

HELENA



Higher Education Global
Efficiency Analysis

A comparative study of budget allocation within European universities

Golnaz Maleki, Matthias Klumpp, HELENA Project, PIM, University of
Duisburg-Essen

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1. Introduction

Background

- International efforts to increase the efficiency of universities
 - increasing growth rates of students
 - increase of societal expectations towards universities
 - the lack of sufficient government financial resources
- Allocation of internal budget

Research Questions

- How have universities divided their budget between different faculties?
- Is there any relationship between faculties' efficiency and their share of the total university budget?

2. Data and Stages of Research

Universities analyzed:

1. University of Duisburg-Essen
(Germany)

2. University of Frankfurt (Germany)

3. University of Bern (Switzerland)

4. University of Zurich (Switzerland)



Analysis of budget allocation



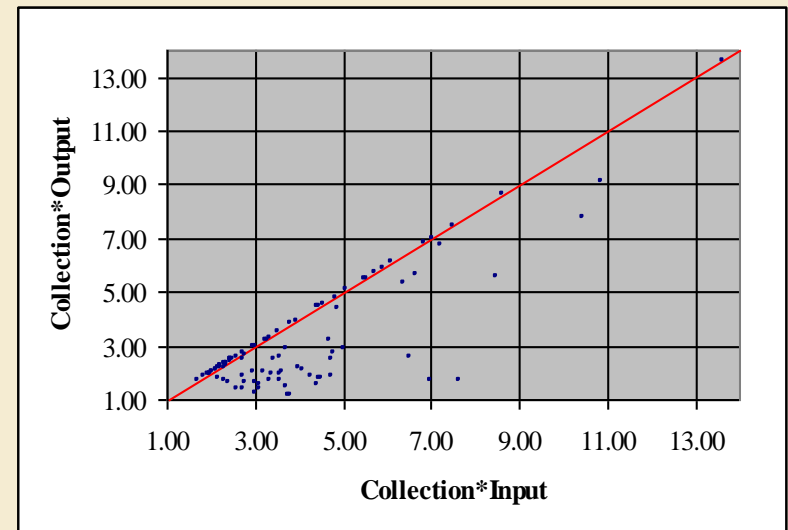
**Measurement of technical
efficiency (DEA)**



**Analysis of relationship
between budget allocation and
efficiency of faculties**

2. DEA Method

- DEA is a mathematical programming technique that produces a single aggregate measure for each DMU in terms of its utilization of inputs to produce desired outputs (Kao and Hung, 2008).
- **Input and Output**
 - ✓ Allocated budget to faculties (Input)
 - ✓ Number of graduates (Output)
 - ✓ Third-party funds



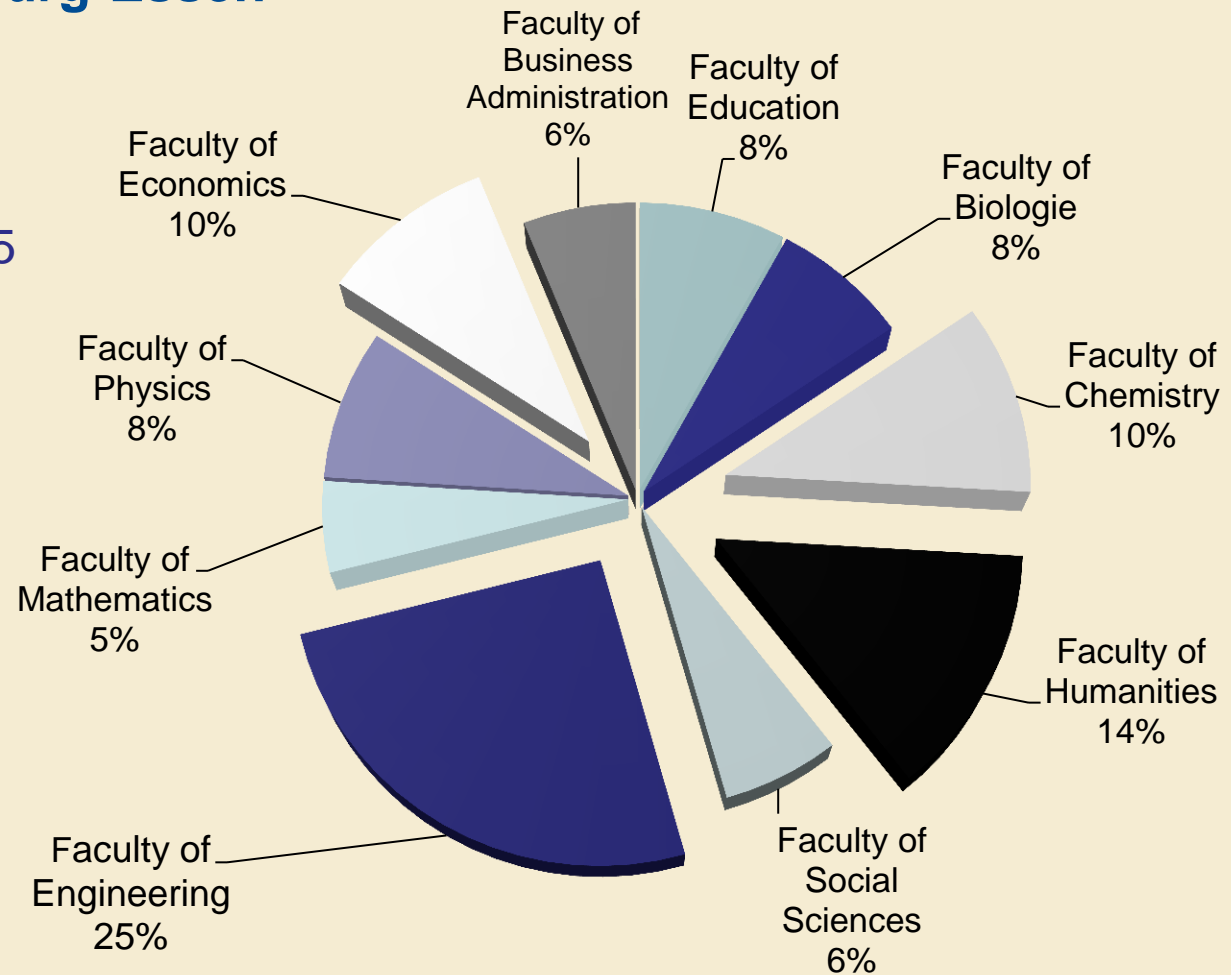
3. Internal Budget Allocation Analysis

a) University of Duisburg-Essen

Number of faculties: 10

Number of students: 37,085

Total budget: 337,994,193



3. Internal Budget Allocation Analysis

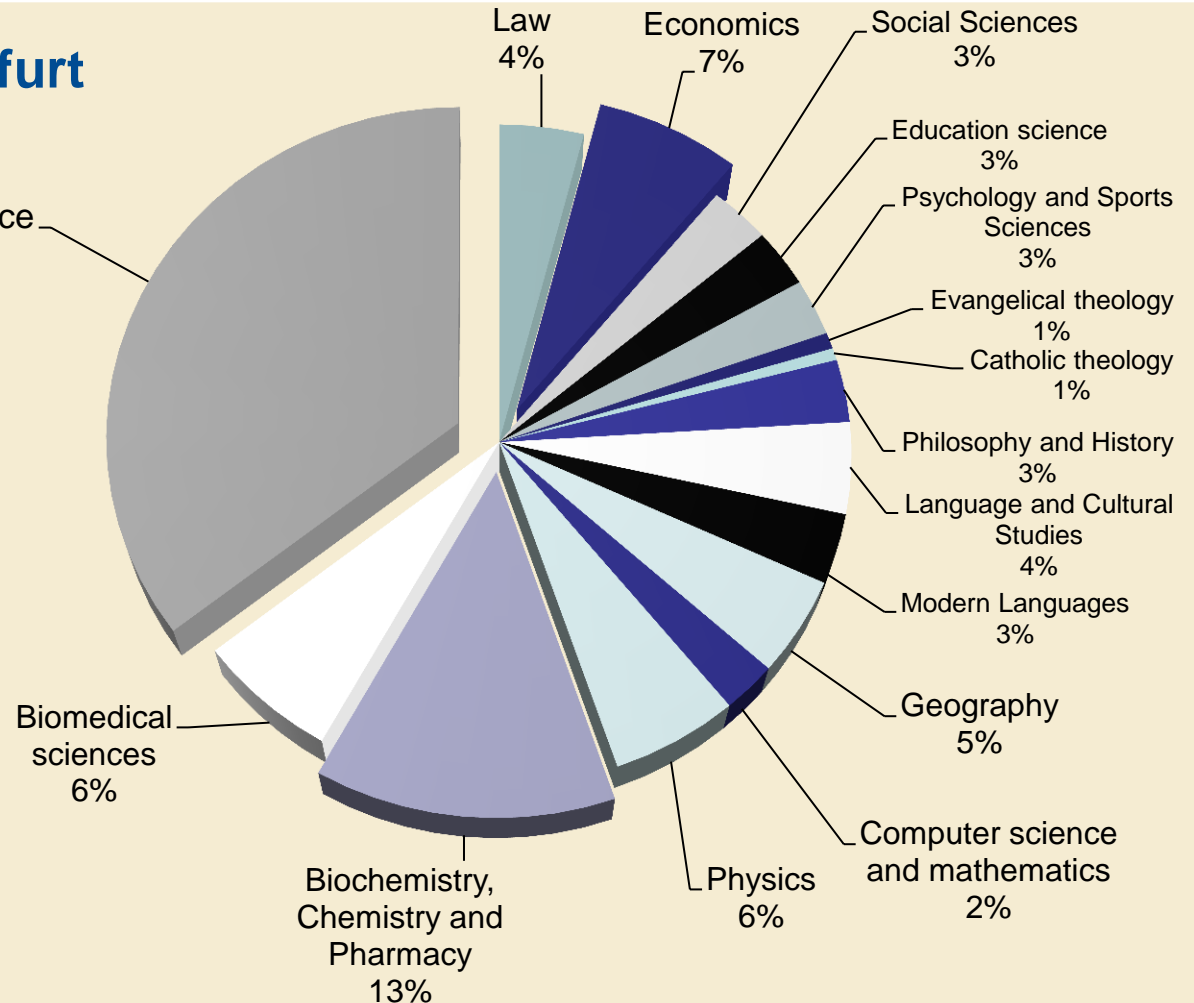
b) University of Frankfurt

Medical Science
36%

Number of faculties: 16

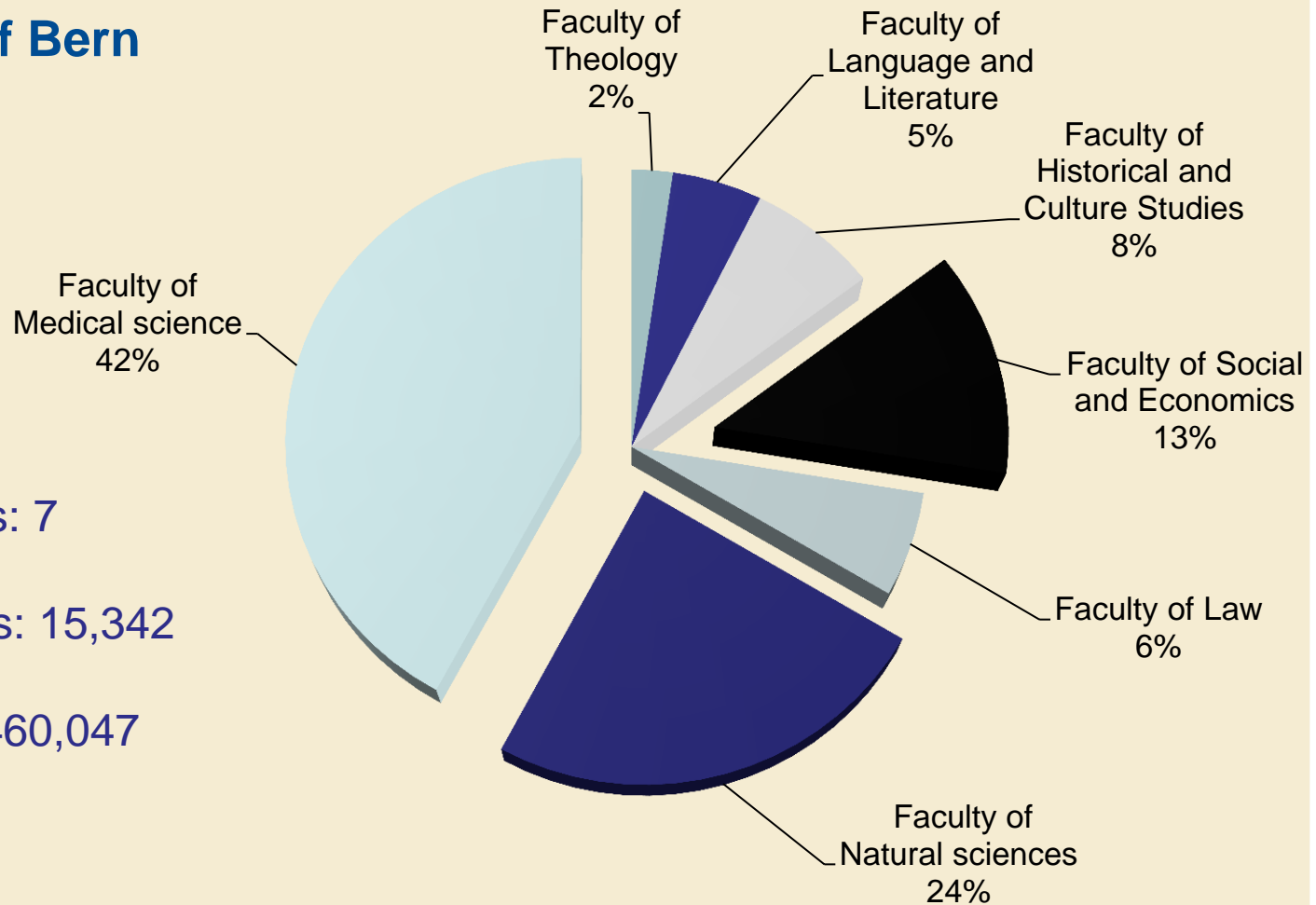
Number of students: 33,666

Total budget: 466,546,355



3. Internal Budget Allocation Analysis

c) University of Bern



Number of faculties: 7

Number of students: 15,342

Total budget: 429,460,047

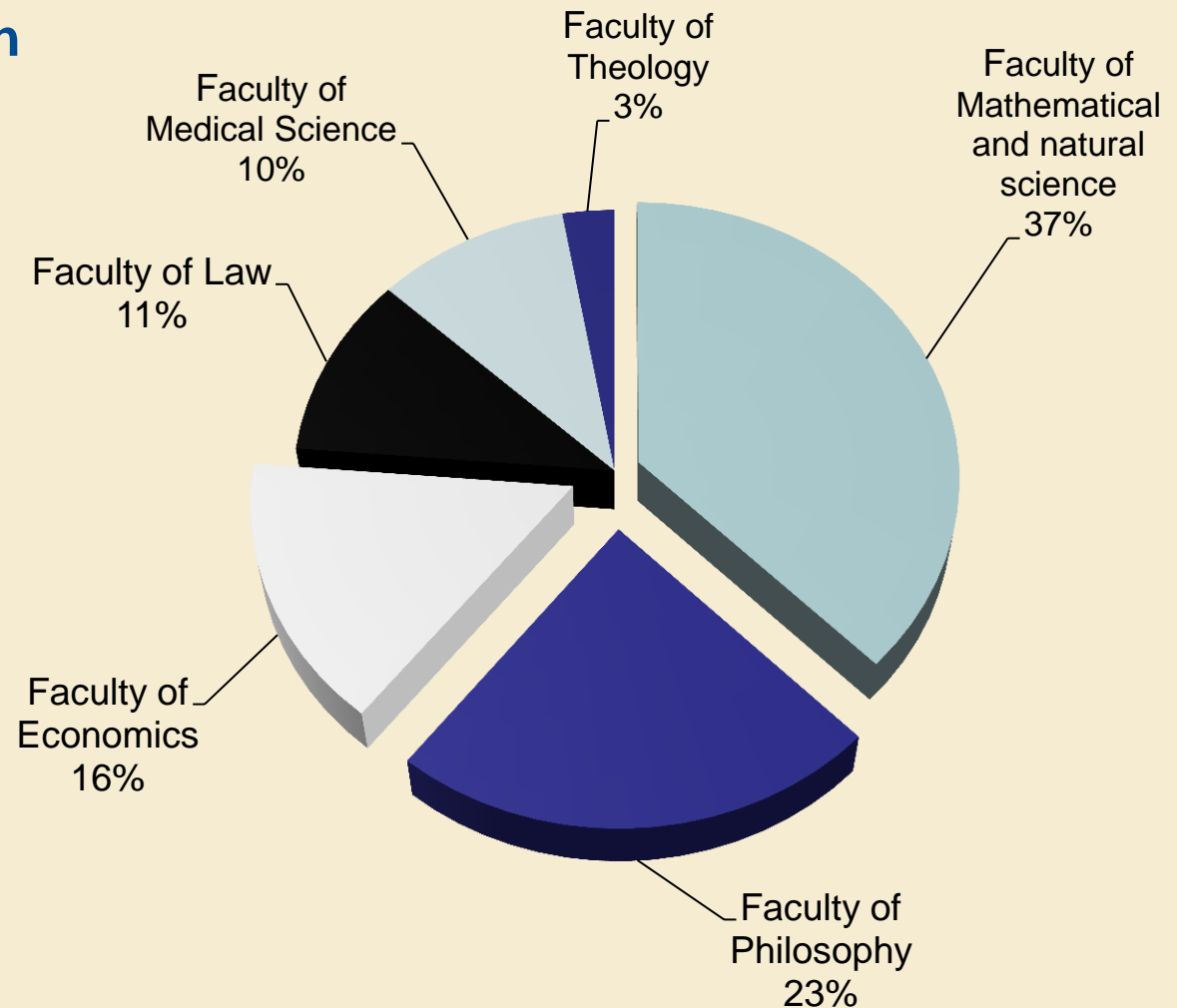
3. Internal Budget Allocation Analysis

d) University of Zurich

Number of faculties: 6

Number of students: 20,404

Total budget: 441,729,395



3. Internal Budget Allocation Analysis

- In general, the internal budget allocation is very diverse and different to each university (“fingerprint”).
- All universities allocated halves of their budget shares to two or three faculties.
- Medical faculties in two universities (Frankfurt and Bern) received more than one third of budget share which is the highest share. Whereas, that of Zurich university’s was only 10%.
- Mathematics faculty in Zurich university received the highest budget share whereas the lowest budget share of 2% was allocated to this faculty compared to university of Duisburg-Essen and Frankfurt.

4. Technical Efficiency Analysis

a) University of Duisburg-Essen

 $\leq 50 = 0\%$
 $\geq 90 = 36.14\%$

Unit name	Share of total Budget	Score of efficiency	Potential improvements		
			Percent Total budget	Percent Third-party funds	Percent Count Graduates
Faculty of Education	7.95%	100	0%	0%	0%
Faculty of Economics	9.63%	100	0%	0%	0%
Faculty of Mathematics	4.98%	100	0%	0%	0%
Faculty of Social Sciences	6.08%	94.92	-5.08%	0%	53.69%
Faculty of Biology	7.49%	93.10	-6.90%	0%	0%
Faculty of Engineering	25.40%	89.56	-10.44%	0%	62.18%
Faculty of Humanities	13.62%	87.54	-12.46%	55.60%	0%
Faculty of Physics	8.26%	87.05	-12.95%	0%	267.16%
Faculty of Business Administration	6.11%	73.58	-26.42%	124.15%	0%
Faculty of Chemistry	10.48%	51.54	-48.46%	0%	0%

b) University of Frankfurt

Unit name	Share of total Budget	Score	Potential improvements		
			Percent Total budget	Percent Third-party funds	Percent Count Graduates
Faculty of Law	4.03%	100	0%	0%	0%
Faculty of Modern Languages	3.40%	100	0%	0%	0%
Faculty of Economics	6.95%	86.13	-13.87%	0%	0%
Faculty of Physics	5.69%	85.73	-14.27%	0%	612.03%
Faculty of Social Sciences	2.91%	72.30	-27.70%	0%	0%
Faculty of Psychology and Sports	2.78%	69.70	-30.30%	0%	0%
Faculty of Computer science and	2.44%	68.74	-31.26%	0%	0%
Faculty of Science of education	2.89%	67.16	-32.84%	0%	0%
Faculty of Natural science	6.36%	54.95	-45.05%	0%	2.55%
Faculty of Medicine	35.57%	54.26	-45.74%	0%	209.15%
Faculty of Language and Cultural	4.46%	51.26	-48.74%	0%	0%
Faculty of Geography	4.75%	50.08	-49.92%	0%	37.59%
Faculty of Philosophy and History	3.07%	44.75	-55.25%	0%	0%
Faculty of Biochemistry, Chemistry	13.31%	40.28	-59.72%	0%	49.44%
Faculty of Evangelical theology	0.79%	25.78	-74.22%	0%	0%
Faculty of Catholic theology	0,59%	24,52	-75,48%	0%	0%

≥90=7%

≤50=18%

c) University of Bern

 $\leq 50 = 42.16\%$
 $\geq 90 = 44.55\%$

Unit name	Share of total budget	Score	Potential improvements		
			Percent total budget	Percent third-party funds	Percent count graduates
Faculty of Social and Economics	12,86%	100	0%	0%	0%
Faculty of natural sciences	24,32%	100	0%	0%	0%
Faculty of Historical and Culture	7,37%	94,87	-5,13%	0%	0%
Faculty of Law	5,92%	75,37	-24,63%	0%	0%
Faculty of Language and Literature	5,05%	63,18	-36,82%	0%	0%
Faculty of Theology	2,32%	54,71	-45,29%	0%	0%
Faculty of Medicine	42,16%	32,81	-67,19%	0%	0%

d) University of Zurich

 $\leq 50 = 0\%$
 $\geq 90 = 76\%$

Unit name	Share of total budget	Score	Potential improvements		
			Percent total budget	Percent third-party funds	Percent count graduates
Faculty of Economics	15,62%	100	0%	0%	0%
Faculty of Philosophy	23,21%	100	0%	0%	0%
Faculty of Mathematical and natural Science	37,47%	91,70	-8,30%	0%	70,66%
Faculty of Medicine	10,30%	88,34	-11,66%	279,37%	0%
Faculty of Theology	2,76%	84,09	-15,91%	0%	173,00%
Faculty of Law	10,65%	74,21	-25,79%	119,02%	0%

5. Conclusion

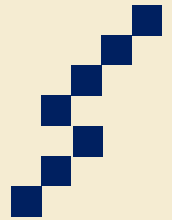
Interesting results:

- **The inefficiency of nearly all faculties which were allocated the highest budget in most universities**
- **The good performance of Zurich university in budget allocation based on the internal efficiency in comparison to other universities**
- **The least budget share allocation and the highest rank achievement of Zurich university medical faculty**
- **The weakness of physics faculties in regard to the numbers of graduates as the main reason of their inefficiency**

5. Conclusion

Suggestions for further research:

- **Considering more participants and universities and accordingly a larger scale**
- **Observing other universities from other countries**
- **Reallocation of the budget share of the universities (simulation study) and the investigation of their efficiency**



**Thank you for
your attention!**

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Contact: Phone +49 201 183 6681

Golnaz.Maleki@pim.uni-due.de

<http://www.helena.wiwi.uni-due.de>

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