

Applied Policy Evaluation

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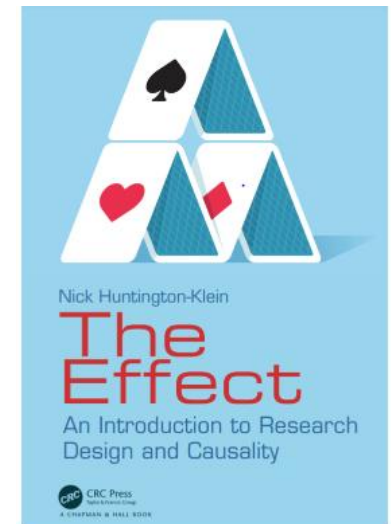
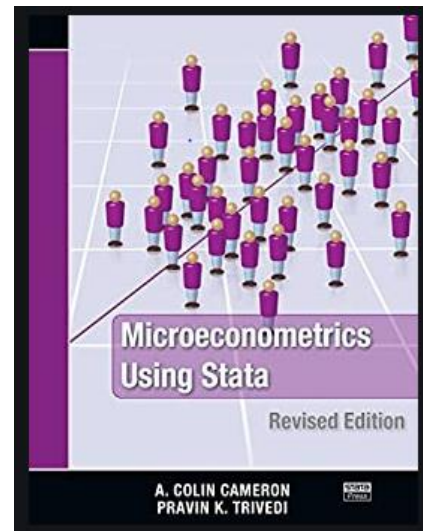
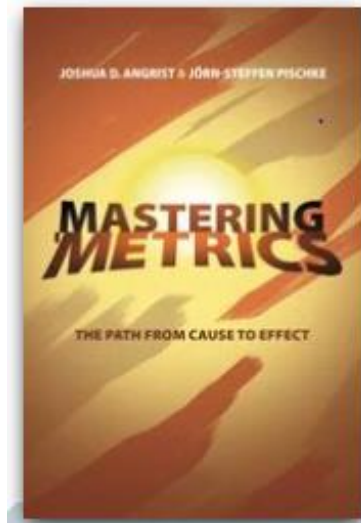
11/11/2022

Applied Policy Evaluation

- We are interested in the *causal* effect of policy X on some outcome Y
- There are very useful estimators available to us (provided we have the data!)
- The first topic we will focus on is
 - **Difference-in-Differences**

Applied Causal Analysis

- Useful books



Applied Causal Analysis

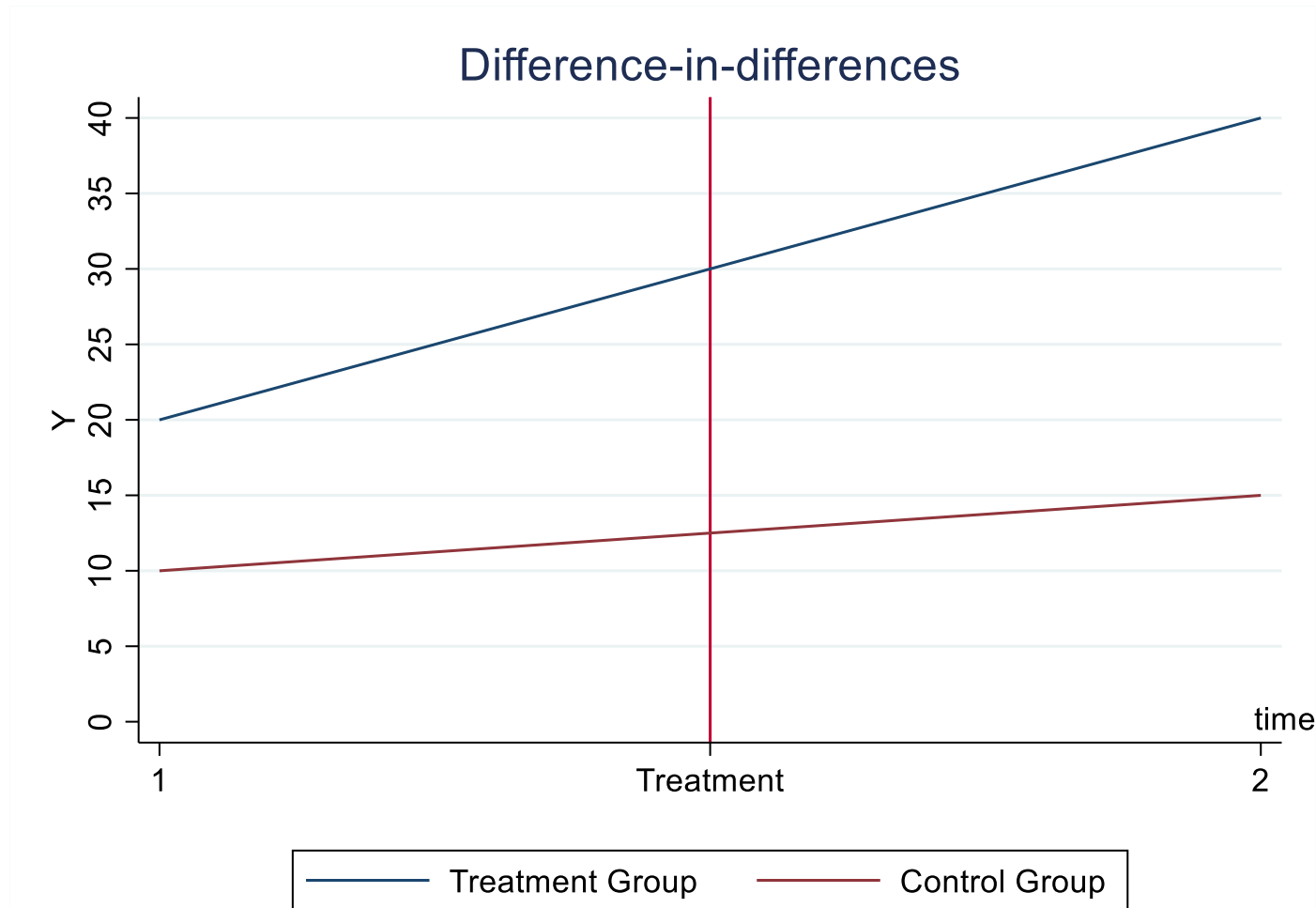
- Our aim
 - Gain an intuitive understanding of the estimator
- Show how the estimator is used in applied policy evaluation
- The literature on these techniques is very large and constantly evolving
 - What you learn here should allow you to dive deeper into the literature to examine recent innovations and more sophisticated techniques

Difference-in-differences

- A very common technique to evaluate the causal impact of a policy
- Treatment occurs at some time point, t
- Based on identifying a treatment and control group
 - The treatment group gets the treatment (is impacted by the policy)
 - The control group is not impacted by the policy
- The DiD estimator takes the change in average outcomes among the treated group (pre- and post-treatment), and subtracts the change in average outcomes among the control group

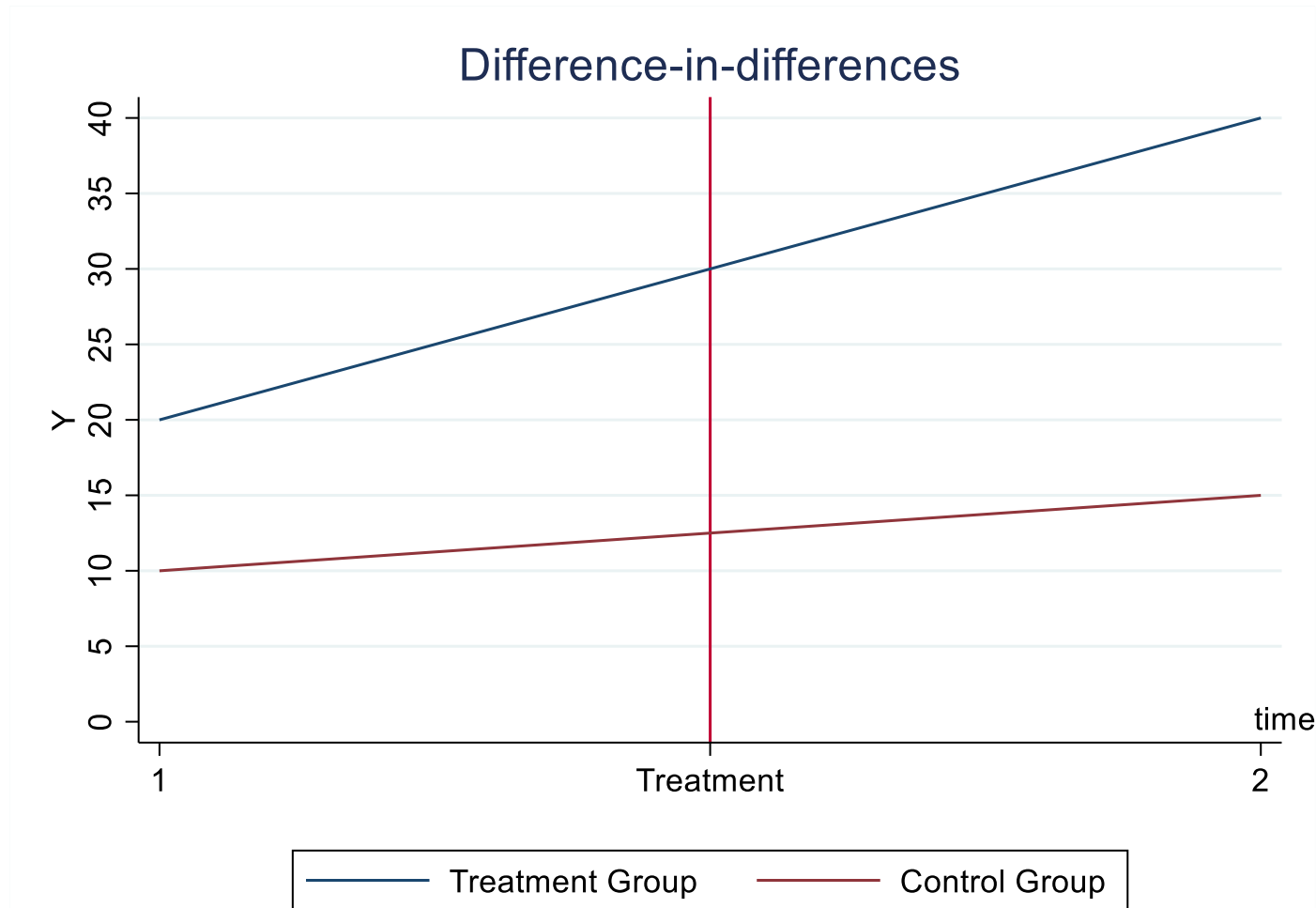
Difference-in-differences

- A graphical explanation of D-i-D



Difference-in-differences

- What is the estimated treatment effect using D-i-D?



Difference-in-differences

- We can implement D-i-D using standard regression techniques
 - Let D be the treatment variable (1 if in treatment group and 0 if in control group).
 - Let T be the time variable (1 for post-treatment period and 0 for pre-treatment period)

$$Y = \alpha + \gamma D + \lambda T + \beta(D \times T) + \varepsilon \quad (5)$$

- The D-i-D estimate is given by β

Difference-in-differences

- Parallel trends is a key assumption (often testable) in DiD
- If the outcomes of the treatment and control group were diverging before the treatment occurred, then we cannot say that the post-treatment difference is caused by the treatment
- If we have multiple pre-treatment years, we can test this
 - At the very least, we could simply plot the averages for each year for the treatment and control group
 - We could implement placebo analysis

Difference-in-differences

EXAMPLE 1: Card and Krueger (1994)

Card, D and Krueger, A. (1994), “Minimum Wages and Employment: A Case-Study of the Fast Food Industry in New Jersey and Pennsylvania”. *American Economic Review*, vol. 84, pp.772-793.

- In November 1992, the minimum wage in New Jersey increased from \$4.25 to \$5.05 per hour. In neighbouring Pennsylvania, the minimum wage remained unchanged at \$4.25 per hour.
- I am posting this article on Blackboard
 - Will be discussed at next week’s tutorial. Good idea to have a quick read through the article before next week’s tutorial.


Difference-in-differences

EXAMPLE 2

Oxford Economic Papers, 2022, 1–25
<https://doi.org/10.1093/oep/gpac029>

OXFORD

The impact of one-parent family payment reforms on the labour market outcomes of lone parents

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Abstract

We evaluate the impact of a reduction in the child qualifying age for the One-Parent Family Payment in Ireland. From 2012 to 2015, the child qualifying age was reduced from 18 to 7 years. Lone parents who no longer qualified for the payment, based on the age of their child, could avail of Jobseekers Transitional Payment, which involves a labour activation component. The reforms led to an increase in the average hours worked of lone parents of between 2 and 5 h per week. Lone parents impacted by the policy were 13 percentage points more likely to be working. In addition, we find an increase in household income of between 9% and 12%, and an increase of between 23% and 29% in earnings from employment. Finally, the policy was associated with a 10–14 percentage point reduction in the poverty rate of lone parents.

JEL classifications: I32, I38, J22, J64

Difference-in-differences

EXAMPLE 2 cont'd

- Prior to 2012, lone parents in Ireland could receive One-Parent Family Payment until their youngest child was 18 years of age
- This long duration and lack of activation was criticised nationally and internationally (OECD, 2003; Department of Social and Family Affairs, 2006)
 - Culminated in the Troika attaching conditions to Ireland's financial assistance programme (Regan et al., 2018)
- The child qualifying age for OFP was subsequently reduced from 18 years to 7 years
 - Parents with children over 7 could apply for Jobseeker's Transitional Payment

Difference-in-differences

EXAMPLE 2 cont'd

- The aim of this paper is to evaluate the impact of this policy change (the qualifying age reduction) on labour market outcomes of impacted lone parents
 - Average hours worked
 - Probability of working
 - Household income
 - Earnings from employment
- We use a difference-in-differences estimator
 - Use SILC data from 2012 to 2017
- Closest work is Avram et al. (2018)
 - UK reform that lowered the age of the youngest child for cash benefit significantly increased the likelihood of a lone parent returning to work

Difference-in-differences

EXAMPLE 2 cont'd

Table 1. Maximum age of child to qualify for OFP

OFP payment commencement	Terminal payment age			
	2012	July 2013	July 2014	July 2015
Before 27 April 2011	18	17	16	7
Between 27 April 2011 and 3 May 2012	14	12	10	7
After 3 May 2012	12	10	7	7

Source: Joint Committee on Social Protection (2017).

- Treatment group?
- Control group?

Difference-in-differences

EXAMPLE 2 cont'd

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Difference-in-differences

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- Treatment group?
- Control group
 - Lone parents whose youngest child < 7 years old

Difference-in-differences

EXAMPLE 2 cont'd

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OFP payment commencement	Terminal payment age			
	2012	July 2013	July 2014	July 2015
Before 27 April 2011	18	17	16	7

Source: Joint Committee on Social Protection (2017).

- Treatment group (2 options)
 - Lone parents whose youngest child is 7-15 years
- Control group
 - Lone parents whose youngest child < 7 years old

Difference-in-differences

EXAMPLE 2 cont'd

Table 1. Maximum age of child to qualify for OFP

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Source: Joint Committee on Social Protection (2017).

- Treatment group (2 options)
 - Lone parents whose youngest child is 7-15 years
 - Lone parents whose youngest child is 7-9 years
- Control group
 - Lone parents whose youngest child < 7 years old

Difference-in-differences

EXAMPLE 2 cont'd

Table 3. Average characteristics of treatment and control group before and after the policy change

	Pre-policy change	Post-policy change
Hours worked		
Treatment group	10	15
Control group	11	11
Probability of working (%)		
Treatment group	40	59
Control group	40	44
Equivalent household income		
Treatment group	€14,450	€17,576
Control group	€14,914	€15,578
Gross monthly earnings from employment		
Treatment group	€1,467	€2,143
Control group	€1,784	€1,503

Source: Authors' calculations based on SILC data.

mean outcomes for the treatment group. Therefore, the descriptive statistics in [Table 3](#) are informative as they directly correspond to the basic DiD estimator.¹⁶

Difference-in-differences

EXAMPLE 2 cont'd

P. REDMOND, S. MCGUINNESS, AND C. KEANE

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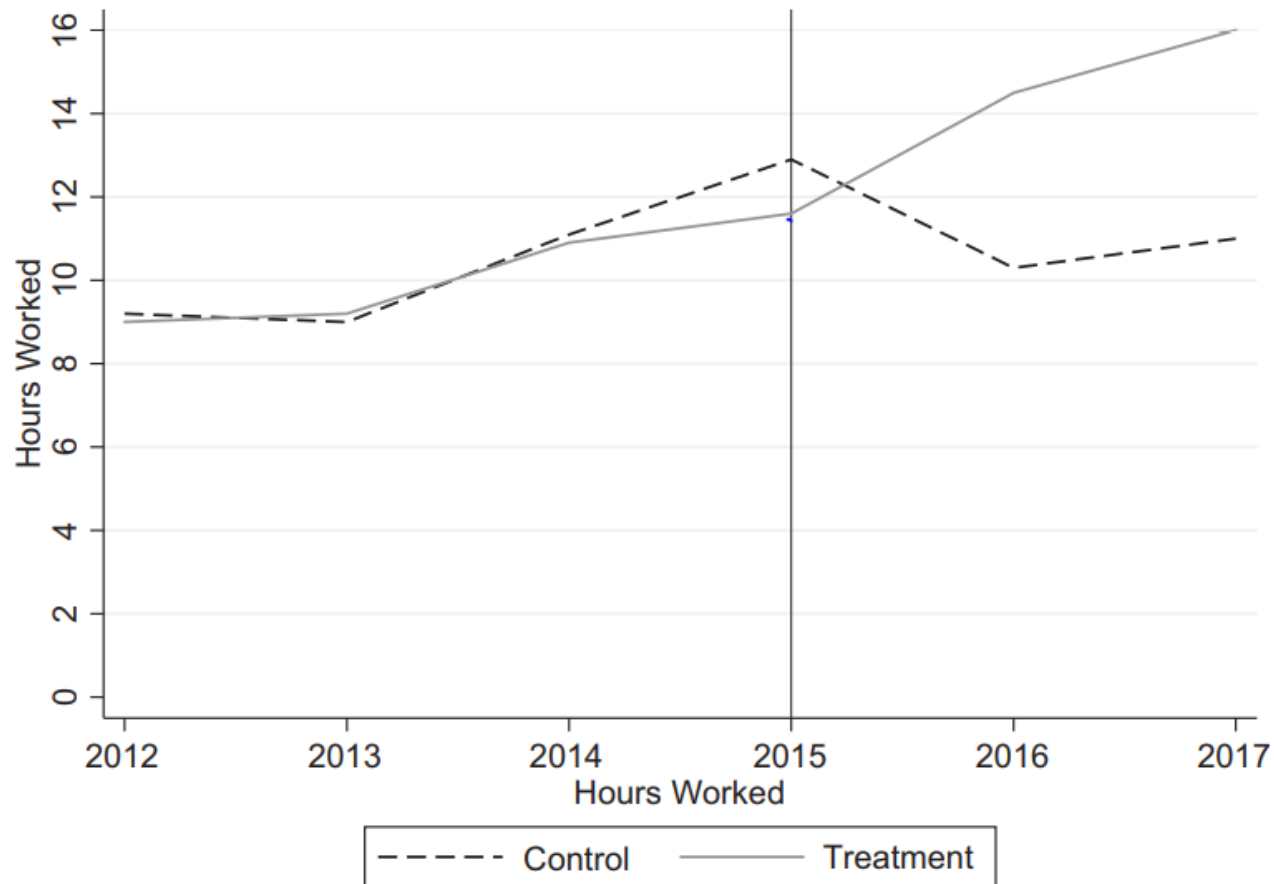


Fig. 3. Usual hours worked of lone parents.

Difference-in-differences

EXAMPLE 2 cont'd

Table 5. Hours worked of lone parents (DiD estimates)

Variables	TG1 (7–9 years)		TG2 (7–16 years)		Placebo
	(1)	(2)	(3)	(4)	
D-i-D	4.906 ^{***} (1.731)	4.410 ^{***} (1.571)	2.318 [*] (1.221)	2.752 ^{**} (1.123)	–0.398 (2.240)
D	–0.627 (1.045)	–2.066 ^{**} (1.017)	2.481 ^{***} (0.768)	0.432 (0.820)	–1.396 (1.320)
Med education		1.982 ^{**} (0.850)		1.110 (0.700)	0.639 (1.141)
High education		7.999 ^{***} (1.045)		7.524 ^{***} (0.832)	6.796 ^{***} (1.416)
Age		0.261 ^{***} (0.060)		0.123 ^{***} (0.046)	0.252 ^{***} (0.080)
Number of children		–2.224 ^{***} (0.361)		–2.049 ^{***} (0.289)	–2.292 ^{***} (0.505)
Irish		0.094 (1.117)		–1.192 (0.981)	–0.698 (1.594)
Good health		2.855 ^{***} (0.964)		6.282 ^{***} (0.735)	2.492 [*] (1.284)
Home owner		7.018 ^{***} (0.988)		7.328 ^{***} (0.736)	6.428 ^{***} (1.363)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Regional fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	11.384 ^{***} (1.212)	–2.557 (3.048)	11.975 ^{***} (1.068)	0.426 (2.462)	–1.347 (4.026)
Observations	1,339	1,326	2,216	2,189	723
R ²	0.018	0.199	0.020	0.206	0.179

Notes: Robust standard errors in parentheses.

Source: Authors' calculations.

***p < 0.01, **p < 0.05, *p < 0.1.

Difference-in-differences

EXAMPLE 2 cont'd

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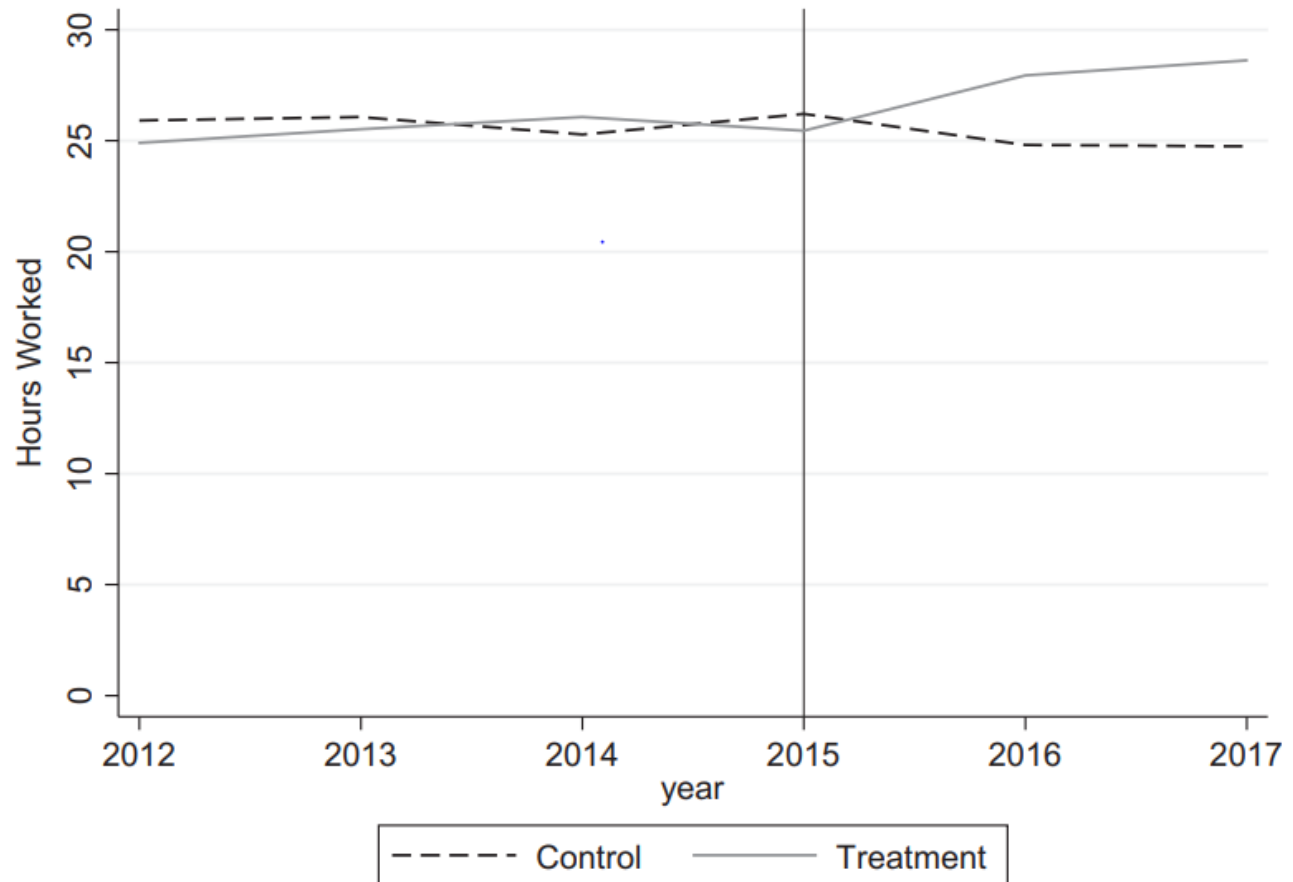


Fig. 4. Usual weekly hours worked of working lone parents.

Difference-in-differences

EXAMPLE 3:



Difference-in-differences

EXAMPLE 3 cont'd

- Minimum wage was introduced in Ireland in 2000, at a rate of €5.58 (£4.40) per hour
- Increased almost yearly up until 2007 (€8.65)
 - Was still €8.65 in 2015
- Subsequent increases after 2015
 - €9.15 in 2016
 - €9.25 in 2017
 - €9.55 in 2018
 - €9.80 in 2019
 - €10.10 in 2020
 - €10.20 in 2021
 - €10.50 in 2022

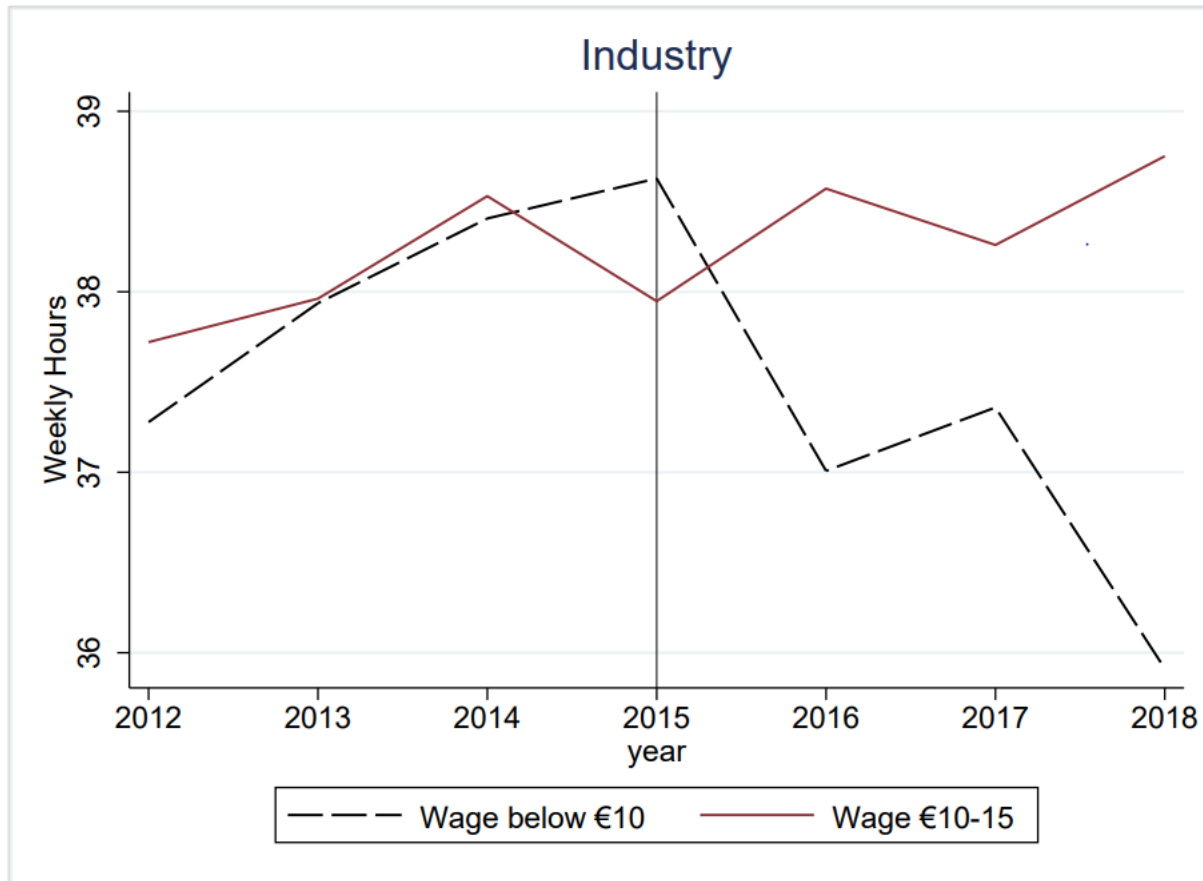
Difference-in-differences

EXAMPLE 3 cont'd

- This paper examines the impact of three successive MW increases (2016 to 2018) on the hours worked of MW employees
- Uses administrative earnings data linked to the Irish Labour Force Survey
- Implements a DiD estimator
 - Treatment group: those earning below the 2018 MW
 - Control group: higher paid non-MW workers (€10 to €15 per hour)
- Examines heterogeneous effects across different groups

Difference-in-differences

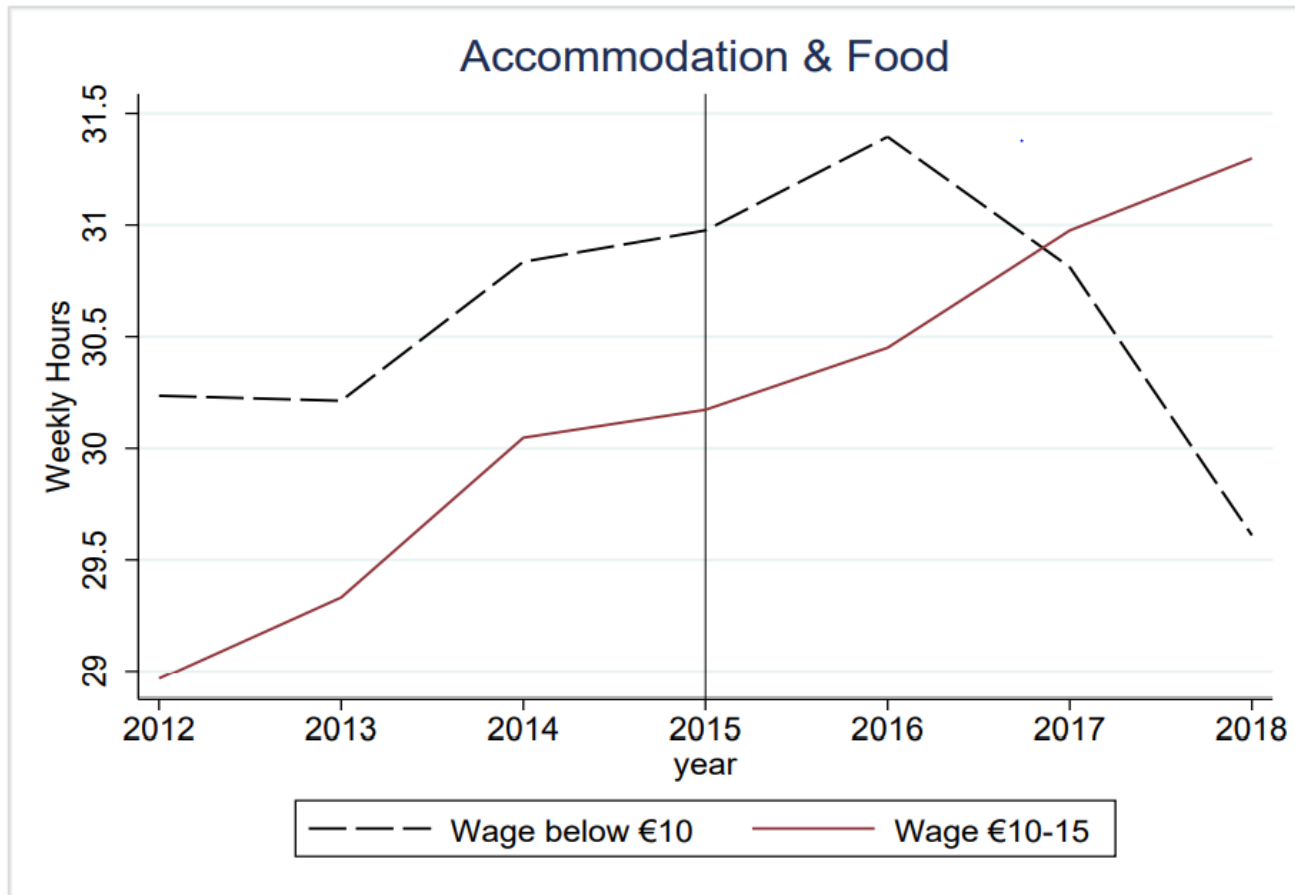
FIGURE 5.2 AVERAGE WEEKLY HOURS WORKED FOR INDUSTRY SECTOR EMPLOYEES (2012 TO 2018)



Source: Authors' analysis.

Difference-in-differences

FIGURE 5.3 AVERAGE WEEKLY HOURS WORKED FOR ACCOMMODATION AND FOOD SECTOR EMPLOYEES (2012 TO 2018)



Difference-in-differences

EXAMPLE 4:

Social Science & Medicine 222 (2019) 101–111



ELSEVIER

Contents lists available at [ScienceDirect](#)

Social Science & Medicine

journal homepage: www.elsevier.com/locate/socscimed



Did the expansion of free GP care impact demand for Emergency Department attendances? A difference-in-differences analysis



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ARTICLE INFO

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Emergency Department
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Administrative data

ABSTRACT

The removal of co-payments for General Practitioner (GP) services has been shown to increase utilisation of GP care. The introduction of free GP care may also have spillover effects on utilisation of other healthcare such as Emergency Department (ED) services, which often serve as substitutes for primary care, and where co-payments to attend exist for many. In Ireland, out-of-pocket payments are paid by the majority of the population to access GP care, and these costs are amongst the highest in Europe. However, in July 2015 all children in Ireland aged under 6 became eligible for free GP care. Using a large administrative dataset on 413,562 ED attendances between January 2015 and June 2016 we apply a difference-in-differences method, with treatment and control groups differentiated by age, to examine whether ED utilisation changed amongst younger children following the introduction of universal free GP care. In particular, we examine ED attendances following a GP referral, as referrals from GPs also afford access to the ED free of charge. We find that the expansion of free GP care did not reduce overall ED utilisation for under 6s. Additionally, we find that the proportion of ED attendances occurring through GP referrals increased by over 2 percentage points. This latter finding may be indicative of increased pressure placed on GPs from increased demand. Overall, this study finds that expanding free GP care to all young children did not reduce their ED utilisation.

Difference-in-differences

EXAMPLE 4 cont'd

- In most European countries, GP care is free or available subject to a small co-payment
- In Ireland, many people pay substantial fees for GP visits, with the out of pocket payment being the highest in the EU
- Irish government committed to provision of free GP care
- In July 2015, all children under 6 became eligible for free GP care in Ireland

Difference-in-differences

EXAMPLE 4 cont'd

- Walsh et al. (2019) use a difference-in-differences estimator to examine the impact of free GP care on ED use
 - Treatment group (0-5 years)
 - Control group (7-15 years)
 - Pre policy period (Jan-June 2015)
 - Post policy period (Jan-June 2016)
- Findings
 - Expansion of free GP care to all under 6s in Ireland did not reduce ED attendances among this group.
 - However, the method of referral did change, with a two percentage point increase in the rate of GP referral to EDs in under 6s observed.