# DO CREATIVE INDUSTRIES GENERATE MULTIPLIER EFFECTS? EVIDENCE FROM UK CITIES, 1997-2018

Diana Gutiérrez-Posada (University of Oviedo)
Tasos Kitsos (City-REDI, University of Birmingham)
Max Nathan (UCL & CEP)
Massimiliano Nuccio (Università Ca' Foscari Venezia)

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UNIVERSITY OF BIRMINGHAM | WM REDI | CITY REDI

*Supporting inclusive economic growth in the West Midlands and across the UK*

*Email: a.kitsos@bham.ac.uk*
*Twitter: @Tasos_Kitsos*

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# Overview

- **What we do:** How cities grow? Look at the wider economic impacts of creative industries in UK cities, 1997-2018.

- **Why this matters:** creative industries cluster in urban areas …
  - Does this imbalance matter? Are there urban-level spillovers of CIs?
  - Large but inconclusive cross-country literature on spillovers
  - Lots of policymaker interest (culture in economic development, industrial strategy, 'levelling up' agenda etc.)

# A note on terminology - Creative industries

- advertising and marketing;
- architecture;
- crafts;
- design;
- film, TV, video, radio and photography;
- IT, software and computer services;
- publishing;
- museums, galleries and libraries;
- music, performing and visual arts.

# Overview

- **Approach:** Estimate Moretti-style multipliers for rich UK microdata, with an IV approach based on historic coalfields & Victorian - Edwardian era art schools

- **Findings**: 1) long term, creative specialisation in few cities 2) jobs multipliers (2 jobs in local services per CI job) – 15% of local services' job growth during 1997-2018 3) impact on jobs rather than workplaces, driven by creative services spending and declining after 2007 4) no impact on other tradable activities

- Implications for 'creative city' policies

# Background

- Creative Industries (CIs) uneven concentration in urban areas
  - Across countries (Lazzeretti, Boix et al. 2008, Nuccio and Ponzini 2017, Kemeny, Nathan et al. 2020)
  - Within countries (Bertacchini and Borrione 2013, Mateos-Garcia, Klinger et al. 2018, Tao, Ho et al. 2019)
  - Within cities (O'Connor and Gu 2014, Hracs 2015)

- Due to
  - Post-industrialisation (Zukin 1995, Scott 2006, Pratt and Jeffcut 2009)
  - Agglomeration economies (Hall 2000, Hutton 2008)

# Background

- Does this urban clustering matter for wider urban economies? 3 views

1) No. They are just the spatial footprint of 'culturalisation' (Lash & Urry, 1984) and 'cognitive-cultural capitalism' (Scott, 2014). Just benefitting from agglomeration and other urban economies (Scott 1988, Zukin 1995, Hall 1998, Hall 2000)

2) Yes. Via
   a) Multiplier effects from creative worker spending on local services (Hutton 2008, Lee 2014)
   b) Amenity effects attracting high-income residents and visitors who spend further (Florida 2002, Pratt and Jeffcut 2009)
   c) Agglomeration economies catalyst by enhancing urban stock of ideas -> innovation -> productivity (Müller, Rammer et al. 2009, Pratt and Jeffcut 2009, Boix-Domenech and Soler-Marco 2017)
   d) Displacement effects on other industries (industrial gentrification)

3) Yes and No. More productive cities have more CIs due to demand from other industries (creative and not) & households

# Background

- Extensive but inconclusive literature on the economic impact of creative industries (Seaman 2011, Bloom et al. 2020)
  a) Single events
  b) Short time-frames
  c) Non-causal identification strategies
  d) No distinction between arts and creative services

- Questions remain on spillovers by:
  a) type of creative industry
  b) type of recipient industry
  c) business cycle stage
  d) causality

# Background

- Contribution
  a) All CIs in urban TTWAs using BSD data
  b) 22 years
  c) IV approach using historical coalfields + art schools
  d) Separation between arts and creative services
  e) Local multipliers for jobs & workplaces, non-tradables and tradables, pre- and post-2007

# Research Questions

**Q1:** How has the UK creative industry system evolved across cities since the 1990s?

**Q2:** What are the urban non-tradable jobs and workplace multipliers from CIs?

**Q3:** Are there differences between the impact of arts and creative services?

**Q4:** What is the impact of CIs on other tradable jobs and workplaces?

# Data

- **Business Structure Database**: census of UK workplaces, covering 99% of economic activity in the UK
- **Controls** from LFS/APS, ONS GVA and GDHI datasets

- Our basic concepts:
  - **Cities** defined as Travel to Work Areas (2011 version) with an urban core of at least 125,000 people [detail]
  - **Creative industries** defined as per UK Government official definition, but crosswalked to SIC2003 to use our full time-series [detail]
  - **Other Tradable sector** – manufacturing; public sector services + tradable services (defined with new Locational Ginis built using 2018 BSD data [detail])
  - **Non-tradable sector –** non-tradable services (Locational Ginis)
- Panel: 1716 obs, 78 TTWAs, 22 years [summary stats]

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# Q1: How has the UK creative industry system evolved across cities since the 1990s?

- The average city has more CI workplaces and jobs in 2018 compared to 1997 (nrs & shares) – LQ workplaces show concentration, LQ jobs show dispersal

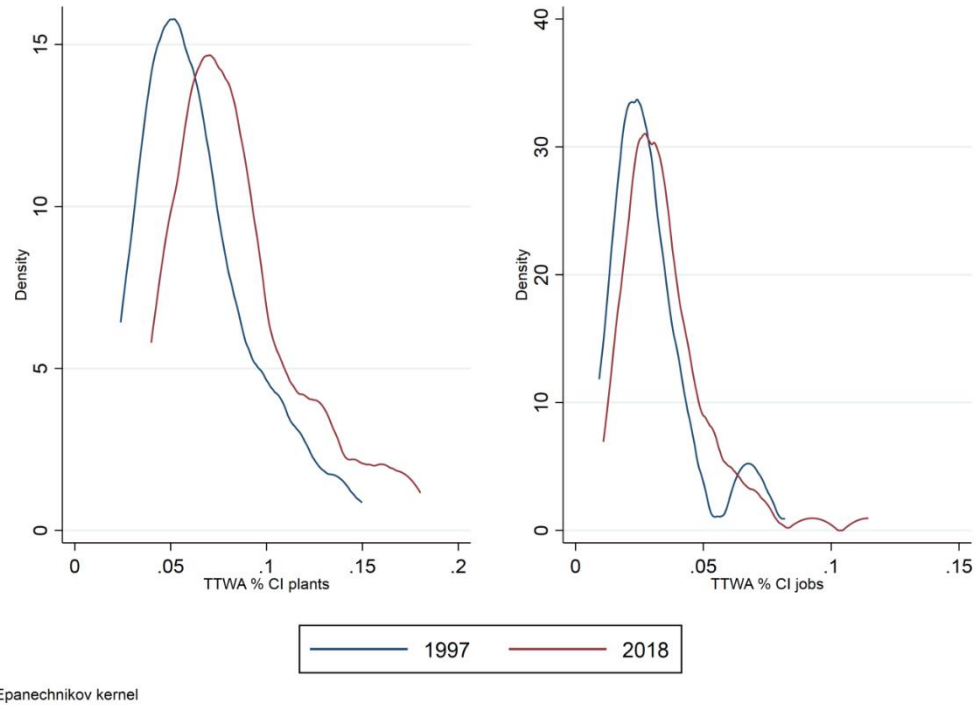
| | A. All years | | B. 1997 | | C. 2018 | |
|---|---|---|---|---|---|---|
| **Variable** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** |
| TTWA all workplaces | 23,898 | 50,492 | 19,006 | 36,180 | 28,790 | 61,437 |
| TTWA all jobs | 263,924 | 505,570 | 220,630 | 407,733 | 307,218 | 586,922 |
| TTWA CI workplaces | 2,374 | 7,852 | 1,595 | 4,862 | 3,153 | 9,961 |
| TTWA CI jobs | 12,181 | 42,730 | 8,849 | 27,837 | 15,513 | 53,646 |
| TTWA % CI workplaces | 0.075 | 0.032 | 0.064 | 0.028 | 0.085 | 0.033 |
| TTWA % CI jobs | 0.032 | 0.017 | 0.03 | 0.016 | 0.035 | 0.018 |
| TTWA LQ CI workplaces | 0.77 | 0.316 | 0.765 | 0.336 | 0.776 | 0.298 |
| TTWA LQ CI jobs | 0.719 | 0.369 | 0.74 | 0.388 | 0.697 | 0.35 |
| Observations | *156* | | *78* | | *78* | |

Source: BSD. 78 urban TTWAs in 1997 and 2018. Table shows descriptive statistics of all workplaces and employment, those of creative industries workplaces (individual plants) and employment as well as shares and LQs in 1997 and 2018.

# **Q1:** How has the UK creative industry system evolved across cities since the 1990s?

- CI increase is concentrated in few cities

**Kernel density plot of % creative industries workplaces and employment, urban TTWAs, 1997 and 2018.**
L: workplaces. R: jobs.

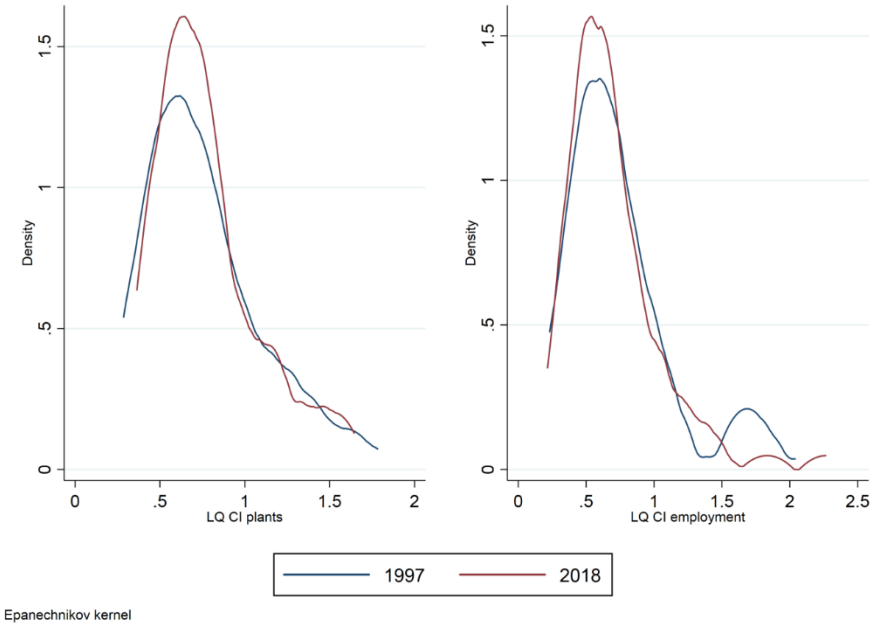



Source: BSD. 78 urban TTWAs. Plots show distribution of creative industries workplaces (individual plants) and employment, as a share of all TTWA workplaces / employment.

# **Q1:** How has the UK creative industry system evolved across cities since the 1990s?

- CI clustering has been accompanied by diffusion on the specialisation of places on CIs – higher densities below LQ=1
- Except the top clusters in terms of jobs

**Kernel density plot of creative industries workplaces and employment LQs, urban TTWAs, 1997 and 2018.**
L: workplaces. R: jobs.




Source: BSD. 78 urban TTWAs. Plots show distribution of creative industries workplaces (individual plants) and employment location quotients.

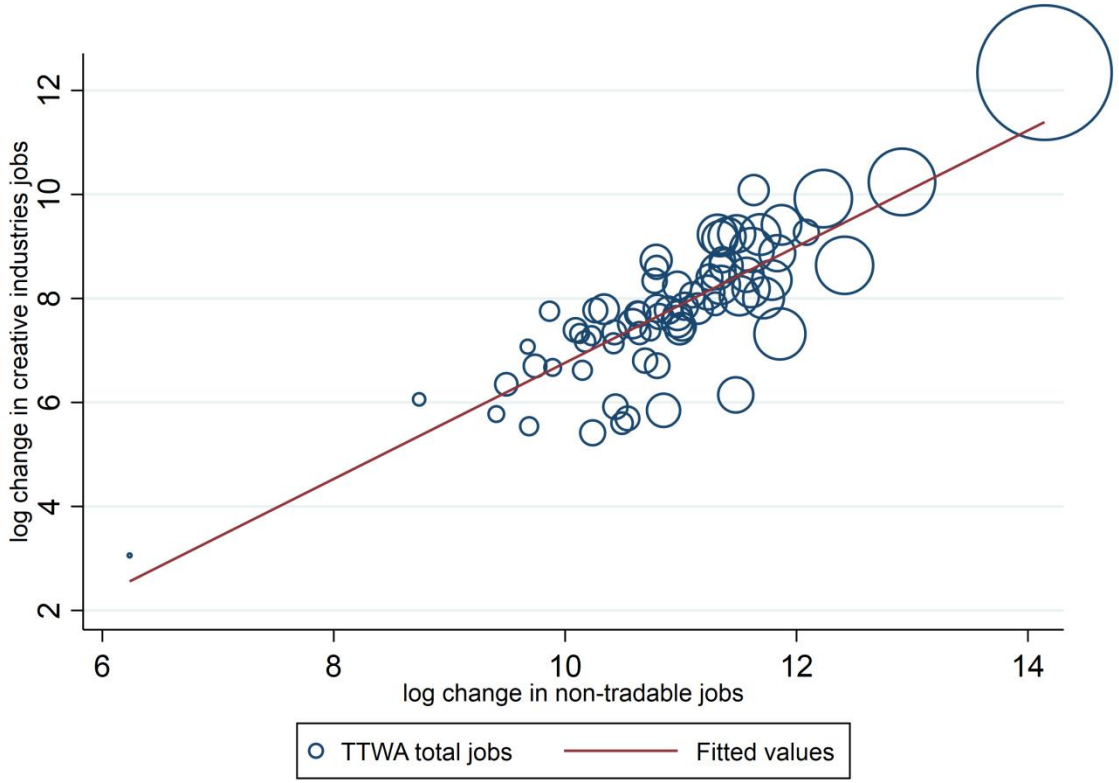
# **Q1:** How has the UK creative industry system evolved across cities since the 1990s?

Shifts in urban CI league table -> more CIs in fewer urban areas

but not the initial top performers [top-20]

# **Q2:** What are the urban non-tradable jobs and workplace multipliers from CIs?

**Change in creative vs. non-tradable jobs, urban TTWAs, 1997-2018.**




Source: BSD. 78 urban TTWAs weighted by #jobs. Plot shows correlation between log change in non-tradable jobs (x-axis) and creative industries jobs (y-axis).

# **Q2:** What are the urban non-tradable jobs and workplace multipliers from CIs?

- Moretti 2010
  - Shock to tradable activities

- Shock to creative industries
  - Multipliers on non-tradables
    - intensive margin (more jobs in existing businesses)
    - extensive margin (more businesses creating jobs)
  - Multipliers on other tradables
    - +ve cross-industry spillovers (supply-chain, knowledge spillovers etc)
    - -ve competition for inputs

# **Q2:** What are the urban non-tradable jobs and workplace multipliers from CIs?

- Adapting Moretti 2010

- $\ln NT_{it} = a + b1 \ln CI_{it} + b2 \ln OT_{it} + \mathbf{Xc}_{it-n} + I_i + T_t + e_{it}$ (1)

- $\Delta \ln NT_{it-tbase} = a + b1 \Delta \ln CI_{it-tbase} + b2 \Delta \ln OT_{it-tbase} + \Delta \mathbf{Xc}_{it-tbase} + T_t + e_{it}$ (2)

- M = *b1*_hat * ($NT_{2007}$ / $CI_{2007}$) (Moretti)
- M = *b1*_hat * ($NT_{1998}$ / $CI_{1998}$) (Van Dijk)

Van Dijk (2018) critique on multiplier calculation

# Q2: What are the urban non-tradable jobs and workplace multipliers from CIs?

| A. Fixed effects | | B. Long differences | |
|---|---|---|---|
| **Employment** | | **Employment** | |
| Creative, all years | 2.844 | Creative, all years | 2.126 |
| Creative, 1998-2006 | 4.526 | Creative, 1998-2006 | |
| Creative, 2007-2018 | 0.798 | Creative, 2007-2018 | |
| Tradables, all years | 0.996 | Tradables, all years | 0.709 |
| **Workplaces** | | **Workplaces** | |
| Creative, all years | 1.158 | Creative, all years | 2.516 |
| Creative, 1998-2006 | 1.027 | Creative, 1998-2006 | |
| Creative, 2007-2018 | 1.429 | Creative, 2007-2018 | |
| Tradables, all years | 1.632 | Tradables, all years | 2.365 |

Source: authors' elaboration from BSD, LFS/APS, ONS. Multipliers calculated using van Dijk (2018) specification of base years. Blank field indicates point estimate is non-significant.

**Robustness tests**

- Alternative time splits
- Alternative controls
- First-differences

# **Q2:** What are the urban non-tradable jobs and workplace multipliers from CIs?

- **Problem 1:** some unobserved factor might drive both non-tradable and creative industries job growth. We need to instrument CIs with a variable that relates to it but is not affected by the potential unobserved factors

- **Problem 2: the typical shift-share IV may also not work**,
  - CIs are highly & persistently clustered across space without large national shock
  - Weak and/or under-identified

# **Q2:** What are the urban non-tradable jobs and workplace multipliers from CIs?

- **We use a TTWA's distance to C19 coalfields as an instrument**
- Cities closer to coalfields more likely to develop as single-industry towns => less small-firm entrepreneurial and creative activity (Chinitz 1961, Glaeser et al 2015, Stuetzer et al 2016)
    - Distance should positively predict creative industries jobs/workplaces
    - Distance should have no link to non-tradables

- **We use a TTWA's count of historic Art Schools (1837-1914)** [results]
- Historical cultural institutions => creative activity today (Lee and Clarke, 2019)
    - Counts should positively predict creative industries jobs/workplaces
    - Counts should have no link to non-tradables

# **Q2:** What are the urban non-tradable jobs and workplace multipliers from CIs?

[results table]

- 10% increase in CI jobs -> 1.12% - 6.2% increase in non-tradable jobs
- An extra CI job -> 2 extra non-tradable jobs
- Multiplier effects 3x larger before 2007
- Workplace coefficients largely non-significant -> impacts come from more jobs in non-tradable businesses rather than more non-tradable businesses

# **Q3:** Are there differences between the impact of arts and creative services?

- A few more tables later… [results]

- Non-causal results (cannot use IV approach) – Impacts arise more from creative worker spending rather than amenities channels.

  - Creative services (architecture; design; film/TV/radio and; publishing) rather than arts (libraries and museums) have the largest and most robust multipliers pre-2007
  - Post-2007 only design, film/TV/radio and the visual/other arts have significant multipliers

# **Q4:** What is the impact of CIs on other tradable jobs and workplaces?

- We estimate

- $\Delta \ln OT_{it\text{-}tbase} = a + b1\Delta \ln CI_{it\text{-}tbase} + b2\Delta \ln NT_{it\text{-}tbase} + \Delta \mathbf{Xc}_{it\text{-}tbase} + T_t + e_{it}$

- A few more tables later… [results table]

# **Q4:** What is the impact of CIs on other tradable jobs and workplaces?

- Suggestive positive effects but no causal link

# Conclusions

- What is the wider economic impact of creative industries in UK cities?

- Microdata on 22 years
- Robust research design
- Answer 4 relevant questions

# Conclusions

**Q1:** How has the UK creative industry system evolved across cities since the 1990s?

- Concentration in clusters & diffusion within top performers

**Q2:** What are the urban non-tradable jobs and workplace multipliers from CIs?

- 2 NT jobs per CI worker, mostly pre-2007
- No workplace effect

**Q3:** Are there differences between the impact of arts and creative services?

- Most impacts from creative services

**Q4:** What is the impact of CIs on other tradable jobs and workplaces?

- No causal link to OT

# Policy implication

- ‘Creative city’ policies -> positive local economic impacts with two constraints:
  - ➢ Spatially-blind policies will benefit existing urban clusters
  - ➢ Policies more effective when they focus on creative services

# Next Steps

- Occupational/wage effects
- Neighbourhood level impacts
- Housing/business space impacts
- Pre- vs post-2007 multiplier differences

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**WP available**

## Thank you

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*Email: a.kitsos@bham.ac.uk*
*Twitter: @Tasos_Kitsos*

# Appendix

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# Defining cities

- We focus on urban economies, so define cities using Travel to Work Areas (TTWAs)
- TTWAs represent self-contained labour markets in which at least 75% of an area's residents work in the area and vice versa (ONS 2016)
- Best tractable approximation to the functional city
- The latest TTWAs were defined in 2011: 228 areas
- Within these, we use work by Gibbons et al (2011) to isolate a set of 78 'primary urban' TTWAs with an urban core of at least 125,000 people
- We define cities as these 'primary urban' TTWAs

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# Defining creative industries

- In the UK, creative industries are officially defined by the Department of Culture, Media and Sport (DCMS 2018)
- DCMS' definition uses SIC2007 codes [= NACE rev2]
- We need to convert these to SIC2003 codes to work with the full time dimension of our data
- We use ONS 2003-2007 crosswalks to do this:

  - In most cases there is a 1:1 match from a creative industries SIC2007 code to a SIC2003 equivalent
  - When this doesn't happen, we use crosswalk weights to allocate the SIC2007 bin to the SIC2003 bins
  - We cross-check for years after 2007, where we have both SIC2003 and SIC2007 info. Crosswalked CIs are slightly smaller than original CIs in firm and job counts, but are highly correlated

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# Defining industry blocs

- Locational Gini indices (0 = dispersed ~ 1 = concentrated) are commonly used to define an industry's degree of tradability. The intuition is that the more spatially concentrated an industry, the bigger its economies of scale, reflecting higher/wider levels of demand (Jensen and Kletzer 2004, Faggio and Overman 2014, Kemeny and Osman 2018, Lee and Clarke 2019)
- For industry *j* across *i* TTWAs in year *t*, the employment Gini is given by:

$$G_{it} = \Sigma_i [(E_i / E) - (E_{ij} / E_j)]^2 \qquad (3)$$

- Recent UK studies use Jensen and Kletzer's 1999-vintage Ginis for US industries. Some risks in doing that: different country, different decade!
- We calculate new measures of *G* using 2018 BSD data on 4-digit UK industries. We identify 'most', 'intermediate' and 'least' tradable groups
- We test the accuracy of our classifier on UK manufacturing sectors. Over 95% of SIC4 bins are classified correctly as most or intermediate tradable

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# Summary statistics

| | A. All years | | B. 1997 | | C. 2018 | |
|---|---|---|---|---|---|---|
| **Variable** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** | **Mean** | **Std. Dev.** |
| TTWA all workplaces | 23898 | 50492 | 19006 | 36180 | 28790 | 61437 |
| TTWA all jobs | 263924 | 505570 | 220630 | 407733 | 307218 | 586922 |
| TTWA CI workplaces | 2374 | 7852 | 1595 | 4862 | 3153 | 9961 |
| TTWA CI jobs | 12181 | 42730 | 8849 | 27837 | 15513 | 53646 |
| TTWA % CI workplaces | 0.075 | 0.032 | 0.064 | 0.028 | 0.085 | 0.033 |
| TTWA % CI jobs | 0.032 | 0.017 | 0.03 | 0.016 | 0.035 | 0.018 |
| TTWA LQ CI workplaces | 0.77 | 0.316 | 0.765 | 0.336 | 0.776 | 0.298 |
| TTWA LQ CI jobs | 0.719 | 0.369 | 0.74 | 0.388 | 0.697 | 0.35 |
| Observations | *156* | | *78* | | *78* | |

Source: BSD. 78 urban TTWAs in 1997 and 2018. Table shows descriptive statistics of all workplaces and employment, those of creative industries workplaces (individual plants) and employment as well as shares and LQs in 1997 and 2018.

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# Top-20 LQ firms and jobs

| A. 1997-2018 | | | B. 1997 | | | C. 2018 | | |
|---|---|---|---|---|---|---|---|---|
| **2011 TTWA** | **LQ firms** | **LQ jobs** | **2011 TTWA** | **LQ firms** | **LQ jobs** | **2011 TTWA** | **LQ firms** | **LQ jobs** |
| Reading | 1.639 | 1.968 | Reading | 1.786 | 1.753 | Reading | 1.646 | 2.269 |
| London | 1.559 | 1.814 | London | 1.605 | 1.714 | Slough and Heathrow | 1.516 | 1.456 |
| Slough and Heathrow | 1.535 | 1.603 | Slough and Heathrow | 1.59 | 1.699 | Milton Keynes | 1.513 | 1.104 |
| Guildford & Aldershot | 1.396 | 1.612 | High Wycombe & Aylesbury | 1.486 | 1.592 | London | 1.486 | 1.833 |
| High Wycombe & Aylesbury | 1.37 | 1.499 | Guildford & Aldershot | 1.45 | 1.62 | Brighton | 1.447 | 1.13 |
| Brighton | 1.352 | 1.077 | Luton | 1.313 | 1.058 | Guildford & Aldershot | 1.317 | 1.374 |
| Luton | 1.341 | 1.051 | Milton Keynes | 1.298 | 1.191 | High Wycombe & Aylesbury | 1.286 | 1.24 |
| Milton Keynes | 1.303 | 1.172 | Stevenage & Welwyn Garden City | 1.27 | 0.92 | Luton | 1.207 | 0.907 |
| Stevenage and Welwyn Garden City | 1.178 | 0.936 | Crawley | 1.23 | 1.04 | Tunbridge Wells | 1.174 | 0.938 |
| Tunbridge Wells | 1.156 | 1.062 | Brighton | 1.212 | 0.832 | Edinburgh | 1.156 | 0.93 |
| Oxford | 1.147 | 1.607 | Tunbridge Wells | 1.199 | 1.039 | Stevenage & Welwyn Garden City | 1.142 | 0.779 |
| Crawley | 1.137 | 1.041 | Oxford | 1.164 | 1.733 | Crawley | 1.098 | 0.907 |
| Swindon | 1.07 | 0.814 | Cheltenham | 1.114 | 0.942 | Oxford | 1.075 | 1.342 |
| Cambridge | 1.067 | 1.163 | Swindon | 1.09 | 0.779 | Cheltenham | 1.07 | 1.088 |
| Bristol | 1.019 | 0.961 | Cambridge | 1.08 | 1.081 | Bristol | 1.064 | 1.025 |
| Cheltenham | 1.013 | 1.076 | Southampton | 1.06 | 0.841 | Swindon | 1.058 | 0.729 |
| Edinburgh | 0.974 | 0.852 | Bristol | 0.977 | 0.936 | Cambridge | 1.009 | 1.151 |
| Bedford | 0.945 | 0.693 | Bedford | 0.976 | 0.726 | Worthing | 0.921 | 0.61 |
| Worthing | 0.882 | 0.872 | Worthing | 0.947 | 0.681 | Bedford | 0.904 | 0.637 |
| Chelmsford | 0.88 | 0.73 | Chelmsford | 0.927 | 0.698 | Chelmsford | 0.901 | 0.751 |

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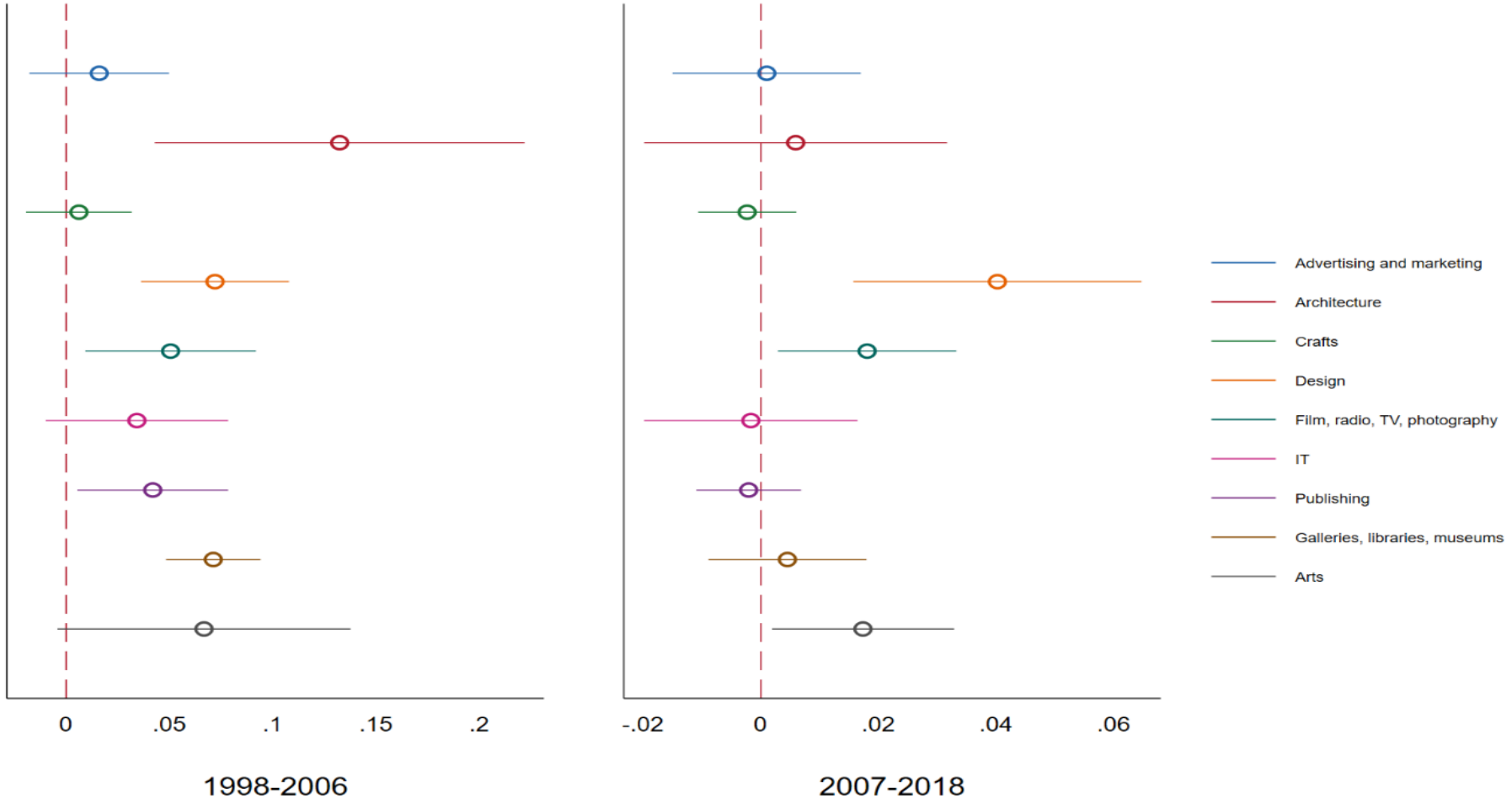
# Arts vs creative services

**OLS regression of creative industries subgroup jobs on non-tradable jobs. Fixed effect estimator.**




Source: BSD, LFS/APS, ONS. Travel To Work Area by year cells.
Each point shows OLS coefficient and 95% confidence interval for subgroup, controlling for the rest of the creative industries. All models use TTWA dummies, plus controls from our main specification.

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# CI on OT

**IV regression of creative and other tradable activity. Long difference, 1998-2018.**

| | OLS | IV | IV | IV |
|---|---|---|---|---|
| **A. Employment** | **(1)** | **(2)** | **(3)** | **(4)** |
| Log creative industries jobs | 0.20* | -0.29 | 4.93 | -0.32 |
| | (0.110) | (1.776) | (102.09) | (2.559) |
| Log non-tradable jobs | 0.95*** | 1.30 | -4.73 | 1.38 |
| | (0.232) | (1.994) | (118.33) | (2.832) |
| *TTWA frequency of art schools* | | *0.02* | *-0.00* | *0.01* |
| | | *(0.076)* | *(0.073)* | *(0.067)* |
| Observations | 156 | 156 | 156 | 156 |
| $R^2$ | 0.47 | 0.93 | -3.10 | 0.93 |
| Kleibergen-Paap F-statistic | | 0.06 | 0.00 | 0.05 |
| Montiel Olea-Pflueger Effective F | | 0.06 | 0.003 | 0.05 |
| Anderson-Rubin $Chi^2$ | | 0.0237 | 0.222 | 0.0176 |
| Anderson-Rubin confidence set | | [.,.] | [.,.] | [.,.] |

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# IVs on main variables

| | A. Employment | | | B. Workplaces | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (1) | (2) | (3) |
| log TTWA-coalfield distance | 0.17*** | 0.01 | -0.11*** | 0.12*** | 0.01 | -0.03*** |
| | (0.051) | (0.020) | (0.027) | (0.038) | (0.014) | (0.012) |
| TTWA frequency of art | 0.10 | 0.02 | -0.06* | 0.02 | 0.01 | -0.01 |
| schools | (0.069) | (0.028) | (0.038) | (0.062) | (0.023) | (0.025) |
| Log other tradable jobs | 0.13 | 0.60*** | | 1.39*** | 0.96*** | |
| | (0.147) | (0.045) | | (0.189) | (0.071) | |
| Log non-tradable jobs | 1.06*** | | 0.93*** | -0.21 | | 0.72*** |
| | (0.165) | | (0.096) | (0.197) | | (0.049) |
| Log creative industries jobs | | 0.26*** | 0.05 | | -0.05 | 0.26*** |
| | | (0.040) | (0.054) | | (0.049) | (0.030) |
| Observations | 1638 | 1638 | 1638 | 1638 | 1638 | 1638 |
| $R^2$ | 0.91 | 0.96 | 0.95 | 0.94 | 0.97 | 0.98 |
| F-statistic | 403.41 | 1067.61 | 987.32 | 977.97 | 1568.95 | 1926.00 |

Source: BSD, LFS/APS, ONS. All specifications include year dummies, controls per main specification. Standard errors clustered on TTWA. Constant not shown.

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# Q2: What are the urban non-tradable jobs and workplace multipliers from CIs?

| | OLS | IV | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Log creative industries jobs | 0.12** | 0.36*** | 0.37*** | 0.24*** | |
| | (0.051) | (0.081) | (0.071) | (0.079) | |
| Log other tradable jobs | 0.25*** | 0.53*** | 0.50*** | 0.62*** | |
| | (0.066) | (0.074) | (0.068) | (0.078) | |
| Log tradable jobs | | | | | 0.13 |
| | | | | | (0.225) |
| *log TTWA-coalfield distance* | | *0.24**** | *0.26**** | *0.23**** | |
| | | *(0.061)* | *(0.061)* | *(0.057)* | |
| *TTWA frequency of art schools* | | *0.19*** | *0.19*** | *0.18*** | |
| | | *(0.093)* | *(0.093)* | *(0.081)* | |
| *Log Bartik tradable employment* | | | | | *1.42**** |
| | | | | | *(0.366)* |
| Observations | 156 | 156 | 156 | 156 | 156 |
| $R^2$ | 0.94 | 0.96 | 0.96 | 0.96 | 0.70 |
| Kleibergen-Paap F-statistic | | 9.52 | 11.33 | 9.66 | 15.15 |
| Montiel Olea-Pflueger Effective F | | 7.465 | 8.710 | 8.944 | 15.15 |
| Anderson-Rubin confidence set | | [0.112, 0.620] | [0.141, 0.557] | [0.046, 0.437] | |
| Multiplier - Van Dijk | 2.126 | [1.961, 10.888] | [2.476, 9.784] | [0.797, 7.568] | 0.287 |