

# Television and the Labour Supply: Evidence from the Digital Television Transition in the UK

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CInSt Research Seminar

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# Outline

- 1 Introduction
- 2 Natural Experiment
- 3 Data
- 4 Methodology
- 5 Results
- 6 Mechanisms
- 7 Conclusions

- Television: one of the most important leisure activities for majority of individuals
  - Average broadcast TV viewing time in the UK: 3 hours 12 minutes (Ofcom, 2019)
- Considerable attention to the effects of television on:
  - Educational performance (Keith et al., 1986; Christakis et al., 2004; Hancox et al., 2005; Gentzkow and Shapiro, 2008; Nieto, 2019)
  - Political outcomes (Gentzkow, 2006; DellaVigna and Kaplan, 2007; Barone et al., 2015)
  - Living conditions of women (Jensen and Oster, 2009)
  - Fertility (La Ferrara et al., 2012)
  - Crime concerns (Mastroiocco and Minale, 2018)

# Motivation

- Effect of television on labour outcomes largely unexplored
- However, reasons to believe that there is an impact
- On the one hand, television increases:
  - Obesity (Tucker and Bagwell, 1991; Tahir et al., 2018)
  - Diseases (Hu et al., 2003; Hamer et al., 2010; Grøntved and Hu, 2011)
  - Violence (Johnson et al., 2002)
- On the other, television reduces:
  - Parents' time spent with children (Vandewater et al., 2006)
- Previous changes may have implications for labour supply. Only existing evidence:
  - Watching television in childhood positively correlated with unemployment in adulthood (Landhuis et al., 2012)

# Research Question

- Does television change labour supply?
- Endogeneity concerns:
  - Initial employment status may be a determinant of TV watching time
  - Presence of unobserved confounders correlated with both TV watching time and labour status
- I use the digital television transition in UK as a natural experiment

- The digital television transition increases labour supply
  - The effect is driven by parents, and in particular, mothers
  - The effect is driven by an increase in part-time and self-employment
  - The effect increases with the number of children and for non-cohabiting parents
- Presence of children plays a crucial role
- Possible explanation:
  - Television may keep children busy → parents increase labour supply
    - Television reduces housework time for mothers, but not for fathers and non-parents

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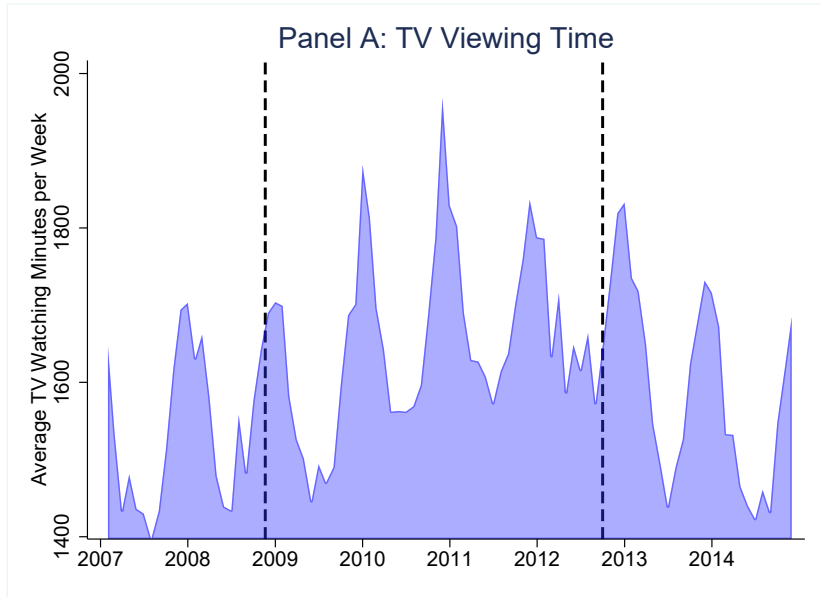
# Natural Experiment

- I use the digital television transition in UK as a natural experiment
- The digital switchover occurred between 2008 and 2012 and it:
  - Raised the number of television channels from 5 to 40
  - Possibility of watching TV in other languages
- One of the most important revolutions in the British TV market:
  - Gave access to digital television to millions of households
  - Part of the population bought top boxes only months before switchover
  - Television viewing time increased by 10%
  - Television contents did not change
- Two advantages of the natural experiment:
  - Implemented by two independent organizations
  - Strong variation in its timing across neighbouring geographical units
    - I exploit variation in digital transition deadlines across 40,000 geographical units in the UK

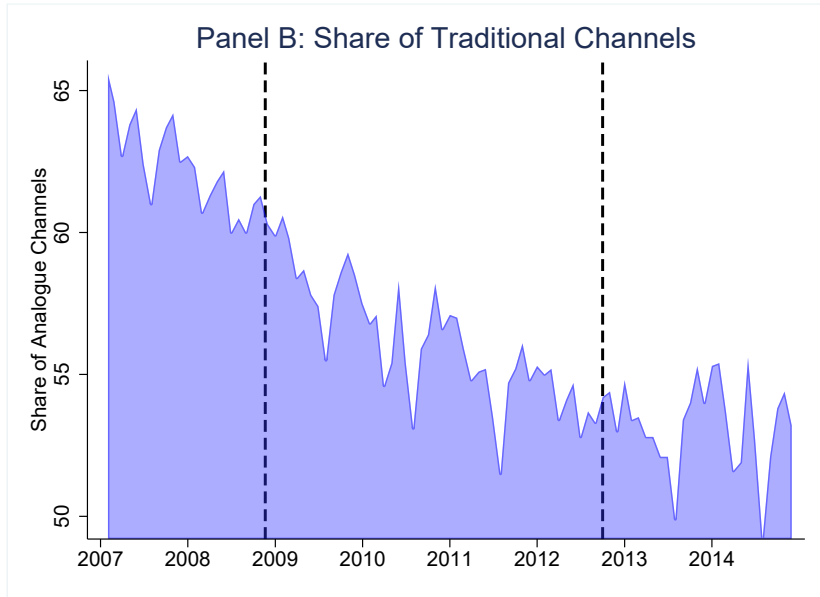


# Natural Experiment

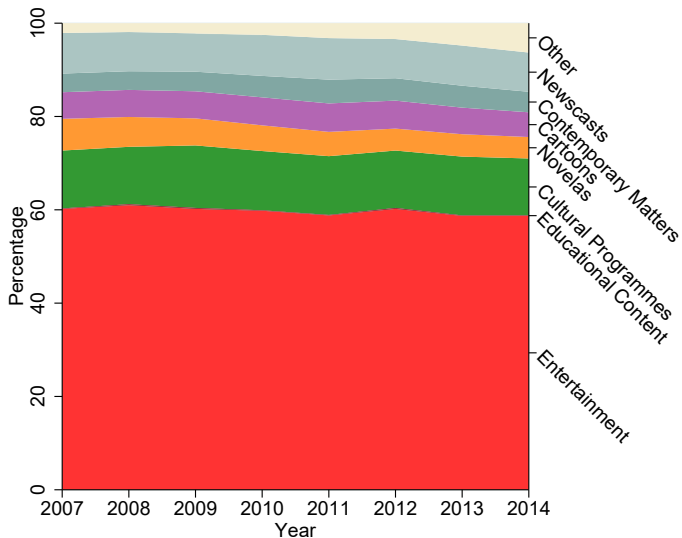
# Television Viewing Time



# Audience Share Traditional Channels



# TV Contents Evolution



TV Content Detailed

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- Use data on digital transition dates across 40,000 geographical units
- Use data on first seven waves of the Understanding Society Survey:
  - US survey follows members of 40,000 households in a yearly basis since 2009
  - I construct a large panel dataset at individual level, with information on:
    - Labour characteristics
    - Socio-demographic characteristics
    - Time use

# Summary Statistics

		Year Introduction Digital Television			
		2009	2010	2011	2012
Gender	0.55 (0.50)	0.56 (0.50)	0.54 (0.50)	0.55 (0.50)	0.55 (0.50)
Age	48.37 (17.83)	49.26 (18.04)	49.57 (17.71)	48.57 (17.82)	47.66 (17.80)
Race	0.19 (0.39)	0.10 (0.30)	0.07 (0.25)	0.16 (0.37)	0.27 (0.45)
Household Size	2.91 (1.50)	2.71 (1.36)	2.64 (1.28)	2.87 (1.46)	3.04 (1.59)
Highly Qualified	0.35 (0.48)	0.35 (0.48)	0.38 (0.49)	0.33 (0.47)	0.37 (0.48)
Labour Market Participation	0.61 (0.49)	0.60 (0.49)	0.63 (0.48)	0.62 (0.49)	0.61 (0.49)
Has a Job	0.56 (0.50)	0.55 (0.50)	0.59 (0.49)	0.56 (0.50)	0.56 (0.50)
Observations	184,092	15,210	13,569	87,866	67,447

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# Empirical Analysis on Educational Attainment

$$y_{i,t} = \alpha + \beta DT_{j,t} + \theta X_{i,t} + \eta_j + \lambda_t + \varepsilon_{i,t} \quad (1)$$

- $y_{i,t}$ : Dummy equal to 1 if individual  $i$  has a job at year  $t$  and 0 otherwise
- $DT_{j,t}$ : Dummy equal to 1 if switchover has occurred by  $t$  in region  $j$ , where  $i$  lives
- $X_{i,t}$ : Time-varying covariates at the individual level
- $\eta_j$ : Region dummies (40,000 geographical units)
- $\lambda_t$ : Year dummies
- $\varepsilon_{i,t}$ : Error term

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# Baseline Results

	Dep Var: Prob Employment		
DT	0.011*** (0.002)	0.013*** (0.003)	0.006** (0.002)
Individual Covariates	No	No	Yes
LSOA Dummies	No	Yes	Yes
Year Dummies	No	Yes	Yes
Observations	185,338	184,092	178,724

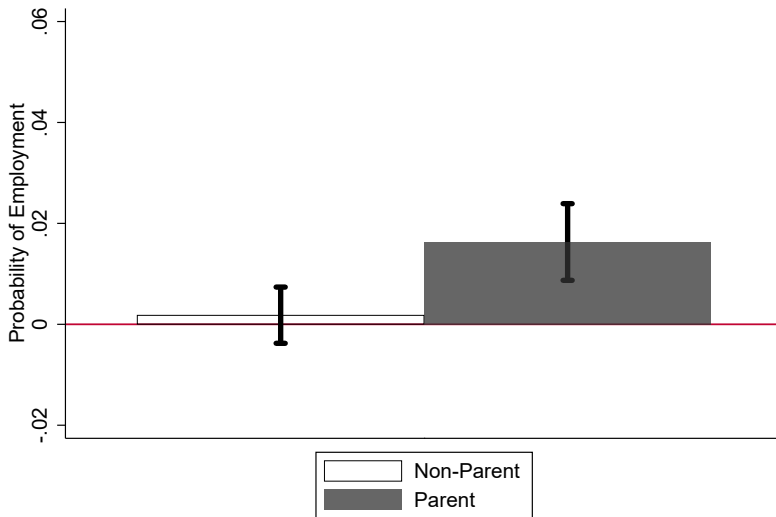
\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

- The estimates are robust to:
  - Checking for pre-trends Pre-trends
  - Balancing tests Balancing Tests
  - Controlling for regional trends Regional Trends
  - Testing for selection Further Robustness Tests
  - Using control groups Further Robustness Tests
  - Alternative specifications Further Robustness Tests
  - Alternative samples Further Robustness Tests

- I explore heterogeneity in the baseline results by:
  - Parental status
  - Gender
  - Further socio-demographic characteristics
  - Type of employment

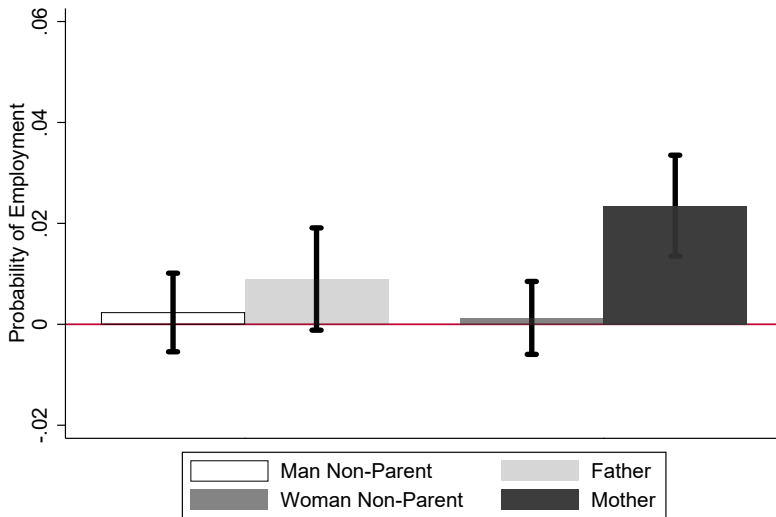
# Heterogeneity: Parental Status

Panel A: Parental Status

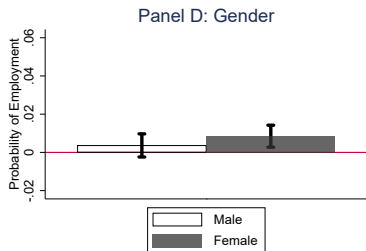
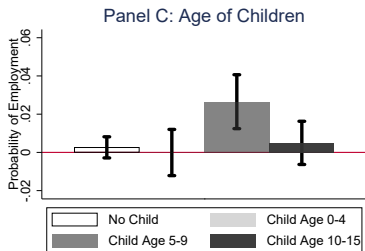
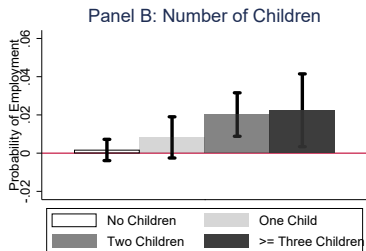
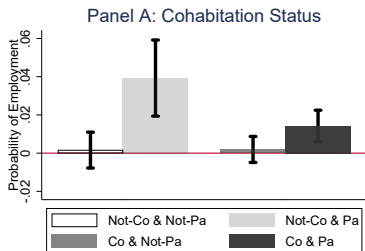


# Heterogeneity: Parental Status and Gender

Panel B: Parental Status and Gender

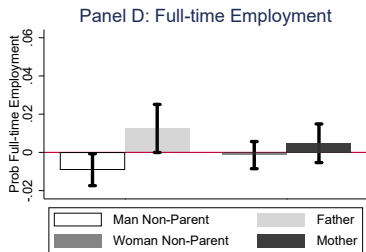
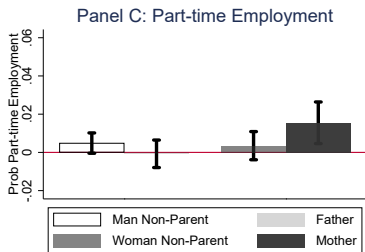
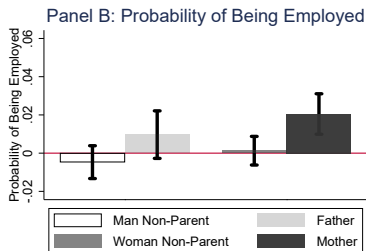
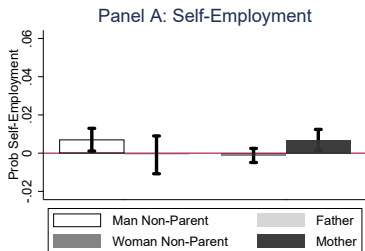


# Heterogeneity





# Type of Employment

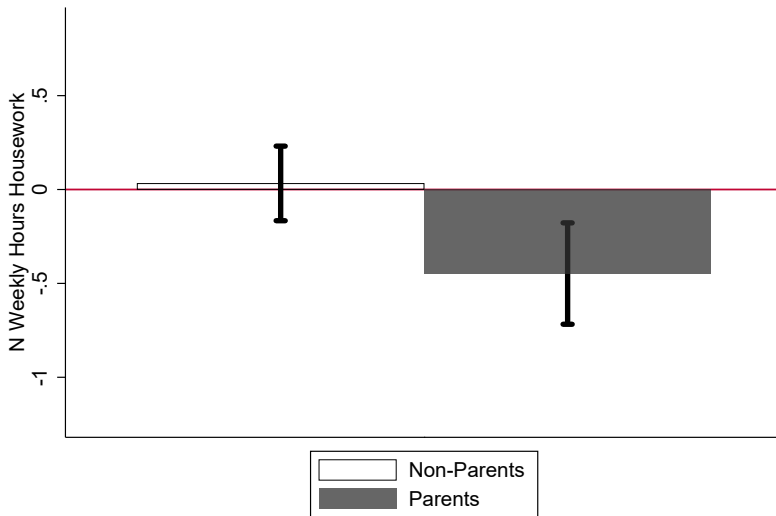


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- Children are crucial in the impact of television on labour outcomes
- I explore possible explanations behind baseline estimates:
  - Changes in time allocation
  - Television may keep children busy, increasing parents' labour supply

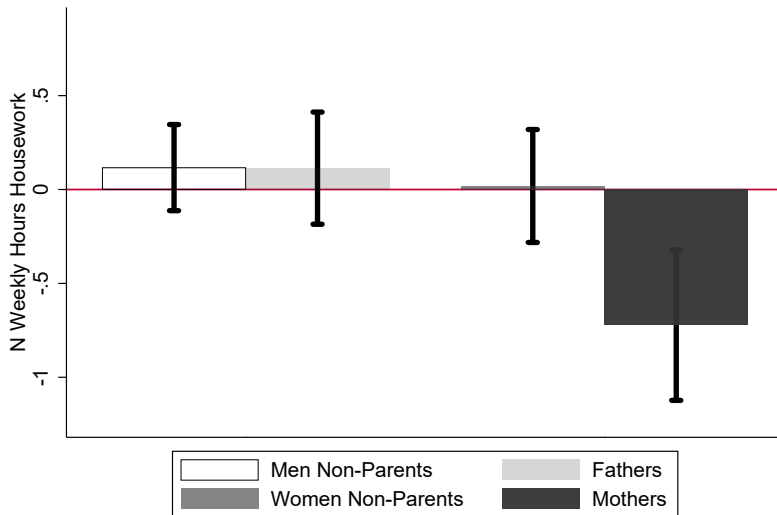
# Mechanism: Parental Status

Panel A: Parental Status



# Mechanism: Parental Status and Gender

Panel B: Parental Status and Gender



## Further Evidence: Opinion of Interviewees

	Family Suffers if...		Who Should Work?	
	Women Work	Women Full-time	Men & Women	Only Men
DT	-0.025 (0.016)	-0.037** (0.016)	0.014 (0.015)	-0.003 (0.016)
Individual Covariates	Yes	Yes	Yes	Yes
LSOA Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Observations	54,650	54,659	54,696	54,737

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Time Allocation

	TV Hours	Hours of Sleep	Hours Commute	Sports	Arts	Arts Events
DT	0.096** (0.040)	-0.057 (0.044)	-0.004 (0.004)	-0.024 (0.037)	-0.009 (0.020)	-0.003 (0.024)
Individual Covariates	Yes	Yes	Yes	Yes	Yes	Yes
LSOA FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	46,082	51,998	85,911	34,731	43,491	42,085

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

# Time Allocation

	Walk	Eat with Family	Visit Friends	Read	Other Leisure
DT	0.098 (0.222)	0.051 (0.050)	-0.006 (0.007)	-0.017** (0.008)	-0.016 (0.038)
Individual Covariates	Yes	Yes	Yes	Yes	Yes
LSOA FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	50,005	3,782	46,305	59,826	31,498

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



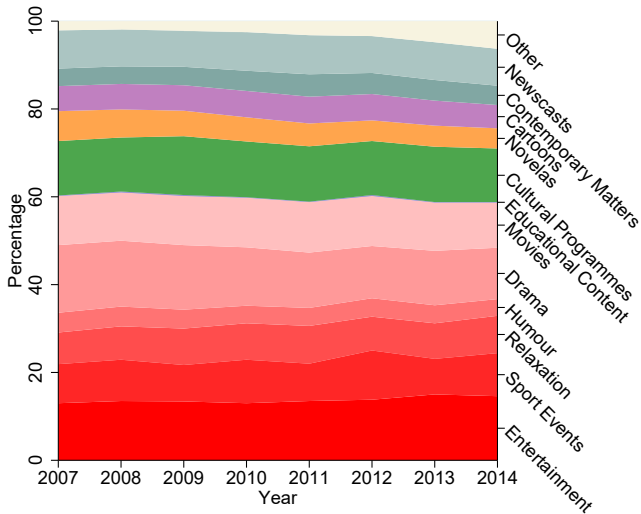
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- The digital transition increases labour supply
  - The impact is driven by mothers
  - The effect is driven by an increase in part-time and self-employment
  - The effect increases with the number of children and for non-cohabiting parents
- The presence of children is crucial
- I explore plausible explanations. The digital transition:
  - Reduces the amount of housework for mothers, but not for fathers and non-parents
  - Decreases families' suffering if mothers work full-time
  - Does not change time allocation other than housework

Thank you!

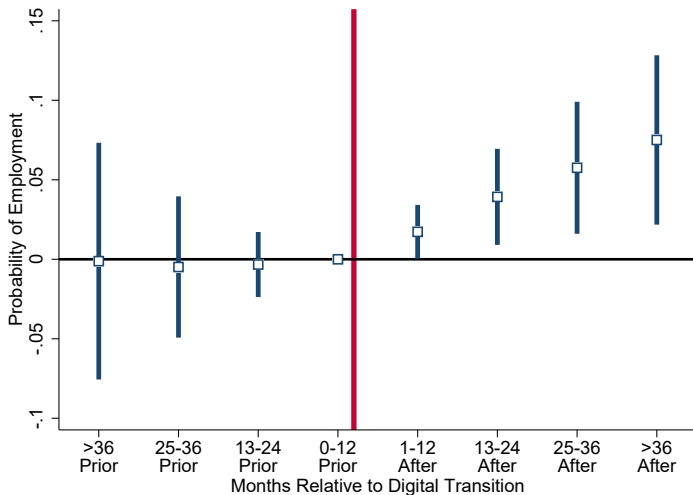
Contact e-mail: [adrian.nietocastro@liser.lu](mailto:adrian.nietocastro@liser.lu)

# TV Contents

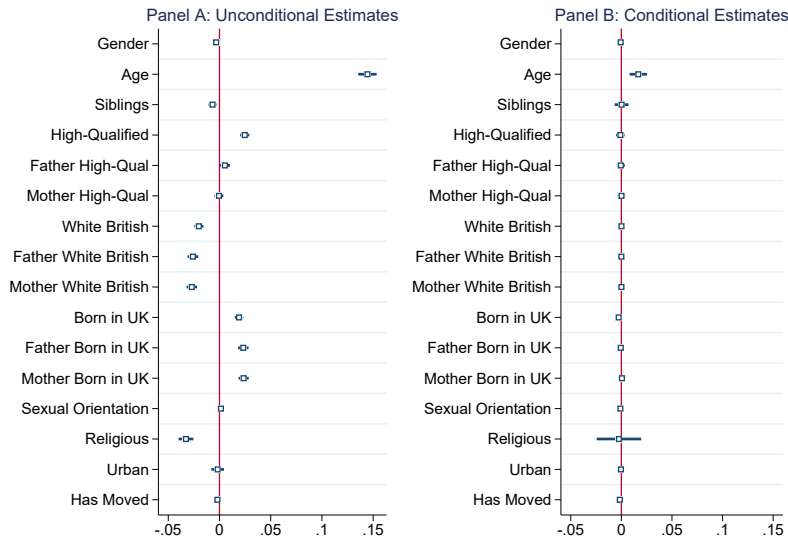


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# Dynamic Impact



# Balancing Tests



## Further Robustness Tests

	Dep Variable: Probability of Employment			
	Never Moved	No TV	Transmitter Dummies	2009–2013
DT	0.008*** (0.003)	0.018 (0.030)	0.006** (0.002)	0.004* (0.003)
Individual Covariates	Yes	Yes	Yes	Yes
LSOA Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Transmitter Dummies	No	No	Yes	No
Observations	140,445	1,852	178,724	150,401

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

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# Local Labour Markets

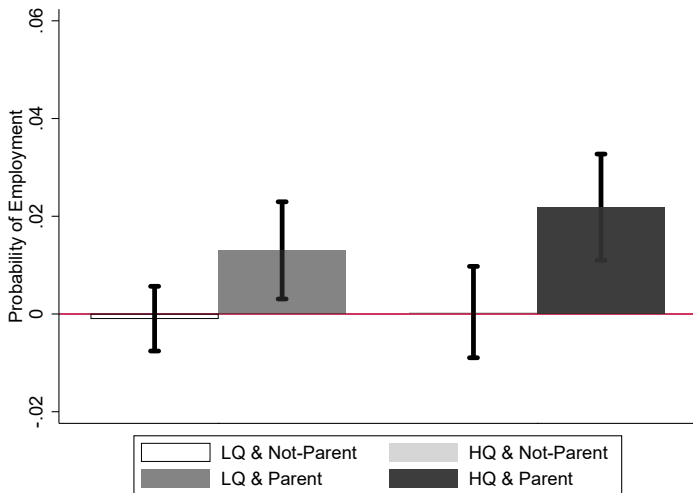
	Dep Var: Prob of Employment		
DT	0.013*** (0.003)	0.010*** (0.004)	0.011** (0.004)
LSOA Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Country*Year Dummies	Yes	No	No
GOR*Year Dummies	No	Yes	No
LA*Year Dummies	No	No	Yes
Observations	184,092	184,092	184,074

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

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# Heterogeneity in Qualification



# Heterogeneity in Local Services

	Dependent Variable: Probability of Employment					
	Primary Schools		Leisure Activities		Public Transport	
	High	Poor	High	Poor	High	Poor
DT	0.006 (0.004)	0.004 (0.003)	0.006* (0.003)	0.005 (0.004)	0.004 (0.004)	0.012*** (0.004)
Individual Covariates	No	Yes	Yes	Yes	Yes	Yes
LSOA FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	45,544	102,448	92,309	71,929	85,690	71,907

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# Number of Hours Worked

