

# Knowledge Transfer Study 2010-2012

Meeting with the European Commission

Brussels, 12 March 2013



## Knowledge Transfer Study 2010-2012: Performance of European knowledge transfer offices (WP2)

**Nordine Es-Sadki & Anthony Arundel**

UNU-MERIT,  
Maastricht

A study on behalf of the  
European Commission





# Outline

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- **Objectives**
- **Methodology**
- **Results EKTIS 2012**
- **Country performances**
- **Panel data**
- **Conclusions**



## Objectives

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- Obtain internationally comparable indicators of the knowledge transfer activities of the **leading** European public research organisations.
  - Covers 39 European countries
- Comparability with surveys in non-EU countries that collect similar data (e.g. AUTM for US).



# Methodology

- Number of selected organisations in each country is weighted by national share of total public (government and higher education) R&D expenditures in the 39 countries (minimum: one organisation per country).
- Organisations are selected based on public data on research personnel and/or research expenditures. But this information was only available for some countries (ie. NL, UK).
- The remaining selection was initially based on university rankings such as, QS, ARWU, Humboldt, CHE etc.
- During the project we revised the sample using new data, including data we collected.



# Methodology

- **Response rates EKTIS 2011**
  - Response rate 57%, 402 replies, 36 countries
  - Additional data from UK, ES and DK
  - Sample of **430** public research organisations for analysis
- **Response rates EKTIS 2012**
  - Response rate 56%, 442 replies, 36 countries
  - Additional data from UK, PT and DK
  - Sample of **498** public research organisations for analysis
- **Panel dataset for 320 organisations**  
(answered both surveys)



## Response rates by country EKTIS 2012

- **0%:** Albania, Montenegro and Serbia
- **100%:** Cyprus, Iceland, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Slovak Republic, Slovenia
  - These are countries with only 1 or a few selected research institutes or universities
- **Other countries:** range from 19% (Turkey) to 84% (Netherlands)



## Response rates by country EKTIS 2012

Country	Percentage	Country	Percentage
Austria	70.0%	Israel	60.0%
Belgium	64.7%	Italy	59.6%
Bosnia-Herzegovina	33.3%	Latvia	66.7%
Bulgaria	75.0%	Netherlands	84.0%
Croatia	33.3%	Norway	69.2%
Czech Republic	58.3%	Poland	60.0%
Denmark	53.3%	Romania	60.0%
Estonia	66.7%	Spain	67.5%
Finland	61.5%	Sweden	44.0%
France	43.6%	Switzerland	79.3%
Germany	66.9%	Turkey	18.5%
Greece	55.6%	United Kingdom	33.6%
Hungary	50.0%		
Ireland	53.3%	<b>All countries</b>	<b>56.0%</b>



# Results EKTIS 2012



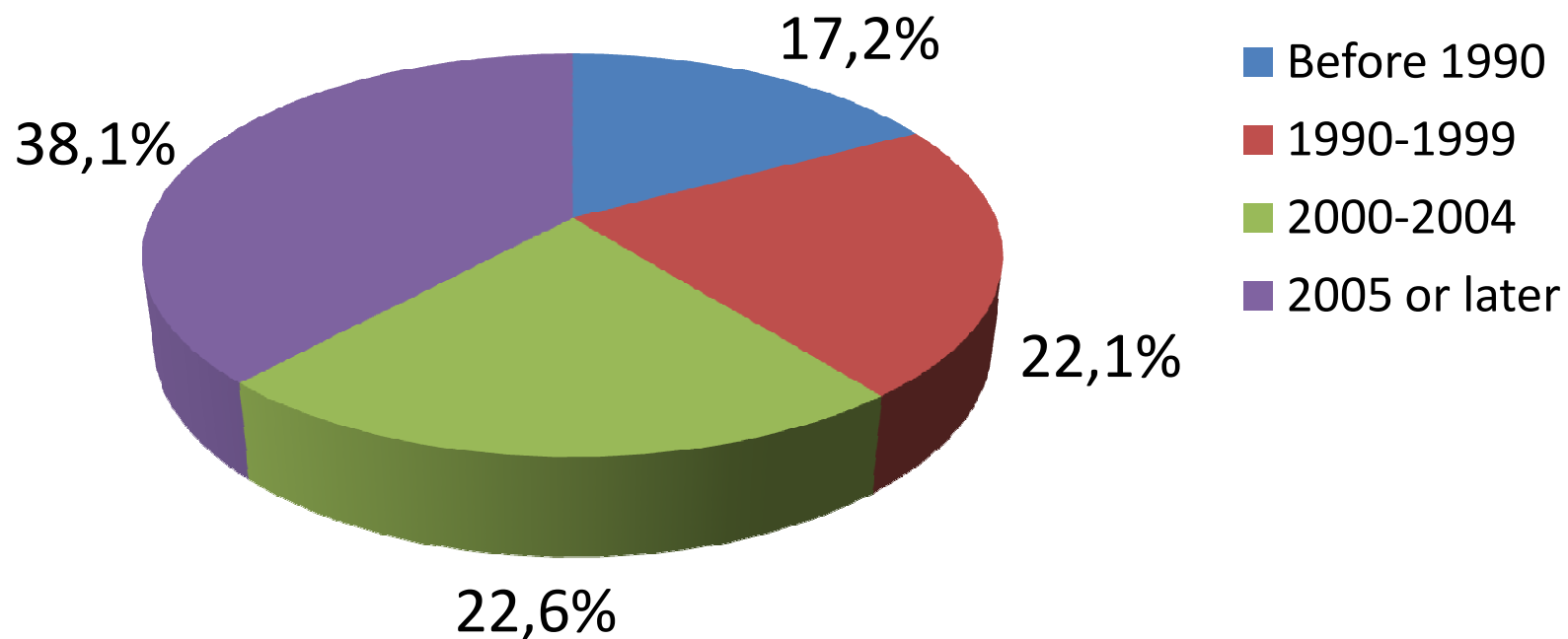


# Results

- **Information on the knowledge transfer office (KTO) and its affiliated institution**
  - Date of establishment
  - Number of staff at KTO
- **Inputs to potential commercialisation**
  - Invention disclosures
  - Patent applications
  - Patent grants
  - Research agreements
- **Close-to-commercialisation outputs**
  - License agreements
  - License revenue
  - Start-ups established



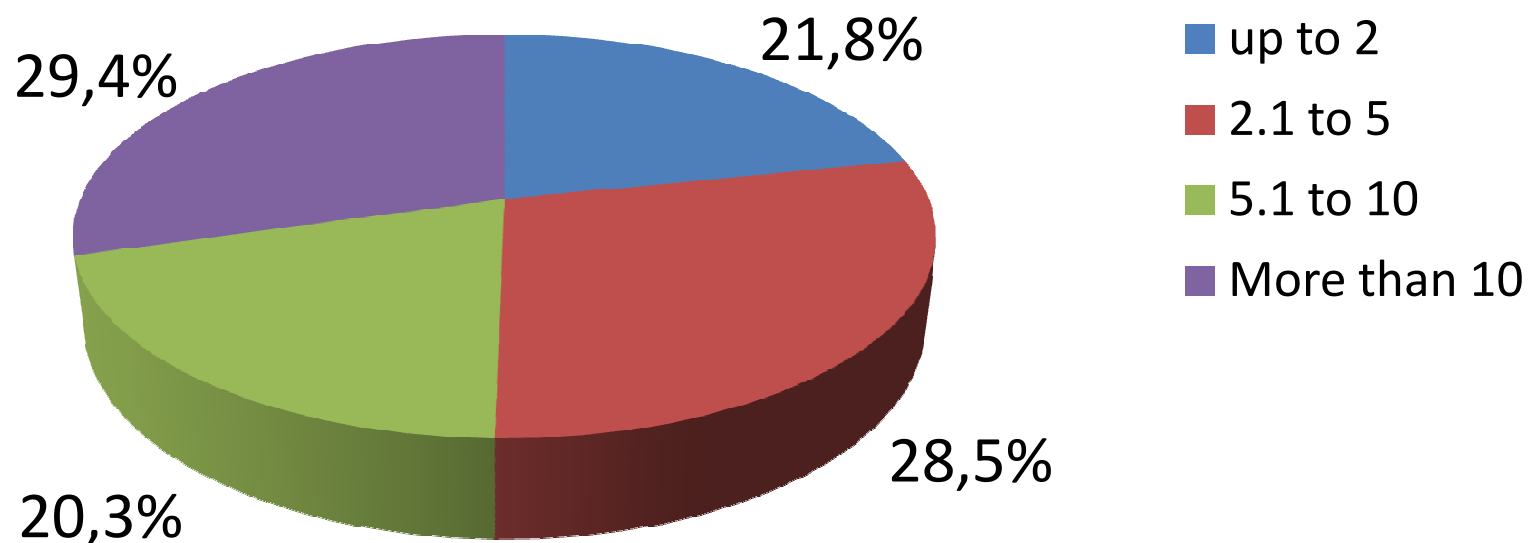
## Date of establishment of the KTO



- Based on results for 407 KTOs
- 60.7% established after 2000



## Knowledge transfer office staff (FTE)



- Based on results for 487 KTOs
- Median at universities is 5, other research organisations 6.
- 50.3% have fewer than five employees.

# Standardised performance outcomes

## Per 1,000 research staff, 2011

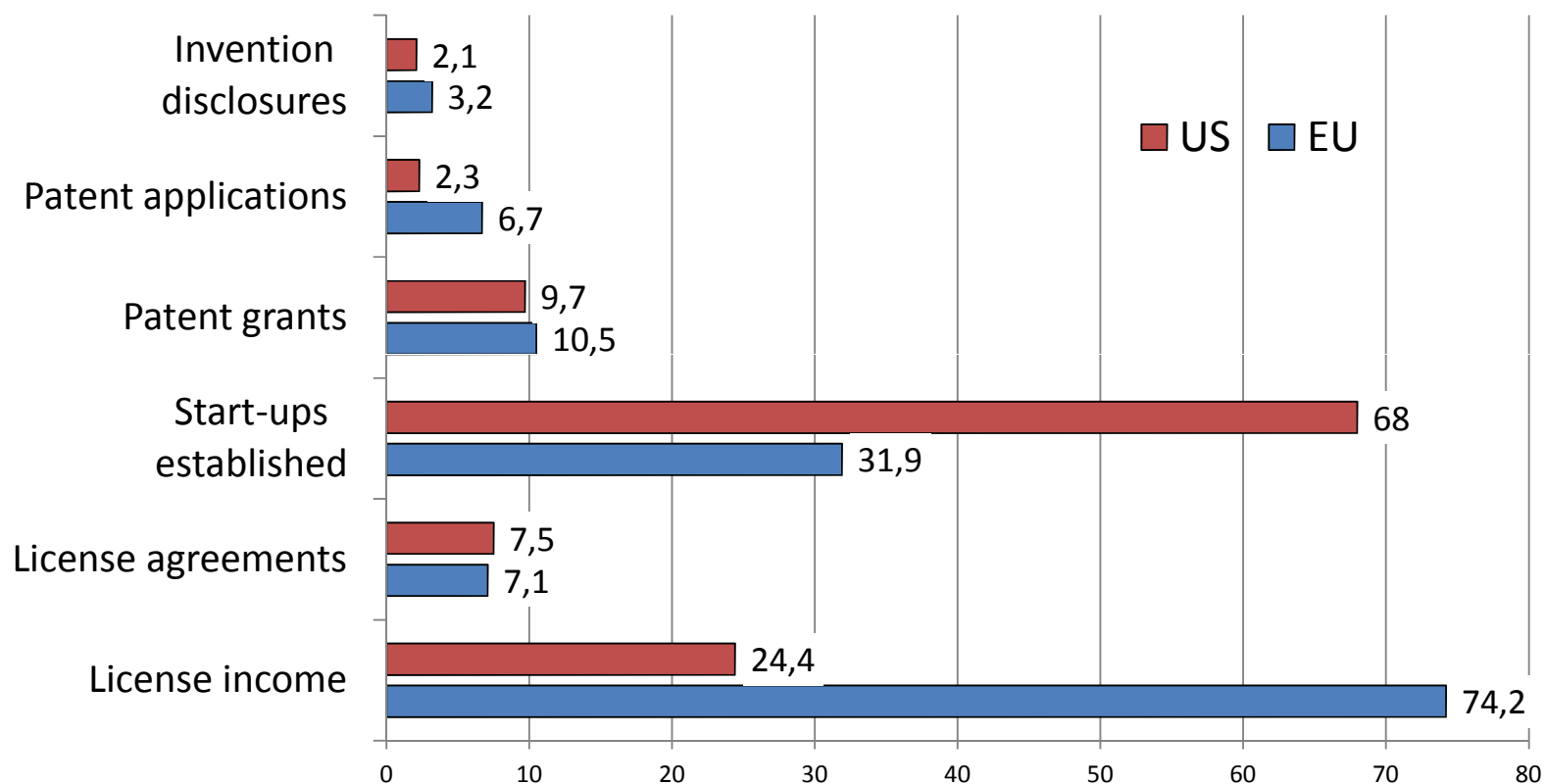


	Universities	Other research organisations	Total
Invention disclosures	16.1	<b>23.3</b>	17.1
Patent applications	8.1	9.2	8.2
Patent grants	4.6	4.4	4.6
USPTO patent grants <sup>2</sup>	1.1	1.0	1.1
Start-ups established	1.6	1.3	1.6
Successful start-ups	<b>2.7</b>	1.7	2.6
License agreements	7.2	6.9	7.2
License income (million €)	0.5	<b>1.7</b>	0.7
Research agreements	83.7	79.2	83

\* Includes EKTIS 2012, HEFCE , DASTI and UTEN respondents



# Europe versus the United States: Million Euros to produce 1 output, 2011



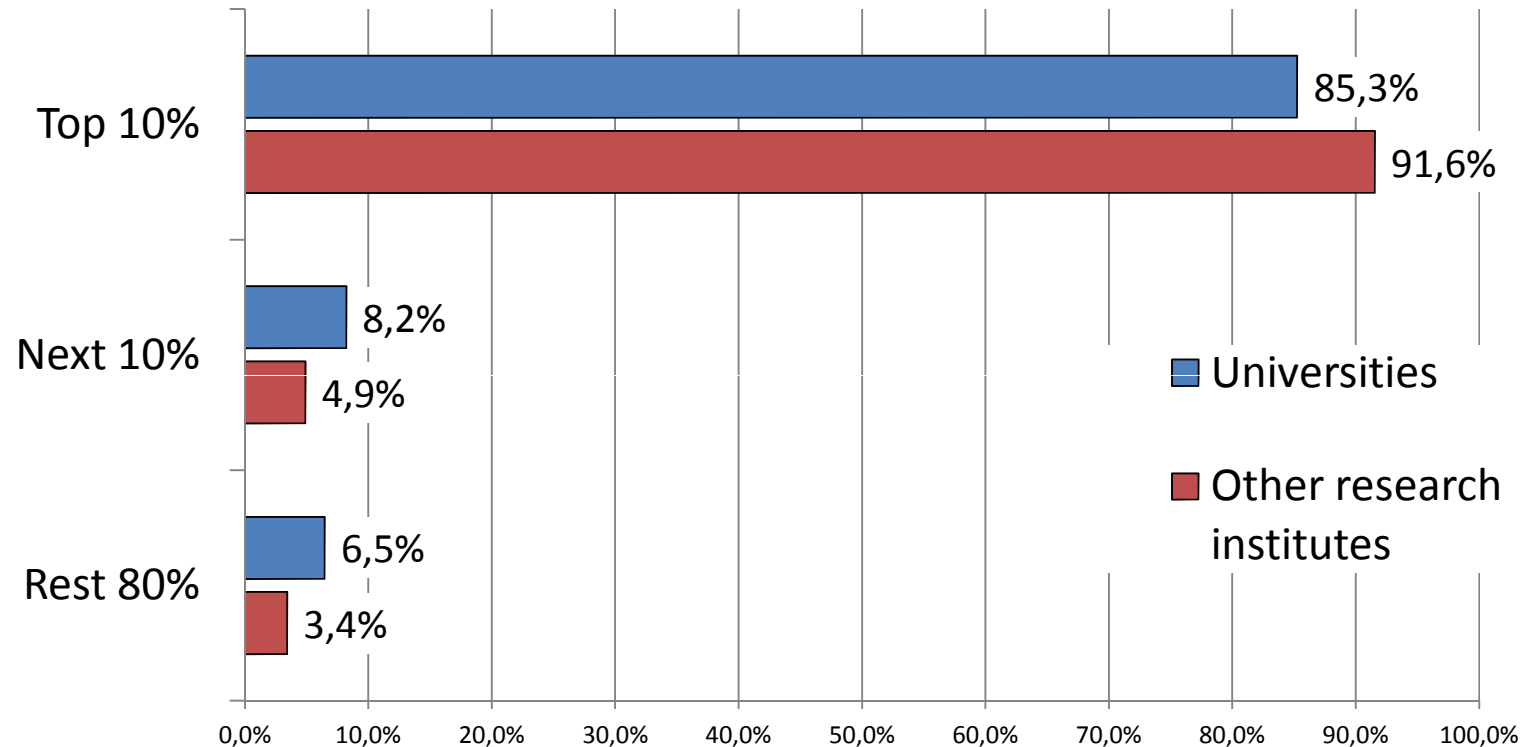
US data from AUTM survey. EU data include EKTIS 2012, HEFCE , DASTI and UTEN respondents



# Licensing results

## EKTIS 2012

# License income: percent earned by top performers, 2011



Total license income reported at universities , €251 million and €160 million by other research organisations.



## Distribution of licenses by type of licensee

Licensee	Universities	Other research organisations	Total
Start-up companies	22.1%	12.2%	19.5%
Other firms with <250 employees	40.3%	47.6%	42.2%
Firms with >250 employees	37.6%	40.2%	38.3%
Total	100.0%	100.0%	100.0%

Smallest share of licenses issued to start-ups. Largest share issued to SMEs.





## License revenue by subject area

	<b>Universities</b>	<b>Other research organisations</b>	<b>Total</b>
Biomedical	80.5%	95.6%	87.1%
Computers, communication equipment and software (ICT)	7.4%	1.4%	4.8%
Nanotechnology and new materials	1.3%	0.2%	0.9%
Low/zero carbon energy technologies	4.0%	0.1%	2.3%
Other subject areas not listed above	6.8%	2.6%	5.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Large majority of all license income is earned from biomedical knowledge.



# Results by country

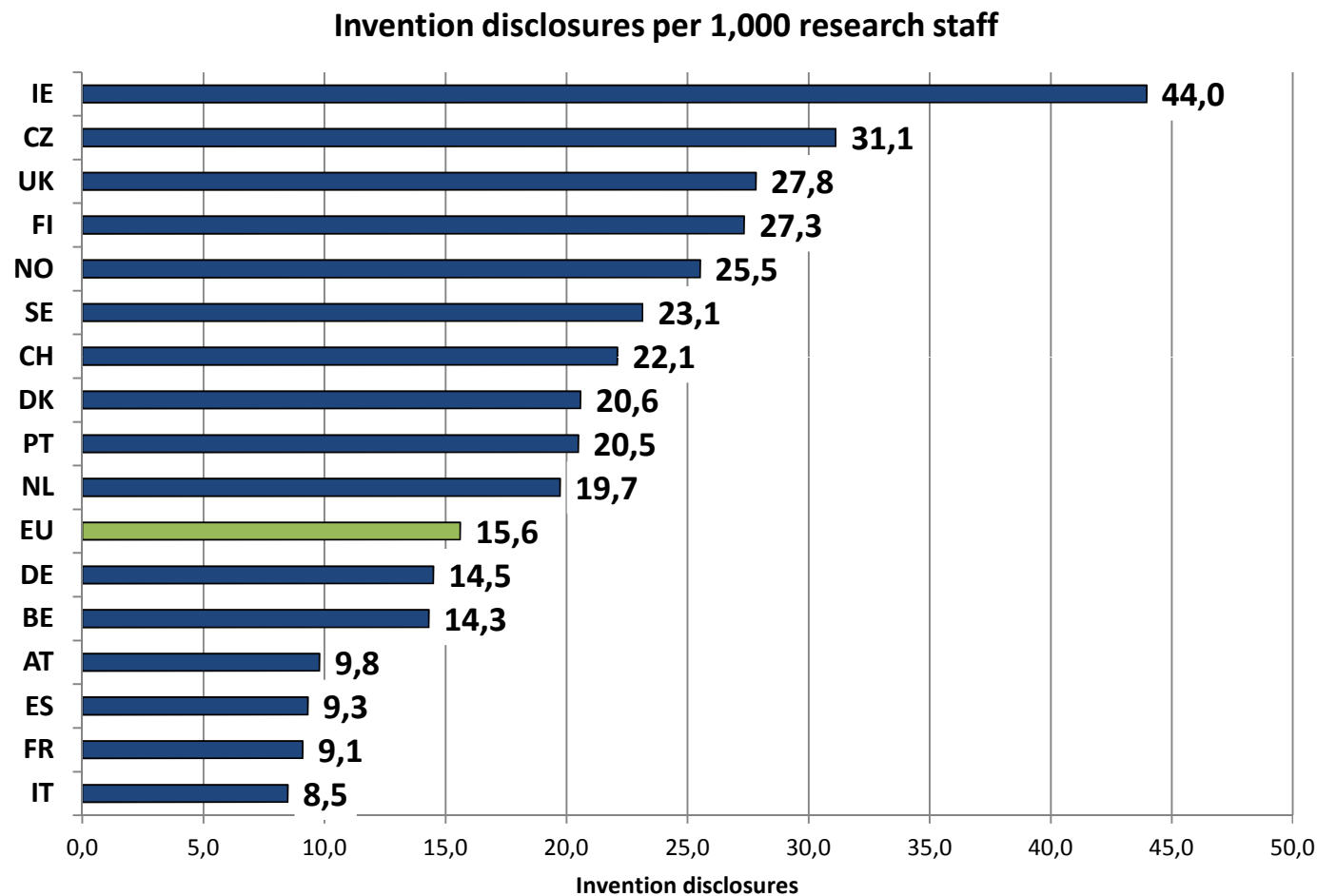


# Number of leading universities included in data

Country	Number of responses (2010 - 2011 combined)	Number of top 500 universities (ARWU 2012)	Of which included in our sample	Percent
Austria	11	7	7	100%
Belgium	11	7	7	100%
Czech Republic	9	1	1	100%
Denmark	10	4	4	100%
Finland	8	5	3	60%
France	33	20	9	45%
Germany	84	37	35	95%
Hungary	6	2	2	100%
Ireland	12	3	3	100%
Italy	34	20	14	70%
Netherlands	11	13	10	77%
Norway	8	4	4	100%
Poland	7	2	2	100%
Portugal	21	3	3	100%
Spain	43	11	11	100%
Sweden	7	11	7	64%
Switzerland	20	7	7	100%
United Kingdom	94	38	38	100%
<b>Total</b>	<b>429</b>	<b>195</b>	<b>167</b>	<b>86%</b>

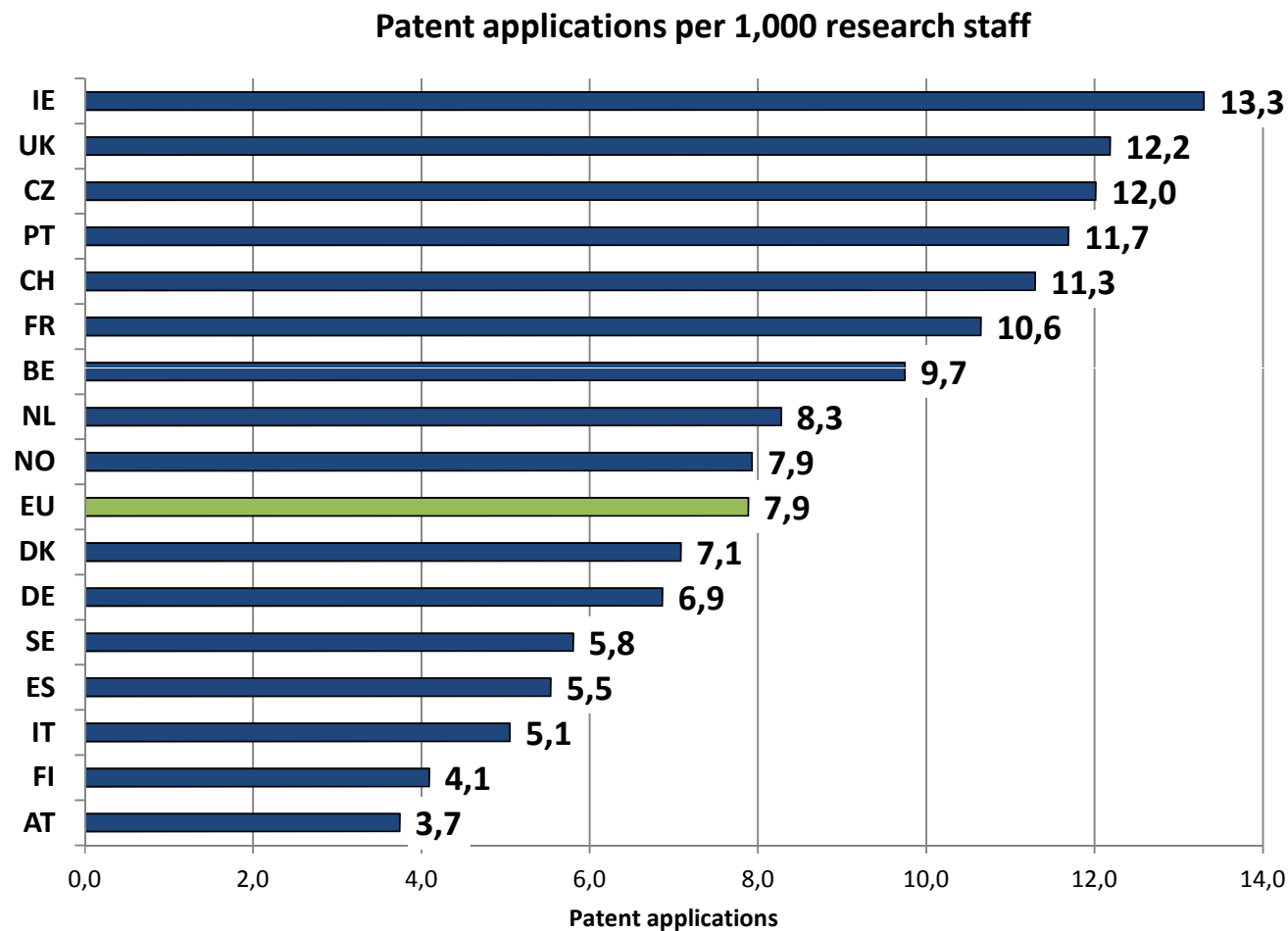


# Invention disclosures



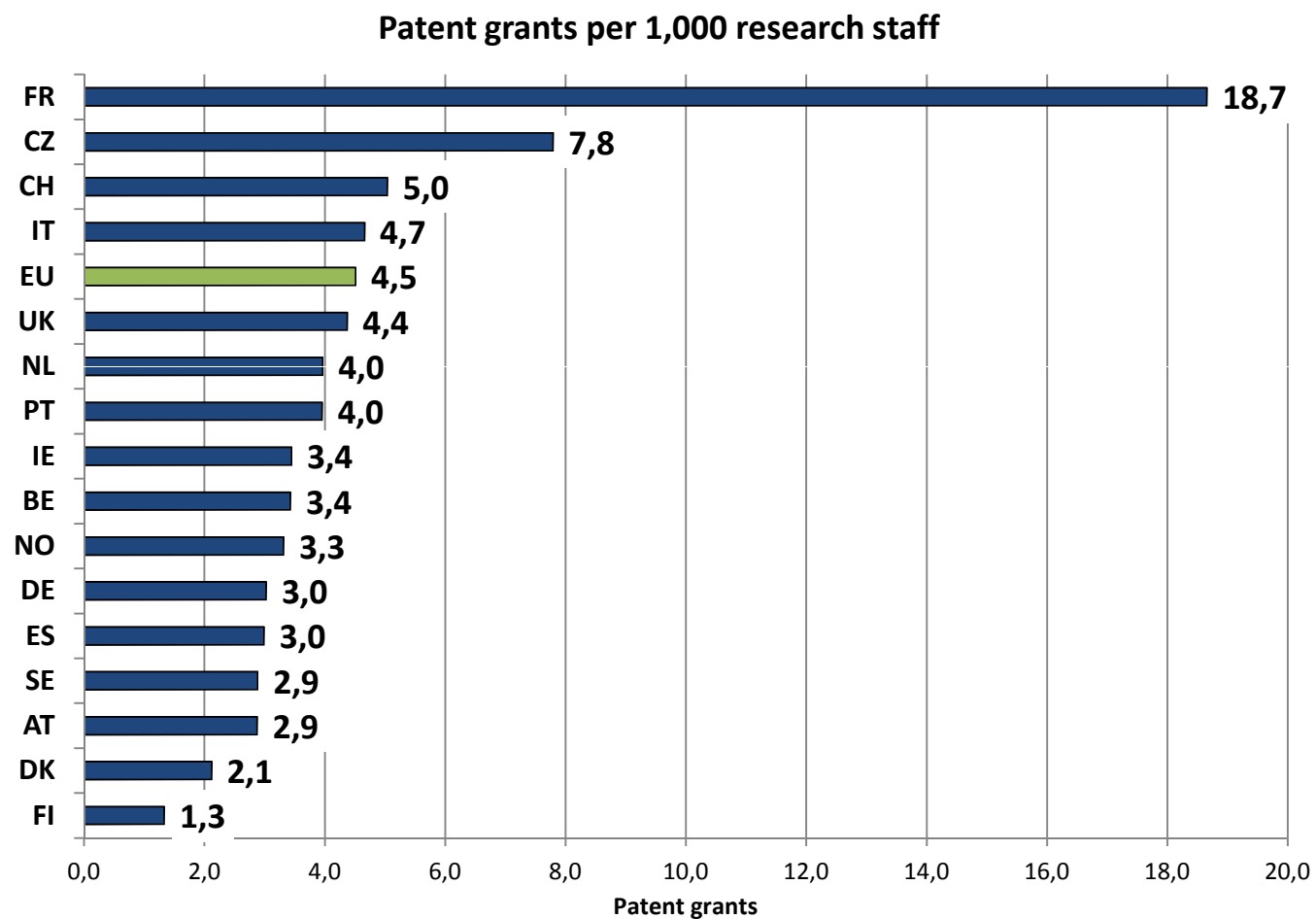


# Patent applications





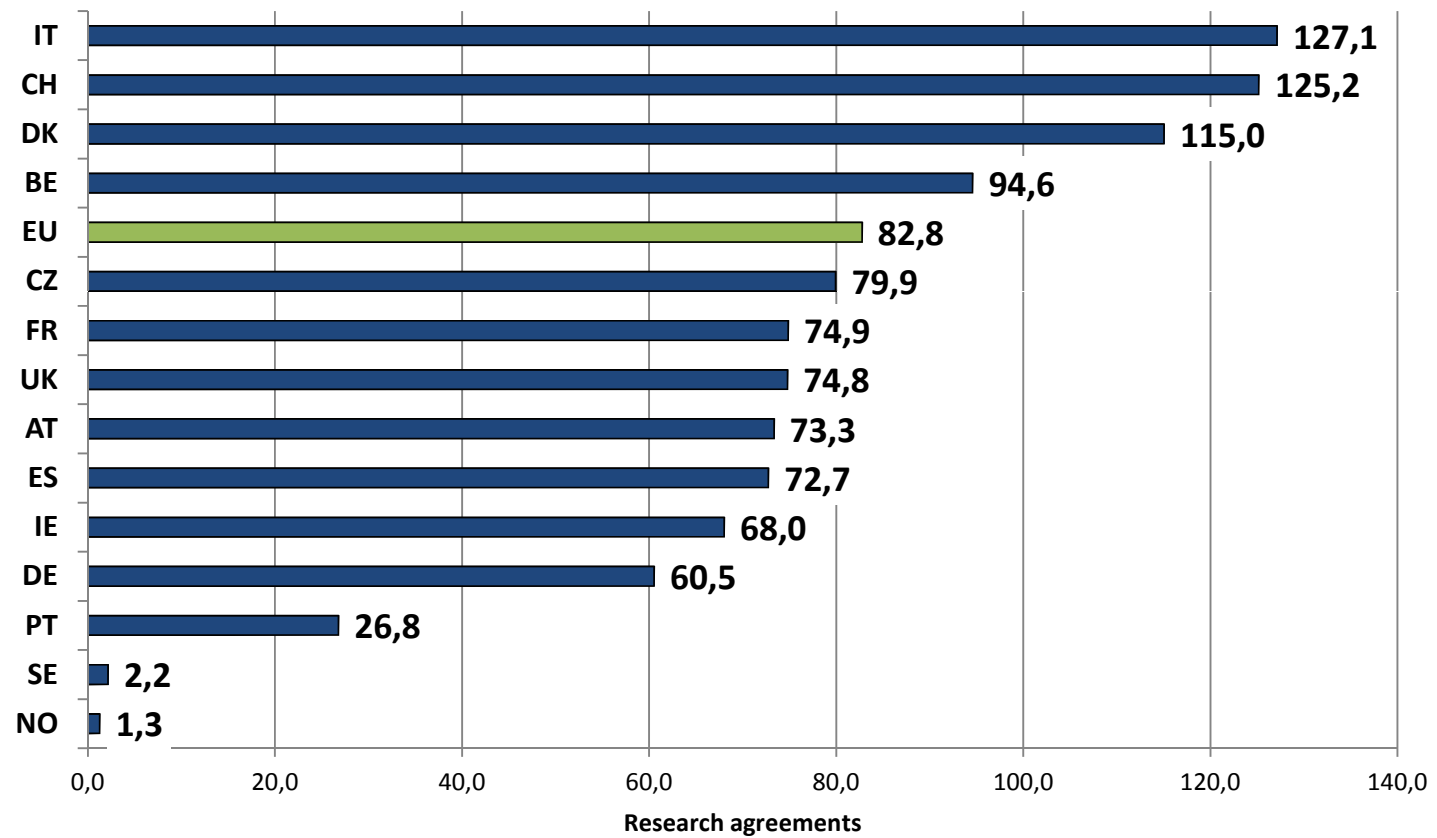
# Patent grants



# Research agreements with companies



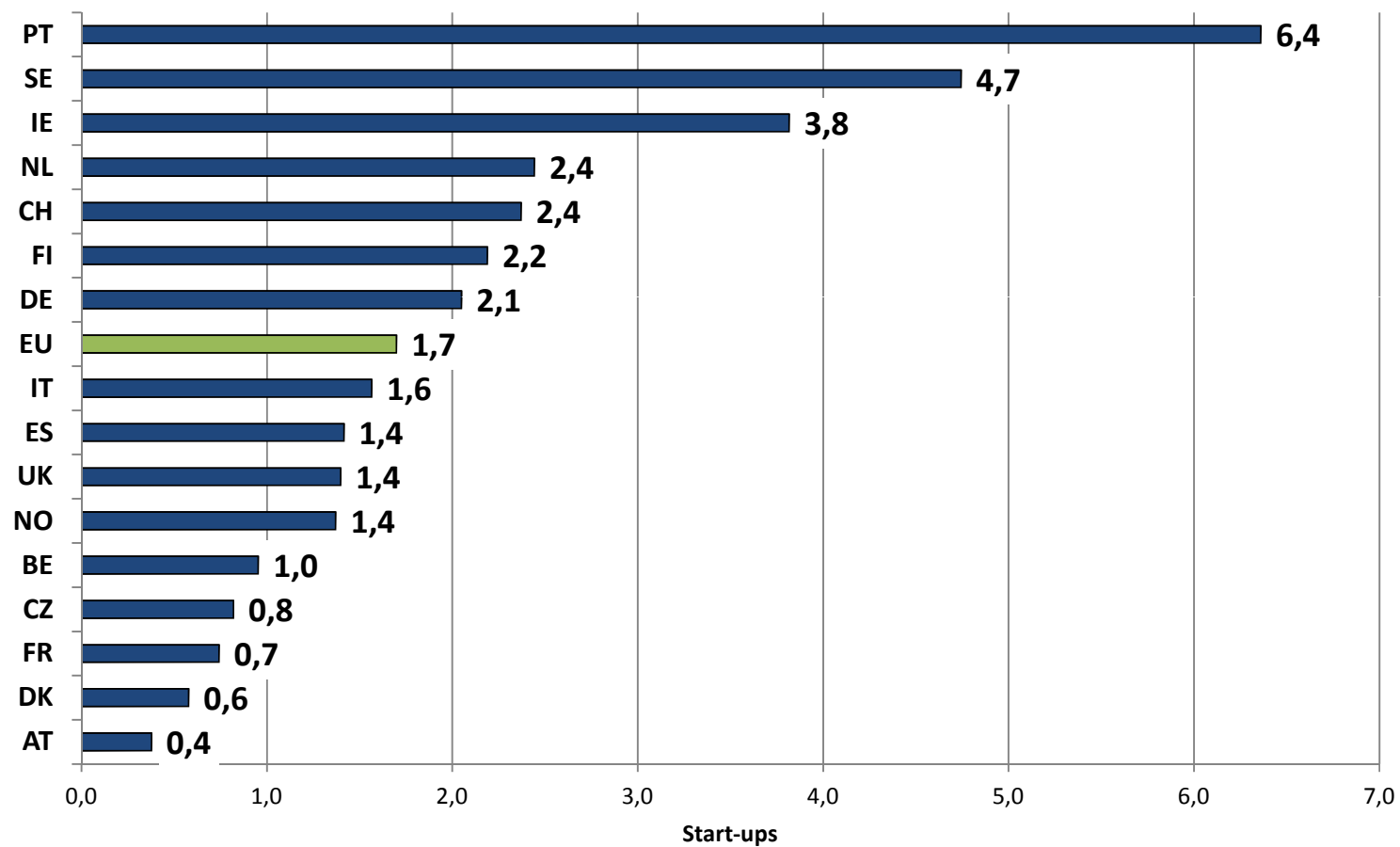
Research agreements per 1,000 research staff





# Start-ups

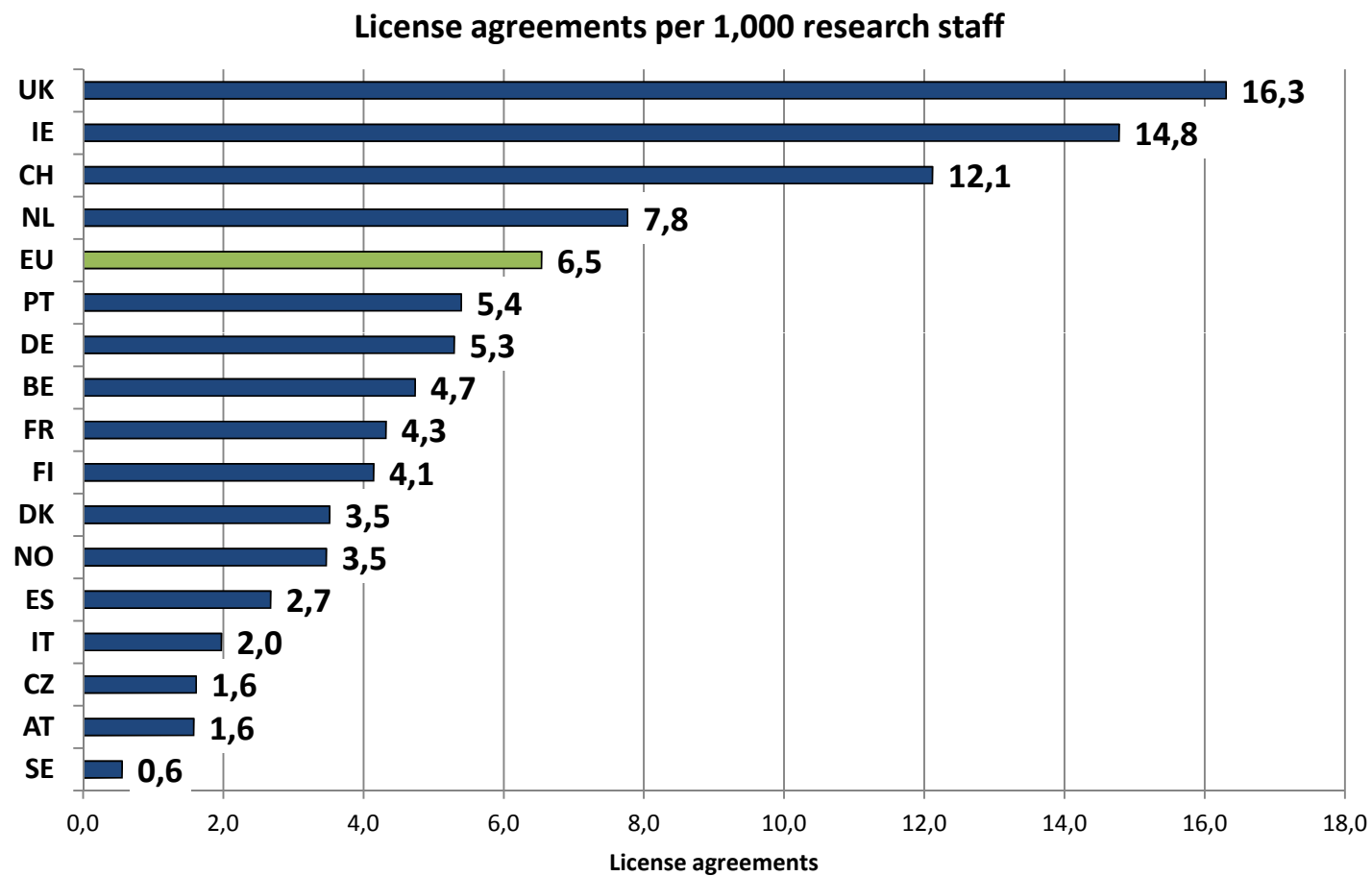
Start-ups per 1,000 research staff







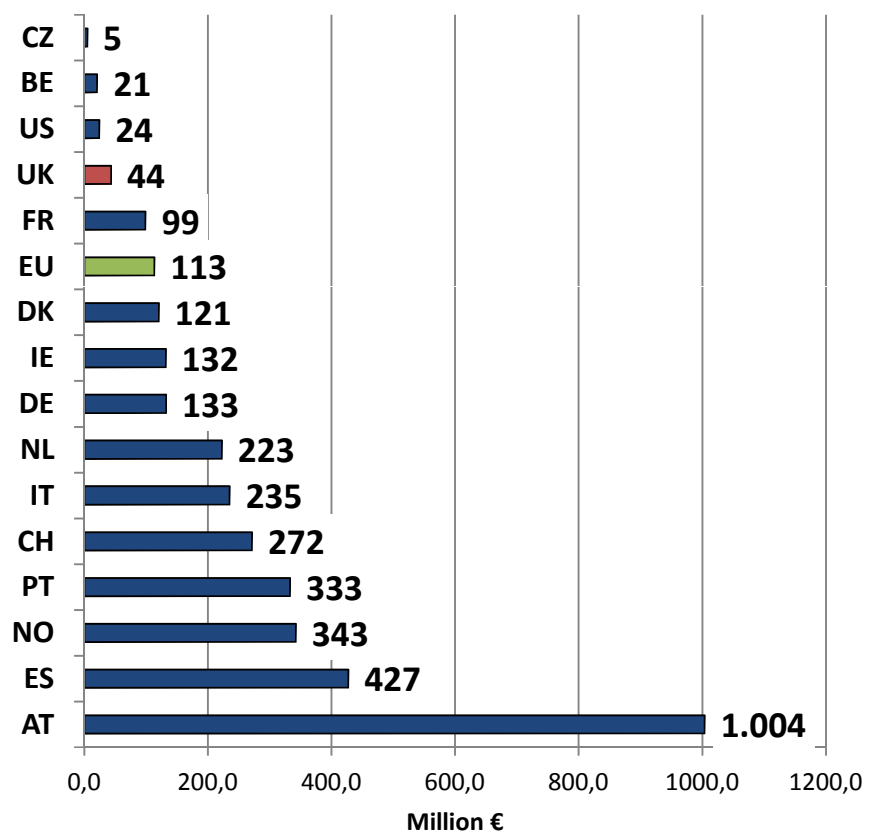
# License agreements



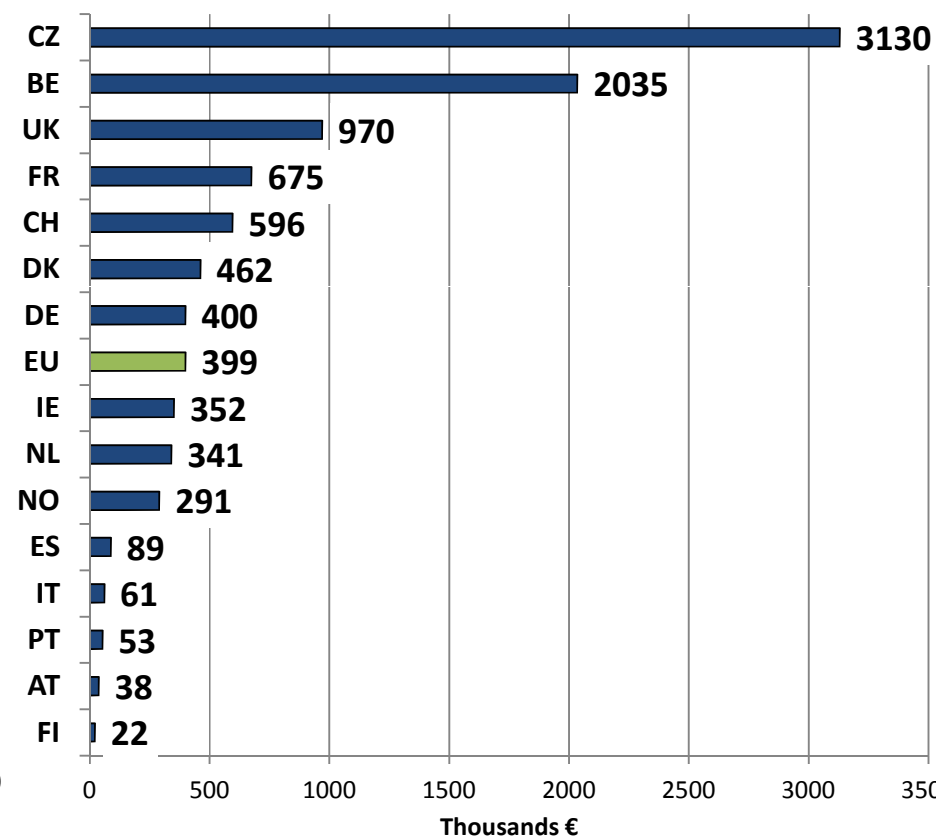


# License income

Million € research to earn 1 million € of license income



License income per 1,000 research staff





# Composite indicator

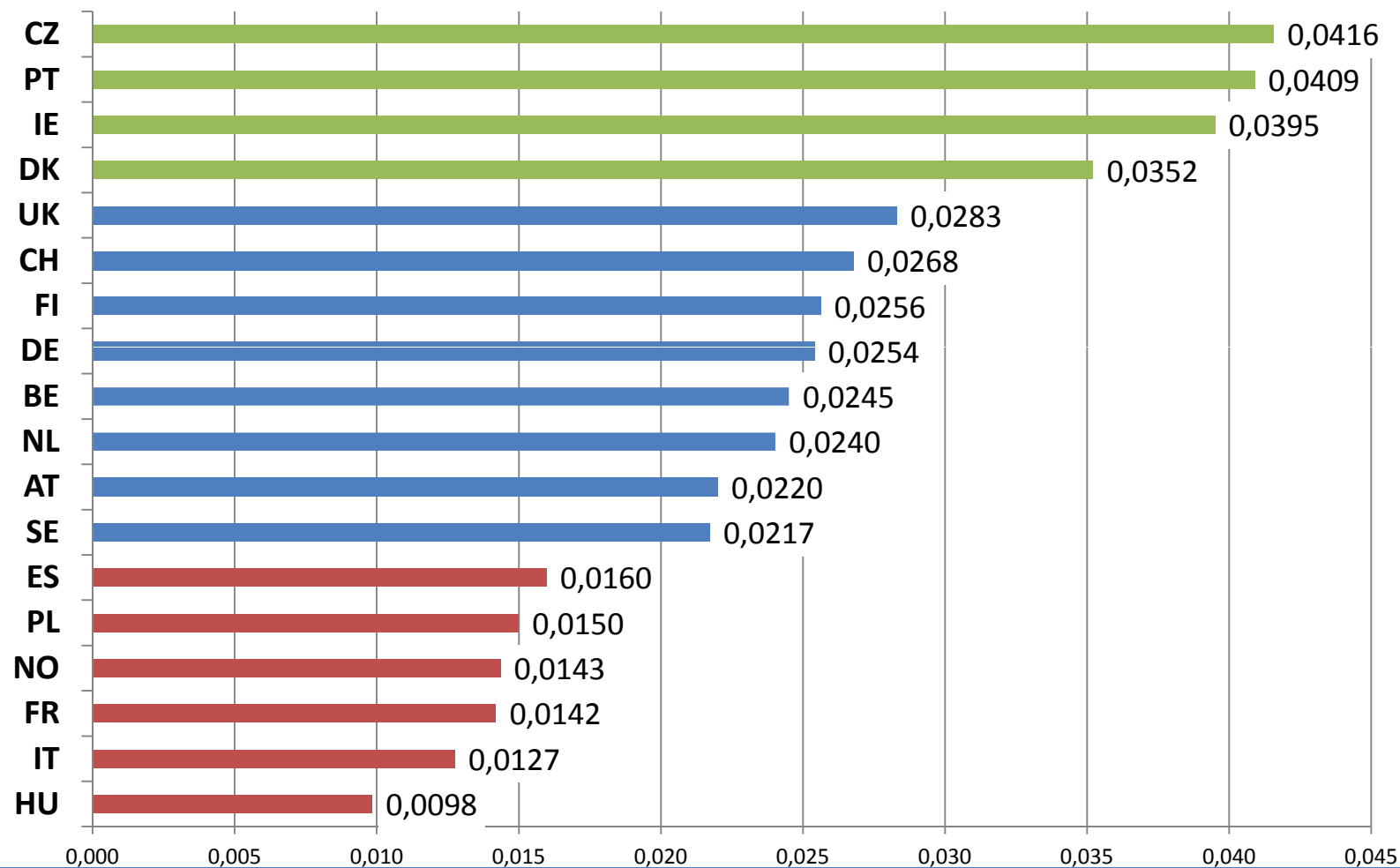


# Methodology

- 7 key indicators, denominator research staff
- Normalisation:  $Y_i = ((X_i - \text{smallest } X) / (\text{largest } X - \text{smallest } X))$ 
  - All scores between 0 and 1
- Weight of output indicators (start-ups, # licenses, license income) **larger** than input variables (invention disclosures, patent applications, patent grants, research agreements)
- Ideally a composite indicators should also include:
  - **KT trained people**, i.e. HEI graduates and PhD graduates employed in business enterprise sector.
  - And **cooperation with industry**, i.e. firms cooperating with PROs, consultancy contracts with firms and revenue generated from this.

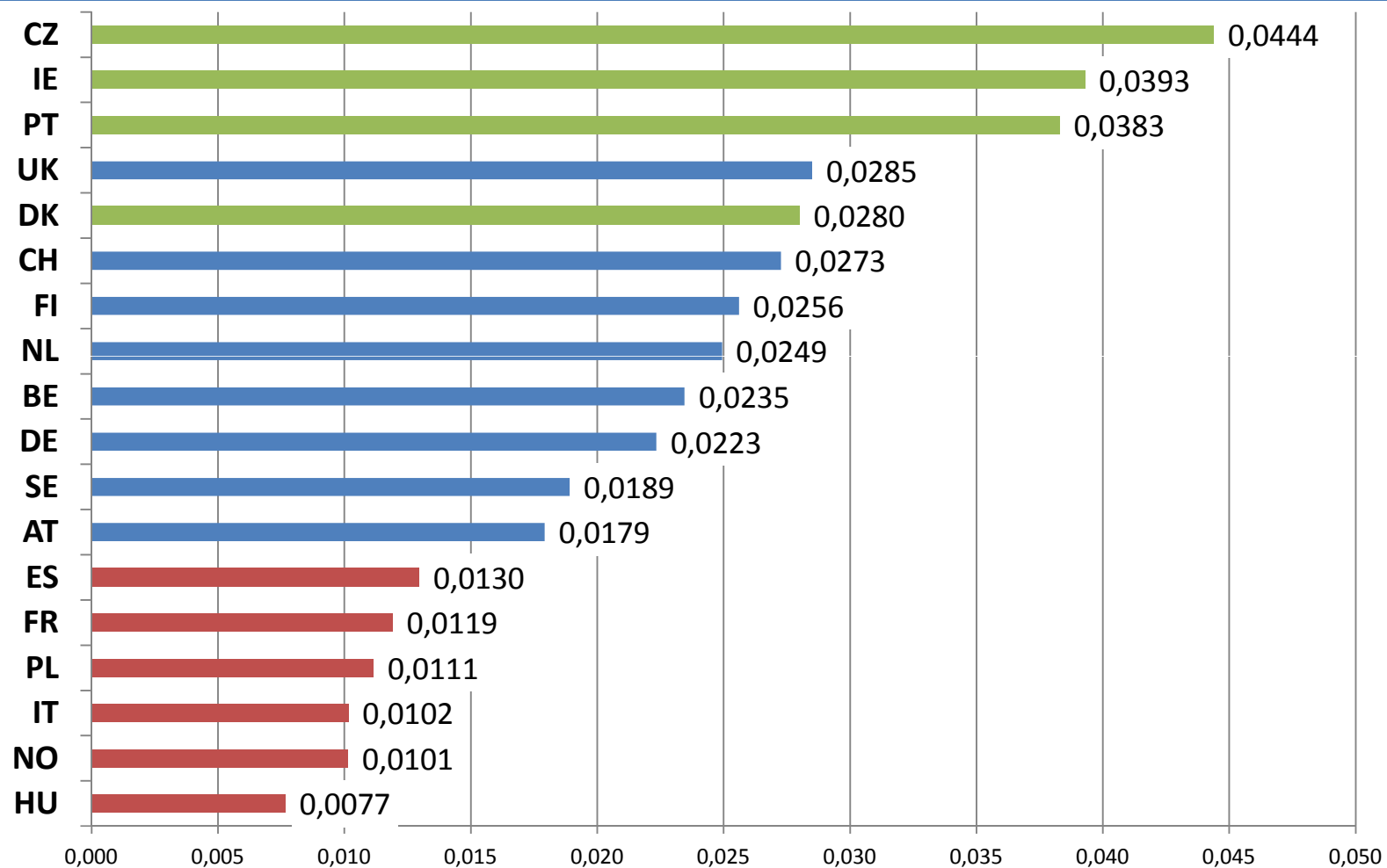


# Composite indicator - equal weights





# Composite indicator – variable weights





# Panel data results



## Panel data results

Panel data for 320 organisations of which 271 are universities and 49 other research organisations

– Average change in 2011 compared to 2010

	Universities	Other research organisations
KTO staff	8.6%	6.1%
Research staff	-2.0%	1.0%
Research expenditures	3.7%	10.9%
License income	-5.1%	6.8%



# Standardised performance outcomes

Per 1,000 research staff at **universities**, panel data  
2010 and 2011



	2010	2011	Absolute change	Growth rate
Invention disclosures	16.2	17.1	0.9	5.7%
Patent applications	8.4	8.8	0.4	5.1%
Patent grants	5.4	5.1	-0.3	-5.0%
USPTO patent grants <sup>2</sup>	0.8	0.9	0.1	10.5%
Start-ups established	1.4	1.6	0.2	17.3%
Successful start-ups	4.0	3.6	-0.4	-10.1%
License agreements	7.9	8.7	0.7	9.2%
License income (million €)	0.5	0.5	-0.0	-3.5%
Research agreements	90.5	80.5	-10.0	-11.0%
Total reported number of research staff	553,330	543,679	- 9,651	-1.7%

Based on answers for EKTIS 2011 and 2011 combined. Results include ASTP, DASTI (DK), HEFCE (UK), RedOTRI (ES) and UTEN (PT) respondents.

# Standardised performance outcomes

Per 1,000 research staff at **other research organisations**, panel data 2010 and 2011



	2010	2011	Absolute change	Growth rate
Invention disclosures	21.5	19.5	-1.9	-9.0%
Patent applications	7.4	8.1	0.7	9.4%
Patent grants	2.7	3.3	0.6	20.6%
USPTO patent grants <sup>2</sup>	0.5	0.5	0.0	5.8%
Start-ups established	1.6	1.2	-0.4	-26.8%
Successful start-ups	1.6	1.4	-0.2	-12.1%
License agreements	4.5	6.0	1.5	33.8%
License income (million €)	2.8	2.9	0.1	4.9%
Research agreements	45.3	35.6	-9.7	-21.4%
Total reported number of research staff	77,814	79,388	1,573	2.0%

Based on answers for EKTIS 2011 and 2011 combined. Results include ASTP, DASTI (DK), HEFCE (UK), RedOTRI (ES) and UTEN (PT) respondents.



# Conclusions

## Characteristics of KTOS

- Most KTOs are young, with 60.7% established after 2000
- 50.3 % have fewer than five employees

## Performance measures

- License income highly concentrated (top 10% account for 85% of all license income)
- Biomedical IP largest generator of license revenue
- Majority of licenses issued to SMEs or large firms
- European PROs are more efficient (lower cost per type of output) than US PROs for start-ups and license agreements.
- US PROs are more efficient for invention disclosures, patent applications, patent grants and license income



# Conclusions

## Country results

- Several possible country specific characteristics for its performance
- Careful interpretation of the significance of knowledge transfer indicators in cross country comparisons

## Panel data

- Average KTO staff has increased
- Average license income at universities decreased (5.1%)
- Universities performed better in 2011 compared to 2010 on invention disclosures, patent applications, USPTO patent grants, start-ups and license agreements
- Other research organisations performed better in 2011 compared to 2010 on patent applications, patent grants, USPTO patent grants, license agreements and license income



# Further information

[a.arundel@maastrichtuniversity.nl](mailto:a.arundel@maastrichtuniversity.nl)

[n.es-sadki@maastrichtuniversity.nl](mailto:n.es-sadki@maastrichtuniversity.nl)

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

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## Knowledge Transfer Study 2010-2012

Monitoring study regarding the implementation of the Commission Recommendation and Code of Practice on the management of intellectual property in knowledge transfer activities in Member States and Associated Countries.

The purpose of the Knowledge Transfer Study 2010-2012 is to support the monitoring and reporting process of the European Commission's Recommendation and Code of Practice on Knowledge Transfer.

Europe seems to be better at producing high-level knowledge than at converting it into socio-economic benefits. In addition to the classical modes of transfer and dissemination of knowledge, such as research publications and exchanges of researchers, Public Research Organisations and Universities performing research need to more actively engage in the exploitation of publicly-funded research results, for instance through academia-industry collaborations, licensing and spin-offs.

In April 2008, the European Commission adopted a Recommendation on the management of intellectual property in knowledge transfer activities and Code of Practice for universities and other public research organisations. The aim was to offer a coherent framework for the management of intellectual property by the public research sector, to promote knowledge transfer between the public and private sectors, both within and between Member States.

In order to follow-up and promote the implementation of this Recommendation and Code of Practice, a monitoring and reporting system is being set up.

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The Knowledge Transfer Study, 2010-2012 is a service for the European Commission's DG Research and Innovation, based on contract number RTD/Dir C/C2/2010/SI2.509045.