University-Industry Networks, Innovation and Knowledge Transfer: A Demand-Led Perspective

Jeremy Howells, Ronnie Ramlogan, Shu-Li Cheng, Davide Consoli, Dimitri Gagliardi and Elvira Uyarra

Manchester Institute of Innovation Research,
University of Manchester

Aims and Objectives:

- Main objective is to develop a better understanding of the impacts of HEIs on the innovativeness and competitiveness of regional economies.
- To identify the various avenues through which universities interact with local firms, businesses and other intermediaries in relation to research and innovative activity.
- Analyse how this, in turn, influences firm performance and the overall competitiveness of local and regional economies.

Project Background: I

- Project: 2007-9; part of wider ERSC HEI Impact Programme
- Project team: Jeremy Howells, Ronnie Ramlogan, Shu-Li Cheng, Davide Consoli, Dimitri Gagliardi, Elvira Uyarra (Manchester) with Rebecca Boden (UWIC) and Fiona Lettice (UEA)
- Project taking three perspectives:
  - HEI/university
  - firm
  - region

Project Background: II

- 3 UK 'regions': North West, Wales and East of England
- 2 main elements:
  - firm level survey – 350+ (so far) firms
  - 15+ HEIs across 3 regions (3X5)
- Focus on the former, from a demand and user perspective
- Supply and competitive perspective on regions for later….

Demand and User Perspectives: I

- Long been established and recognised that firms as consumers, users and collaborators of university knowledge and innovation outputs have a very different view of their use and value which is salutatory…..

Importance of Universities: UK CIS4

Partners for innovation co-operation

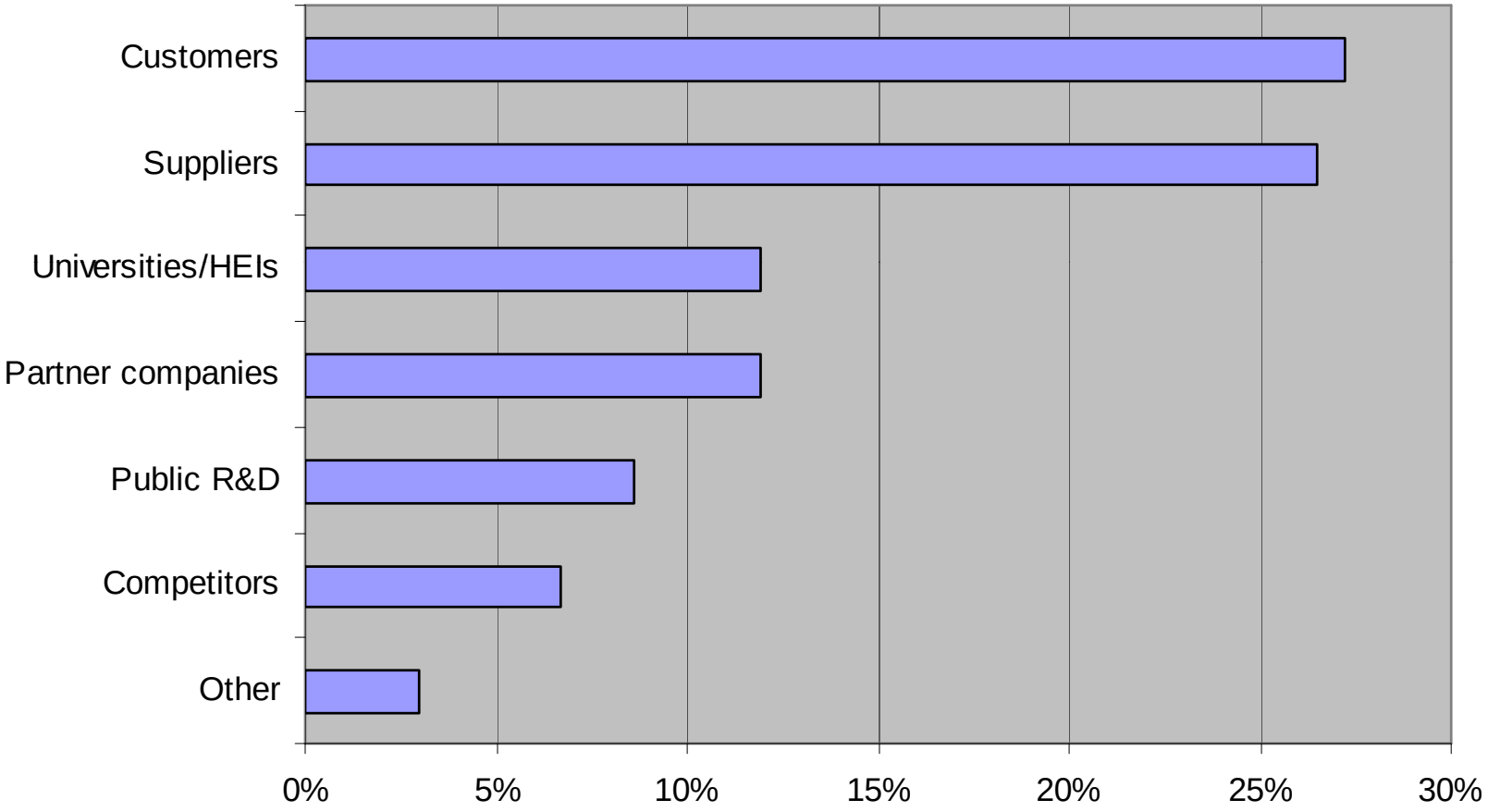
Percentage of those enterprises with co-operation arrangements

Type of partner	Geography of co-operation				
	Local/ regional	UK	Other Europe	All other countries	Any
Suppliers	34	42	16	12	76
Clients or customers	37	42	15	12	74
Other enterprises within enterprise group	24	18	10	11	50
Competitors	19	23	7	5	44
Consultants	20	23	6	4	42
Universities/higher education institutes	20	16	4	2	33
Government research organisations	16	17	2	2	31
Any	65	69	32	25	100

Demand and User Perspectives: II

- …. actually in this study the use universities and HEIs not as low as expected….

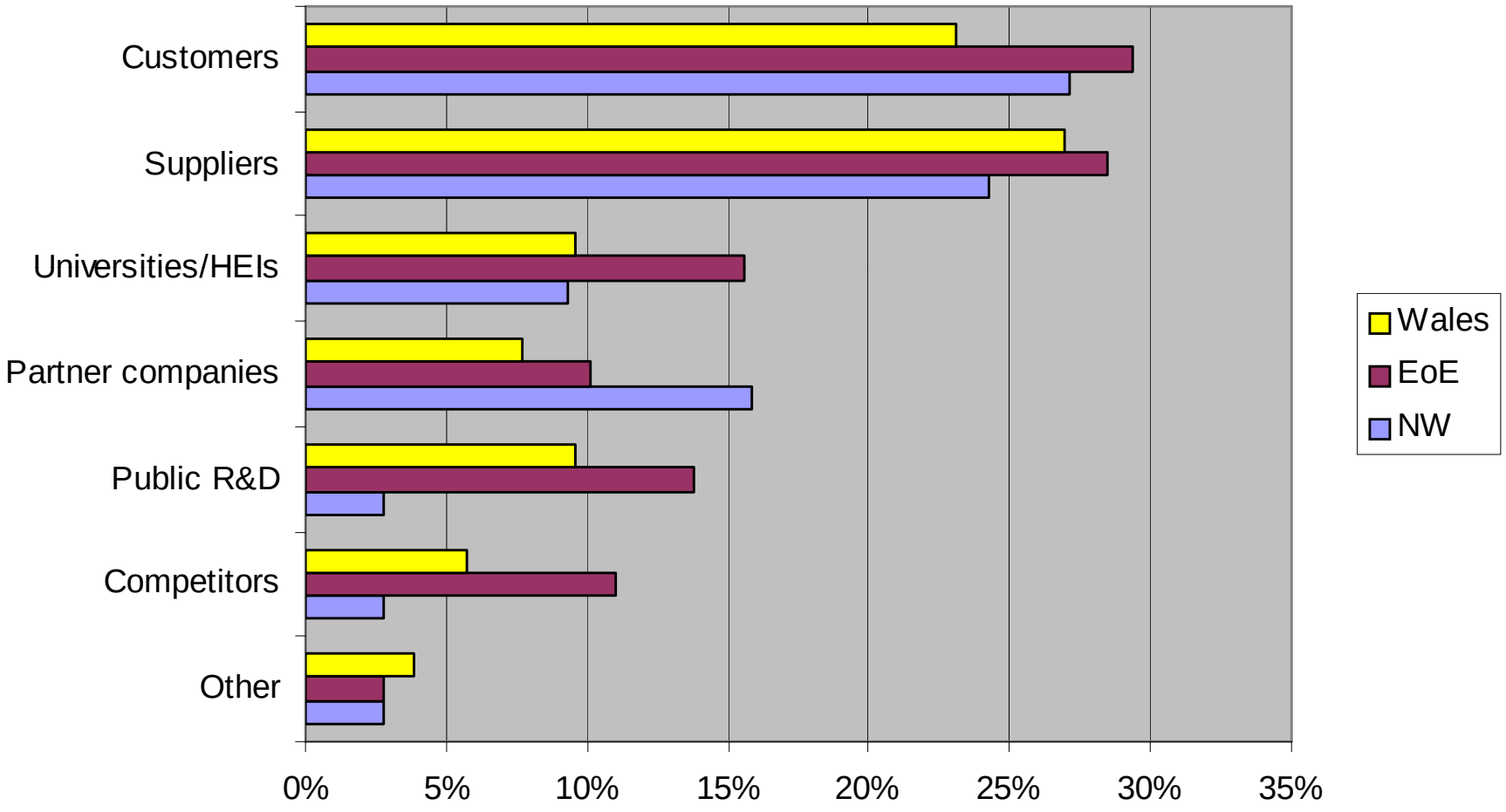
Distribution of Types of Collaborations (%)



Demand and User Perspectives: III

- However we found some significant regional variations in innovation collaboration profiles
- …. use of public research establishments (PREs), universities, partner and competitor companies varies

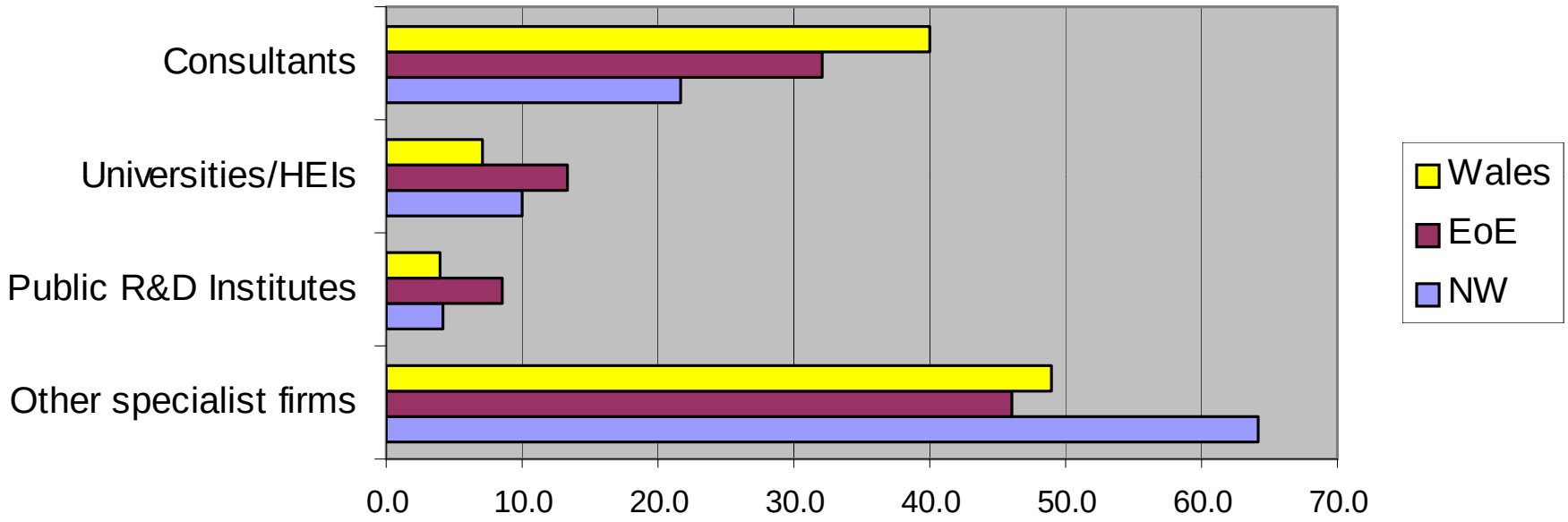
Distribution of Collaborators by Region (%)



Demand and User Perspectives: IV

- On a more specific level in terms R&D outsourcing provisions also evident
- E.g. role of consultants playing a particular important role in Wales

R&D Suppliers for Outsourcing Firms (%)



Demand and User Perspectives: V

- Important to recognise use is not the same as value surrounding innovation collaboration and some complex issues here
- As sources of information for innovation… universities emerge very lowly in rankings

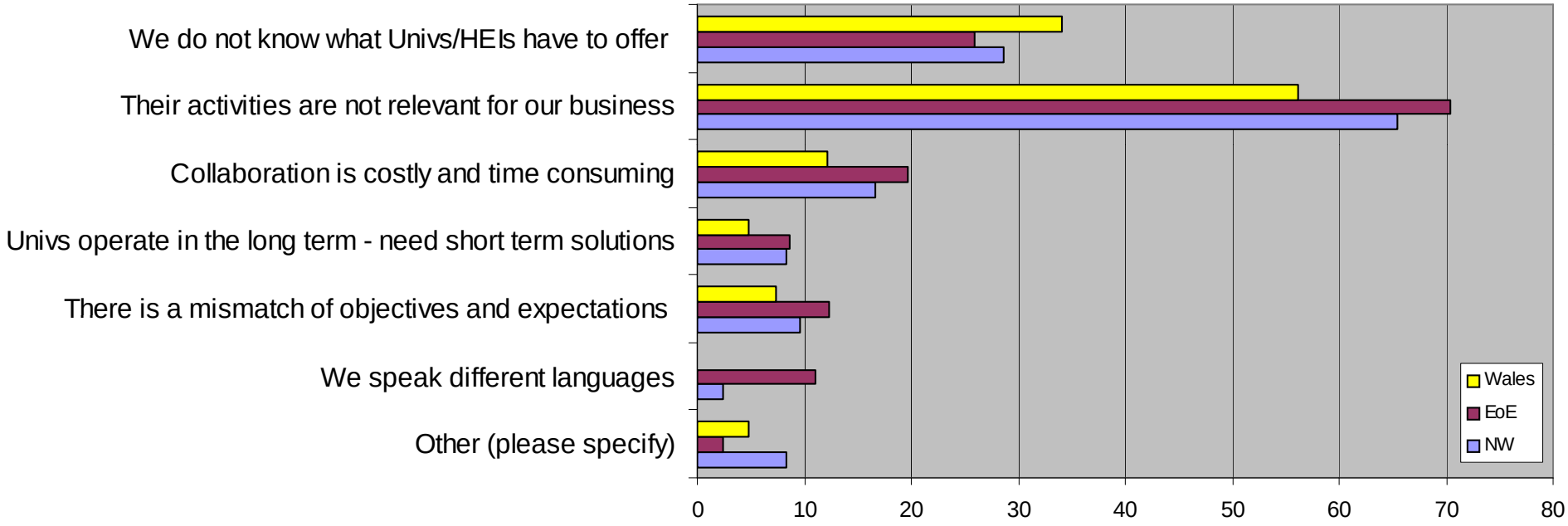
Firm's Information Source:

1. Customers or clients
2. Suppliers
3. In-house knowledge
4. Standards
5. Professional/industry associations
6. ….
12. Universities/HEIs

Demand and User Perspectives: VI

- Are we asking the right questions here?
- Difference between initial information, knowledge, problem solving and solution providing
- Some further insights when look at barriers and reasons for not collaborating
  - Lack of awareness is one factor (and important for policy)
  - … but major element is alignment (non-relevance) are we asking too much of universities here?

Reasons for not Collaborating by Region (%)



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Collaboration and Performance: I

- Mentioned earlier that collaborations enhanced performance….
- … this is highly significant and important effect…
- …although not implying causal relationship just that there is a significant probability and association, still highly important
- Universities moreover have an important impact… especially in new product/services innovation

Impact of Collaboration on Innovation (Logistic Regression Analysis) *

	Prod/Svs	Proc	Org. mthd
Public R&D institutions	4.3	2.7	3.6
Universities/HEIs	5.0	4.9	
Suppliers	3.9	3.4	3.8
Customers	4.7	3.5	2.9
Partner companies		7.0	3.8
Competitors	2.0		3.3

*: results presented as odds ratios

Note: all results shown are significant at 1%

Note: missing cell = insignificant odds ratio

Collaboration and Performance: II

- But again significant regional variations in terms of actor collaboration significance on various forms of innovation
- East of England (EoE) effects greatest across all actor types
- North West more limited
- Wales sparse and only via other firms (suppliers and customers)

Impact of Collaboration on Innovation (Logistic Regression Analysis)

	Products/services			Processes			Organisational methods		
	NW	EoE	Wales	NW	EoE	Wales	NW	EoE	Wales
Public R&D institutions	~	*		~	*		**	**	
Universities/HEIs	*	**			***			**	
Suppliers	*	**	*		*	**	**	*	**
Customers	*	***	*		**	**		**	
Partner companies		***		*	***		*		
Competitors			~	~			~		~

Note: ***: p <0.001; **:p <0.01; *:p <0.05

Note: ~: model cannot be estimated

Collaboration and Performance: III

- Also replicated in the association between R&D outsourcing activity by firms and innovation
- R&D outsourcing has a positive effect on innovation in terms of products/services, processes and even organizational innovation

Association between Innovation and Outsourcing (%)

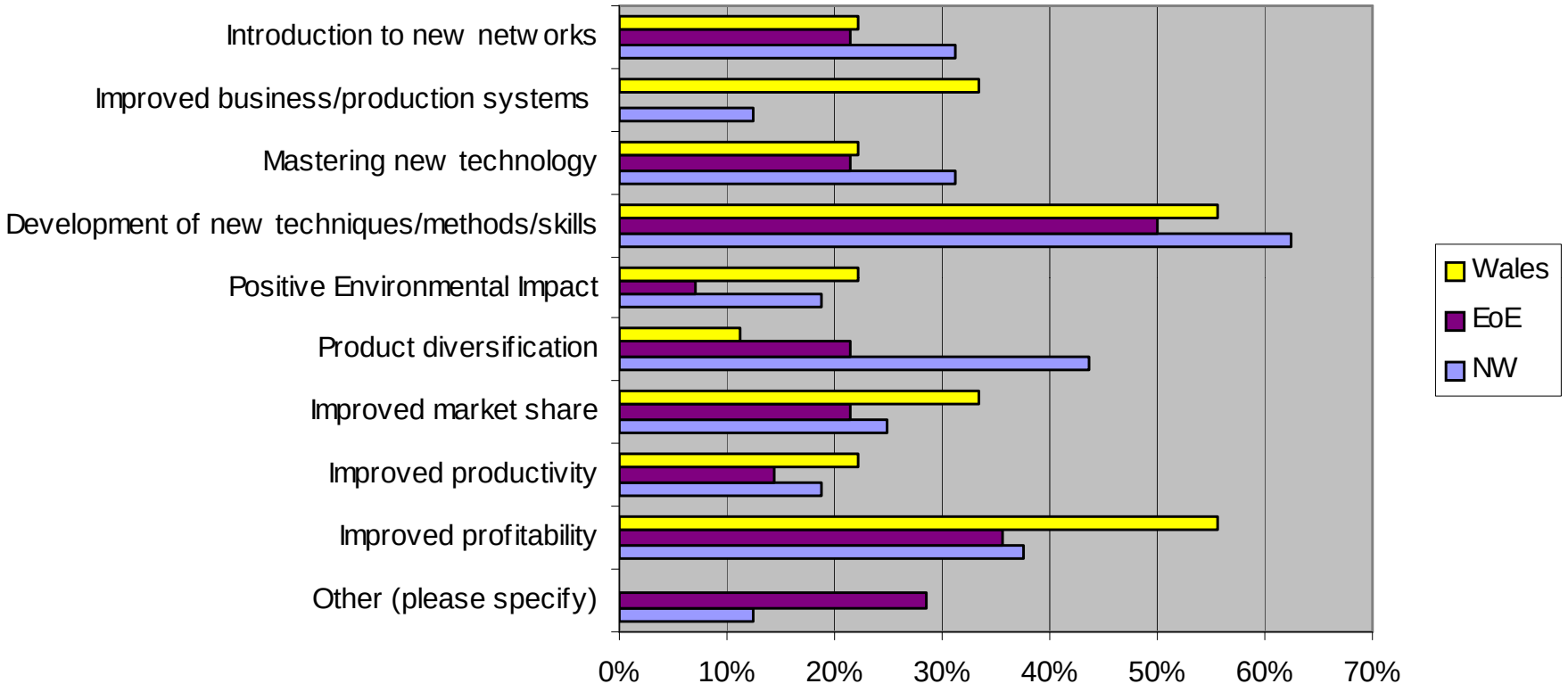
	Outsourcing	
	No	Yes
Prod/Services		
No	95.03	4.97
Yes	69.79	30.21
Processes		
No	93.14	6.86
Yes	67.12	32.88
Org. methods		
No	89.45	10.55
Yes	78.21	21.79

All associations are significant

Regional Impacts: I

- But we have the regional thing…
- How does the impact of firm collaboration with universities and other partners 'pan out' by region? Some interesting results here…
- Although Wales has lowest contacts and impacts, Welsh firms seem to value these contacts most highly in terms of perceived profitability, productivity, improvements to business systems and so on
- North West in the middle and EoE lowest…
- … some indication of marginal return effects

Distribution of Impacts for Firms with University Collaboration



Regional Impacts: II

- Wales an 'innovation poor' system environment, North West intermediate and EoE 'innovation rich' system
- Actor diversity, availability and responsiveness in each of these regions innovation systems associated with this
- Indication of displacement activity with Welsh firms having to make use of consultants more
- But when Welsh firms do use universities and other HEIS (and, for example, PREs) they value them more even if their impact (for whatever) is much more marginal

Conclusions: I

- Complex interaction between use (and not using), impact and value in relation to universities and other providers
- Not sure whether asking the right questions
- Openness and collaboration associated with major impact on likelihood to innovate (evident in firm growth and performance)
- However regional variations are important

Conclusions: II

- Actor diversity and nature of regional innovation system seem to be significant in influencing firm behaviour
- However suggests that policy intervention in relation to innovation and higher education policy is supported….
- …. but not one size fits all
- Different regions need to work on different dimensions

Thank You

jeremy.howells@mbs.ac.uk