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Counterfactual impact evaluation of hiring incentives and EPL reduction on youth employment in Italy

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Outline

Counterfactual impact evaluation of hiring incentives and EPL reduction on youth employment in Italy

1. Policies under evaluation
2. Data
3. Empirical strategy/methodology
4. Sample descriptive statistics
5. Impact evaluation results
6. Conclusions and recommendations



1. Policies under evaluation

Policy	Jointly evaluated: 1) Lowered firing costs for open ended contracts (Graded Security Contract) 2) Hiring incentives for new open-ended contracts and conversions from a fixed-term to an open-ended position.
Eligibility criteria	Persons who had not had an open-ended contract in the 6 months preceding their hiring.
Duration	1) Permanently changes in the regulation on dismissals. 2) 36 months of hiring subsidy/incentive
Type of measure	1) Reform of regulation of dismissals 2) 36 months 100% rebate of non-wage labour costs
Data	SISCO (Statistic System of online mandatory communication). Sisco is the public administrative registry with elementary information on hires, conversions, terminations.
Sample	Employment contracts registered in 2014-2015
Identification Strategy	DiD, with age-classes specific effect estimation and parametric correction for sample selection
Outcome	Share of new hires with an open-ended contract over the total employment contracts registered in 2015

1. Policies under evaluation

Policy under evaluation 1: Law 190/2014 – social security rebates

Eligibility:

- **Workers**
 - **Not employed with an open-ended contract** (including apprenticeship, open-ended domestic work contracts or open-ended staff leasing contracts) for at least **6 months before the beginning date of the new contract**, independently of the employer.
 - **In the 3 months preceding the reform (01.10.2014-31.12.2014) was not fired by the employer** that is hiring or by another employer related to the latter – to avoid opportunistic behaviours.
- **Employers**
 - Type: all employers without industrial or geographical specificity. It includes associations and public enterprises but excludes public administration.
 - With no pending contributory arrears or any other irregular situation in terms of collective agreements or territorial agreements.

Funding:

2 million euro in 2015, 15 million euro in 2016, 15 million euro in 2017, 11 million euro in 2018 and 2 million euro in 2019.

1. Policies under evaluation

Policy under evaluation 2: Decree 23/2015 – Graded security

Period:

Since 7 March 2015

Target:

All newly signed open-ended (or fixed-end converted into open-ended) contracts

Characteristics:

- entail **no reinstatement in case of dismissal declared unlawful by a court** (unless in case of discriminatory dismissal).
- Monetary compensation is envisaged in case (two monthly wages for each year of seniority, between a minimum of six months and a maximum of 36 months)

2. Data

SISCO:

- The elementary data used in this study is **a sample of more than 1.9 million records** referred to the total population of employment contracts started within the period 2014 and 2015.
- The sample comes from the registry of the «Sistema Informativo Statistico delle Comunicazioni Obbligatorie» (SISCO)
- The SISCO elementary data are longitudinal records covering the universe of the employment relationships related to individuals, collected in real-time since 2008.

3. Empirical strategy

Diff-in-Diffs model (Card & Krueger 1994; Wooldridge 2010) applied to the new employment contracts, between 1st January 2015 and 31st of December 2015, compared to those registered the previous year among two groups of individuals (eligible and non-eligible).



Our research:

- Evaluate reformed legal standards and hiring incentives
- Use data on 2014 and 2015
- Evaluate differential impact by age cohort and gender of universalistic policies



3. Empirical strategy

According to the *Diff-in-Diffs model*, we define:

- two *different groups (treated and control)**
- two periods, 2015 and 2014
- the outcome = the share of new open-ended contracts caused by treatment

**In this model, eligible and not eligible to the treatment.*

3. Empirical strategy

The identification strategy is structured in three stages:

- I. **First stage**, we apply a correction to the outcome variable of the control group in the 2015 in order to respect the **Stable Unit Treatment Value Assumption, SUTVA** (individuals of the control group become likely to have similar average of the outcome in 2015 they would have had in the absence of treatment on treated);
- II. **Second stage**, the *Diff-in-Diffs model* estimates the incremental share of new open-ended contracts caused by the treatment;
- III. **Third stage**, the share is applied to the whole new *eligible* open-ended employment contracts registered during 2015 to estimate the impact of the public intervention on the number of the new contracts that would not have been signed in its absence.

3. Empirical strategy

First stage of the identification strategy:

We suppose that due to the presence of a crowding-out effect, **the outcome of the control group units may be affected by the regulatory changes** through the **outcome of the treated group** units.

Employers may have preferred to hire a worker eligible for hiring incentives rather than a non-eligible worker.

We claim a **violation of the Stable Unit Treatment Value Assumption, SUTVA.**

3. Empirical strategy

We **apply a correction to the outcome variable** of the control group in the 2015:

- We use a **logistic model to regress in 2014 the outcome variable** on the units **of the control group** with respect to the characteristics of the individuals and the profile of the employment relationship (the covariates);
- **The parameters** resulting from the logistic model are then applied to the 2015 data (on the control group).
- The values estimated with the logistic model stand for any individual along a continuous range (0-1). The estimated outcome variable in 2015 has been then processed to convert it into a discrete one whose possible values are 0 or 1.
- By doing so, **the theoretical value** of the outcome variable (i.e. in the absence of regulatory changes) **for each unit of the control group in 2015** is obtained.

3. Empirical strategy

The **Second stage** of the identification strategy:

the *Diff-in-Diffs model* estimates the incremental share of new open-ended employment contracts caused by the treatment within young people 15-34 years old and, among them, within male and female individuals.

Variables definition:

Y = contractual arrangement of each new hire, equals to 1, if open-ended, or equals to 0, if fixed-term;

P = Period, equals to 0 in 2014 or to 1 in 2015;

T = Treatment, equals to 1, if it is a new eligible hire, or equals to 0, if it is a new not-eligible hire;

ITT = Intention To Treat = incidence of new hire which would not have been registered among eligible population if the two policies under evaluation were not implemented.



3. Empirical strategy

To analyse the impact of the regulatory changes on the young generation, we estimate any different effect on the eligible individuals by age class as a component of the effect on the eligible individuals as a whole.

The OLS model is specified as follows:

$$y = \alpha + [\beta T + \gamma P + \delta TP] + [\bar{\lambda}\bar{X} + \bar{\xi}T\bar{X} + \bar{\vartheta}P\bar{X}] + \tau TPX_{age} + \varepsilon \quad (2)$$

Where:
$$\tau TPX_{age} = \sum_{k=1}^6 \tau_k TPX_{age,k}$$

Given the (2), as shown above, per each of the 6 age classes:

$$ITT_k = (\delta + \tau_k), k=1, \dots, 6$$

Where:

δ = the common component of the effect on the eligible individuals as a whole;

τ = the component of the effect on the eligible individuals by each age class

k = 6 age classes.

3. Empirical strategy

A **similar model** has been adopted for estimating any different effect on the eligible individuals, by age class and sex as a specific component of the effect on the eligible individuals as a whole:

$$y = \alpha + [\beta T + \gamma P + \delta TP] + [\bar{\lambda}\bar{X} + \bar{\xi}T\bar{X} + \bar{\vartheta}P\bar{X}] + \tau TPX_{age_sex} + \varepsilon \quad (3)$$

Where:

$$\tau TPX_{age_sex} = \sum_{z=1}^{12} \tau_z TPX_{age_sex,z}$$

Given the (3), as shown above, per each of the 12 categories (age classes **nested by sex**):

$$ITT_z = (\delta + \tau_z), \quad z=1, \dots, 12$$

Where:

δ = the common component of the effect on the eligible individuals as a whole;

τ = the component of the effect on the eligible individuals by each age class nested by sex ;

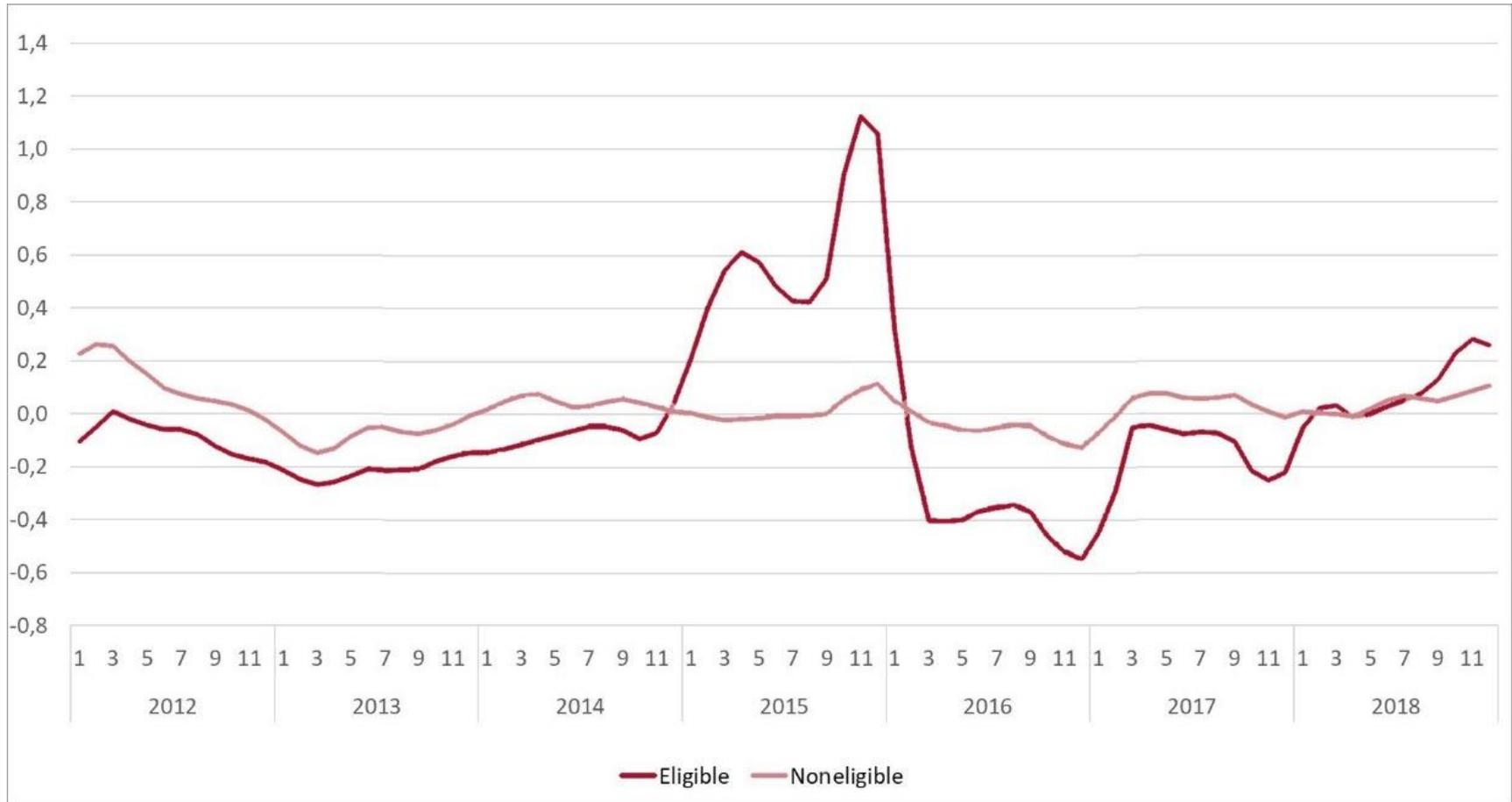
z = age classes nested by sex.

3. Empirical strategy

Third stage, the share is applied to the whole new *eligible* open-ended employment contracts registered during 2015 to estimate the impact of the public intervention on the number of the new contracts that would not have been signed in its absence.

4. Sample descriptive statistics

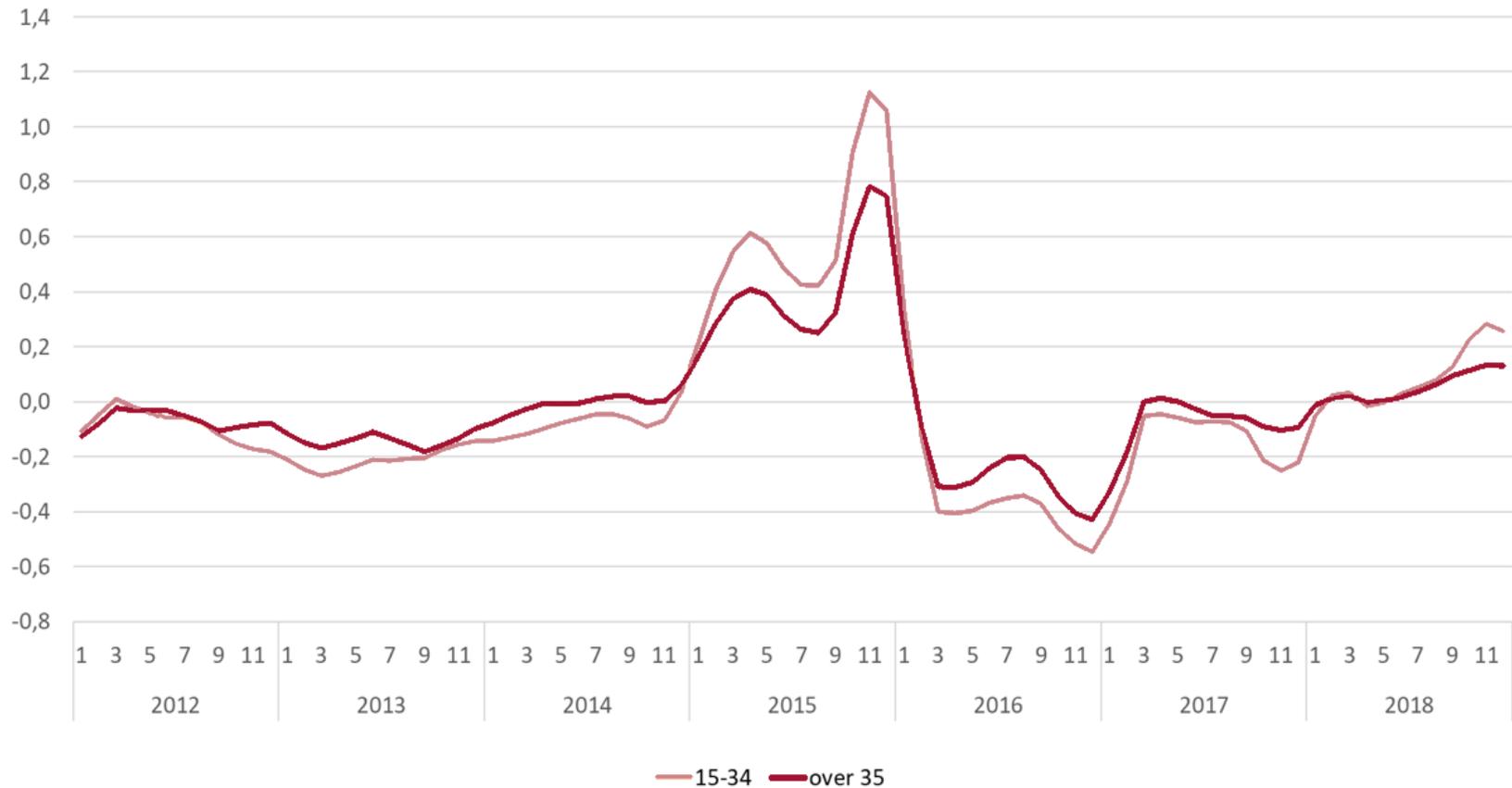
Figure 3 Growth rate of new hires with open-ended employment contract: eligible vs. non-eligible (15-34)



Source: Ministry of Labour (SISCO), data seasonally adjusted and processed by Inapp

4. Sample descriptive statistics

Growth rate of new hires with open-ended employment contract: 15-34 vs over 35



Source: Ministry of Labour (SISCO), data seasonally adjusted and processed by Inapp

4. Sample descriptive statistics

Table 2 Details of the outcome distribution by sex, age, education, working time and nationality

		2014				2015				Differences 2015-2014			
		E(y)			Total hires	E(y)			Total hires	E(y)			Total hires
		Non eligible	Eligible	Total		Non eligible	Eligible	Total		Non eligible	Eligible	Total	
sex	male	0.57	0.17	0.21	3,520,142	0.50	0.26	0.28	4,096,251	-0.07	0.09	0.07	576,109
	female	0.55	0.13	0.17	2,761,215	0.50	0.22	0.25	3,057,808	-0.05	0.09	0.08	296,593
age	15-24	0.39	0.12	0.14	826,009	0.35	0.22	0.23	949,290	-0.04	0.10	0.09	123,281
	25-34	0.50	0.16	0.20	1,766,009	0.46	0.27	0.29	1,990,014	-0.04	0.10	0.09	224,005
	35-44	0.61	0.17	0.21	1,735,327	0.53	0.25	0.28	1,953,101	-0.08	0.09	0.07	217,774
	45-54	0.63	0.16	0.20	1,337,731	0.55	0.23	0.26	1,529,576	-0.09	0.08	0.06	191,845
	55-64	0.69	0.15	0.20	544,293	0.60	0.21	0.24	646,378	-0.10	0.06	0.04	102,085
	Over 64	0.72	0.09	0.11	71,988	0.59	0.14	0.17	85,700	-0.13	0.06	0.05	13,712
Educational attainment	Lower secondary	0.60	0.15	0.20	4,012,028	0.53	0.21	0.25	4,388,595	-0.07	0.06	0.05	376,567
	Upper secondary	0.45	0.15	0.17	1,743,047	0.38	0.28	0.28	2,105,461	-0.06	0.12	0.11	362,414
	Tertiary and over	0.58	0.19	0.22	526,281	0.58	0.31	0.33	660,002	-0.01	0.12	0.11	133,721
Part /full time	Full time	0.53	0.12	0.16	4,429,986	0.46	0.20	0.22	5,045,568	-0.07	0.07	0.06	615,582
	Part-time	0.62	0.23	0.28	1,851,371	0.56	0.36	0.39	2,108,490	-0.06	0.13	0.10	257,119
Nationality	Italian	0.53	0.15	0.19	4,975,392	0.46	0.25	0.27	5,718,280	-0.07	0.10	0.08	742,889
	others	0.64	0.16	0.23	1,305,965	0.61	0.21	0.27	1,435,778	-0.03	0.05	0.04	129,813
Total		0.56	0.15	0.19	6,281,357	0,50	0.24	0.27	7,154,058	-0,06	0.09	0.07	872,701

Source: Ministry of Labour (SISCO), data processed by Inapp



5. Evaluation results

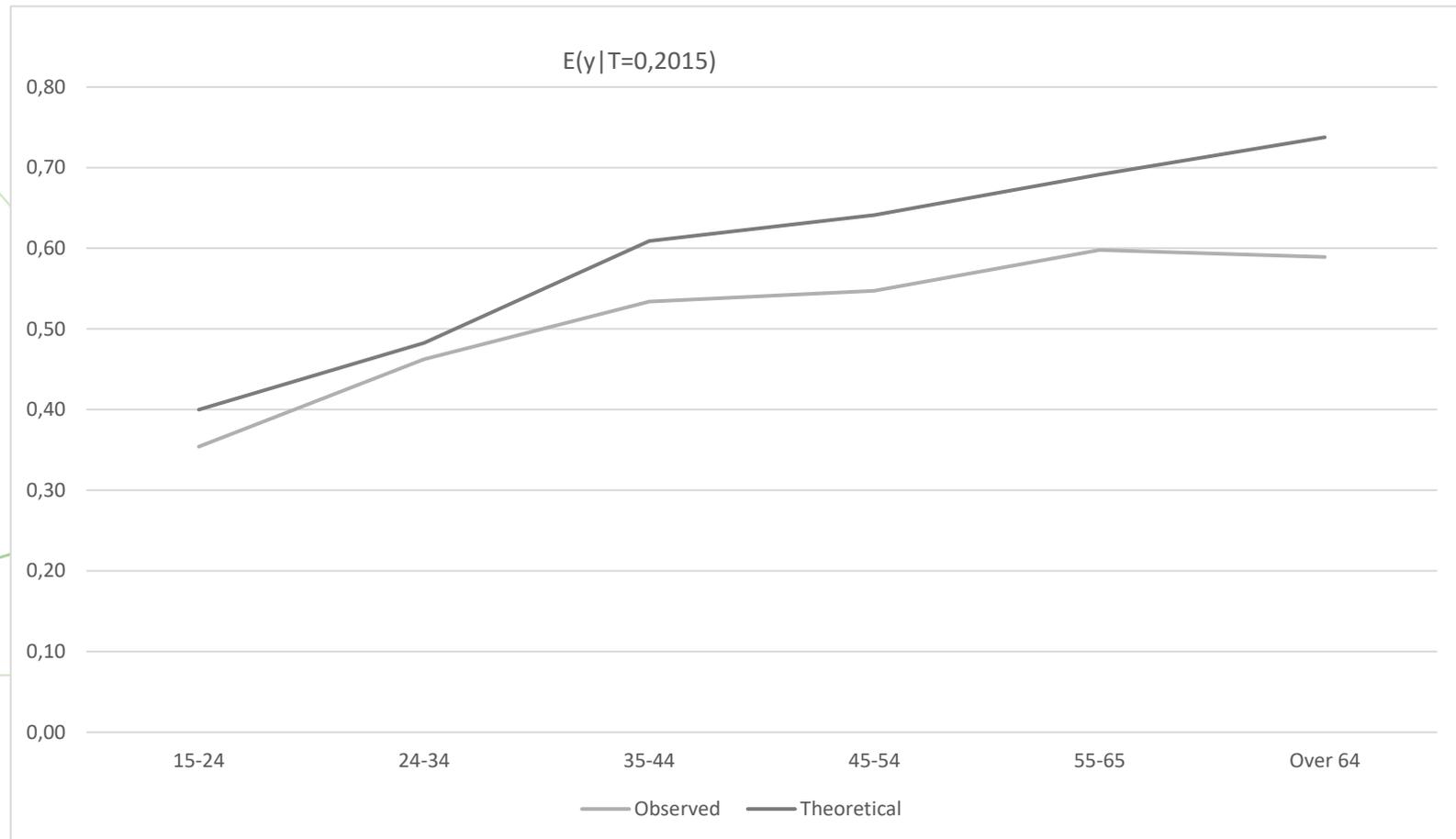
Table 3 Average observed - $E(y)$ - and theoretical - $E(y_{cd})$ - value of the **Control group's** outcome variable in 2014 and 2015

		2014	2015	
		$E(y)$	$E(y)$	$E(y_{cd})$
sex	male	0.57	0.50	0,56
	female	0.55	0.50	0,56
age	15-24	0.39	0.35	0,40
	25-34	0.50	0.46	0,48
	35-44	0.61	0.53	0,61
	45-54	0.63	0.55	0,64
	55-64	0.69	0.60	0,69
	Over 64	0.72	0.59	0,74
	Education attainment	Lower secondary	0.60	0.53
	Secondary	0.45	0.38	0,45
	Tertiary and over	0.58	0.58	0,59
Part/Full Time	Full time	0.53	0.46	0,53
	Part-time	0.62	0.56	0,60
Nationality	Italian	0.53	0.46	0,53
	Other	0.64	0.61	0,64
Total		0.56	0.50	0.56

Source: Ministry of Labour (SISCO), data processed by Inapp

5. Evaluation results

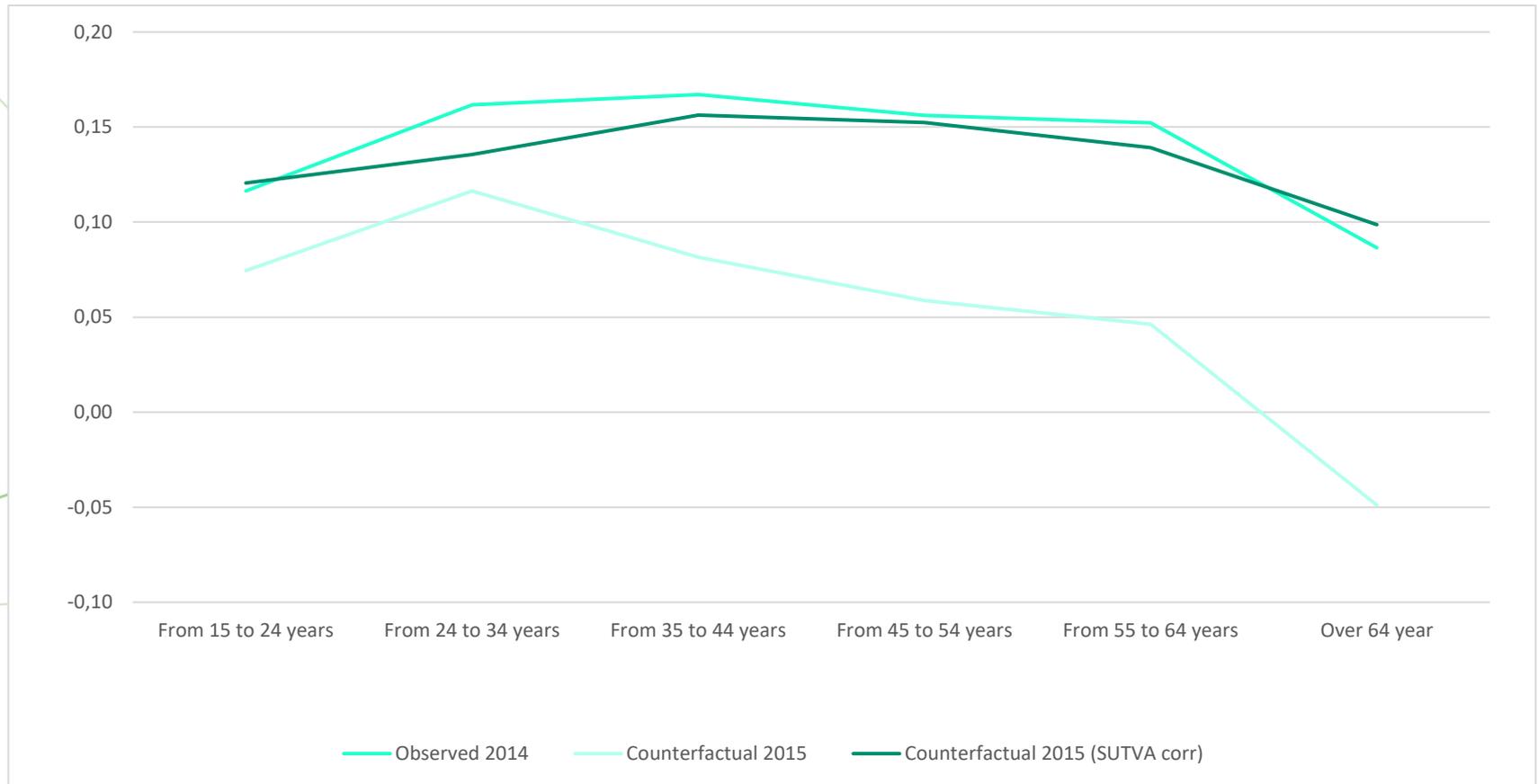
Figure 7 Control group: average of the outcome in 2015 (with vs. without correction)



Source: Ministry of Labour (SISCO), data processed by Inapp

5. Impact Evaluation results

Figure 8 Treatment Group: average outcome in 2014 and estimated counterfactual values in 2015 (with vs. without correction).



Source: Ministry of Labour (SISCO), data processed by Inapp

5. Impact Evaluation results

Table 4 Outcome variable distribution on treatment group by periods

			Type of Employment contract (y)					
			Fixed term		Open ended		Total	
			%	contract	% (outcome)	contract	%	contract
Observed	2015	15-34	75.0	1,978,472	25.0	660,966	100.0	2,639,438
		Total	75.8	4,881,842	24.2	1,556,095	100.0	6,437,937
	2014	15-34	85.3	1,986,124	14.7	341,993	100.0	2,328,117
		Total	84.6	4,794,472	15.4	873,569	100.0	5,668,041
	diff	15-34	-	-7,652	-	318,973	-	311,321
	2015-2014	Total	-	87,371	-	682,526	-	769,897
ITT	2015	15-34	88.0	2,323,174	12.0	316,264	100.0	2,639,438
		Total	90.1	5,799,817	9.9	638,120	100.0	6,437,937

5. Impact Evaluation results

Table 5 Outcome variable distribution on treatment group by gender and periods

			Type of Employment contract (y)					
			Fixed term		Open ended		Total	
15-34			%	contract	% (outcome)	contract	%	contract
Observed	2015	M	74.2	1,112,978	25.8	386,301	100	1,499,279
		F	75.9	865,494	24.1	274,665	100	1,140,159
		Total	75.0	1,978,472	25.0	660,966	100	2,639,438
	2014	M	84.1	1,080,741	15.9	204,320	100	1,285,061
		F	86.8	905,383	13.2	137,673	100	1,043,056
		Total	85.3	1,986,124	14.7	341,993	100	2,328,117
	diff 2015- 2014	M	-	32,237	-	181,981	-	214,218
		F	-	-39,889	-	136,992	-	97,103
		Total	-	-7,652	-	318,973	-	311,321
ITT	2015	M	85.5	1,282,067	14.5	217,212	100	1,499,279
		F	92.4	1,053,158	7.6	87,001	100	1,140,159
		Total	88.5	2,335,225	11.5	304,213	100	2,639,438

Source: Ministry of Labour (SISCO), data processed by Inapp

Conclusion and recommendation

According to our estimates, **the presence of both the hiring incentives** (Law 190/2014, art. 1, c. 118) and the **employers' expectation of reduced firing cost** of employees (Legislative Decree 23/2015 under Law 183/2014) in Italy **increased by 12 % the incidence of newly signed open ended contracts** among eligible people 15-34 years old during 2015.

The impact of the regulatory change on the eligible individuals by age class as a component of the effect on the eligible individuals as a whole **was stronger over the young individuals 15-34 years old (an increase of 12%) than over the entire population (9.9%).**

The results reveal also an impact clearly lower on the female eligible individuals 15-34 years old (ITT=7.6%) than that observed among male ones (ITT=14.5%).

The policies under scrutiny were introduced to recover Italian economy after “the Great recession” (2007-2014). **The results of this study could therefore be of interest** considering that the Italian labour market is about **to face a new unprecedented shock after the pandemic crisis** which is hitting the world economy in 2020.

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