

Do On-Line Labor Market Intermediaries Matter?

The impact of *AlmaLaurea* on University-to-Work Transition

Manuel Bagues and Mauro Sylos Labini

Carlos III and IMT Lucca

February 21, 2009

IZA/World Bank Workshop – Bonn

- 1 Introduction and Motivation
- 2 AlmaLaurea's features
- 3 The empirical strategy
- 4 The data
- 5 Empirical Results
- 6 Discussion

Motivation

- On-line labor markets intermediaries are everywhere...
...but no clear-cut evidence on their effectiveness (Autor, 2001)
- While (likely) beneficial in the aggregate,
the impact might differ across different groups
- E.g. Internet job search is not associated with shorter
unemployment duration (Kuhn and Skuterud, 2004)

Motivation

- On-line labor markets intermediaries are everywhere...
...but no clear-cut evidence on their effectiveness (Autor, 2001)
- While (likely) beneficial in the aggregate,
the impact might differ across different groups
- E.g. Internet job search is not associated with shorter
unemployment duration (Kuhn and Skuterud, 2004)

Motivation

- On-line labor markets intermediaries are everywhere...
...but no clear-cut evidence on their effectiveness (Autor, 2001)
- While (likely) beneficial in the aggregate,
the impact might differ across different groups
- E.g. Internet job search is not associated with shorter
unemployment duration (Kuhn and Skuterud, 2004)

Motivation

- On-line labor markets intermediaries are everywhere...
...but no clear-cut evidence on their effectiveness (Autor, 2001)
- While (likely) beneficial in the aggregate,
the impact might differ across different groups
- E.g. Internet job search is not associated with shorter
unemployment duration (Kuhn and Skuterud, 2004)

Motivation

- Theory
 - Search theory predicts that lower search costs \Rightarrow
 - 1 better matches
 - 2 lower unemployment duration (under reasonable assumptions)
 - Info on geographically distant opportunities \Rightarrow Mobility
 - On-line (and cheap!) search methods may cause over-application and exacerbate adverse selection
- Empirical problem:
 - Selection into internet job search on unobservables that are (negatively or positively) correlated with employability

Motivation

- Theory
 - Search theory predicts that lower search costs \Rightarrow
 - 1 better matches
 - 2 lower unemployment duration (under reasonable assumptions)
 - Info on geographically distant opportunities \Rightarrow Mobility
 - On-line (and cheap!) search methods may cause over-application and exacerbate adverse selection
- Empirical problem:
 - Selection into internet job search on unobservables that are (negatively or positively) correlated with employability

Motivation

- Theory
 - Search theory predicts that lower search costs \Rightarrow
 - 1 better matches
 - 2 lower unemployment duration (under reasonable assumptions)
 - Info on geographically distant opportunities \Rightarrow Mobility
 - On-line (and cheap!) search methods may cause over-application and exacerbate adverse selection
- Empirical problem:
 - Selection into internet job search on unobservables that are (negatively or positively) correlated with employability

Motivation

- Theory
 - Search theory predicts that lower search costs \Rightarrow
 - 1 better matches
 - 2 lower unemployment duration (under reasonable assumptions)
 - Info on geographically distant opportunities \Rightarrow Mobility
 - On-line (and cheap!) search methods may cause over-application and exacerbate adverse selection
- Empirical problem:
 - Selection into internet job search on unobservables that are (negatively or positively) correlated with employability

Motivation

- Theory
 - Search theory predicts that lower search costs \Rightarrow
 - 1 better matches
 - 2 lower unemployment duration (under reasonable assumptions)
 - Info on geographically distant opportunities \Rightarrow Mobility
 - On-line (and cheap!) search methods may cause over-application and exacerbate adverse selection
- Empirical problem:
 - Selection into internet job search on unobservables that are (negatively or positively) correlated with employability

This paper

- The effect of on-line labor market intermediaries on university to work transition
- A case study (*AlmaLaurea*) providing exceptional evidence:
 - 1 Initially only a subset of universities joined *AlmaLaurea*
 - 2 E-recruitment was almost non-existent in Italy
 - 3 The *overall* effect and not the private benefits of using
- Results:
 - Positive effects on unemployment and wages
 - Increase geographic mobility
 - The benefits are bigger for "movers"

This paper

- The effect of on-line labor market intermediaries on university to work transition
- A case study (*AlmaLaurea*) providing exceptional evidence:
 - ① Initially only a subset of universities joined *AlmaLaurea*
 - ② E-recruitment was almost non-existent in Italy
 - ③ The *overall* effect and not the private benefits of using
- Results:
 - Positive effects on unemployment and wages
 - Increase geographic mobility
 - The benefits are bigger for "movers"

This paper

- The effect of on-line labor market intermediaries on university to work transition
- A case study (*AlmaLaurea*) providing exceptional evidence:
 - ① Initially only a subset of universities joined *AlmaLaurea*
 - ② E-recruitment was almost non-existent in Italy
 - ③ The *overall* effect and not the private benefits of using
- Results:
 - Positive effects on unemployment and wages
 - Increase geographic mobility
 - The benefits are bigger for "movers"

This paper

- The effect of on-line labor market intermediaries on university to work transition
- A case study (*AlmaLaurea*) providing exceptional evidence:
 - 1 Initially only a subset of universities joined *AlmaLaurea*
 - 2 E-recruitment was almost non-existent in Italy
 - 3 The *overall* effect and not the private benefits of using
- Results:
 - Positive effects on unemployment and wages
 - Increase geographic mobility
 - The benefits are bigger for "movers"

This paper

- The effect of on-line labor market intermediaries on university to work transition
- A case study (*AlmaLaurea*) providing exceptional evidence:
 - 1 Initially only a subset of universities joined *AlmaLaurea*
 - 2 E-recruitment was almost non-existent in Italy
 - 3 The *overall* effect and not the private benefits of using
- Results:
 - Positive effects on unemployment and wages
 - Increase geographic mobility
 - The benefits are bigger for "movers"

This paper

- The effect of on-line labor market intermediaries on university to work transition
- A case study (*AlmaLaurea*) providing exceptional evidence:
 - 1 Initially only a subset of universities joined *AlmaLaurea*
 - 2 E-recruitment was almost non-existent in Italy
 - 3 The *overall* effect and not the private benefits of using
- Results:
 - Positive effects on unemployment and wages
 - Increase geographic mobility
 - The benefits are bigger for "movers"

This paper

- The effect of on-line labor market intermediaries on university to work transition
- A case study (*AlmaLaurea*) providing exceptional evidence:
 - ① Initially only a subset of universities joined *AlmaLaurea*
 - ② E-recruitment was almost non-existent in Italy
 - ③ The *overall* effect and not the private benefits of using
- Results:
 - Positive effects on unemployment and wages
 - Increase geographic mobility
 - The benefits are bigger for "movers"

AlmaLaurea's goals and features

- *AlmaLaurea* is today a consortium of 49 (out of 65) Italian universities
- Goals:
 - 1 Providing reliable information to academic institutions
 - 2 Facilitating university-to-work transition selling graduates' resumes on-line
- Free for graduates (high participation) and relatively cheap for firms

AlmaLaurea's goals and features

- *AlmaLaurea* is today a consortium of 49 (out of 65) Italian universities
- Goals:
 - 1 Providing reliable information to academic institutions
 - 2 Facilitating university-to-work transition selling graduates' resumes on-line
- Free for graduates (high participation) and relatively cheap for firms

AlmaLaurea's goals and features

- *AlmaLaurea* is today a consortium of 49 (out of 65) Italian universities
- Goals:
 - 1 Providing reliable information to academic institutions
 - 2 Facilitating university-to-work transition selling graduates' resumes on-line
- Free for graduates (high participation) and relatively cheap for firms

AlmaLaurea's goals and features

- *AlmaLaurea* is today a consortium of 49 (out of 65) Italian universities
- Goals:
 - 1 Providing reliable information to academic institutions
 - 2 Facilitating university-to-work transition selling graduates' resumes on-line
- Free for graduates (high participation) and relatively cheap for firms

AlmaLaurea's data set

- ➊ From undergrads: periods of study abroad, work experience, foreign languages and computer skills
- ➋ From graduates: resumes updated up to three years after graduation
- ➌ From Universities: grades, course durations, and degrees
- An electronic cv provides information on:
 - ➊ Biography (age, city of birth, address, sex,...)
 - ➋ University curriculum
 - ➌ Studies abroad
 - ➍ Pre- and post- graduate studies
 - ➎ Languages and Computer literacy
 - ➏ Work experience and work preferences

AlmaLaurea's data set

- ➊ From undergrads: periods of study abroad, work experience, foreign languages and computer skills
- ➋ From graduates: resumes updated up to three years after graduation
- ➌ From Universities: grades, course durations, and degrees
- An electronic cv provides information on:
 - ➊ Biography (age, city of birth, address, sex,...)
 - ➋ University curriculum
 - ➌ Studies abroad
 - ➍ Pre- and post- graduate studies
 - ➎ Languages and Computer literacy
 - ➏ Work experience and work preferences

AlmaLaurea's data set

- ➊ From undergrads: periods of study abroad, work experience, foreign languages and computer skills
 - ➋ From graduates: resumes updated up to three years after graduation
 - ➌ From Universities: grades, course durations, and degrees
- An electronic cv provides information on:
 - ➊ Biography (age, city of birth, address, sex,...)
 - ➋ University curriculum
 - ➌ Studies abroad
 - ➍ Pre- and post- graduate studies
 - ➎ Languages and Computer literacy
 - ➏ Work experience and work preferences

AlmaLaurea's data set

- ➊ From undergrads: periods of study abroad, work experience, foreign languages and computer skills
- ➋ From graduates: resumes updated up to three years after graduation
- ➌ From Universities: grades, course durations, and degrees
- An electronic cv provides information on:
 - ➊ Biography (age, city of birth, address, sex,...)
 - ➋ University curriculum
 - ➌ Studies abroad
 - ➍ Pre- and post- graduate studies
 - ➎ Languages and Computer literacy
 - ➏ Work experience and work preferences

AlmaLaurea's performance

	1998	2000	2002	2004
Number of CVs sold	3973	115603	164209	389625
Number of purchases	130	2500	3831	6519
CVs acquired by local firms	.55	.50	.35	.30
Number of CVs in <i>AlmaLaurea</i>	62745	153843	286345	477282
Share on the population	.24	.34	.39	.43

Source: Authors' calculation based on data provided by *AlmaLaurea*

Difference in Differences

- The basic Identification Assumption:

$$Y_i(t) = \begin{cases} Y_i^N(t) & \text{Outcome of } i \text{ at time } t \text{ if not exposed to treatment} \\ Y_i^I(t) & \text{Outcome of } i \text{ at time } t \text{ if exposed to treatment} \end{cases}$$

$$E[Y_i^N(1) - Y_i^N(0)|G_i = 1] = E[Y_i^N(1) - Y_i^N(0)|G_i = 0],$$

- 1 Time varying individual and university controls
 - 2 Pre-treatment falsification test
 - 3 Alternative DID setting: Turin and Western Piedmont
- Another important assumption: no interactions among the groups
 - 1 Different treatment and control groups based on geographical proximity

Difference in Differences

- The basic Identification Assumption:

$$Y_i(t) = \begin{cases} Y_i^N(t) & \text{Outcome of } i \text{ at time } t \text{ if not exposed to treatment} \\ Y_i^I(t) & \text{Outcome of } i \text{ at time } t \text{ if exposed to treatment} \end{cases}$$

$$E[Y_i^N(1) - Y_i^N(0)|G_i = 1] = E[Y_i^N(1) - Y_i^N(0)|G_i = 0],$$

- 1 Time varying individual and university controls
 - 2 Pre-treatment falsification test
 - 3 Alternative DID setting: Turin and Western Piedmont
- Another important assumption: no interactions among the groups
 - 1 Different treatment and control groups based on geographical proximity

Difference in Differences

- The basic Identification Assumption:

$$Y_i(t) = \begin{cases} Y_i^N(t) & \text{Outcome of } i \text{ at time } t \text{ if not exposed to treatment} \\ Y_i^I(t) & \text{Outcome of } i \text{ at time } t \text{ if exposed to treatment} \end{cases}$$

$$E[Y_i^N(1) - Y_i^N(0)|G_i = 1] = E[Y_i^N(1) - Y_i^N(0)|G_i = 0],$$

- 1 Time varying individual and university controls
 - 2 Pre-treatment falsification test
 - 3 Alternative DID setting: Turin and Western Piedmont
- Another important assumption: no interactions among the groups
 - 1 Different treatment and control groups based on geographical proximity

Difference in Differences

- The basic Identification Assumption:

$$Y_i(t) = \begin{cases} Y_i^N(t) & \text{Outcome of } i \text{ at time } t \text{ if not exposed to treatment} \\ Y_i^I(t) & \text{Outcome of } i \text{ at time } t \text{ if exposed to treatment} \end{cases}$$

$$E[Y_i^N(1) - Y_i^N(0)|G_i = 1] = E[Y_i^N(1) - Y_i^N(0)|G_i = 0],$$

- 1 Time varying individual and university controls
 - 2 Pre-treatment falsification test
 - 3 Alternative DID setting: Turin and Western Piedmont
- Another important assumption: no interactions among the groups
 - 1 Different treatment and control groups based on geographical proximity

Difference in Differences

- The basic Identification Assumption:

$$Y_i(t) = \begin{cases} Y_i^N(t) & \text{Outcome of } i \text{ at time } t \text{ if not exposed to treatment} \\ Y_i^I(t) & \text{Outcome of } i \text{ at time } t \text{ if exposed to treatment} \end{cases}$$

$$E[Y_i^N(1) - Y_i^N(0)|G_i = 1] = E[Y_i^N(1) - Y_i^N(0)|G_i = 0],$$

- 1 Time varying individual and university controls
 - 2 Pre-treatment falsification test
 - 3 Alternative DID setting: Turin and Western Piedmont
- Another important assumption: no interactions among the groups
 - 1 Different treatment and control groups based on geographical proximity

AlmaLaurea's timing

1994	University of Bologna collects electronic data
1995	University of Bologna sells data
1996	Modena, Ferrara, Parma, R. Emilia and Florence join
February 1997	Catania joins
May 1997	Trieste, Udine and Messina join
August 1997	Chieti, Trento and Molise join
January 1998	Venice School of Architecture joins
...	...
Today	49 Italian universities (66% of graduates)



The data

- University-to-Work Transition Survey 1998 and 2001
 - Two samples of University Graduates three years after graduation (15282 and 18181 observations)
 - Right-hand side variables: demographic, social background, high school, province before college (predetermined); college performance (potentially endogenous)
 - Left-hand side variables: occupational status, mobility, wages, job satisfaction
- University and Geographic Indicators 1991-1998
 - Faculties, Students, Delayed Students
 - Provincial GDP

The data

- University-to-Work Transition Survey 1998 and 2001
 - Two samples of University Graduates three years after graduation (15282 and 18181 observations)
 - Right-hand side variables: demographic, social background, high school, province before college (predetermined); college performance (potentially endogenous)
 - Left-hand side variables: occupational status, mobility, wages, job satisfaction
- University and Geographic Indicators 1991-1998
 - Faculties, Students, Delayed Students
 - Provincial GDP

The data

- University-to-Work Transition Survey 1998 and 2001
 - Two samples of University Graduates three years after graduation (15282 and 18181 observations)
 - Right-hand side variables: demographic, social background, high school, province before college (predetermined); college performance (potentially endogenous)
 - Left-hand side variables: occupational status, mobility, wages, job satisfaction
- University and Geographic Indicators 1991-1998
 - Faculties, Students, Delayed Students
 - Provincial GDP

The data

- University-to-Work Transition Survey 1998 and 2001
 - Two samples of University Graduates three years after graduation (15282 and 18181 observations)
 - Right-hand side variables: demographic, social background, high school, province before college (predetermined); college performance (potentially endogenous)
 - Left-hand side variables: occupational status, mobility, wages, job satisfaction
- University and Geographic Indicators 1991-1998
 - Faculties, Students, Delayed Students
 - Provincial GDP

The data

- University-to-Work Transition Survey 1998 and 2001
 - Two samples of University Graduates three years after graduation (15282 and 18181 observations)
 - Right-hand side variables: demographic, social background, high school, province before college (predetermined); college performance (potentially endogenous)
 - Left-hand side variables: occupational status, mobility, wages, job satisfaction
- University and Geographic Indicators 1991-1998
 - Faculties, Students, Delayed Students
 - Provincial GDP

Table: Sample Design and Means of Key Variables

	All	AlmaLaurea	nonAlmaLaurea
<i>1998 Survey:</i>			
Number of Graduates	15282	3512	11770
Weighted Share		.188	.812
<i>2001 Survey:</i>			
Number of Graduates	18181	3515	14666
Weighted Share		.183	.817
	All	AlmaLaurea	nonAlmaLaurea
<i>Means of selected sample characteristics in 1998:</i>			
Share of Female	.527 (.004)	.528 (.010)	.527 (.005)
Age	27.45 (.038)	27.61 (.086)	27.41 (.042)
High School Grade	48.38 (.066)	47.87 (.151)	48.49 (.074)
<i>Means of selected sample characteristics in 2001:</i>			
Share of Female	.551 (.004)	.567 (.009)	.548 (.004)
Age	27.47 (.042)	27.55 (.028)	27.45 (.063)
High School Grade	48.96 (.057)	48.62 (.130)	49.04 (.064)

Table: Sample Design and Means of Key Variables

	All	<i>AlmaLaurea</i>	<i>nonAlmaLaurea</i>
<i>Universities in 1995</i>			
Number of students per faculty	35.16 (.284)	28.50 (.114)	36.71 (.348)
Share of Delayed Students	.411 (.001)	.433 (.001)	.406 (.001)
<i>Universities in 1998</i>			
Number of students per faculty	35.27 (.246)	28.72 (.110)	36.74 (.299)
Share of Delayed Students	.410 (.001)	.429 (.001)	.406 (.001)

Notes: Standard errors in parenthesis. Shares, means and standard errors are computed with stratification weights. High school grades range from 36 to 60. Only individuals that answered to the question concerning their employment status have been considered.

Table: Unemployment, Mobility and Wages by Year and *AlmaLaurea*

Unemployment				
	1998	2001	Diff.	
<i>AlmaLaurea</i>	.228	.094	-.134	
<i>non AlmaLaurea</i>	.205	.107	-.098	
Diff.			-.036	***
<i>St. Err.</i>			(.011)	
Mobility				
	1998	2001	Diff.	
<i>AlmaLaurea</i>	.570	.566	-.004	
<i>non AlmaLaurea</i>	.480	.449	-.031	
Diff.			.025	*
<i>St. Err.</i>			(.015)	
Wage				
	1998	2001	Diff.	
<i>AlmaLaurea</i>	899.7	1118.4	218.7	
<i>non AlmaLaurea</i>	980.9	1155.1	174.2	
Diff.			44.5	***
<i>St. Err.</i>			(16.8)	

Notes: Unemployment rates have been computed using stratification weights. Average gross monthly wages are expressed in Euros and have been calculated for 20838 individuals that provide it. The bold differences are the results of a difference in difference estimation, where $Diff = (Y_{Alma}^{01} - Y_{Alma}^{98}) - (Y_{nonAlma}^{01} - Y_{nonAlma}^{98})$. In parenthesis are displayed robust standard errors of regressions of the dependent variables on dummies for year, belonging to *AlmaLaurea*, and their interaction.

A set of linear controls

$$Y_i = \mu + \beta \cdot X_i + \gamma \cdot G_i + \delta \cdot T_i + \alpha \cdot (G_i \cdot T_i) + u_i \quad ,$$

Table: The effect of *AlmaLaurea* on unemployment probability

	(1)	(2)	(3)	(4)
<i>AlmaLaurea</i>	-0.020** (.008)	-0.021** (.008)	-0.021** (.008)	-0.016* (.008)
2001	-.101*** (.013)	-.103*** (.013)	-.099*** (.013)	-.073*** (.013)
Female	.060*** (.006)	.061*** (.005)	.061*** (.005)	-.061*** (.005)
Age	-.002** (.001)	-.004*** (.001)	-.004*** (.001)	-.004*** (.001)
High school grade	-.002*** (.0003)	-.001*** (.0004)	-.001*** (.0004)	-.001*** (.0004)
University grade		-.001** (.005)	-.001** (.001)	-.001** (.0006)
Students per faculty			-.002*** (.001)	-.002*** (.001)
Share of delayed students			-.018 (.073)	-.076 (.077)
GDP				-.001*** (.0003)
Provincial unemployment				.009*** (.003)
Dummies on year delay		YES	YES	YES
R-squared	0.147	0.147	0.149	0.150
Obs.	33463	33463	33463	33463

Notes: The results of four different specifications of a linear probability model are displayed. The dependent variable assumes the value 1 if the individual declares not to be working and to be searching, 0 otherwise. All specifications include university*department fixed effects, 14 dummies for high school type, 11 dummies for having another university degree, 5 dummies for each parent's level of education, 104 dummies for province of residence before university enrolment. Column 1 includes only predetermined individual control, column 2 considers all individual controls, column 3 incorporates time variant university characteristics, and column 4 includes Provincial GDP and unemployment rate. Robust Standard Errors in parenthesis. All regression are clustered at region*degree*year.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table: The effect of *AlmaLaurea* on mobility

	(1)	(2)	(3)	(4)
<i>AlmaLaurea</i>	.024** (.011)	.024** (.012)	.027** (.012)	.024** (.012)
2001	-.008 (.007)	-.008 (.007)	.007 (.008)	-.009 (.011)
Female	-.022*** (.004)	-.022*** (.005)	-.022*** (.005)	-.022*** (.005)
Age	-.001** (.001)	.0004 (.0006)	.0003 (.0006)	.0002 (.0006)
High school grade	.001** (.0003)	.0002 (.0003)	.0003 (.0003)	.0004 (.0003)
University grade		.0003 (.0006)	.0003 (.0006)	.0001 (.0006)
Students per faculty			.001 (.001)	-.001 (.001)
Share of delayed students			-.209*** (.001)	-.179** (.077)
GDP				-.0005 (.001)
Provincial unemployment				-.005 (.004)
Dummies on year delay		YES	YES	YES
R-squared	0.282	0.283	0.283	0.283
Obs.	33463	33463	33463	33463

Notes: The results of four different specifications of a linear probability model are displayed. The dependent variable assumes the value 1 if an individual resides in a different region from one where she attended university, and 0 otherwise. All specifications include university*department fixed effects, 14 dummies for high school type, 11 dummies for having another university degree, 5 dummies for each parent's level of education, 104 dummies for province of residence before university enrolment. Column 1 includes only predetermined individual controls, column 2 considers all individual controls, column 3 incorporates time variant university characteristics, and column 4 includes Provincial GDP and unemployment rate. Robust Standard Errors in parentheses. All regression are clustered at region*degree*year.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table: The effect of AlmaLaurea on wages

	(1)	(2)	(3)	(4)
<i>AlmaLaurea</i>	.034* (.017)	.036** (.018)	.035* (.018)	.031* (.018)
2001	.222*** (.015)	.227*** (.015)	.227*** (.016)	.201*** (.020)
Female	-.153*** (.008)	-.157*** (.008)	-.158*** (.008)	-.158*** (.008)
Age	.013*** (.002)	.017*** (.001)	.017*** (.002)	.017*** (.002)
High school grade	.005*** (.0005)	.003*** (.0006)	.003*** (.0006)	.003*** (.0006)
University grade		.005*** (.0008)	.005*** (.0008)	.005*** (.0008)
Students per faculty			.003* (.001)	.002 (.001)
Share of delayed students			.020 (.100)	.055 (.102)
GDP				.002*** (.0005)
Provincial unemployment				-.011** (.005)
Dummies on year delay		YES	YES	YES
R-squared	0.252	0.259	0.259	0.260
Obs.	20838	20838	20838	20838

Notes: The results of three different specifications of a OLS model are displayed. The dependent variable is the logarithm of monthly net wages. All specifications include university*department fixed effects, 14 dummies for high school type, 11 dummies for having another university degree, 5 dummies for each parent's level of education, 104 dummies for province of residence before university enrolment. Column 1 includes only predetermined individual control, column 2 considers all individual controls, column 3 incorporates time variant universities characteristics, column 4 includes provincial GDP and provincial unemployment rates. Robust Standard Errors in parentheses. All regression are clustered at region*degree*year.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table: Pre-adoption falsification test of *AlmaLaurea*

	Unemployment	Mobility
<i>AlmaLaurea</i>	.004 (.013)	.011 (.012)
1998	-.027*** (.008)	.005 (.006)
Female	.079*** (.008)	-.026*** (.005)
GDP	-.001** (.0004)	-.003 (.003)
Provincial unemployment	.003 (.002)	.001 (.002)
R-squared	0.150	0.322
Obs.	27373	27565

Notes: In the first column the dependent variable takes the value 1 if a given graduate is unemployed, and 0 otherwise. In the second column the dependent variable takes the value 1 if a given individual resides in a different region from the one where she attended universities. Only individuals that graduated in 1992 and 1995 are considered. *AlmaLaurea* takes the value 1 for 1995 graduates from universities that enrol in *AlmaLaurea* in between 1995 and 1998. All specifications include university*department fixed effects. Robust Standard Errors in parentheses. All regression are clustered at region*degree*year.

* significant at 10%; ** significant at 5%; *** significant at 1%.

AlmaLaurea's timing

1994	University of Bologna collects electronic data
1995	University of Bologna sells data
1996	Modena, Ferrara, Parma, R. Emilia and Florence join
February 1997	Catania joins
May 1997	Trieste, Udine and Messina join
August 1997	Chieti, Trento and Molise join
January 1998	Venice School of Architecture joins
August 1998	Turin and Eastern Piedmont join

The Diff-in-Diffs

	Treatment	Control
jan-jul 1998		
	Turin and E. Piedmont	The rest
aug-dec 1998		

Table: The Effect of *AlmaLaurea*: the case of Turin and E. Piedmont

	Unemployment	Mobility	Wage
<i>AlmaLaurea</i>	-0.025*** (.008)	.027 (.031)	-16.23 (24.35)
Female	.043*** (.005)	-.024*** (.005)	-173.33*** (11.80)
Age	-.002* (.001)	-.001 (.001)	20.27*** (2.18)
High School Grade	-.001*** (.0002)	.001* (.0004)	2.105*** (.576)
Dummies for parents education	YES	YES	YES
Month of graduation	YES	YES	YES
University Grade	YES	YES	YES
Dummies on year delay	YES	YES	YES
Students per faculty	YES	YES	YES
Share of delayed Students	YES	YES	YES
Province GDP	YES	YES	YES
R-squared	0.123	0.375	0.227
Obs.	20441	20441	12907

Notes: Treatment group are graduates from Universities of Turin and Eastern Piedmont. All specifications include university*department fixed effects. Robust Standard Errors in parenthesis. All regression are clustered at region*degree*year.

* significant at 10%; ** significant at 5%; *** significant at 1%.



Table: Alternative treatment and control groups based on geographic proximity

	Unemployment	Mobility	Wage
<i>AlmaLaurea</i>	-.035** (.017)	.024* (.026)	.053 (.039)
R-squared	0.149	0.492	0.263
Obs.	6225	6225	3521

Notes: Only graduates from regions that have both *AlmaLaurea* and non-*AlmaLaurea* universities are included. All specifications include the full set of controls used in column 4 of Tables 4, 5, and 6. Robust Standard Errors in parenthesis. All regression are clustered at region*degree*year.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Table: The effect of *AlmaLaurea* on nearby universities

	Unemployment	Mobility	Wage
<i>AlmaLaurea</i>	-.008 (.012)	.006 (.015)	.010 (.023)
R-squared	0.152	0.295	0.260
Obs.	26436	26436	16464

Notes: Only individuals that graduated from universities non-*AlmaLaurea* are included. The variable *AlmaLaurea* takes the value 1 if a 1998 graduate is awarded a degree from a non-*AlmaLaurea* university that is located in a region where there are also *AlmaLaurea* universities, and 0 otherwise. All specifications include the full set of controls in the 4th columns of Tables 4, 5, and 6. Robust Standard Errors in parentheses. All regression are clustered at region*degree*year.

* significant at 10%; ** significant at 5%; *** significant at 1%.

When is *AlmaLaurea* more important?

	<i>Unemployment</i>		<i>Wages</i>	
	Movers	Non Movers	Movers	Non Movers
<i>AlmaLaurea</i>	-0.024*	-0.014	0.056***	-0.001
	(0.015)	(0.016)	(0.025)	(0.025)

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%.

When is *AlmaLaurea* more important?

	<i>Unemployment</i>		<i>Wages</i>	
	Movers	Non Movers	Movers	Non Movers
<i>AlmaLaurea</i>	-0.024*	-0.014	0.056***	-0.001
	(0.015)	(0.016)	(0.025)	(0.025)

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%.

Results

- *AlmaLaurea*:
 - decreases graduates' unemployment probability by about 2 points
 - increases monthly wages by about 35 euros and improves two distinct self-reported measures of job satisfaction
 - No evidence this is negatively affecting non *AlmaLaurea* students
 - Increases geographical mobility
 - "Movers" are the ones who benefit the most

Results

- *AlmaLaurea*:
 - decreases graduates' unemployment probability by about 2 points
 - increases monthly wages by about 35 euros and improves two distinct self-reported measures of job satisfaction
 - No evidence this is negatively affecting non *AlmaLaurea* students
 - Increases geographical mobility
 - "Movers" are the ones who benefit the most

Results

- *AlmaLaurea*:
 - decreases graduates' unemployment probability by about 2 points
 - increases monthly wages by about 35 euros and improves two distinct self-reported measures of job satisfaction
 - No evidence this is negatively affecting non *AlmaLaurea* students
 - Increases geographical mobility
 - "Movers" are the ones who benefit the most

Results

- *AlmaLaurea*:
 - decreases graduates' unemployment probability by about 2 points
 - increases monthly wages by about 35 euros and improves two distinct self-reported measures of job satisfaction
 - No evidence this is negatively affecting non *AlmaLaurea* students
 - Increases geographical mobility
 - "Movers" are the ones who benefit the most

Results

- *AlmaLaurea*:
 - decreases graduates' unemployment probability by about 2 points
 - increases monthly wages by about 35 euros and improves two distinct self-reported measures of job satisfaction
 - No evidence this is negatively affecting non *AlmaLaurea* students
 - Increases geographical mobility
 - "Movers" are the ones who benefit the most

Things to be done

- Additional spill-overs concerns: data on employment outcomes of high school graduates
- More on heterogeneous effects and effects on outcome distribution

Things to be done

- Additional spill-overs concerns: data on employment outcomes of high school graduates
- More on heterogeneous effects and effects on outcome distribution