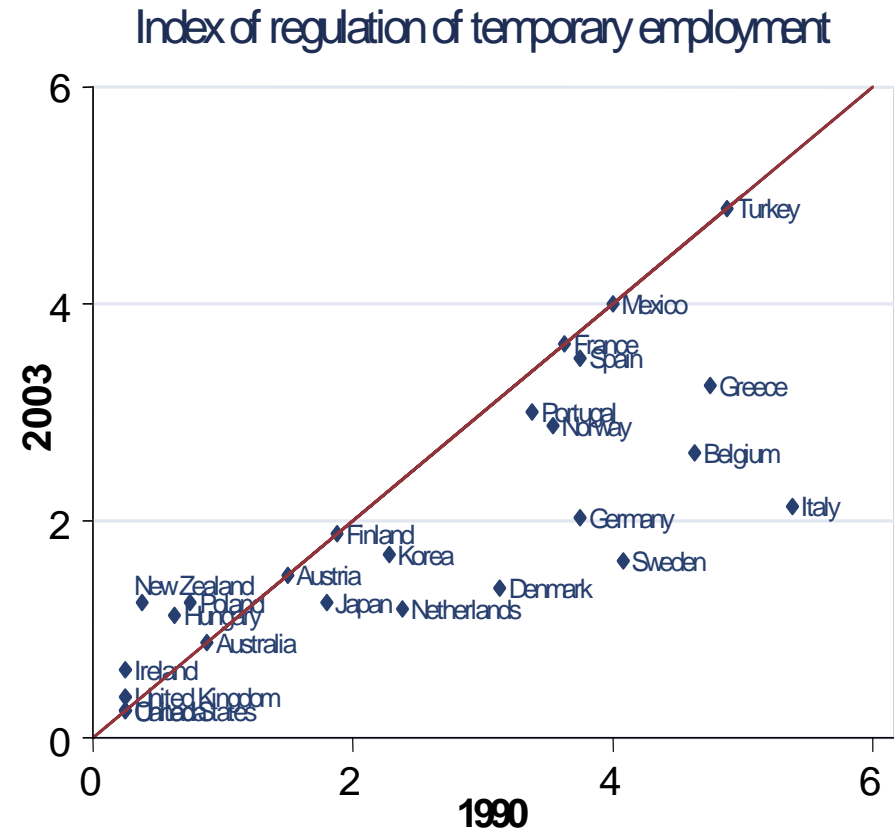
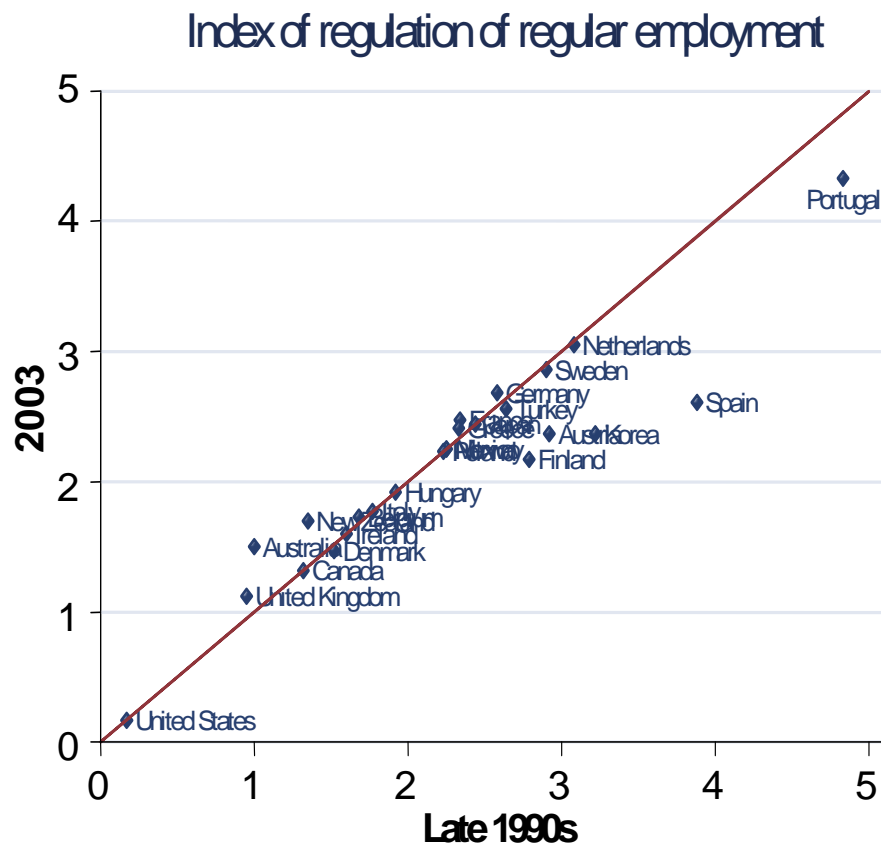
Index of the overall strictness of EPL



Index of overall strictness of collective dismissals



# Reforms focused on temporary contracts



# Stylized facts about reforms

- Some convergence in overall EPL
- Driven almost entirely by reforms of temporary contracts: dual track reforms
- However inertia in country rankings: rank correlations in overall strictness is .9
- See also pages 1-5 in the handout
- Flexibility introduced only at the margin: two-tier labor market reforms

# Stylized facts about EPL and labor market performance

- No effect on overall employment or unemployment, but positive (negative) effect on employment prospects of insiders (outsiders). See pages 6-8 in the handout
- Negative effects on labor market turnover and flows. Positive effects on job tenure and unemployment duration. See pages 10-12 in the handout
- These are very descriptive correlations, but confirmed by econometric studies (Nickell, 2003)

# Evidence from cross-country studies

Author(s)	Stocks		Flows	
	Employment	Unemployment	Employment	Unemployment
Emerson (1988)	?	?	–	–
Bertola (1990)	?	?	?	–
Lazear (1990)	–	+		
Grubb and Wells (1993)	–			
Garibaldi, Koenig, and Pissarides (1994)	?	?	?	–
Addison and Grosso (1996)	?	?		
Jackman, Layard, and Nickell (1996)	?	?	–	–
Gregg and Manning (1997)	?	?		–
Boeri (1999)	?	?	+	–
Di Tella and McCulloch (1998)	–	+		
OECD (1998)	?	?	?	–
Kugler and StPaul (2000)			+	–
Belot and van Ours (2001)		–		
Nickell, Nunziata, and Ochel (2005)	?	?		

# EPL and productivity shocks

- Can more rigid EPL explain negative labor market performance of Europe in the 1980s and 1990s (“Eurosclerosis”)?
- Not really: see page 13 in the handout
- Theory/explanation that incorporates shocks, EPL and interactions between the two (Blanchard and Wolfers, 2000)

# Exploiting within-country variation

- Cross-country studies face serious identification problems (e.g., unobservable country characteristics)
- Recent literature exploiting within-country variation in EPL:
  - Italy: threshold scale *below* which the most restrictive regulations are not applied (firms with less than 15 employees exempted from art.18 of the “Statuto dei Lavoratori”)
  - US: common-law exceptions to legal tradition of “employment at will”, adopted sequentially in different States during 1970s and 1980s

# The Italian case

- Law 300/1970 (*Statuto dei lavoratori*):
  - Firms  $> 15$ : in case of wrongful dismissal, they must hire back the worker and pay foregone wages (*tutela reale*)
  - Firms  $\leq 15$ : before 1990, exempted from *Statuto*; after 1990, they must pay severance payment equal to 2.5-6 monthly wages (*tutela obbligatoria*)
- Two sources of variation:
  - Above/below 15 employees
  - Before/after 1990

Double-difference: temporary/permanent and above/below 15 employees. Boeri-Jimeno (2004)

	Probability of being dismissed (%)		
	Permanent workers	Temporary workers	Difference
Firms with fewer than 15 employees	1.7	0.8	0.9
Firms with more than 15 employees	0.9	2.2	-1.3
Difference	0.8	-1.4	2.2

# Kugler and Pica (2008)

- Diff-in-diff strategy. *Treatment*: 1990 reform increasing EPL for small firms.
- *Treatment group*: firms below 15 employees. *Control group*: firms between 16 and 35 employees.
- At employer/employee level, they estimate:  
$$m_{ijt} = \beta X_{ijt} + \delta_0 \text{Post}_t + \delta_1 D_j + \delta_3 D_j \text{Post}_t + u_{ijt}$$

(separation or accension between individual  $i$  and firm  $j$  at time  $t$ ;  $D_j=1$  if firm below 15 employees)
- At firm level, they estimate:  
$$e_{jt} = \theta K_{jt} + \rho_0 \text{Post}_t + \rho_1 D_j + \rho_3 D_j \text{Post}_t + u_{jt}$$

(entry or exit of firm  $j$  at time  $t$ )

# Kugler and Pica (2008)

## (contd.)

- Estimates show that:
  - Accension rate is reduced by 0.019 for men (-8.2%) and by 0.020 for women (-9.2%)
  - Separation rate is reduced by 0.029 for men (-9%) and by 0.034 for women (-10.4%)
  - Entry rate of firms is reduced by an amount between 0.005 (-10%) and 0.009 (-18%)
  - Exit rate of firms is increased by an amount between 0.009 and 0.011 (about +20%)
- They also find negative impact on the variance of employment growth (EPL reform flattens labor demand of small firms relative to large firms)

# Diff-in-diff descriptive evidence (1)

Tab.1	<i>Small</i>	<i>Large</i>	Tab.2	<i>Small</i>	<i>Large</i>	Tab.3	<i>Small</i>	<i>Large</i>
<i>Pre</i>	0.27	0.23	<i>Pre</i>	0.23	0.17	<i>Pre</i>	0.14	0.09
<i>Post</i>	0.23	0.21	<i>Post</i>	0.18	0.15	<i>Post</i>	0.12	0.10
<i>Diff</i>	-0.04	-0.02	<i>Diff</i>	-0.05	-0.02	<i>Diff</i>	-0.02	0.01
<i>DiD</i>	<b>-0.02</b>		<i>DiD</i>	<b>-0.03</b>		<i>DiD</i>	<b>-0.03</b>	

- Tab.1, accension rate for young workers (<26)
- Tab.2, accension rate for middle-age workers (26-50)
- Tab.3, accension rate for old workers (>50)

## Diff-in-diff descriptive evidence (2)

Tab.1	<i>Small</i>	<i>Large</i>	Tab.2	<i>Small</i>	<i>Large</i>	Tab.3	<i>Small</i>	<i>Large</i>
<i>Pre</i>	0.36	0.29	<i>Pre</i>	0.31	0.24	<i>Pre</i>	0.31	0.25
<i>Post</i>	0.29	0.24	<i>Post</i>	0.24	0.20	<i>Post</i>	0.26	0.26
<i>Diff</i>	-0.07	-0.05	<i>Diff</i>	-0.07	-0.04	<i>Diff</i>	-0.05	0.01
<i>DiD</i>	<b>-0.02</b>		<i>DiD</i>	<b>-0.03</b>		<i>DiD</i>	<b>-0.06</b>	

- Tab.1, separation rate for young workers (<26)
- Tab.2, separation rate for middle-age workers (26-50)
- Tab.3, separation rate for old workers (>50)

# Diff-in-diff descriptive evidence (3)

Tab.1	<i>Small</i>	<i>Large</i>
<i>Pre</i>	0.050	0.028
<i>Post</i>	0.045	0.027
<i>Diff</i>	-0.005	-0.001
<i>DiD</i>	<b>-0.004</b>	

Tab.2	<i>Small</i>	<i>Large</i>
<i>Pre</i>	0.048	0.025
<i>Post</i>	0.052	0.029
<i>Diff</i>	0.004	0.004
<i>DiD</i>	<b>0</b>	

- Tab.1, firms' entry rate
- Tab.2, firms' exit rate
- But: very different starting rates, we should look at relative changes pre/post (see previous discussion on estimates)

# Leonardi and Pica (2007)

- Other identification strategy: Regression Discontinuity Design (**RDD**)
- *Treatment group*: firms just above the 15 threshold. *Control group*: firms just below 15 thresholds. Interacted with 1990 reform
- Identifying assumption: potential outcomes are continuous at the threshold (i.e., there are no other policies & firms cannot sort below the threshold)
- And, in any case, RDD just identifies **local effect** (for firms around the threshold)

# Leonardi and Pica (2007)

## (contd.)

- Random sorting around the threshold not particularly credible here, but:
  - They control for workers' sorting by looking at dismissed workers because of firm closing
  - They control for firms' sorting by using pre-1990 size
- They find no effect on entry wage, but negative impact on wage one year later
- They interpret this as consistent with Lazear's result plus idea that you cannot decrease the wage immediately (due to institutional constraints)

# The US case

- US has long had legal presumption of employment at will: “for good cause, bad cause, or no cause at all” (Supreme Court of Tennessee, 1884)
- Well, there are always been limitations:
  - “just cause” contractual protection negotiated by unions
  - legislative statutes constraining employers’ discretion to fire “protected workers”

# The US case (contd.)

- But in the 1970s and 1980s most state courts created common-law restrictions to employment at will, known as “wrongful-discharge laws”
  - **Public policy** exception: protection against discharges that would hurt public policy (jury duty, refuse to commit perjury, etc.)
  - **Good faith** exception: protection against discharges that would deprive workers of earned benefits (commissions, pension, etc.)
  - **Implied contract** exception: employer assurances of applying “good cause” are legally enforceable (e.g., personnel handbooks, promotion letters, etc.)

# Autor, Donohue and Schwab (2006)

- They exploit variation across States and time to estimate effect of EPL on both employment and wages:

$$y_{st} = \gamma_s + \delta_t + \beta_1 \text{Treat}_{st} + \beta_2 \text{Post}_{st} + \beta_3 \text{Treat}_{st} \text{Post}_{st} + u_{st}$$

(employment in state  $s$  at time  $t$ )

$$w_{ijst} = \gamma_s + \delta_t + \Pi_j + \beta_4 \text{Treat}_{st} + \beta_5 \text{Post}_{st} + \beta_6 \text{Treat}_{st} \text{Post}_{st} + u_{ijst}$$

(wage of individual  $i$  belonging to demographic group  $j$  in state  $s$  at time  $t$ )

- Results: see page 13bis in the handout

# Review questions on EPL

- From a theoretical point of view, what is the effect of EPL on wages? State the assumptions of your answer.
- EPL affects both labor market flows and stocks. True or false?
- EPL always decreases firm's profits and, as a result, efficiency in the labor market. True or false?
- EPL have differential impacts on insiders and outsiders. What does cross-country evidence show on this point?
- What are the assumptions/motivation of diff-in-diff studies using the 1990 reform in Italy to evaluate the EPL effect?
- What does the within-US evidence show with respect to the effect of EPL on labor market performance? Is this consistent with cross-country studies?

# Temporary Work (TW)

- We have seen general tendency to reduce EPL by liberalizing temporary contracts in OECD
- What about incidence of TW? See pages 14-15 in the handout. Positive growth almost everywhere
- What about composition of temporary workers? See pages 16-17 in the handout
- We focus on two sets of questions:
  - What determines TW utilization?
  - What are the effects of TW utilization?

# Determinants of TW

- Strict EPL on permanent employment as possible “cause” of TW growth
  - US evidence by Autor (2003): wrongful-discharge laws and temporary work agencies. See pages 19-20 in the handout
  - At the aggregate level, Italian evidence on temporary work agencies consistent with this story
- Political economy and two-tier reforms
  - TW liberalization as only way to sidestep insiders’ opposition to labor market reforms
  - Spanish evidence (Dolado et al. 2002): reforms only when (mid-1990s) share of permanent guys below 50% of workers (including temps & unemployed)

# Effects of TW

- Risk of labor market segmentation. Temporary contracts usually associated with lower welfare benefits, wages and labor conditions
- But segmentation could be avoided in intertemporal sense: mobility from temp to perm. See page 18 in the handout
- Theory could predict both
  - positive effect (signaling or general HC acquisition)
  - and negative effect (stigma or low specific HC)
- Empirical studies: “springboard” literature

## Ichino, Mealli and Nannicini (2008)

Growing share of temporary employment and feared risk of market segmentation.

But, a balance between flexibility and security may be possible in an intertemporal sense, as long as temporary jobs are a springboard to permanent employment.

From a theoretical point of view, temporary jobs may represent either a “springboard” or a “trap”. This is ultimately an empirical question.

Focus: Temporary Work Agency (TWA) employment.

All European studies find a positive springboard effect of TWA. For the US, Autor and Houseman (2005) find a negative effect on the basis of quasi-experimental evidence. Are European studies completely unreliable?

## Evaluation strategy

We perform an evaluation study of TWA employment in Italy, where in 1997 the liberalization of this work contract originated a very harsh debate.

We implement a propensity-score matching estimation strategy.

Hence, like all the other European studies, we rely on the Conditional Independence Assumption (CIA) or “selection on observables”.

But, unlike the other studies, we put our results under the further scrutiny of a sensitivity analysis.

From a methodological perspective, we propose a sensitivity analysis for matching estimators aimed at assessing their robustness to deviations from the CIA.

## The evaluation question

Our goal is to understand whether TWA employment is an effective springboard toward permanent jobs.

To answer this question, we estimate the causal effect of

- a *treatment* consisting in a TWA assignment
- on an *outcome* defined as the probability of having a permanent job approximately 18 months after the assignment.

Institutional context: liberalization of TWAs in 1997, in a labor market where permanent and other fixed-term contracts are highly regulated.

First agencies begin to operate in 1998.

Afterwards, TWA jobs experience a rapid growth: 1% of total employment in 2002 (against: 2.5% in the US; 1.5% in the EU).

## Sampling strategy

In 2001, Sicily and Tuscany were among the remaining Italian regions with incomplete penetration of agencies. We selected the provinces:

- with Agency: Livorno, Pisa, Lucca, Catania, Palermo;
- without Agency: Grosseto, Massa, Messina, Trapani.

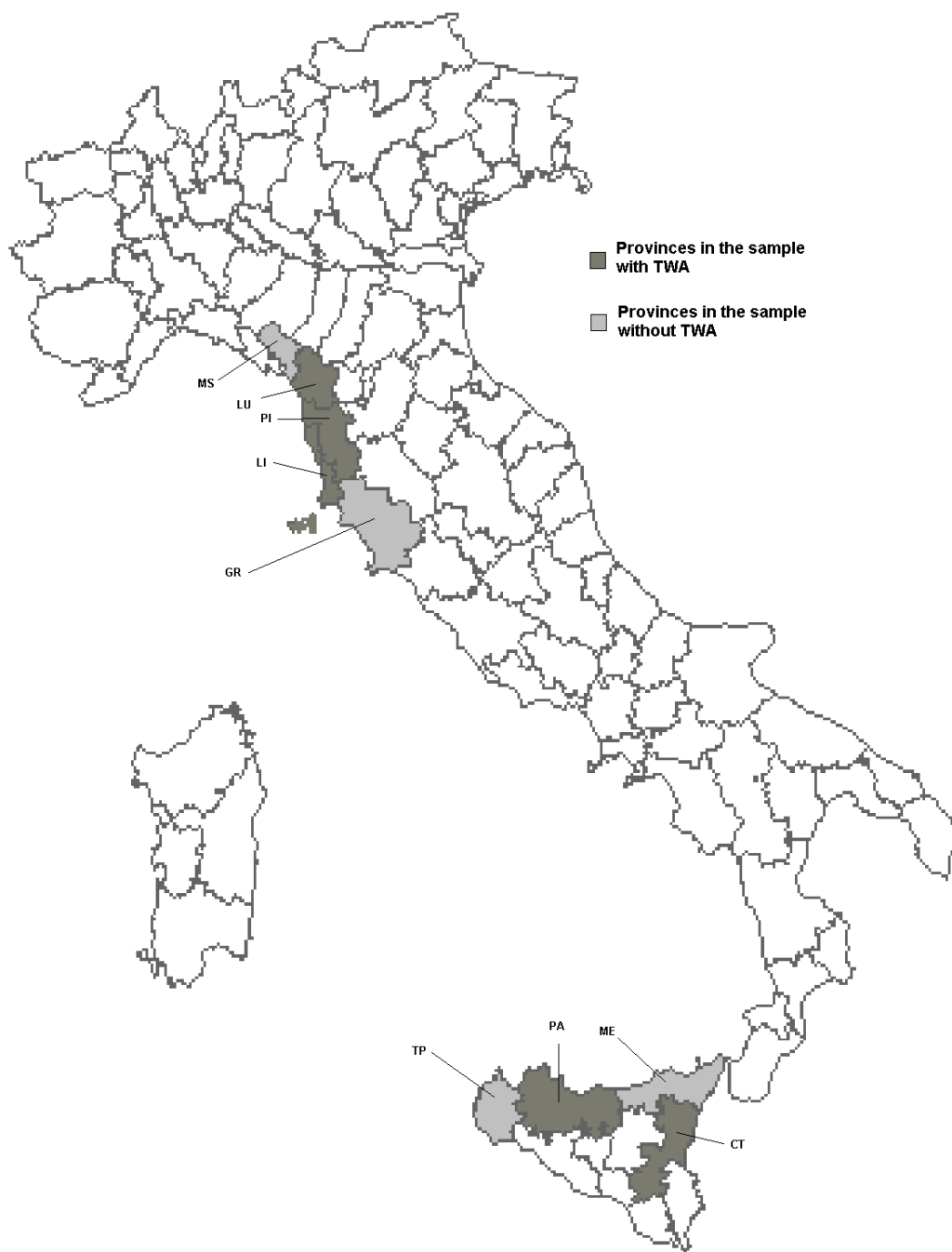
### *Treated group:*

all residents in the 9 provinces who were on a TWA assignment through *Manpower* during the first semester of 2001.

### *Comparison group:*

residents in the 9 provinces, aged 18-40, who belonged to the labor force but were not permanent employees as of January 1, 2001.

We have to take care of choice-based sampling and geographical stratification.



## Data collection

Identical sets of questions for treated and controls:

1. demographic characteristics;
2. family background;
3. educational attainments;
4. work experience before 2001;
5. job characteristics during the first semester of 2001;
6. work experience from July 2001 to the end of 2002;
7. job characteristics at the end of 2002.

The final dataset contains 2,030 individuals:

- 511 treated (temporary workers);
- 1,519 controls (other “atypical” or unemployed workers).

## Pre-treatment characteristics of the whole sample

	TUSCANY			SICILY		
	Treated	Matched Controls	All Controls	Treated	Matched Controls	All Controls
Age	26.5	27.5	29.1	26.8	27.8	30.0
Male	0.56	0.41	0.29	0.67	0.57	0.29
Single	0.90	0.87	0.66	0.83	0.81	0.49
Children	0.09	0.16	0.45	0.20	0.23	0.86
Father school	9.3	9.2	8.6	8.7	9.2	7.6
Father blue	0.33	0.39	0.43	0.30	0.31	0.39
Father active	0.53	0.46	0.37	0.46	0.45	0.29
School	12.5	12.7	12.3	12.0	12.4	11.6
Grade	75.9	77.1	76.9	74.7	74.6	76.5
Training	0.32	0.30	0.28	0.42	0.42	0.34
Unemployment	0.38	0.42	0.48	0.42	0.44	0.62
Employed 2000	0.35	0.36	0.42	0.34	0.35	0.30
Unemployed 2000	0.52	0.53	0.52	0.60	0.60	0.67
Out I.force 2000	0.13	0.10	0.05	0.06	0.05	0.03
N.individuals	281	135	628	230	128	891

## Characteristics of the employed before the treatment

	TUSCANY			SICILY		
	Treated	Matched Controls	All Controls	Treated	Matched Controls	All Controls
Permanent	0.16	0.22	0.26	0.14	0.16	0.36
Atypical	0.84	0.78	0.74	0.86	0.84	0.64
Blue-collar	0.62	0.59	0.39	0.44	0.24	0.22
White-collar	0.36	0.41	0.54	0.54	0.71	0.67
Self-empl.	0.02	0.00	0.07	0.01	0.04	0.10
Manufact.	0.53	0.41	0.23	0.39	0.20	0.15
Service	0.39	0.45	0.67	0.49	0.67	0.70
Other	0.08	0.14	0.11	0.11	0.13	0.15
Wage	5.2	5.6	6.8	5.6	7.6	7.0
Hours	38.0	36.3	33.3	34.5	32.1	31.1
N.individuals	98	49	266	79	45	267

## Is the CIA plausible?

Because of the recent penetration of TWAs in the provinces of our sample, it is plausible that individuals with the same observable characteristics *do* or *do not* enter a TWA just because of random events.

Quality and amount of pre-treatment observable covariates:

- gender, age, place of birth, nationality, marital status, number of children;
- years of schooling and prevalent job of the father, living status of the father;
- educational level, grade, post-school training;
- share of time without any occupation from school to the baseline period;
- occupational status, type of contract, sector, profession, wage, hours;
- province of residence and distance from the nearest TWA at the baseline.

By the way, we assess the robustness of the results w.r.t. deviation from the CIA (sensitivity analysis).

# Effect of a TWA job on the probability to find a stable position

	TUSCANY			SICILY		
	ATT	Treated	Controls	ATT	Treated	Controls
Whole sample	0.19 (0.06)	281	133	0.10 (0.05)	230	131
Thick-support	0.23 (0.07)	109	56	0.14 (0.08)	92	43
Male	0.24 (0.10)	157	59	0.10 (0.07)	155	76
Female	0.14 (0.07)	124	71	-0.07 (0.06)	75	57
Under 30	0.11 (0.07)	199	88	0.09 (0.06)	170	90
Over 30	0.33 (0.09)	82	44	0.00 (0.09)	60	39

## Summary of the empirical results

A TWA assignment increases the probability of finding a permanent job by 19 percentage points in Tuscany and by 10 percentage points in Sicily.

Note that the observed probabilities of finding a permanent job in the treated group are respectively 31% and 23% in the two regions.

The sensitivity analysis complements these results in an important way.

In Tuscany, but not in Sicily, the effect is robust to deviations from the CIA caused by binary confounders distributed similarly to gender, education, marital status and previous employment history.

Only when the unobservable confounding factor is calibrated so as to have a selection effect much larger than the one associated to observed covariates, the effect for Tuscany is estimated to be close to zero.