

Ticket to Impact

The impact of transport infrastructure on collaborative research projects

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Motivation

- Regional economic divides reflecting productivity, capacity to innovate, skills
- Disproportionate concentration of public R&D funding in South-East
- UK transport infrastructure, particularly public, highly regionally uneven and performance has deteriorated
- Research questions:
 - What is the impact of transport connectivity on collaborative research projects?
 - Intensive margin: outcomes of projects (publications)
 - Extensive margin: probability to collaborate (again)



Relevant literature

- Geographical 'stickiness' of knowledge (Storper & Sonn, 2008; Van der Wouden & Youn, 2023)
- Connectivity and opportunities for in-person meetings important for collaboration (Chai & Freeman, 2019; Bahar et al., 2023; Kang et al., 2023)
- Uneven geography of innovation and R&D funding (e.g. Forth & Jones, 2020)

Approach

- Endogeneity of connectivity and collaboration
 - Historical links
 - Better transport → more likely to collaborate
 - Bigger, more ambitious projects make bridging further distances worthwhile
- Train delays as source of exogenous shocks to connectivity (yay?)
- Franchising of lines: delays are caused by franchisees + weather, less due to historical investment

Total spent **£78.40**
All time **£162.70 received**

THURSDAY 5 MAR

 Govia Thameslink Railway
DRTL32962980 **+10.80**

FRIDAY 30 JAN

 Govia Thameslink Railway
DRTL32807007 **+21.30**

SATURDAY, 20 DEC 2025

 Govia Thameslink Railway
DRTL32673718 **+10.80**

 Govia Thameslink Railway
DRTL32669429 **+10.80**

SATURDAY, 4 OCT 2025

 Govia Thameslink Railway
DRTL32234780 **+10.80**

SATURDAY, 27 SEP 2025

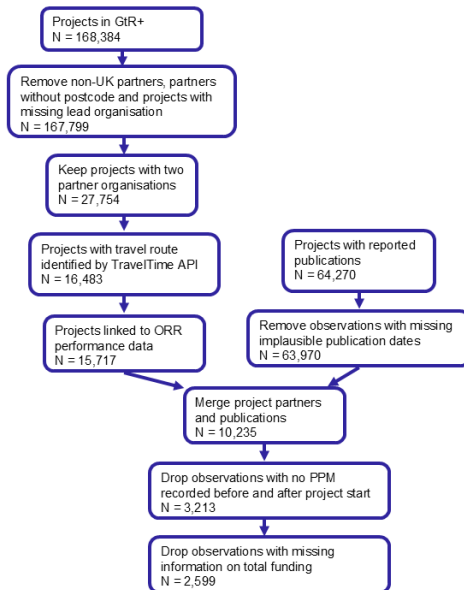
Data (1)

- GtR+: Publicly funded research projects since 2006
 - Focus on collaborative projects with 2 partners organisations (could be 2+ individuals)
 - Partner location (postcode of organisation), sector
 - Project discipline, funding, duration
 - Outputs: publications (+ patents, spin-outs – relatively rare)

Data (2)

- TravelTime API
 - Public transport routes → train operators
 - Travel time between postcodes when driving, using public transport, or combination
- Office for Road and Rail
 - Quarterly Public Performance Measure (PPM): % of trains arriving at final destination within 5/10 minutes of schedule
 - Captured by operator → match to travel routes
- Estimation sample
 - Collaborative projects with two organisations in England/Scotland/Wales
 - Connected by at least one mainline rail operator
 - At least one reported publication

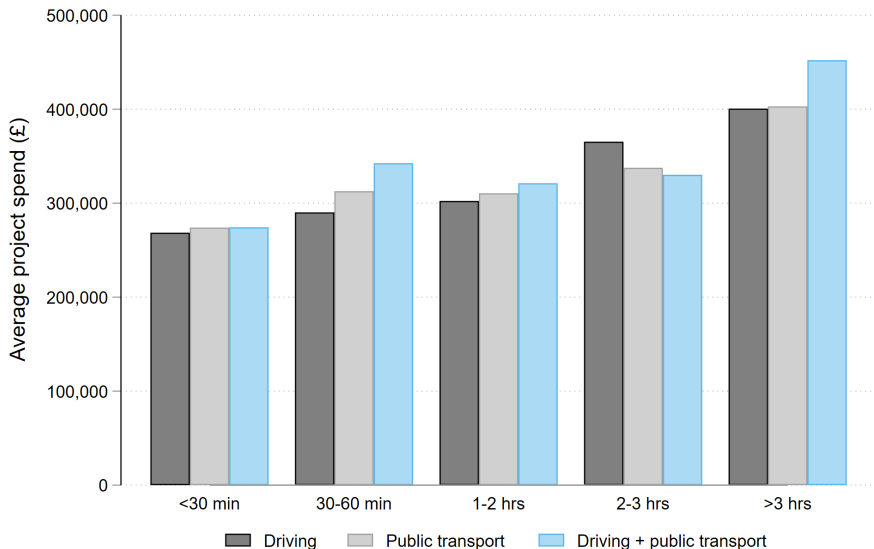
Sample construction



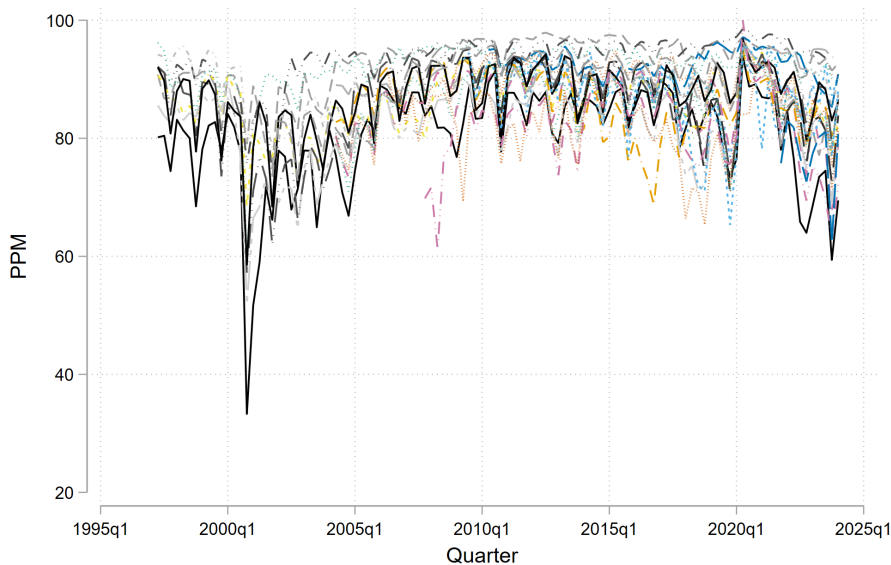
Methods

- Regress no. **publications** on average rail performance over project duration
 - Log publications - OLS
 - Count of publications - Poisson
- Controlling for/splitting sample by prior performance
- Regress re-collaboration of partners on PPM during first project and travel time

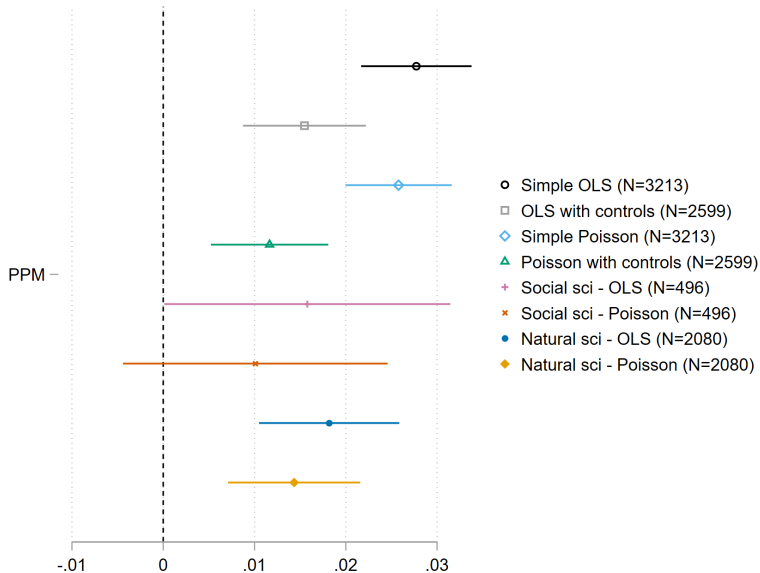
Longer travel time for bigger projects



Significant variation in rail operator performance

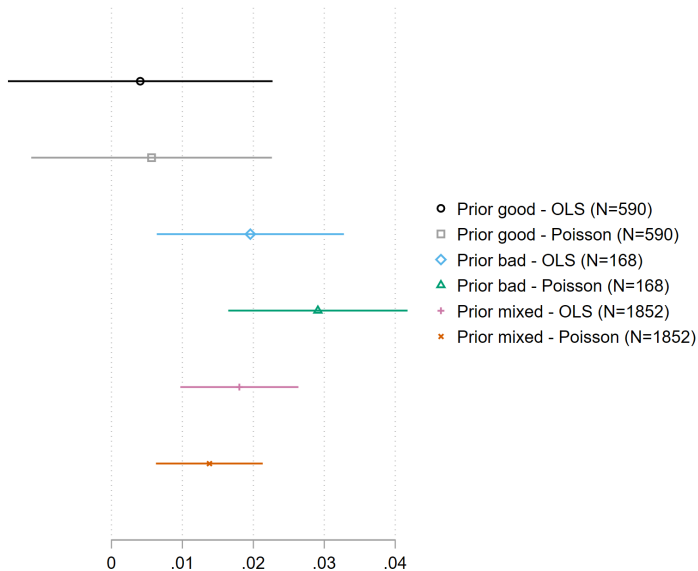


Correlation of PPM and project publications

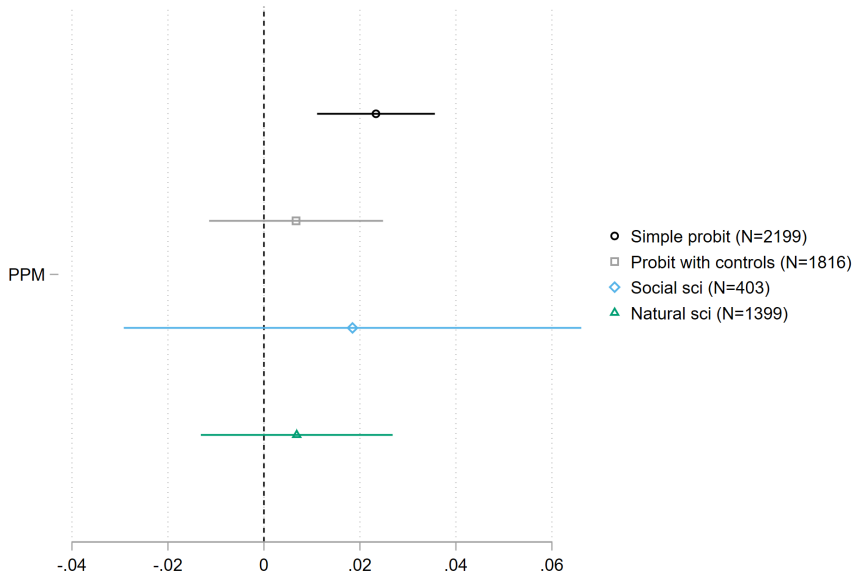


Correlations by prior performance

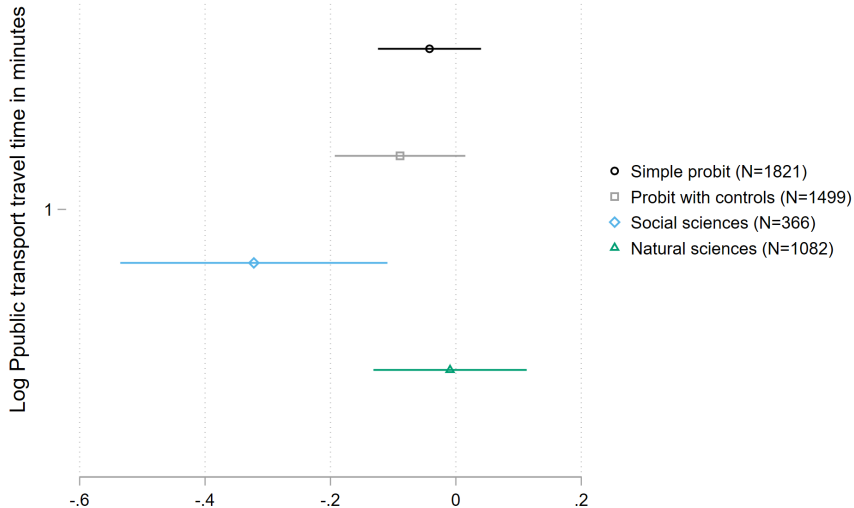
PPM –



Probability to collaborate again (rail performance)



Probability to collaborate again (travel time)



Conclusion & questions

- Poor connectivity related to lower performance of collaborative research projects
- Driven by projects with the worst connections
- Future research
 - Outcomes beyond publications
 - Selection: missed projects and suboptimal collaborations?
 - Multi-partner projects

Summary statistics

Table: Summary statistics

	Mean	Std. dev.	Min	Max
Project funding (£)	420297.8	614419.3	1480	9600000
Project duration (quarters)	10.8	5.5	0	44
Total publications	4.1	2.6	1	26
<i>Grant category</i>				
Research	0.9	0.3	0	1
Studentship	0	0	0	0
Fellowship	0.09	0.3	0	1
Training	0.004	0.06	0	1
Other	0.02	0.1	0	1
<i>Sector of lead organisation</i>				
Private	0.006	0.08	0	1
Public	0.05	0.2	0	1
Charity/Non-profit	0.003	0.06	0	1
University	0.9	0.2	0	1
Average PPM during project	85.8	4.9	64	97
<i>Travel time between project partners (min)</i>				
Driving	136.6	54.4	7	240
Public transport	143.1	51.0	9	240
Driving and public transport	136.1	52.0	7	240
Straight line distance (km)	138.5	84.8	2	403
<i>N</i>	2599			