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ERC Research showcase

June 3rd 2026

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Agenda – Morning Session

11.00-11.10	Welcome and introduction - Stephen Roper
11.10-11.40	Panel Study of Entrepreneurial Dynamics – Mark Hart
11.40-12.10	Gender and entrepreneurial mindset - Kevin Mole
12.10-12.40	A research agenda for business dynamism – Neha Prashar & George Paily

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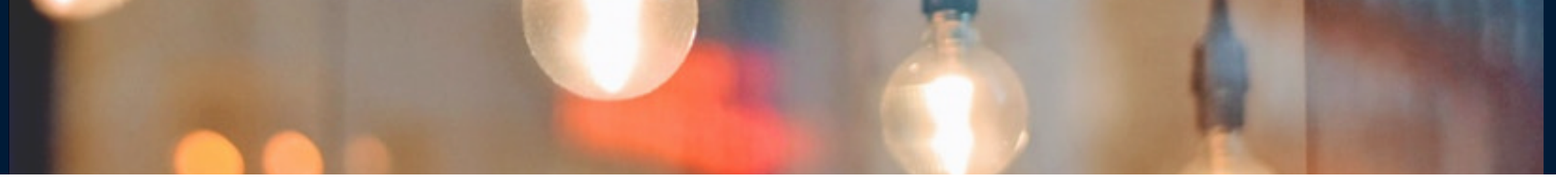

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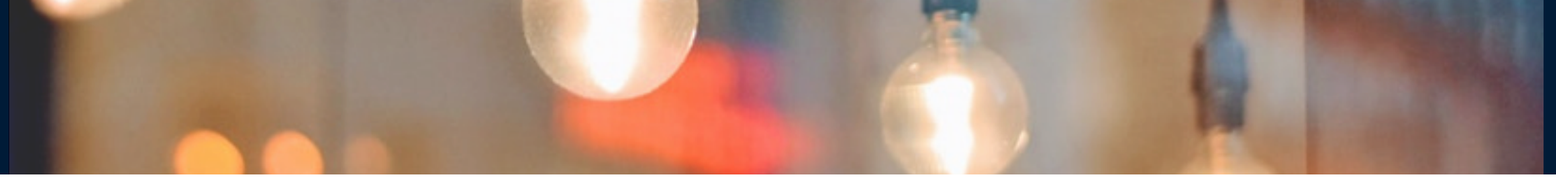
Welcome and introduction

Stephen Roper



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Panel Study of Entrepreneurial Dynamics

Mark Hart

Economic and Social Research Council

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Panel Study of Entrepreneurial Dynamics (PSED) 2023-25

ERC Research Showcase
3rd June 2026

Professor Mark Hart, Deputy Director, ERC

Dr Anastasia Ri, Assistant Professor, ERC

Warwick Business School

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PSED Conceptual Framework

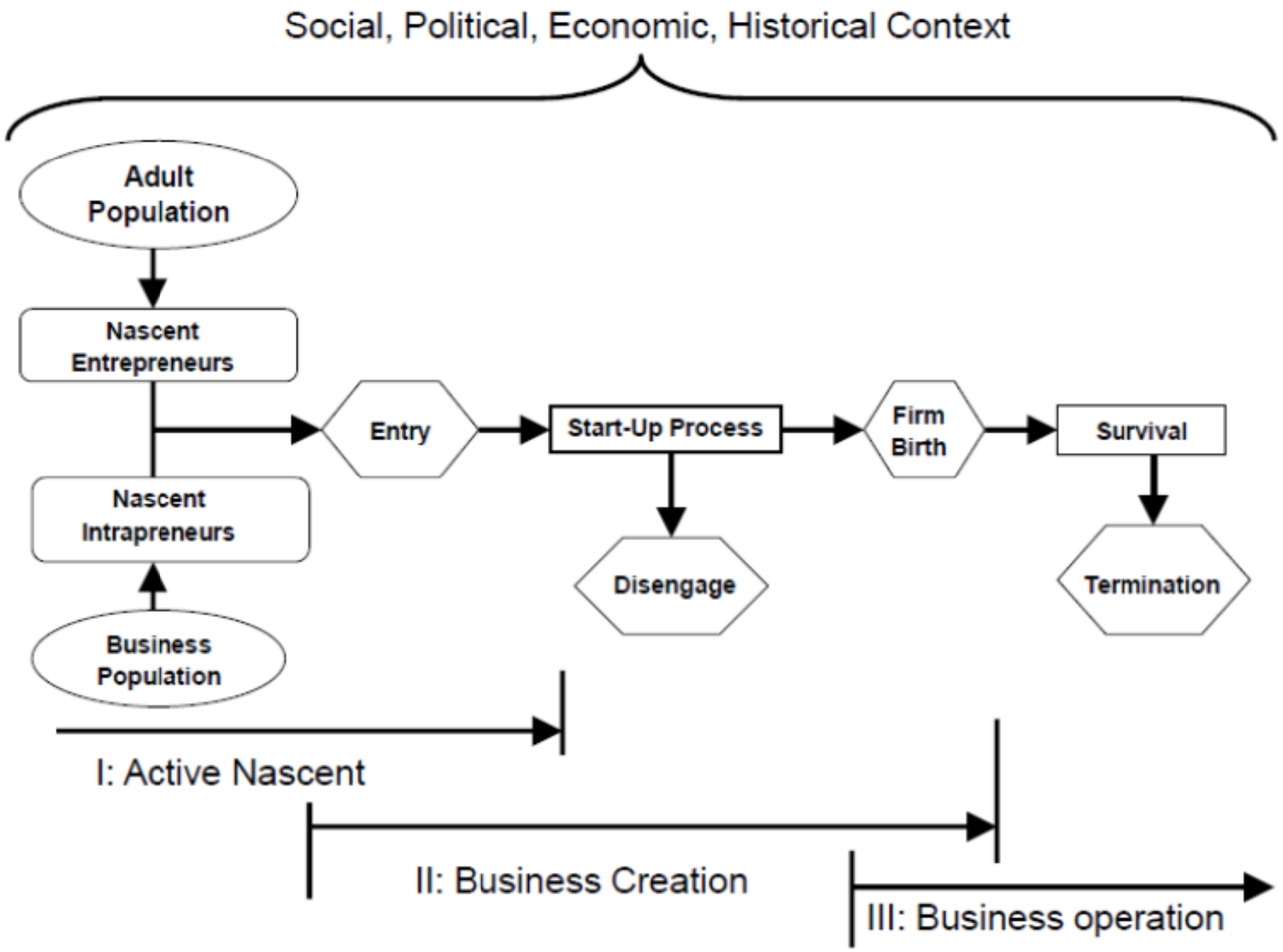
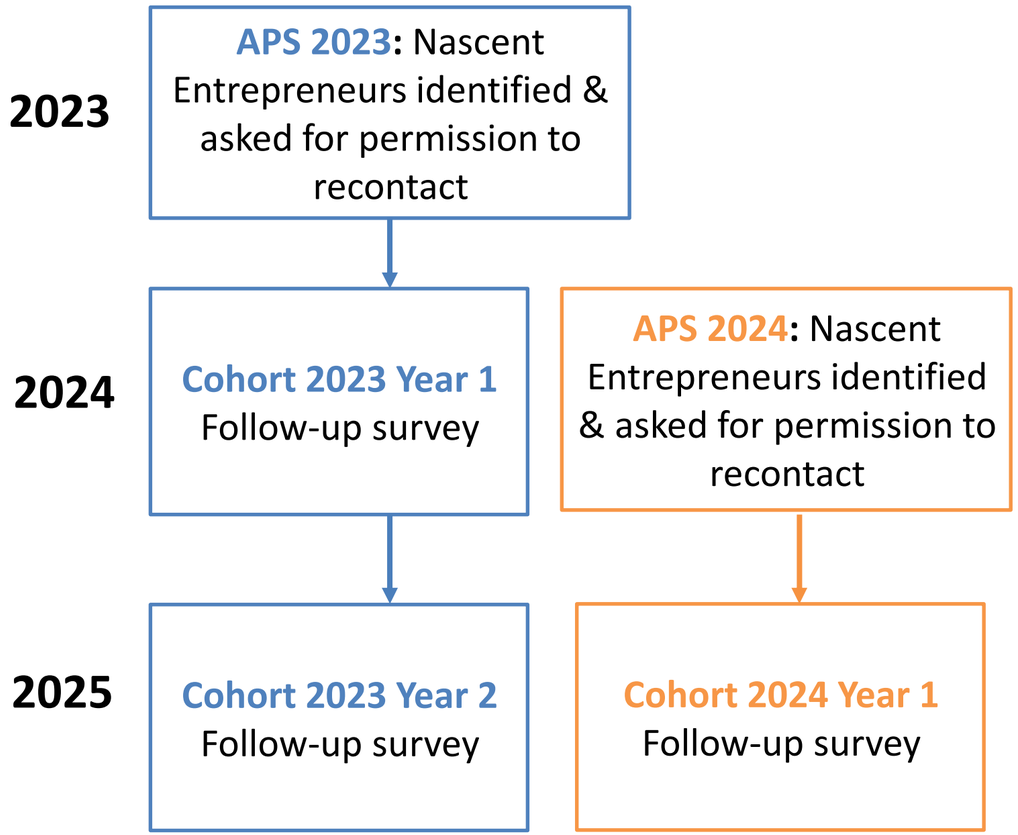


Figure 1 Business Creation: Conceptual Overview

UK PSED 2023-25: Method

- The UK PSED 2023-25 was commissioned by Be the Business with the financial support of MasterCard and the GEM UK Adult Population Survey (APS) in 2023 was used as the baseline.
- The usual GEM UK 2023 sample of c.10,000 interviews were undertaken between June and September. This included 816 nascent entrepreneurs (8%) defined as individuals in the first 3 months of setting up their business, of which just under 200 are from ethnic minority groups.
- To facilitate the creation of a PSED in the UK a boost of an additional 6,000 online (CAWI) interviews was enabled by financial support from Mastercard and Be the Business under their Strive project. This boost was designed to provide a large enough sample of nascent entrepreneurs to enter into the panel study over the period 2023–25.



FINDINGS

Repairing the Bridge for Ethnic Minority Businesses

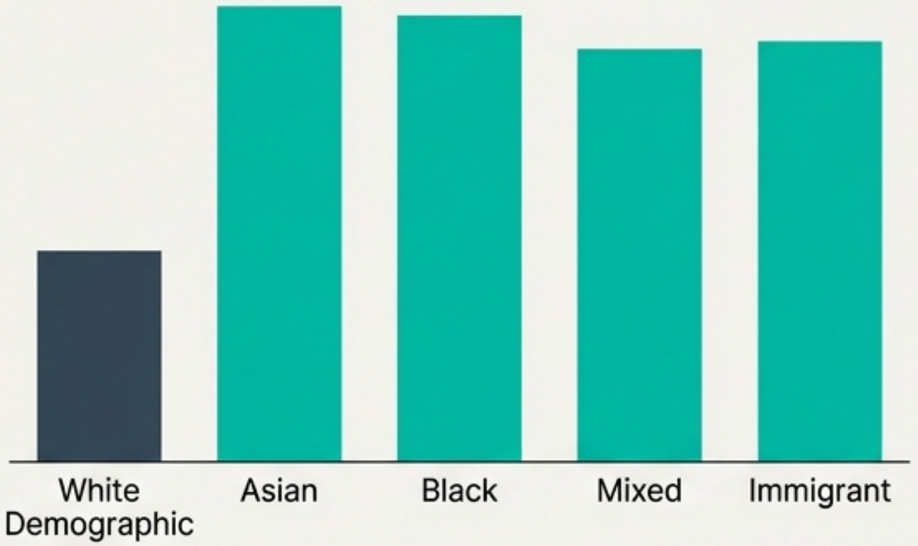
Insights from the Panel Study of Entrepreneurial Dynamics (PSED) 2023-25.

Tracking the critical first 24 months of venture creation to understand why the **UK's most active nascent entrepreneurs face the highest attrition rates.**

High Ambition Collides with Low Retention

The Potential

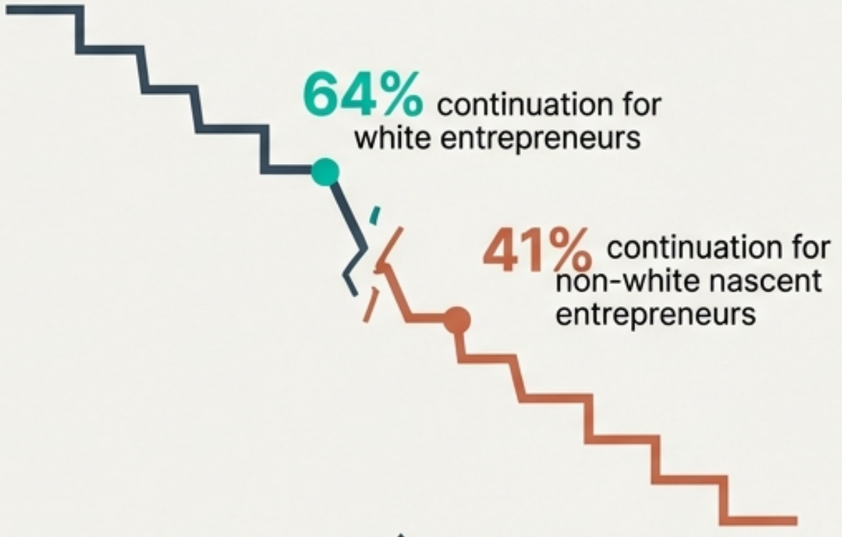
Early-Stage Entrepreneurial Activity



Non-white populations, immigrants, and regional migrants are statistically the most entrepreneurial groups in the UK.

The Friction

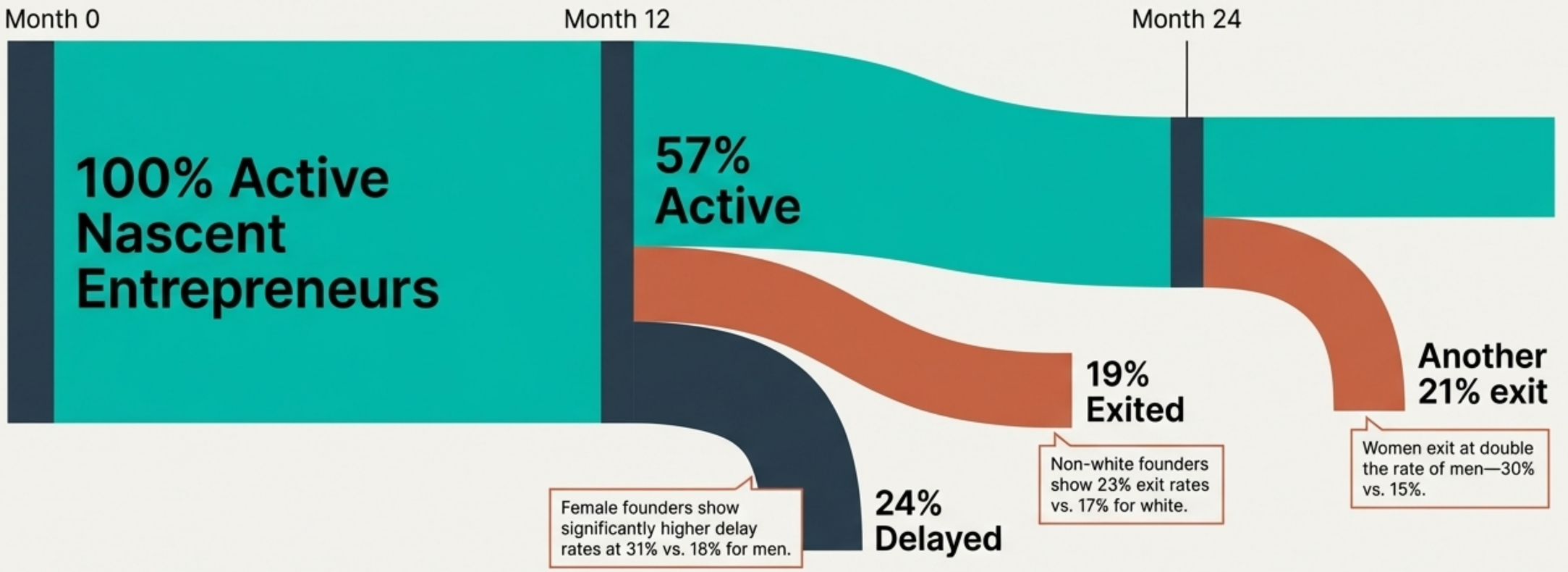
Year 1 Continuation Rate



Non-white founders report double the rate of delayed ventures (36% vs. 19%).

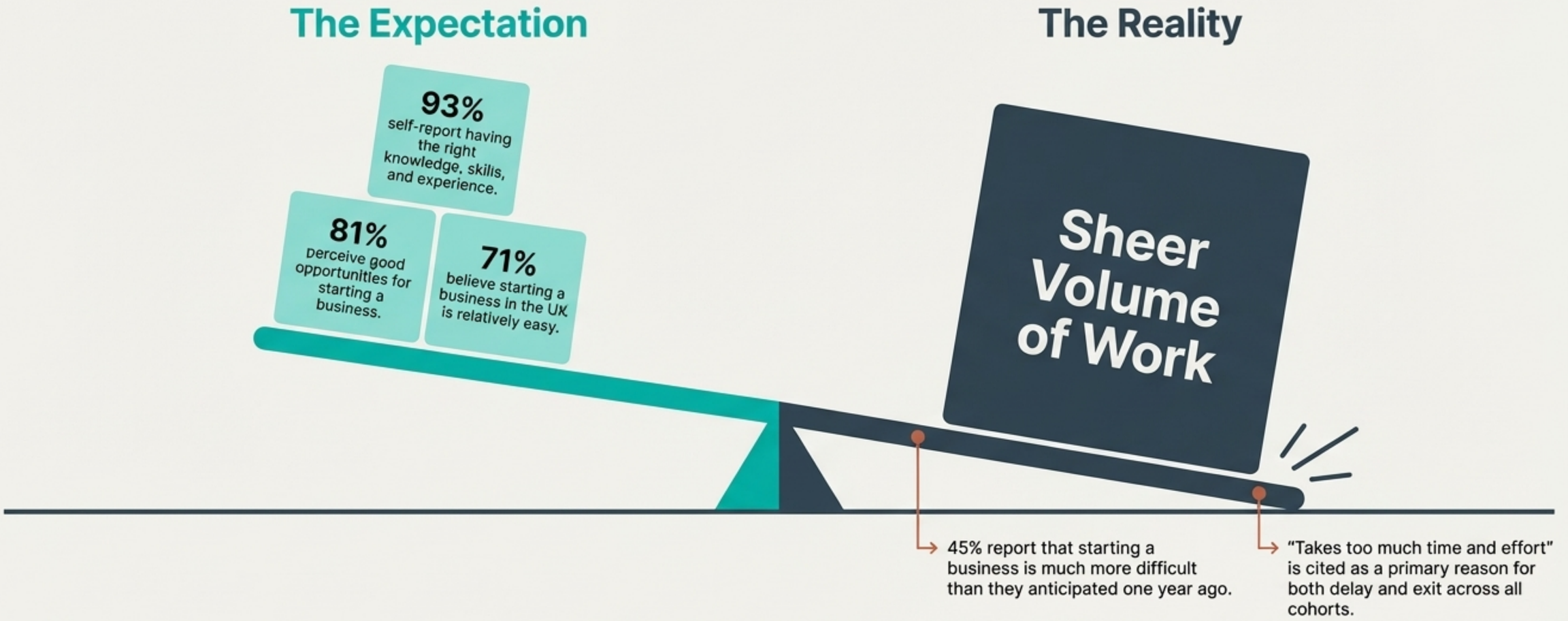
The UK does not have an ambition problem; it has a systemic retention problem.

Mapping the 24-Month Leaky Pipeline



The critical danger zone for underrepresented founders is the first 12 to 24 months, demanding highly targeted early intervention.

The Optimism vs. Reality Collision



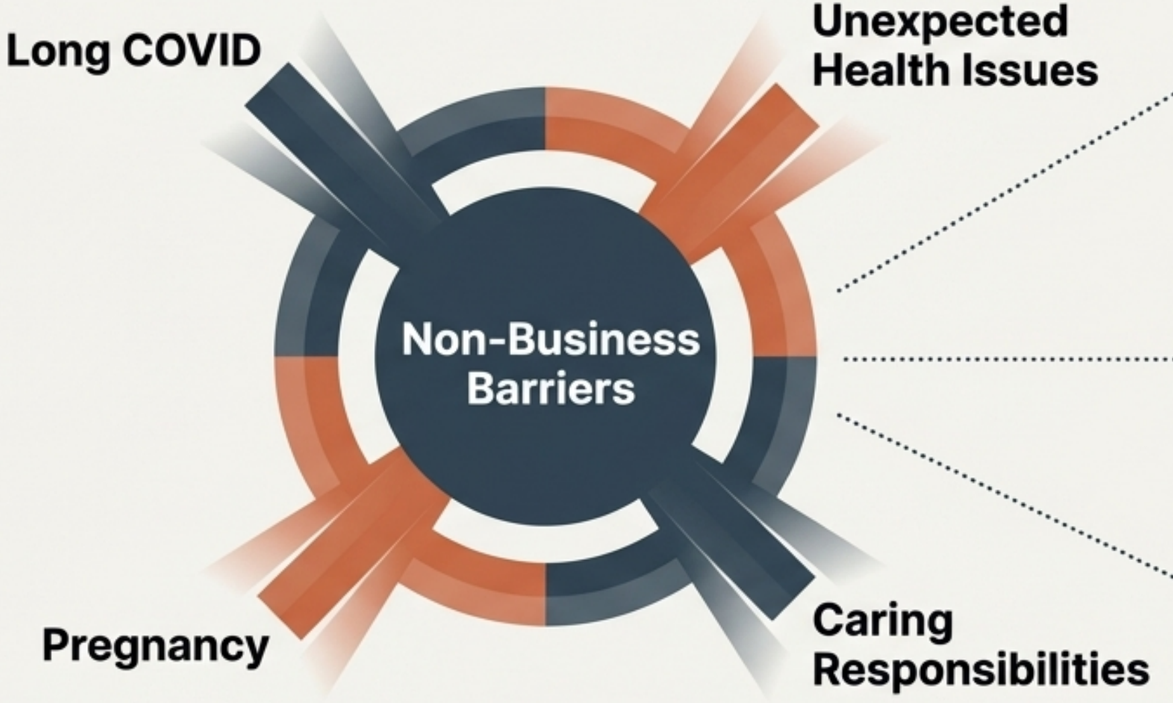
Founders are not failing due to a lack of capability; they are being crushed by the unsupported realities of solo execution.

Diagnostic Matrix of Venture Attrition

	White Entrepreneurs	Non-White Entrepreneurs
Idea Origin	Current/previous work (29-31%)	Hobby (62%), or Self/Team (50%)
Primary Delay Factor	Market barriers & management (22-26%)	Funding constraints (45% vs 17% for white)
Primary Exit Driver	Lack of customers, high setup costs	Pivoting to traditional job opportunities (25%)
Underlying Mechanism	Opportunity-driven friction / Market failure	Necessity-driven entrepreneurship / Structural failure

Ethnic minority attrition is highly correlated with immediate financial pressures and necessity-driven job switching, not a lack of viable business ideas.

The Invisible Burden of Time and Care



Over **50%** of delays for non-white entrepreneurs **(59%)** are attributed to personal issues, significantly higher than white entrepreneurs **(48%)**.

33% of Year 1 exits are driven entirely by **family or personal reasons**.

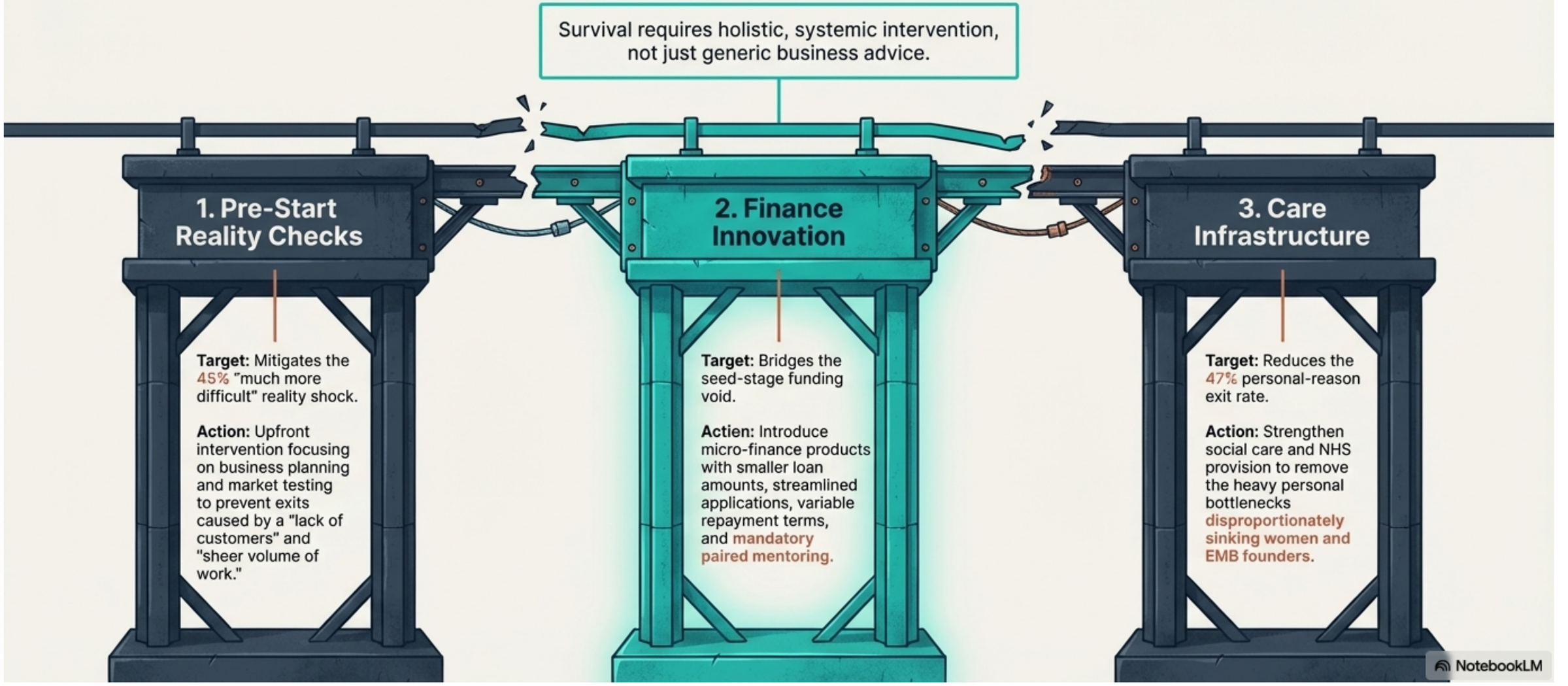
47% of Year 2 exits are driven entirely by **family or personal reasons**.

Entrepreneurial survival is inextricably linked to social infrastructure. Without adequate care provision, the business pipeline inevitably leaks.

The Seed-Stage Funding Void

Existing business finance products fail to serve the reality of early-stage EMB founders, forcing reliance on precarious personal capital.

A Structural Blueprint for Retention



Securing the UK's Economic Engine

Immigrants and ethnic minorities have consistently been the most entrepreneurial UK society since the start of the millennium. UK

Fixing the start-up pipeline for underrepresented founders is not just an equity initiative—it is a **critical** requirement for for national economic growth.

We must shift our focus from encouraging ambition to engineering survival.

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Questions

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Gender and the Entrepreneurial Mindset

Anastasia Ri, Kevin Mole, and Stephen Roper

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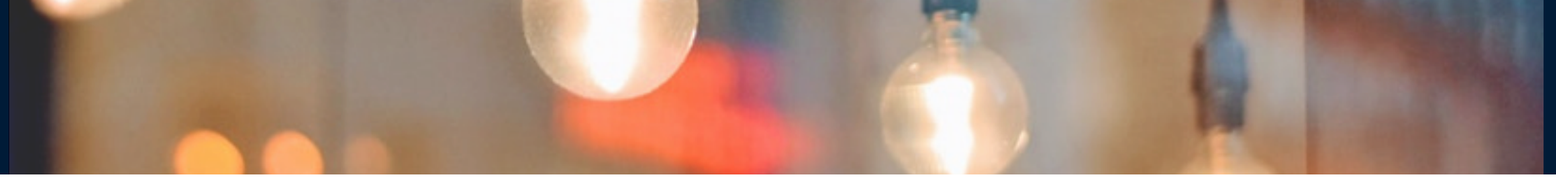
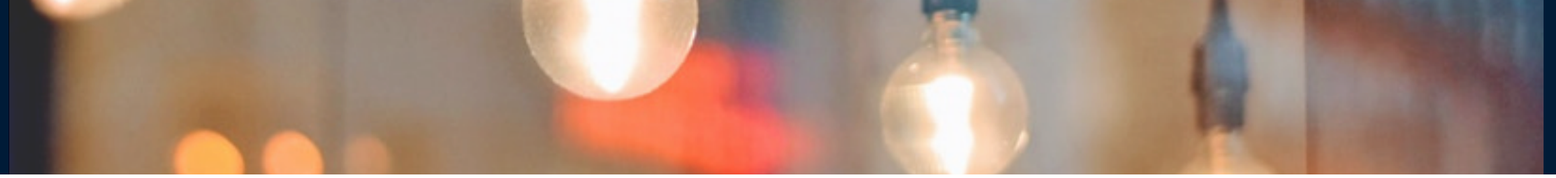


Quibi failure - an entrepreneurial mindset problem?

Quibi, co-founded by Jeffrey Katzenberg – a media titan ex chair of Disney studios, raised approximately $1.75 billion in 2018 to launch a platform for premium, short-form mobile videos, believing users would pay for 10-minute content designed for on-the-go viewing. The idea felt obvious, so the **first mindset problem** was overconfidence and not to test.

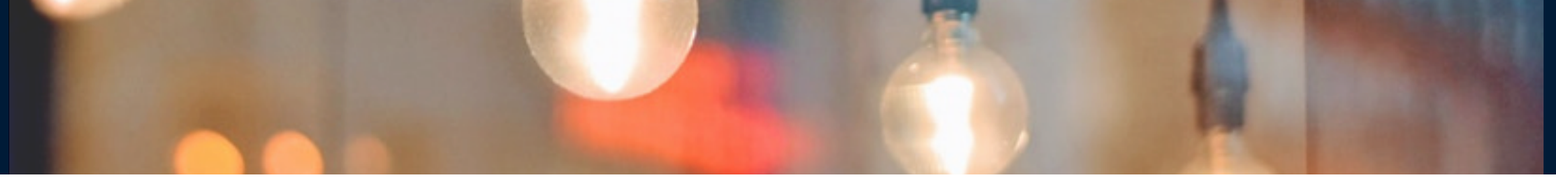
However, after its launch in April 2020, 92% of trial users did not convert to paying customers, revealing a lack of demand. Instead of reassessing their core assumptions, the team attributed failures to external factors like COVID-19 - the **second mindset problem**.

- Six months later, with less than 500,000 subscribers and significant investment wasted, Quibi shut down, illustrating that a flawed mindset can lead to rapid failure, regardless of the quality of the idea.



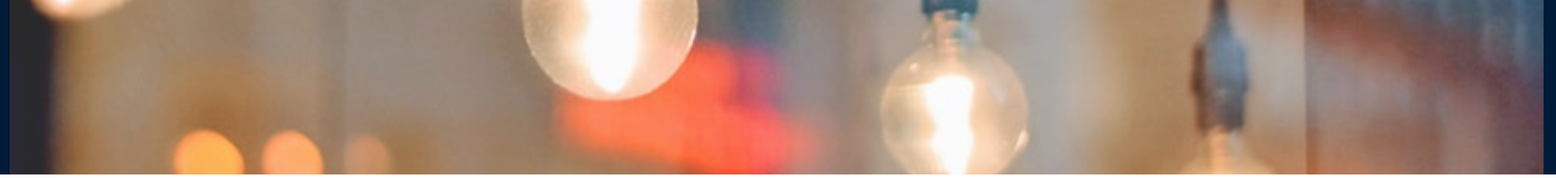
Introduction

- Entrepreneurs are faced with a myriad of problem-solving challenges. Our interest is examining some of the decision-making behaviours – entrepreneurial mindset
- We compare psychological measures of metacognition “thinking about thinking” across women-led firms and in different industries
- We show average metacognition differs between the leaders of women-owned and men-owned firms



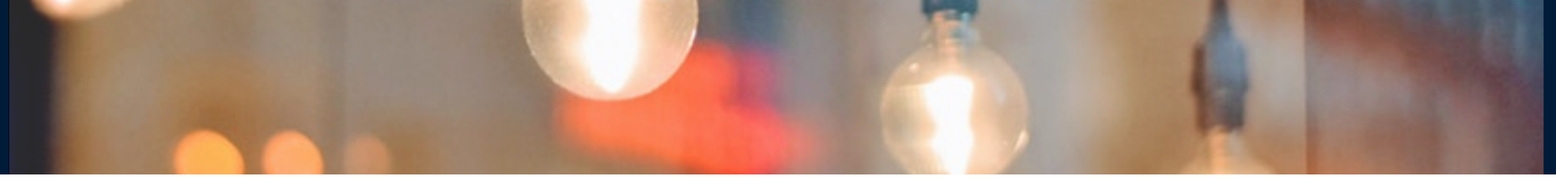
Entrepreneurs think differently

ENTREPRENEURIAL MINDSET



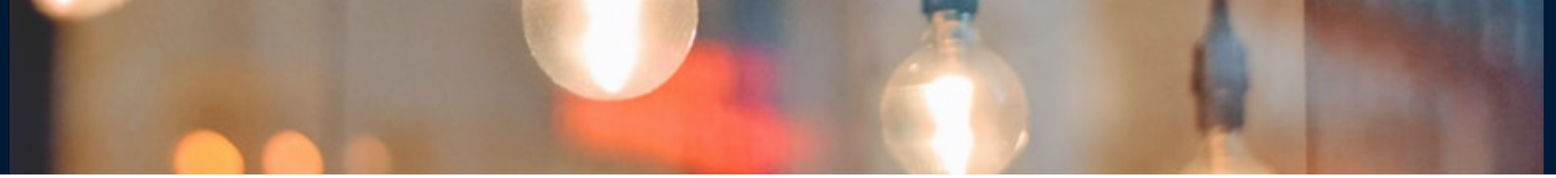
Entrepreneurs think differently?

- Personality? ‘entrepreneurs think differently’
  - Need for achievement (McClelland, 1959)
  - Locus of Control (Rotter, 1966)
  - Big Five personality
- Baron (1998) ‘entrepreneurs think differently because of the context’ focused on the uncertain open-ended context for entrepreneurial thinking
  - New products, new markets, new technologies, new procedures
- ‘entrepreneurs think differently because of their experience’ Disposition reflect agent’s habitual responses
- Growth-resistant, growth-ambivalent and growth-inclined dispositions (Theodorakopoulos et al., 2015)
- Theodorakopoulos, N., M. Hart, G. Burke, U. Stephan, P. Braidford, G. Allinson, M. Houston & S. Jones (2015) Sociology of Enterprise *BIS Research Paper* 238. https://assets.publishing.service.gov.uk/media/5a74e36440f0b65c0e8454c3/BIS-15-482-sociology-of-enterprise.pdf



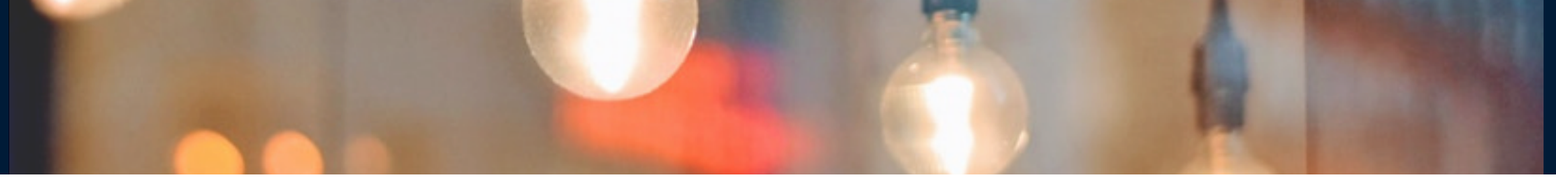
An Entrepreneurial Mindset

- Kuratko, Fisher and Audretsch (2021) describe the entrepreneurial mindset as three interrelated dimensions:
  - cognitive: how entrepreneurs think using mental models;
  - behavioural: how they act on opportunities; and
  - emotional: what they feel during entrepreneurial engagement.
- Not dispositions but more like a reflective practitioner reflecting on cognitive and behavioural experience - a mindset conducive to entrepreneurship?
- The concept of the entrepreneurial mindset relies on past experience to give personal resources in the present.



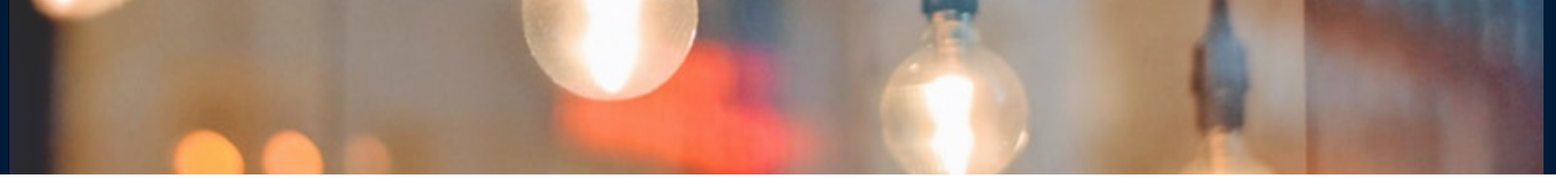
Metacognition concept comes from education

- Flavell (1979) attempts to measure individual differences in schoolchildren's cognitive adaptability, as children develop adultlike knowledge and behaviour.
- The result is a model of cognitive monitoring consisting of four sub-items:
  - (a) metacognitive knowledge, e.g. your strengths and weaknesses, the variety of knowledge available
  - (b) metacognitive experience, e.g. problems remind you of others, you perceive yourself as far from the goal
  - (c) goals or tasks and
  - (d) actions (or strategies), e.g. testing yourself or active learning techniques.



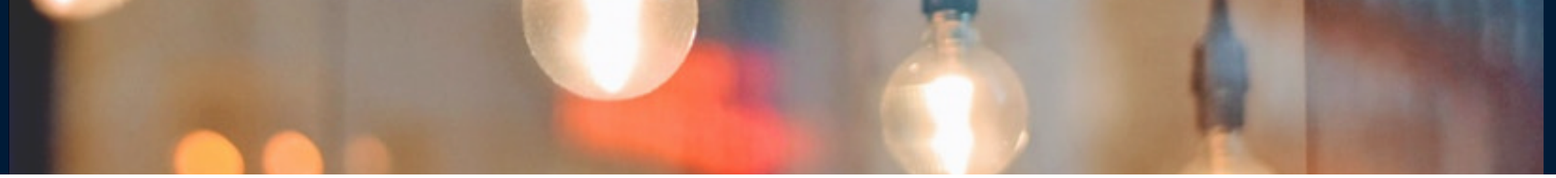
Metacognition defined – thinking about thinking

- Metacognition is essentially our thinking about thinking. Metacognition includes being self-aware, monitoring, and controlling one's ideas about identifying potential opportunities and launching and managing a new company (Haynie et al. 2010).
- It helps entrepreneurs understand what changes they need to make and how to accomplish them (Haynie, Shepherd and Patzelt 2012).
- Preferring to use the term entrepreneurial metacognition Bastian et al. (2025 p3) say “Entrepreneurial metacognition *refers to the mental activities of generating self-awareness and monitoring and controlling one’s cognition about identifying potential opportunities, creating a new venture, and/or managing a new venture.”.* This definition seems quite consistent with the measurement of Haynie and Shepherd (2009).

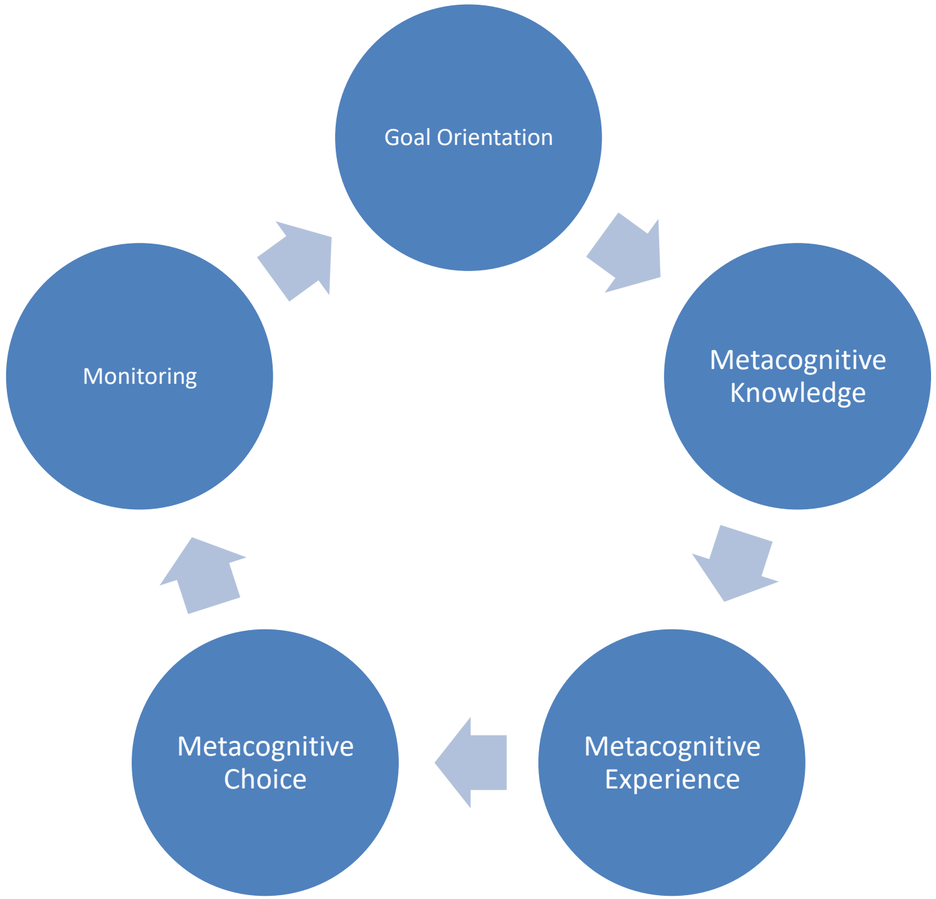


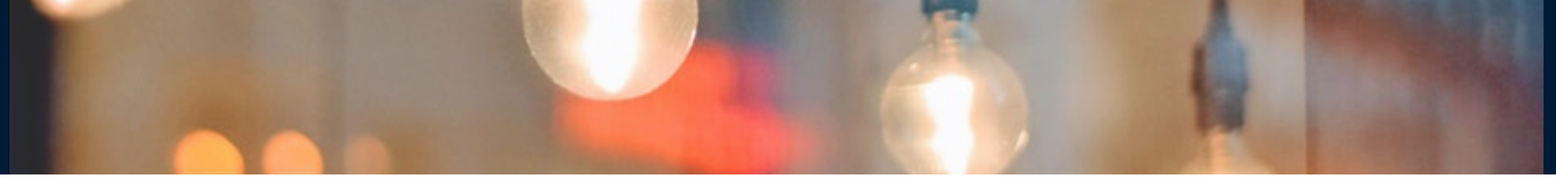
Haynie and Shepherd (2009) measure MetaCognition

- *I often define goals for myself"* (Goal Orientation)
- *"I think of several ways to solve a problem and choose the best one"* (Metacognitive Knowledge)
- *"I depend on my intuition to help me formulate strategies"* (Metacognitive Experience)
- *"I re-evaluate my assumptions when I get confused"* (Metacognitive Choice)
- *"I stop and reread when I get confused"* (Monitoring)
- Haynie, M., & Shepherd, D. A. (2009). A measure of adaptive cognition for entrepreneurship research. *Entrepreneurship Theory and Practice*, *33*(3), 695-714.



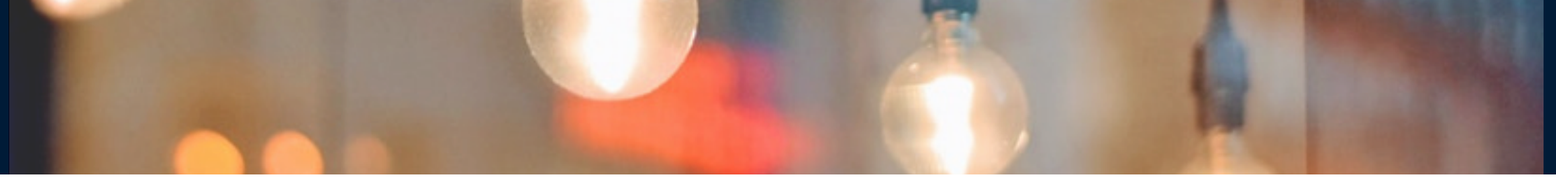
Metacognition is iterative



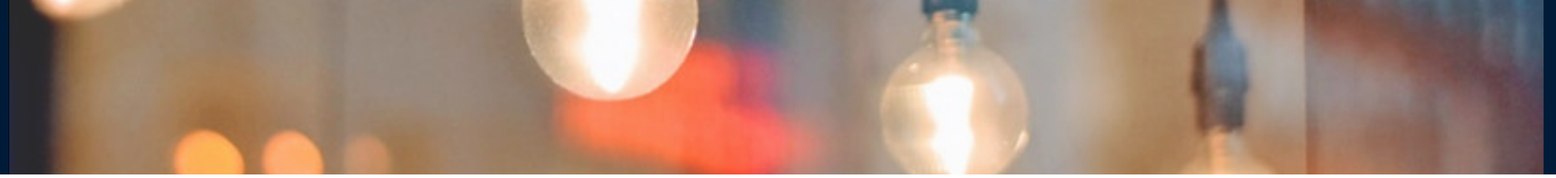


Goal Orientation (with factor loadings)

- *I often define goals for myself (.750)*
- *I understand how accomplishment of a task relates to my goals (.750)*
- *I set specific goals before I begin a task (.701)*
- *I ask myself how well I've accomplished my goals once I have finished (.668 – note this also loaded .302 on metacognitive control)*
- *When performing a task, I frequently assess my progress against my objectives (.650)*
- Haynie, M., & Shepherd, D. A. (2009). A measure of adaptive cognition for entrepreneurship research. *Entrepreneurship Theory and Practice*, *33*(3), 695-714.



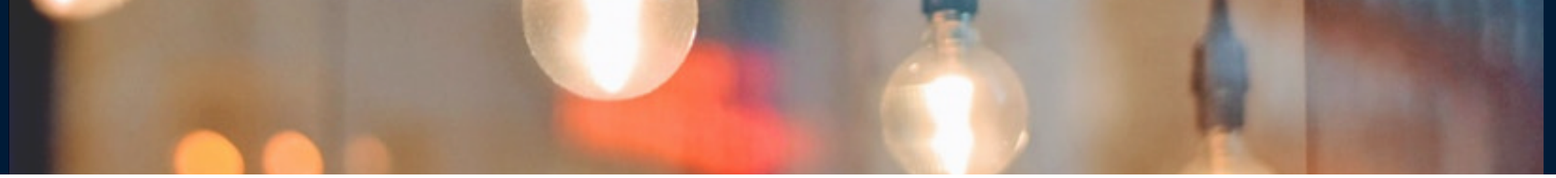
WOMEN'S ENTREPRENEURIAL MINDSET



Women’s Entrepreneurship - doing more with less

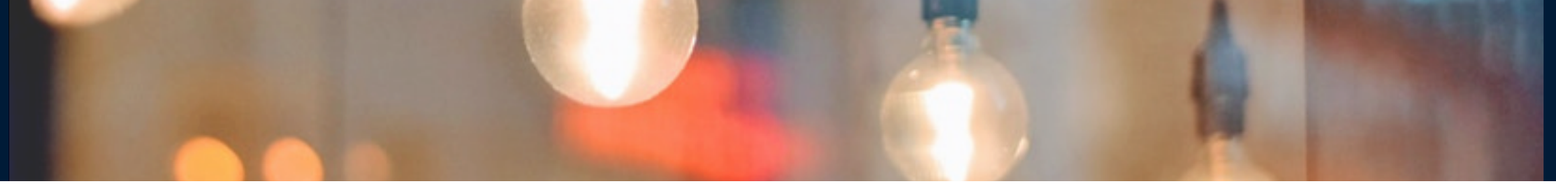
- Female-led firms grew faster. The Gender Index 2026 (p.7) showed female-led companies increased turnover by an average of 22.1% in 2025, more than male-led companies (18.0%) and mixed-led companies (17.8%). (p.7)
- Yet female-led firms raised less external capital – (12.1%) compared to 18.5% of male-led firms and 17.2% of mixed-led firms.
- Female-led firms are under-represented in debt financing across all UK regions.
- Fewer female-led firms are high-growth (13.2%), compared to 18.0% of all active companies. Perhaps due to ‘deviant men’ (Martiarena et al., 2023)
- Nonetheless average female-led firms seem to be doing more with less.

- Martiarena, A., J. Levie, S. Marlow, M. Hart & K. Bonner (2023) A ‘deviant men’ theory of business expectations in nascent entrepreneurs. *Small Business Economics,* 61**,** 909-930.



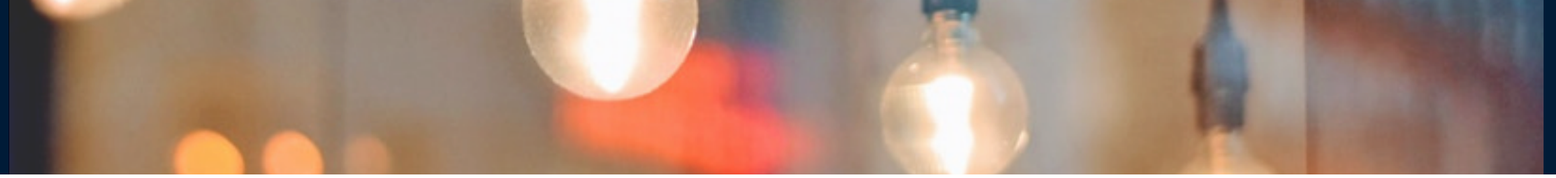
Hypotheses 1

- *Hypothesis 1: female gender is positively associated with the level of metacognition*
- Different leadership styles of women entrepreneurs (and managers) (e.g. Eagly, Johannesen-Schmidt and van Engen (2003)
- Doing more with less
- Eagly, A. H., M. C. Johannesen-Schmidt & M. L. Van Engen (2003) Transformational, transactional, and laissez-faire leadership styles: a meta-analysis comparing women and men. *Psychological bulletin,* 129**,** 569.
- Source The Gender IndexReport 2026 https://thegenderindex.co.uk/uploads/Reports/TGI-2026-report.pdf



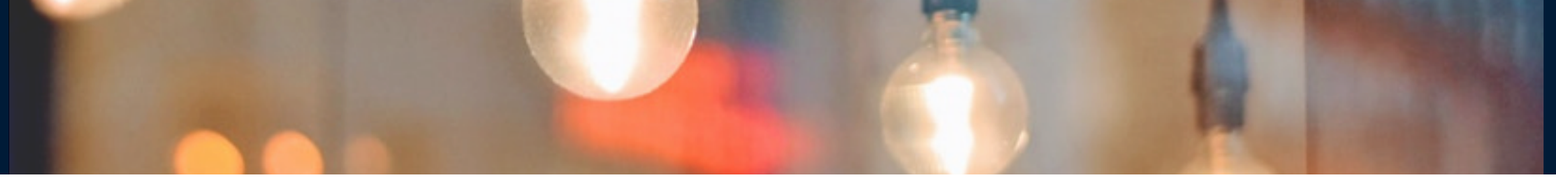
Hypotheses 2

- *Hypothesis 2: more interaction in peer networks enable greater metacognition.*
- *Cliches*
- “Two heads are better than one” (Brennan and Enns, 2015)
- “A trouble shared is a trouble halved”
- Brennan, A.A. and Enns, J.T., 2015. When two heads are better than one: Interactive versus independent benefits of collaborative cognition. *Psychonomic bulletin & review*, *22*(4), pp.1076-1082.

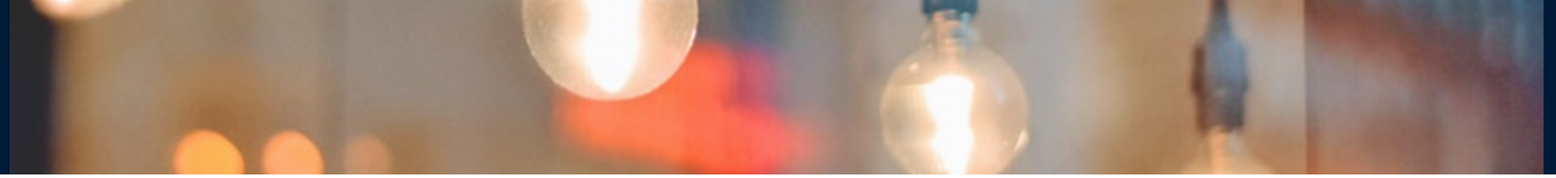


Hypotheses 3

- *Hypothesis 3: higher levels of metacognition will enable women entrepreneurs to enter more hostile industries as the metacognition enables greater agency.*
- *‘where others fear to trade’*



EVIDENCE

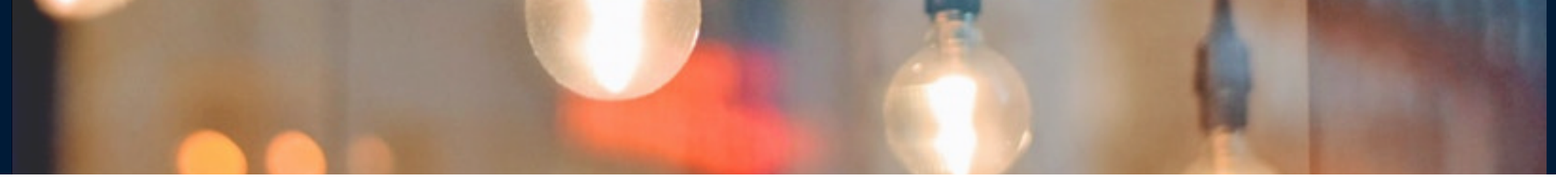


Methods

- A YouGov stratified, representative survey of over 2000 respondents from Great Britain.
- OLS regression of the factor scores for metacognition on independent variables (gender, peer interaction) and a series of controls (firm size, firm age, age or respondent, top management team size)
- A look at quartiles to understand the effect
- A mediator-outcome model for H3
- Measurement of Metacognition through a reduced version of the five-dimensions of adaptive cognition scale (Haynie and Shepherd, 2009).
- **Goal Orientation**
- **Metacognitive Knowledge**
- **Metacognitive Experience**
- **Metacognitive Choice**
- **Monitoring**

Confirmatory Factor Analysis led to adjustments

- The model shows that that four of the measures loaded onto a different variable so that we adjusted the model to have fewer variables for the Metaknowledge and metaexperience
- The model fit indices for the CFA model demonstrates acceptable to good fit. The chi squared is significant (chi2 (df=179) = 2098.24, p<.001) which is expected with large sample The RMSEA is slightly above the ideal threshold of 0.06, (RMSEA + 0.073, p=0.000) but this is an acceptable fit. the CFI (0.925) , TLI (0.913) , and SRMR (0.44) values support the adequacy of the model. The high coefficient of determination (CD = 0.999) indicates that the model explains nearly all variance in the observed variables. The BIC is 158,714.64.
- Specifically, we dropped four questions. Two from the metaknowledge and two from the metachoice. These were mostly concerned with reproducing previously successful strategies and knowing what information mattered. These seemed to be associated together.



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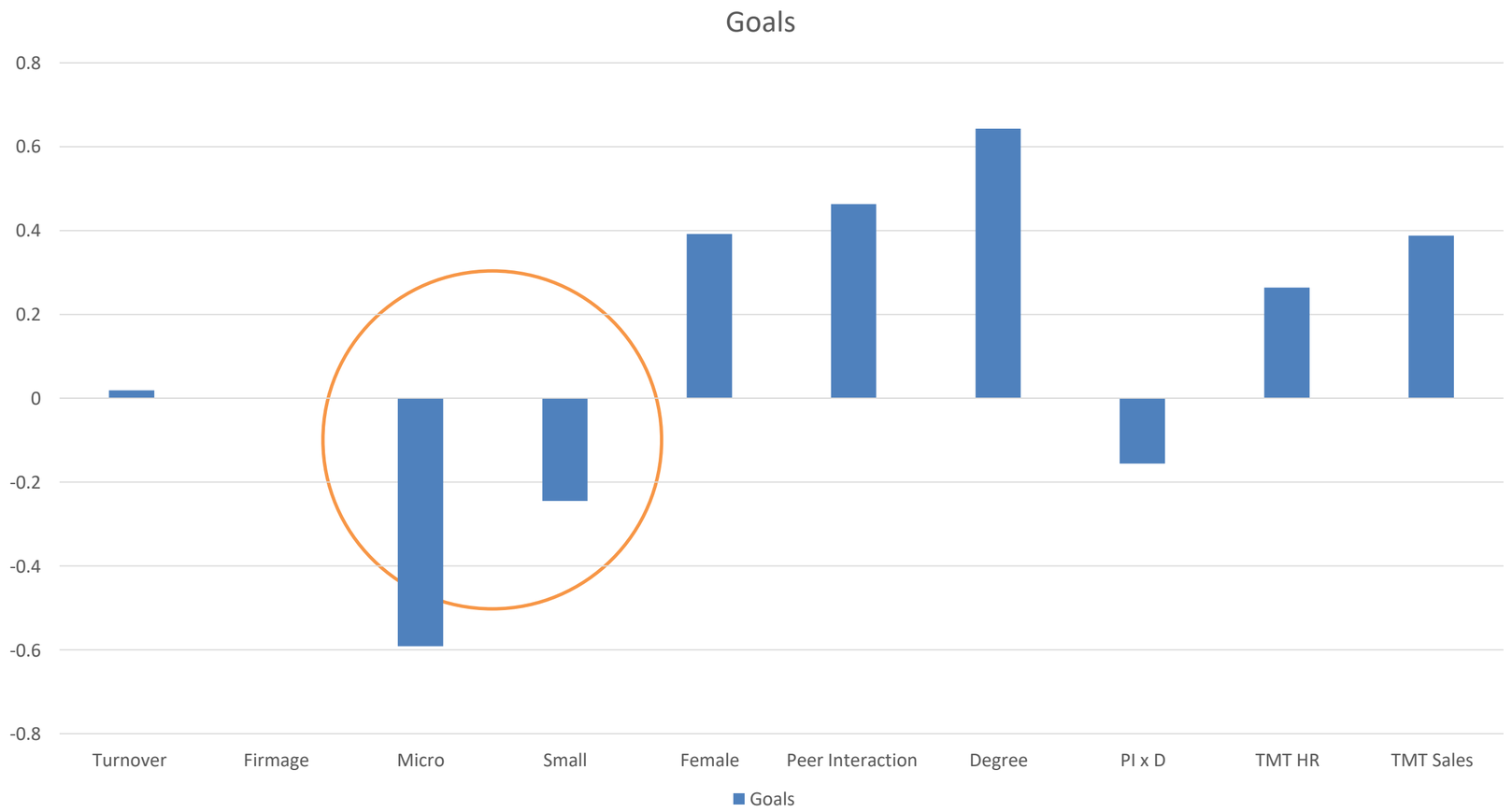
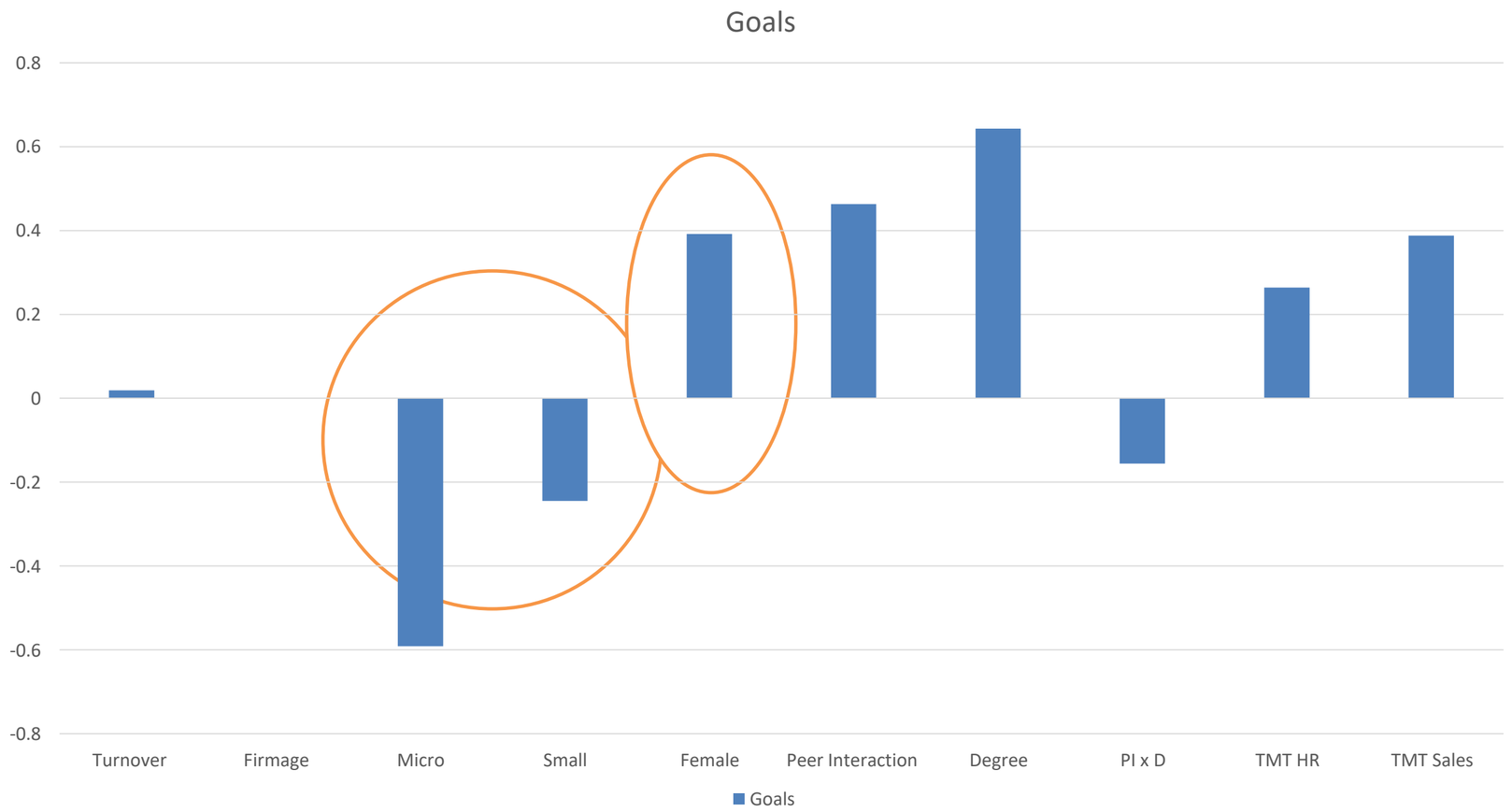
	(1)	(2)	(3)	(4)	(5)
	Factor score (Goals)	Factor score (Mtaknowledge)	Factor score (Mtaexperience)	Factor score (Mtachoice)	Factor score (Mtamonitoring)
Turnover	0.019	0.022	0.002	0.033	0.018
	(0.032)	(0.022)	(0.021)	(0.026)	(0.020)
Firmage	-0.000	-0.000	0.001	-0.001	-0.001
	(0.004)	(0.003)	(0.002)	(0.003)	(0.002)
Micro Firm	-0.591***	-0.408***	-0.439***	-0.358***	-0.338***
	(0.125)	(0.087)	(0.084)	(0.102)	(0.079)
Female	0.392**	0.156	0.133	0.234*	0.164*
	(0.155)	(0.109)	(0.105)	(0.127)	(0.098)
Micro Firm # Female	0.007	0.061	0.099	-0.051	0.146
	(0.193)	(0.135)	(0.131)	(0.157)	(0.122)
Small Firm	-0.245**	-0.259***	-0.274***	-0.245**	-0.216***
	(0.124)	(0.087)	(0.084)	(0.101)	(0.079)
Small Firm # Female	-0.198	0.009	0.073	-0.135	0.030
	(0.215)	(0.150)	(0.146)	(0.175)	(0.136)
Peer Interaction	0.463***	0.300***	0.244***	0.296***	0.259***
	(0.064)	(0.044)	(0.043)	(0.052)	(0.040)
Degree	0.643***	0.484***	0.377***	0.276	0.438***
	(0.210)	(0.147)	(0.142)	(0.171)	(0.133)
Degree# Peer Interaction	-0.156**	-0.108**	-0.073	-0.054	-0.108**
	(0.077)	(0.054)	(0.052)	(0.063)	(0.049)
Age	0.405	0.166	0.143	0.182	0.145
	(0.376)	(0.263)	(0.254)	(0.306)	(0.238)
Age squared	-0.452	-0.190	-0.102	-0.261	-0.193
	(0.369)	(0.258)	(0.250)	(0.301)	(0.233)
TMT HR	0.264***	0.170***	0.157***	0.235***	0.118**
	(0.087)	(0.061)	(0.059)	(0.071)	(0.055)
TMT Sales	0.388***	0.234***	0.218***	0.213***	0.211***
	(0.092)	(0.065)	(0.062)	(0.075)	(0.058)
Constant	-1.209***	-0.921***	-0.944***	-0.695*	-0.660**
	(0.442)	(0.309)	(0.299)	(0.360)	(0.280)
R-squared	0.139	0.132	0.107	0.121	0.119
Observations	2037.000	2037.000	2037.000	2037.000	2037.000

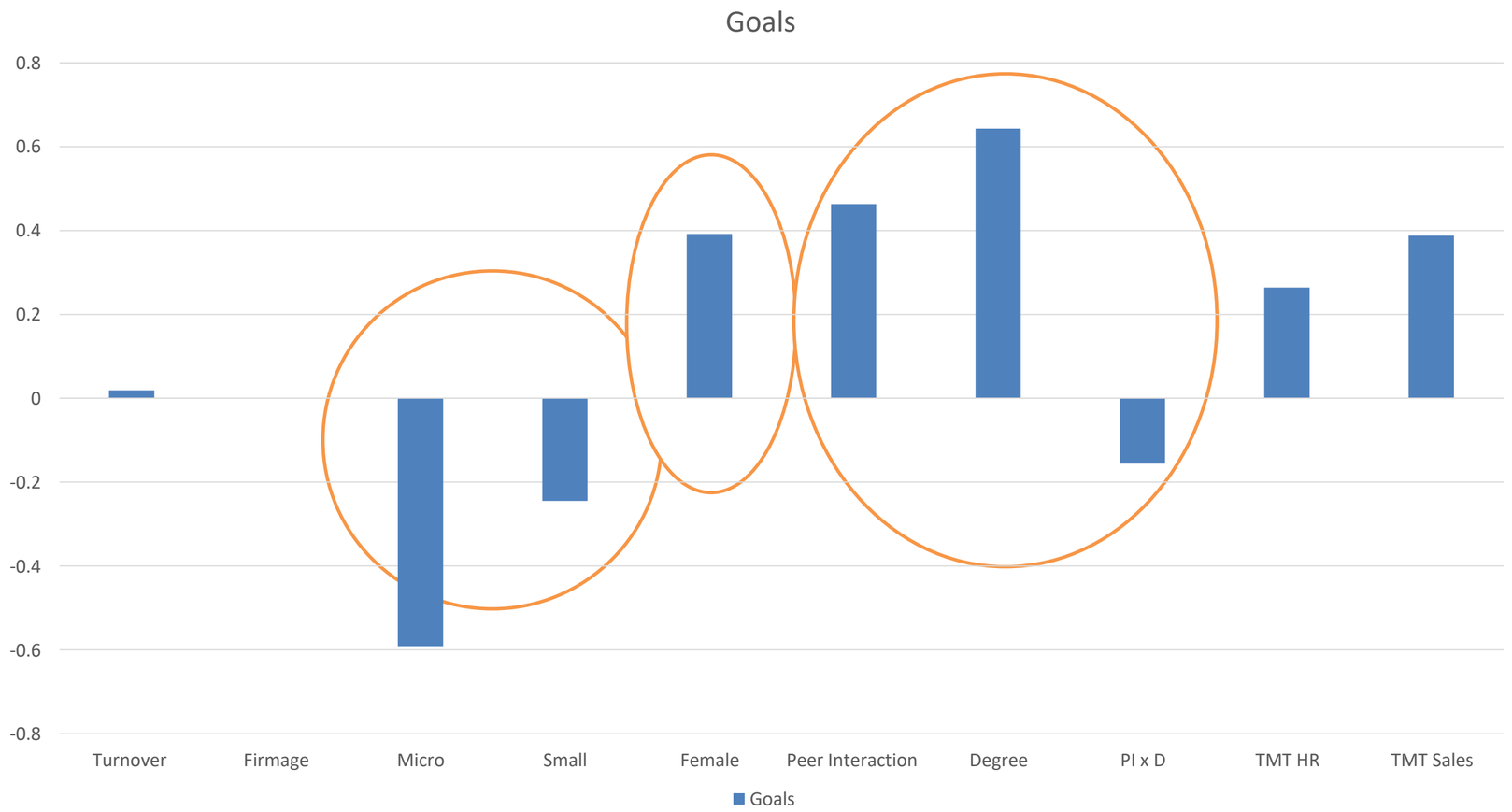
Influence on Goals

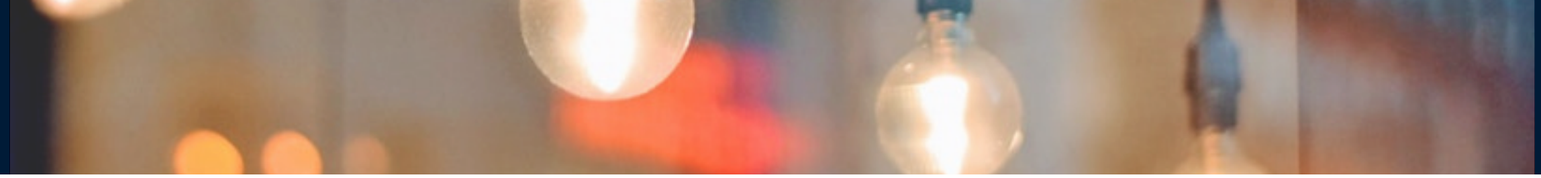


Influence on Goals

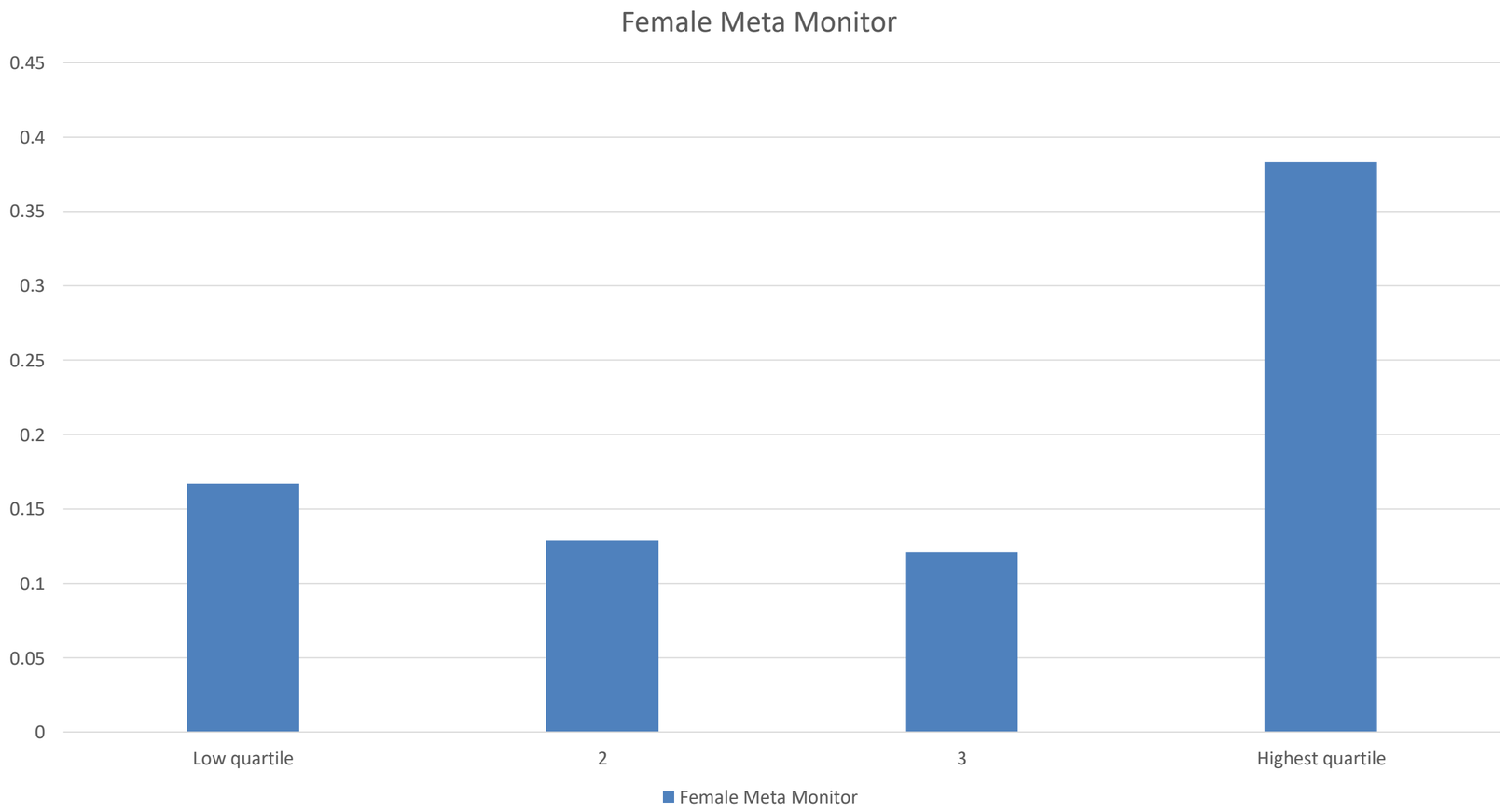


Influence on Goals

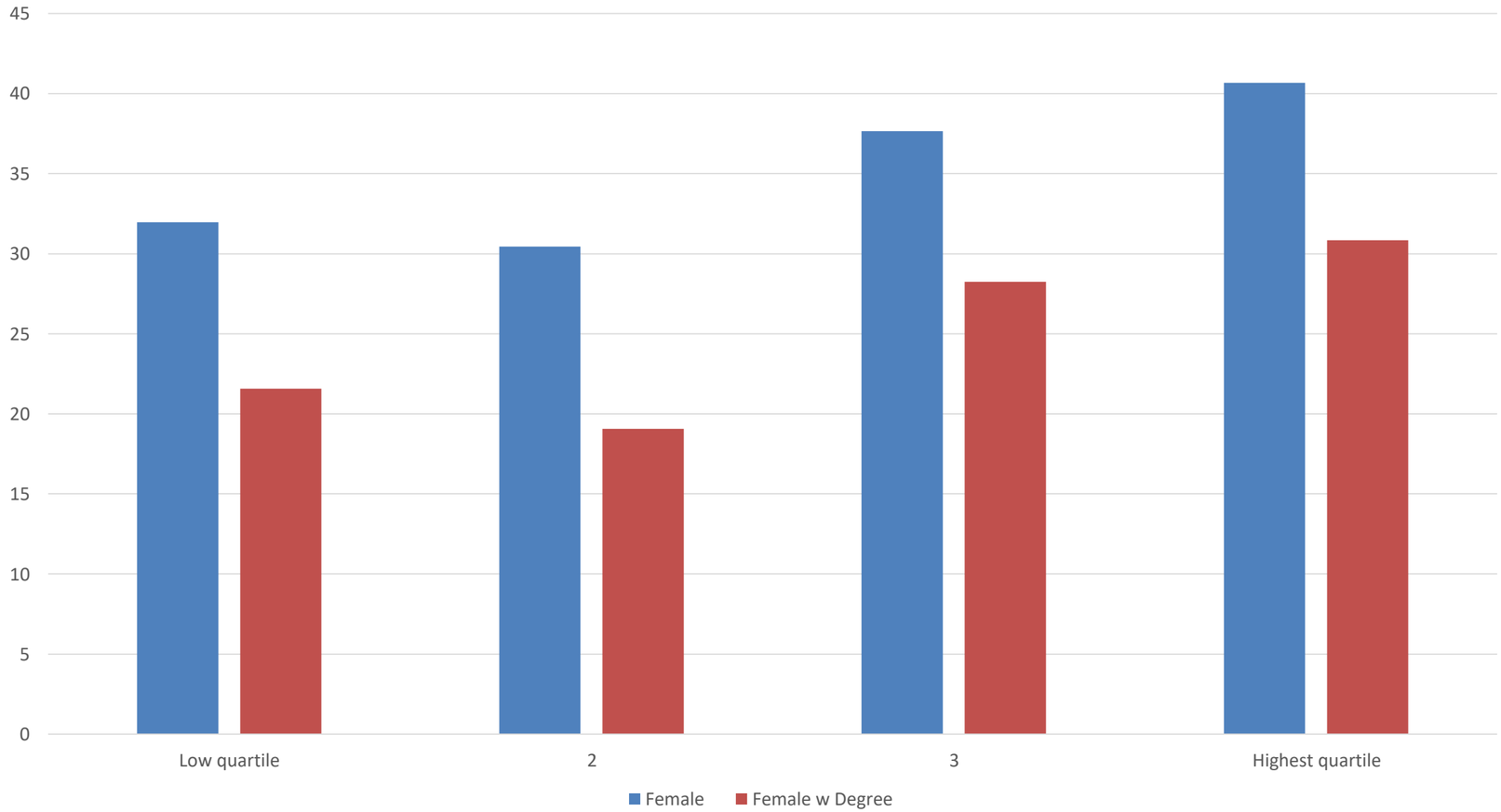




Greater female effect in higher levels

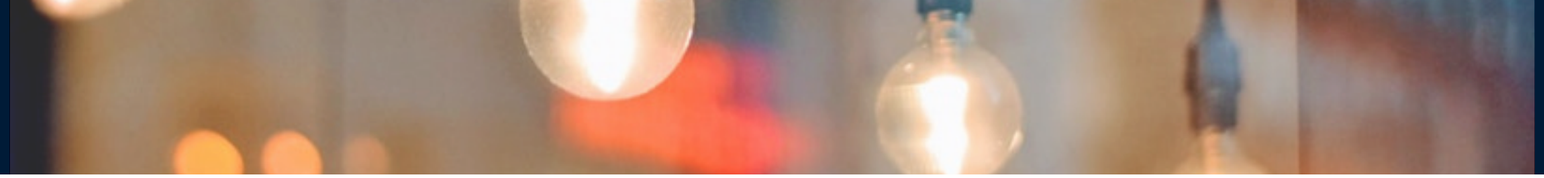


More % female-led at higher quartiles



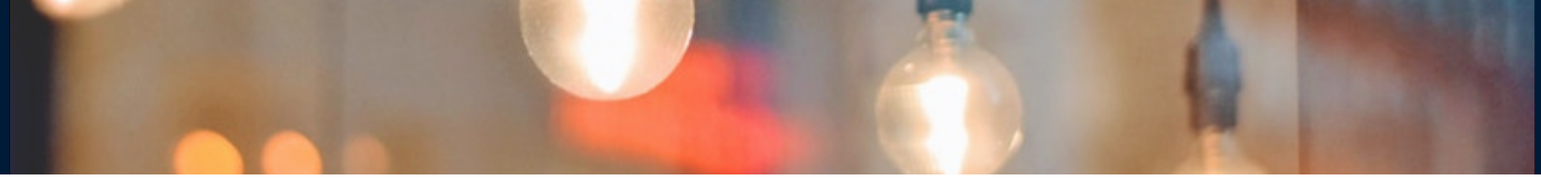
Women over-represented in higher quartiles

Quartiles of Mtamon	Male	Female	Total
Lowest	347 (68.04 %)	163 (31.96 %)	510
Second Lowest	354 (69.55 %)	155 (30.45 %)	509
Second Highest	318 (62.35 %)	192 (37.65 %)	510
Highest	302 (59.33 %)	207 (40.67 %)	509
Total	1,321 (64.82 %)	717 (35.18 %)	2,038



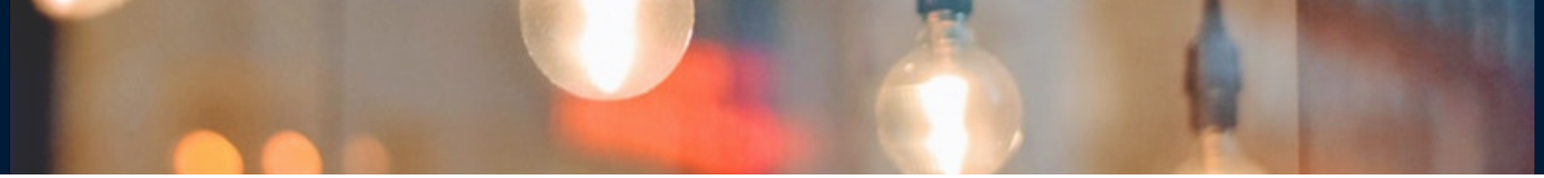
Metaknowledge and challenging industries

- Does higher metaknowledge encourage women to enter more challenging industries?
- First a mediator model which shows female owned businesses were significantly more likely to have higher metaknowledge ($\mathcal{B}$ = 0.167, p < 0.004)
- Next an outcome model showing metaknowledge reduces going into female friendly industry ($\mathcal{B}$ = -0.141, p < 0.000)
- The indirect effect is the product -0.024 which is significant but…
- The direct effect of female ownership into female friendly industry is ($\mathcal{B}$ = 0.832, p < 0.000)



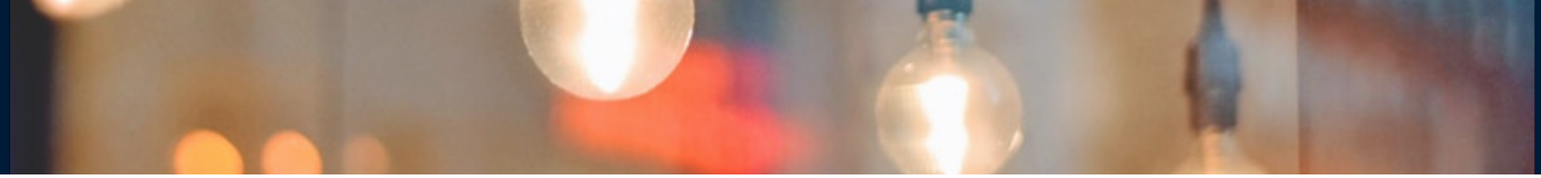
Summary of Findings

- H1: female firm managers have higher metacognition – particularly at the top of the distribution
- H2: peer interaction boosts metacognition – also degree of managerial intensity
- H3: metacognition boosts women-led firms' participation in hostile industries but not by much



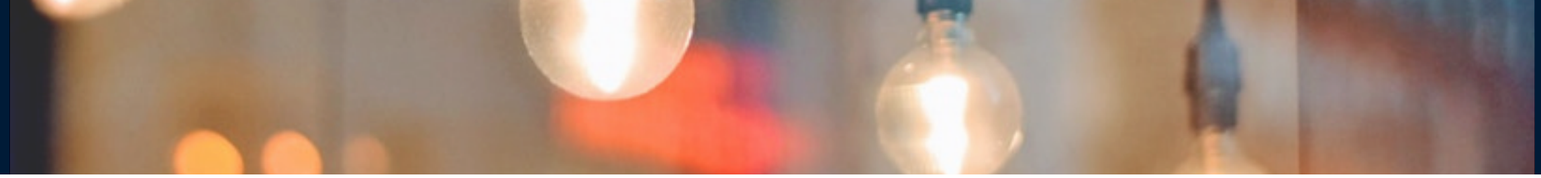
Hurdles or Diamonds?

- Higher level of women-led firms metacognition might indicate a greater hurdle to participation.
- The diamond (result of great pressure) requires future research
- We had cross-sectional data so it is difficult to adjudicate but we found no firm age effect, which favours the hurdle hypothesis



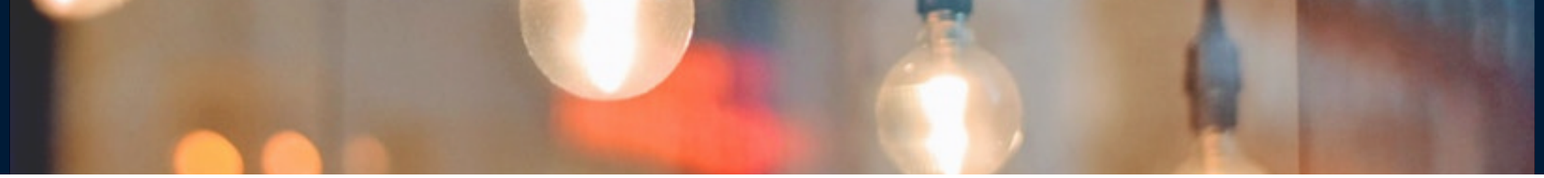
Policy implications

- The role of mindset in the development of support for entrepreneurs
- Women entrepreneurs' access to peer networks
- All firm managers might benefit from supportive peer networks particularly for those without degree level qualifications



What next?

- Writing more detailed assessment of the metacognition construct
- Also thinking about how metacognition impacts on other behaviour such as climate adaptation



Conclusions

- Metacognition enables entrepreneurs to face greater challenges
- Women entrepreneurs showed higher metacognition especially at the higher levels –potentially reflecting greater hurdles to participation.
- Greater metacognition enables women entrepreneurs to participate in more hostile industries
- Perhaps Quibi managers would have *asked themselves how well they accomplished their goals and once they finished* and then reassessed their approaches

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Questions

Other Funders

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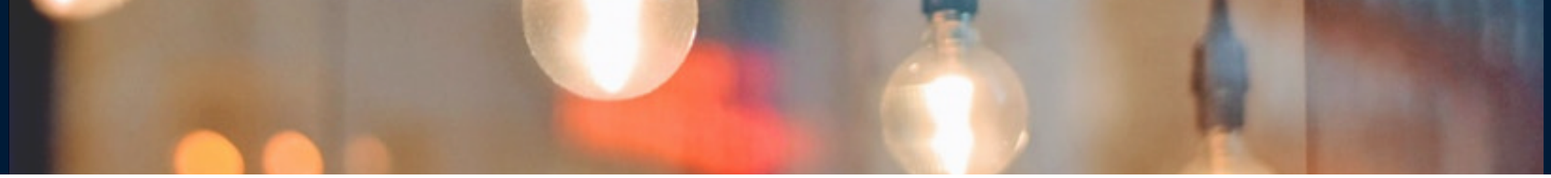
Department for Science, Innovation & Technology

Intellectual Property Office



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The iceberg of economic turbulence: Uncovering the hidden mechanics of UK job creation and destruction 1998-2024

Neha Prashar, George Paily,
Karen Bonner & Mark Hart

What JCD can tell us

- UK employment has largely remained unchanged over the last 25 years (72.5% in 2000, 75.1% in 2025*)
  - **Does this mean we can claim the labour market was stable?**

- Let's assume the UK experienced 1% employment growth

Scenario A

This could have come about from
- 3% of jobs created
- 2% of jobs destroyed

Scenario B

This could have come about from
- 16% of jobs created
- 15% of jobs destroyed

- Same outcome, vastly different underlying economies

*Source: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/lf24/lms

Why is JCD important?

- Net employment hides the true scale of labour market activity
- A strong measure of economic adaptability
  - High rates of JCD indicate firms are responding to market changes and conditions.
- Strong link to productivity – creative destruction
  - Jobs reallocated from less productive firms to more productive firms that survive/expand.
- Better evidence for policy design
  - Important to understand the mechanisms driving employment change.

What we have done

- Analyse how the business stock in the **private sector** in the UK has changed between 1998 and 2024. These metrics help us to understand the level of turbulence in jobs in the UK[1]

- Using employee data from the ONS BSD, we examined **the average annual job creation and destruction rates** between 1998-2024, as well as entry and exit rates of firms.

- Going beyond what the ONS have already published, our analysis focuses on **'employer enterprises'** – firms with one or more employees - defined as per OECD guidelines and focus on national/regional differences.

- In addition, we also apply a cohort analysis for an in-depth view on how employment dynamics evolve over the life cycle of older and new generation of firms.

(1. Davis et al., (2008); "Turmoil and Growth: Young Businesses, Economic Churning and Productivity Gains"

Definitions of Metrics

- The job creation and destruction metrics are defined as follows:

  - **Job Creation (JC) =** New firm entrants + firm expansions
  - **Job Destruction (JD) =** Firm exits + firm contractions
  - **Job Reallocation (JR) =** Job creation + job destruction
    - Captures the overall intensity of the UK labour market regardless of whether it is growing or shrinking
  - **Net Employment (NE) =** Job creation – job destruction
  - **Excess Job Reallocation (EJR)** = Job Reallocation - |Net Employment|
    - Captures the hidden restructuring or reshuffling of jobs. It reflects genuine restructuring rather than overall employment growth changes

- These job creation and destruction figures are expressed as rates by dividing by employment averaged over the current and previous year (businesses with no change in employment do not contribute to either job creation or job destruction).

A glance into Job Gains & Losses in the UK 2024

ERC Enterprise Research Centre

	Job Gains	Job Losses
Start-ups	748,861	
Expansion	1,830,650	
Closure/Exit		1,026,042
Contraction		1,395,740
Total	**2,579,511**	**2,421,782**
Net Employment	**157,729**	
Job Reallocation	**5,001,293**	

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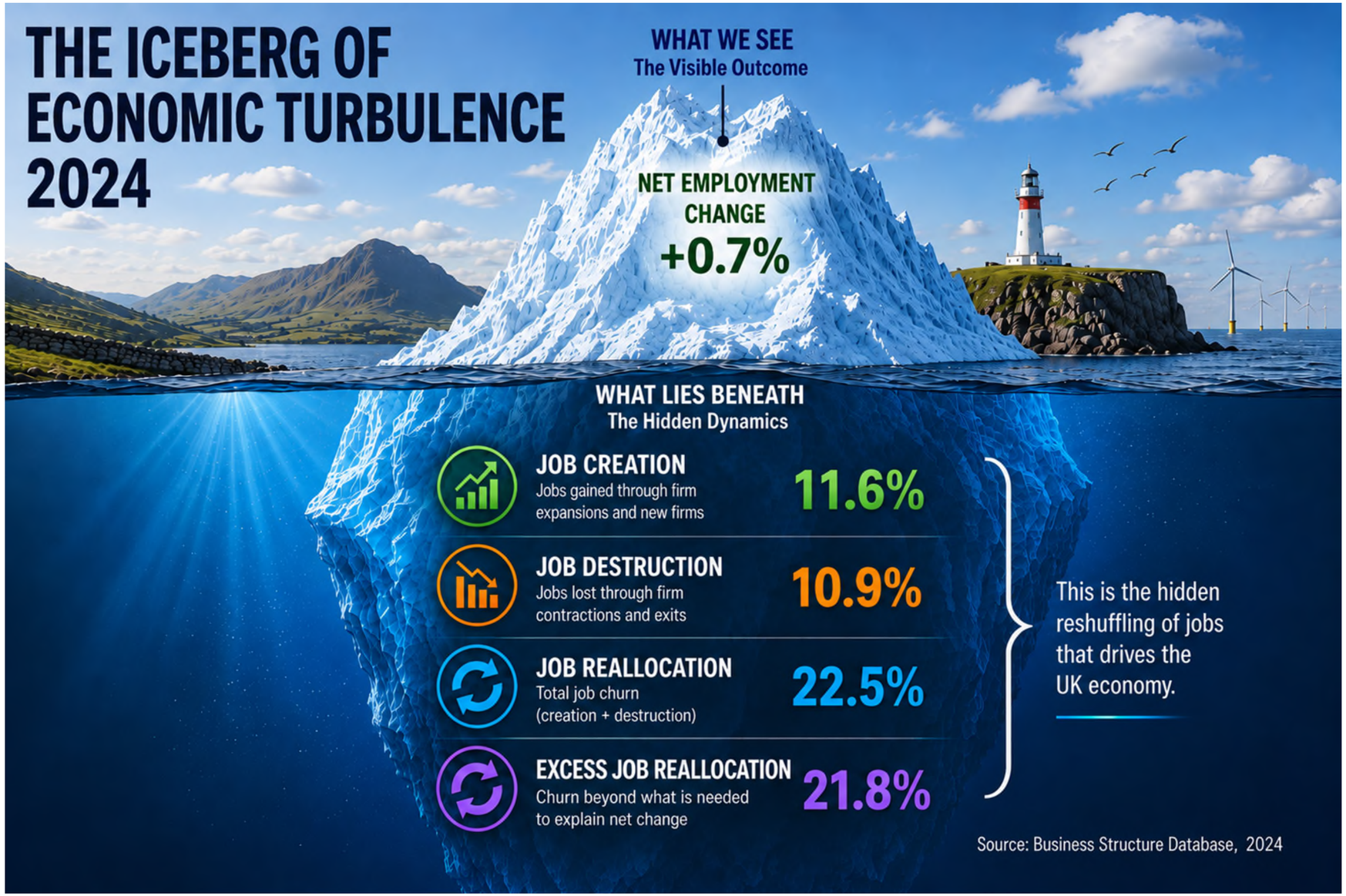
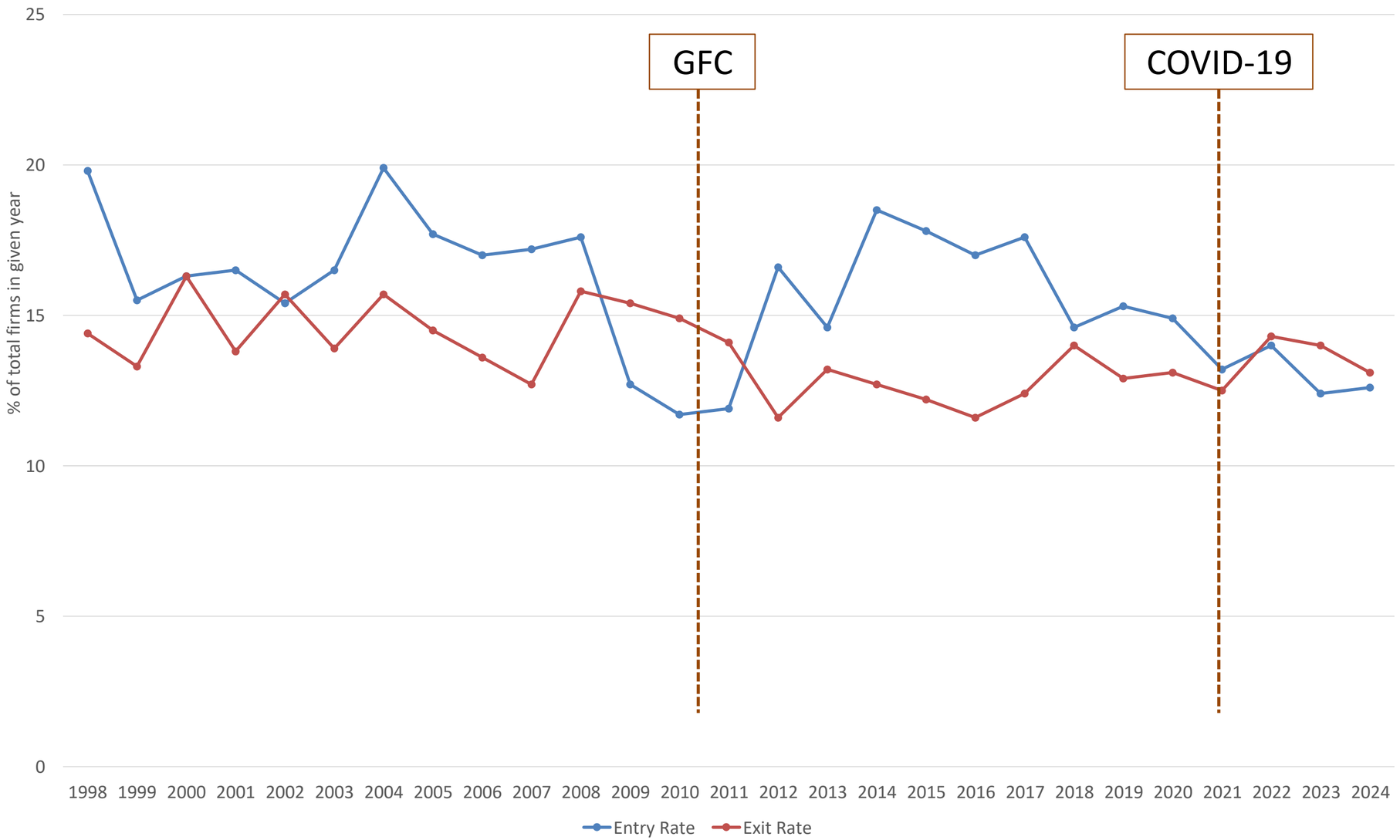
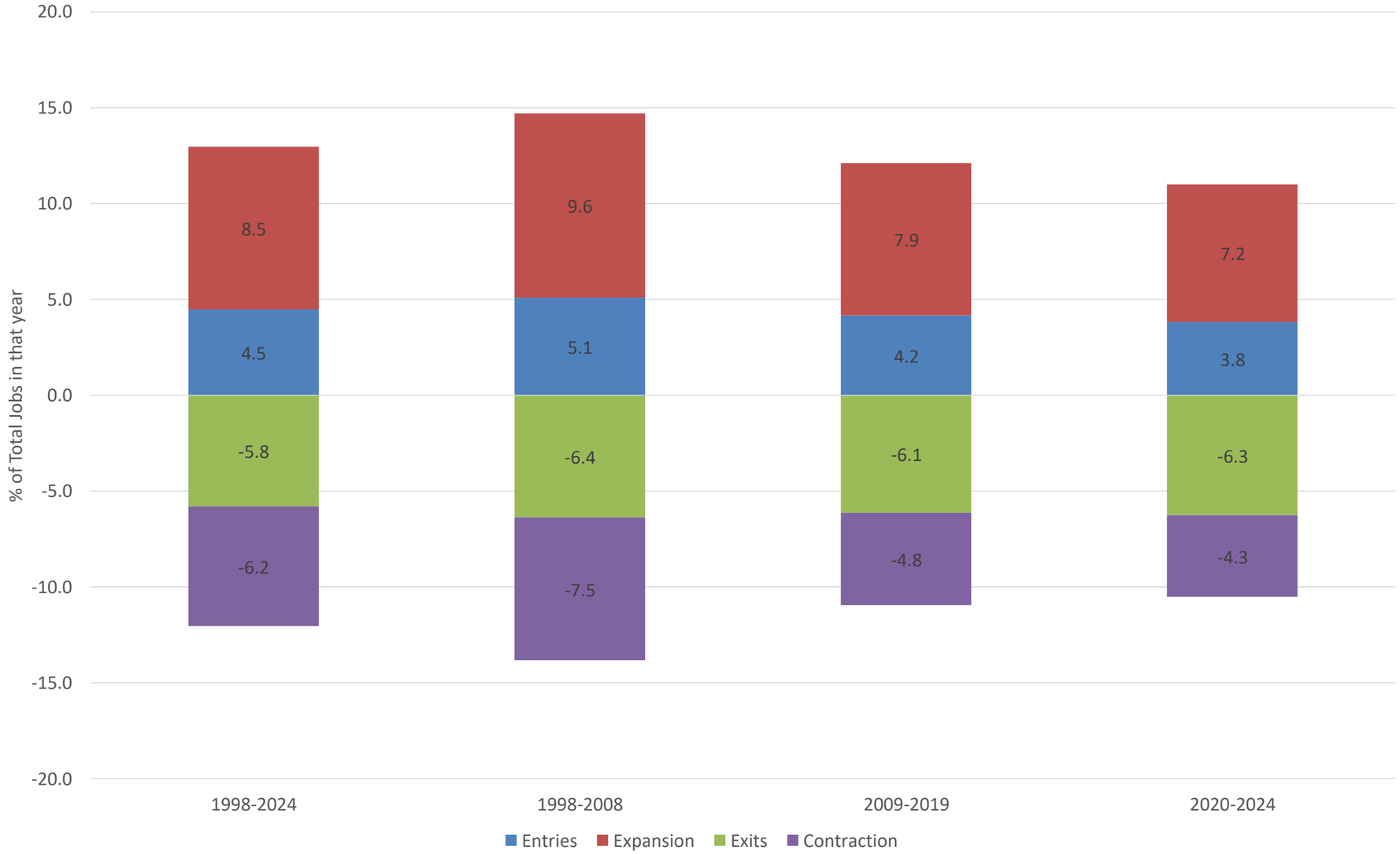


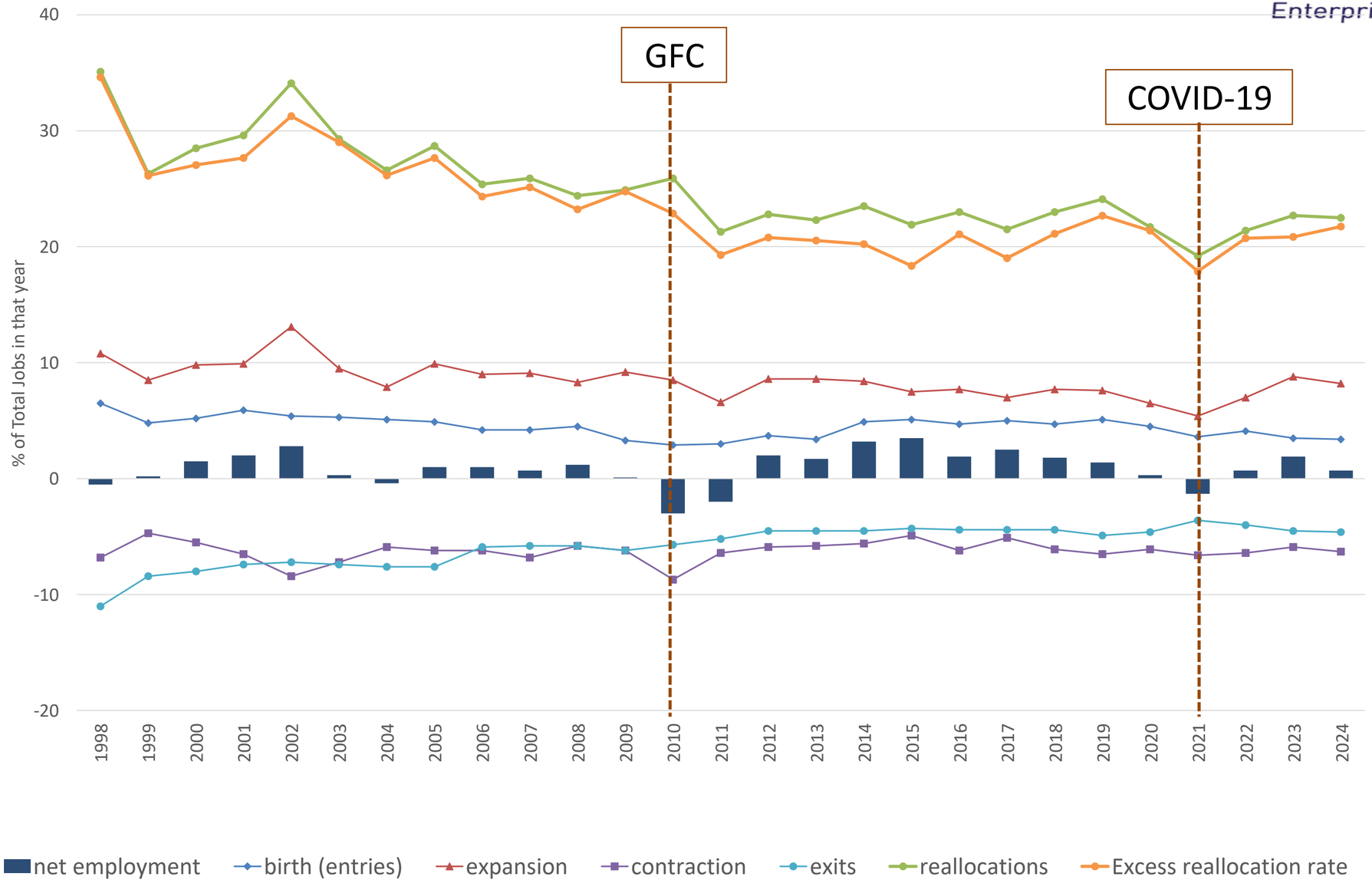
UK Firm Entry & Exit Rates: 1998-2024



UK Job Creation and Destruction: 1998-2024



UK Job Creation and Destruction: 1998-2024



Trends over 25+ years

- Entry and exit rates of firms are now similar levels (12.6% & 13.1%) when compared with 1998 (19.8% & 14.4% respectively)

- Jobs created through firm entries have fallen from 6.5% in 1998 to 3.4% by 2024.

- Jobs lost through firm exits have fallen from 11% to 4.6%
  - The UK is experiencing fewer business starts and fewer business deaths than it did 26 years ago.
  - Less dynamism
  - Fewer young firms replacing older ones.

- This is similar to what other OECD countries are experiencing (https://www.oecd.org/en/topics/productivity-and-business-dynamism.html)

The COVID-19 effect

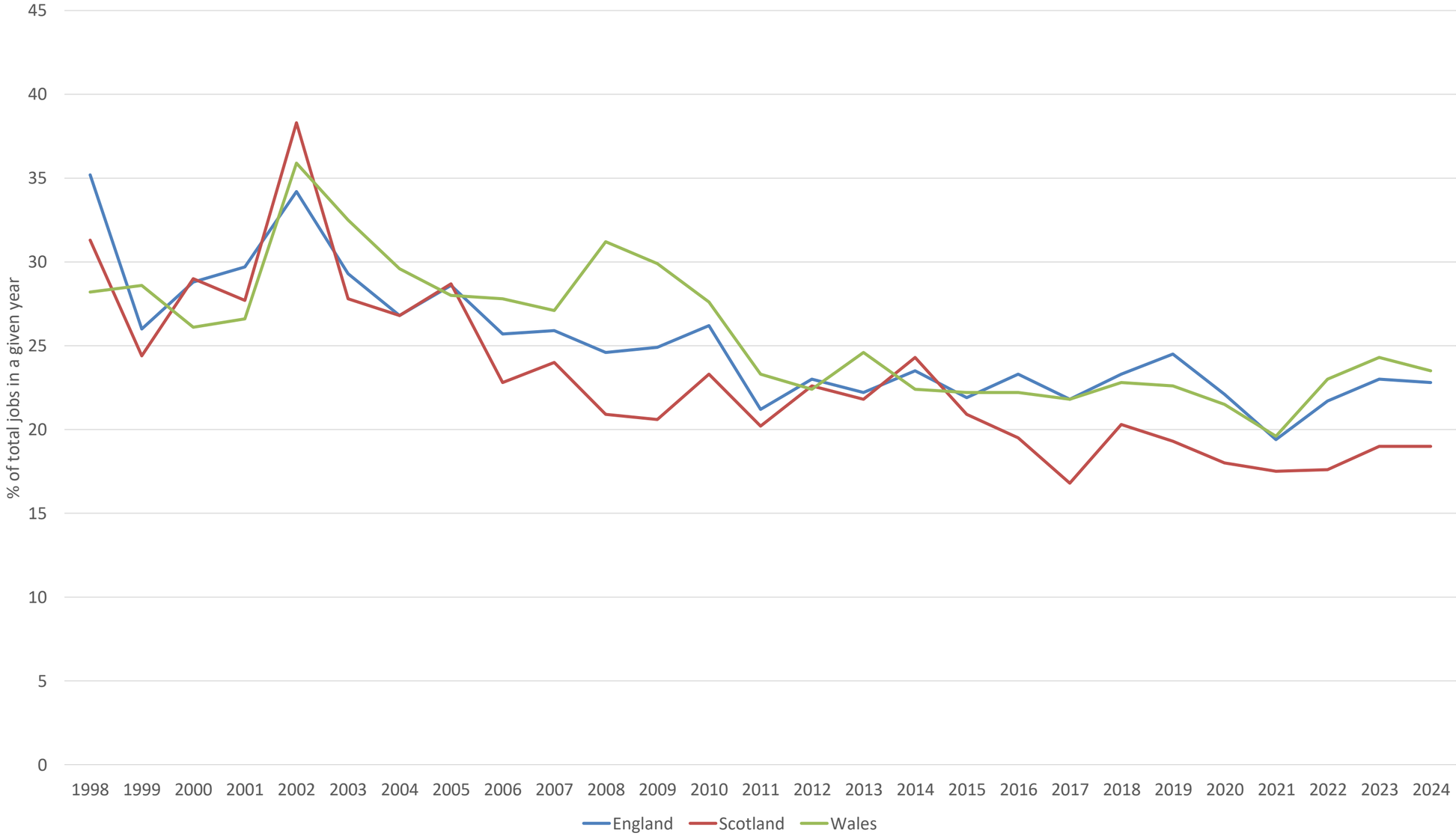
- COVID-19 saw a drop in firm entries, but not as severe as the GFC.

- There was a surprising drop in firm exits to 3.6%
  - Possible impact of government schemes available at the time.

- There was a bigger drop in firm expansions, which fell to it's lowest at 5.4% and an increase in contractions to 6.6%.

- As a result, employment became negative suggesting existing firms were hiring less and contracting more.

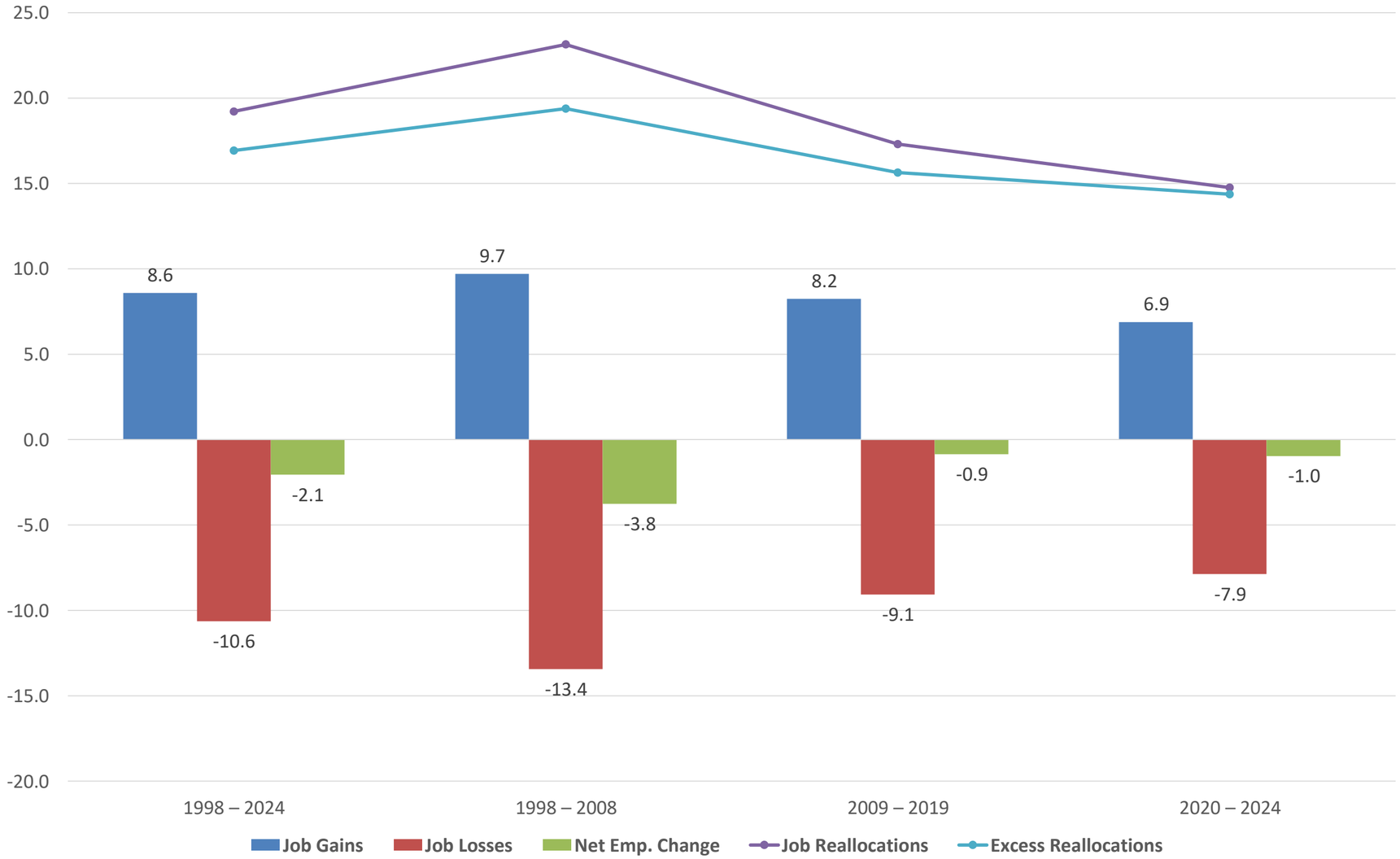
Job Reallocation Rates by Home Nation (1998-2024)



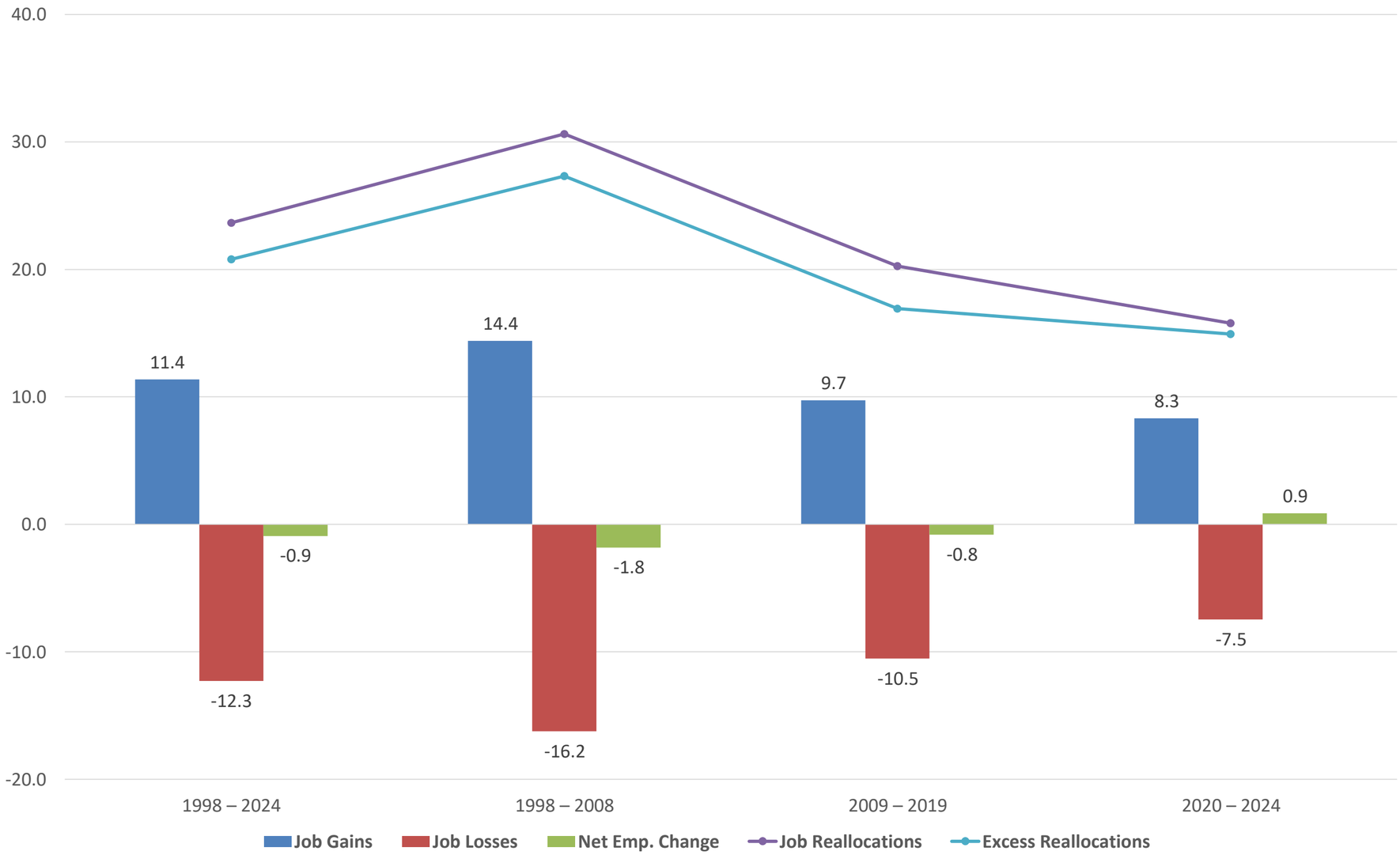
UK National & Regional Differences

- Differences in net employment are small.
- But there are substantial differences in dynamism.
  - 21.1% reallocation rate in the East Midlands vs 27.1% in the North-West.
- The North-West, London, the North-East and South-East are the most dynamic regions.
  - High labour market dynamism is not exclusively a London phenomenon.
- The East Midlands is the least dynamic
  - Lower turnover of jobs, possible greatly stability in job retention and fewer structural changes.
- Regional labour markets are characterised less by differences in employment growth but by differences in the underlying amount of restructuring occurring

Average JCD: Manufacturing (1998-2024)



Average JCD: Financial Sector (1998-2024)



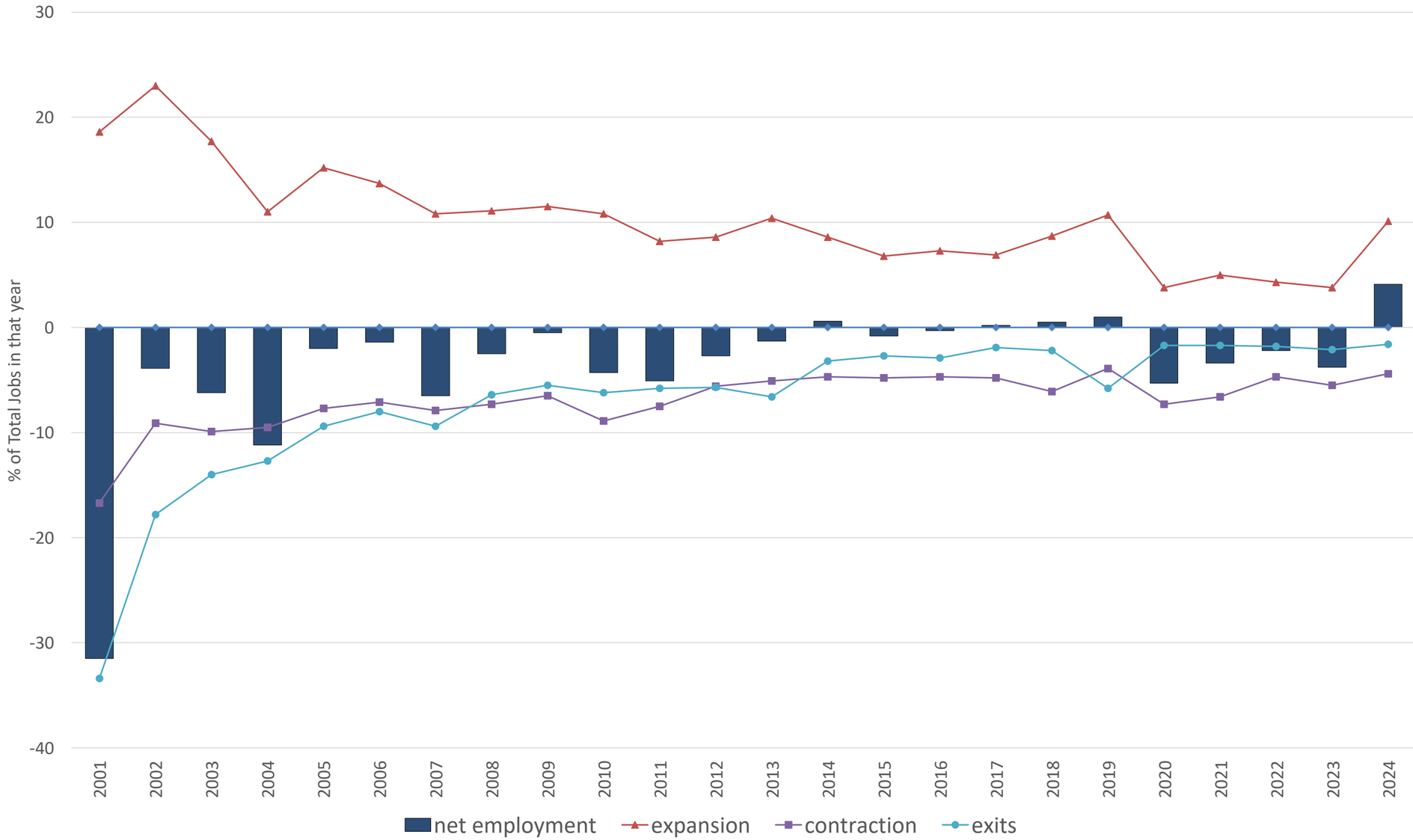
Cohort Analysis

- Standard analysis looks at how much job creation and destruction is occurring in the economy at any one point in time

- But how do employment dynamics evolve over the life cycle of a firm?

  - Long-run employment contribution of the firm.
  - Firm growth dynamics with age
  - Look at two birth cohorts of firms (2000 and 2012) at different times to compare.

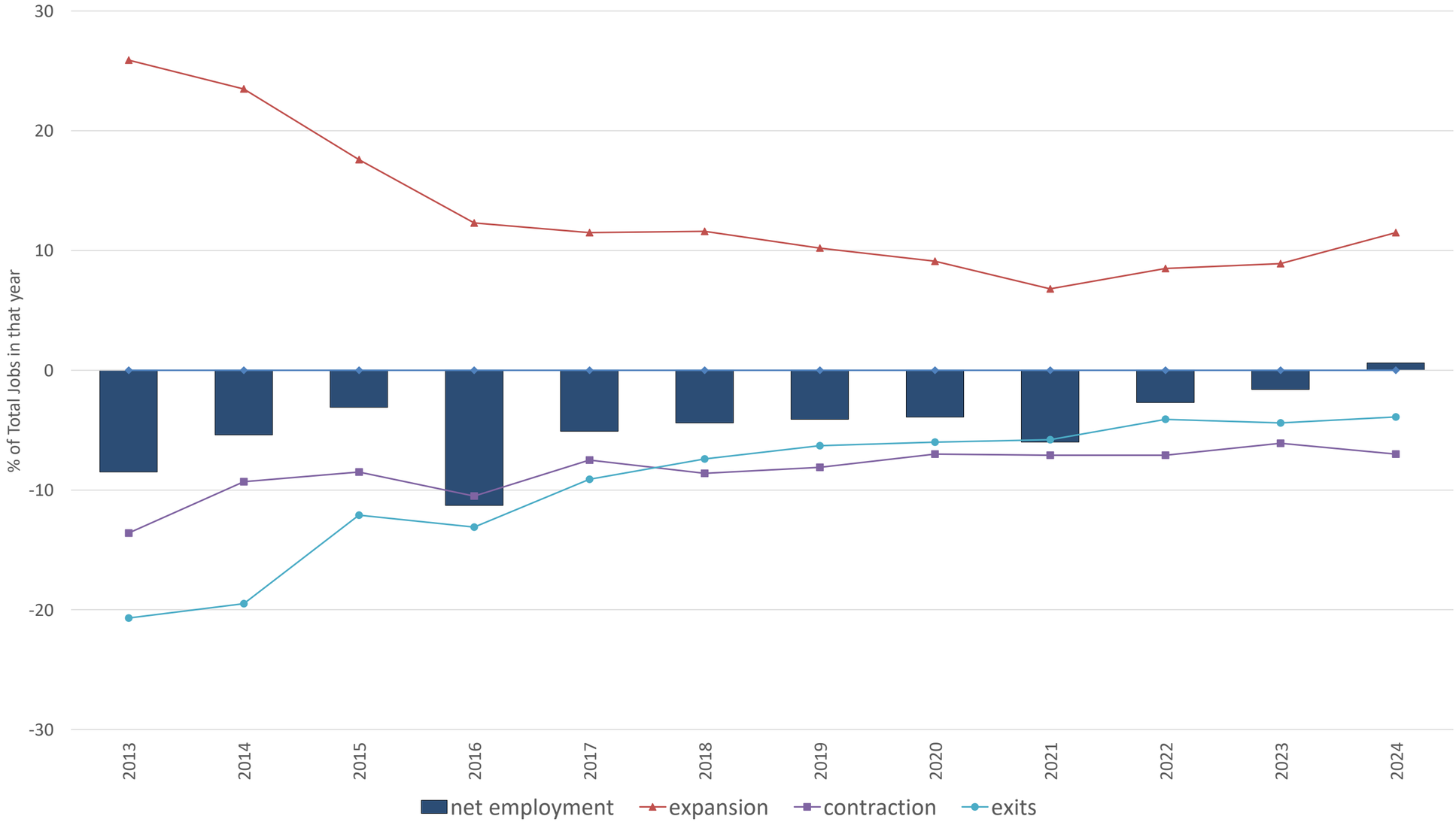
JCD: Cohort 2000



Cohort 2000 Analysis

- 211,926 firms were born in 2000, only 16% survived to 2012 and 7.6% survived to 2024.
- Expansion, contraction and exits are highest in the first year of business.
  - Early-stage selection process.
- Negative net employment dominates the lifecycle of these firms, exceeding 30% in the first year (2001). It falls significantly after.
  - Well-known young-firm behaviour of rapid growth, rapid survival or rapid failure.
- As the cohort matures, post GFC, expansions settle around 7-10% and exits fall to around 2-4%.
  - But there are still employment dynamics occurring as net employment fluctuates.
- Source of job destruction changes over time, from exits to contractions of surviving firms.
- Generally, appear resilient to COVID-19 shock with only slight changes in expansion and exits.

JCD: Cohort 2012



Cohort 2012 Analysis

- 247,572 firms were born in 2012, 20.5% survived to 2024, 4.5 percentage points more than the 2000 cohort.
- This cohort experiences stronger early expansion, possibly due to firms experiencing more employment growth post-GFC.
- They also had much lower job exit rates at around 21%, compared with the 2000 cohort which has 33%.
- However, both cohorts show similar lifecycle pattern
  - Early years of high expansion, high exits and net employment losses
  - Later years od expansion and contraction stabilising and lower net employment losses.
  - Net employment losses.
- Business dynamism persists throughout both cohort lifecycles.

Conclusion

- The UK labour market is far more dynamic than headline employment figures suggest.

- The evidence is clear – looked at in aggregate or by sector, Nation/Region and cohorts of entry – expansion of firms has declined over the period

- Policy should focus on understanding the mechanisms of job creation and destruction and how this differs across the heterogeneity of firms and especially small firms.

- Evidence underlines the importance of productive reallocation rather than simply preserving existing jobs.

Thank you!

Questions and comments?

More information at http://enterpriseresearch.ac.uk/

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Agenda – Afternoon Session

13.30-14.00 Assessing the economic impacts of publicly funded research and innovation on UK firms – Halima Jibril

14.00-14.30 Knowledge spillovers and innovation in micro-businesses - Ully Nafizah

14.30-14.45 Looking ahead – future research plans – Steve Roper

Other Funders

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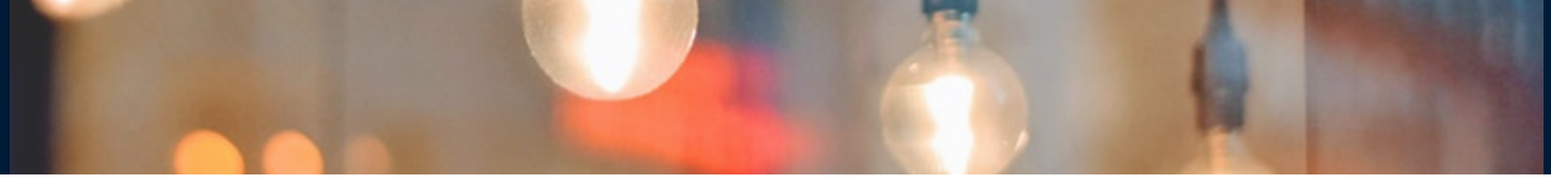

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Assessing the economic impacts of publicly funded research and innovation on UK firms

Halima Jibril

INNOVATION & RESEARCH CAUCUS

Assessing the economic impacts of publicly funded research and innovation on UK firms

Phase 2: Direct impacts on business growth

Halima Jibril[1], Enrico Vanino[2], Serdal Ozusaglem[1], Ully Nafizah[1], Stephen Roper[1]

1 University of Warwick

2 University of Sheffield

April 2026 Steering Group Meeting.

Project Background and Aims

- This project aims to provide robust population-level evidence on the business impacts of UKRI support, providing the basis for future business and investment cases.
- The project builds on previous work (conducted by the present project team) which found positive impacts of UKRI support on business growth and performance (Vanino et al. 2019) and spillovers (Becker et al. 2023).
- The aim is to update and extend these earlier analyses by utilising more recent data and robust approach to provide contemporary robust insights into key policy areas
- The project will explore how impacts differ across several dimensions e.g., different types of support and firm characteristics (size, age, sector, location).
- The project also updates the methodology by incorporating a Staggared DiD approach which allows for staggered access to support and impact over different timelines

Overview of Key Findings

1. UKRI support has positive, but heterogeneous, impacts on business growth and more widespread impacts on innovation.
2. Employment grows by 4% on average, with much larger gains (24–32%) for smaller and younger firms in recent cohorts.
3. Turnover growth rises by around 6% on average, reaching 30–43% for smaller and younger firms.
4. Innovation (patents) increase by around 6.5% on average, with strongest effects (up to 46%) for larger and established firms.
5. Foreign-owned firms and those in knowledge intensive and high-tech sectors see larger business growth and innovation gains.
6. Impacts of UKRI support tend to be persistent and cumulative over time.

Data and Methods

Data

To understand the impact of UKRI engagement, we link **three longitudinal datasets**:

- **Gateway to Research plus (GtR+)**
  - All UKRI-funded RDI projects, 2006-2023.
  - Data on projects, funders, size of the award, types of project partners
  - We worked with IUK, ESRC and UKRI to categorize UKRI projects for the analysis.
- **Business Structure Database (BSD)**
  - Population of UK businesses,1997-2023.
  - Data on employment, turnover, industry, location, ownership, etc.
- **IPO Intellectual Property Rights (IPO-IPR)**
  - Population of UK businesses registering IPRs in the UK, 2013-2023.
  - Number of patents, trademarks and registered designs.

Methods

- **Propensity Score Matching (PSM)**
  - PSM used to create balanced groups of comparable treated (engaged with UKRI) and control (never engaged) firms which are as similar as possible to each other before first UKRI engagement.
  - Matching based on firms' size, productivity, age, industry, IPR, employment, turnover and productivity growth, market share and industry/regional agglomeration.

- **Callaway and St'Anna (2021) Staggard Difference in Difference estimator (CS-DiD)**
  - CS-DiD estimates difference in average and dynamic impact between matched treated and control.
  - More robust when there is variation (stagger) in treatment timing.
  - Maryland Scientific Scale score of 3.

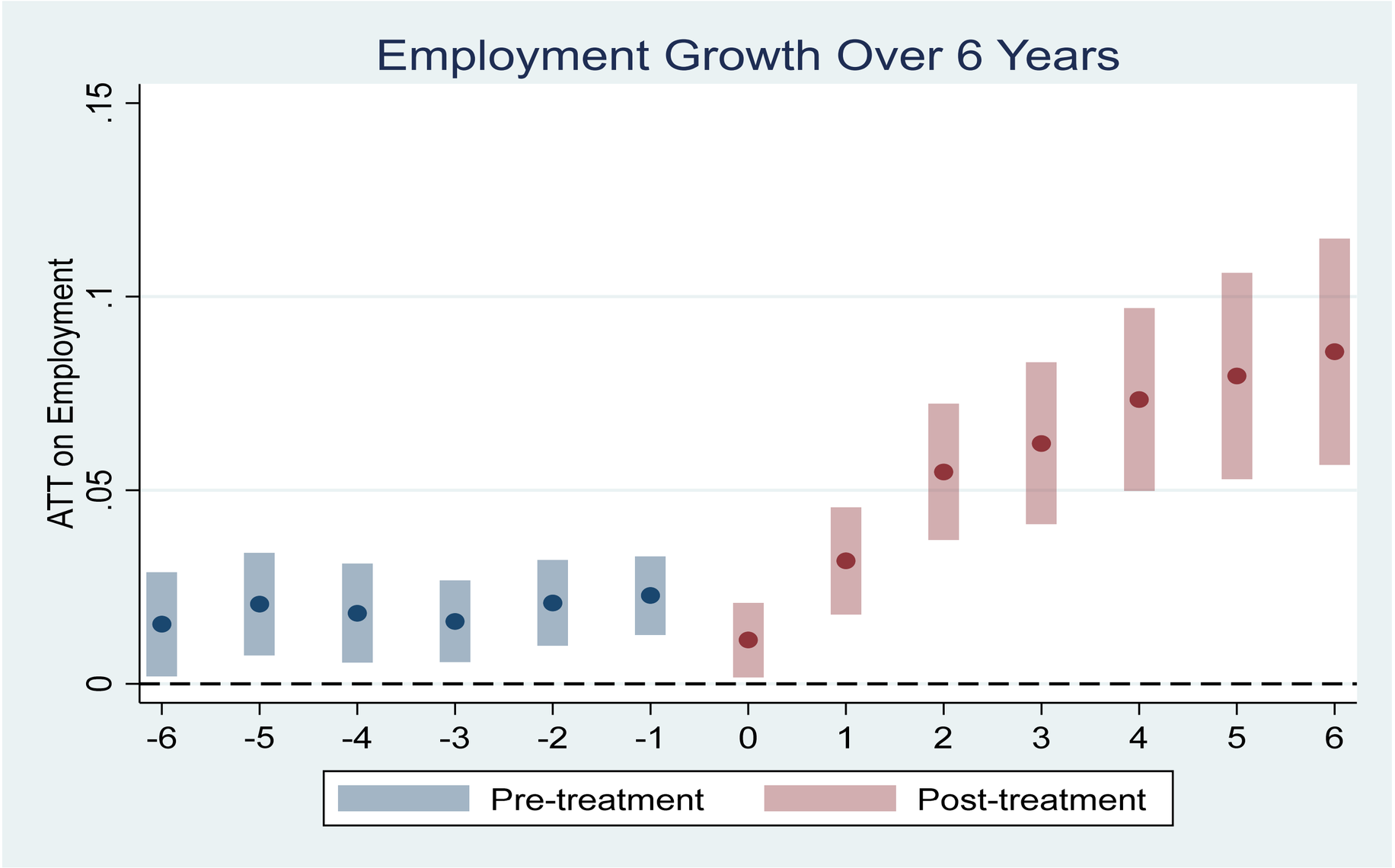
- Use fully balanced panel data for firms continuously observed for at least 2, 4, and 6 years before and after first UKRI engagement.
- Main outcomes of interest: **business growth** (employment and turnover) **and innovation** (patents).

Findings I: Business Growth

Employment growth – Key Findings

- UKRI engagement boosts employment growth selectively.
- Employment for UKRI supported firms increases by about 4% relative to control group
- Heterogeneous effects:
  - Strong gains for **smaller, younger firms** (up to 32%), with no effect for larger established firms
  - More **recent cohorts** see up to 24% increase in employment growth
  - Impact appears **regionally concentrated** in East (10%), South-East (7%) and Wales (10%)
  - Higer impact among **Knowledge Intensive Services** (7%) and **High-tech Manufacturing** (7%), and among **foreign owned firms** (9%)
- Employment growth effects are **sustained and cumulative**, increasing steadily over time.

Dynamic Employment Growth Effect

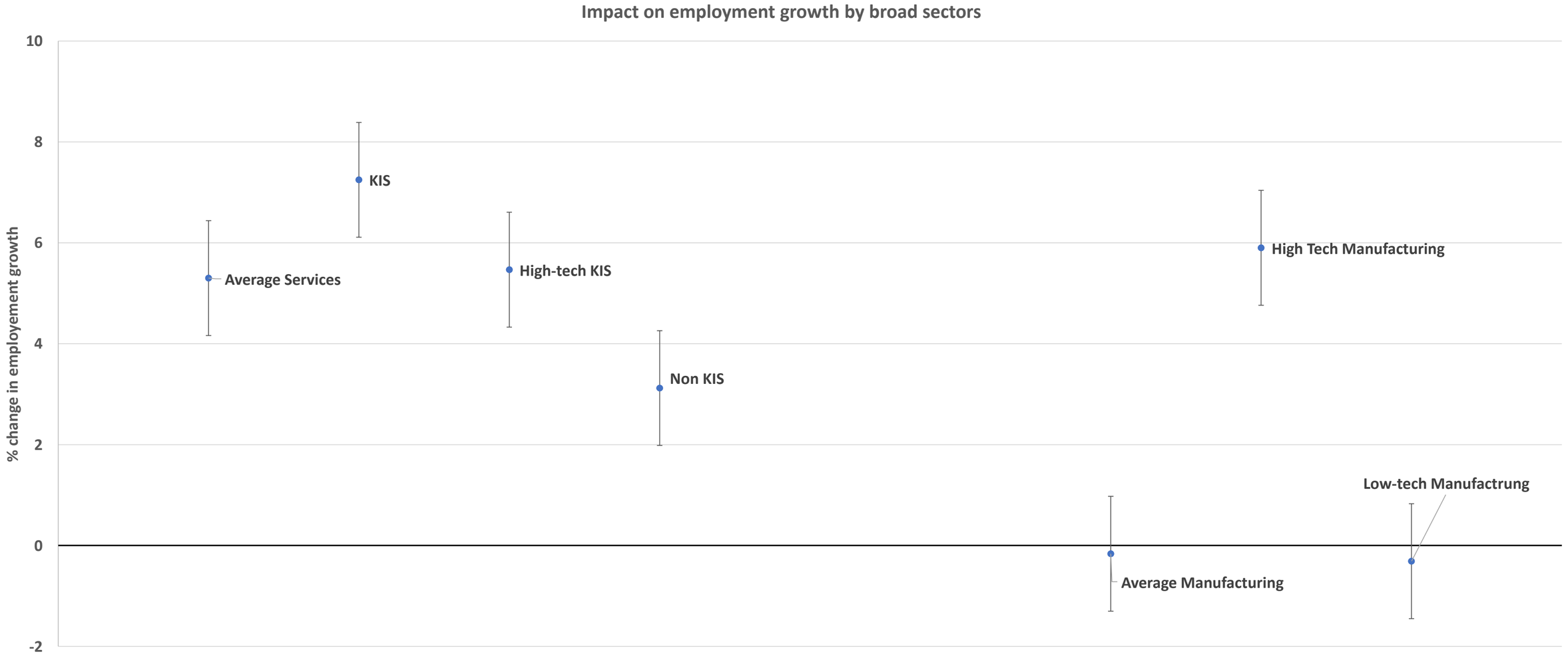


Employment Effect by Size and Age

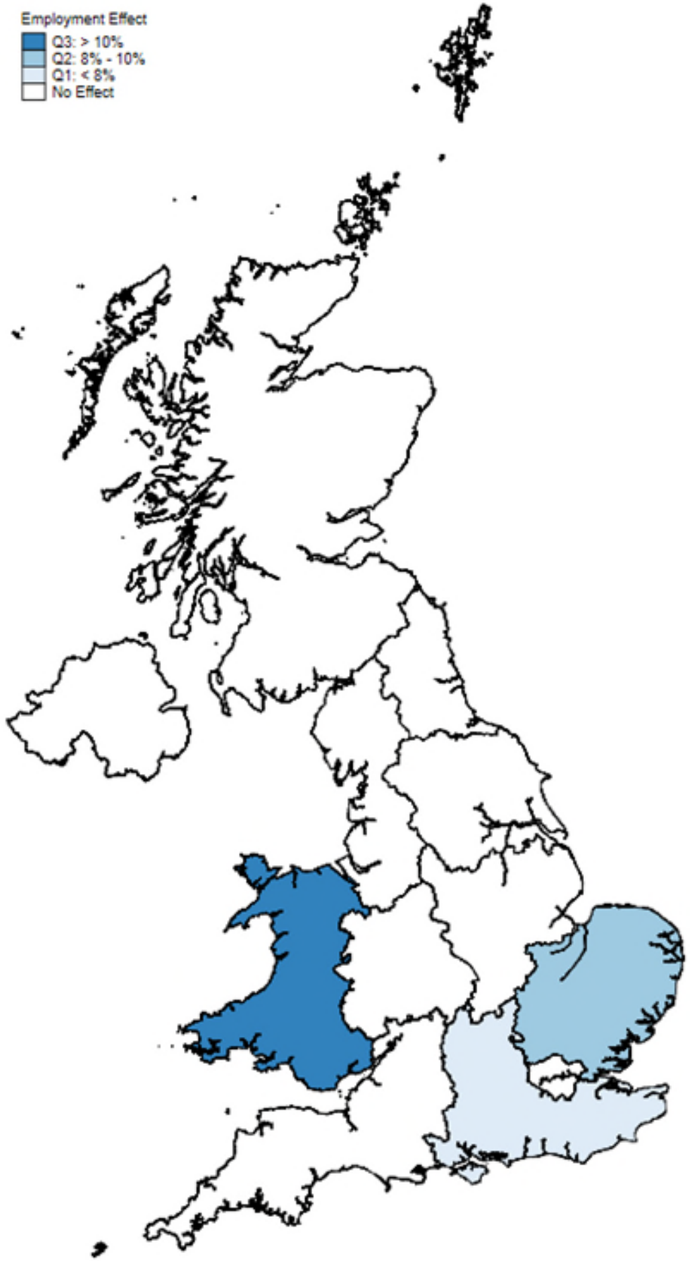
	Micro (< 10 employees)	Small (10–49 employees)	Medium (50–250 employees)	Large (>250 employees)
Young (<5 years)	**0.326*** (0.037)**	**0.263** (0.105)**	0.210 (0.351)	0.277 (0.264)
Established (5–10 years)	**0.162*** (0.023)**	-0.012 (0.036)	-0.112 (0.093)	-0.412 (0.262)
Mature (>10 years)	**0.088** (0.041)**	0.009 (0.025)	0.012 (0.030)	-0.058 (0.044)

- Micro firms see largest employment benefits.
- Effect declines with age of business.
- Small firms benefit only if young.
- No effect for medium and large firms.

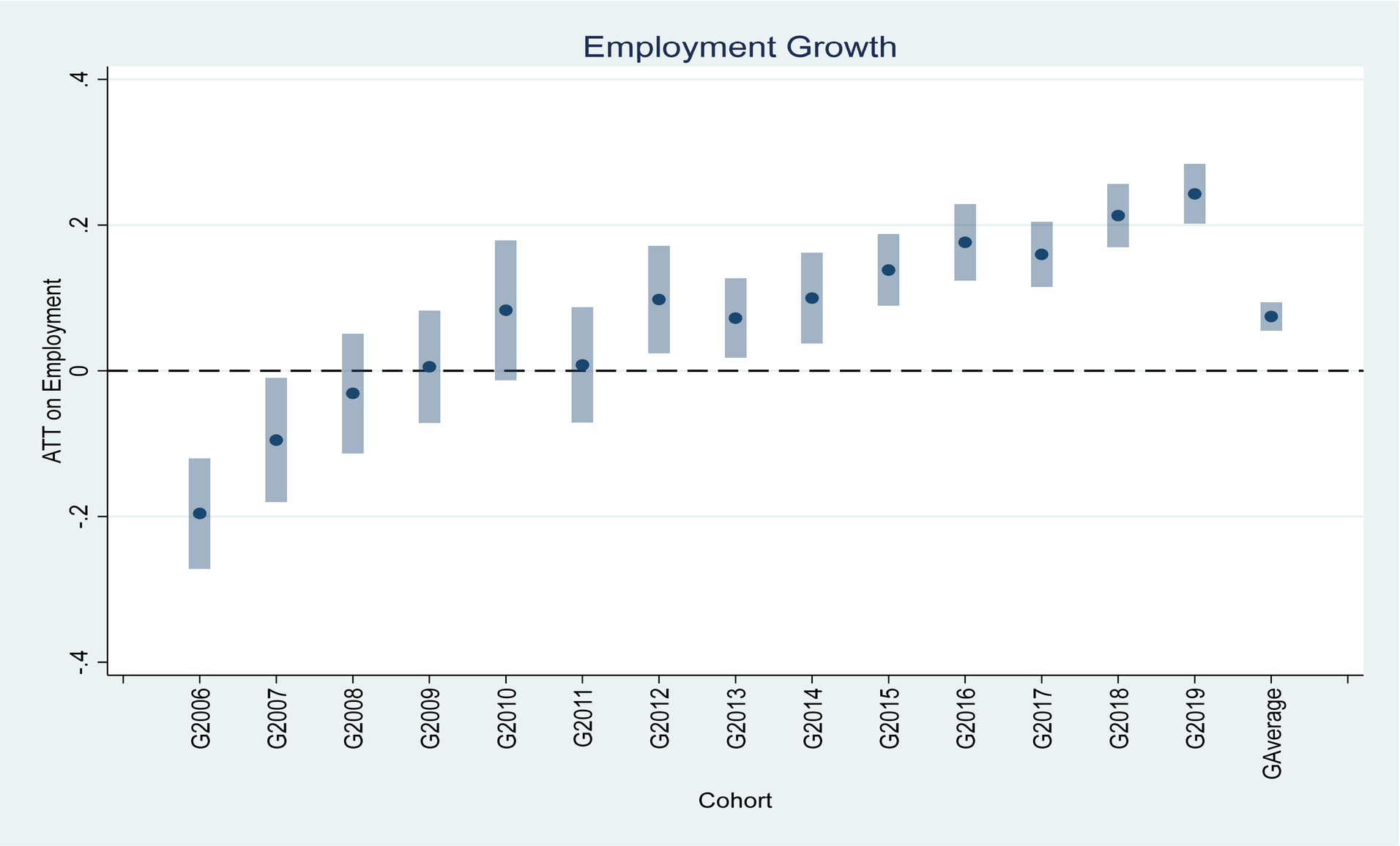
Employment Effect by Sector



Employment Effects by Region



Employment growth impact by Cohort



Turnover – Key Findings

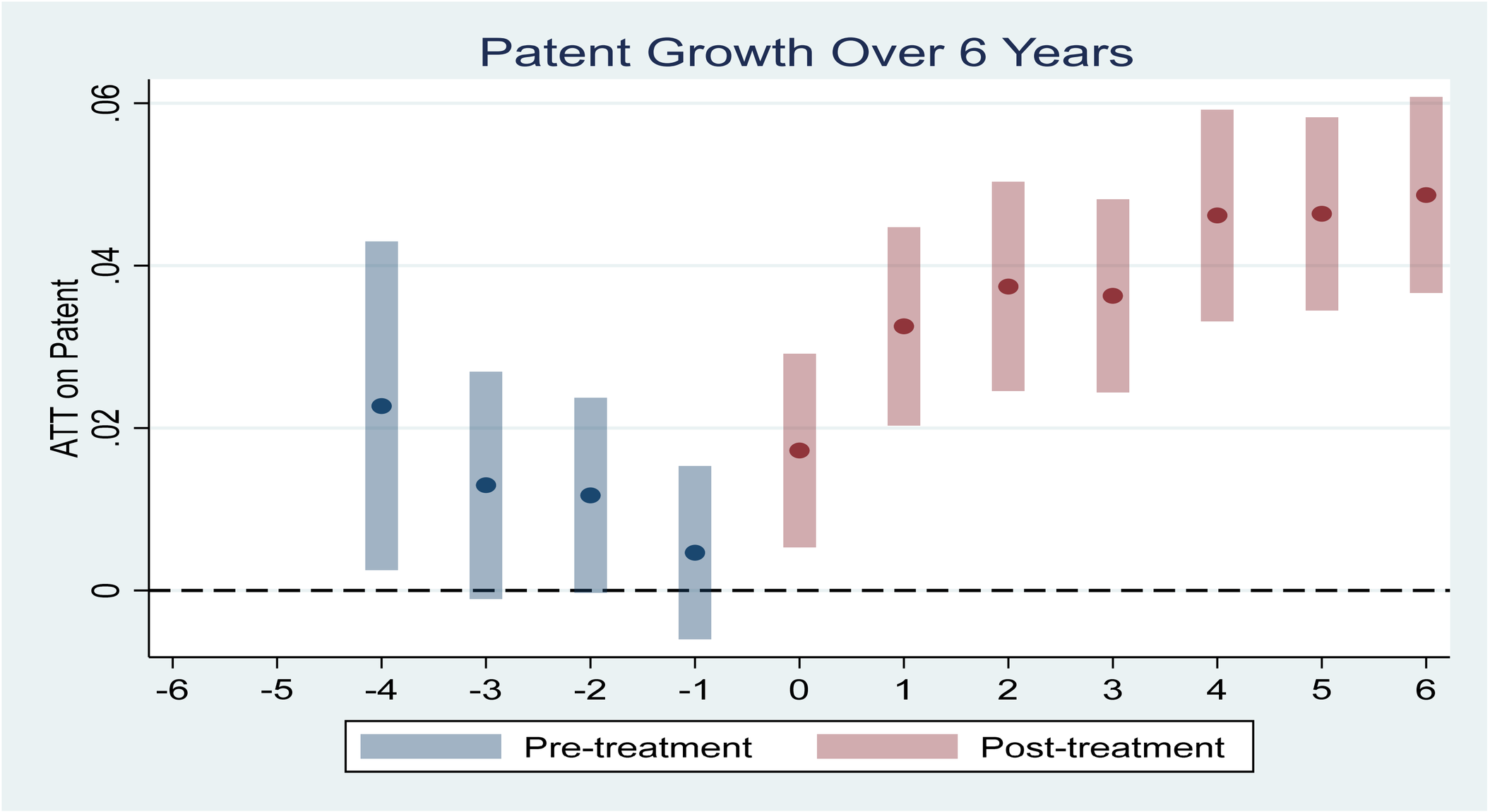
- Impacts on turnover growth follow a **very similar pattern to employment growth**.
- UKRI supported firms increase turnover by about 6% relative to the control group
- Heterogenous effects:
  - Stronger for **younger firms that are micro** (43%) or **small** (35%), with little effect on larger established firms
  - More **recent cohorts** see up to 30% turnover growth
  - Impact **regionally concentrated** in East of England (13%) and Northern Ireland (25%)
  - Higher impact among **Knowledge Intensive Services** (12%) and **High-tech Manufacturing** (12%), and among **foreign owned firms** (17%)
- Dynamic and increasing turnover impact **for about 5 years** after first UKRI engagement, then it flattens out.

Findings 3: Innovation (Technological)

Technological Innovation – Key Findings

- UKRI support leads to a 6.5% increase in registered patents relative to control group
- Innovation effects **more widespread across firms**, with larger impact in respect to business growth effects.
  - Strongest effects for **larger and more established** firms (up 46%)
  - **Earlier cohorts** see up to 23% increase in patent growth
  - **Regionally dispersed** impact: significant benefits across most regions
  - Higher impact in **High-tech Manufacturing (13%)**, and among **foreign owned firms** (10%)
- Patent effects are **sustained, highly persistent, and cumulative**

Dynamic Patent Growth Effect

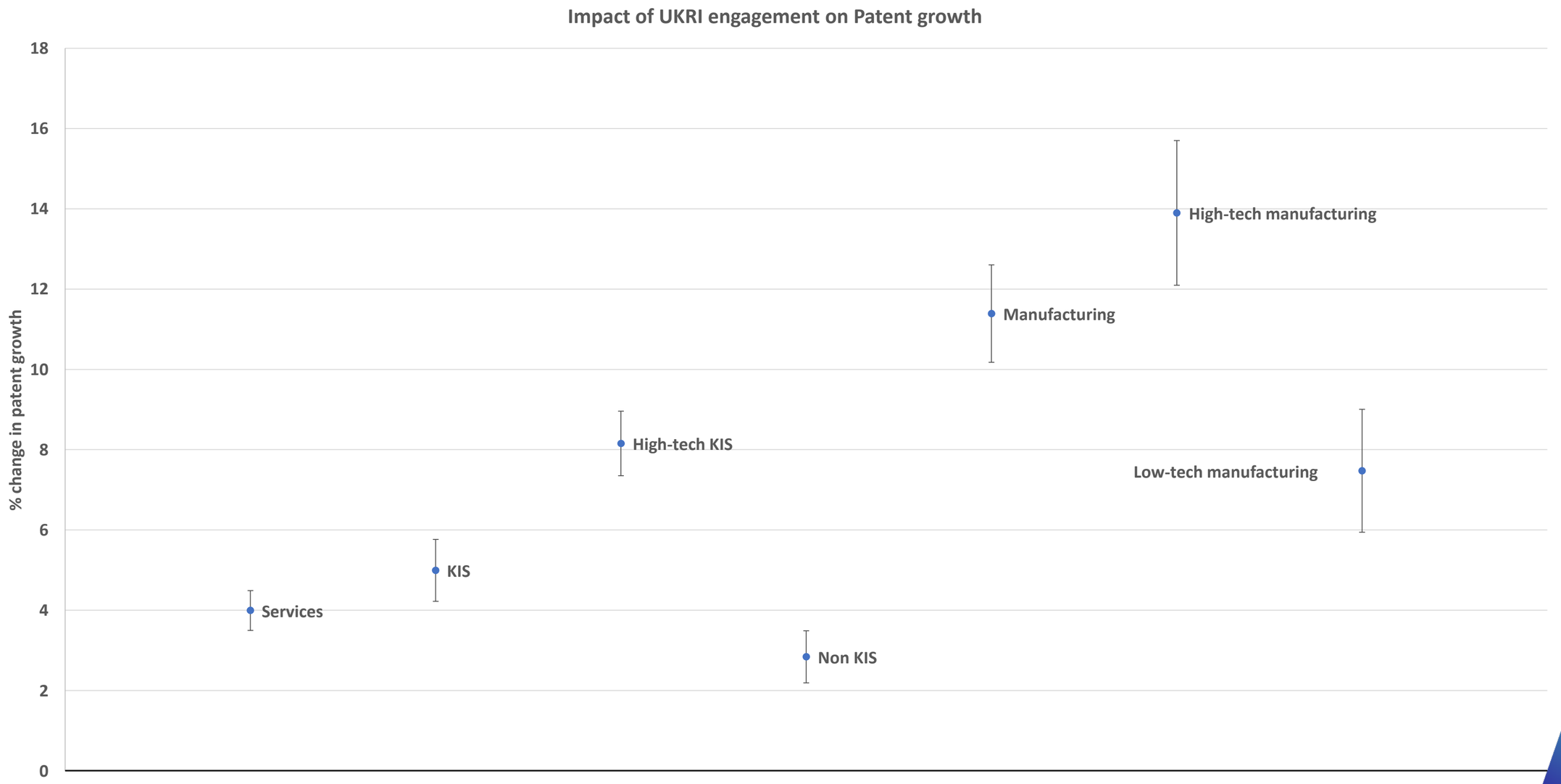


Patent Effect by Size and Age

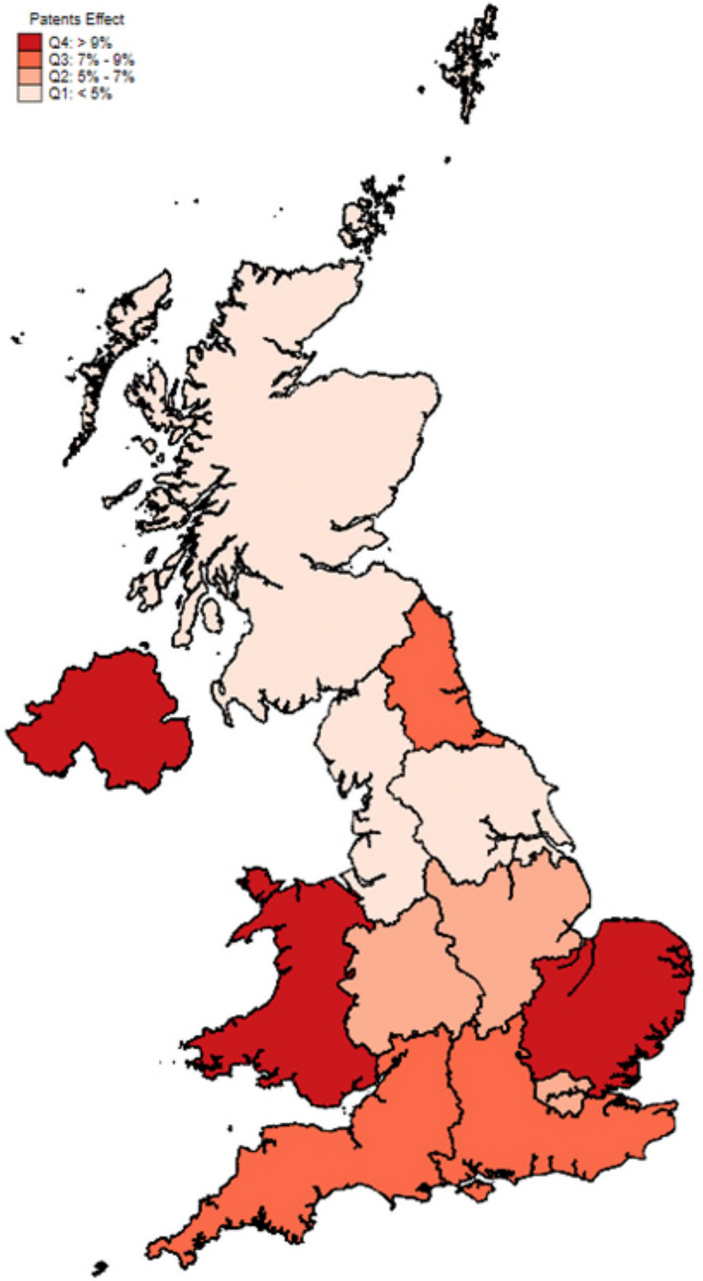
	Micro (< 10 employees)	Small (10-49 employees)	Medium (50-250 employees)	Large (>250 employees)
Young (<5 years)	**0.017** **(0.009)**	**0.084** **(0.038)**	-0.024 (0.131)	**0.759*** **(0.397)**
Established (5-10 years)	**0.022***** **(0.003)**	**0.029***** **(0.007)**	**0.088***** **(0.023)**	**0.468***** **(0.116)**
Mature (>10 years)	**0.020**** **(0.008)**	**0.026***** **(0.006)**	**0.041***** **(0.011)**	**0.185***** **(0.023)**

- Widespread positive effect on patents, strongest for larger firms.
- Effect on patenting for micro and small firms is smaller
- May reflect greater absorptive capacity for innovation in larger firms, or different type of support received.

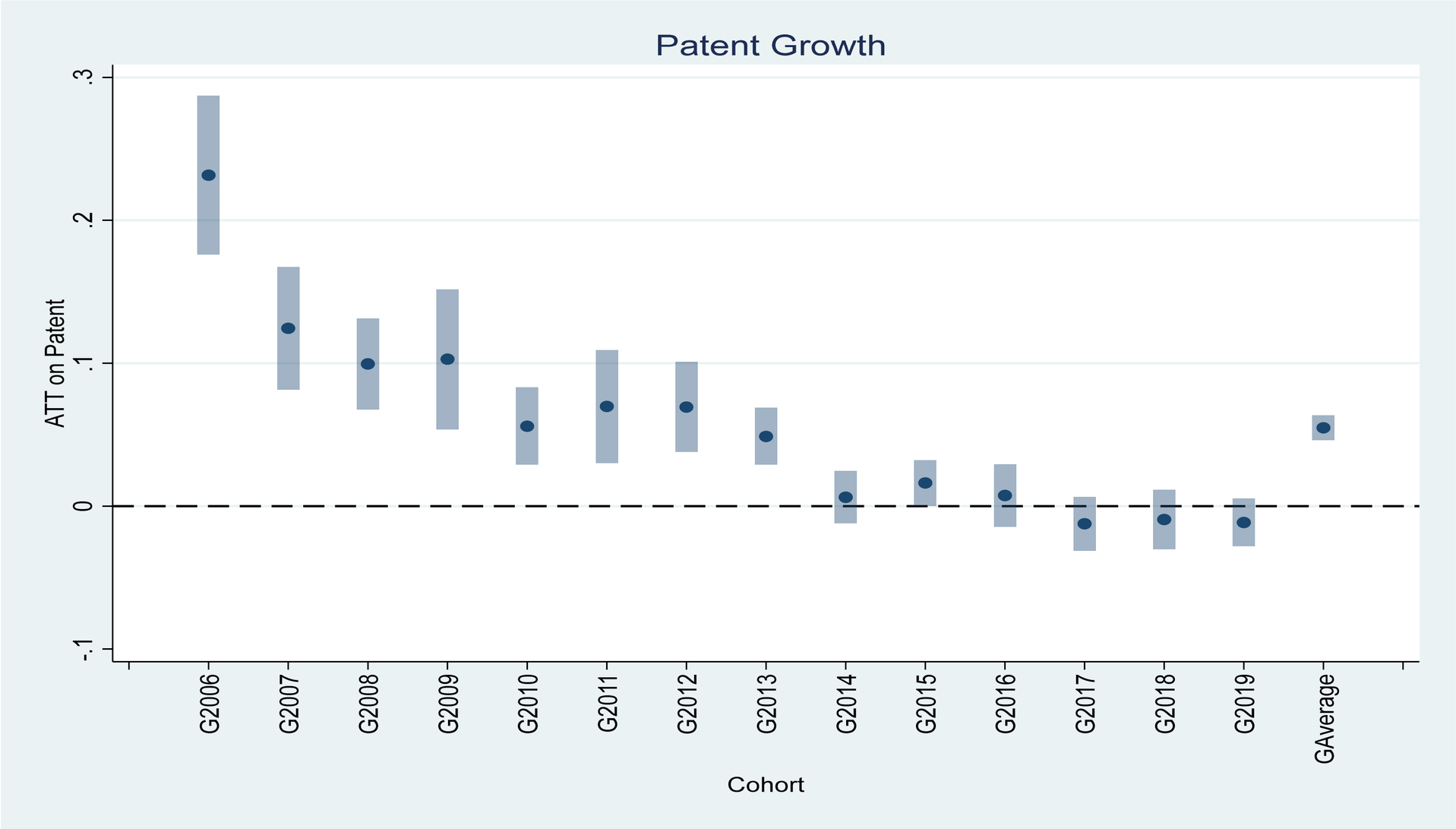
Patent Effects by Sector



Patent Effects by Region



Patents Impact by Cohort



Additional Findings

Additional Key Findings

- **Non-technological innovation** outputs: Impact on **trademarks and designs** similar to patents, although impacts on designs are smaller.
- No impact on **productivity** (labour), mainly because of similar impacts on both employment and turnover (cannot estimate Total Factor Productivity).
- Analysis by **project characteristics** suggests high degree of complementarity between IUK (business led) and Research Council (University led) support:
  - Business get the strongest benefits when they receive innovation grants (IUK) and participate in research grants (RC)
  - Even greater benefits when they are also involved in a grant related to talent development (fellowships, training grants, studentships)
  - The sequencing of support doesn't seem to matter here.

Conclusions, Limitations and Actionable Insights

Conclusions

- **Positive** but uneven impact of UKRI support for business growth, and more widespread impact on innovation.
- **Dichotomy** in innovation and business growth effects:
  - **Business growth** effects stronger for start-ups and young scale-ups, whereas **innovation** effects more strongly aligned with high absorptive capacity of larger firms.
  - Faster business growth for recent cohorts, vice versa for innovation outputs.
- Most positive impacts concentrated among **knowledge intensive** and **high-tech sectors**.
- Stronger benefits for **foreign firms**, suggesting potential importance of global value chains and access to complementary resources.
- UKRI engagement **effects highly persistent and cumulative** over time, indicating longer-term impact of support.

Limitations

- Data does not allow identification of **project technological sector, and** no credible and expedient alternative classification.
- Data does **not report level of business engagement**, or any requirements for match funding or in-kind contributions: results represent an average over all levels of business contributions
- Results seem robust to **possible headquarter effect.**
- Data does not allow estimation of **Total Factor Productivity**: labour productivity simply a ratio between turnover and employment.
- Due to ONS SRS restrictions, we cannot distinguish more granularly beyond **IUK v RCs**.
- Nevertheless, this is the best possible analysis with the available data to understand the population level impacts of business engagement with UKRI projects.

Actionable insights

- Target smaller and younger to improve business growth:
  - Around 60% of UKRI-engaged firms are already micro or small firms, but more than 50% are mature firms: **room for more intentional targeting of start-ups.**
- Target larger and older firms to boost innovation:
  - UKRI-engaged firms are larger and older than population.
  - Potential value in **incentivising collaboration between large mature firms and start-ups**.
- Given stronger impact for foreign-owned firms, UKRI support could encourage:
  - **Knowledge diffusion to UK start-ups** through collaborations;
  - Integration of foreign-owned companies with **local supply chains**;
  - Using foreign-owned firms as a **bridge into international markets** and global value chains.

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Questions

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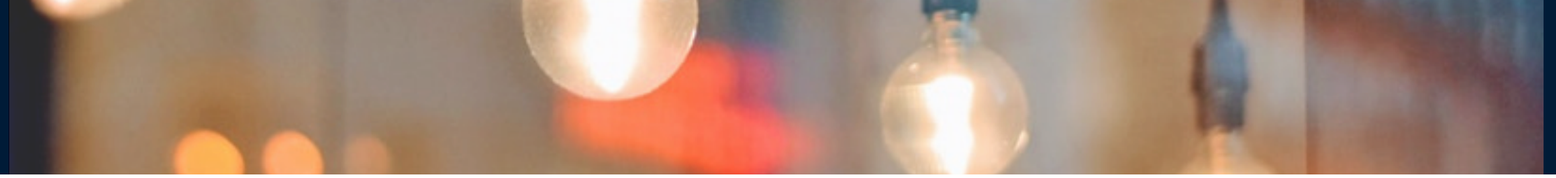

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Knowledge spillovers and innovation in micro-businesses

Ully Nafizah

INNOVATION & RESEARCH CAUCUS

Knowledge Spillovers and Innovation in Micro-Businesses: Evidence from the UK

Ully Nafizah and Stephen Roper
(Warwick Business School)

ERC Research Showcase, 3rd June 2026

Introduction

- **Micro-businesses (under 10 employees) dominate the UK economy**:1.15M firms (81% of staffed businesses) supporting 4.1M jobs (17.7%) in 2025.
- **Despite their scale, innovation is resource-constrained:** limited internal finance, skills, and R&D capacity.
- **Innovation depend on external knowledge**: through collaboration (e.g., Chesbrough 2003), non-interactive learning (e.g., Thomas Zimmermann, 2020), or **knowledge spillover.**

- **RQ: How do knowledge spillovers influence innovation in UK microbusinesses?**

Sources of Knowledge Spillover

- Knowledge is semi-public: flows beyond firm boundaries (e.g., Sadri, 2011)
- **Sources of spillover (Audretsch and Belitski, 2022):**

1. **Local/Cluster based :** Clustered industries enhanced innovation through competition, collaboration, and networks (Porter, 1990)
2. **Jacobian approach :** Knowledge flows across diverse industries within location clusters(Jacobs, 1976)
3. **Marshall-Arrow-Romer (MAR) approach:** Knowledge flows within the same industry and region (Marshall, 1920; Arrow, 1962; Romer, 1986)

- **Types of Spillover: R&D investments spillovers (**Acs et al., 1994), **spillovers from innovation outcomes** (Bloom et al., 2012), **spillover from openness or collaboration** (Roper et al., 2018)

1. R&D Spillover in Micro-Businesses

- **R&D Spillover:** coming from knowledge created and developed outside through other organization's R&D efforts (e.g., Acs et al., 1994)
- **Micro-businesses have higher dependence on external R&D** due to their limited in-house R&D (e.g., Aldeiri and Vnci, 2017)
- Knowledge transferred via collaborations, employee mobility, patents, or publications
- **Local and industry-specific spillover:** strongest when firms are geographically close to knowledge sources and operate in the same industry (Boschma, 2005, Macpherson, 1998)

H1: R&D spillovers, enabled by geographical and industrial proximity, will positively influence micro-businesses' innovation

2. Innovation Spillover in Micro-Businesses

- **Innovation Spillover:** occurs when firms benefit from the innovation of other firms (Bloom et al., 2012)
- **Micro-businesses often learn by imitation, coping competitors, or adopting late-mover strategies** (e.g., Cappeli et al., 2014) – help reduce risks and innovation costs
- **Industry-specific spillover:** learning and imitation effects (Cappeli et al., 2013)

H2: Innovation spillovers will positively influence micro-businesses' innovation through intra-industry knowledge flows.

3. Collaboration Spillover in Micro-Businesses

- **Collaboration spillover:** results from firms' openness (Roper et al., 2013)
- **Being part of an innovation network/ collaboration bridge small firms' innovation gaps with larger firms**
- **Local spillover:** local knowledge externalities (Roper et al. 2017).

H3: Collaboration spillover benefits for innovation in micro-businesses will occur when firms are located in localities with denser local collaboration.

Data

- We use two UK Innovation Surveys

1. **The Innovation States of the Nation** (ISNS) 2023, 2024, 2025: provides detailed information about UK businesses' innovation related activities, investments, and output - **includes only micro-businesses, resulting in total 1,764 observations** across three waves.

2. **The UK Innovation Survey (UKIS) 2023–** to extract the knowledge spillover variables

Spillover variables

Pathways

- **R&D Spillovers -** the prevalence of R&D engagement within a firm's reference environment
- **Innovation Spillovers -** the prevalence of product or service innovation in the peer group
- **Collaboration Spillovers -** the average breadth of collaboration in innovation among the peer group.

Geography and industry

- **Spillovers based on geographical proximity**: defined peer group as those in the same NUTS 2
- **Intra-sectoral spillovers**: defined peer group as those in the same UK SIC 2007 industry with 9 broad categories
- **Combined spillovers of geographical and sectoral proximity:** defined peer group as those in the same NUTS 2 and same UK SIC 2007

Modelling Strategy

$$Innov_i = \beta_0 + \beta_1 Spillover_i + \beta_2 Cont_i + \varepsilon_i$$

- Where:
  $Innov_i$: the probability of firms introducing product innovation
- $Spillover_i$ represent the spillover variables.
- $Cont_i$ serves as a control variable representing key characteristics of businesses, such as additional knowledge inputs (e.g., internal R&D activities, investment in equipment, training, or whether firms sought external advice.

Summary of Results -

	Industry Spillover	Geography Spillover	Industry + Geography Spillover
R&D Spillover	---	(+)	(-)
Innovation Spillover	+++	(+)	(+)
Open Innovation Spillover	+++	(-)	(-)

H1: RD Spillover coming from both Industry+ Geography Spillover (Rejected) → coming from Industry only
H2: Innovation Spillover coming from Industry spillover → Supported
H3: Collaboration Spillover coming from geography spillover (Rejected) → coming from industry only

Net Industry Spillover Effect

$$NetSpillover_{it} = \beta_1 RD\_Spillover_{it} + \beta_2 Innov\_Spillover_{it} + \beta_3 Collab\_Spillover_{it}$$

where $\beta_1 = -4.36$, $\beta_2 = +8.72$, $\beta_3 = +1.16$ (average marginal effects from separate probit models)

where i = firm, t = time, j = industry peer, N_{it} = number of industry peers of firm i at time t

Sector	Average Industry- R&D Spillover	Average Industry-Innovation Spillover	Average Industry-Collaboration Spillover	Total Industry Spillover
Primary	-1.002	1.39	6.05	6.438
Manufacturing	-2.26	3.7	5.69	7.13
Construction	-1.002	1.38	5.77	6.148
Retail/Distribution	-0.65	1.56	5.77	6.68
Transportation/Storage	-0.53	1.13	5.91	6.51
Hotel/Catering	-0.15	0.93	5.69	6.47
Finance	-0.74	1.56	5.32	6.14
Business Services	-1.36	2.35	5.72	6.71
Other Services	-0.82	1.56	6.2	6.94

Key findings

- **Spillover effects in micro-businesses operates only through industry** closeness, rather than geographic proximity or combined proximity due to technological and market similarity and easier information channels (e.g., patents, or technical know-how)

- **Negative intra-industry R&D spillovers (micro-businesses):** Strong R&D activity by competitors may create a perceived competitive disadvantage, leading micro-firms to reduce their own innovation efforts (Aghion et al., 2005)

- **Positive intra-industry innovation spillovers (micro-businesses):** Successful peer innovations can validate market opportunities and demonstrate innovation paths requiring less intensive R&D (Lowe & Taylor, 1999)

- **Positive intra-industry open innovation spillovers:** Greater peer engagement in external collaboration encourages knowledge sharing and supports innovation among micro-businesses

- **Net spillovers for micro-businesses are positive across all sectors** and are strongly influenced by collaboration spillovers due to industry collaboration

Implications

- For micro-businesses innovation spillovers seem predominantly sectoral but emerge through each of the three mechanisms envisaged – R&D, innovation and openness
- This (again) emphasises the importance of external (sectoral) environment for innovation. Location seems much less critical for micro-business innovation spillovers
- Emphasises the potential value for micro-business innovation of knowledge-sharing within sectors through supply-chains, industry associations, centres of excellence etc. Place-based initiatives seem less important
- Considering the nature of micro-business' innovations, support programs helping micro-businesses to develop capabilities to observe and adapt successful innovation from industry peers may be useful

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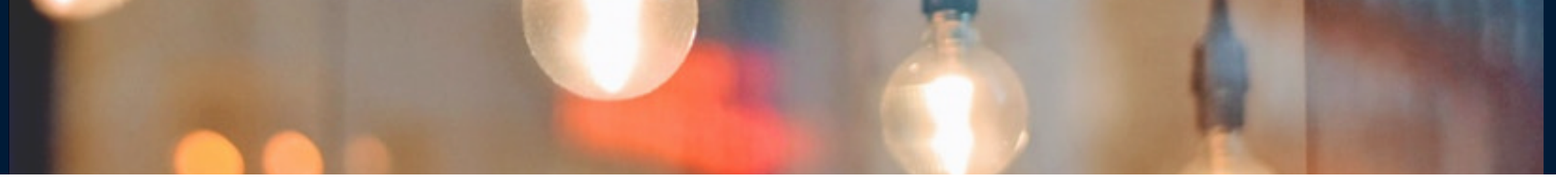
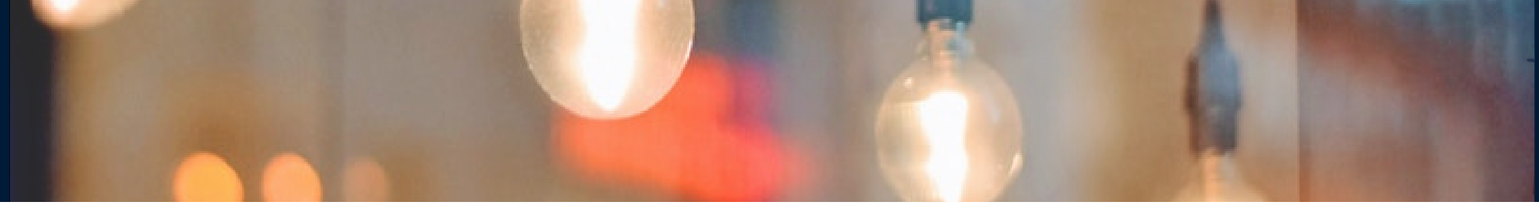


Looking ahead: ERC future research plans

Stephen Roper

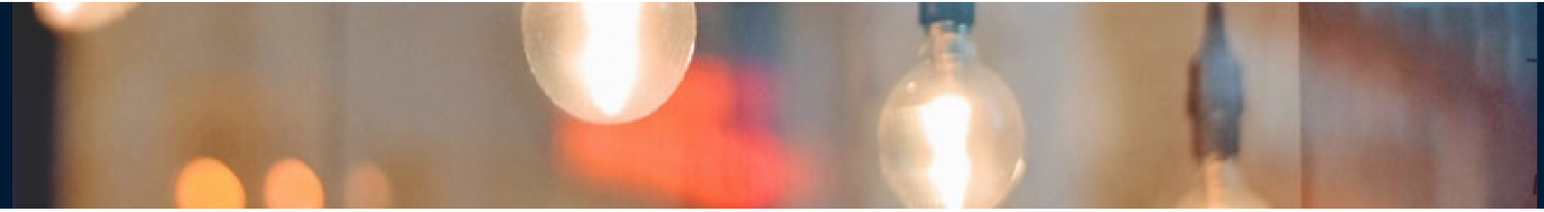


What’s next from ERC? - Projects and partnerships

June 2026

Projects and partnerships – national partnerships

- ***Late payments*** – international workshop (June) and related insight report (DBT, OSBC)
- ***Evaluation of IP Audit programme*** (IPO)
- ***Regional and local impacts of universities*** (DSIT)
- ***Innovation State of the Nation Survey*** (IUK through IRC)
- ***Global Entrepreneurship Monitor*** (DBT; Welsh Govt.; Scottish Govt; DFE (NI); NatWest Group)
  - Specific focus in 2026 on fear of failure and attitudes to risk – international study with Canada and Luxembourg national teams + others (TBC)



Projects and partnerships

Sectors

- ***Innovation and productivity in the creative industries*** (PEC)
- ***Defence opportunities in Wales*** (EIW)
- ***Understanding innovation in the IS-8 sectors*** (IUK)

Geographies

- ***Technology adoption in Wales*** (EIW)
- ***Evaluation of export and inward investment support in Scotland*** (Scottish Ent)
- ***Identifying clusters in Ireland*** (DFE NI)
- ***Access to finance for mid-sized firms*** in the West Midlands (WMCA/WM GC)

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