

Locally embedded reindustrialization through a system of students' theses oriented to companies

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The role of Universities

- traditionally:
 - teaching
 - research
- end of 20th century:
 - supporting of economic development




A triple helix model of university–industry–government

- developed in the 1990s by Etzkowitz (1993) and Etzkowitz and Leydesdorff (1995)
- a reaction to increasing role of universities as producers and disseminators of knowledge
- spiral pattern of interactions at different levels among three institutional spheres: academic, public and private



open innovation

- The concept of proposed by Chesbrough (2003)
- effective usage both of inflows and outflows of knowledge in order to improve internal innovation
- Among six characteristics: change from unimportance of universities to their importance

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- “members of the small band of British scientific men have made revolutionary discoveries in science; but yet the chief fruits of their work have been reaped by businesses in Germany and other countries, where industry and science have been in close touch with one another”
 - Marshall 1919, p. 102.



The success of German commercial utilization of science

- creation of new type of universities, called technical universities conducting research on natural sciences and engineering,
- crucial for regional development in this country

absorptive capacity (Giuliani and Arza, 2009)

- Has impact on level of profits which are achieved by companies from external interactions
- is connected with personal relations of managers with researchers in universities and other R&D institutions

no one universal perception of U-I relations

- the role rather of general activity of universities like conferences, publications and teaching than more formal financial relations based on intellectual property (Cosh et al. 2006)
- the most important informal contact which are accumulated as tacit value (Arvanitis et al., 2005)
- U-I co-inventions as a core kind of relations among them (Hussler and Ronde 2007)

U-I relations - negatives

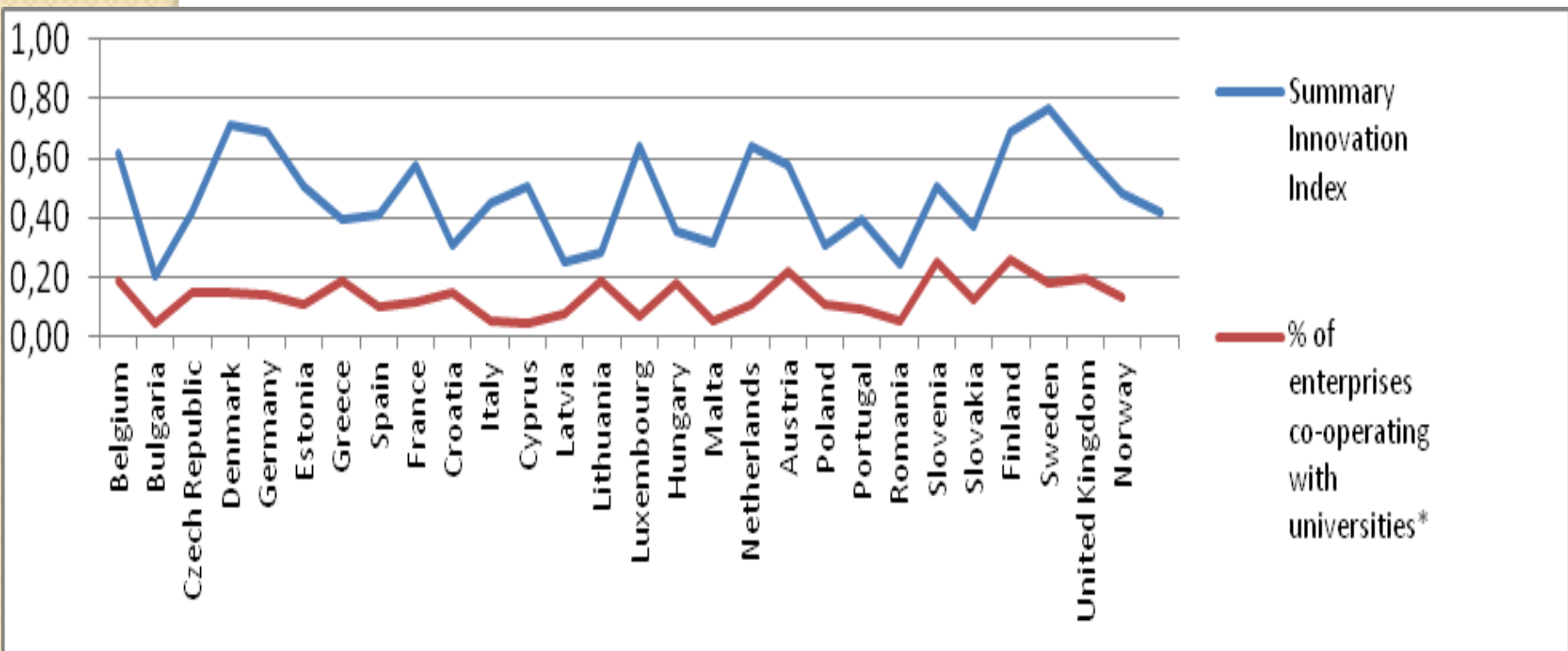
- setting up their own businesses by the brightest researchers or their transfer to industry



- negative impact on quality of research at universities, output of this group of researchers was much higher than average output rates from a control group of those who stayed at universities (Toole and Czarnitzki 2007)

Summary innovation index (European Innovation Scoreboards 2012) and % of enterprises cooperating with universities or other higher education institutions in 2012

- The correlation coefficient (0,42)





Institutional and legal framework for research stimulations

- The Research Corporation (est. 1912, US) by scientist and inventor F. G. Cottrell, who offered as an initial funding profits from his patents,
- Bayh–Dole Act from 1980 guaranteed universities in USA ownership of intellectual property acquired from federally funded research

Lack of public money for research

- In GB “a shift from a grant to an exchange economy in higher education” (Etzkowitz et al., 2000, p. 319).

Poland

- employee is entitled to receive not less than 50% of the funds raised by the university from the commercialization reduced by no more than 25% of the costs directly related to whole process


Personal aspect of U-I relations

- social network analysis done by Pinheiro, Cândida and Pinho (2015) showed that innovation depends on interpersonal relationships,



- characteristics and achievements of the institutions do not guarantee automatically the success.

What do researchers prefer?


- The research at Canadian universities (Fisher, 2008):
 - more researchers are personally interested in basic research (85%) or didactics (80%) than in commercially oriented research (34%).
- 
- Contacts with firms should be stimulated

Types of benefits from students – industry relations

Industry	Students	Universities	Region
access to new, non standard solutions	knowledge of practical problem and technologies in firms	knowledge about regional technologies	increase of economical competitiveness
verification of future employees	chances for finding employment	profits from industrial orders	network of contacts
cheap labour force	testing of theoretical knowledge	higher attractiveness for students/better candidates	efficient allocation of human resources

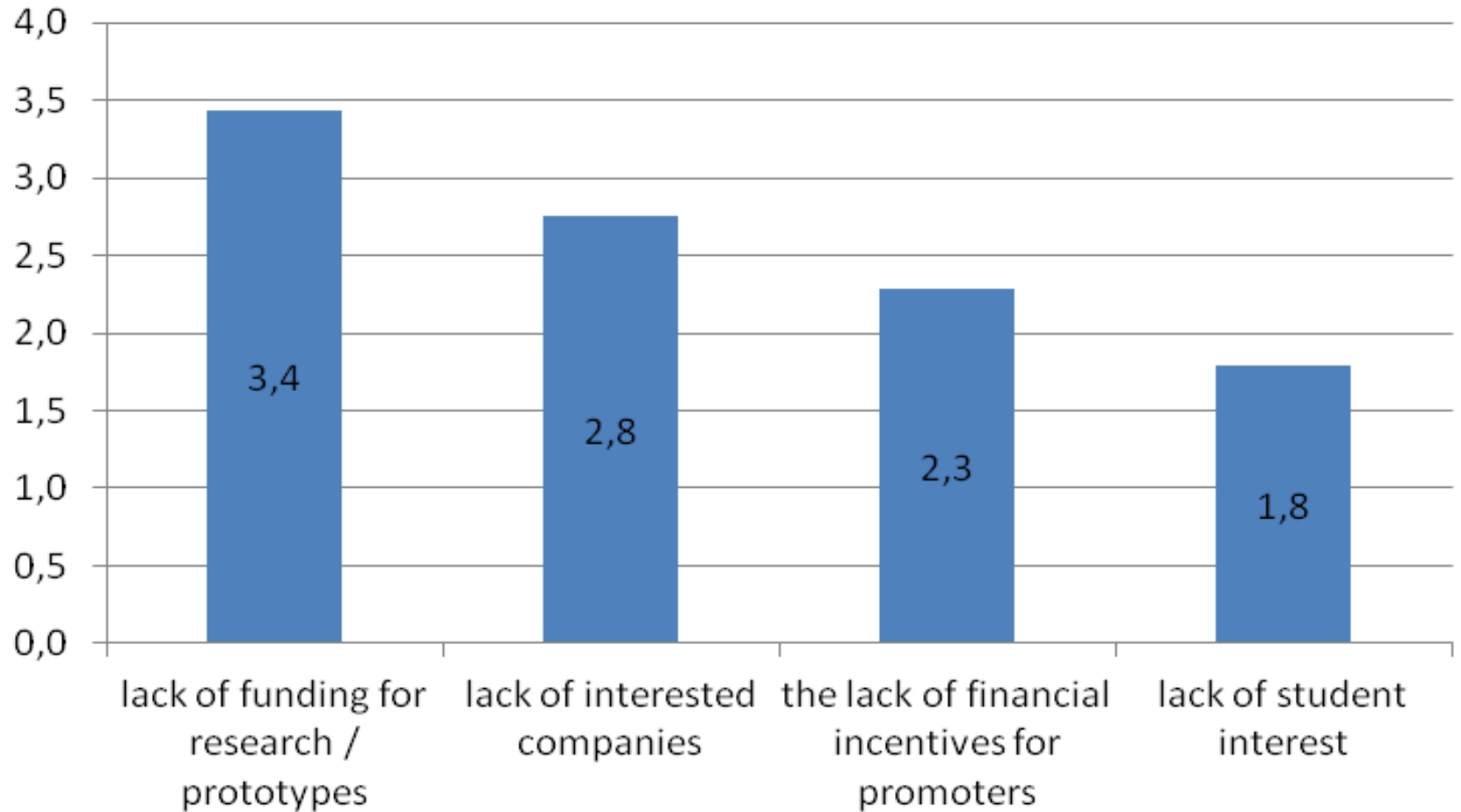
Poland

- public university receives 25% of funds received by employee from commercialization of research, reduced by no more than 25% of the costs directly related to the commercialization,

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- The results of own research (2016) among 70 University teachers and 500 students in Krakow

Problems in cooperation with companies in order to realize oriented to their needs students theses – university teachers opinion

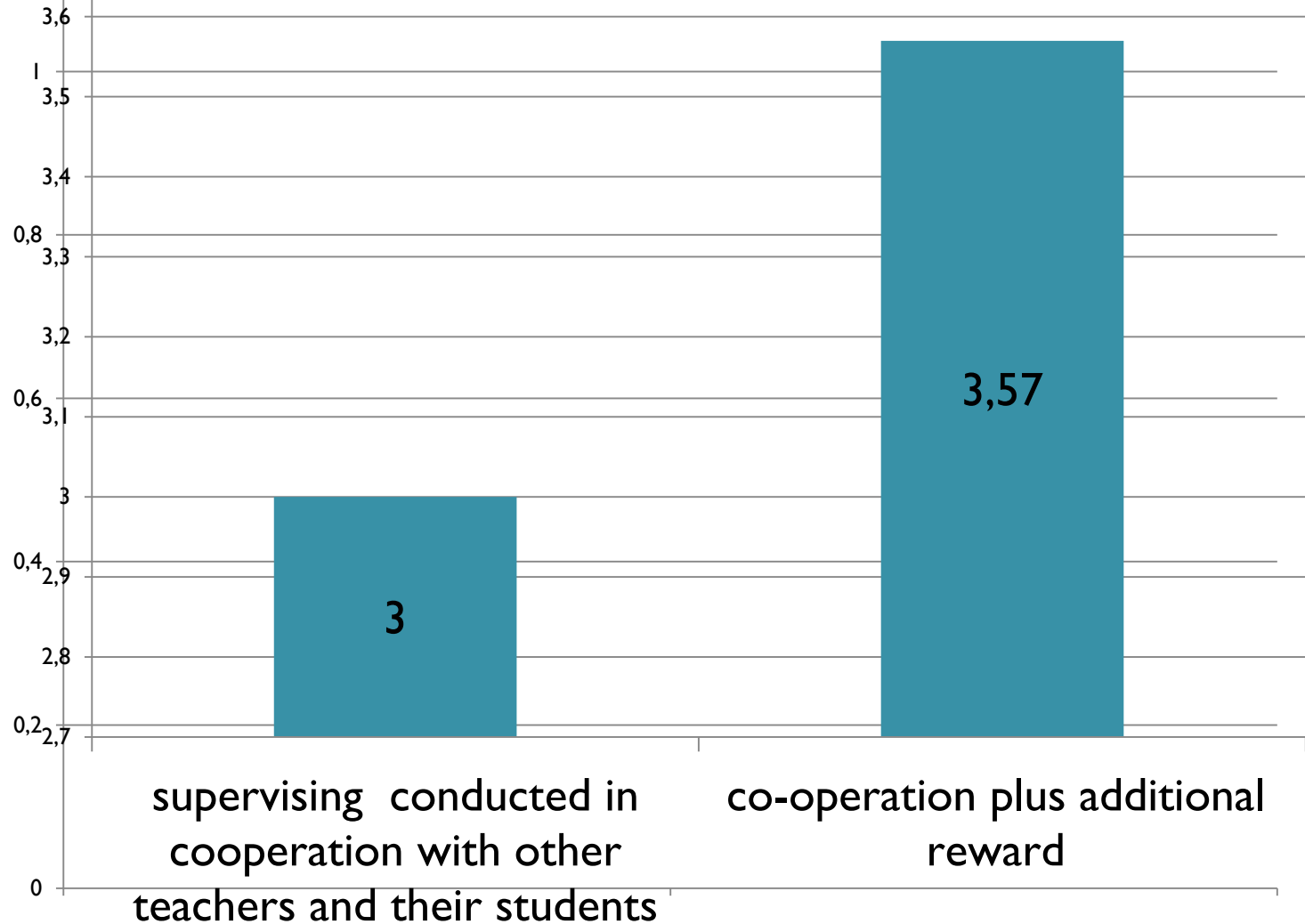
(in 5 points scale where 1 - minor problem, 5 - a very big problem, N=70)



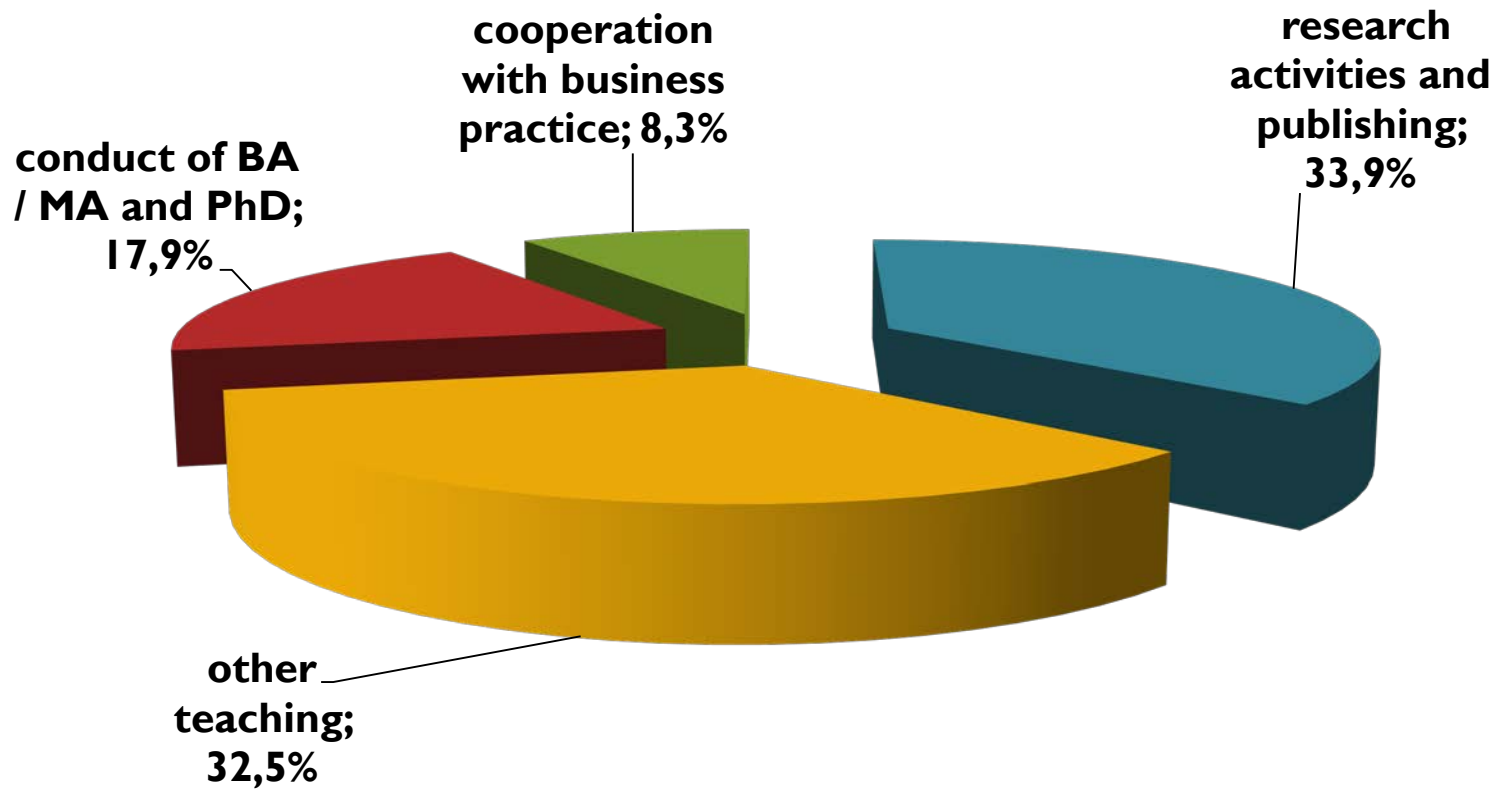
university teachers opinion about supervising company oriented thesis

(in 5 points scale)

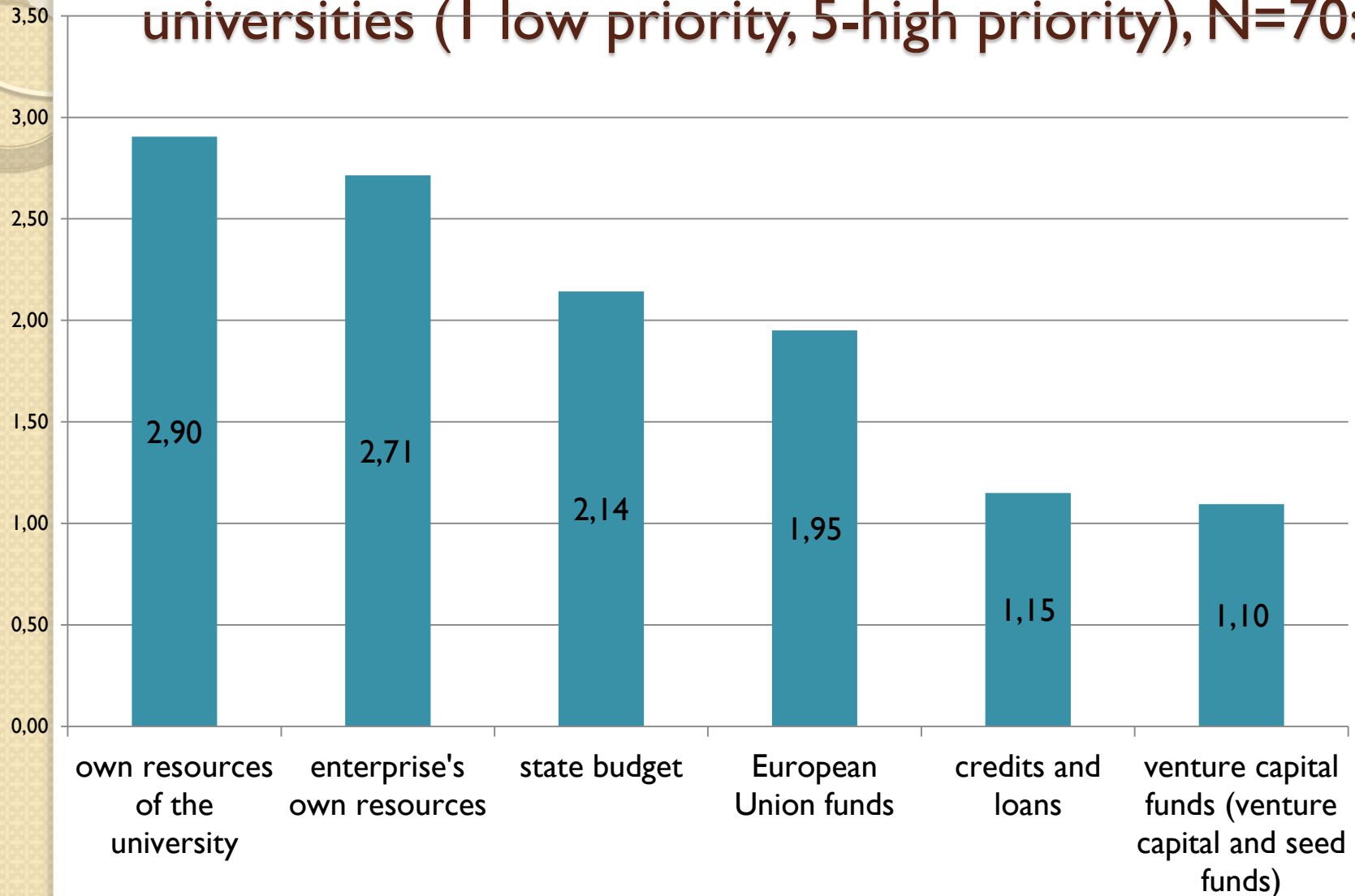
where 1 – small interest 5 - a very big interest, N=70



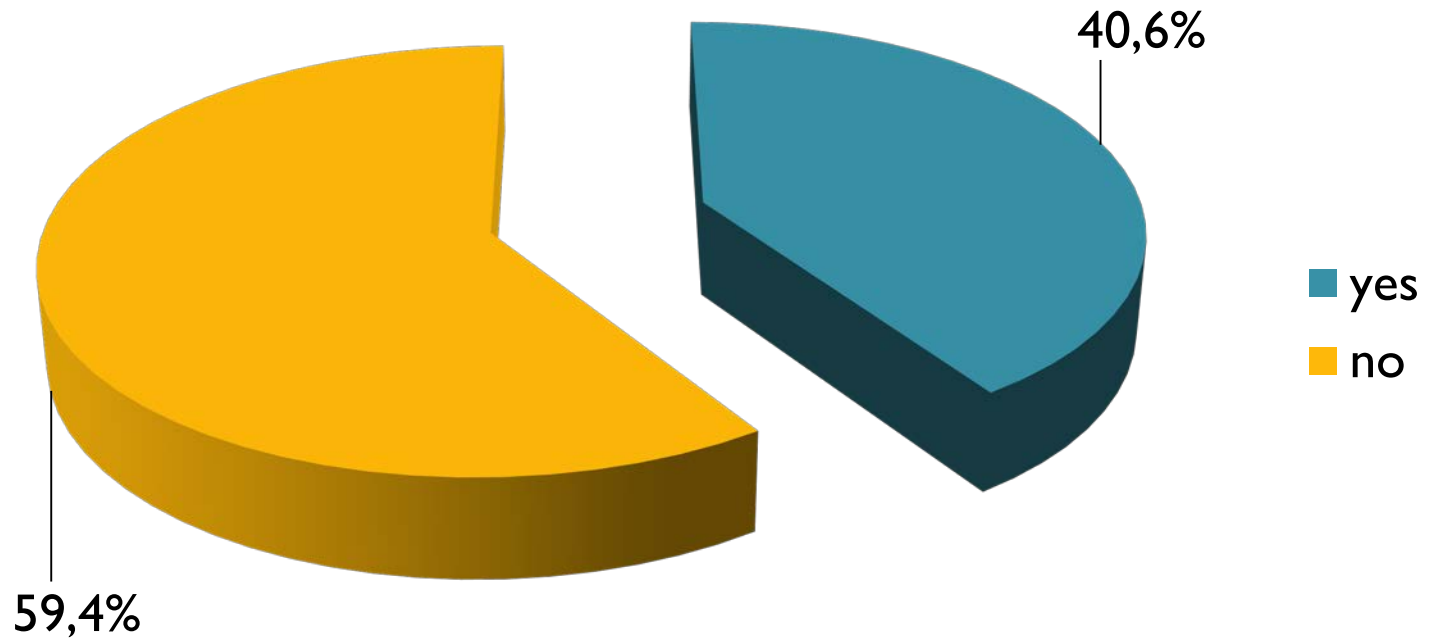
Percentage of duties in the total work of university staff $N=70$



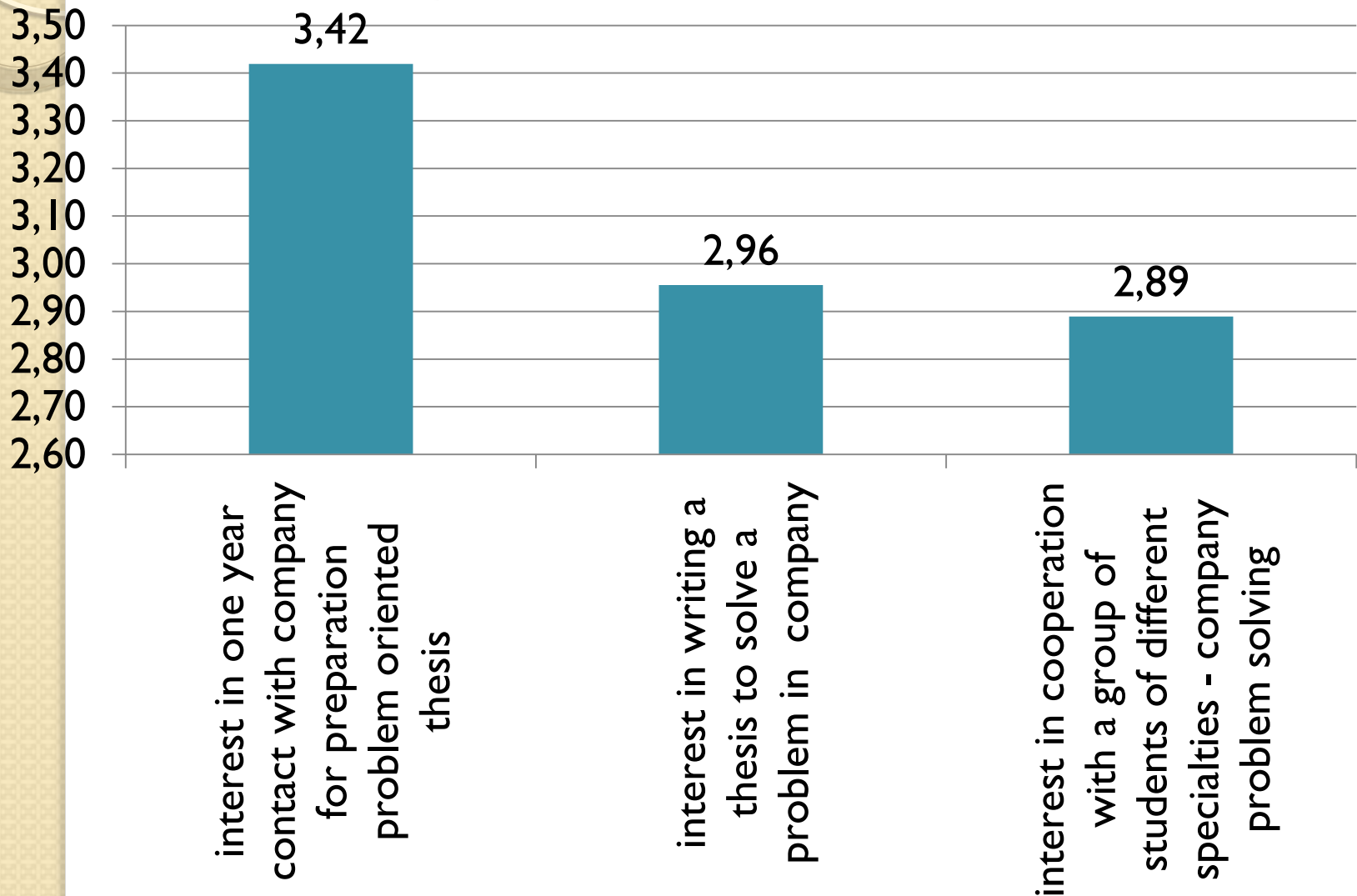
Importance of sources of financing the thesis preparation ordered by the company at universities (1 low priority, 5-high priority), N=70:



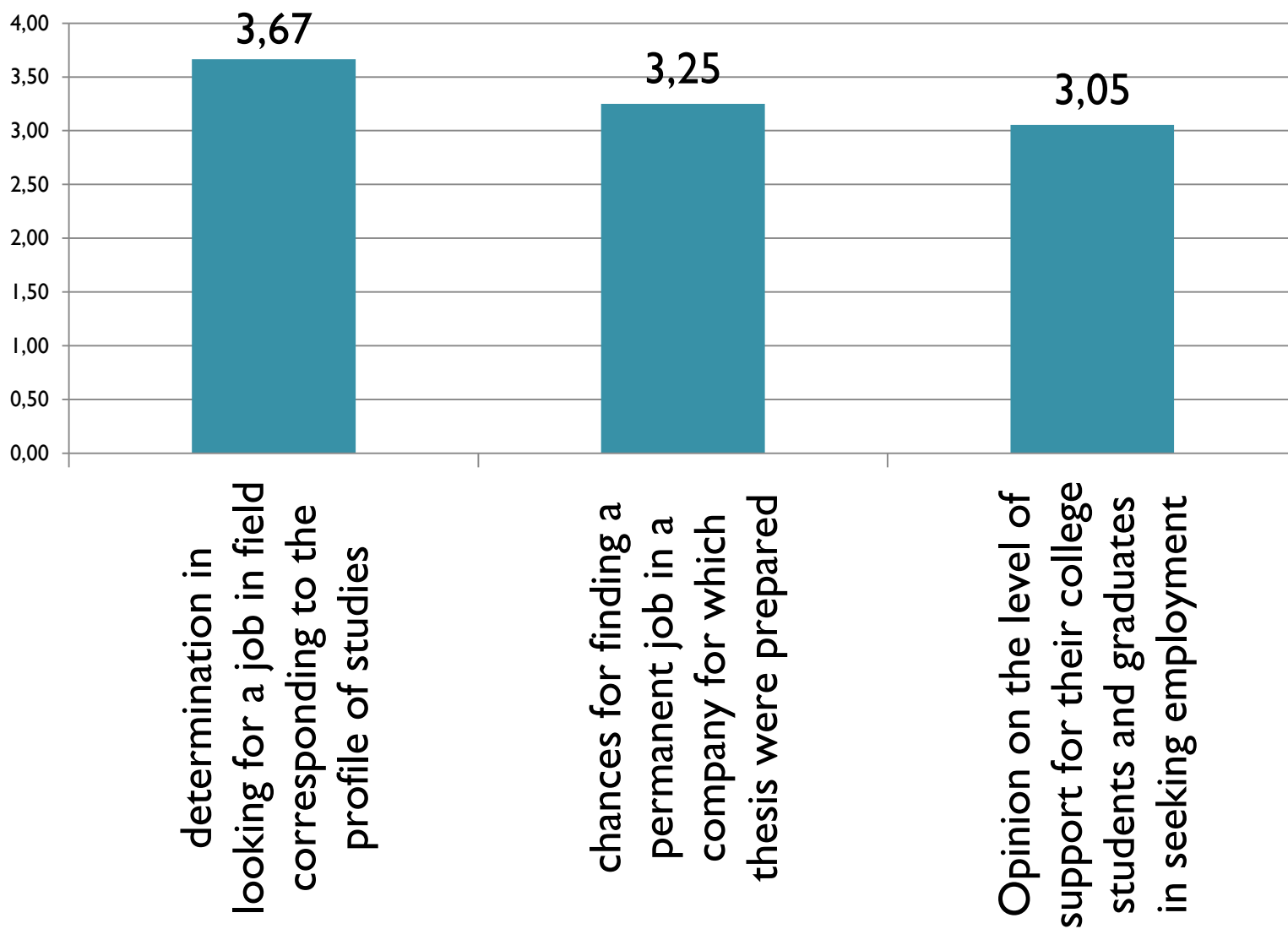
contact of students in the course with the company related to the profile of studies focused on a solution to its problem N=500



Students opinion about contacts with firms – thesis writing (in 5 points scale, N=500)



Students opinion about contacts with firms and activity of university (in 5 points scale, n=500)



System of financial stimulation the U-I relations by modification of government subsidy formula

- Level of subsidy should depends on number of students thesis realised with firms' cooperation (subsidy partly transferred directly to supervisors)