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Diversification, Human Capital and the Internationalisation of Knowledge Intensive Service Firms

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KIBS – Their Growth and Development



Outline

- KIBS: Organisational Learning & Internationalisation:
An empirical analysis
 - Theory and Hypotheses
 - Data and Methods
 - Results
 - Implications

KIBS: Scale, Scope and Specialisation

- Scale ...
 - KIBS (or PSFs) are typically small (with some notable exceptions)
 - Generally difficult to scale-up whilst maintaining quality
- Scope ...
 - Typically, firms expand scope incrementally
(e.g., Anand et al., 2007; Wennberg et al., 2010; Miozzo et al., 2011)
 - Build complementarities between activities + use labour flexibly
(e.g., Criscuolo, Salter and Sheehan, 2007)
- From Specialisation to Diversification
 - Expert labour, reputation and relationships are key resources
(e.g., Maister, 1993; Teece, 2003)
 - Traditionally expertise is applied through Project Ecologies
(e.g., Gann and Salter 2000 ; Grabher, 2004)
 - But increasing demand for ‘One-Stop-Shops’ (integrated capabilities)

The Internationalisation of KIBS

- KIBS (or PSFs) traditionally close to clients
(Miozzo & Soete, 2001; Miozzo and Miles, 2002)
- Rapid growth in Trade and Foreign Direct Investment
- Advances in ICTs; diffusion of air travel
- Trade Liberalisation: GATS, Single EU Market

Motivations ..

- Exploit of knowledge and technological advantages
- Economies of scale and scope; and localised resources
- Benefits = higher returns; market power; lower risk
(risk spreading); stronger reputation; better quality job applicants

Services Internationalisation in the Literature

- Academic neglect (especially in International business)
 - Merchant and Gaur, 2008: in past 20 years only 4% of articles in leading IB journals have had a non-manufacturing focus
 - However, work by Innovation Scholars and Geographers
- 3 dominant themes:
 - Drivers of service internationalisation (Li and Guisinger, 1992; Dunning, 1993)
 - Entry modes (Erramilli, 1991; Contractor and Kundu, 1998)
 - Performance impact (Contractor et al., 2003; Hitt et al., 2006)
- **Our focus = drivers of internationalisation**

Key Question

How does diversification and human capital relate to internationalisation amongst Knowledge Intensive Service Firms?

Key Determinants : Diversification (1)

Diversification in Activities ...

Expansion Choice – do more things or internationalise?

Doing both will divide managerial attention (sub-optimal)

Therefore, specialised firms tend to have deeper engagement in international market than diversified firms.

Domestic Geographical Expansion ...

Firms can learn to scale their services by expanding into domestic regional markets

Learn to serve clients at greater distance,

And/or set up and coordinate regional 'satellite offices'

Valuable experience for foreign expansion

Key Determinants: Diversification (2)

Diversification into Unrelated Activities ...

Engaging in several related ('local') activities is relatively easy:
unlikely to confer a significant competitive advantage

Engaging simultaneously in some more unrelated (or 'distant')
activities is difficult, but if achieved enables the firm to
provide more complex and hard to replicate services

Hence – unrelated diversification is beneficial for the
internationalisation of KIBS

Key Determinants: Human Capital

Higher Specific Human capital is associated with

- Greater ability to engage in more complex projects
- Greater capacity to learn (absorptive capacity)
- Greater capacity to forge relationships (relational capital) & address the 'liability of foreignness' (Zaheer, 1995)
- Greater ability to coordinate diverse activities and exploit economies of scope
- Helps build and protect the firms reputation

Determinants (3): Others

Controls

- Age
- Size
- Changes in ownership or governance (MBO)
- Domestic location
- 'Types' of activity
- Productivity
- Year dummies

Hypotheses

- **Diversification in Activities**

H1a Firms specialised in a small number of activities will have a greater level of internationalisation than firms engaged in a larger number of activities.

- **Home market (geographical) diversification**

H1b A firm's extent of engagement in domestic regional markets and its level of internationalisation have a positive relationship.

- **Unrelated Diversification**

H1c Diversification into relatively more unrelated activities enhances a firm's the level of internationalisation

- **Human capital**

H2 A firm's human capital and its level of internationalisation have a positive relationship.

Hypotheses

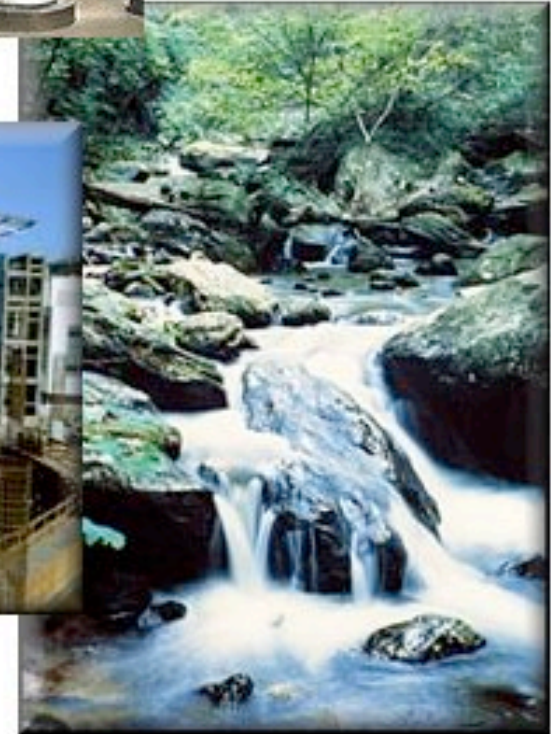
- **Interactions: Diversification and Human Capital**

H3a A firm's level of internationalisation varies positively with the interaction of its specific human capital and industrial scope

H3b A firm's level of internationalisation varies positively with the interaction of its specific human capital and domestic regional diversification.

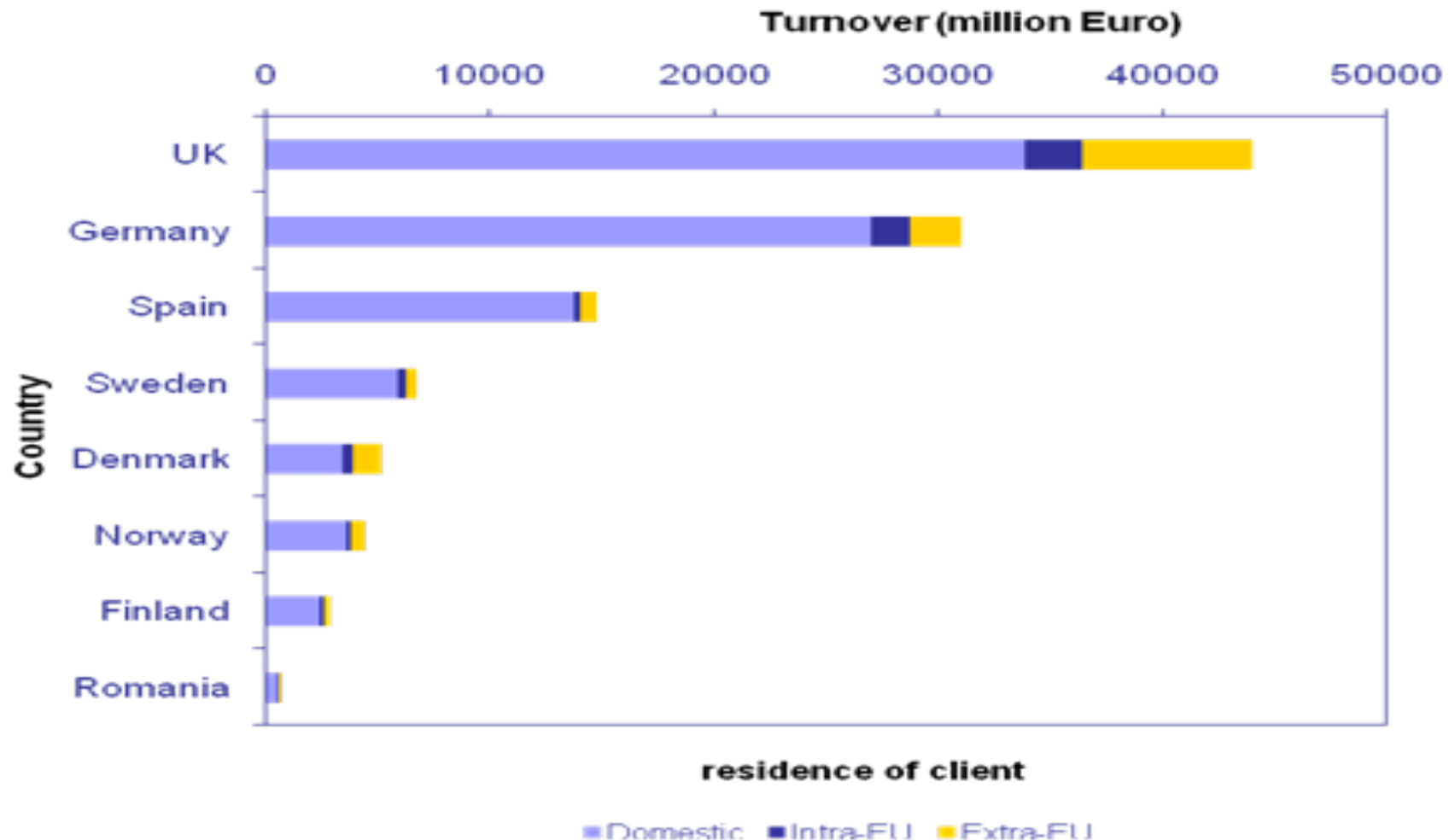
H3c A firm's level of internationalisation varies positively with the interaction of its specific human capital and its unrelated industrial diversification

Civil and Structural Engineering



The Engineering Consulting Industry in the UK

Turnover in architectural and engineering consulting sector (K742) in selected EU countries, by residence of client, 2004



Source: Li and Tether – based on Eurostat (SBS) data, 2004

Data

- Archival Data from *New Civil Engineer's (NCE)* 'Consultants File', 847 firms (6,915 firm-year records), 1979-2009
- Info on # of staff employed in UK / abroad, % technical staff in UK/abroad, total sales, regions of work in UK/abroad, areas of work in UK/abroad
- Additional info. from *FAME* and *Zephyr* on postcode, ownership status, ownership change, other life events
- Unbalance panel of 265 firms with 2,380 observations
- *Dependent variable*: Composite internationalisation index: % foreign staff + % foreign markets involved in

Measuring Diversification

Simple measure

Count of different activities or products firm producer
However, ignores relatedness

Relatedness

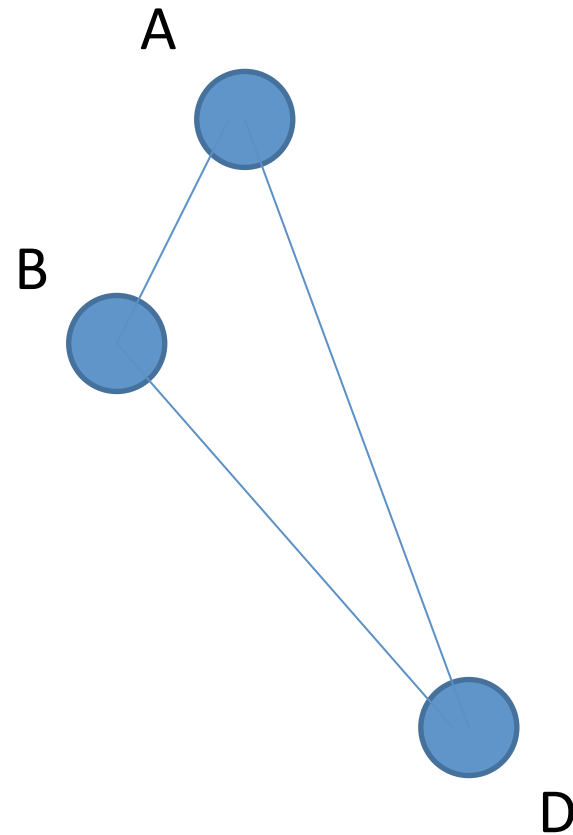
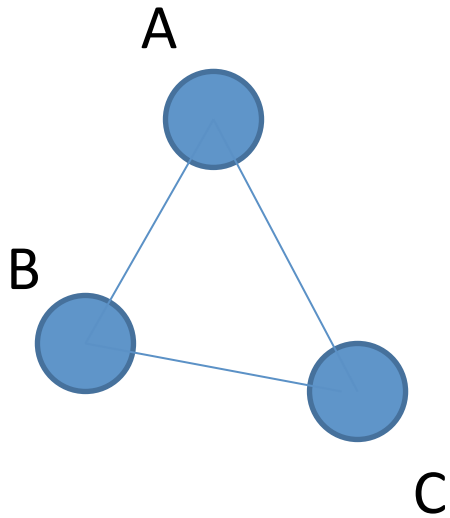
New Input-Output indices (McGuckin et al., 1992; Fan & Lang, 2000)
Co-occurrence matrices (e.g., Bryce and Winter, 2009)

Our measure

... is based on co-occurrence of activities in firms' portfolios
Frequent co-occurrence = short 'distance';
Rare co-occurrence = long 'distance'

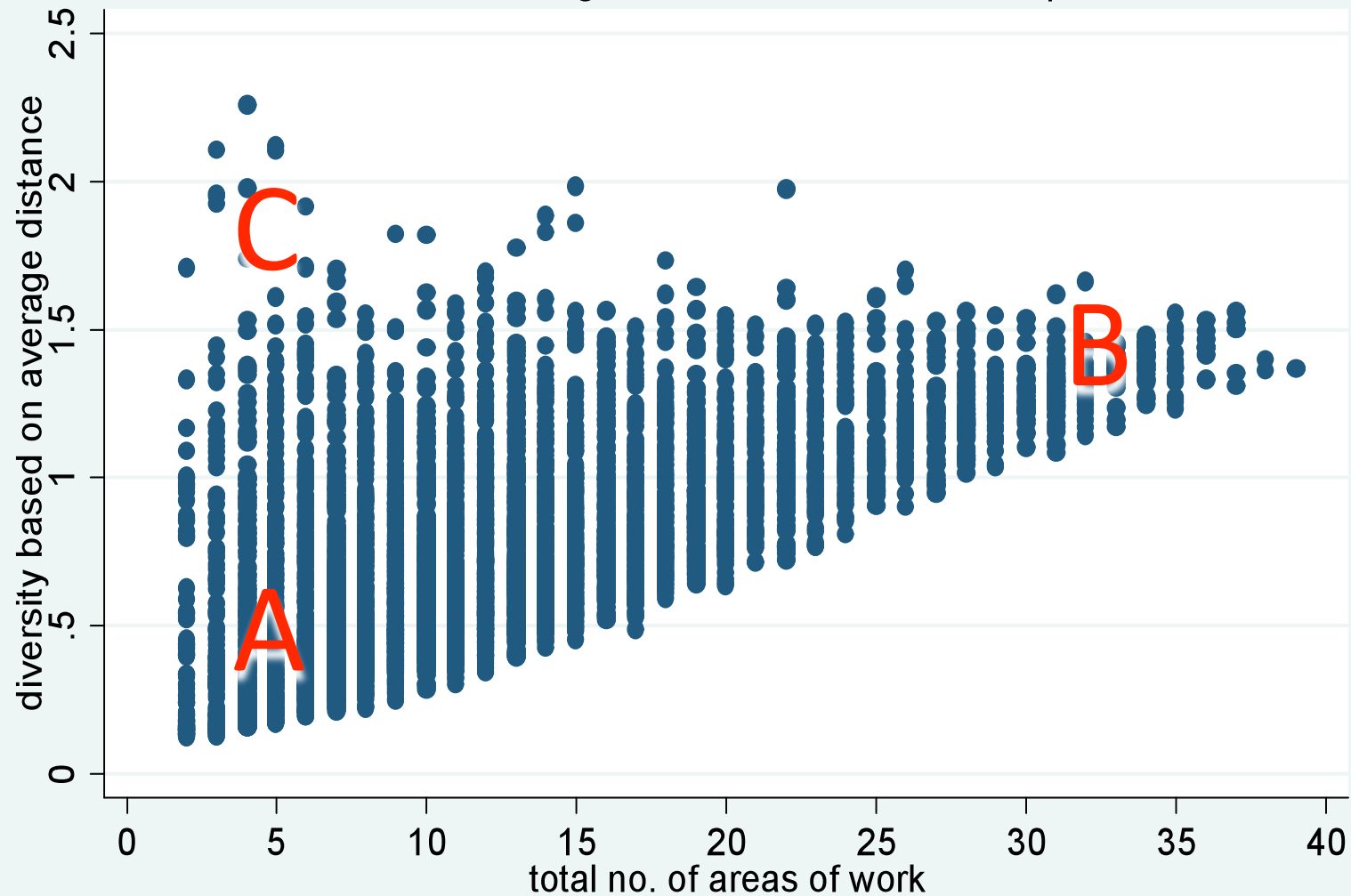
Diversity measured by number of activities engaged in
AND – average 'distance' between activities

Measuring Industrial Diversification: Bryce and Winter (2009)



Measuring Industrial Diversification: Following Bryce and Winter (2009)

Diversification by Total Number of Disciplines, 1989-2009
based on average distances between disciplines



Empirical Modelling of Internationalisation

$$E[\text{INTLSTN}_{it} | x_{it}] = G(\beta_0 + \beta_1 \text{INTLSTN}_{it-1} + \beta_2 \ln \text{Inddiv}_{it-1} + \beta_3 \ln(\text{Inddiv}_{it-1})^2 + \beta_4 \ln \text{Regdiv}_{it-1} + \beta_5 \ln \text{Age}_{it-1} + \beta_6 \ln(\text{Age}_{it-1})^2 + \beta_7 \ln \text{Prod}_{it-1} + \beta_8 \ln \text{Size}_{it-1} + \beta_9 \ln \text{Humcap}_{it-1} + \beta_{10} \text{Foreign}_{it-1} + \beta_{11} \text{M \& A}_{it-1} + \beta_{12} \text{MBO}_{it-1} + \beta_{13} \text{Closure}_{it} + \beta_{14} \text{Region}_i + \beta_{15} \text{Time}_t), \quad i = 1, \dots, N$$

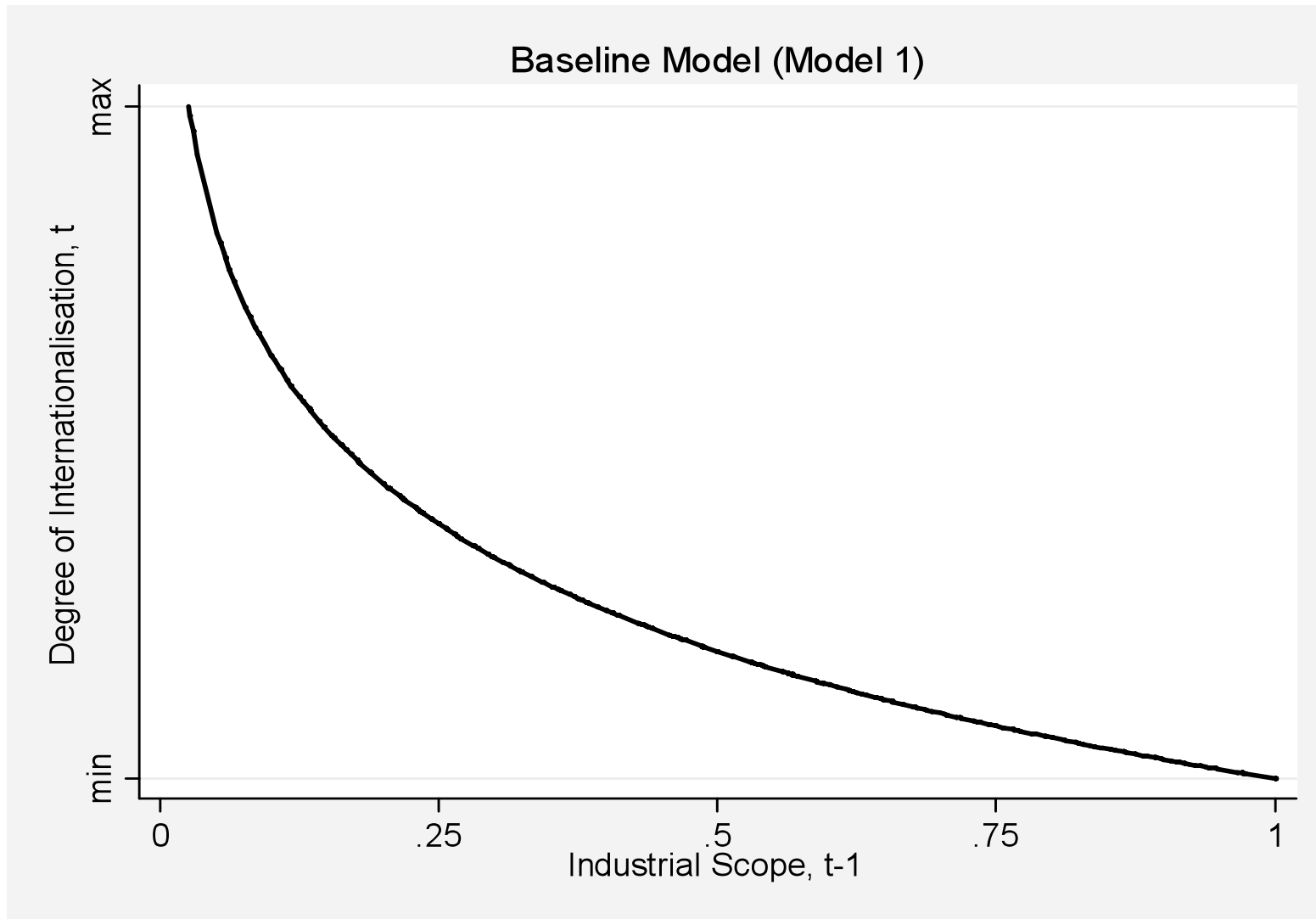
$$G(z) = \frac{\exp(z)}{1 - \exp(z)}$$

- Fractional response model (QMLE) - Papke and Wooldridge (1996)
- Advantages: predicted value [0, 1]
- Allows non-linearity

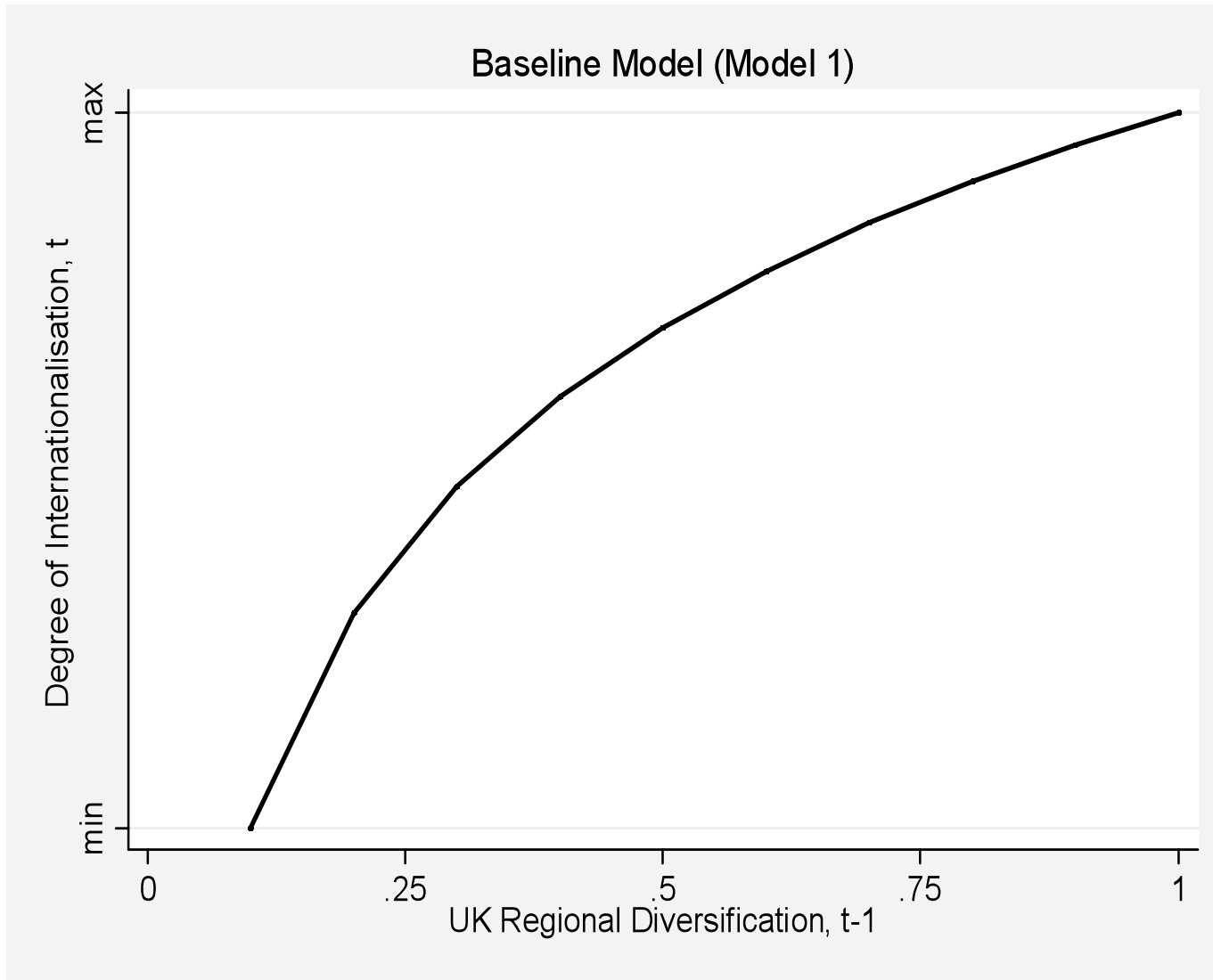
Results: Top Half ...

Dependent variable: Internationalisation	Baseline model (1)			
	$\hat{\beta}$	Robust SE	$\partial y / \partial x$	Robust SE
Internationalisation $_{(t-1)}$	5.559***	0.182	0.528***	0.018
\ln industrial diversity (level) $_{(t-1)}$	-0.270**	0.134	-0.026**	0.013
\ln industrial diversity (level) squared $_{(t-1)}$	0.009	0.052	0.001	0.005
\ln unrelated diversity $_{(t-1)}$	4.548***	0.681	0.432***	0.063
\ln unrelated diversity squared $_{(t-1)}$	-2.867***	0.507	-0.272***	0.047
\ln human capital $_{(t-1)}$	1.114***	0.263	0.106***	0.025
\ln UK regional diversity $_{(t-1)}$	0.339***	0.068	0.032***	0.006
London	0.217***	0.039	0.022***	0.004
Northern Ireland	0.520***	0.133	0.060***	0.018
Mergers & Acquisitions $_{(t-1)}$	0.043	0.058	0.004	0.006
Being acquired $_{(t-1)}$	0.004	0.184	0.000	0.018
Management Buyout $_{(t-1)}$	0.467***	0.160	0.053**	0.021

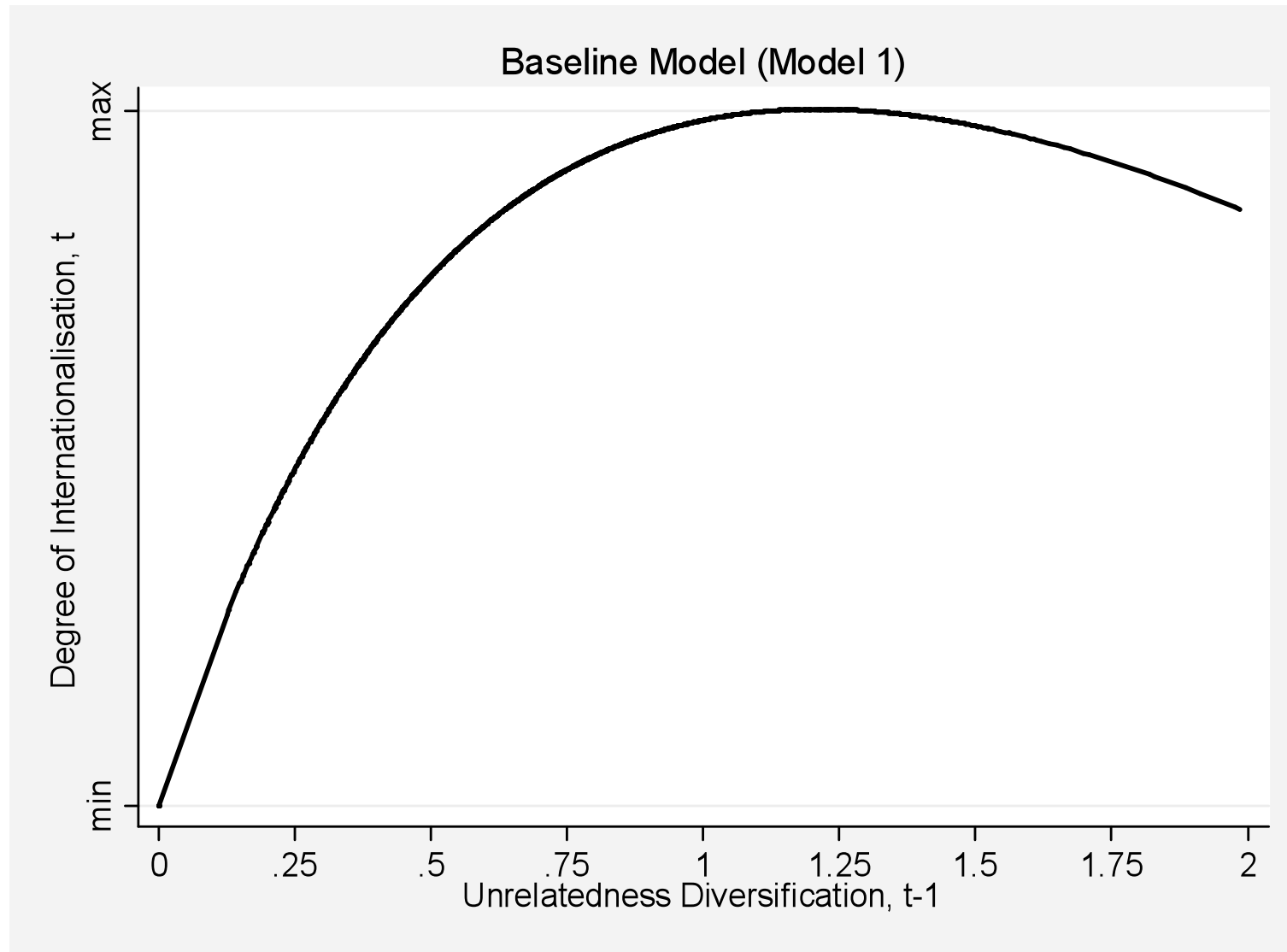
Effect of Diversification by Number of Activities



Effect of UK Regional Diversification



Non-linear Effect of Unrelated Diversification



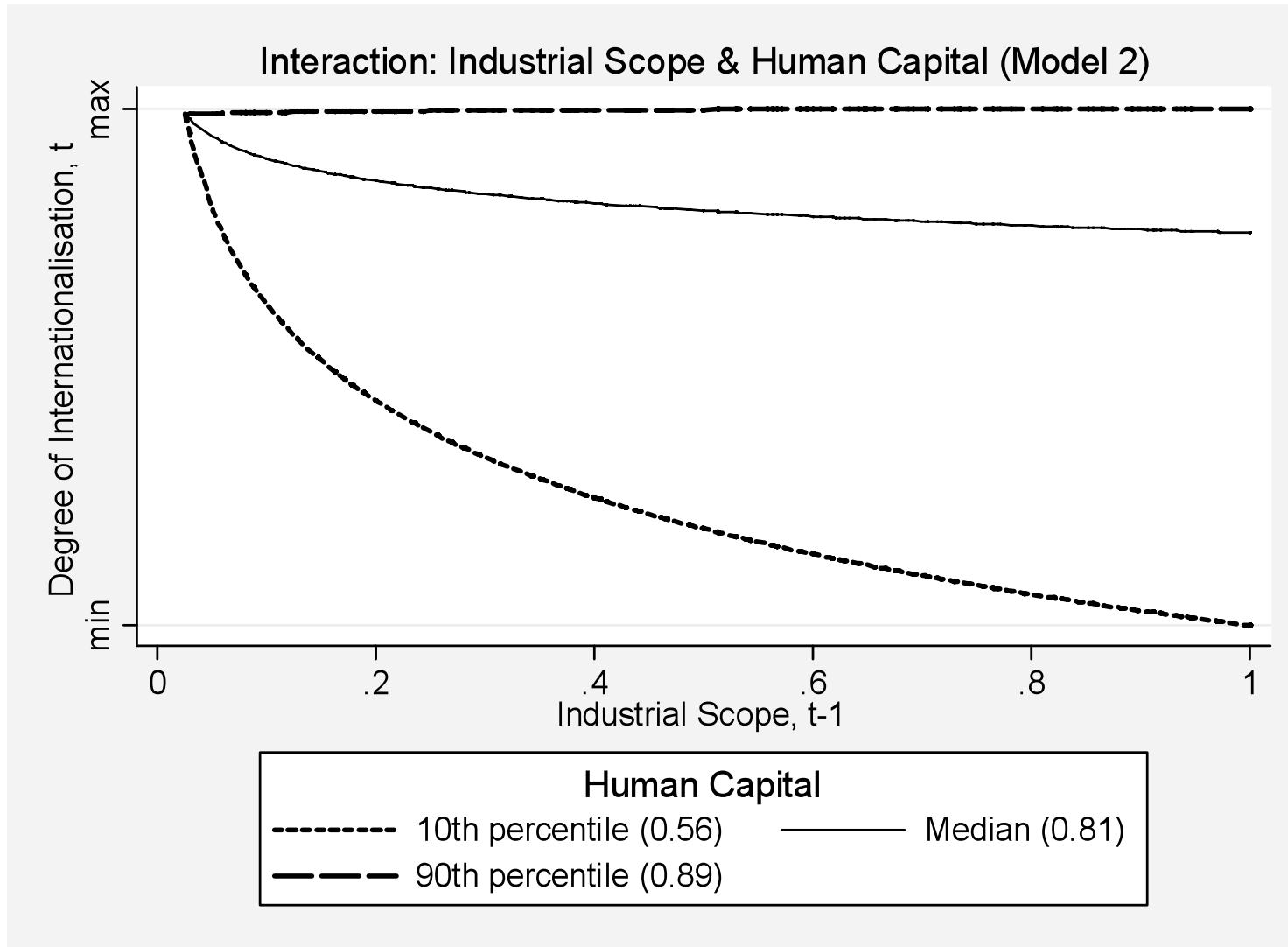
Results: Top Half (2) ...

Dependent variable: Internationalisation	Baseline model (1)			
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Internationalisation $_{(t-1)}$	5.559***	0.182	0.528***	0.018
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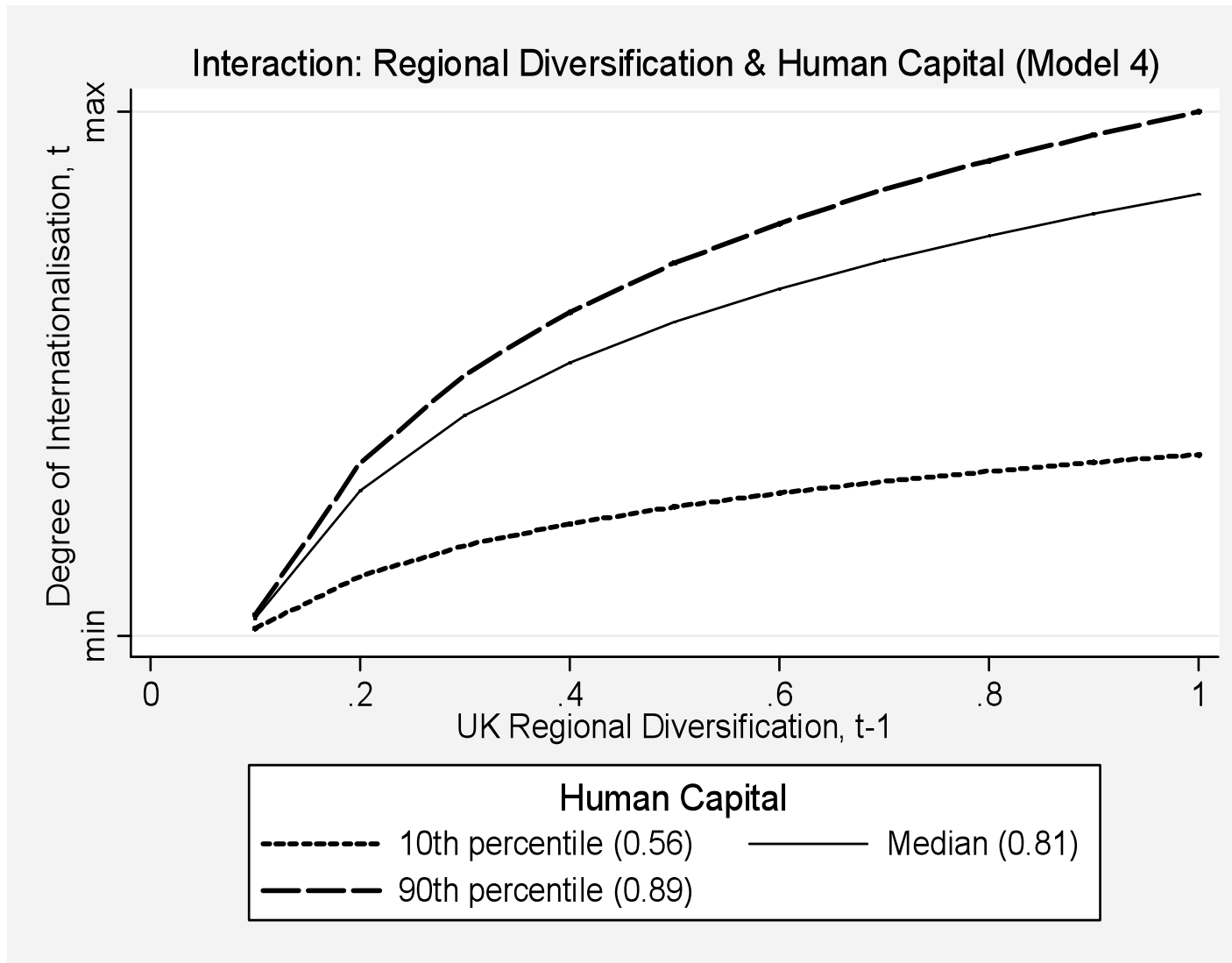
Results: Bottom Half ...

Dependent variable: Internationalisation	Baseline model (1)			
	$\hat{\beta}$	Robust SE	$\partial y / \partial x$	Robust SE
Independent variable				
\ln labour productivity $_{(t-1)}$	0.048	0.050	0.005	0.005
\ln age $_{(t-1)}$	0.406**	0.187	0.039**	0.018
\ln age squared $_{(t-1)}$	-0.050**	0.024	-0.005**	0.002
\ln size $_{(t-1)}$	0.100***	0.023	0.010***	0.002
Foreign ownership $_{(t-1)}$	0.111**	0.053	0.011**	0.005
Closure	-0.277**	0.108	-0.024***	0.008
<i>Corporate disciplines</i>				
Foundation $_{(t-1)}$	0.112	0.087	0.010	0.008
complex systems $_{(t-1)}$	-0.231	0.357	-0.024	0.040
Specialist areas $_{(t-1)}$	-0.016	0.046	-0.002	0.004
Non-technical areas $_{(t-1)}$	-0.127**	0.064	-0.012*	0.006
<i>Year effects</i>				
1995, 1996, 1997, 1999 = +ve & signif.				
Constant	-6.404***	0.612	-	-
Observations	2,380			
Log pseudo-likelihood	-569.2			

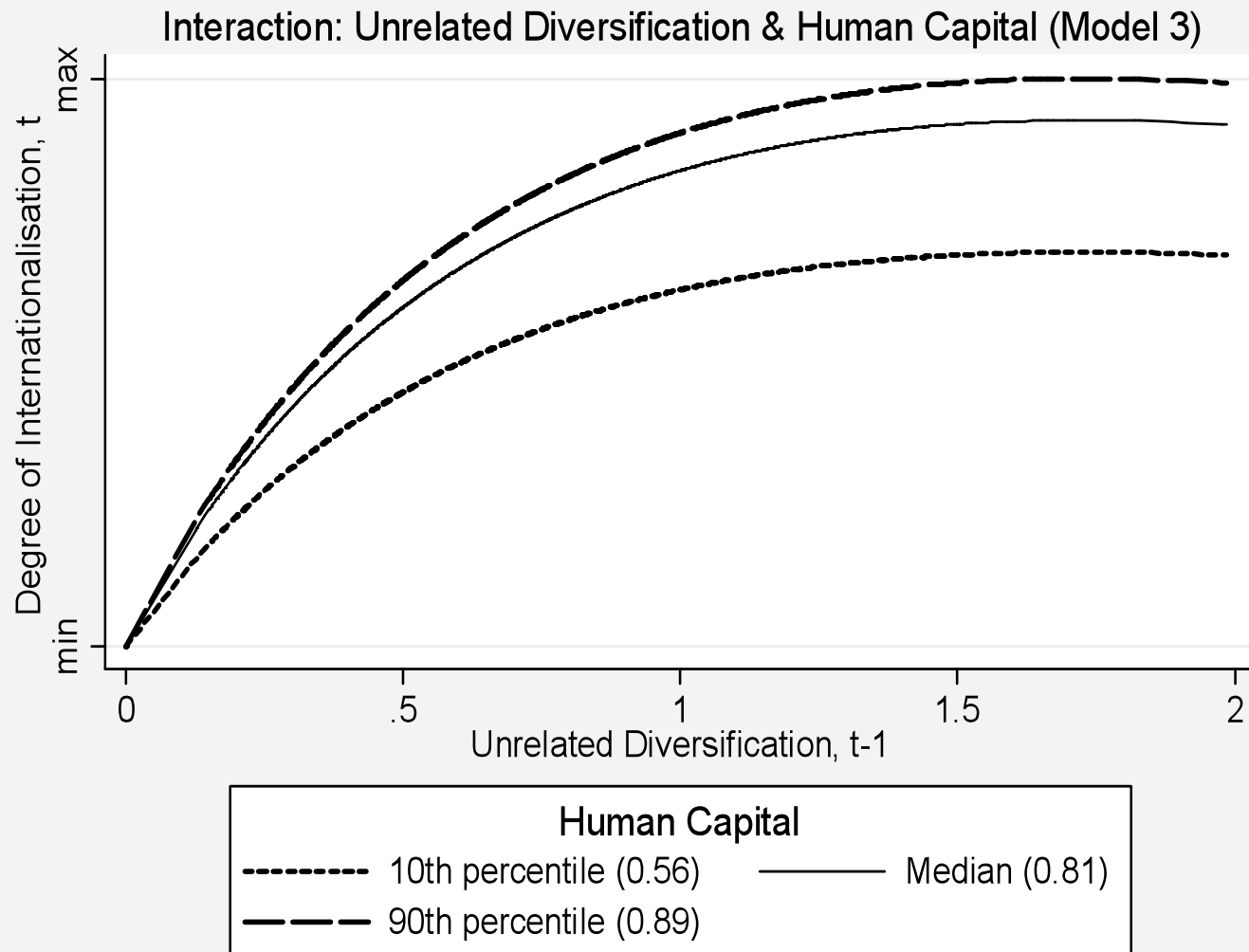
Interactions: Scope and Human Capital



Interactions: UK Regional Div. and Human Capital



Interactions: Unrelated Div. and Human Capital



Descriptive Summary of Findings

- Diversification and Human Capital both matter ...
 - Doing fewer **activities** → greater internationalisation **(H1a ✓)**
 - i.e., Specialists tend to internationalise more than generalists
 - Greater UK **regional diversification** → greater internationalisation **(H1b ✓)**
 - Learning effect ... Useful for internationalisation
 - **Unrelated diversification** → greater internationalisation **(H1c ✓)**
with a diminishing marginal effect.
 - **Human Capital** – greater HC increases internationalisation **(H2 ✓)**
- And Interact ...
 - Human Capital x Scope of Activities: enhances internationalisation **(H3a ✓)**
 - Human Capital x UK Regional Experience: enhances internat. **(H3b ✓)**
 - Human Capital x Unrelated diversification: enhances internat. **(H3c ✓)**

Descriptive Summary of Findings

- Other drivers
 - Firm Size
 - Firm Age – with diminishing marginal effect; flat after c.40 years.
 - Location: London and Northern Ireland
 - Management Buy Outs

Contributions ...

Addresses a gap in the literature

Unique dataset

Novel approach to measuring service diversification

(Tentative) Management Implications ...

Assuming the objective is to internationalise the firm:

- Enhance human capital
- Specialise
- Learn to scale business through UK regional offices
- Diversify into less related activities
 - BUT, **don't step too far too soon**
 - Balance risks/costs and benefits unrelated div.

(N.B., This assumes internationalisation is beneficial!)

(Tentative) Policy Implications ...

Context: Substantial scope for greater internationalisation

Engineering consulting is a UK strength; Single EU Market, etc.

- Encourage further consolidation in the industry

Fewer bigger players

- Encourage human capital deepening

Visa policy (and university fees!)

- Public procurement (?)

Use this to help firm to build capabilities that involve unusual combinations of activities

Limitations & Future Work

Limitations ...

- Lack of evidence on external relationship and relational assets: ‘follow the client’
(Johanson and Vahlne, 1992; Hitt et al., 2006)
- Evidence is from a single sub-sector, so generalisation is questionable

Future Work ...

- Exploit more fully the temporal dimension of data
- Internationalisation and performance



Thank You

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