

Can you move a cluster? Multipliers from a large public sector relocation

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The work represents the views of the authors, not the funders or the data providers.

Background

- Rise of **'superstar cities'** (Moretti 2012, Glaeser 2011)
- **Knowledge-intensive and creative activities persistently cluster** in these cities (Kerr and Robert-Nicoud 2021, Hutton 2010, Scott 2002, Hall 2000, Zukin 1996)
- **Big concerns about spatial inequality** – in the UK, 'left-behind' places and 'levelling up' (DLHUC 2022, Jennings 2021)
- Revival of **industrial policy**, including for local economic development (Bryan and Williams 2021, Moretti and Kline 2014, Mazzucato 2013, Rodrik 2004)
- Government relocation as a 'big push' policy tool – can we shift clusters across space?

What we do

- We test economic impacts of a major public sector relocation: the BBC's move of key departments to Salford in 2011
- We use a synthetic control design on rich microdata, 1997-2017
- The BBC's move is part of a much larger set of interventions
 - We focus on impacts on jobs, wages, firms + house prices
 - We don't consider the wider physical regeneration impacts; innovation; productivity; rents; social mobility, etc
- **Findings so far:**
 - Each BBC job creates 0.75 creative industries jobs in Salford (+2.1k jobs)
 - Cumulative effect is larger: by 2017, 1.04 jobs created for each BBC job
 - Drivers: radio and TV; movers + entrants; little local displacement; no evidence of losses in London creative industries
 - We don't find total jobs or adjacent sector effects

Lit review: the BBC move

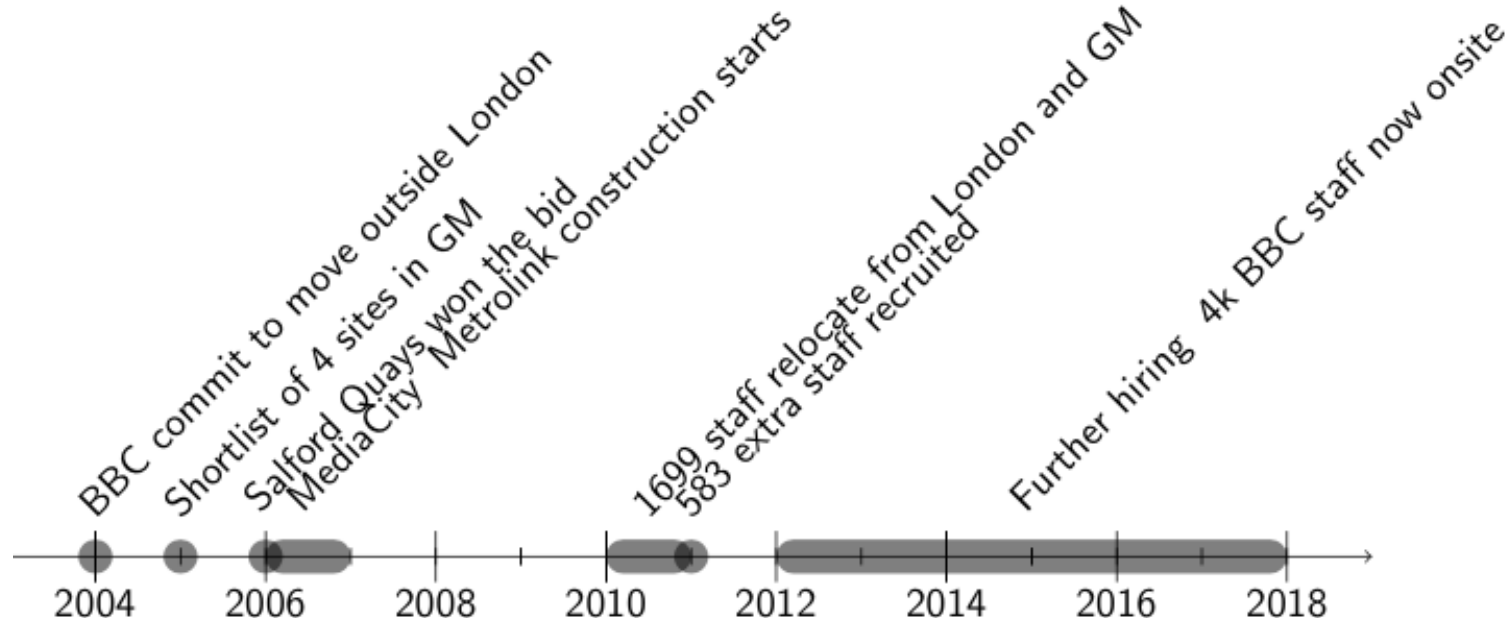
- Some ex-ante studies by consultants suggested **up to 15,000 job gains from the BBC move** (NAO, 2103)
- **Two ex-post evaluations:**
 - **Forth (2017): before/after analysis.** Compares Greater Manchester (GM) to other large UK cities, finds significant gains in radio, TV and film productivity and turnover
 - **Swinney and Piazza (2017): descriptive analysis.** Find job gains, but suggests these are largely explained by creative firms moving within GM
- **Both studies have some limitations.** Forth tracks impact but can only use aggregate city-region data, no controls. Swinney and Piazza don't actually identify impact (no counterfactual)

Lit review: relocations & halo effects

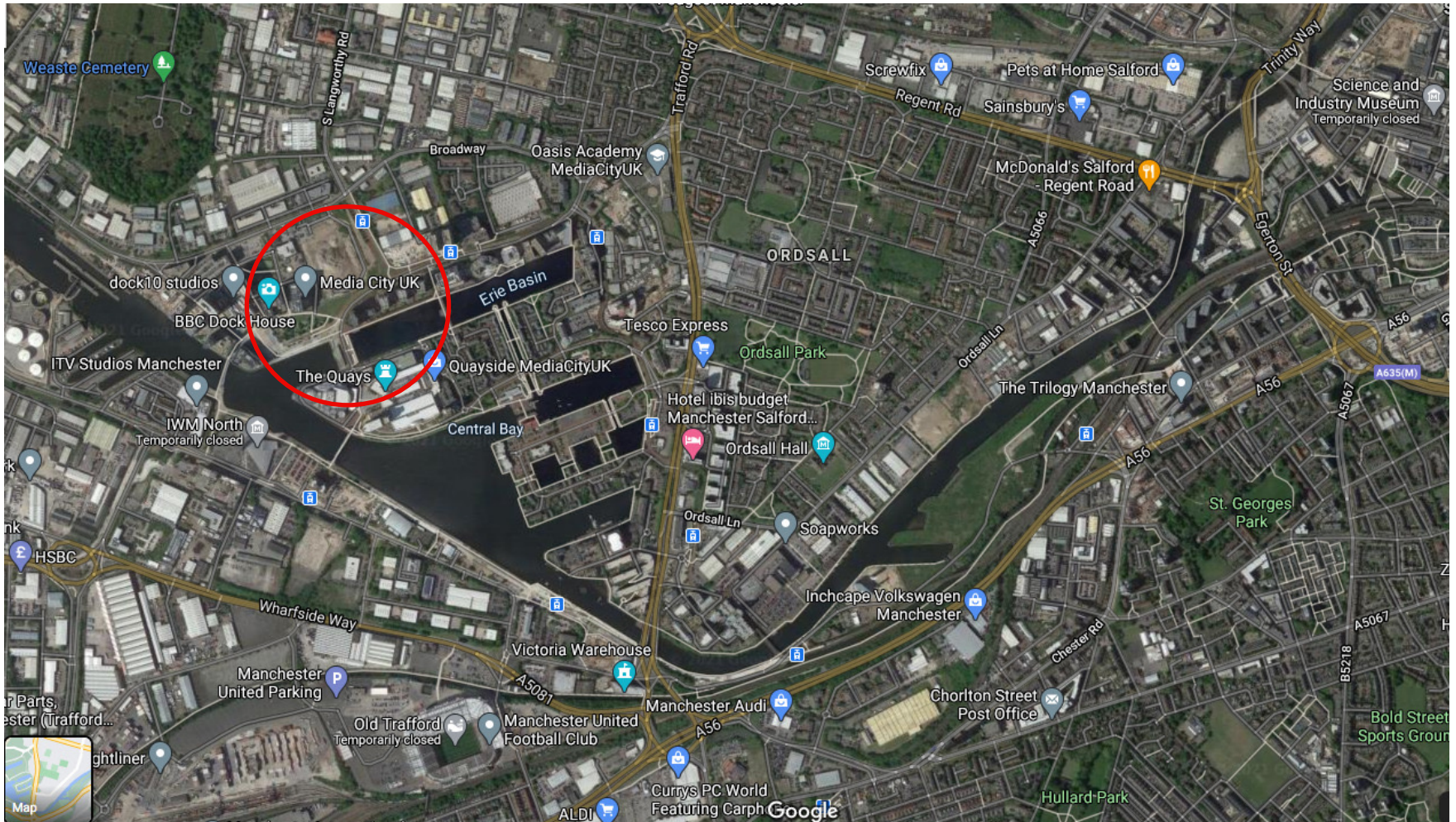
- **Job multipliers literature** initially uses cross-section data or I-O models. Moretti (2010) triggers wave of directly estimated multiplier studies, e.g. Faggio and Overman (2014), Aurricchio et al (2015), Gerolimetto et al (2016), Kemeny and Osman (2018), Lee and Clarke (2019). Reviewed in WWC (2019)
- **Within this, limited public sector relocation literature**
 - Becker et al (2020): relocation of German capital Berlin ~> Bonn: 0.86
 - Faggio et al (2019): Bonn back to Berlin: 0.55
 - Faggio and Overman (2014): no public ~> private sector job spillovers
 - Faggio (2019): Lyons Review. Some displacement, but also highly localised agglomeration effects

Timeline

- The **British Broadcasting Corporation (BBC)** is the largest broadcaster in the world. >20,000 staff. Est 1922
- **Why decentralise?** 1) better serve audiences in 'The North' and across the UK 2) reduce costs 3) local economic benefits



Locations



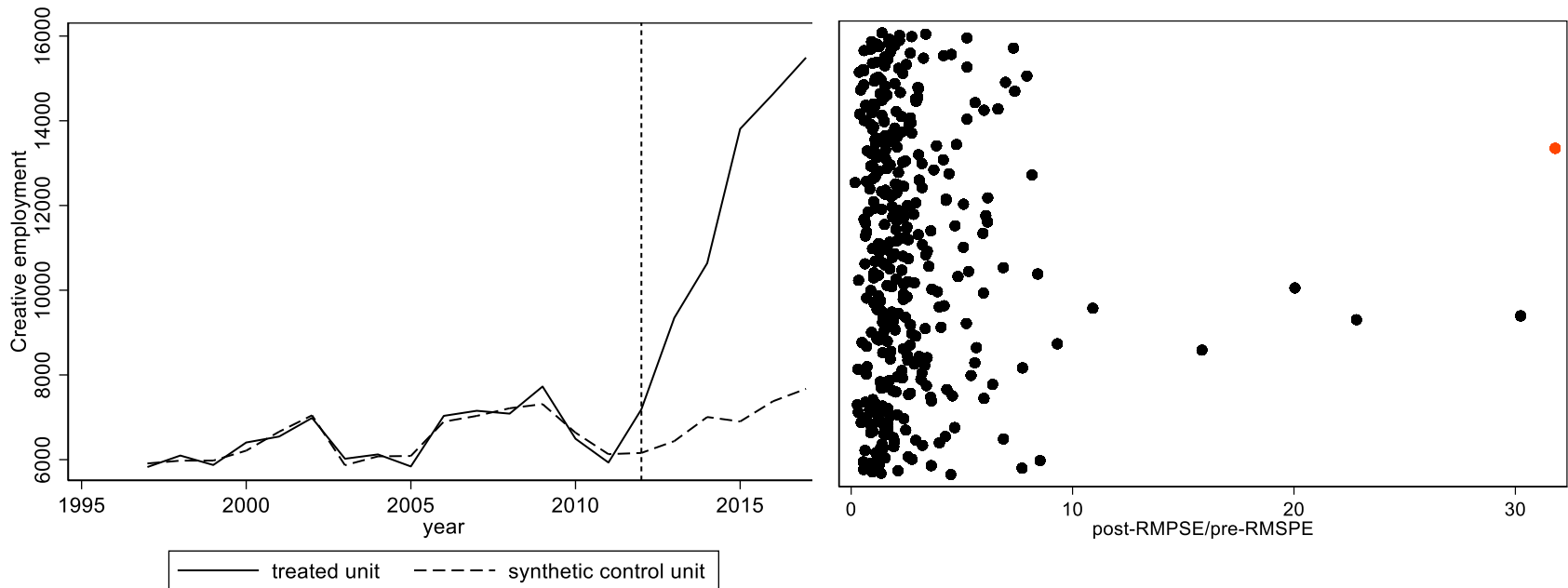
Data

- **Business Structure Database:** census of UK workplaces, covering 99% of economic activity in the UK
 - 1996-2017 panel, aggregated to 349 local authorities [\[descriptives\]](#)
 - Firms and employment in 4-digit SIC2003 bins
 - Use DCMS definition of creative industries, crosswalk to SIC2003 [\[more\]](#)
 - Also look at tech sector, using Tech Nation definition [\[more\]](#)
- **Caveat:** the BSD excludes some self-employed workers, who are disproportionately in the creative industries (35% vs 15% UK average). Implies **we may be under-estimating the effect** on creative industries activity
- We check self-employment with Annual Population Survey data

Research design

- We want to identify **the effect of the BBC relocation in Salford, compared to a no-relocation counterfactual**
- **Difference-in-differences** = compare outcome changes in Salford to outcome changes in some similar control areas
- Why is that **problematic in this case?**
 - Creative industries in the UK are highly clustered, with London and Manchester the two biggest clusters => *makes controls harder to find*
 - No cities than Manchester were considered for relocation => *selection problem, so even harder to do like-for-like comparison*
- **Preferred approach = synthetic control.** Make a weighted average of other local authorities that resembles Salford as closely as possible, *before* the BBC relocates [\[detail\]](#)

Main results (1)



Source: BSD. The **left panel** shows the trends in creative employment between actual Salford and synthetic Salford. The BBC relocation occurs in BSD year 2012. The **right panel** depicts placebo tests and their goodness of fit, specifically the distribution of post-period error / pre-period error for Salford (red) vs all other local authorities in England (black). A higher post/pre error ratio indicates better goodness of fit. The more placebos are fitted at least as well as the treatment, the more likely the treatment effect is just noise.

Main results (2)

Outcome	Period of predictors	Levels	Long diff	Obs
Creative employment	1997-2011	4918***	7441***	349
Total employment	1997-2011	1495	1078	349

Effects are gross additional jobs, including BBC jobs.

Between 2012 and 2017, creative industries job multiplier =
 $(4918 - 2800) / 2800 = 0.75$. By 2017: 1.04

Total employment multiplier is not significant.

Mechanisms (1)

Outcome	Period of predictors	Levels	Obs
Creative employment	1997-2011	4918***	349
Publishing/Broadcasting employment	1997-2011	3843***	349
Tech employment	1997-2011	932	349

Within the creative industries, the biggest change is in publishing and broadcasting (including the BBC)

No effect on adjacent sectors like tech

Mechanisms (2)

Outcome	Period of predictors	Levels	Long diff	Obs
Creative employment	1997-2011	4918***	7441***	349
Share of creative employment over total	1997-2011	0.049***	0.060***	349

Average increase in Salford LA's creative jobs share is 4.9% points,
up from 7% to 13%, significant at 1%.

Cumulative impact is 6% points

Mechanisms (3)

Outcome	Period of predictors	Levels	Long diff	Obs
Creative employment	1997-2011	4918***	7441***	349
Number of creative firms (incl BBC)	1997-2011	204***	349	349
Average size of creative firms (excl BBC)	1997-2011	1.11***	1.21**	349

The relocation resulted in just over 200 additional creative industries firms in Salford (including the BBC)

Excluding the BBC, creative industries firms added just over 1 worker on average

Mechanisms (4)

- **Incumbent firms' survival rate increases**, but no other significant impacts [\[more\]](#)
 - Bulk of creative firms are incumbents. ~20% movers, ~1% entrants
 - Implies bulk of impacts come from movers, startups
 - Anecdotally: BBC slow to build local supply chain links with incumbents
- **Did the BBC displace activity in the city-region?** [\[more\]](#)
 - Overall, displacement effects are very small and concentrated in LAs furthest from the Salford site. Possible spillovers in contiguous LAs?
- **What about displacement from London?**
 - Re-run results on the LA where BBC White City was located. Noisy!
 - Find no local impacts, but again, effects may be dispersed London-wide
 - Given London's large creative economy, unlikely welfare effects are big

Wider impacts

- Outside of the creative industries, what about the wider local economy? We run two tests:
 - 1) **Wages** – we find a ~7% rise in average weekly wages in Salford: £374.50/week, up from £350/week [\[more\]](#)
 - 2) **House prices** – use Land Registry microdata to look at house price changes. No BBC effect on Salford or GM house prices. Possible that effects are highly localised, or shift via rents

Summing up

- Public sector relocation *can* have positive local economic impacts
 - In this case, gains for Greater Manchester without losses for London
- But: spillover effects, both good and bad, seem limited
 - Caution needed, especially about ex-ante predictions of what such policies can achieve (15k new jobs predicted vs. ~4k actual)
 - Importance of big push: doubtful a smaller move would have had much effect locally
 - Importance of targeting: size of move * fit to local economy
- Caveats
 - Our analysis is quite short term: only five years out!
 - We don't test for effects on innovation, productivity
 - We don't test for impacts on rents, or gentrification

Thanks!

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Appendix

Creative industries

Group	SIC(2007)	Description
1. Advertising and marketing	70.21	Public relations and communication activities
	73.11	Advertising agencies
	73.12	Media representation
2. Architecture	71.11	Architectural activities
3. Crafts	32.12	Manufacture of jewellery and related articles
4. Design: product, graphic and fashion design	74.10	Specialised design activities
5. Film, TV, video, radio and photography	59.11	Motion picture, video and television programme production activities
	59.12	Motion picture, video and television programme post-production activities
	59.13	Motion picture, video and television programme distribution activities
	59.14	Motion picture projection activities
	60.10	Radio broadcasting
	60.20	Television programming and broadcasting activities
6. IT, software and computer services	74.20	Photographic activities
	58.21	Publishing of computer games
	58.29	Other software publishing
	62.01	Computer programming activities
7. Publishing	62.02	Computer consultancy activities
	58.11	Book publishing
	58.12	Publishing of directories and mailing lists
	58.13	Publishing of newspapers
	58.14	Publishing of journals and periodicals
	58.19	Other publishing activities
8. Museums, galleries and libraries	74.30	Translation and interpretation activities
	91.01	Library and archive activities
9. Music, performing and visual arts	91.02	Museum activities
	59.20	Sound recording and Music publishing activities
	85.52	Cultural education
	90.01	Performing arts
	90.02	Support activities to performing arts
	90.03	Artistic creation
	90.04	Operation of arts facilities

Tech industries

SIC (2007)	Description
26.20	Manufacture of computers and peripheral equipment
58.21	Publishing of computer games
58.29	Other software publishing
61.10	Wired telecommunications activities
61.20	Wireless telecommunications activities
61.30	Satellite telecommunications activities
61.90	Other telecommunications activities
62.01	Computer programming activities
62.02	Computer consultancy activities
62.03	Computer facilities management activities
62.09	Other IT & computer service activities
63.11	Data processing, hosting & related activities
63.12	Web portals
95.11	Repair of computers & peripheral equipment

Summary statistics [old]

Table: Main outcomes

Variable	mean	st. deviation	min	max
Creative empl	2838.096	2915.948	397	24666
Total empl	60452	50403	12160	457218
Creative firms	569.44	462.67	63.80	3013
Av. size of firms	5.00	3.40	2.6	12.43
Share creative sector	0.044	0.019	0.018	0.184

Note: all variables are averaged for the 1996-2011 period

Synthetic control

- Generalisation of diff in diff, controlling for time-varying unobservables. The ATT α_1 for the treated area T is given by:

$$\alpha_{1,t} = Y_{1,t} - \sum_{j=2}^{J+1} w_j^* Y_{j,t} = Y_{1,t} - Y_{W^*,t}$$

- The optimal weights W^* are chosen to minimize:

$$\|\mathbf{X}_1 - \mathbf{X}_J \mathbf{W}\|_V$$

- Where
 - \mathbf{X}_1 is a set of pre-treatment outcomes for the treated location T
 - \mathbf{X}_J is a matrix of the same pre-treatment outcomes for J control locations
 - \mathbf{V} denotes the relative importance of the pre-treatment outcomes \mathbf{X}

Synthetic control (2)

- Inference uses placebo-in-space tests based on goodness of fit, where the test statistic p_T is given as follows, for the 349 LAs:

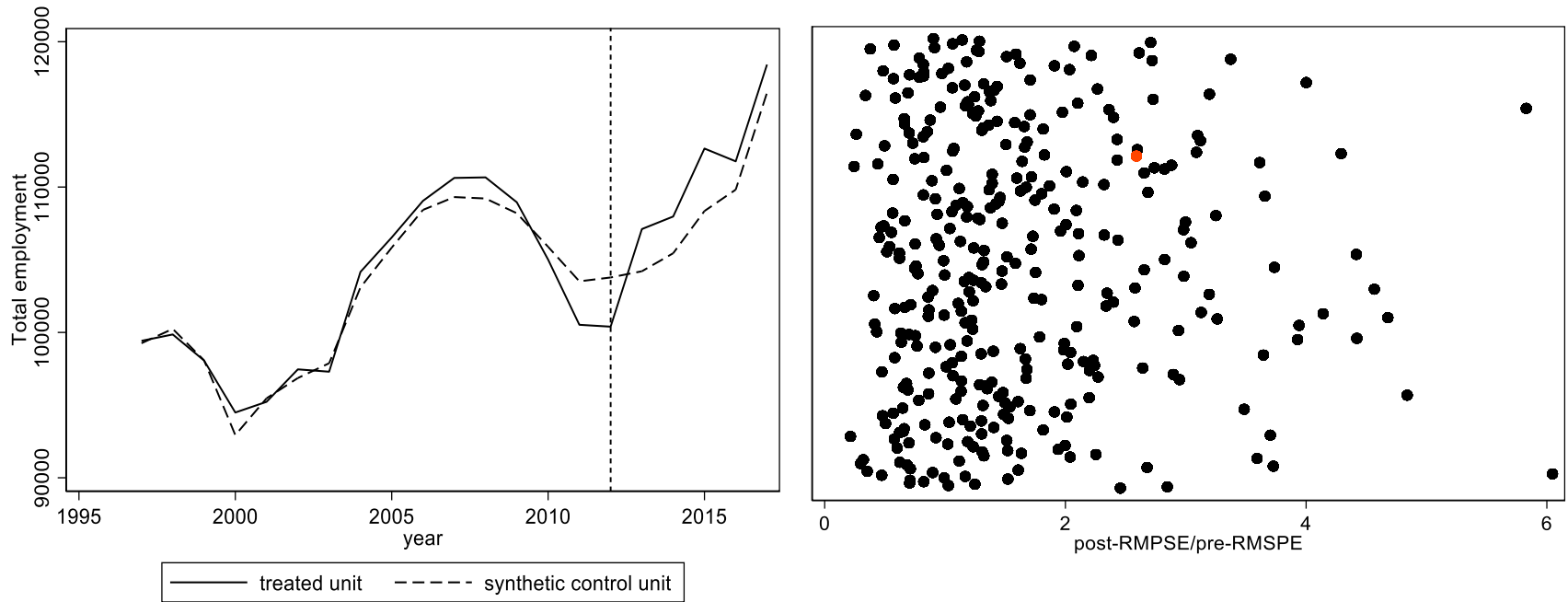
$$p_T = \frac{\sum_{j=2}^{J+1} RRMSPE_j}{349} > RRMSPE_T$$

- ... that is, we look the share of placebos are better fitted than the true treatment area in the pre-treatment period, where fit is given by post-treatment / pre-treatment error rates
- Intuitively, this gives a level of confidence that the treatment effect comes from the treatment, rather than from noise
- This means that p_T can be interpreted as a p -value.

Robustness checks

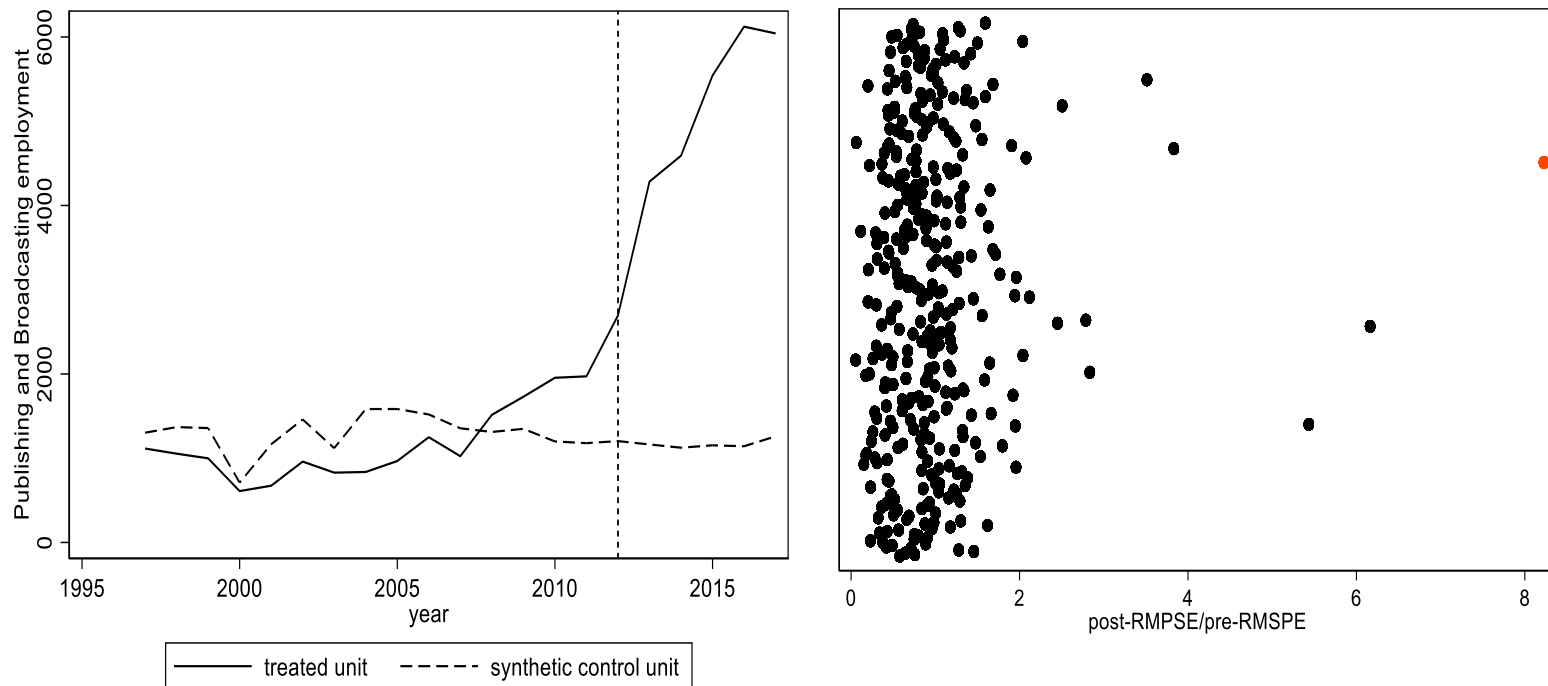
- Results are robust to:
 - Different specifications of the \mathbf{V} matrix, generating different weights
 - Using only the 1996-2008 pre-period, excluding the post-crash dip
 - Cross-check with 2007-2016 data and SIC2007 codes
 - Placebo-in-time check, using the Salford Quays announcement (2006) rather than the actual relocation
 - Re-estimating our main results using difference-in-differences: effects are ballpark similar, less precise [\[ongoing\]](#)

Main results (2)



Source: BSD. The **left panel** shows the trends in total employment between actual Salford and synthetic Salford. The BBC relocation occurs in BSD year 2012. The **right panel** depicts placebo tests and their goodness of fit, specifically the distribution of post-period error / pre-period error for Salford (red) vs all other local authorities in England (black). A higher post/pre RMSPE ratio indicates better goodness of fit. The more placebos are fitted at least as well as the treatment, the more likely the treatment effect is just noise.

Within creative industries



Within the creative industries, the biggest change is in publishing and broadcasting

Within-CI trends

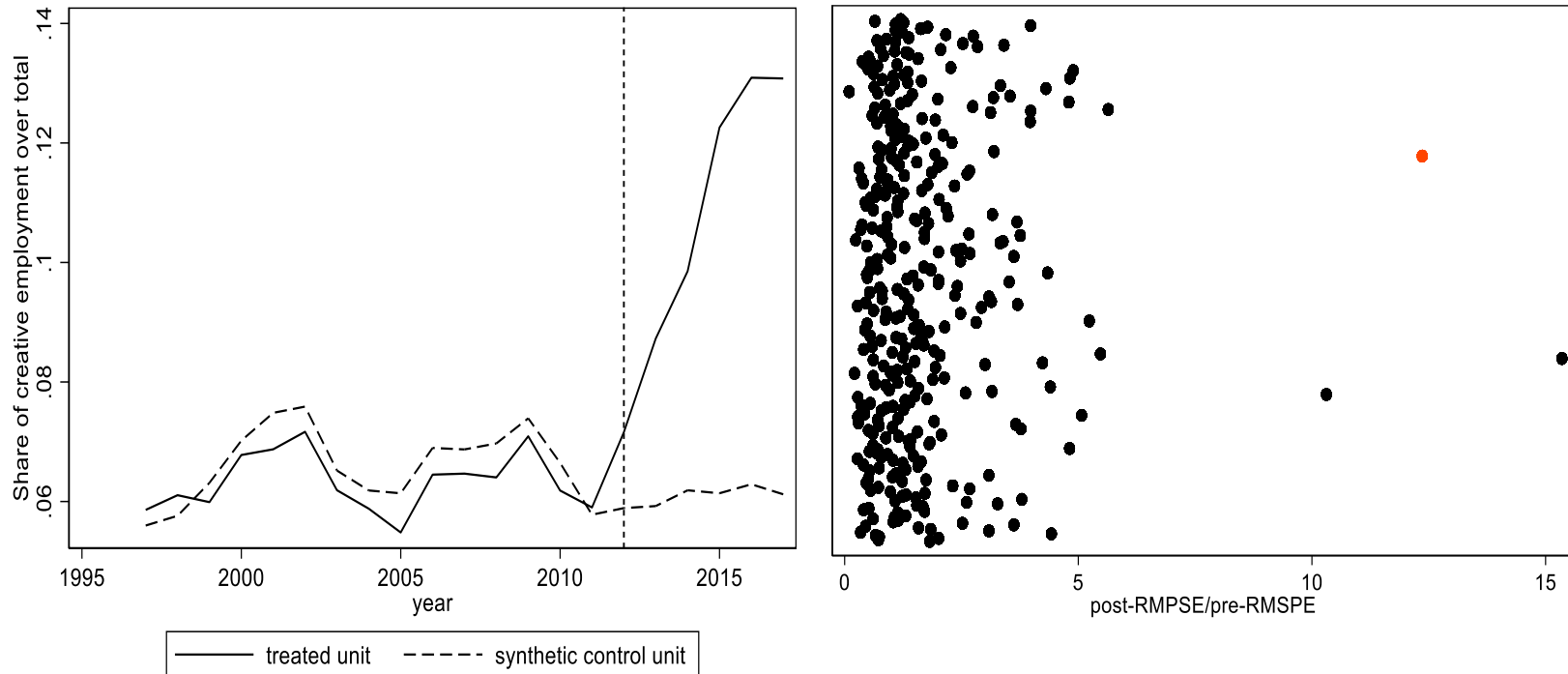
Table: Sub-sector analysis

period	Radio and TV	Other creative sub-sectors
1996-2010	250	2278
2011	1082	2176
2012	2518	2102
2013	2762	2207
2014	3609	2059
2015	4120	1856
2016	3994	1923

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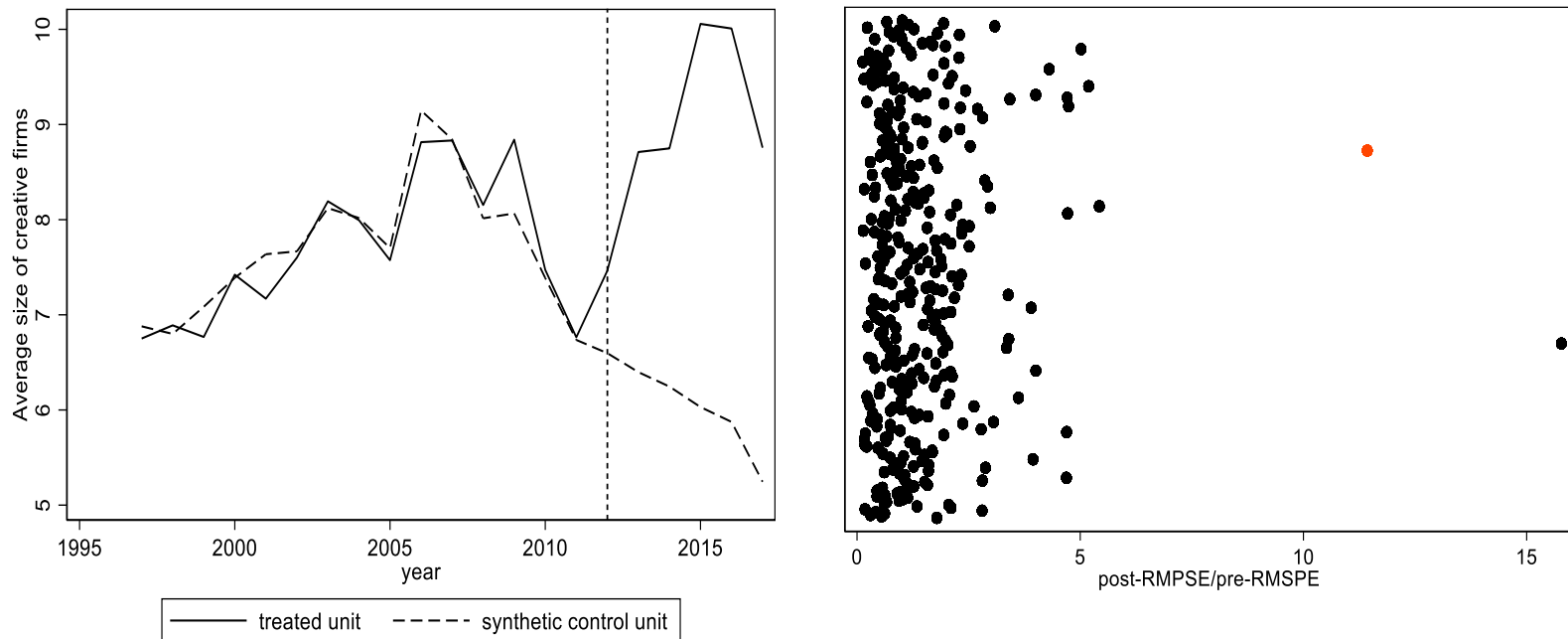
Note: totals exclude the BBC

Densification



Average increase in Salford LA's creative jobs share is 6% points,
up from 7% to 13%, significant at 1%

Creative firm size



Note: holding graph, includes the BBC

Incumbents

Outcome	Period of predictors	Levels	N
Creative employment for incumbents	1997-2011	315.12	349
Share of creative employment over total	1997-2011	0.004	349
Number of creative incumbent firms	1997-2011	32.283**	349
Average size of creative incumbent firms	1997-2011	-0.304	349

Incumbents defined as firms present in Salford in or before 2011. No significant impacts on employment, employment share, firm size. Increase in firm counts => higher survival rate than in no-BBC counterfactual

Rest of GM effects

<i>Local Authority</i>	Creative employment	Share of creative over total jobs	Creative firms	Average size of creative firms	Obs
<i>Bolton</i>	867	0.012	-146*	1.57	349
<i>Bury</i>	473	0.006	21	0.49	349
<i>Manchester City</i>	6616	0.005	359	0.62	349
<i>Oldham</i>	468***	0.005***	-25***	0.88***	349
<i>Rochdale</i>	71***	0.003***	-10***	0.28***	349
<i>Stockport</i>	42***	0.004***	-69***	0.29***	349
<i>Tameside</i>	-174***	0.000***	-10***	-0.19***	349
<i>Trafford</i>	933***	0.004***	-168***	1.30***	349
<i>Wigan</i>	-216***	0.000***	20***	-0.15***	349

Changes are zero or positive in LAs contiguous to Salford (Bolton, Bury, COM, Trafford). Exception = Wigan
 Negative impacts largest in Tameside, a distant LA

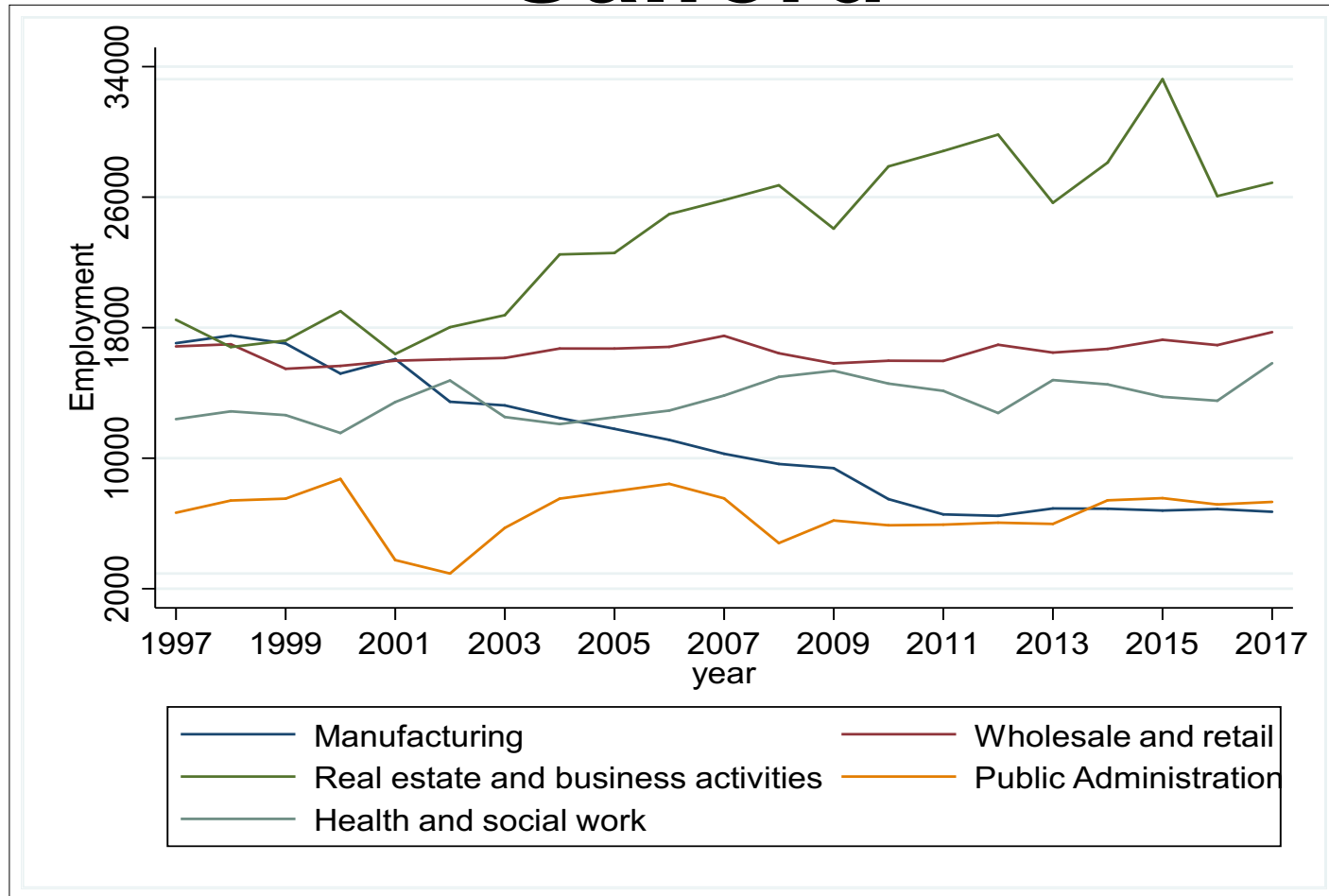
Wages

Outcome	Period of predictors	Levels	Obs
LA base hourly earnings	1997-2011	0.71*	337
LA base earnings	1997-2011	34.5**	337

We find a roughly 7% increase in average hourly wage in Salford compared to the pre-period Salford mean of £10.27 and an increase of 10% of weekly earnings compared to the pre-period Salford mean of £350.

Using Freedom of Information request data, we are trying to (roughly) exclude the effect of BBC jobs. Current estimates => weekly wage rise without the BBC is 7%, not 10% (so an extra £24.50/week)

Sectoral job change in Salford



Source: BSD. 1-digit SICs

Background

- The Levelling Up agenda is still ‘evolving’ ...
- So far, **public sector relocation has been one of the biggest elements in the mix.** Why?
- **Take 1: it’s great policy theatre** (Jennings 2021)
 - Has little effect, and doesn’t have to – it’s just symbolism
- **Take 2: it’s ‘big push’ industrial policy** (Moretti & Kline 2014)
 - Generates halo effects that drive local growth
- **Take 3: it helps do government differently** (Gove 2020)
 - Changes the ‘Whitehall Mindset’ by bringing new voices into the room