Knowledge Transfer Study 2010-2012

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PRELIMINARY Results of the 2011 Survey of European knowledge transfer offices (KTOs)

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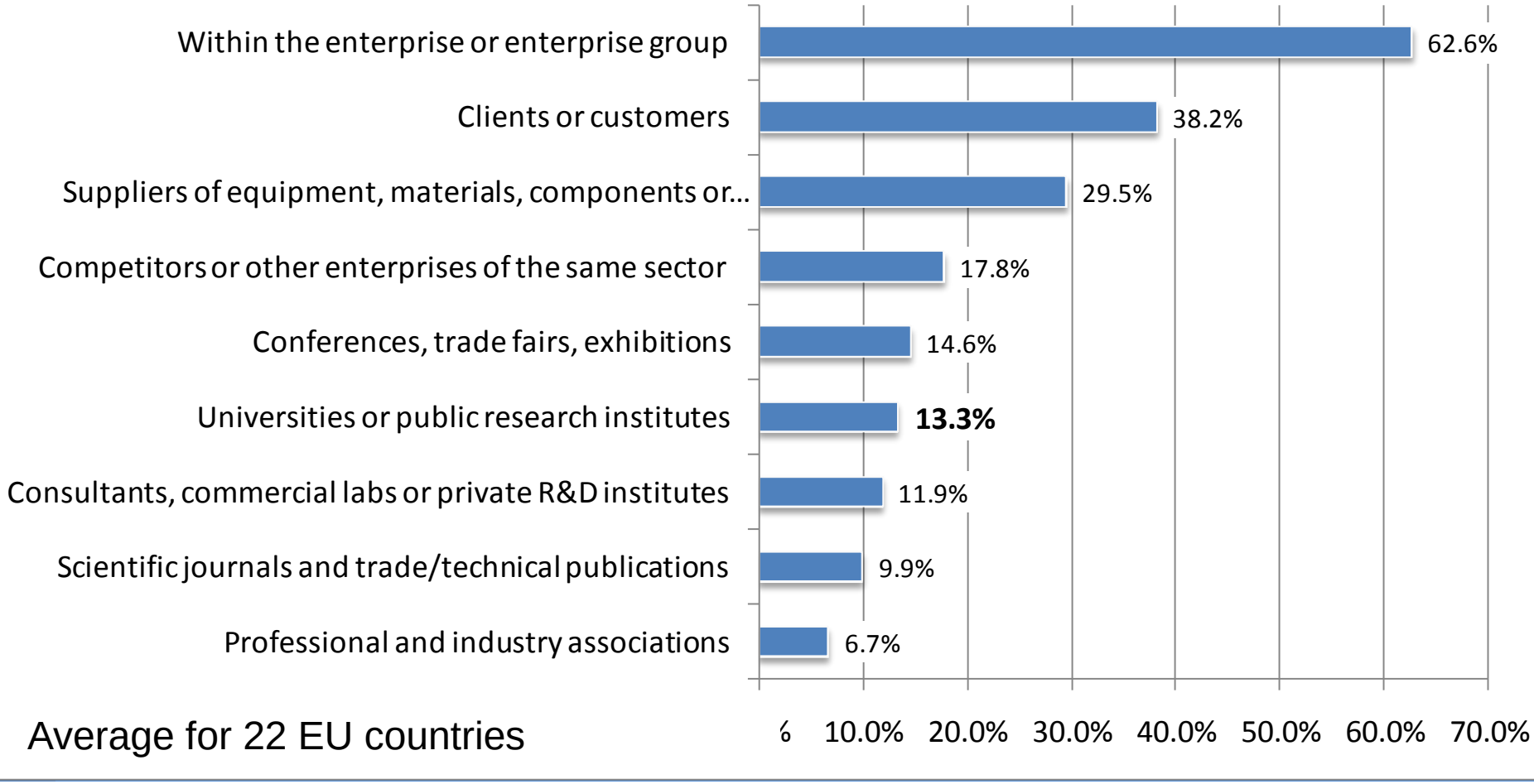
Percent of large European firms (250+ employees) giving a rating of 'very important' to information sources for innovation, 2006-2008



Average for 22 EU countries

For small firms (10 – 49 employees) only 5.4% give a very important rating to universities or public research institutes.

Study objectives

- Study funded by European Commission to provide comparable data on the knowledge transfer activities of the **leading research-intensive** universities and public research institutes in Europe.

- Covers all member states of the European Union and associated states (Croatia, Iceland, Israel, Macedonia, Norway, Switzerland, Turkey, etc.)

Research methods

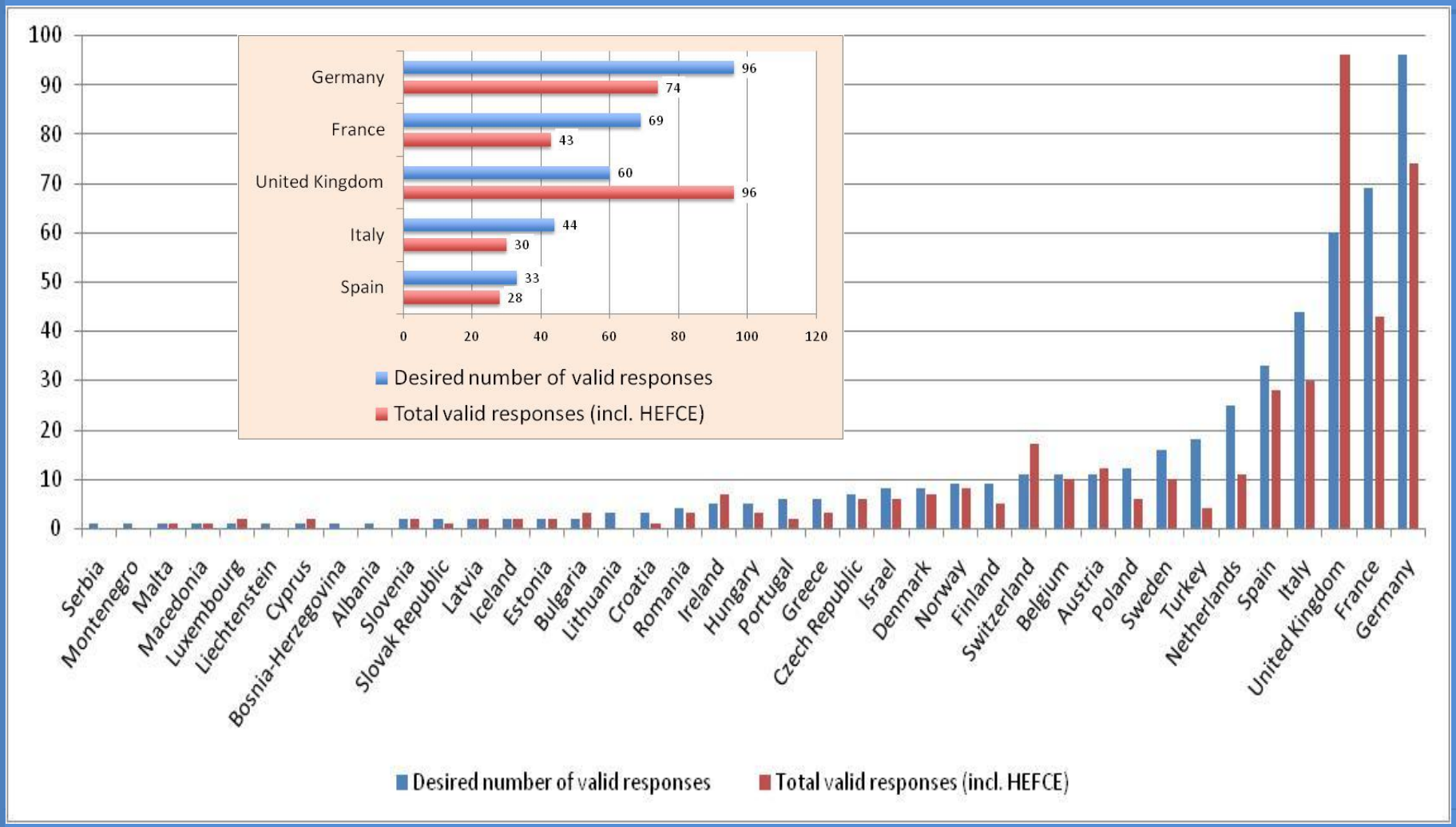
- **Four page mailed survey** plus, wherever possible, collaboration with professional or national organisations that collect comparable data (ASTP, RedOTRI (Spain), the UK (HEFCE), France (CURIE), Denmark (TechTrans), Portugal (UTEN).

- Two surveys administered by UNU-MERIT in 2011 and 2012 covering knowledge transfer activities in 2010 and 2011 respectively.

Focus on *leading* public research institutions

- Goal to 'match' AUTM results for the United States, plus obtain data on leading research institutes in every EU member state plus associated states.
  - Minimum sample of 1 institute per country
  - 500 universities and public research institutes across Europe and associated states
- Weighted survey design
  - Number of leading institutes per country weighted by national public research sector R&D expenditures (government and higher education) as a share of total EU expenditures

Desired and observed sample, 2011

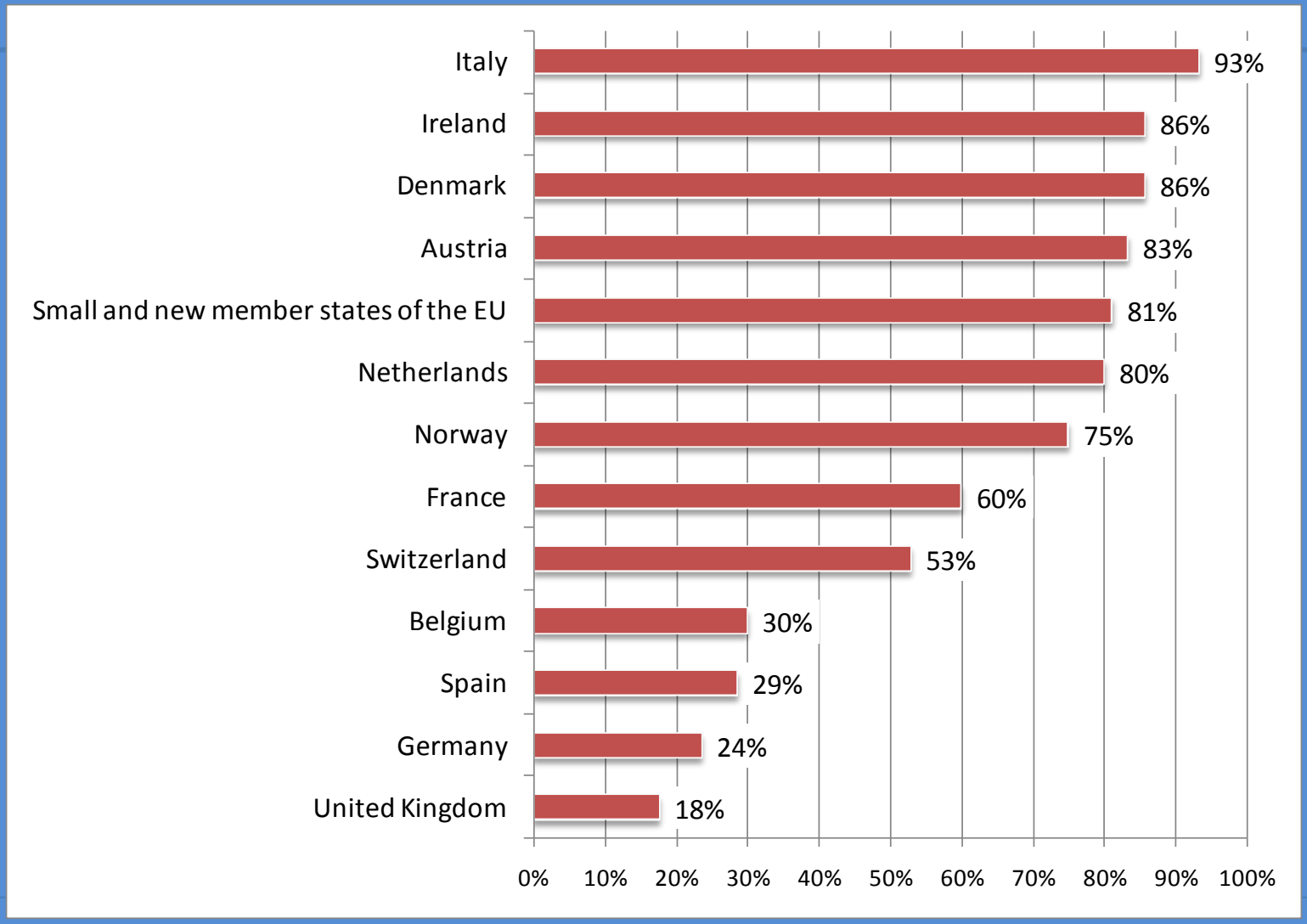


2011 Survey characteristics

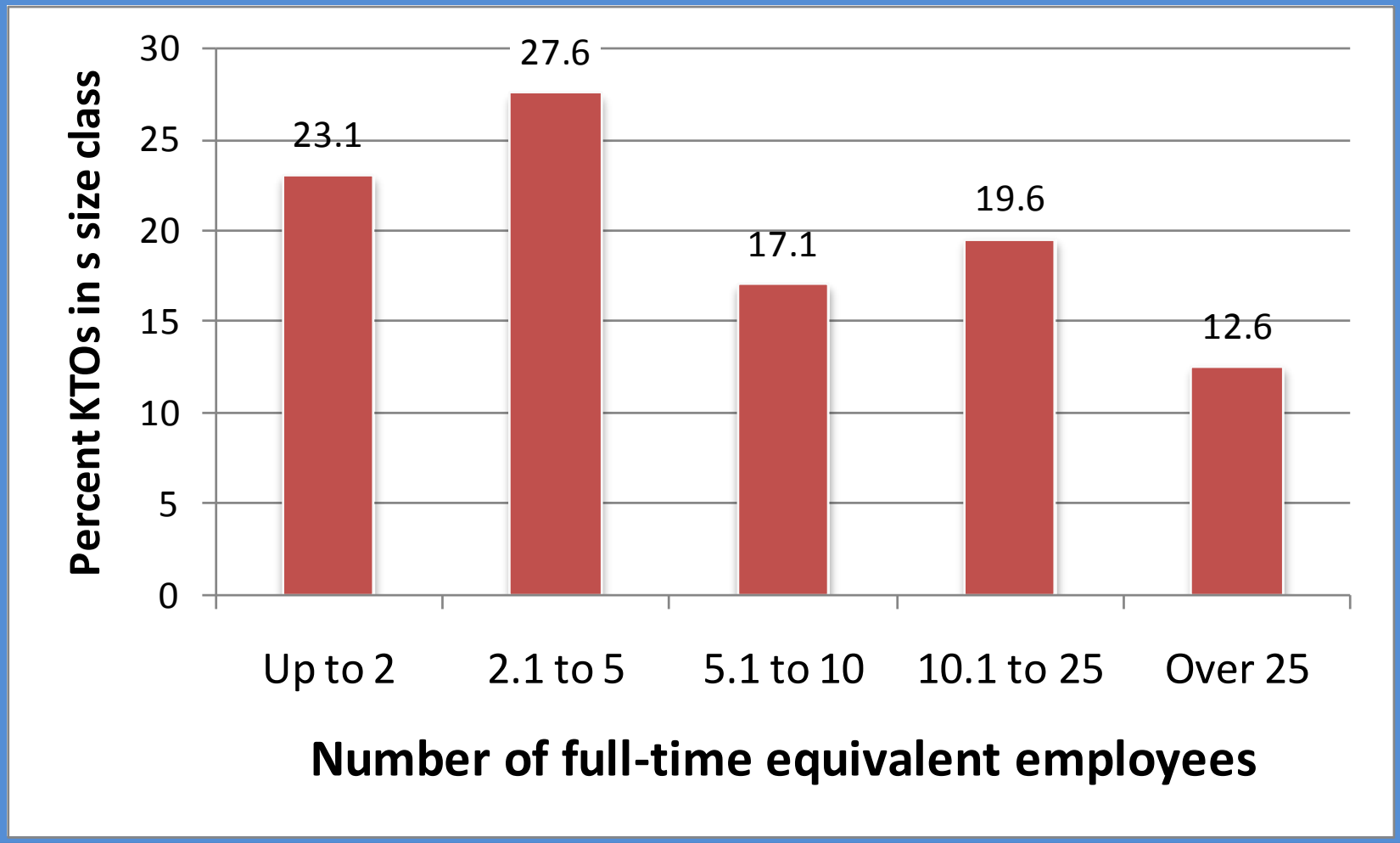
- **Response rate** of 51% as of 14 September (survey not yet completed).
- 410 responses, of which 58 were not valid
  - (no knowledge transfer activities reported, office does not represent a public sector research organisation, organisation not one of Europe's leading research organisations)
  - 22 incomplete responses from Spain (remaining data expected from RedOltri)
- Results given here are for up to 406 KTOs (349 from the survey and 57 from HEFCE in the UK)
- **Panel data** for 249 research organisations

KTO characteristics

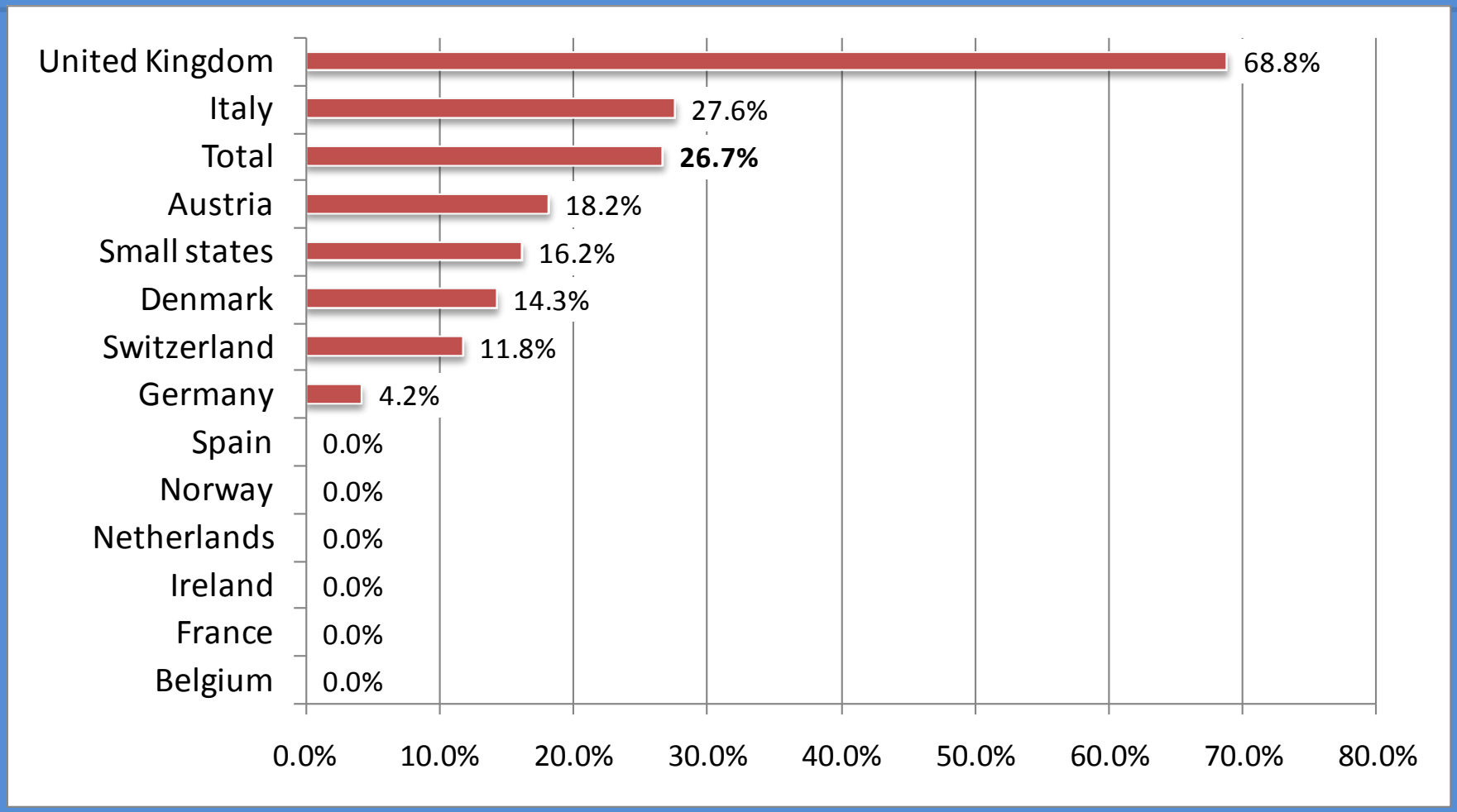
Percent KTOs established in 2000 or later by country



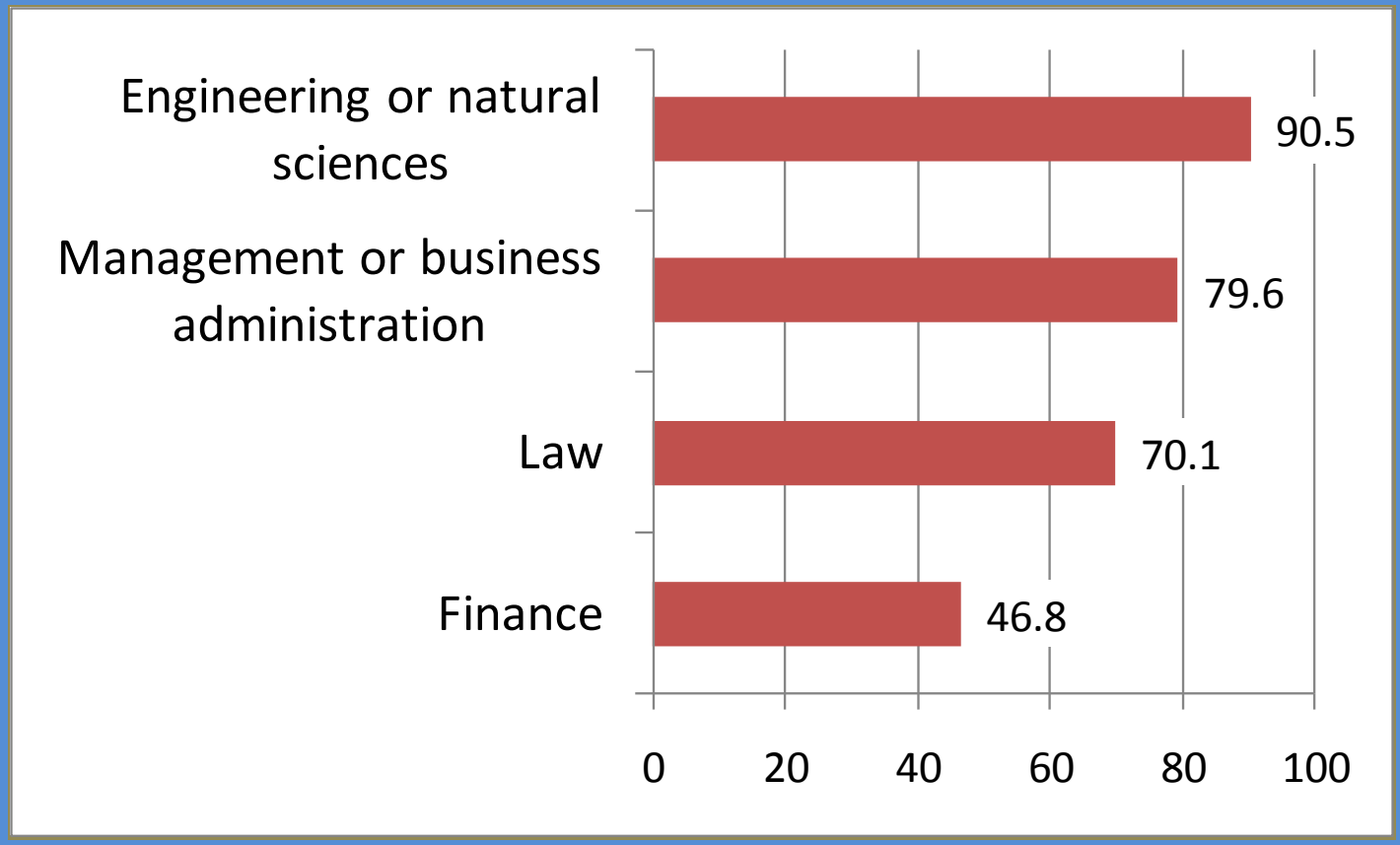
Size of KTOs in 2011



Ownership of the IP: Percent KTOs reporting that the institution does not own any of the IP, 2011



Percent KTOs with university trained staff by subject area, 2011

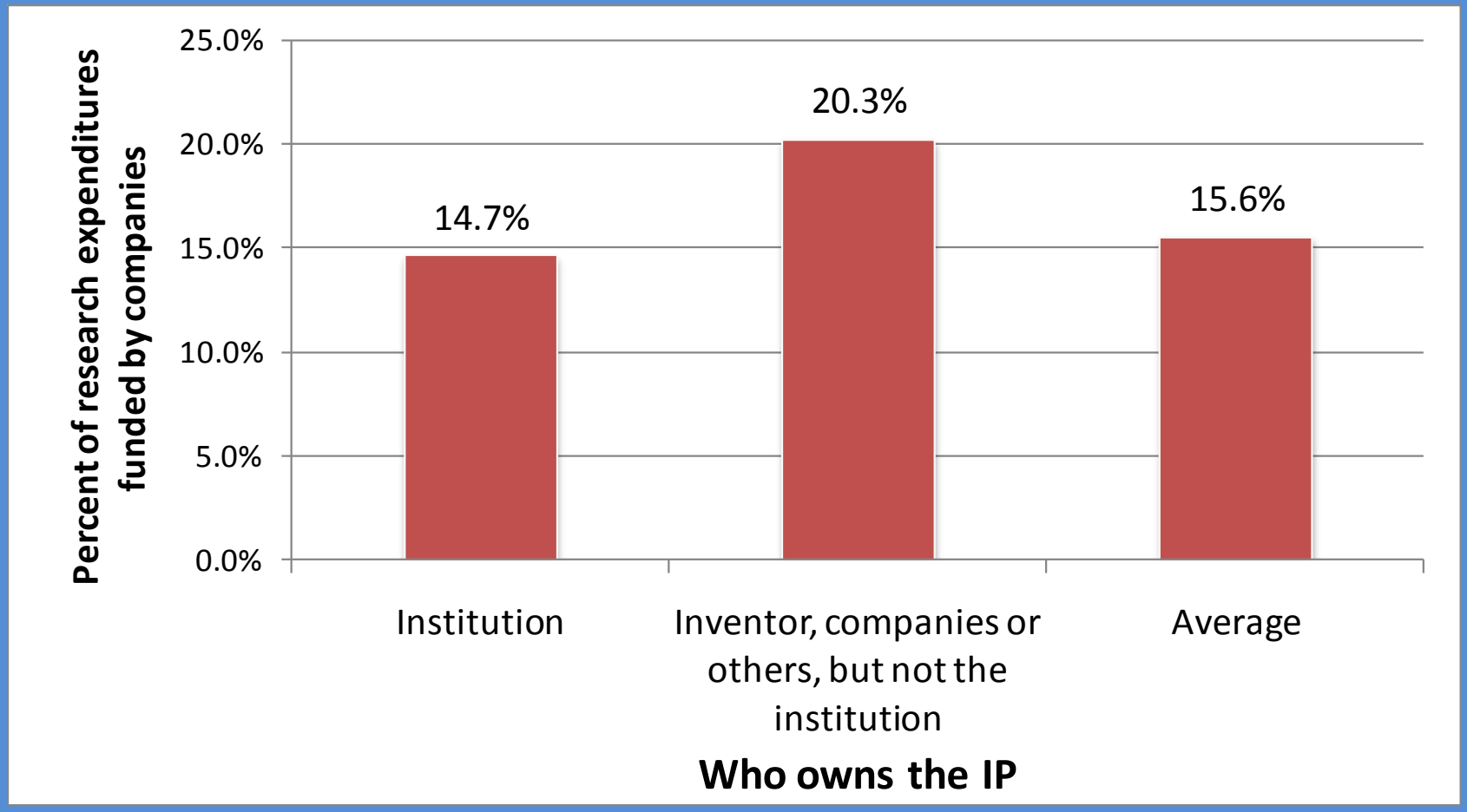


Older KTOs (before 2000) have a higher percentage of staff with finance backgrounds (51.2% versus 43.1% for KTOs est. in 2000 or later).

Use of external expertise by size of KTO, 2011

FTE staff	Evaluating commercial potential of discoveries	Legal assistance on IP	Preparing contracts for research agreements, licensing etc.	Marketing IP
Up to 2	68.4%	96.1%	44.7%	36.8%
2.1 to 5	55.4%	95.0%	46.5%	36.6%
5.1 to 10	74.1%	94.8%	41.4%	41.4%
10.1 to 25	54.5%	92.7%	29.1%	32.7%
Over 25	55.0%	95.0%	20.0%	20.0%

Share of research funded by companies, 2011

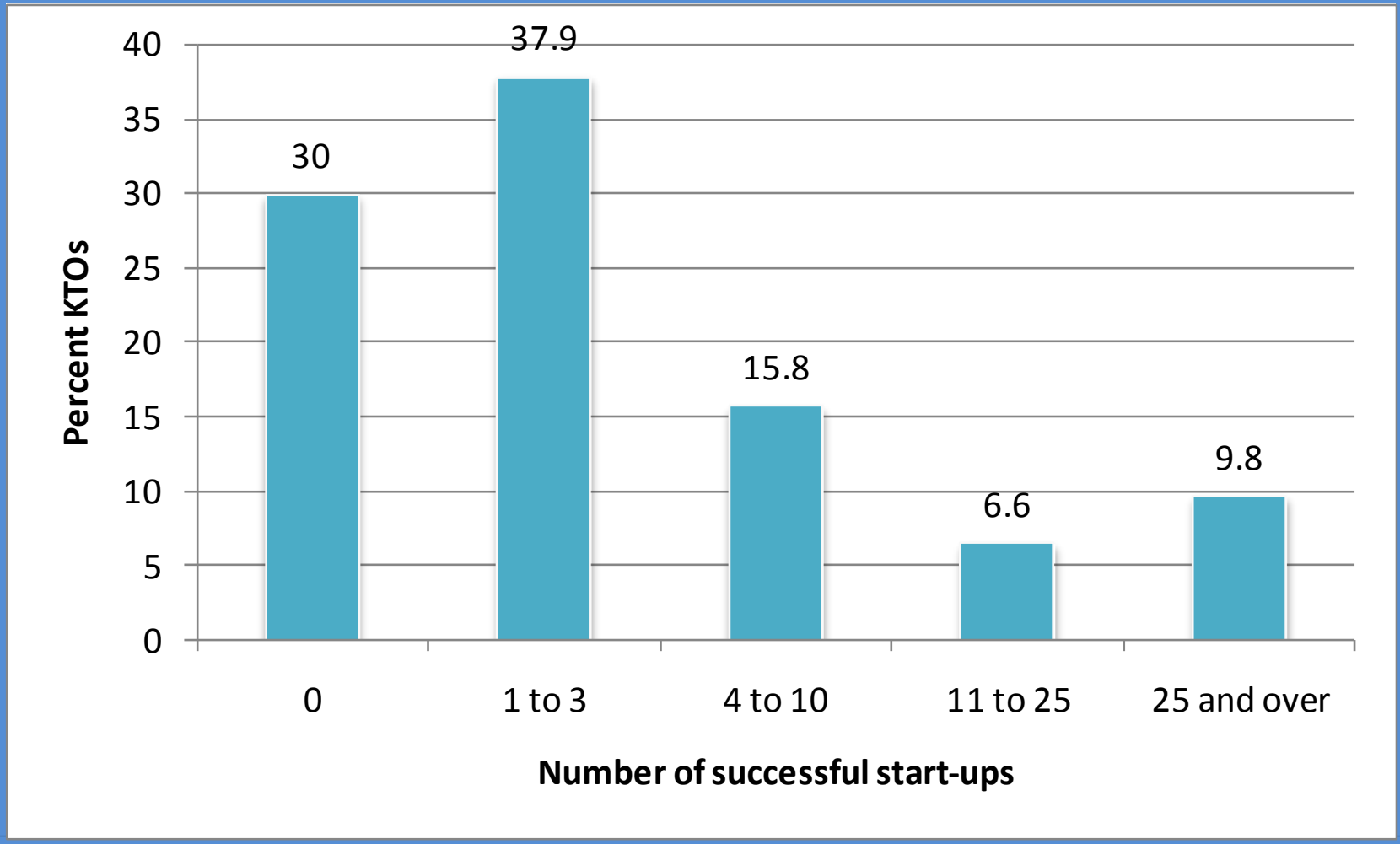


Funding shares do not differ by KTO size, age or type (university or research institute)

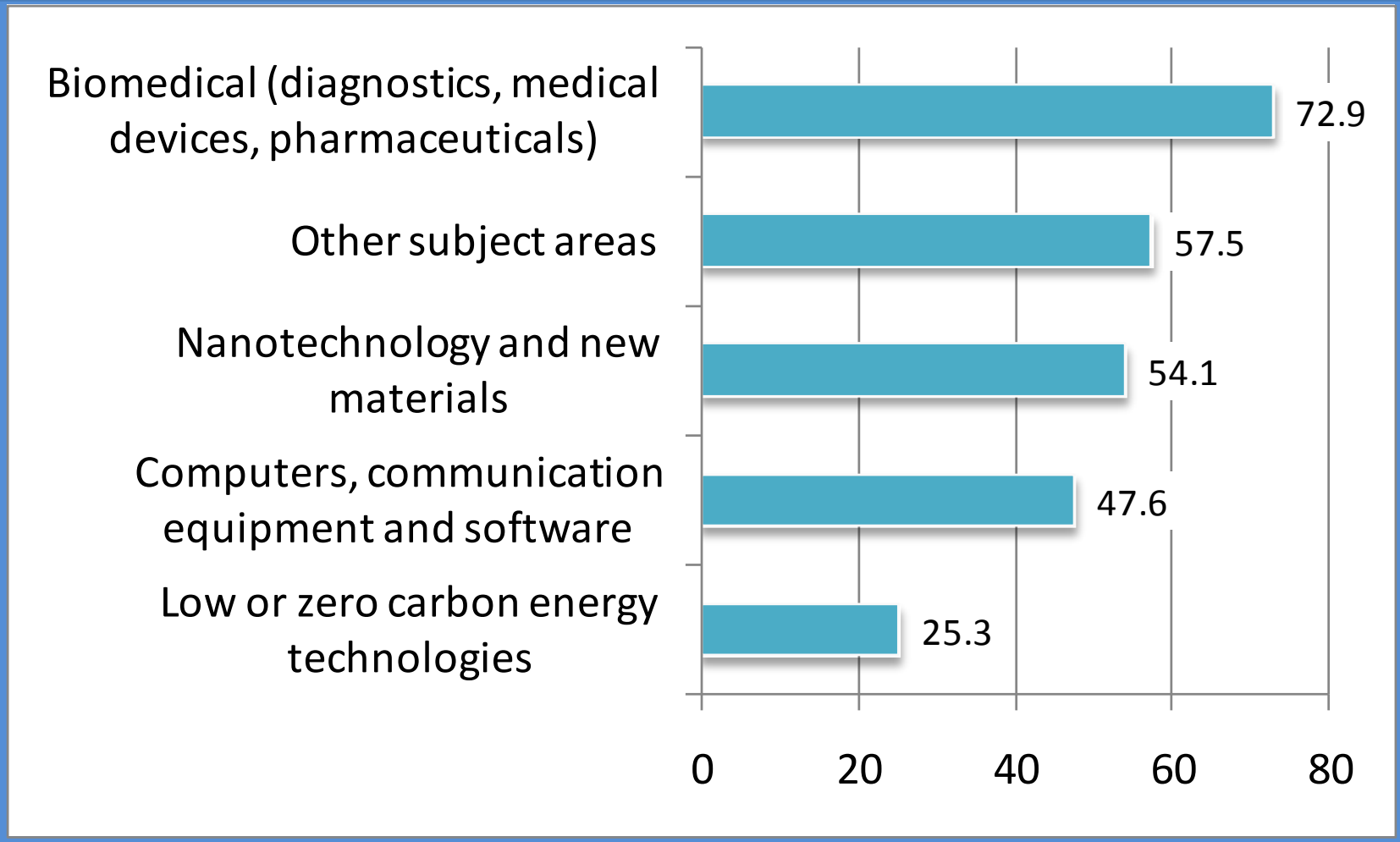
Results

Successful start-ups, 2011

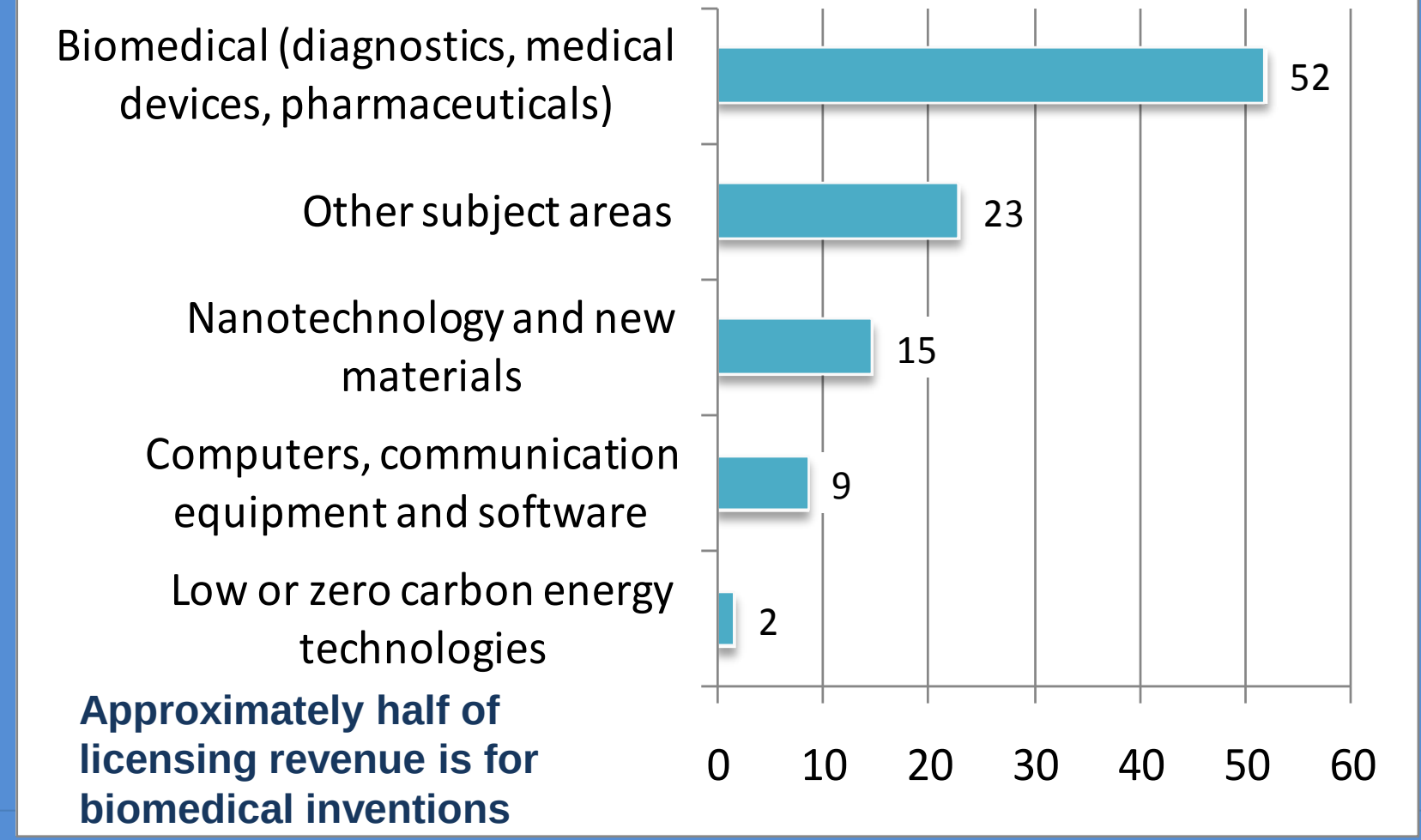
(Established in previous five years and developed a licensed technology into a marketed product or process)



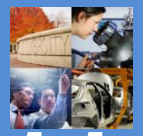
Percent KTOs reporting patent applications by subject area, 2011



Percent KTOs: most frequent subject area for patent applications, 2011



Approximately half of licensing revenue is for biomedical inventions



Performance on main indicators, 2011

Main output indicators per 1,000 research staff

	Universities	Other research organisations	Total
Invention disclosures	17.5	22.5	18.3
Patent applications	8.5	7.4	8.3
Patent grants	16.9	5.0	14.6
USTPO patent grants	1.5	0.8	1.3
Start-ups established	5.6	1.1	4.7
Successful start-ups	9.1	1.6	7.6
License agreements	10.4	6.8	9.7
License income (million €)	0.6	0.7	0.7
Research agreements	87.5	82.2	86.5
Number of institutes	333	73	406
Total research staff	434,222	92,720	526,942

Comparison with the United States
(per million Euros research expenditures)

Million Euros research expenditures to produce 1 outcome, 2011

	European Universities	European research institutes	Total	United States (AUTM, 2011)
Invention disclosures	3.1	2.8	3.1	**2.1**
Patent applications	6.6	7.9	6.7	**2.3**
Patent grants	3.2	10.7	**3.6**	9.7
Start-ups established	8.5	57.9	**10.0**	68.0
Succesful start-ups	5.1	29.0	6.0	-
License agreements	5.3	9.8	**5.7**	7.5
€ per 1 € license income	88.7	60.8	82.4	**24.4**

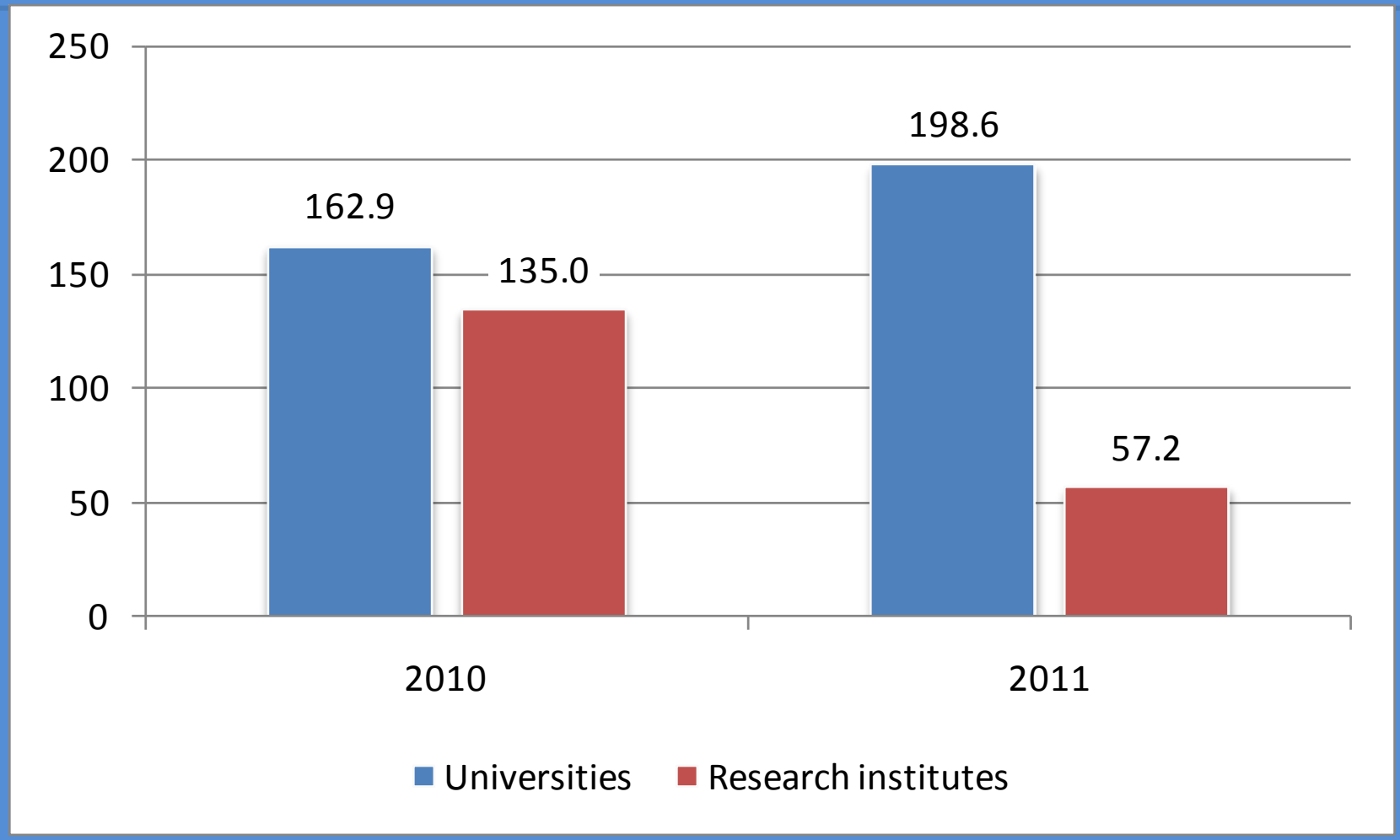
Maximum of 249 organisations for Europe (210 universities and 39 research institutes), 186 for United States (157 universities and 28 research institutes)

Average outputs over time (panel data for 159 universities and 35 research institutes)

	Universities		Research institutes		Total	
	2010	2011	2010	2011	2010	2011
Invention disclosures	34.7	**37.9**	42.8	42.8	35.8	**38.6**
Patent applications	17.9	**18.7**	14.2	**15.7**	17.4	**18.3**
Patent grants	11.4	**32.0**	5.8	**8.0**	10.6	**28.7**
USPTO patent grants	1.6	**2.4**	0.6	**0.7**	1.4	**2.1**
Start-ups established	2.9	**7.3**	3.1	1.9	2.9	**6.5**
Successful start-ups	7.4	**12.0**	3.0	2.6	7.0	**9.0**
License agreements	21.4	**22.5**	8.4	**11.7**	19.6	**20.9**

Possible respondent bias?

Panel data: total license income in million Euros, 2010 and 2011



Comparisons before and after the GFC: Performance per 1,000 research staff

	2007	2011
Invention disclosures	17.3	18.3
Patent applications	6.2	8.3
Patent grants	2.8	14.6
Start-ups established	1.4	4.7
License agreements	4.4	9.7
License income (million)	0.5 $	0.7 €
Research agreements	89.4	86.5

2007 data for 153 respondents to a UNU-MERIT survey funded by ASTP

Factors influencing performance: regression results using 2010 data

	Invention Disclosures	Patent applic's	Patent grants	Start ups	Licenses	License income[2]
Number of researchers	**0.20**	**0.16**	**0.12**	**0.16**	**0.14**	**0.33**
Number of KT office staff	**0.04**	**0.04**	**0.04**	0.01	**0.02**	**0.09**
KT office established before 2000[3]	0.18	**0.42**	**0.71**	0.18	-0.19	**1.16**
IP owned in part by institute [4]	0.17	0.23	0.06	0.42	0.39	**0.43**
Institute has a hospital[5]	**0.40**	0.24	-0.27	0.11	-0.05	**3.22**
University[6]	0.42	**0.51**	0.26	**1.17**	-0.17	**-3.13**

1: Negative binomial regression models suitable for count data.

2: OLS regression model.

3: Comparison group is KTOs established from January 1st, 2000.

4: Comparison group is when IP is owned by the inventor or 'other' arrangements.

Includes country dummies (not shown)

ASTP membership: regressions using 2011 data

- Membership in the Association of European Science and Technology Transfer Professionals could improve performance (though not necessarily causal).
- **Better performance** for ASTP members for:
  - Invention disclosures
  - Patent applications
  - Patent grants
  - Licenses.
- **No effect** of membership for:
  - Number of start-ups established
  - License income

Conclusions

- Possible to create data for Europe's leading universities and public research institutes, but
  - Have not met the goal of collecting data for 500 leading institutes - better collaboration required over the long term.
  - Not yet a mechanism for regular data collection over time.
  - Concerns about sending out the 'wrong' signals favouring formal over informal collaboration between universities/research institutes and firms.

Conclusions for performance

- European performance is considerably below that of the US for license income.
- European performance is improving over time (slightly since 2010 and possibly more substantially since 2007, although not for license income).
- France and Italy considerably lag behind the performance of Germany and the UK: younger KTOs in France and Italy could partly cause this result.
- Large positive effect of more KTO staff on performance.

Questions

- Europe produces more start-ups than the US per unit of research expenditure. Many are successful, but the impression is that the US does better. Why?
- Other than size and age, what other KTO characteristics might influence performance?
- How to improve performance on license income? Is this only a matter of KTO experience?
- How can we better measure informal knowledge transfer from universities and research institutes to firms?

Further information

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Interim findings report 2011 available at:

http://www.knowledge-transfer-study.eu