Graded Security and Labor Market Mobility Clean Evidence from the Italian Jobs Act

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- Motivation and the Italian job market
- What did we expect from the jobs act?
- The Data-Set
- Descriptive Analysis :
    - Job Flows
    - Mobility Measure and Threshold Passing
    - The treatment and control group
- Regressions and Quasi-experiment with matched employer employee data:
    - firm behavior
        1. Regressions on share of hirings and transformation at the firm level
        2. Regressions on share of firings at the firm level
    - individual job to job flows
        1. Regressions on individual job to job transitions

The Italian Jobs Act

- Italian jobs act 2015 concerns two main policies
- **Temporary hiring subsidy** introduced in January 2015
  - (Almost) All new contracts on a open ended basis were eligible to a reduction in social security contributions up to 8060 per year
- **Graded Security on new contracts**
- All open ended contracts as of 7 March 2015 are subject to graded security (severance increasing with tenure)
  - Reinstatement clause for unjust dismissal for new hires for *firms above 15 employees was (largely) abolished*
  - No substantial changes in employment protection for firms below 15 employees
  - Firms passing the threshold subject to graded security for all their workers

Literature

- Early research on jobs act
    - Viviano and Sestito (2018). Look at job creation and gross hirings. 6% due to graded security and 25% to hiring subsidy;
    - Leonardi, Nannicini (2016, presented at INPS) use "dichiarazioni obbligatorie"

- Threshold effects and variable EPL
    - Garibaldi, Pacelli and Borgarello (2004). Firm mobility around the threshold falls
    - Schivardi Torrini (2008)
    - Boeri et al. (2008), Scarpetta et al. (2016)

- Academic and Policy Research on graded security
    - France (Cahuc et al. 2012); Spain (Bentolila, DOlado et al.); Italy (Boeri and Garibaldi, 2008)
    - Graded Security (Blanchard Tirole, 2008); Boeri Garibaldi and Moen (2016)

What did we expect from the jobs act?

- Graded Security (lower firing costs) at the firm level (above 15 employees)
  - firms should increase hiring in good business time **and** firing in bad business times
  - No clear predictions on average employment
  - firms should **transform fixed term into open ended contract**
- Graded security at the firm level (below 15 employees)
  - substantially no changes.
- Graded security at the individual mobility level (Jobs to jobs transitions)
  - Individuals that were more protected in the old contract may have fewer incentives to move
- Marginal Employment Subsidies for open ended
  - Firms should hire more at the open ended level regardless of their business conditions
  - Marginal employment subsidy applies to all firms

Results: What we will learn about graded security? (I)

- Descriptive Analysis
  - Increase in overall mobility; increase in the number of firms passing the threshold
  - increase in measure of job reallocation (job creation and destruction)

- Quasi-experiment: firms (always) above the threshold before March 2015 are considered treated firms (subject to graded security).
- hiring and firing per firm
  - increase in open ended hirings (relative to control group)
  - increase in transformation from fixed term contract to open ended contract, both through inside hiring and outside hiring
  - increase in firing per firm (both overall firing as well as unjust firing)
- individual job to job
  - workers formerly protected by the reinstatement clause (art. 18) are less likely to switch job relative to other workers.

The Data

- Firm selection:
  - all private firms that between January 2013 and December 2016 hit the band 10-20 employees are selected.
  - approximately 240.000 firms observed each month (time span 48 months)
- Worker Selection
  - All workers employed in those firms are observed monthly between 2013 and 2016
  - Approximately 6.2 millions different workers are observed over the 3 years (48 months) time span
  - More than 250 million of records

Descriptive Analysis: Threshold and Firm Size

- Beyond firm anagraphic (province, city, sector, birth date, death, sector, etc.) we observe at firm level monthly total employees, part time employees, overall wage
  - *Inps* calculate also "firm labor force" (forza aziendale), a full time equivalent measure that we use for threshold effects (include both fixed term and open ended).

  - *legislation*, i) open ended measured at the full time equivalent iii) average fixed term employees in the last 24 months weighted by their duration

- Threshold is not observed easily. Forza aziendale compiled by Inps is a reasonable proxy

Threshold Passing

- Before March 2015 firms passing the 15 employees threshold were subject to reinstatement in case of unfair dismissal
- As of March 2015 firms that pass the 15 employees threshold are no longer subject to reinstatement for their *entire workforce*
- L_{it} is firm size at time (year/month)
- Define threshold pass as passing the 15 employees threshold as

$$
Threshold\_Pass = \left\{ \begin{array}{c} 1 = \text{if} \quad L_{i,t} \geq 16 \quad \text{and} \quad L_{i,t-12} < 16 \\ \\ 0 = \text{otherwise} \end{array} \right.
$$

- Legislation changes on march 6, 2015

Crossing Threshold Increases by 20 percent since march 2015

Number of Firms Crossing the Treshold in Yearly Passage
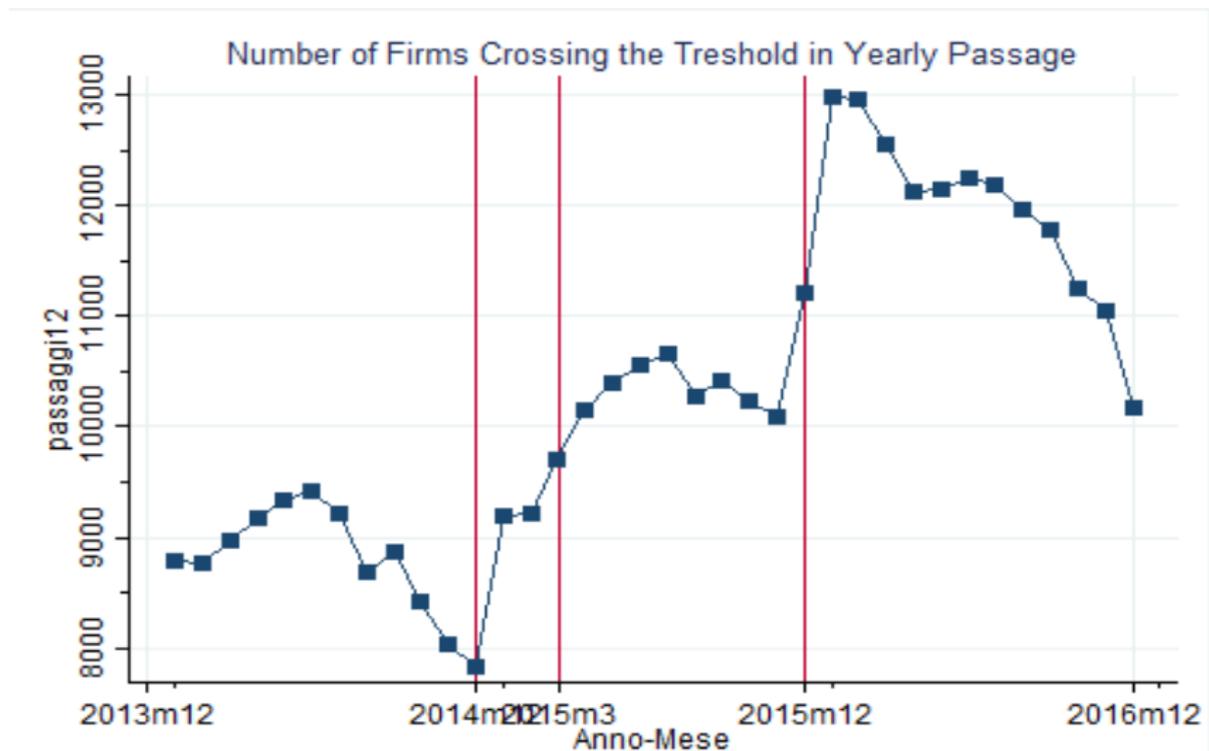
Increase in Number of Firms Passing the Threshold

Tabella: Average Number of Firms Passing the 15 threshold

	Before March 2015		After March 2015		Difference in Percentage	
	Total Pass.	Prob.	Total Pass.	Prob.	Total Pass.	Prob.
12 months lag	8853	0.090%	11360	0.115%	28.32	28.21
3 months lag	5525	0.056%	6482	0.066%	17.32	17.33
1 month lag	2664	0.027%	2972	0.030%	11.56	11.60

Descriptive Analysis: Transition Matrices

- We take as state s_t the firm size at time t. We consider $s_t \in \{\leq 11, 12, \ldots\ldots 19, \geq 20\}$. s_{it} is size for firm i at time t
- The transition M_t records simply the probability of changing size s_{it} to size $s_{i,t+12}$

$$s_{t+12} = M_t s_t$$

Estimating Average Transition matrices: Less Mass in the main diagonal

Post G. Sec.: After March 2015

	≤ 11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	≥ 19.00
≤ 11.00	**0.47**	0.26	0.13	0.06	0.03	0.02	0.01	0.01	0.01
12.00	0.22	**0.36**	0.21	0.11	0.05	0.03	0.01	0.01	0.01
13.00	0.10	0.19	**0.33**	0.20	0.10	0.05	0.02	0.01	0.01
14.00	0.05	0.09	0.19	**0.32**	0.18	**0.08**	**0.04**	0.02	0.02
15.00	0.03	0.05	0.10	0.20	**0.31**	**0.16**	**0.08**	0.04	0.03
16.00	0.02	0.03	0.06	0.11	0.20	0.27	0.16	0.09	0.05
17.00	0.02	0.03	0.04	0.07	0.12	0.19	0.26	0.17	0.10
18.00	0.02	0.02	0.03	0.05	0.07	0.12	0.21	0.29	0.20
≥ 19.0	0.02	0.02	0.03	0.04	0.06	0.09	0.15	0.25	0.34

Pre G. Sec. before March 2015

	≤ 11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	≥ 19.0
≤ 11.00	**0.52**	0.25	0.11	0.05	0.03	0.02	0.01	0.01	0.00
12.00	0.23	**0.39**	0.20	0.09	0.04	0.02	0.01	0.01	0.00
13.00	0.10	0.21	**0.35**	0.18	0.09	0.04	0.02	0.01	0.01
14.00	0.05	0.10	0.20	**0.34**	0.17	**0.07**	**0.04**	0.02	0.01
15.00	0.03	0.05	0.10	0.20	**0.33**	**0.15**	**0.07**	0.04	0.02
16.00	0.03	0.04	0.06	0.11	0.20	0.29	0.16	0.08	0.04
17.00	0.02	0.03	0.04	0.07	0.11	0.20	0.28	0.16	0.09
18.00	0.02	0.02	0.03	0.05	0.08	0.12	0.20	0.30	0.18
≥ 19.0	0.02	0.02	0.03	0.04	0.06	0.09	0.14	0.24	0.36

Mobility Measures

- Idea: Summarize Information of the transition matrix in a single number
- **Trace Measure**: $\frac{M - Tr(M)}{m-1}$ from Shorrocks (1978 Ecm)
- Determinant measure $\frac{det(M)}{m-1}$ from Shorrocks (1978 Ecm)
- Eigenvalue measure: one minus the modulus of the second largest eigenvalue of M Sommers and Conlisk (1979)
- M Mean crossing measure: the sum over i and j (from 1 to m) of M

Mobility Indices: Average Increase in mobility by 4-5 %

Shorrock Yearly Moblity index by Month
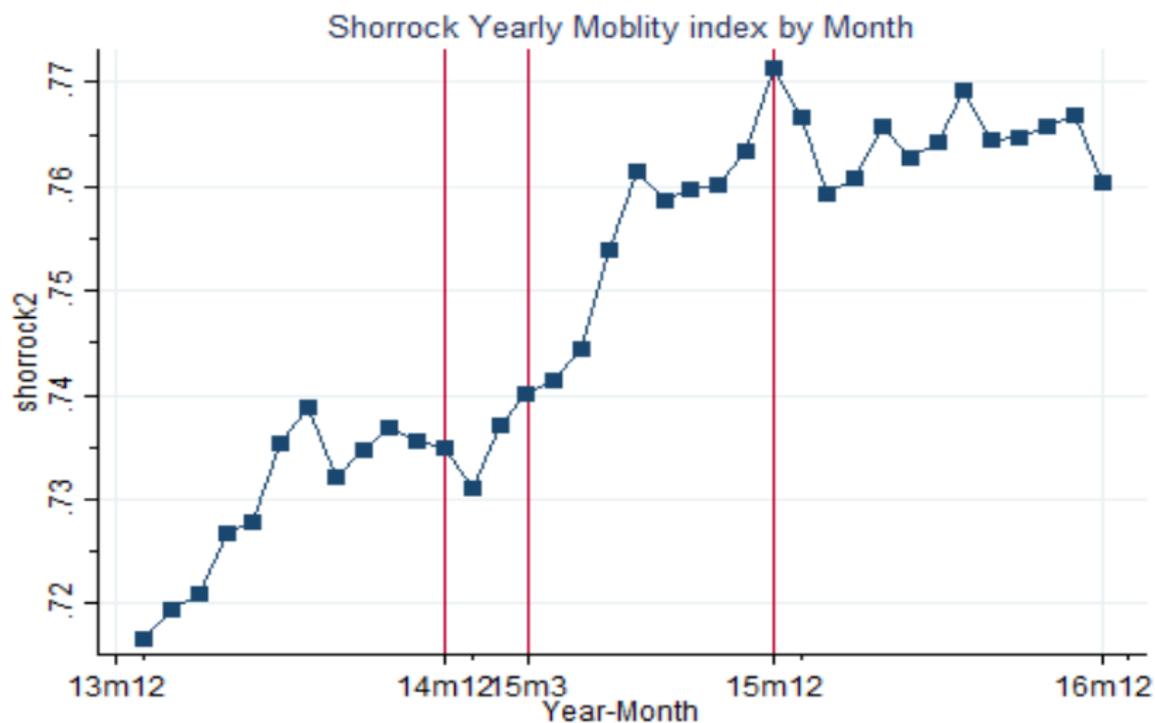
Descriptive Analysis: Job Flows for continuing firms

- distinguish expanding and contracting firms (Davis-Haltiwanger, 1999)
- **aggregate job creation** sum all expanding firms
- sum (in absolute value) contracting firms to obtain a measure of job destruction
- different between job creation and destruction is net employment growth
- Flows are constructed for every month between 2013 and 2016 at three frequencies
    - monthly; quarterly; yearly
- Job flows fall substantially by firm size (Haltiwanger, Scarpetta, Scweiger, 2008)

Job Creation at Different Frequencies

Monthly, Quarterly and Yearly Job Creation
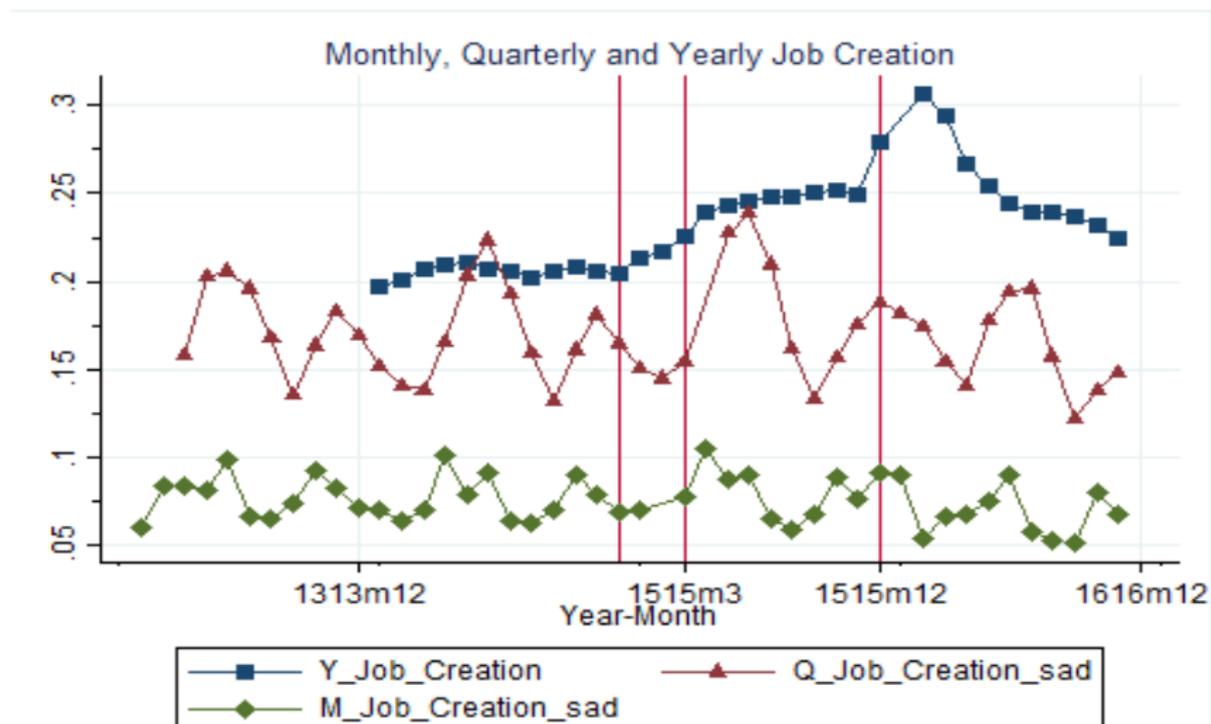
Net and Gross Yearly Flows

Yearly JC and JD seas. adj.

Y_Job_Destruction_sad   Y_Job_Creation_sad
net12_mean_sad
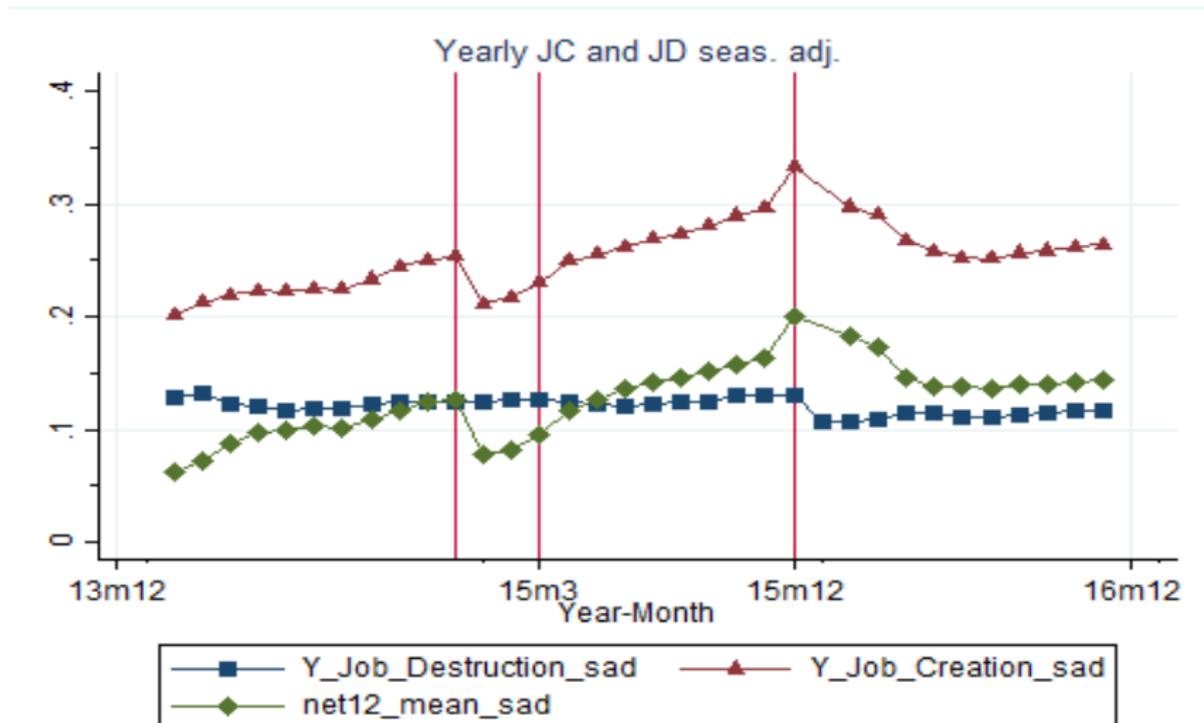
Descriptive Analysis: Summary

- Overall Mobility increases
- Increase in number passing
- Net job creation increases substantially in the period of the jobs act
- Gross job reallocation (creation plus destruction) increases substantially

Who is subject to graded security?:

- Treated Firms
    - Treated firms are firms that before march 2015 were always above 15 employees
    - Those firms clearly experienced a reduction in EPL for new employees
- Control firms
    - Control firms are currently firms below 13 employees
    - Robustness: all firms not in the treatment group
- Hiring subsidy applies uniformly to both large and small firms

What we would like to test at the firm level ?

- Graded security should induce an increase in *both* hiring and firing
- When we look at Hiring we should expect
  - an Increase in open ended hiring in treated firms, relative to control
  - Increase in transformation of fixed term contract into open ended in treated firms, relative to control group
  - Reduced fixed term hiring in treatment vs control?
- When we look at Firing we should expect
  - Increase in overall firing in treated firms, relative to control group
  - Increase in firing for economic reasons in treated firms
- All these effects should become significant in March 2015 when graded security came into play
- The idea is a Difference in Difference

Empirical Strategy

- We select all hirings as of January 2014. Jobs that started before are not considered
    - We observe whether the hiring is temporary of fixed term.
    - We also observe whether the worker was previously employed fixed term (in the previous month)
- We then collapse the hirings at the firm level and consider each variable at the firm level on a per worker basis (hiring per worker)
- We do the same also for the firings

Regression Analysis: Difference in Differences

- Outcome is $Y_{i,t}$ is hiring (or firing) in firm i
- Treatment T_i (firms always above 15 before March 2015)
- Basic Specification with Graded Security Dummy (GS_i) for period after March 2015

$$Y_{i,t} = \sum_{k=\underline{k}}^{12,2016} \gamma_k \delta_k + \beta_1 T_i + \beta_2 T_i GS_i + \epsilon_{i,t}$$

- With time specific coefficients before graded security

$$Y_{i,t} = \alpha_i + \sum_{k=\underline{k}}^{12,2016} \gamma_k \delta_k + \beta_1 T_i + \sum_{k=\underline{k}}^{12,2016} \beta_k T_i GS_k + \epsilon_{i,t}$$

Look at open Ended Hiring in Treated and Control

Firm Hiring Share on Open Ended Basis: small (control)

Firm Hiring Share on open Ended Basis: large (treated)
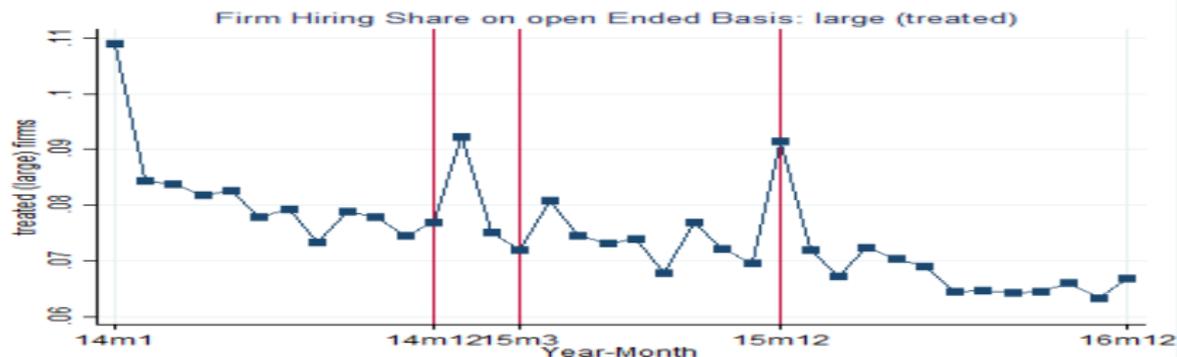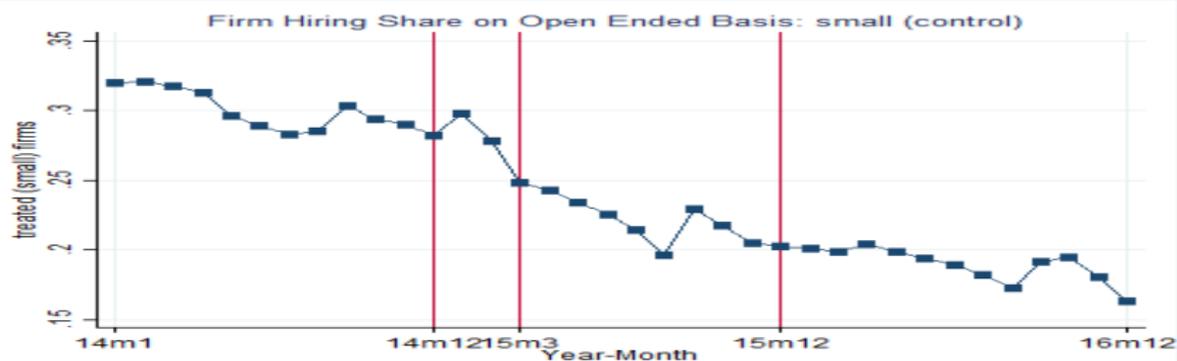
Basic Specification: Open Ended Hiring per Worker

Tabella: Basic Regressions On Hiring per Firm

| Variables	(1) Hires per-worker Open Ended	(2) Transformation per-worker into Open Ended	(3) Within Firm Transformation per-worker into Open Ended	(4) Hires per-worker Fixed Term
	Dependent Variable:			
Treated Firms [a]	-0.209***	-0.160***	-0.155***	-0.183***
	(0.00177)	(0.00184)	(0.00260)	(0.00776)
Treated Firms Jobs-Act [b]	0.0911***	0.0671***	0.0487***	0.0126
	(0.00186)	(0.00246)	(0.00371)	(0.0107)
Constant	0.324***	0.235***	0.225***	0.284***
	(0.00123)	(0.00198)	(0.00296)	(0.00830)
Fixed Effect	YES	YES	YES	YES
Observations	506,113	133,214	49,249	1,135,062
Number of Firms	106,799	50,934	26,080	202,121

[a] Treated Firms refer to firms that between January 2014 and March 2015 employ more than 15 employees
[b] Treated Firms Jobs-Act refer to Treated Firms after March 2015
Equation estimated is the following

# Diff-in-diff Coefficients over time for open ended for Hiring per Worker

Diff in Diff estimates of Graded Security on Hiring Share as of January 2014

Legend:
- Parameter estimate
- zerol
- Lower 95% confidence limit
- Upper 95% confidence limit
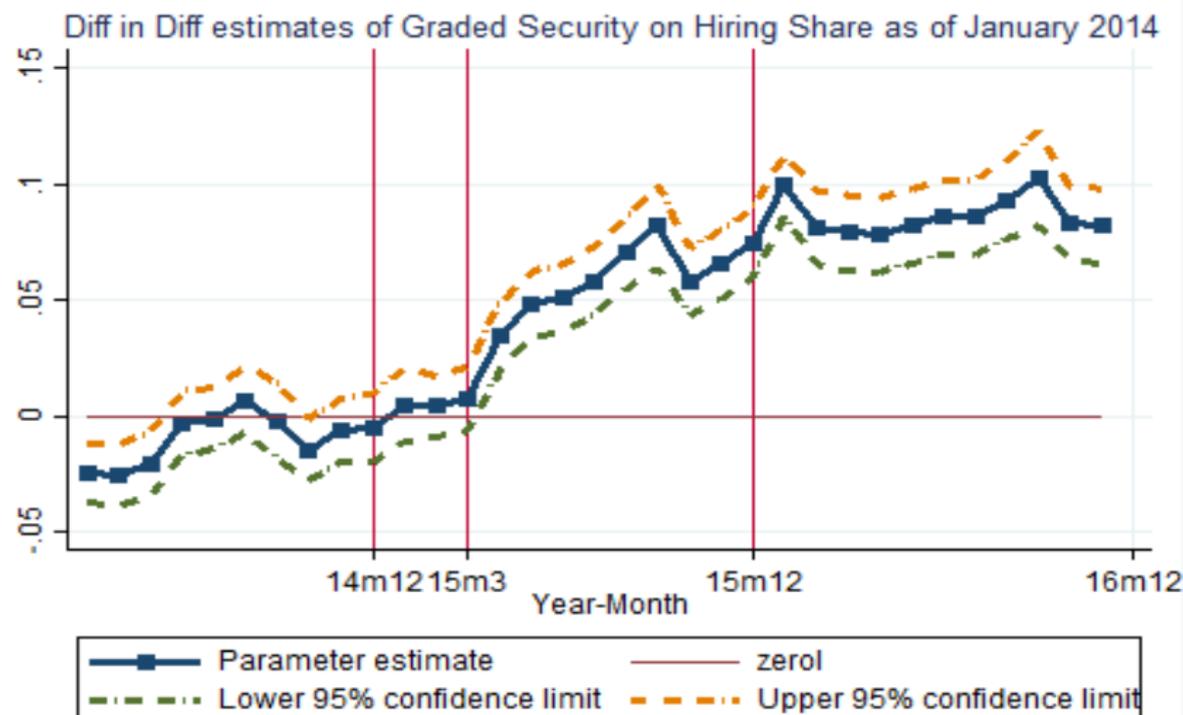
Diff-in-diff Coefficients in **transformation** from fixed term contract per Worker

Diff in Diff estimates of Graded Security on Trasf Share Fixed Term as of January 2

Legend:
- Parameter estimate
- zerol
- Lower 95% confidence limit
- Upper 95% confidence limit

X-axis: Year-Month (14m12, 15m3, 15m12, 16m12)
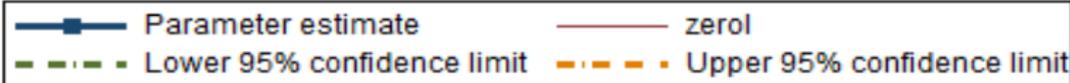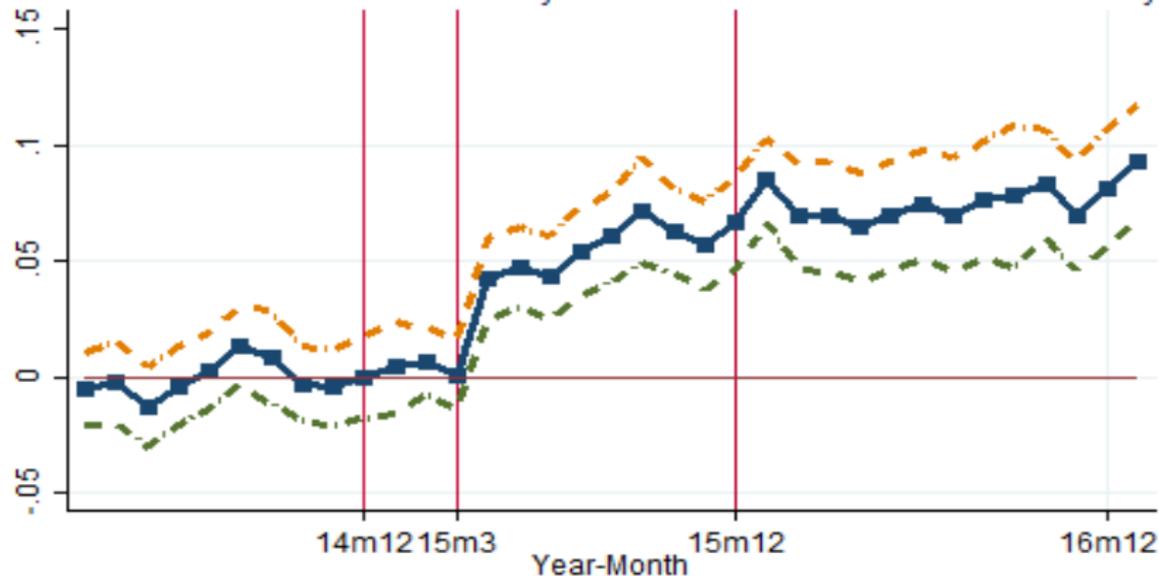
Diff-in-diff Coefficients as INSIDE in transformation from fixed term contract per Worker

Diff in Diff estimates of Graded Security on Trasf Share Fixed Term as of January 2

Legend:
- Parameter estimate
- zero1
- Lower 95% confidence limit
- Upper 95% confidence limit

X-axis: Year-Month (14m12, 15m3, 15m12, 16m12)

Fixed Term Hirings in Treated and Control

Firm Hiring Share on Fixed term Basis: large (treated) and small (control)

Legend: (mean) mean_hiring_treat — (mean) mean_hiring_contr

x-axis: group(anno mese)
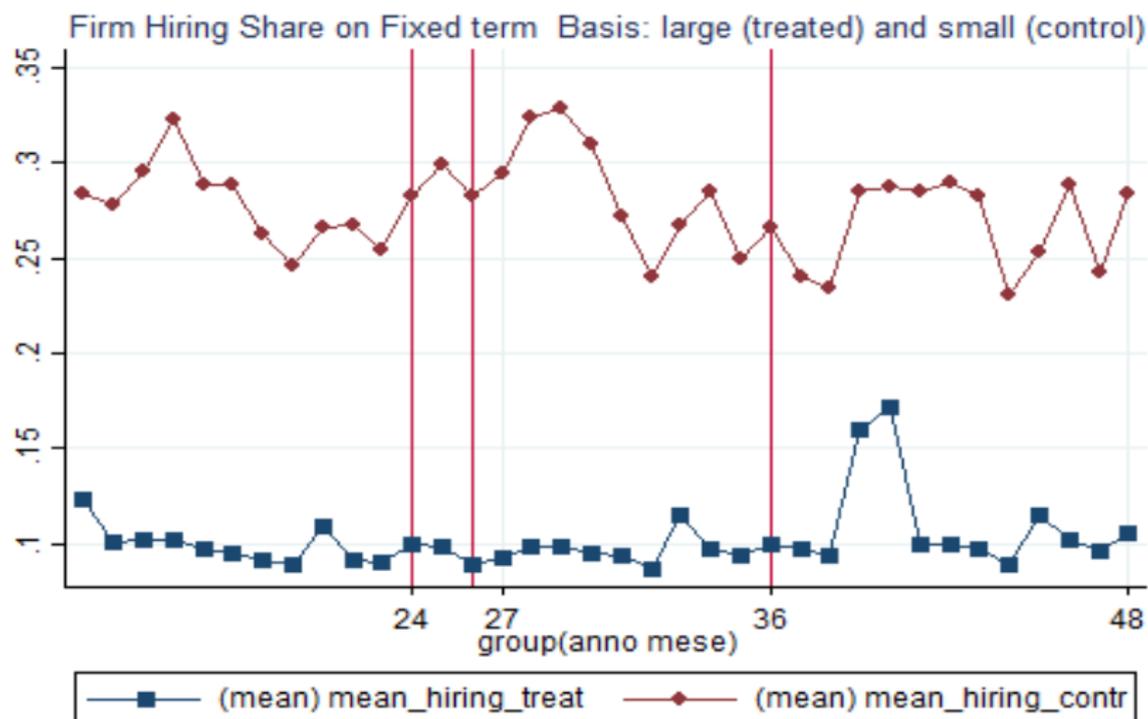
Diff-in-diff Coefficients of fixed term contract per Worker %

Diff in Diff estimates of Graded Security on Hiring Share Fixed Term as of January 2...

Legend:
- Parameter estimate
- Lower 95% confidence limit
- zerol
- Upper 95% confidence limit

X-axis: Year-Month (14m12, 15m3, 15m12, 16m12)

Summary of Results for Hiring Share per firm

- Significant increase in hiring share on open ended basis
- Significant increase in transformation per worker from fixed term contract to open ended (both outside and inside)
- quantitatively sizeable. For example, average hiring share increases by more than 50 percent in treated firms relative to control firms.

Look at Firings

- Again, all new jobs as of January 2014 and follow each of them for at most two years
- We look at the firings of those new jobs in a two years time horizon.
- Effects on Dismissals
  - We identify the dismissal of these selected jobs both for i) any reasons and for ii) unjust reasons
  - The jobs opened in non treated (large) firms should be more likely to be dismissed relative to the control group

Firing per Worker in of New Jobs started after january 2014

Firm Firing Share on open ended Basis: large (treated) and small (control)

Legend: treated (large) firms — treated (small) firms
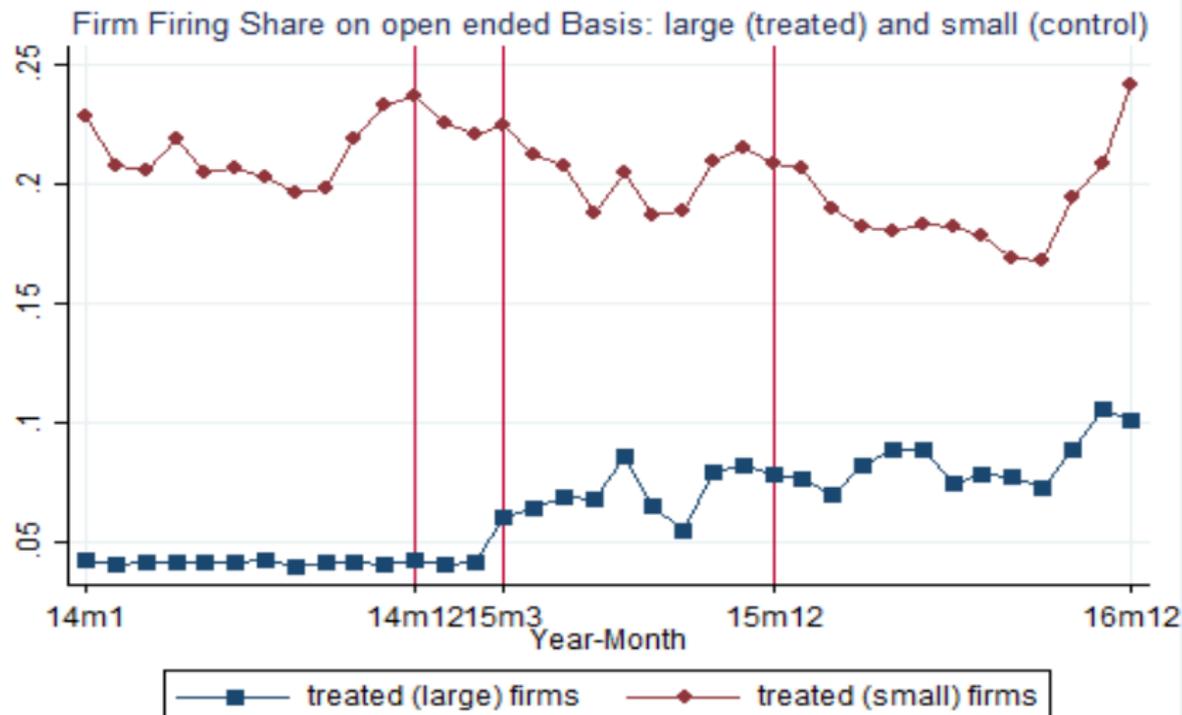
Basic Diff in Diff for All Firings

Tabella: Basic Regressions On Firing per Firm

Variables:	Dependent Variable:	
	(1)	(2)
	Firing	Firing
	per-worker	per worker
	Open Ended	Open Ended
	All reasons	Unjustified
Treated Firms [a]	-0.174***	-0.119***
	(0.00323)	(0.0138)
Treated Firms- Jobs Act [b]	0.0519***	0.0357*
	(0.00392)	(0.0182)
Constant	0.215***	0.191***
	(0.00257)	(0.0162)
Fixed Effect	Yes	Yes
Observations	52,342	438
Number of id_azienda	24,473	405

[a] Treated Firms refer to firms that between January 2014 and March 2015 employ more than 15 employees

[b] Treated Firms Jobs-Act refer to Treated Firms after March 2015
Equations estimated is the following

$$Y_{i,t} = \alpha_i + \sum_{k=\underline{k}}^{12,2016} \gamma_k \delta_k + \beta_1 T_i + \beta_2 T_i GS_i + \epsilon_{i,t}$$

Diff in Diff estimates in Control and Treated Jobs/Firms

Figura: All Firing

Diff in Diff estimates of Firing Probability in New Hires as of January 2014

Legend: Parameter estimate — zerol

Diff in Diff estimates in Control and Treated Jobs/Firms

Figura: Unjust Firing

Diff in Diff estimates of (Unjust) Firing Probability in New Hires as of January 201
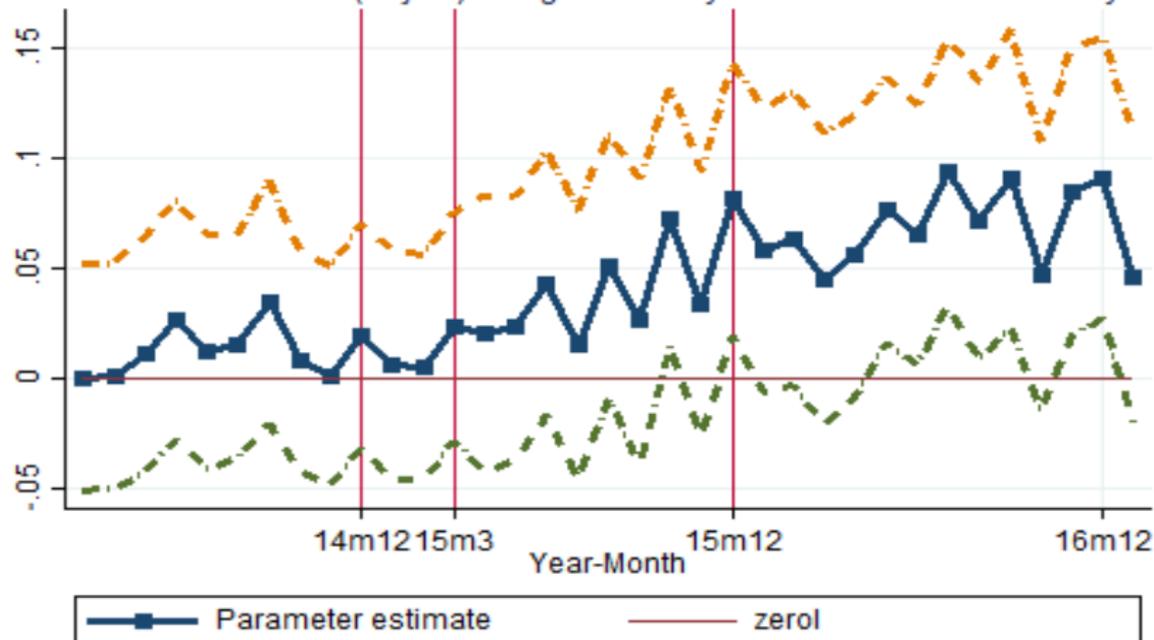
Quantitative Effects of Graded Security on Firings

- Average firing share per worker around 0.04 in treated group before March 2015
- Diff in Diff Coefficient in the simple regression around 0.03
- Average firing increases by some 50 percent in larger firms relative to small firms.

Work with Individual Job to Job Data

- We focus now on individual behavior
- What are the incentive of switching between jobs with graded security?
- There are two effects at work
  1. More labor demand from firms and thus more incentives to move
  2. Yet, workers under the previous EPL regime (with art. 18) fewer incentives to change jobs
- Which of the two effects will dominate?

Treatment in Individual Data

- We take all individuals with a open ended contract
- Treated individuals are those individuals who are hired with a open ended contract before March 2015 that are working in firms above 15
- Control are other workers hired with open ended contracts in smaller firms

Job to job transitions in treated and control firms

b to Job on open ended: workers with old protection (treated) and other workers (co

Legend: workers with old protection — workers without old protection

X-axis: Year-Month (13m12, 14m12, 15m3, 15m12, 16m12)

Diff in Diff estimates in Control and Treated Jobs/Firms

Diff in Diff estimates of Jobs to jobs for former protected workers as of January 20...

Legend:
- Parameter estimate
- zerol
- Lower 95% confidence limit
- Upper 95% confidence limit

X-axis: Year-Month (14m12, 15m3, 15m12, 16m12)
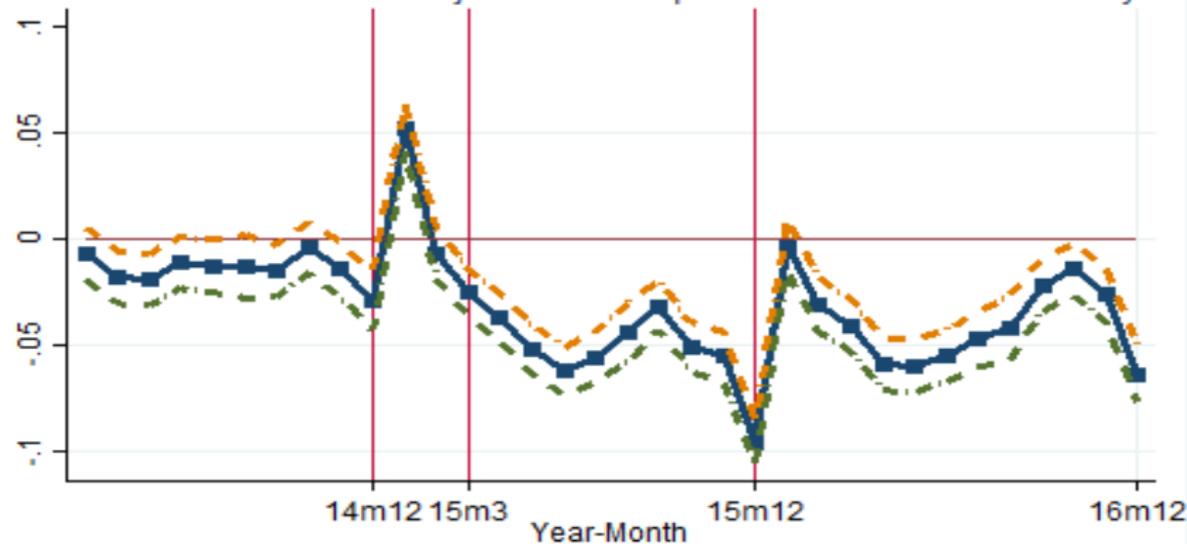
Quantitative Effects of Graded Security on JTJ

- Average job to job probability approximately 40 percent of all hires
- Simple diff in diff coefficients after March 2015 around -0.05,
- Share of job to job transitions among all hiring falls by 12 percent for individuals who were employed in contract with reinstatement clause.

Conclusions

- Mobility increased overall in the aftermath of graded security (threshold passing and mobility measures)
- FIrms above the 15 employees threshold before March 2015 are treated firms and effects of graded security can be identified.
- Hiring per firm
  - increase in open ended hiring in treated firms
  - increase in transformation of fixed term contract in treated firms
  - increase in INSIDE transformation of fixed term contract in treated firm
  - no effect on fixed term contracts
- Firing per firm
  - increase in overall firing and unjustified
- Jobs to jobs transition
  - reduction in job to job transition among individuals protected by the old rules.