KOF

The Impact of Employment Protection Legislation on the Incidence of Work-Related Training

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Hypotheses

H1a: An increase in EPL increases training of employees

1. Employment relations last longer
2. EPL creates a wedge between productivity gains and actual wage
3. EPL as commitment device

H1b: An increase in EPL decreases training of employees

1. “Insider wage”
2. Temporary contracts as substitute for regular contracts
3. More heterogeneous workforce

H2: The interaction of EPL and the use of temporary work contracts affects training provision negatively

H3: The interaction of EPL and the share of workers above 55 years affects training provision negatively

Empirical evidence

No effect	Sign. Neg effect	Sign. Pos. effect
Country-level: us	**Cross-country:** Brunello et al. (2007)	**Cross-country:** Almeida and Aterido (2011) Pierre and Scarpetta (2004 and 2013)
		Country-level: Picchio and van Ours (2011) Messe and Rouland (2014)

Exemptions

Finland: firm size threshold <20

1. Notification procedures in the case of individual dismissal of a regular worker given a lack of work on the part of the firm
2. Exemption from the definition of collective dismissal

➢ would involve further red tape costs

Italy: firm size threshold <16

1. They are not required to pay, back-pay or reinstate workers who are found to be unfairly dismissed
2. Exemption from the definition of collective dismissal

Empirical framework: RDD

$$Y_i = \alpha + D_i\tau + f(Fi) + \beta X_i + \varepsilon_i$$

- Y_i training activities of firm i
- D_i treatment variable (=1 for firms above size threshold)
- F_i Firm size of firm i
- $f(\cdot)$ functional form of assigment variable
- X_i vector of observed firm charcteristics
- ε_i normally distributed error with mean zero

Method: 2 steps

1. Find optimal bandwidth (non-parametric method, Imbens& Kalyanaraman, 2009)

→ If opt. bandwidth exceeds max. possible, choose maximal («balanced» windows around thresshold)

2. Optimal functional form acc. to AIC (up to 3rd order polynomial)

Validity of the RDD

RDD

- No manipulation of the assigment variable assumption:
  → no self-selection of firms out of or into treatment (being subject to EPL)
  → «as good as» randomly assigned
  → so that: firms (just) above the size threshold are a good counterpart of those (just) below
- Only want to isolate the different behaviour of firms below and above threshold wrt training as a response to stricter EPL

3 validity tests:

1. McCrary Test (2008)
2. Propensity-to-grow below and above the size threshold
3. Balancedness of the covariates

Empirical framework II: heterogeneity & robustness check

$$Y_i = \alpha + D_i\tau + f(Fi) + Z_i\gamma + \delta D_i Z_i + \beta X_i + \varepsilon_i$$

- Where Z_i:

a) Dummy=1 if firm i has temporary employees
   → hypothesis H2

b) Share of workers above country mean in firm i
   → hypothesis H3

c) Employment volatility of sector j, then index i=j
   → robustness check DiD
   - validity assumption 1: have to assure that volatility is not «contamined» by presence of EPL (USA as «benchmark» country)
   - validity assumption 2: assure independence of volatility and selection across industries (by means of a McCrary Test by industry)

Data

- CVTS3 firm survey (Eurostat), reference year 2005

Two outcome variables:

1. Extensive margin: *Train 0/1*; =1 if firm trained persons (≥ 1) employed by enterprise
   → Finland: N=353; Italy: N=7387
2. Intensive margin: *Train Hours*; total # number of paid working hours spent for training
   → Finland: N=183; Italy: N=1795

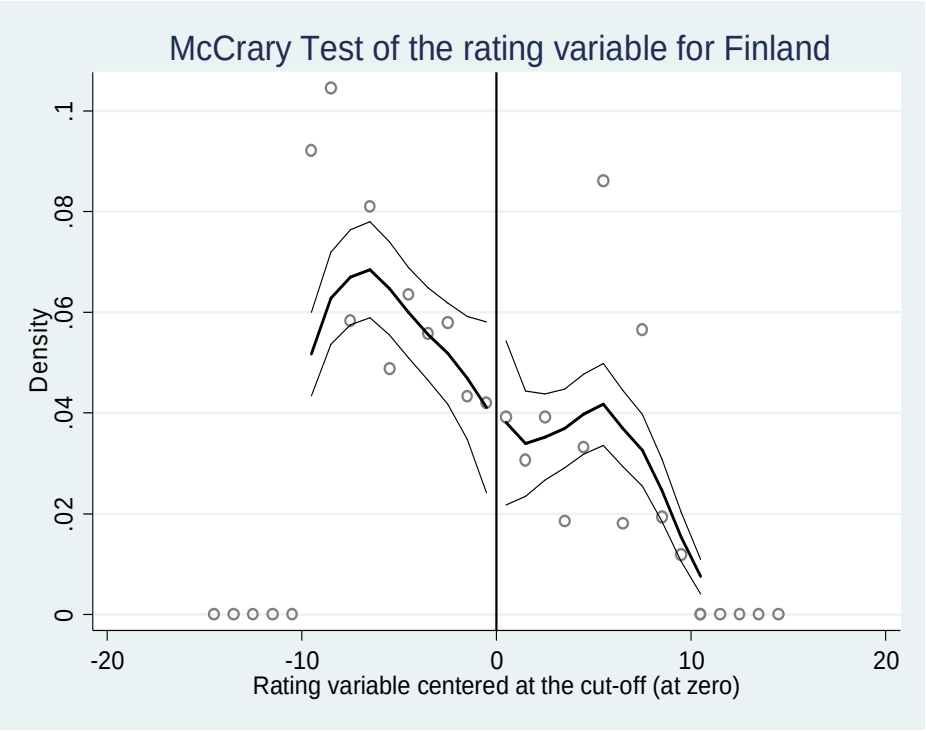
- Definition of training: «Continuing vocational education & training»

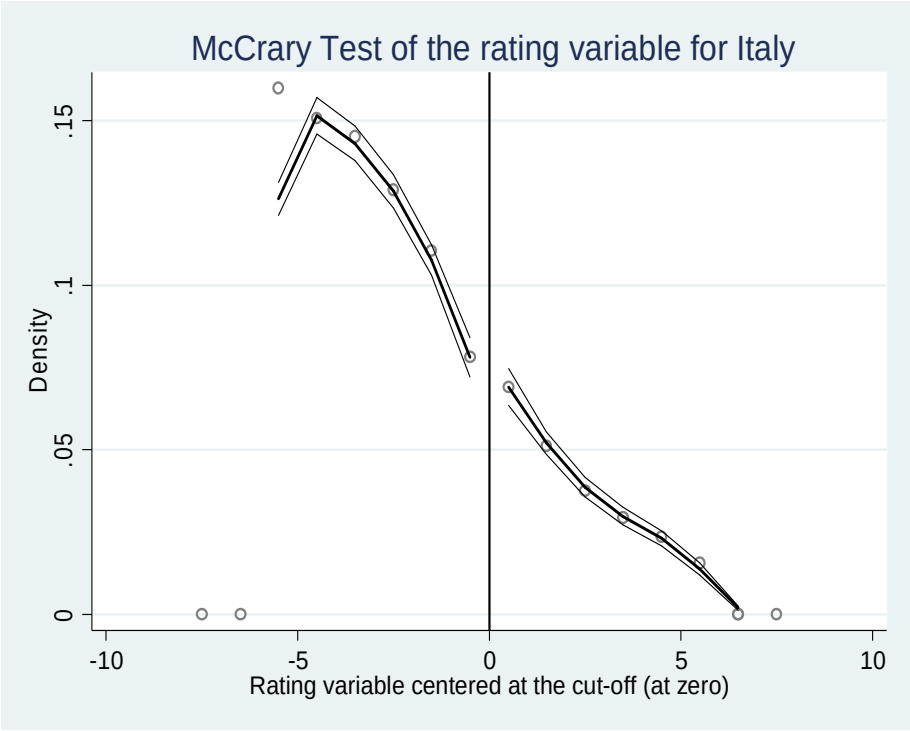
→ formal training (no on-the-job, no apprentice training)

- Covariates: industr. dummies, innovation (0/1), average wage, age (shares:<25; 25-54; 55+), if firms has: part-time employees (0/1), or temporary employees (0/1)
- Assigment variable: # of employees (only for firms > 10 employees), centered (F country-specific firm size threshold substracted)

➢ integer → clustered SEs

Results: Validity of the RDD



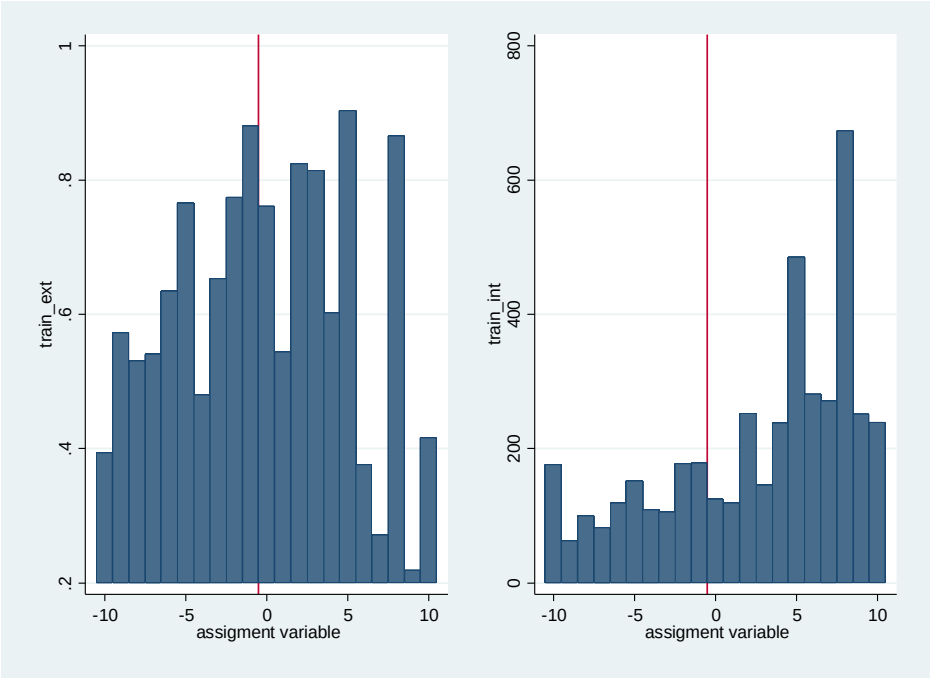


FI	Bandwidth	**10**	**20**
	Discontinuity estimate	0.057	-0.156
	[standard errors]	[0.386]	[0.357]

IT	Bandwidth	**6**	**12**
	Discontinuity estimate	-0.123	0.229***
	[standard errors]	[0.109]	[0.085]

Results: Outcome against assignment variable

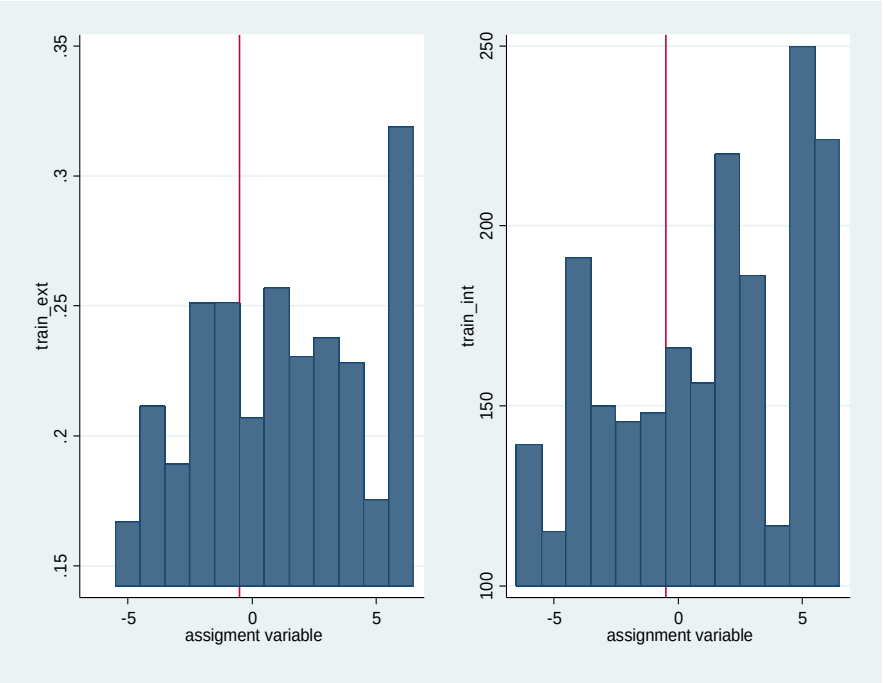
Finland



Extensive margin

Intensive margin

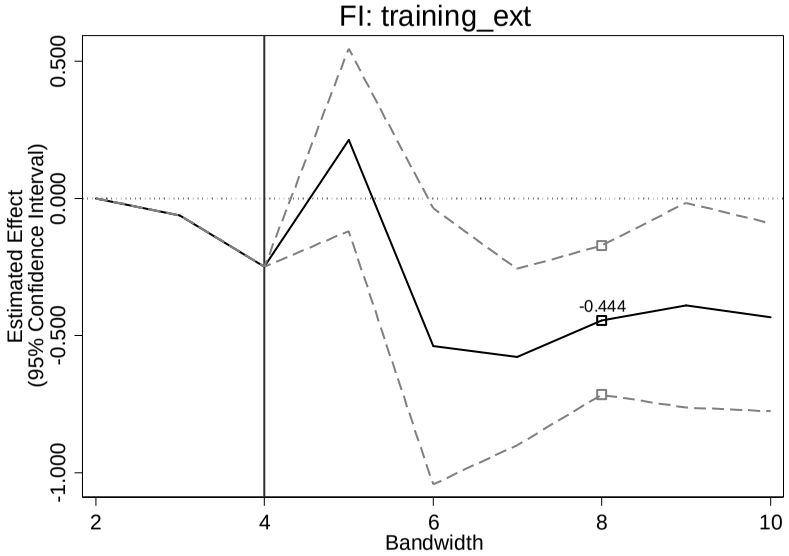
Italy

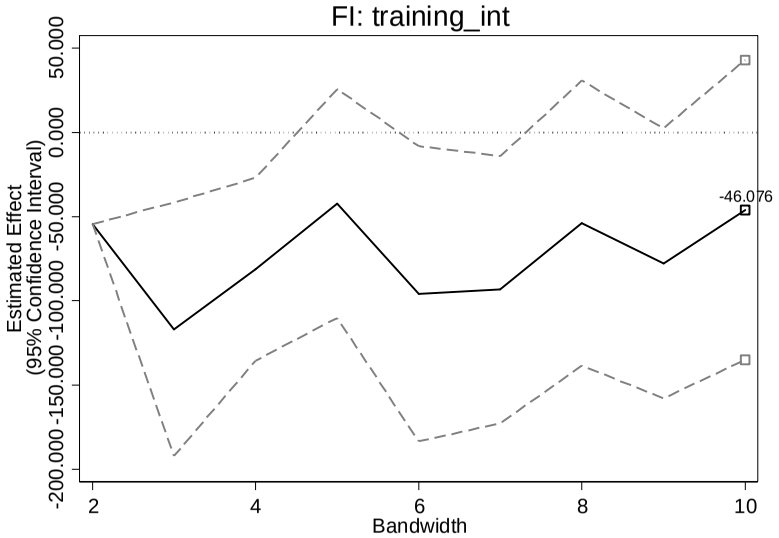


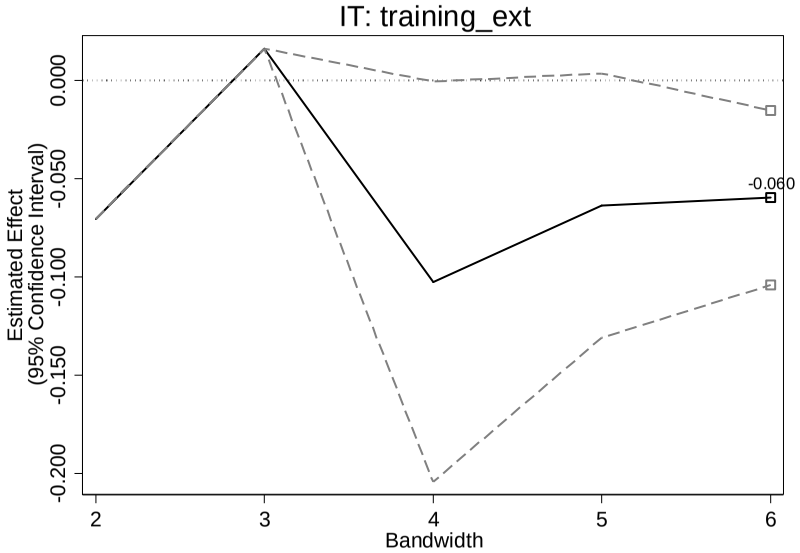
Extensive margin

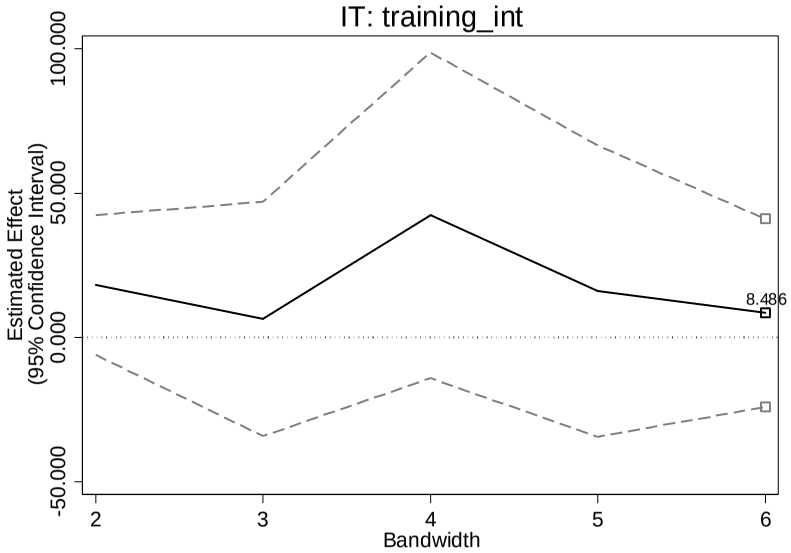
Intensive margin

RDD estimates to test hypotheses H1a & H1b

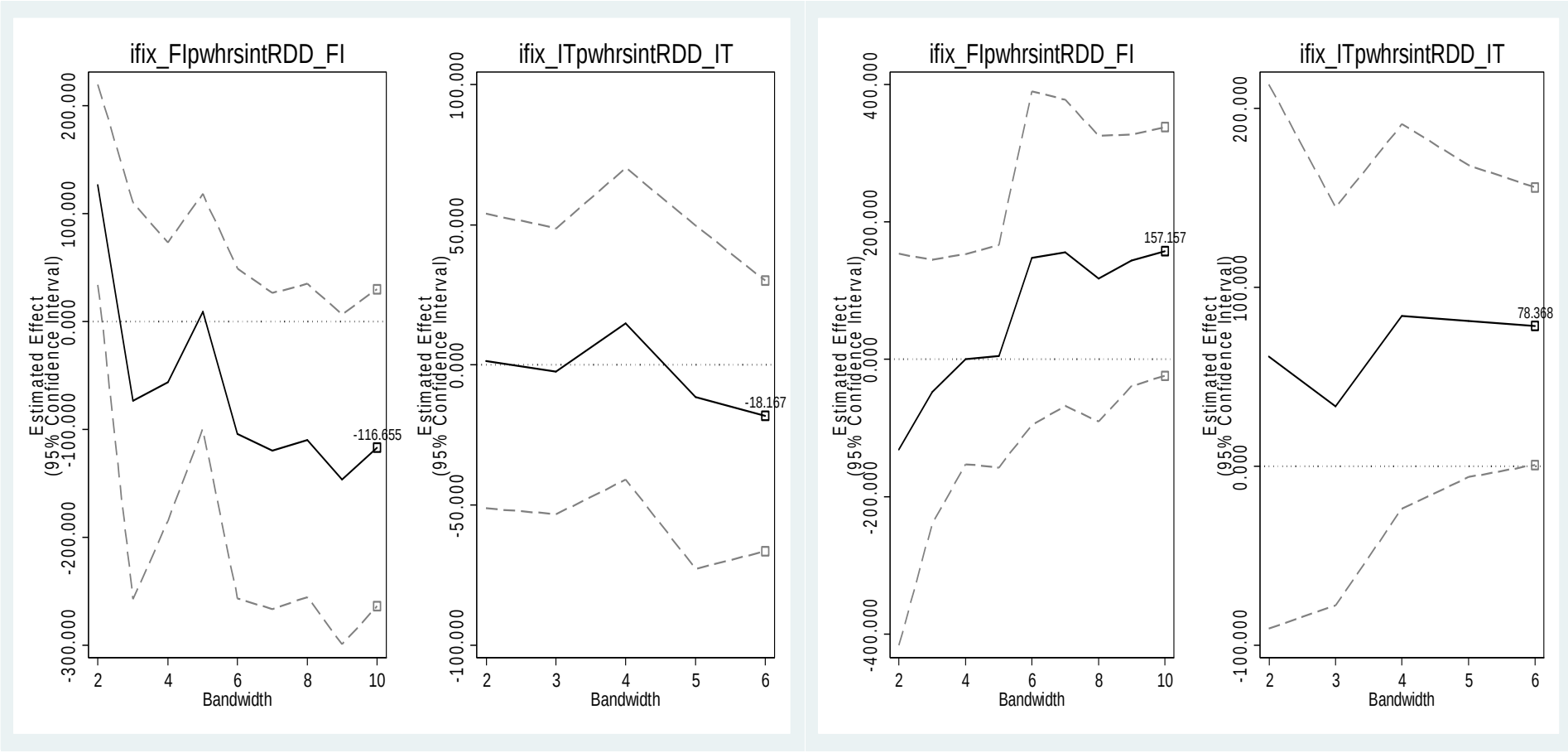








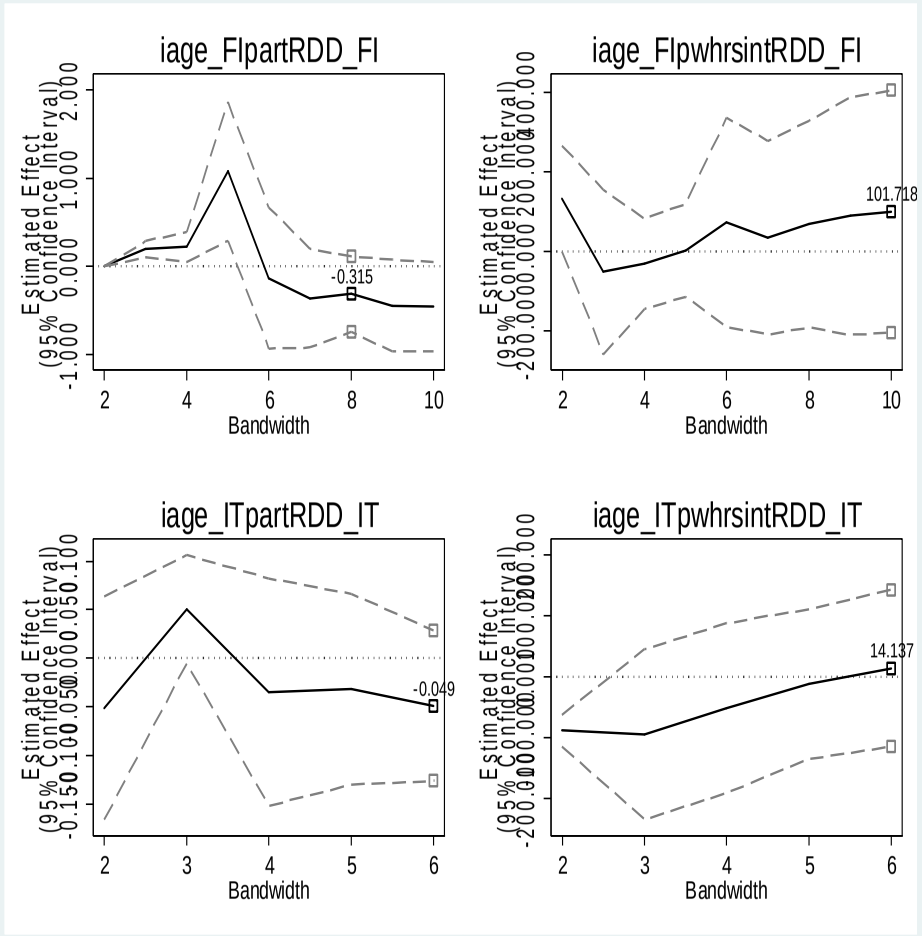
Heterogeneity: Interaction of treatment and temporary worker use (for intensive margin only) to test hypotheses H2



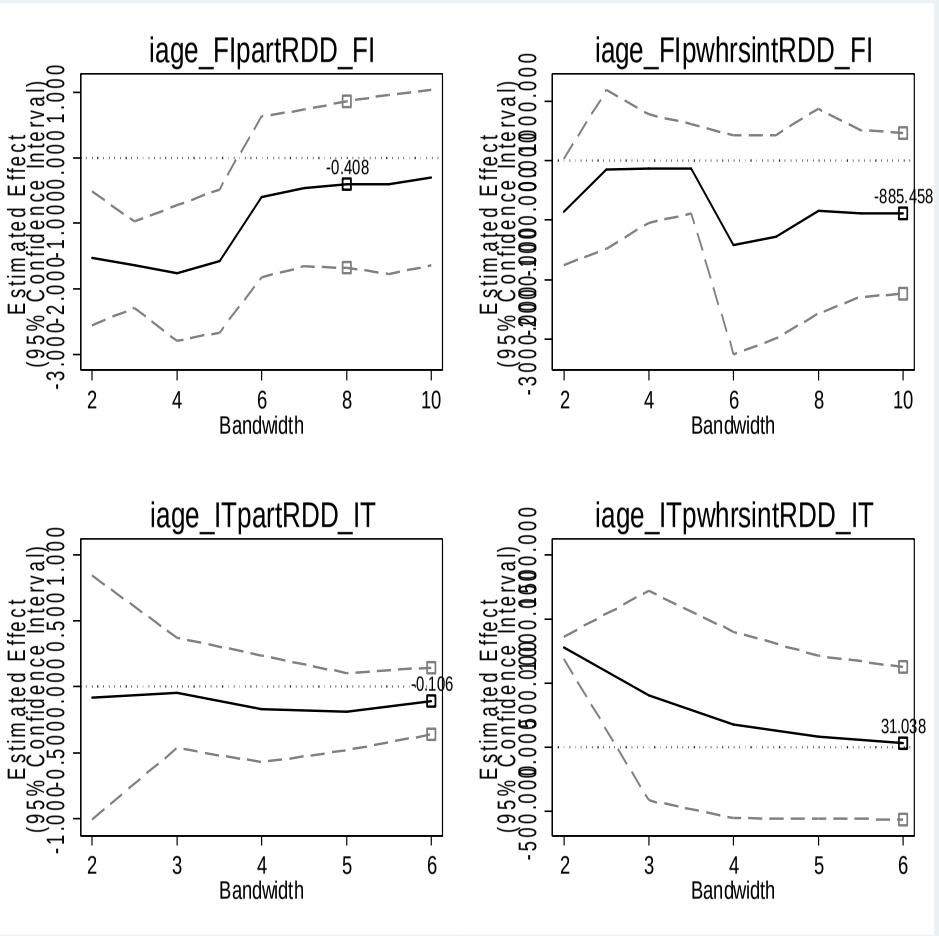
Threshold effect

Interaction term

Heterogeneity: Interaction of treatment and share of workers aged 55+ to test hypotheses H3



Threshold effect



Interaction term

Robustness checks

- Donut regressions (leaving out 1 and 2 obs of the assignment variable to the right and left of threshold respectively)
- With robust standard errors
- With robust standard errors and covariates
- Without weights
- DiD sector volatility

Open Question

How to account for selection in intensive margin?

1. OLS (not account)
2. Including inverse Mills Ratio, baseline model for extensive margin as selection model
   i) Using non-linearity of baseline model for extensive margin
   ii) Using instrument: whether lack of suitable courses in the market affects firm decision to train or not
3. Using Tobit model: marginal effects of Tobit estimates conditional on positive training

Consistent estimates for Finland...

Bandwidth	2	3	4	5	6	7	8	9	10
Baseline	-54.401***	-116.818**	-81.212***	-42.245	-95.842**	-93.326**	-53.873	-77.749*	-46.076
	(0.000)	(29.253)	(22.958)	(30.009)	(39.812)	(36.699)	(39.689)	(37.958)	(42.503)
IMR Nonlinear	-54.401***	-49.960**	-32.774	-29.010	-20.476	-52.692	-60.882*	-77.278*	-46.203
	(0.000)	(17.251)	(44.071)	(21.847)	(42.767)	(41.778)	(31.586)	(41.180)	(43.889)
IMR Instrument	3.443	-96.484	-64.161	2.171	-65.849	-92.206	-65.421	-75.492	-35.319
	(39.623)	(86.516)	(71.153)	(61.540)	(68.222)	(68.893)	(51.927)	(47.460)	(50.328)
Tobit	-75.786***	-126.774***	-107.503***	-42.573	-89.180*	-69.367*	-3.066	-20.953	-2.995
	(0.465)	(28.631)	(21.627)	(36.990)	(44.357)	(42.140)	(52.517)	(50.783)	(48.349)
N	34	53	74	94	112	122	140	152	162

Note: Standard errors in parenthesis

IMR not significant in both specifications

...but inconsistent estimates for Italy

Bandwidth	2	3	4	5	6
Baseline	18.131*	6.441	42.300	16.053	8.486
	(7.598)	(15.805)	(23.875)	(22.316)	(14.796)
IMR Nonlinear	3.785***	-39.214	39.155	61.433*	14.219
	(0.000)	(28.647)	(42.684)	(30.549)	(31.567)
IMR Instrument	41.151	3.039	50.687	32.216	31.475
	(37.901)	(19.464)	(26.961)	(20.553)	(18.333)
Tobit	-12.052*	-16.829***	-8.501**	-12.152**	-13.940***
	(6.672)	(4.384)	(4.244)	(5.178)	(5.303)
N	712	1006	1334	1586	1795

Note: Standard errors in parenthesis

IMR not significant in both specifications

Literature

- Almeida, R. K. and Aterido, R. (2011)."On-the-job training and rigidity of employment protection in the developing world: Evidence from differential enforcement," Labour Economics, Elsevier, vol. 18(S1), pages S71-S82.
- Brunello, G., Garibaldi, P. and Wasmer, E. (ed.) (2007)."Education and Training in Europe," OUP Catalogue, Oxford University Press, number 9780199210978, March.
- Messe, P.-J. and Rouland, R. (2014). “Stricter emplyoemnt protection and firm’s incentives to sponsor training: The case of French older workers”, Vol.31, December 2014, Pages 14–26.
- Picchio, M. and Ours, J. C. van (2011)."Market imperfections and firm-sponsored training," Labour Economics, Elsevier, vol. 18(5), pages 712-722, October.
- Pierre, G. and Scarpetta, S. (2004)."Employment regulations through the eyes of employers - do they matter and how do firms respond to them?", Policy Research Working Paper Series 3463, The World Bank.
- Pierre, G. and Scarpetta, S. (2013). “Do firms make greater use of training and temporary employment when labour adjustment costs are high?”, IZA Journal of Labour Policy, Vol.2(15).

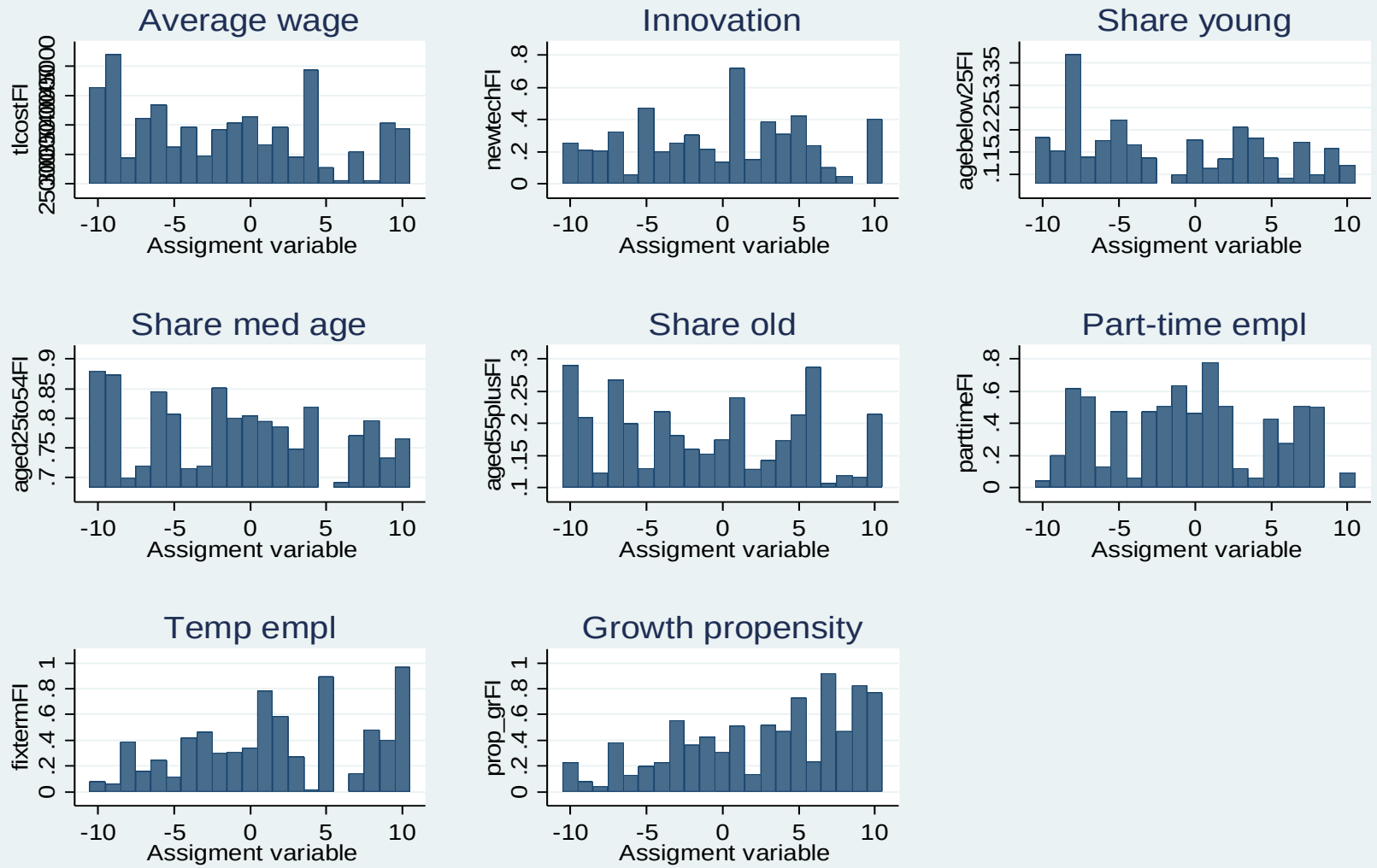
Thanks for your attention!

Descriptive statistics detailed

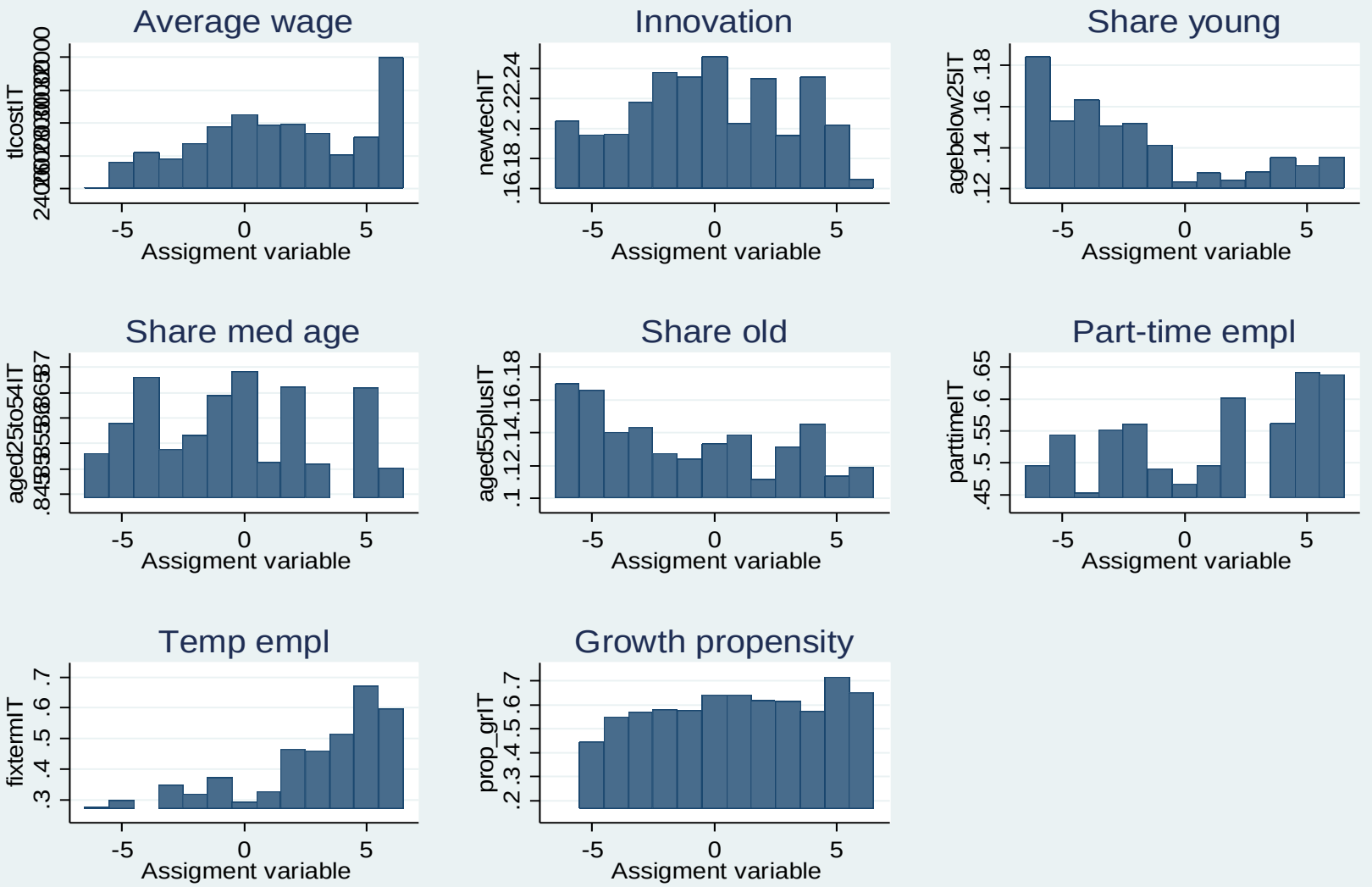
Finland	Full Sample			Firm Size 10-19		Firm Size 20-29		Firm Size 10-29
Variable	**Obs**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**obs**
Train 0/1	1240	0.70	0.46	0.60	0.49	0.66	0.48	353
Train Hours	896	662.3	2178.3	122.8	128.1	328.2	332.5	183
Average Wage	1205	34760.1	13490.4	36811.6	12696.2	31945.7	12644.9	353
Innovation	1117	0.28	0.45	0.25	0.43	0.28	0.45	319
Share Young	973	0.17	0.17	0.18	0.18	0.14	0.08	204
Share Med Age	1199	0.76	0.17	0.80	0.17	0.76	0.13	351
Share Old	1060	0.17	0.12	0.19	0.13	0.17	0.13	254
Part-Time Emp	812	0.50	0.50	0.36	0.48	0.41	0.50	158
Temp Emp	813	0.51	0.50	0.23	0.42	0.57	0.50	160
Growth Propensity	991	0.45	0.50	0.25	0.44	0.55	0.50	272

Italy	Full Sample			Firm Size 10-15		Firm Size 16-21		Firm Size 10-21
Variable	**Obs**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**obs**
Train 0/1	15470	0.27	0.44	0.19	0.40	0.23	0.42	7387
Train Hours	5985	1071.4	9342.7	149.8	276.3	174.4	289.7	1795
Average Wage	15470	28319.0	12607.5	25809.7	11572.1	27769.7	10983.8	7387
Innovation	15470	0.24	0.43	0.21	0.41	0.22	0.42	7387
Share Young	8218	0.13	0.12	0.16	0.12	0.13	0.11	3278
Share Med Age	14493	0.86	0.13	0.86	0.13	0.86	0.12	7378
Share Old	9788	0.12	0.09	0.15	0.09	0.13	0.10	4078
Part-Time Emp	5986	0.62	0.48	0.51	0.50	0.51	0.50	1795
Temp Emp	5986	0.49	0.50	0.31	0.46	0.40	0.49	1795
Growth Propensity	15470	0.55	0.50	0.46	0.50	0.63	0.48	7387

Validity of the RDD II: Firm charact. around threshold Finland



Validity of the RDD II: Firm charact. around threshold Italy



Propensity to grow by country

	Finland	Italy
Size dummy		
Firmsize 12		-0.0688
		[0.635]
Firmsize 13		0.112
		[0.664]
Firmsize 14		-0.0645
		[0.645]
Firmsize 15		0.00929
		[0.555]
Firmsize 16	0.484	
	[0.837]	
Firmsize 17	-1.079	
	[0.872]	
Firmsize 18	-0.0658	
	[0.851]	
Firmsize 19	-0.228	
	[0.684]	
Total firmsize_t-1	-1.009*	-0.82
	[0.479]	[0.465]
(Total firmsize_t-1)^2	0.0598*	0.0464
	[0.0253]	[0.0241]
(Total firmsize_t-1)^3	-0.00125*	-0.000983*
	[0.000490]	[0.000479]
(Total firmsize_t-1)^4	0.00000713**	0.00000609*
	[0.00000272]	[0.00000289]
Average Wage	-0.0000226	0.0000102***
	[0.0000166]	[0.00000161]
Innovation	0.465	0.0668
	[0.315]	[0.0654]
Share Young	-2.326**	-0.706**
	[0.729]	[0.260]

RDD estimates by bandwidth

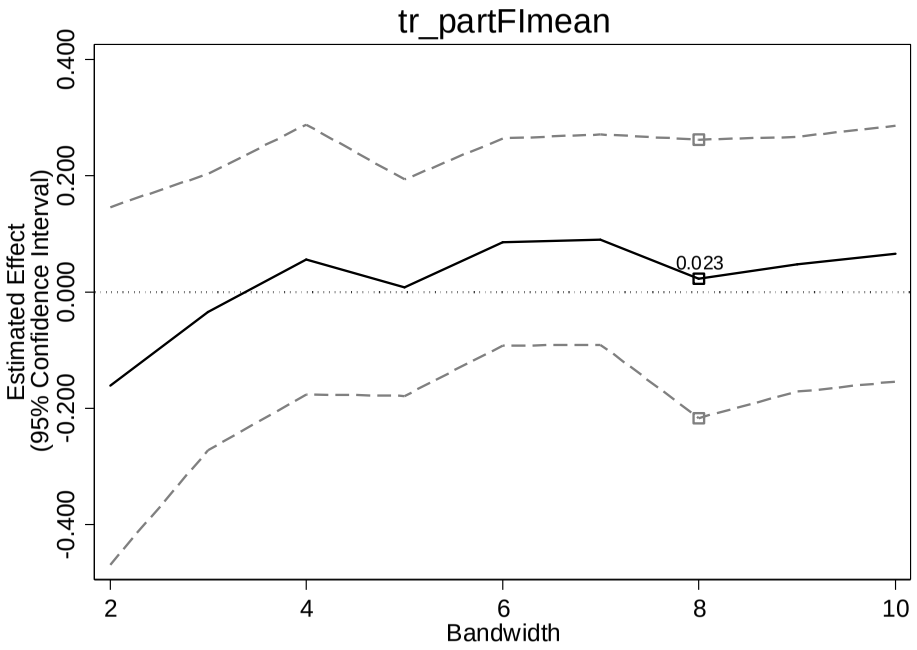
RDD Results for Finland

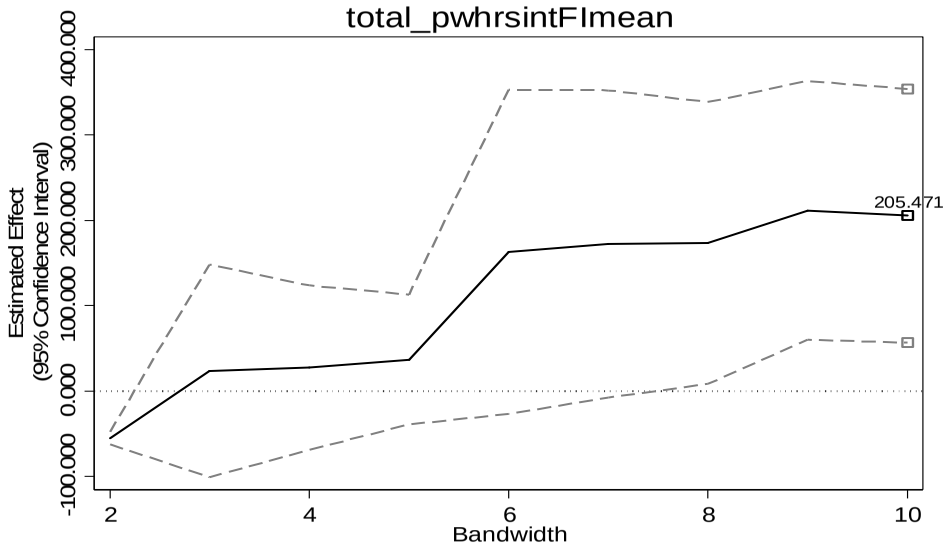
Specification	**Bandwidth**								
training_ext	**2 (1)**	**3(1)**	**4(1)**	**5**	**6**	**7**	**8**	**9**	**10**
cubic interaction	0	-0.0620***	-0.249***	0.213	-0.538*	-0.578**	-0.444**	-0.389*	-0.433*
	[.]	[6.53e-15]	[4.50e-13]	[0.147]	[0.229]	[0.149]	[0.128]	[0.177]	[0.164]
R^2	0.07	0.057	0.089	0.07	0.047	0.054	0.097	0.041	0.065
N	[1.55e-13]	96	136	172	206	248	290	323	353
training_int	0.038	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
linear interaction	38	-116.8*	-81.21**	-42.25	-95.84*	-93.33*	-53.87	-77.75	-46.08
	0	[29.25]	[22.96]	[30.01]	[39.81]	[36.70]	[39.69]	[37.96]	[42.50]
R^2	[.]	0.058	0.038	0.031	0.234	0.24	0.204	0.291	0.273
N	63	59	83	106	124	140	160	173	183

RDD Results for Italy

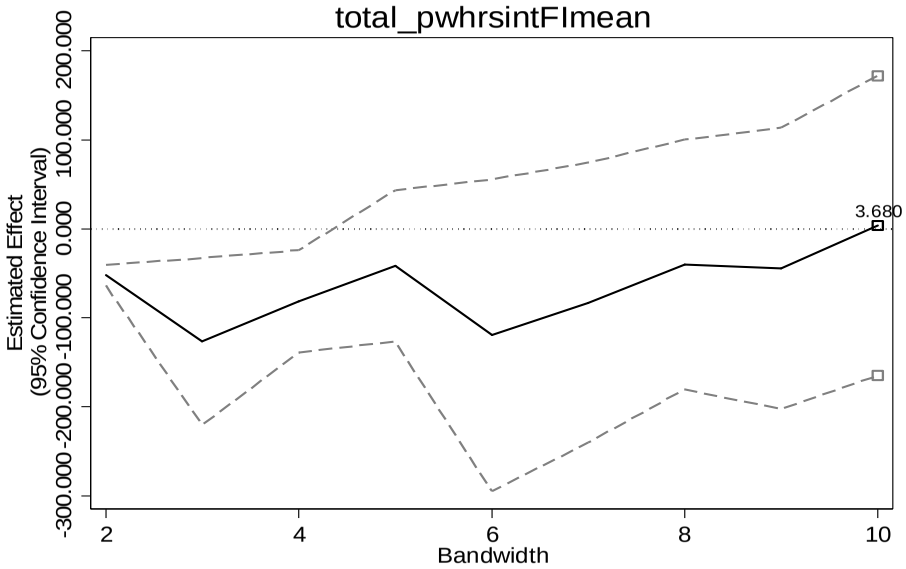
Specification	**Bandwidth**				
training_ext	**2 (1)**	**3**	**4**	**5**	**6**
quadratic interaction		0.0163***	-0.102*	-0.0636	-0.0596*
		[8.71e-14]	[0.0431]	[0.0297]	[0.0202]
R^2		0.004	0.002	0.004	0.008
N	2588	3904	5194	6314	7387
training_int	**2**	**3**	**4**	**5**	**6**
linear	18.13	6.441	42.3	16.05	8.486
	[7.598]	[15.80]	[23.88]	[22.32]	[14.80]
R^2	0.001	0.003	0.001	0.001	0.002
N	712	1006	1334	1586	1795

Finland: means

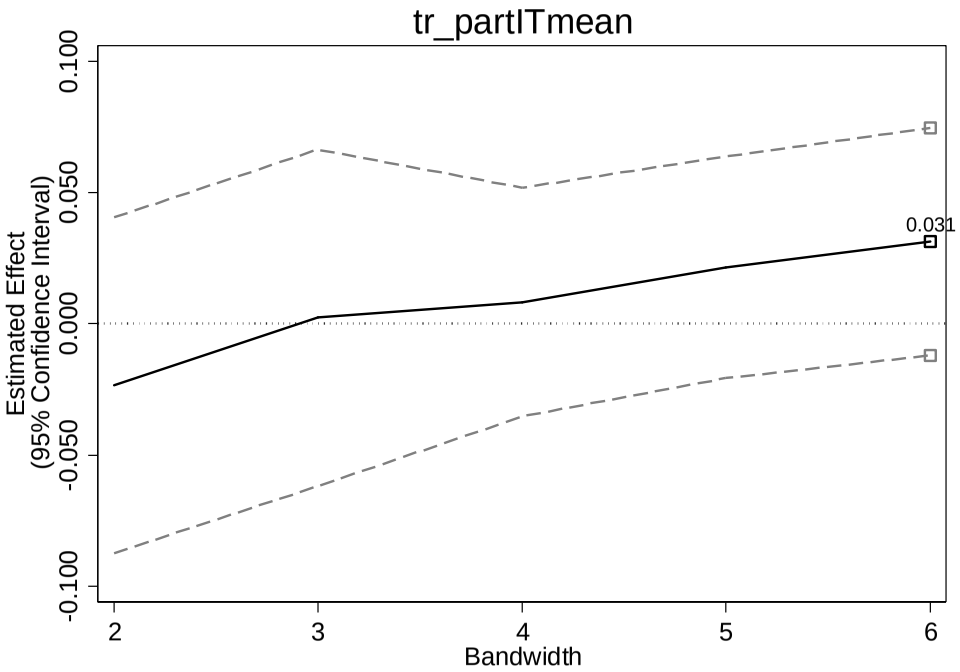


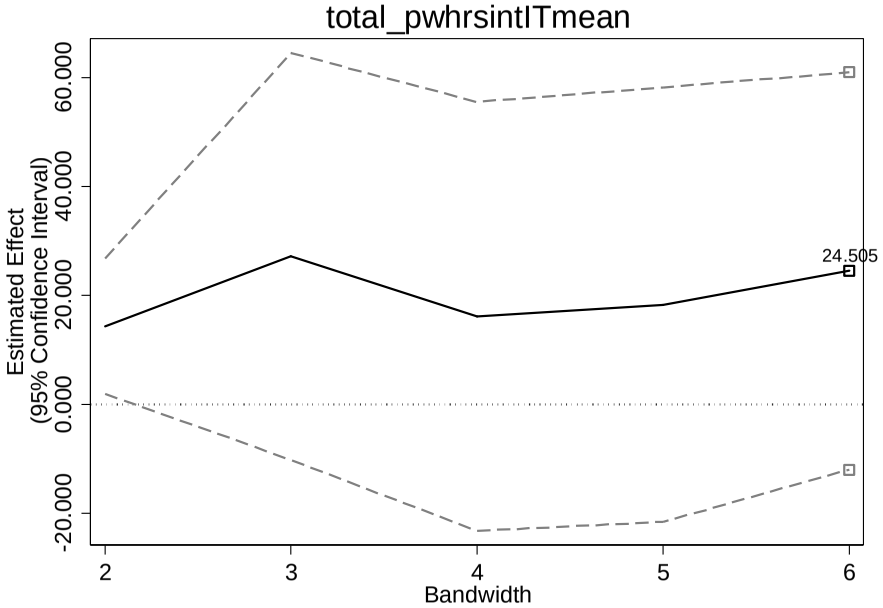


Below: allowing for different slopes for intensity var

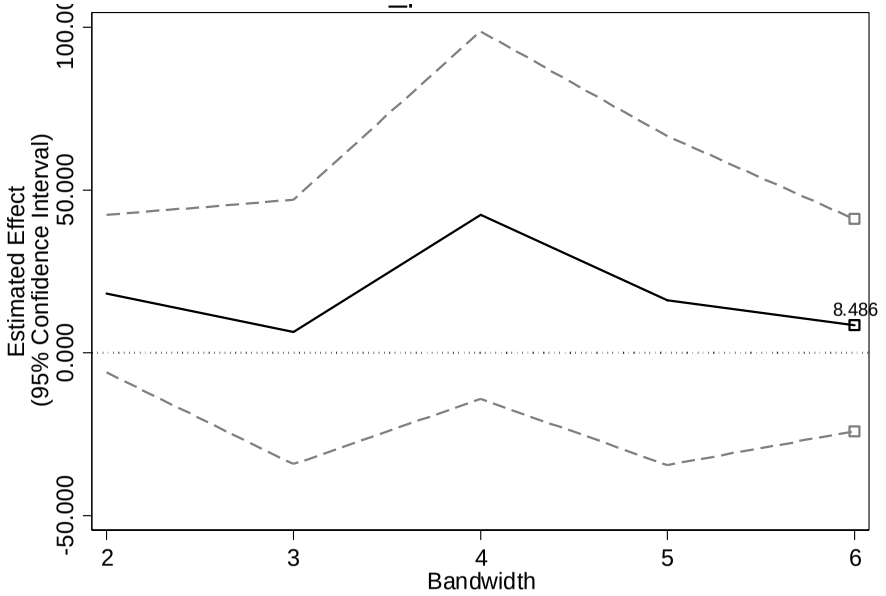


Italy: means

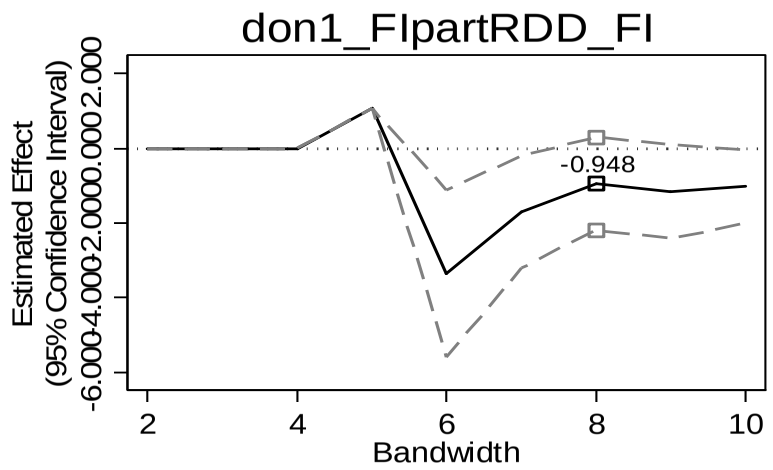


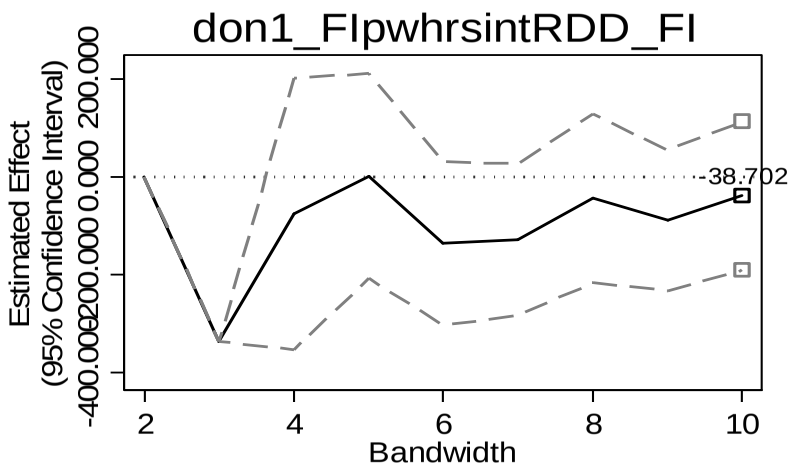


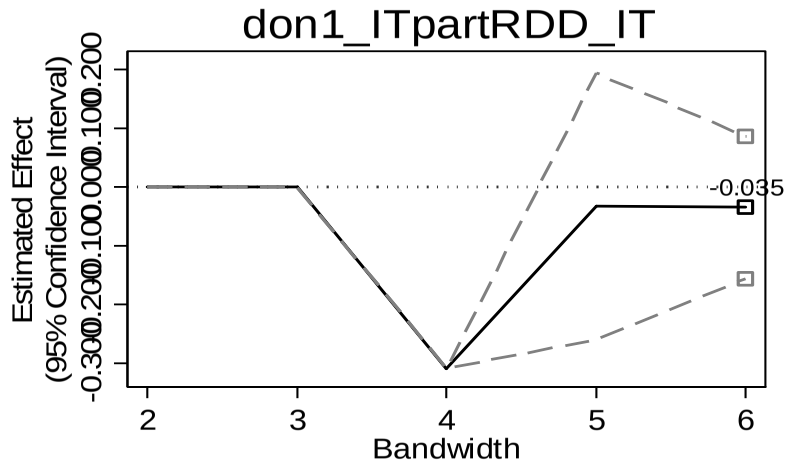
Below: allowing for different slopes for intensity var

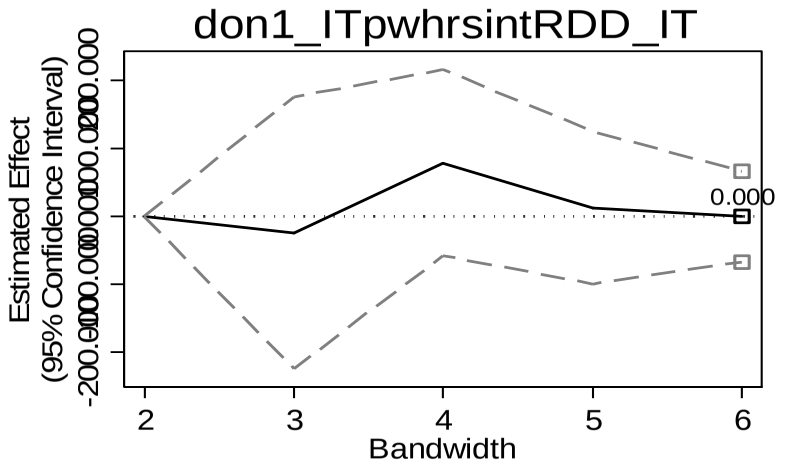


Donut regressions

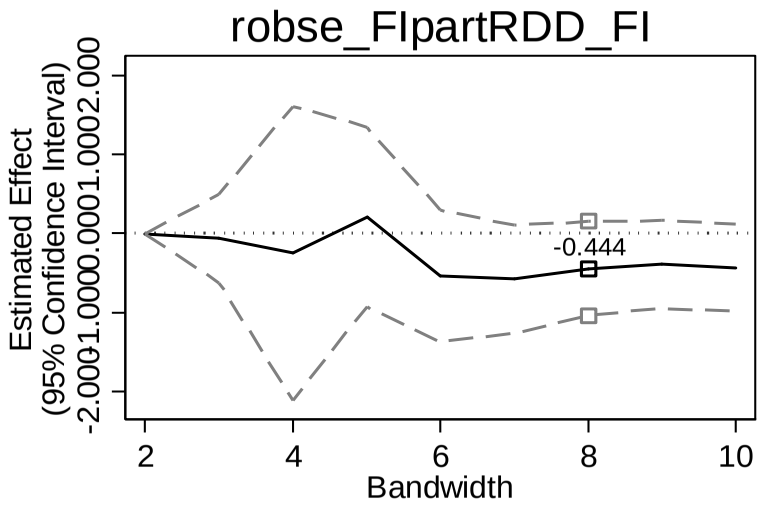


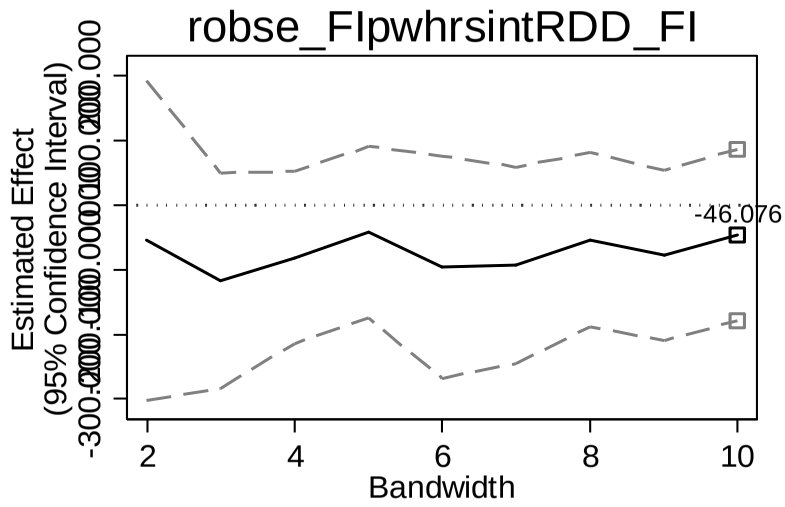


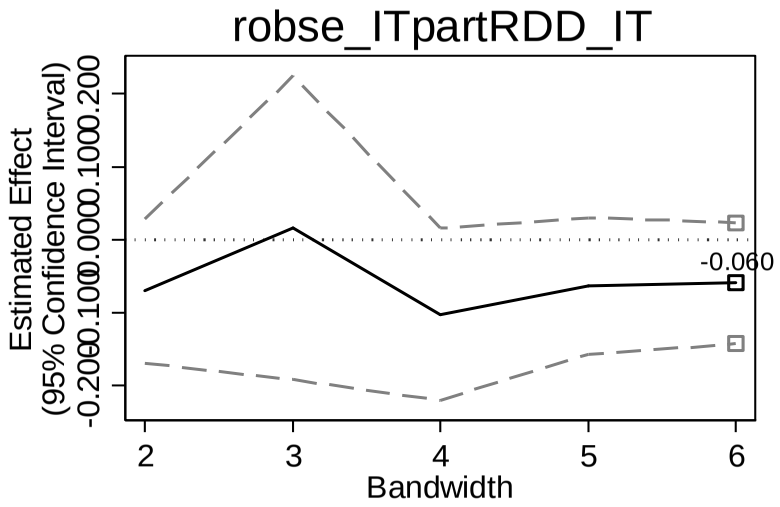


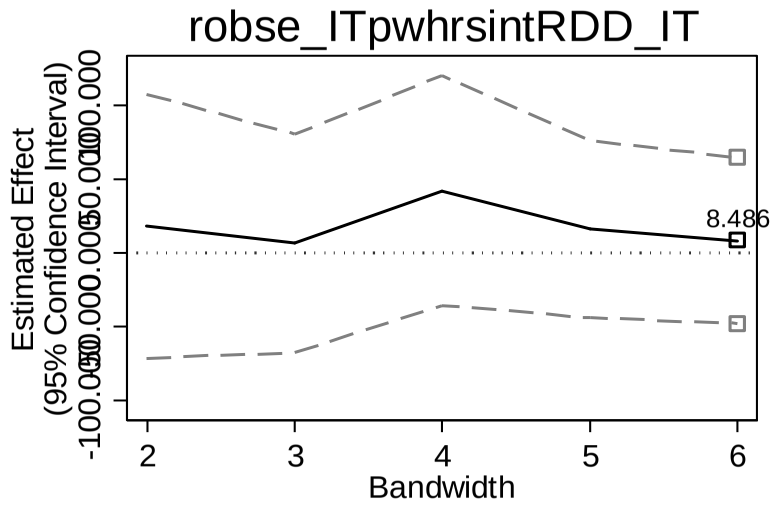


Robust SEs

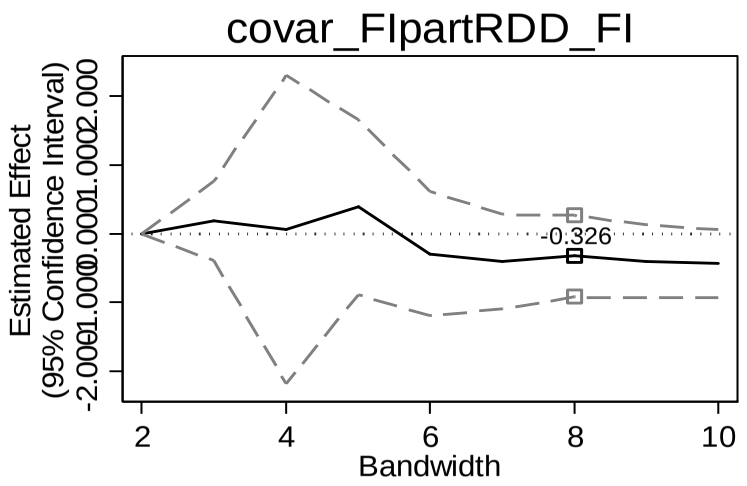

robse_FIpartRDD_FI
Estimated Effect (95% Confidence Interval)
-2.000
-1.000
0.000
1.000
2.000
-0.444
2
4
6
8
10
Bandwidth

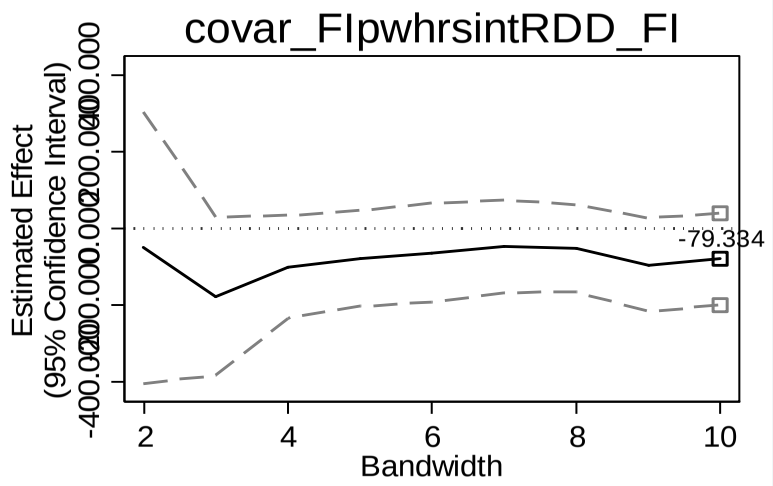

robse_FIpwhrsintRDD_FI
Estimated Effect (95% Confidence Interval)
-300.000
-200.000
-100.000
0.000
100.000
200.000
-46.076
2
4
6
8
10
Bandwidth

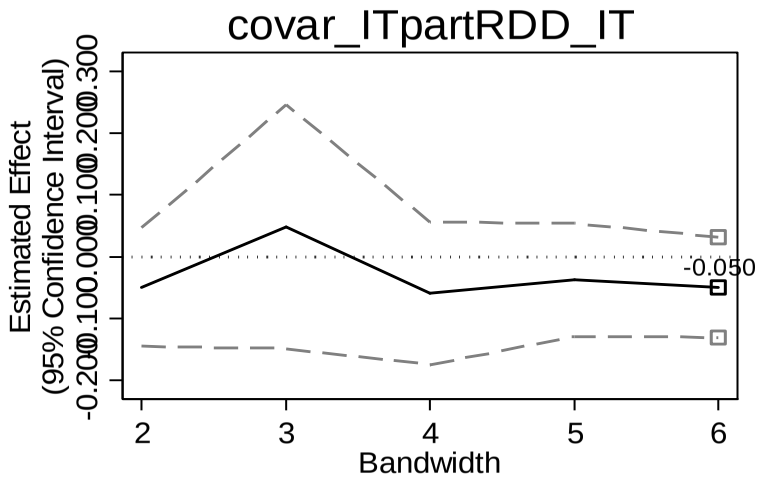

robse_ITpartRDD_IT
Estimated Effect (95% Confidence Interval)
-0.200
-0.100
0.000
0.100
0.200
-0.060
2
3
4
5
6
Bandwidth

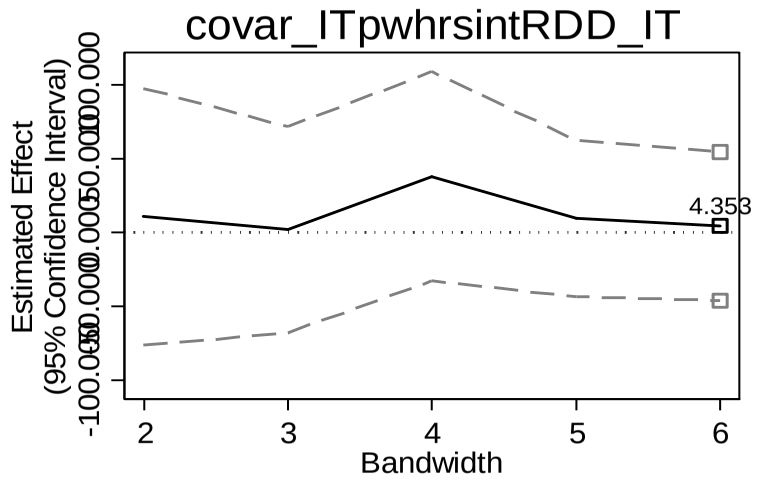

robse_ITpwhrsintRDD_IT
Estimated Effect (95% Confidence Interval)
-100.000
-50.000
0.000
50.000
100.000
8.486
2
3
4
5
6
Bandwidth

With covars and robust SEs

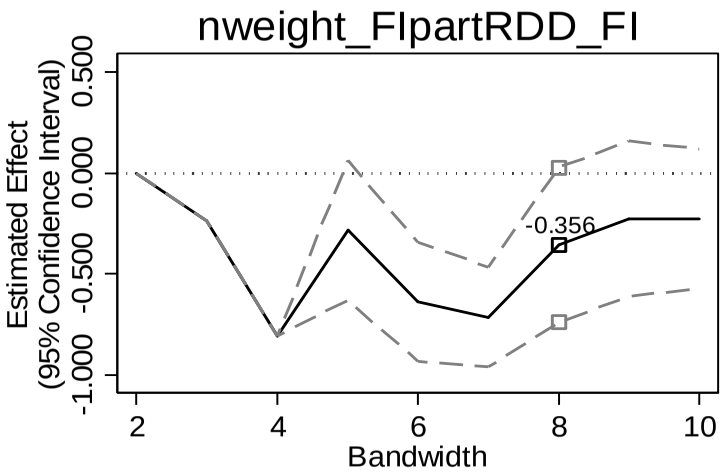


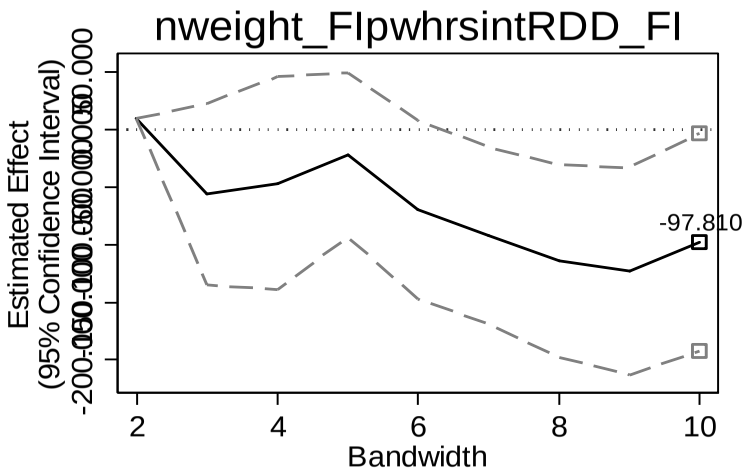


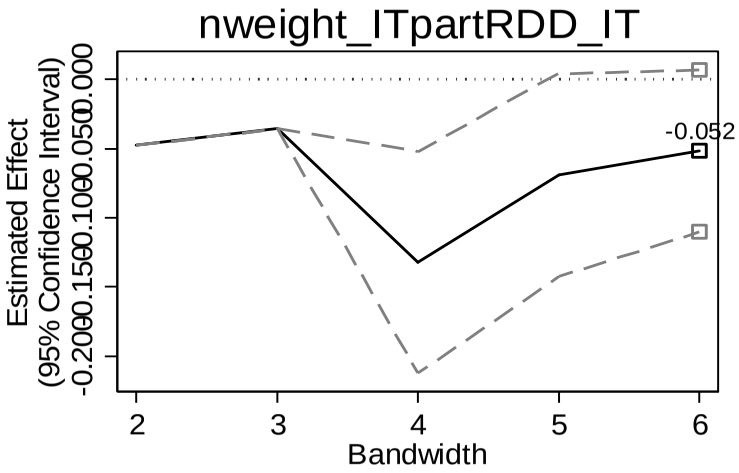


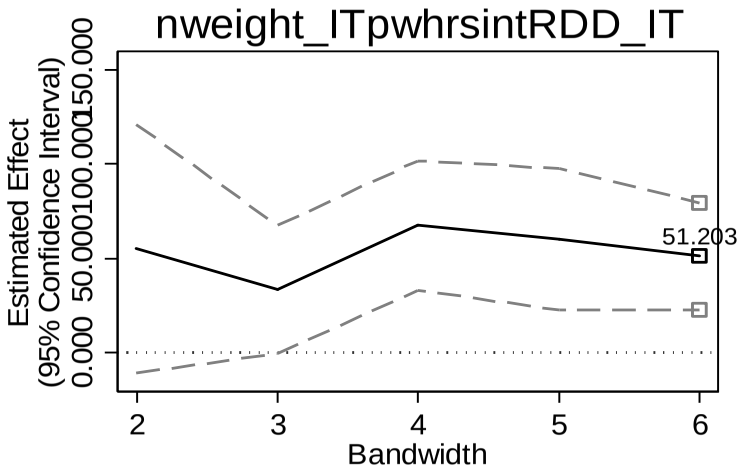


Without weights









Covariates

- **Industry dummies:** NACE Rev. 1.1 (2002), NACE19 classification
- **Innovation:** If SIGNIFICANTLY new technologically improved products or services or methods of producing or delivering products and services during the reference year (2005)
- **Average wage:** Total labour costs (direct + indirect) of all persons employed, divided by # of persons employed by respective firm

Exemptions detailed I

Finland:

1.1 Notification must be given to the employment office and trade union representatives

- Sufficient to notify the lay-off to the employment office

1.2 Consultation must be made on reasons and ways to avoid a lay-off

- No consultation has to take place, which reduces the time delay involved before notification can take place.

Exemptions detailed II

Italy: firm size threshold <16

- Unfair or unjustified dismissal: severance pay, varying by age, tenure, number of employees and size of company; can be higher in case of a lack of reasons in the written notice or violation of procedural aspects and highest in case of unfair or unlawful dismissal.
- In case of discriminatory dismissal or if the reason for dismissal is manifestly false or inapplicable, reinstatement will be ordered instead of monetary compensation.

Firms with 15 employees or below:

1. Have the choice between re-employment (different from reinstatement because it does not give rise to compensation for the period between the date of dismissal and the court decision) and financial compensation of the employee, varying by age, tenure and firm size.
2. Exemption from the definition of collective dismissal if workers have been working over a period of 120 days, not in a single production unit, or several units within one province