

Research at universities and its dependency on organisational factors

41th EAIR Forum,
26. August 2019
University Leiden, Netherlands

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Mission Statement

We...

- carry out application-oriented **empirical research** in the field of higher education and science studies.
- are partner and **service-provider** in the area of science and scientific policy.
- provide **research-based services** and **consulting**.
- are establishing a **research data centre** to provide **primary data** for the scientific community.



Facts and Figures

- **founded in 2013** as a non-profit company; formerly part of the company Hochschul-Informationssystem GmbH (**HIS**)
- integration of the Institute for Research Information and Quality Assurance (**iFQ**) in 2016, location Berlin
- about **200 colleagues** in 5 research areas in Hannover, Berlin und Leipzig
- Funding by the **German Federal Government** and all 16 German **Federal States**



Agenda

- Scientific Interest and Leading Questions
- Third-Party Funds (TPF) in the German Scientific System
- Data Basis and Univariate Analyses
- Results
- Conclusion

Scientific Interest and Leading Question

- important role of third-party funds (TPF) in financing universities
 - significant increase of this type of research financing since the beginning of the 1990s
 - indicators on TPF are constituents in the vast majority of the instruments used (performance based resource allocation, rankings), reasons:
 - the ready availability of data
 - indicators on TPF indirectly include quality ascriptions
- Which organisational framework is significant for specialist institutions of universities to successfully acquire DFG third-party funds for the implementation of research projects?

Third-Party Funds in the (German) Scientific System

- TPF are predominantly applied by the state in Germany
- Research on TPF and TPF-indicators:
 - correlation between TPF and publication success
 - concentration on major research institutions, “matthew-effect”
 - amount of granted TPFs indicates success at obtaining funds rather than research success
 - Research on TPF in an organisational context deals with size, academic human resources, reputation, the level of expenditure from main funds and Student numbers

Data Basis and Univariate Analyses

- information to third-party funds obtained through the DFG → *performance variable*
- Data of the German Federal Bureau of Statistics (employees, students) } → *context variable*
- other Data (cooperation potentials) }
- subjects:
 - History, Archaeology
 - Psychology
 - Physics, Astronomy
 - Engineering, Process Engineering

Data Basis and Univariate Analyses

variables

performance

dfg-fund_prof **performance**; granted funds of the DFG per annum per professors

context

sci **size**; number of scientists (professors and non-professorial scientists)

non-prof-sci_prof **endowment with other scientific personnel**; number of non-professorial scientists per professors

non-sci_prof **endowment with non-scientific personnel**; number of non-scientific employees per professors

stud_sci **teaching activities**; number of students per scientists (including professors)

coop_reg **regional cooperation potential**; discipline-specific and location-specific potential for regional research cooperations

coop_int **internal cooperation potential**; potentials for interdisciplinary cooperation within the own organisation

Data Basis and Univariate Analyses

dfg-funds, 2014-2016

	History, Archaeology	Psychology	Physics, Astronomy	Engineering, Process Engineering
n	67	61	57	33
median	366.667	433.333	2.800.000	3.100.000
arithmetic average	1.181.095	713.115	3.669.006	5.179.798
1. quintile	71%	55%	48%	53%
2. quintile	20%	26%	25%	28%
3. quintile	7%	13%	15%	11%
4. quintile	2%	4%	9%	6%
5. quintile	0%	1%	3%	2%

Data Basis and Univariate Analyses

	History/Archaeology				Psychology			
	number	median	min	max	number	median	min	max
<i>dfg-fund_prof</i>	67	45.833	0	454.167	61	44.444	0	253.333
sci	67	21,75	2,1	100	61	34,65	4	87,25
non-prof-sci_prof	67	1,56	0,50	2,91	61	2,48	0,20	4,71
non-sci_prof	67	0,47	0,00	1,55	61	0,76	0,00	3,75
stud_sci	61	21,0	2,6	52,5	51	18,2	4,9	41,0
coop_reg	67	10	1	23	61	9	1	29
coop_int	67	32	6	40	61	15	4	19
	Physics/Astronomy				Engineering/Process Engineering			
<i>dfg-fund_prof</i>	57	147.126	33.333	477.778	33	164.444	0	756.140
sci	57	54,8	9	154,6	33	93,4	1	426,65
non-prof-sci_prof	57	2,22	0,50	4,41	32	3,75	0,12	8,38
non-sci_prof	57	2,18	0,00	4,54	33	3,18	0,00	13,20
stud_sci	56	9,6	2,3	60,0	32	17,1	4,7	30,7
coop_reg	57	16	0	34	33	20	2	48
coop_int	57	13	9	23	33	12	6	19

Results

Bivariate Analyses

Correlation Coefficient (Spearman). Dependent Variable: dfg-fund_prof				
	History/ Archaeology	Psychology	Physics/ Astronomy	Engineering/ Process Engineering
Size (sci)	0.698	0.497	0.521	0.635
Endowment with other scientific personnel (non-prof-sci_prof)	0.199	0.272	0.129	0.556
Endowment with non- scientific personnel (non-sci_prof)	0.507	0.519	0.261	0.413
Teaching activities (stud_sci)	0.256	0.105	0.218	0.386
Regional cooperation potential (coop_reg)	0.129	-0.159	0.231	0.288
internal cooperation potential (coop_int)	0.570	0.381	0.066	0.206


Results

Multivariate Analyses

	History/Archaeology			Psychology			Physics/ Astronomy			Engineering/ Process Engineering		
	0.05% quantile	median	0.95% quantile	0.05% quantile	median	0.95% quantile	0.05% quantile	median	0.95% quantile	0.05% quantile	median	0.95% quantile
Intercept	-175.200	-33.300	112.500	-124.500	-10.500	95.700	-45.400	93.200	242.300	-389.600	-102.900	193.600
sci	200	1.900	3.600	-1.000	700	2.300	400	1.300	2.200	-1.200	0	1.400
non-prof-sci_prof	-66.700	-16.600	32.200	-34.200	2.400	29.200	-79.600	-32.000	16.300	-21.700	32.800	91.600
non-sci_prof	17.500	88.200	162.000	-7.900	31.000	69.000	-13.900	19.900	54.400	-25.900	17.500	56.100
stud_sci	-1.400	1.400	4.200	-2.600	700	3.900	-3.400	0	3.300	-4.900	3.700	12.700
coop_reg	-6.300	-2.200	1.900	-3.600	-1.100	1.500	-4.300	-900	2.600	-5.600	-800	3.700
coop_int	-3.000	1.000	5.600	-3.800	2.200	8.200	-7.300	1.300	9.100	-16.900	4.100	23.800

Conclusion

- discipline-specific differences in research financing through DFG-TPF
- scale effects regarding the variables size and endowment with non-scientific personnel
 - decreasing marginal benefit (size)
- higher teaching activities have a (weak) positive effect on the procurement of DFG-TPF in two disciplines
- relation to regionally adjacent research institutions characterised by competition rather than cooperation?
- implications for the practical application of performance-measuring procedures



Thank you very much for
your attention!

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Bivariate Analyses (II)

