



Education and Culture DG

Lifelong Learning Programme



# The Graduates of Science: Labour Market Experience and HEIs Context

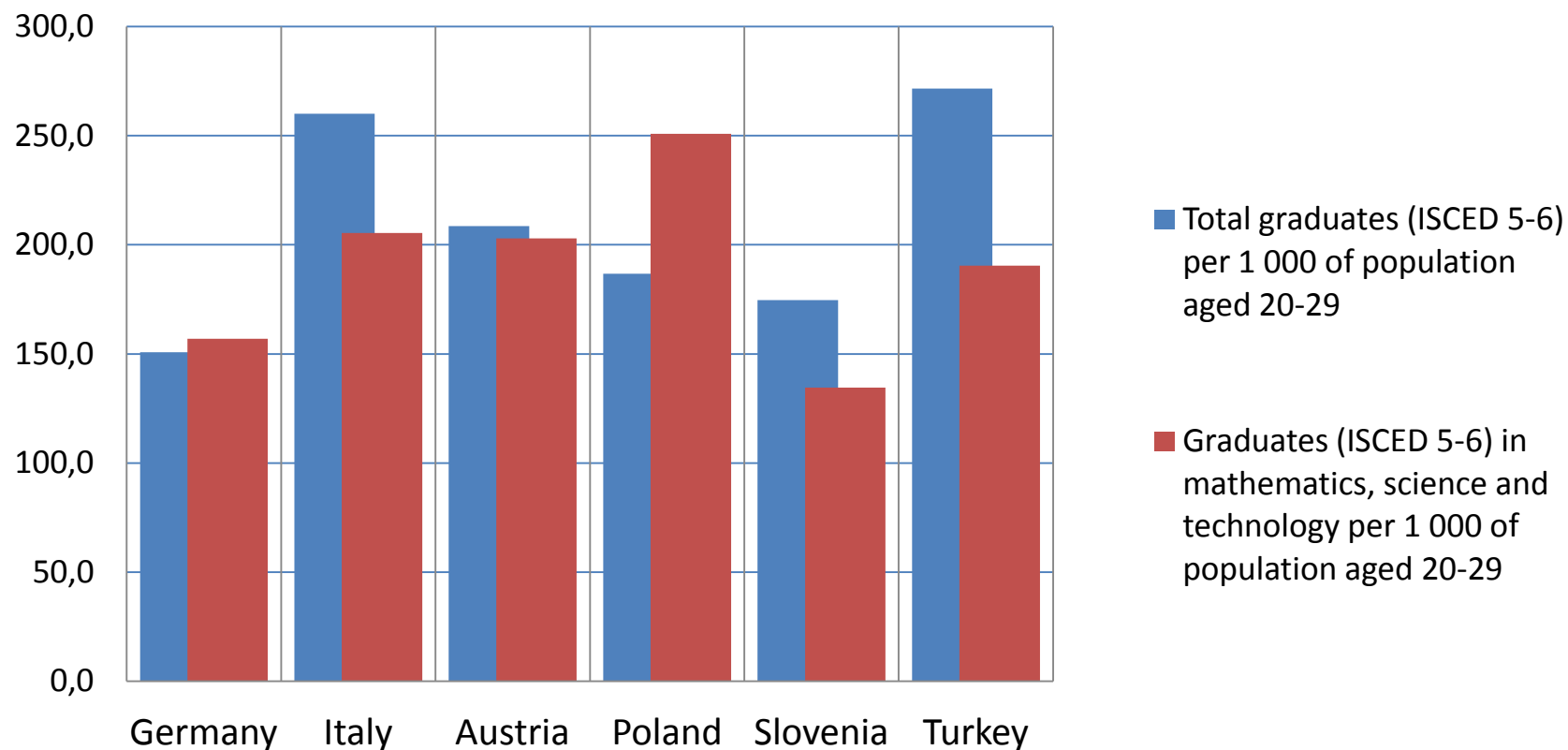
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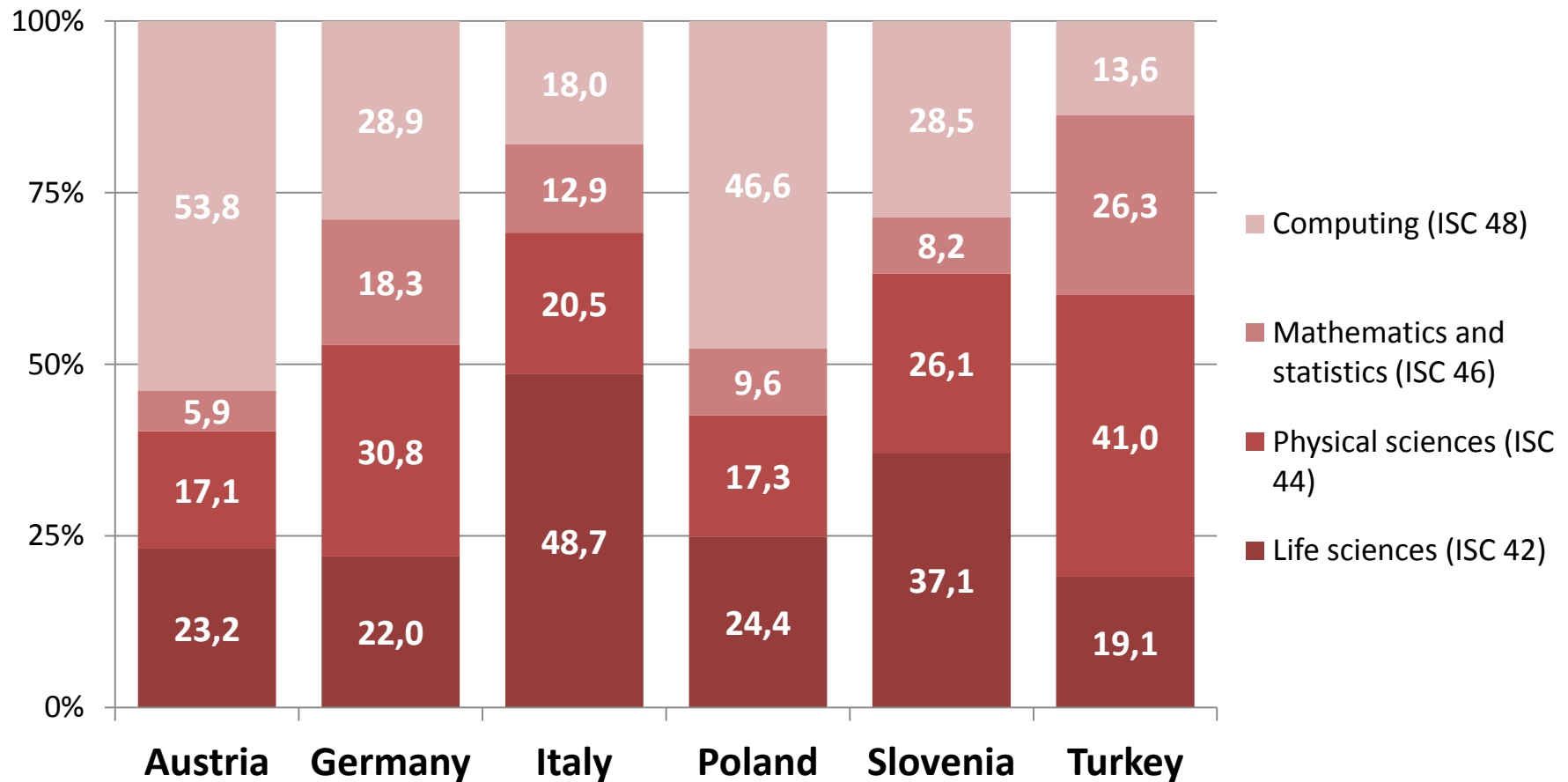
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# Total tertiary graduates and tertiary graduates in Science and Technology 2009/1999 dynamics



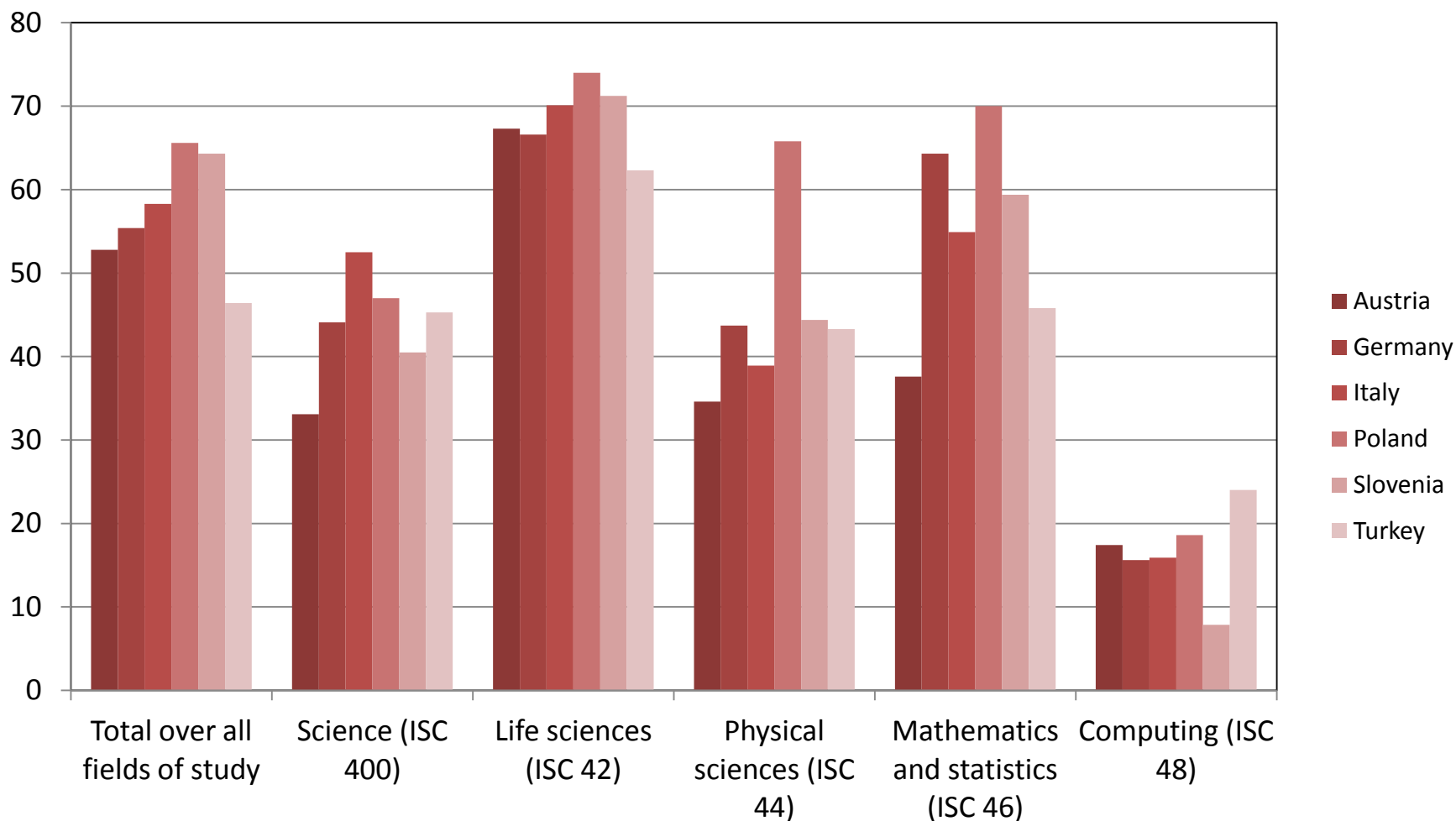
Source: Own elaboration of the Eurostat data.

# Structure of the Science domain



Source: Own elaboration based on OECD (2011).  
 Note: Last available data for Austria for 2008.

# Feminization rates



# Teaching and learning modes

	Non-DEHEMS	AT	DE	IT	PL	SI	TR	Total
Extent in which the following characteristic was emphasized in the study programme:								
Multiple choice exams	2.08	1.63	1.43	1.68	2.82	1.63	2.20	2.00
Oral presentations	2.62	3.02	3.17	3.38	2.94	2.88	2.57	2.74
Written assignments	3.16	3.48	3.41	3.26	3.32	3.61	2.86	3.20
Problem based learning	2.71	2.91	2.60	2.63	2.79	2.49	2.69	2.70
Teacher as the main source of information	3.49	3.51	3.37	3.85	3.48	3.32	3.41	3.50
Theories and paradigms	3.75	3.63	3.46	3.31	3.80	3.80	3.24	3.66
Research Project	2.32	2.47	2.17	2.50	1.89	1.98	2.64	2.33
Group assignments	2.94	3.10	3.01	2.55	3.21	2.49	2.57	2.88
Lectures	3.84	4.18	4.17	4.21	4.01	4.14	4.10	3.94
Academically prestigious programme	3.13	3.40	3.38	3.41	3.33	3.16	3.43	3.20
Employers familiar with the programme	2.79	2.83	2.60	2.68	2.92	2.96	2.32	2.75
To what extent has your study programme been a good basis for:								
Personal development	3.67	4.09	3.93	3.78	3.73	3.44	3.44	3.69
Performing your current work tasks	3.28	3.63	3.23	3.20	3.20	3.30	2.86	3.26
Starting work	3.46	4.01	3.39	3.27	3.58	3.22	2.89	3.42

Source: Own elaboration based on REFLEX/HEGESCO data.

Note: In each question a respondent assessed given programme characteristics by choosing a number from 1 ("Not at all") to 5 ("Very high extent").

# International mobility

Country	After graduation for work			After graduation for study			During study for work			During study for study		
	Science	Total	Ratio	Science	Total	Ratio	Science	Total	Ratio	Science	Total	Ratio
Austria	37.5	24.7	1.5	12.5	8.1	1.6	11.9	10.7	1.1	27.4	32.2	0.9
Germany	16.2	12.5	1.3	5.6	5.2	1.1	2.3	4.7	0.5	24.7	28.6	0.9
Italy	10.9	11.3	1.0	10.3	10.0	1.0	1.6	3.2	0.5	15.1	16.1	0.9
Poland	29.6	23.6	1.3	8.0	5.4	1.5	18.2	21.0	0.9	13.6	15.5	0.9
Slovenia	10.0	7.5	1.3	10.5	7.4	1.4	7.8	6.1	1.3	8.9	9.6	0.9
Turkey	10.7	15.3	0.7	3.6	7.1	0.5	2.7	3.5	0.8	3.1	5.8	0.6
Total	17.2	14.5	1.2	8.5	6.8	1.2	7.2	8.4	0.9	14.9	16.9	0.9

Source: Own elaboration based on REFLEX/HEGESCO data.

# Transition to employment – search for first jobs (duration in months)

Country	DEHEMS	AT	DE	IT	PL	SI	TR	Other	Total
Mean	4.8	1.8	1.9	4.3	1.5	4.0	10.2	3.5	3.9
SD	8.7	3.1	3.2	8.0	1.5	6.1	12.8	6.0	7.0
Science/All domains									
Mean	1.203	0.798	0.878	1.358	0.792	0.837	1.266	1.307	1.287
SD	1.258	0.875	0.733	1.276	0.638	0.912	1.267	1.172	1.229

Note: SD – standard deviation

Source: own calculations based on HEGESCO and REFLEX data.

# Occupations

- No general occupational destination of Science graduates:
  - **school teachers** in the public sector of secondary education,
  - **professional experts** in various fields not necessarily related to Science (requiring analytical thinking as in banking, financial and insurance sectors being very popular employment among physics and mathematics graduates),
  - **advanced researcher positions** in research institutes and universities.

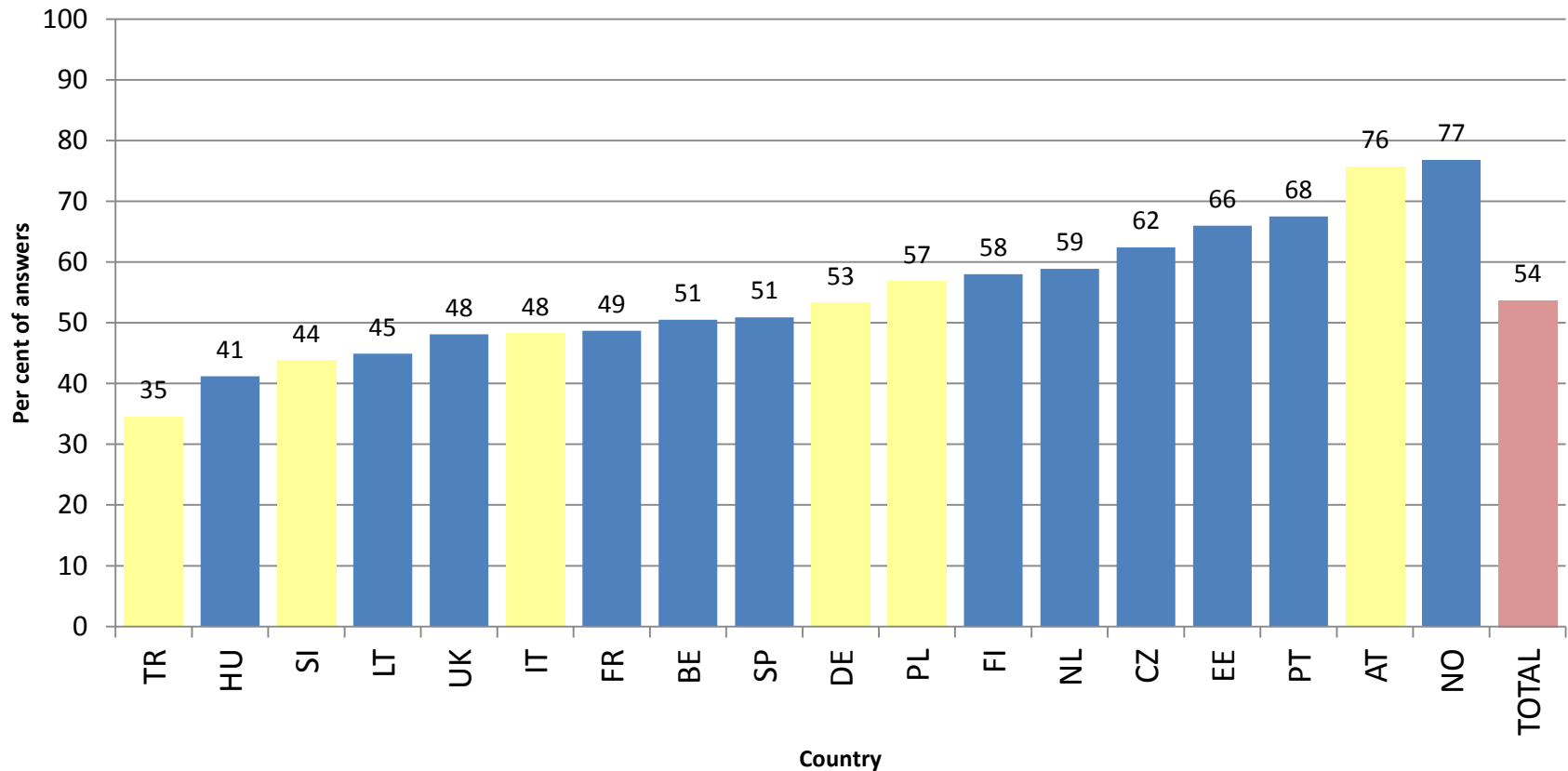


# Type of contract in the first job: Science vs all domains

	DEHEMS	AT	DE	IT	PL	SI	TR	Other	Total
Unlimited	43.04	65.06	45.12	27.74	31.51	33.52	55.11	45.99	45.06
Fixed-term	52.32	34.34	54.88	68.98	65.75	57.95	34.67	48.01	49.37
Other	4.64	0.60	0.00	3.28	2.74	8.52	10.22	6.01	5.57
Science/All domains									
Unlimited	0.902	1.081	0.883	0.835	0.948	0.790	0.819	0.912	0.908
Fixed-term	1.129	0.885	1.130	1.143	1.042	1.160	1.706	1.078	1.095
Other	0.782	0.606	0.000	0.510	0.747	1.115	0.826	1.195	1.051

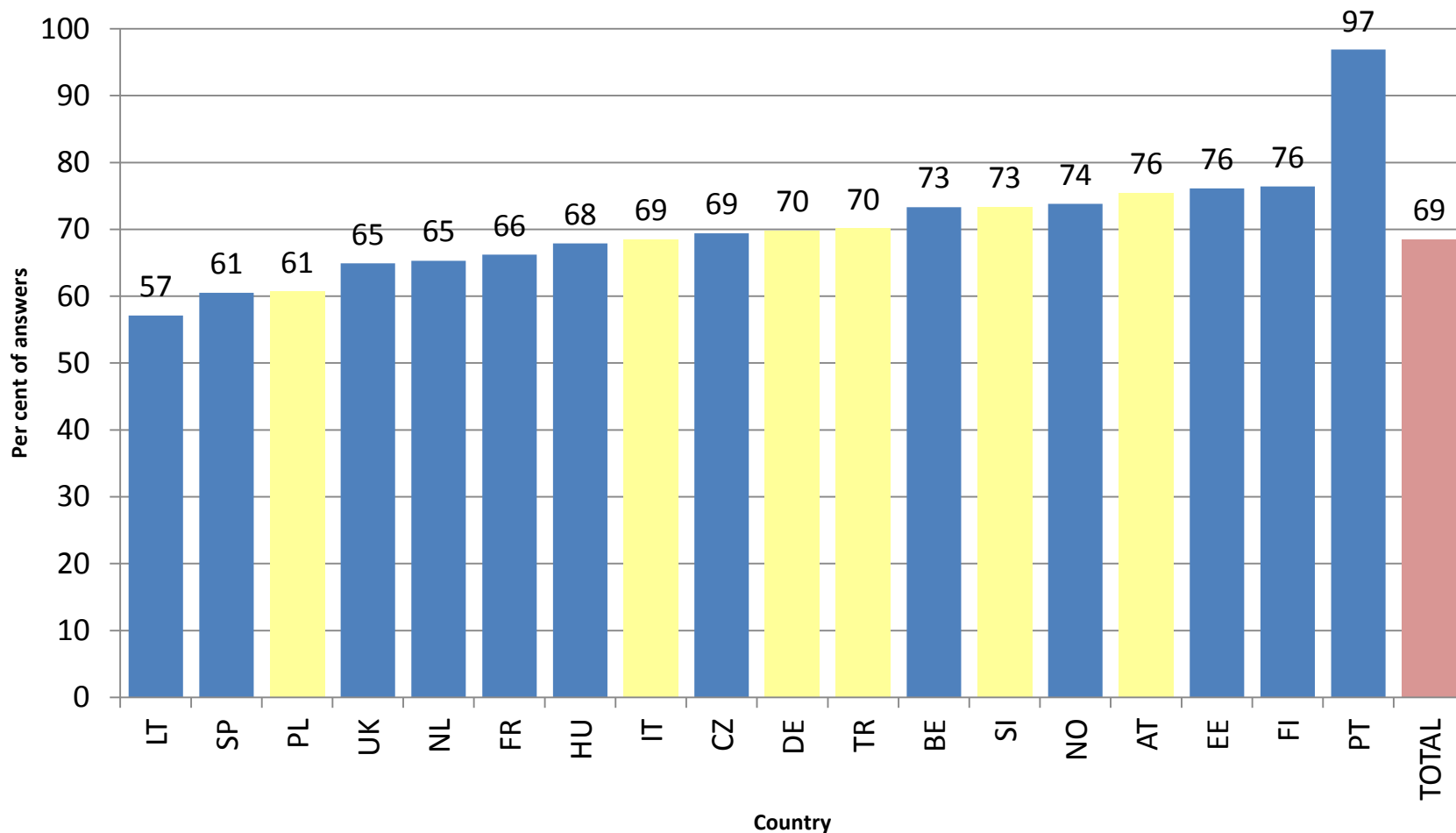
Source: own calculations based on HEGESCO and REFLEX data.

# Study programme as a basis for starting work



Question I1a (Hegesco), I1a (Reflex): To what extent has your study programme been a good basis for starting work. Responses 4 and 5 on a scale of answers from 1 = "Not at all" to 5 = "To a very high extent".

# Utilisation of knowledge and skills in current work



Question F11 (Hegesco), F11 (Reflex): To what extent are your knowledge and skills utilized in your current work? Responses "to a high or a very high level".

# HEI management perspectives on graduates professional careers – the idea of success

- Generally quite **unclear** notion of **success**
- **Contact** between HEIs and their former students are **generally** reported to be **rare** and **not formalized**
- **Scarcity of hard data** regarding professional paths of the graduates

# HEI management perspectives on graduates professional careers – HEIs' activities

- Study programmes:
  - **not much oriented towards labour market** requirements
  - slowly reacting to challenges (exception of Computer Science)
- **International orientation** is an important trait of this domain
- Teaching **modes** combine **practical** and **theoretical** approaches
- **Practical** orientation and **apprenticeships** are relevant only in **some** subdomains
- **Research projects** play an **important** role in fostering student research potential

# HEI management perspectives on graduates professional careers – developmental needs

- **Closer** and more intensive **cooperation with employers** and high quality apprenticeship
- **Closer** and individualized **relationship** between **professors and students** strengthen soft skills
- **Quality** of education and internationalisation with **fewer financial resources?**
- Problem of **secondary school graduates'** competencies

# Conclusions

- Division between **Computing** sciences and **other** subdomains:
  - dynamic increase vs relatively stable **numbers of students**
  - programmes offered also by newly established, private **HEIs**, vs traditional, large universities
  - **programme changes** more market driven vs more isolated from the external world

# Conclusions

- Higher than average incidence of continuing education for the **M.A.** and **Ph. D.** studies (exception: Computing)
- **Academic careers** listed by HE Interviewees as main career paths for successful graduates
- **Bologna** process adopted in all subdomains, negative assessment of **three cycle studies**



# Conclusions

- Generally high **employment rates** (over 90%)
- Higher incidence of **unemployment** and inactivity among Science graduates compared to other domains
- HEIs opinion: Science graduates **not having problems** with finding employment.

# Conclusions

- Longer search for **first job** than for graduates of other domains
- Key factor of successful finding of the first employment according to graduates is the **support provided by HEIs**
- HEIs opinion: **no need for assistance** due to high employability of their graduates. As one of the interviewee from Poland said: *“Mathematics graduates work partially in their field and partially as simply intelligent people”*.