

HELENA



Higher Education Global
Efficiency Analysis

“Sind griechische Hochschulen weniger effizient als deutsche und was bedeutet das unter volkswirtschaftlichen und ethischen Gesichtspunkten für die EU-Strukturhilfen?”

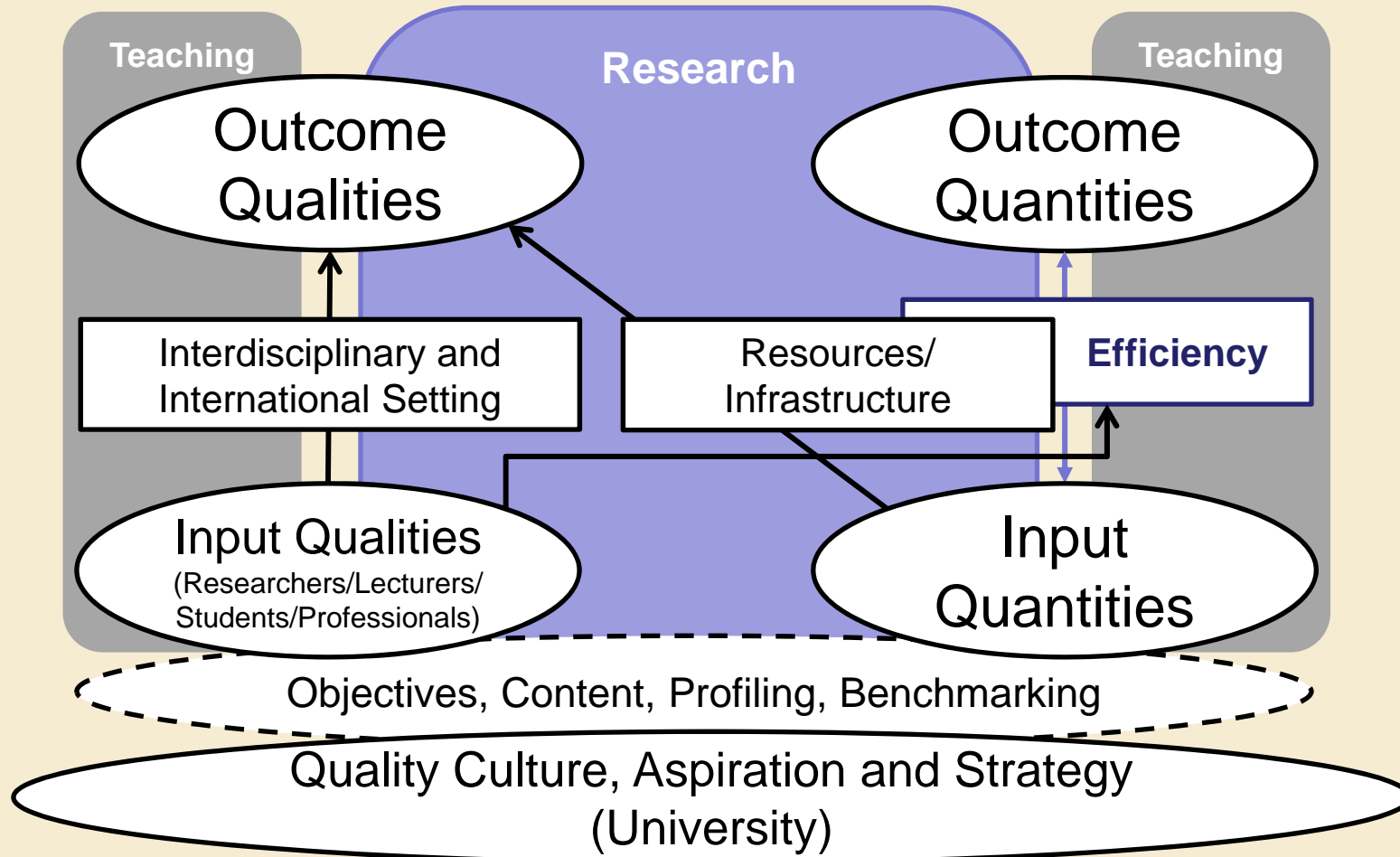
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HELENA Projekt, Institut PIM, Universität Duisburg-Essen

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- 1. Background: HE and Efficiency**
- 2. Research Question and Method**
- 3. Analysis Results**
- 4. Discussion**
- 5. Conclusion and Outlook**

1. Background: HE and Efficiency



Higher Education and Economics - Background

- strategic economic importance of HE for innovation, productivity and growth (e.g. Lisbon Declaration of the EU, publications of the OECD)
- HE specifics in production function e.g. multi-product service production, HE organisations as loosely coupled systems, same persons (e.g. professors) for different objectives

Research Question and Method

- What international research results can be found regarding **efficiency in higher education comparing Greece and Germany?**
- use of data envelopment analysis (DEA) for international data sets from Greece and Germany: EUMIDA data for the 40 largest universities in each country, selection by data quality

2. Research Hypothesis and Method

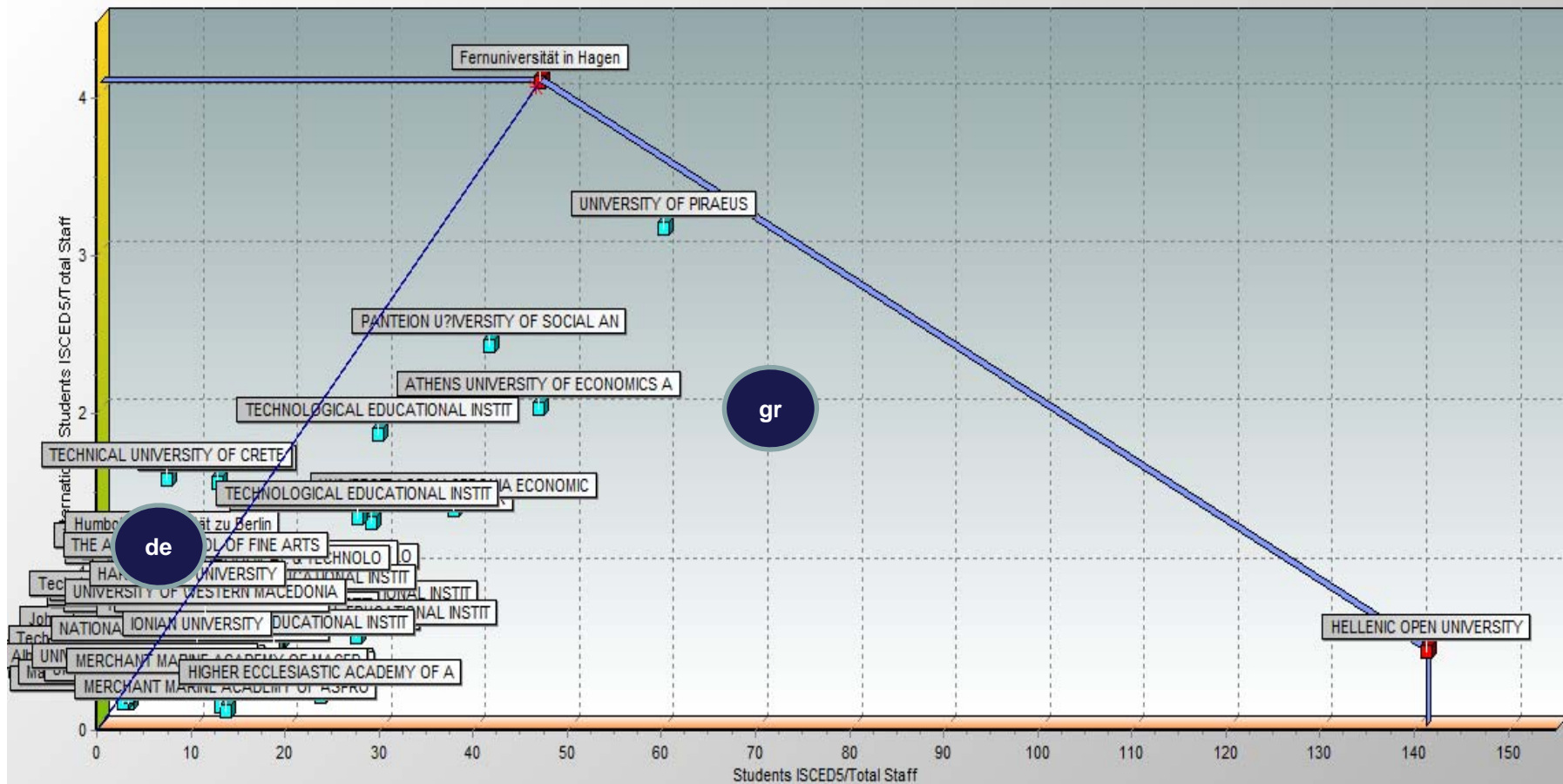
DEA & Data

- data envelopment analysis (DEA) as established research method for non-parametric efficiency analysis (e.g. Taylor/Harris 2004 for South Africa; Worthington/Higgs 2011 for Australia)
- data from the EU EUMIDA project with several available indicators - intended data for Greece was not available on a university level
- only 59 universities with complete data (FH/TEI excluded; 21 GR, 38 DE)

Institution Name	Inst. Age	Total Staff	Students ISCED5	Students ISCED6	International Students ISCED5	International Students ISCED6	Doctorate Degrees Awarded
Fernuniversität in Hagen	38	936	43720	397	3806	-	61
Ludwig-Maximilians-Universität München	540	13955	39297	2479	4779	-	1270
Universität zu Köln	624	8345	36725	5057	3751	-	742
Universität Hamburg	93	8671	33247	2861	3275	-	836
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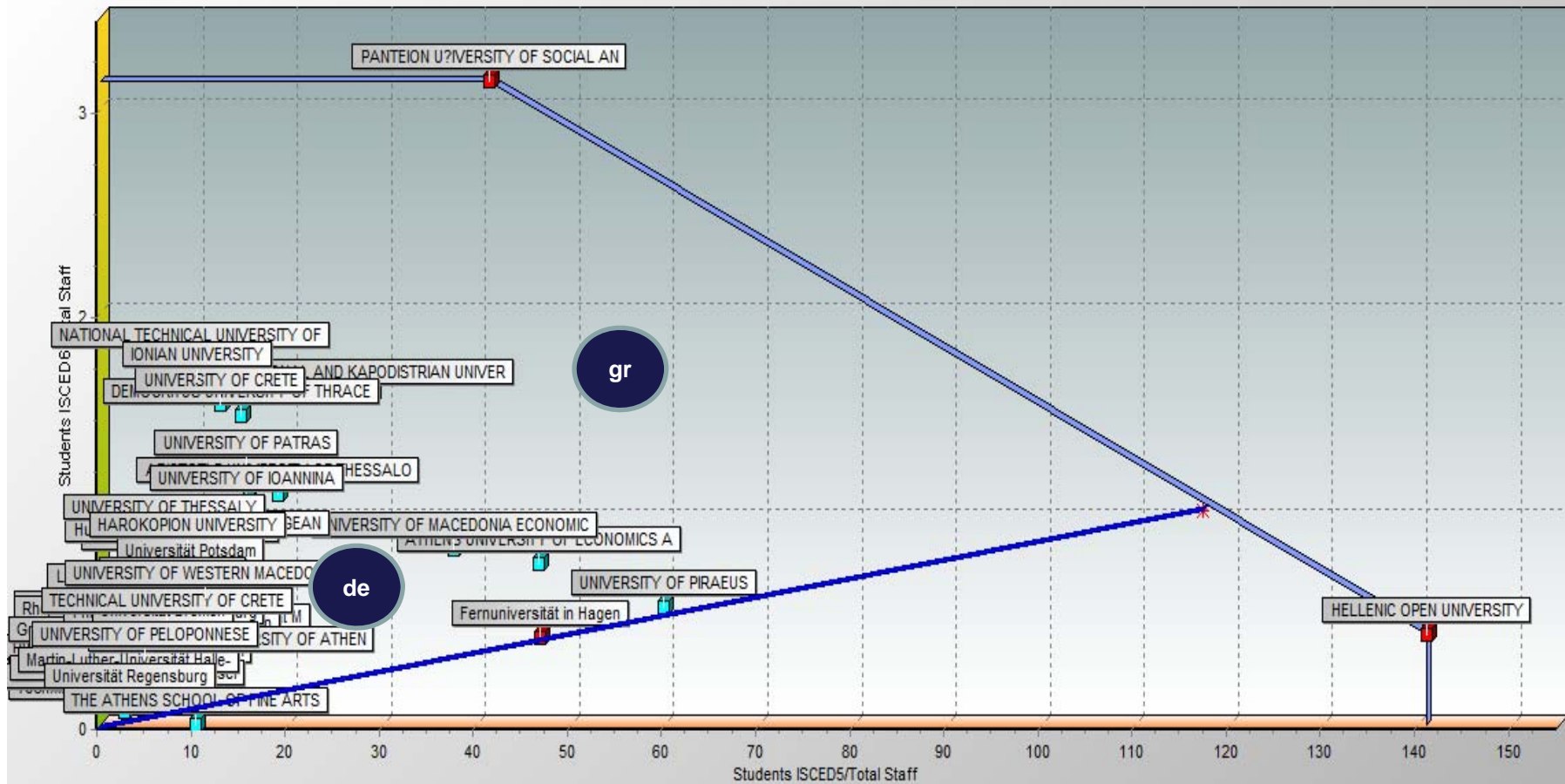
3. Analysis Results: Efficiency Frontier

CASE 2: Input Staff, Outcome Students ISCED5, Int. Stud. ISCED5



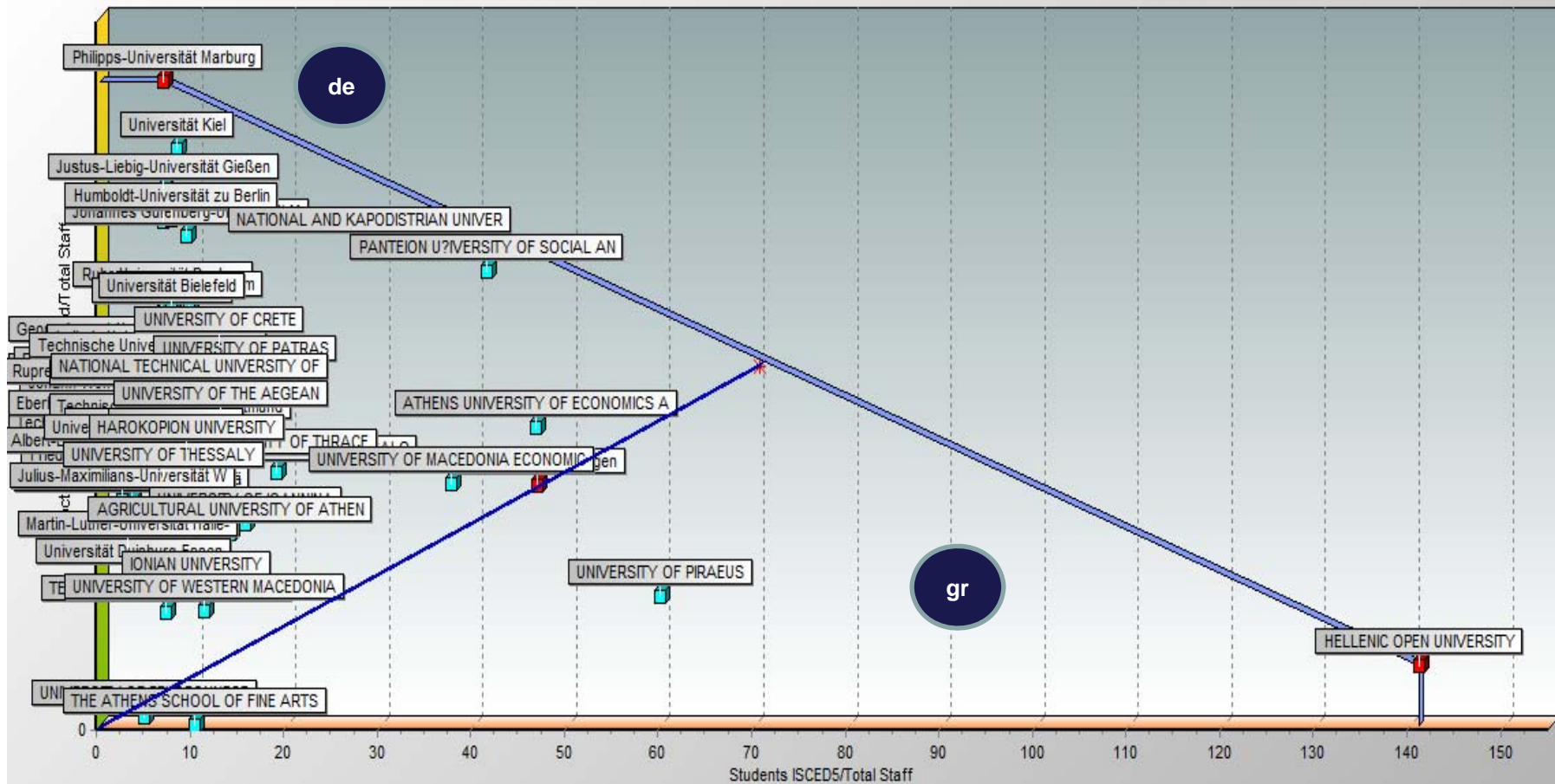
3. Analysis Results: Efficiency Frontier

CASE 3a: Input Staff, Outcome Students ISCED5, Students ISCED6



3. Analysis Results: Efficiency Frontier

CASE 4a: Input Staff, Outcome Students ISCED5, Doctoral Degrees



3. Analysis Results: Greece

CASES 1-6, including Inst. Age in cases 1, 3b, 4b, 5b, 6b - Greece

Country	Unit name	Case 1	Case 2	Case 3a	Case 3b	Case 4a	Case 4b	Case 5a	Case 5b	Case 6a	Case 6b	Average
GR	HELLENIC OPEN UNIVERSITY	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
GR	PANTEION UNIVERSITY OF SOCIAL AN	29,30%	68,00%	100,0%	100,0%	94,20%	94,20%	100,0%	100,0%	100,0%	100,0%	88,57%
GR	NATIONAL AND KAPODISTRIAN UNIVERSITY	48,20%	40,60%	55,90%	100,0%	90,00%	100,0%	92,60%	100,0%	92,60%	100,0%	81,99%
GR	UNIVERSITY OF CRETE	25,40%	10,40%	49,70%	98,80%	64,80%	74,00%	72,70%	100,0%	72,70%	100,0%	66,85%
GR	UNIVERSITY OF PIRAEUS	42,40%	92,80%	51,50%	51,50%	57,80%	57,80%	58,50%	58,50%	94,70%	94,70%	66,02%
GR	ATHENS UNIVERSITY OF ECONOMICS A	33,00%	64,70%	48,10%	48,10%	74,40%	74,40%	75,30%	75,30%	82,60%	82,60%	65,85%
GR	ARISTOTLE UNIVERSITY OF THESSALO	67,00%	27,90%	38,40%	100,0%	49,70%	62,50%	51,60%	100,0%	51,70%	100,0%	64,88%
GR	UNIVERSITY OF PATRAS	36,80%	24,60%	40,10%	80,90%	62,50%	71,40%	65,40%	88,50%	65,40%	89,30%	62,49%
GR	DEMOCRITUS UNIVERSITY OF THRACE	35,30%	20,00%	47,90%	100,0%	48,20%	53,00%	54,10%	100,0%	54,10%	100,0%	61,26%
GR	NATIONAL TECHNICAL UNIVERSITY OF	8,60%	14,00%	56,60%	67,60%	55,80%	55,80%	68,10%	71,50%	68,10%	71,50%	53,76%
GR	UNIVERSITY OF MACEDONIA ECONOMIC	26,60%	47,80%	43,90%	43,90%	60,10%	60,10%	61,30%	61,30%	63,80%	63,80%	53,26%
GR	UNIVERSITY OF THE AEGEAN	25,30%	19,30%	28,50%	42,80%	54,00%	59,40%	55,30%	60,80%	55,30%	60,80%	46,15%
GR	UNIVERSITY OF IOANNINA	30,40%	18,60%	35,40%	61,00%	39,90%	42,30%	41,90%	61,00%	41,90%	61,00%	43,34%
GR	IONIAN UNIVERSITY	9,60%	14,90%	53,70%	63,70%	26,90%	26,90%	53,70%	63,70%	53,70%	63,70%	43,05%
GR	UNIVERSITY OF THESSALONIKI	20,20%	9,10%	30,10%	59,10%	40,90%	47,10%	46,20%	61,00%	46,20%	61,30%	42,12%
GR	HAROKOPION UNIVERSITY	6,50%	19,70%	27,20%	27,20%	46,60%	46,60%	49,50%	49,50%	50,50%	50,50%	37,38%
GR	AGRICULTURAL UNIVERSITY OF ATHEN	9,80%	13,30%	15,80%	15,80%	37,30%	37,30%	37,60%	37,60%	37,60%	37,60%	27,97%
GR	TECHNICAL UNIVERSITY OF CRETE	8,20%	38,30%	15,90%	15,90%	21,30%	21,30%	22,20%	22,20%	42,90%	42,90%	25,11%
GR	UNIVERSITY OF WESTERN MACEDONIA	21,60%	19,00%	21,60%	24,30%	24,10%	24,10%	25,20%	25,70%	26,50%	27,40%	23,95%
GR	THE ATHENS SCHOOL OF FINE ARTS	7,10%	24,20%	7,10%	7,10%	7,10%	7,10%	7,10%	7,10%	24,20%	24,20%	12,23%
GR	UNIVERSITY OF PELOPONNESE	14,50%	8,00%	10,60%	10,60%	4,30%	4,30%	10,60%	10,60%	11,20%	11,20%	9,59%

GR Average 51,23%

3. Analysis Results: Germany

Country	Unit name	Case 1	Case 2	Case 3a	Case 3b	Case 4a	Case 4b	Case 5a	Case 5b	Case 6a	Case 6b	Average
DE	Fernuniversität in Hagen	100,00%	100,00%	39,70%	100,00%	65,90%	100,00%	66,20%	100,00%	100,00%	100,00%	87,18%
DE	Universität Potsdam	67,10%	19,70%	23,30%	100,00%	68,20%	100,00%	69,50%	100,00%	70,50%	100,00%	71,83%
DE	Freie Universität Berlin	35,10%	24,10%	25,20%	80,90%	79,30%	100,00%	83,00%	100,00%	85,50%	100,00%	71,31%
DE	Ruhr-Universität Bochum	46,50%	14,50%	19,40%	66,90%	67,70%	100,00%	69,50%	100,00%	69,50%	100,00%	65,40%
DE	Philipps-Universität Marburg	4,70%	15,70%	14,40%	14,40%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	64,92%
DE	Humboldt-Universität zu Berlin	12,00%	27,40%	26,60%	28,90%	80,00%	93,00%	83,60%	94,70%	87,70%	97,80%	63,17%
DE	Universität Kiel	6,80%	15,20%	16,40%	16,40%	90,90%	94,60%	91,10%	94,60%	91,10%	94,60%	61,17%
DE	Universität Duisburg-Essen	100,00%	9,40%	6,90%	100,00%	24,50%	100,00%	24,70%	100,00%	26,80%	100,00%	59,23%
DE	Justus-Liebig-Universität Gießen	5,90%	9,80%	13,10%	13,10%	83,80%	87,30%	83,90%	87,30%	83,90%	87,30%	55,54%
DE	Universität Bielefeld	31,30%	12,50%	20,30%	39,70%	66,70%	82,30%	68,30%	82,30%	68,30%	82,30%	55,40%
DE	Johannes Gutenberg-Universität Mainz	7,00%	23,30%	15,50%	15,50%	78,60%	78,60%	78,80%	78,80%	82,90%	83,10%	54,21%
DE	Universität Bremen	32,90%	17,70%	14,50%	26,70%	65,20%	81,30%	65,60%	81,30%	68,40%	81,30%	53,49%
DE	Universität Hamburg	27,20%	9,30%	10,50%	20,40%	55,20%	70,60%	56,10%	70,60%	56,10%	70,60%	44,66%
DE	Technische Universität Berlin	10,20%	25,80%	13,40%	13,40%	57,50%	64,40%	57,80%	64,40%	66,40%	71,60%	44,49%
DE	Leibniz Universität Hannover	9,30%	16,80%	19,40%	19,40%	57,50%	65,30%	60,30%	67,10%	61,40%	67,70%	44,42%
DE	Technischen Universität Dortmund	37,30%	16,50%	16,70%	32,30%	48,60%	59,10%	49,30%	59,10%	51,50%	59,70%	43,01%
DE	Technische Universität Darmstadt	11,00%	18,40%	10,20%	10,20%	56,10%	65,80%	56,20%	65,80%	61,20%	68,10%	42,30%
DE	Georg-August-Universität Göttingen	6,40%	5,60%	11,10%	11,10%	57,70%	69,20%	58,70%	69,20%	58,70%	69,20%	41,69%
DE	Johann Wolfgang Goethe-Universität Frankfurt	24,80%	12,80%	11,50%	20,60%	50,30%	62,60%	51,00%	62,60%	52,60%	62,60%	41,14%
DE	Rheinische Friedrich-Wilhelms-Universität Bonn	10,20%	8,90%	14,20%	18,80%	53,00%	64,70%	55,30%	64,70%	55,30%	64,70%	40,98%
DE	Universität zu Köln	6,00%	11,10%	19,40%	19,40%	51,50%	54,10%	54,90%	57,90%	54,90%	57,90%	38,71%
DE	Universität Kassel	34,40%	16,70%	8,20%	8,20%	46,80%	56,10%	46,80%	56,10%	49,50%	57,00%	37,98%
DE	Universität Karlsruhe (TH)	8,60%	17,40%	5,50%	5,50%	51,60%	58,80%	51,60%	58,80%	56,70%	61,90%	37,64%
DE	Ludwig-Maximilians-Universität München	6,30%	8,40%	6,00%	6,00%	52,00%	61,50%	52,00%	61,50%	52,20%	61,50%	36,74%
DE	Ruprecht-Karls-Universität Heide	3,50%	7,60%	8,10%	8,10%	51,20%	57,70%	51,50%	57,70%	51,50%	57,70%	35,46%
DE	Universität Stuttgart	8,40%	17,00%	8,00%	8,00%	44,10%	50,10%	44,20%	50,10%	49,70%	54,10%	33,37%
DE	Universität Regensburg	23,90%	5,50%	4,70%	5,20%	42,60%	54,00%	42,60%	54,00%	42,60%	54,00%	32,91%
DE	Technische Universität München	12,60%	9,70%	3,00%	3,00%	43,20%	54,00%	43,20%	54,00%	45,00%	54,00%	32,17%
DE	Technische Universität Dresden	14,20%	8,50%	8,20%	8,20%	42,60%	51,20%	42,70%	51,20%	43,10%	51,20%	32,11%
DE	Friedrich-Alexander-Universität Nürnberg	7,70%	5,80%	3,70%	3,70%	45,20%	53,80%	45,20%	53,80%	45,20%	53,80%	31,79%
DE	RWTH Aachen	15,10%	8,40%	12,00%	22,50%	37,60%	47,10%	39,80%	47,30%	39,80%	47,30%	31,69%
DE	Eberhard Karls Universität Tübingen	3,70%	5,70%	5,00%	5,00%	46,10%	50,10%	46,10%	50,10%	46,10%	50,10%	30,80%
DE	Universität Leipzig	4,40%	7,50%	7,80%	7,80%	44,30%	44,30%	44,30%	44,30%	44,30%	44,30%	29,33%
DE	Westfälische Wilhelms-Universität Münster	11,40%	5,80%	14,90%	22,70%	35,10%	41,30%	37,80%	43,20%	37,80%	43,20%	29,32%
DE	Albert-Ludwigs-Universität Freiburg	3,20%	6,90%	3,90%	3,90%	48,80%	48,80%	48,80%	48,80%	40,90%	43,60%	27,08%
DE	Friedrich-Schiller-Universität Jena	4,30%	4,30%	5,60%	5,60%	48,80%	48,80%	48,80%	48,80%	38,60%	38,60%	25,14%
DE	Julius-Maximilians-Universität Würzburg	3,10%	4,00%	5,10%	5,10%	48,80%	48,80%	48,80%	48,80%	35,10%	35,10%	22,79%
DE	Martin-Luther-Universität Halle-Wittenberg	3,40%	5,00%	6,50%	6,50%	28,20%	28,20%	28,40%	28,40%	28,40%	28,40%	19,14%

DE Average 43,94%

3. Analysis Results

TOP 10 and BOTTOM 10

Country	Unit name	Case 1	Case 2	Case 3a	Case 3b	Case 4a	Case 4b	Case 5a	Case 5b	Case 6a	Case 6b	Average
GR	HELLENIC OPEN UNIVERSITY	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
GR	PANTEION UNIVERSITY OF SOCIAL AN	29,30%	68,00%	100,0%	100,0%	94,20%	94,20%	100,0%	100,0%	100,0%	100,0%	88,57%
DE	Fernuniversität in Hagen	100,0%	100,0%	39,70%	100,0%	65,90%	100,0%	66,20%	100,0%	100,0%	100,0%	87,18%
GR	NATIONAL AND KAPODISTRIAN UNIVERSITY	48,20%	40,60%	55,90%	100,0%	90,00%	100,0%	92,60%	100,0%	92,60%	100,0%	81,99%
DE	Universität Potsdam	67,10%	19,70%	23,30%	100,0%	68,20%	100,0%	69,50%	100,0%	70,50%	100,0%	71,83%
DE	Freie Universität Berlin	35,10%	24,10%	25,20%	80,90%	79,30%	100,0%	83,00%	100,0%	85,50%	100,0%	71,31%
GR	UNIVERSITY OF CRETE	25,40%	10,40%	49,70%	98,80%	64,80%	74,00%	72,70%	100,0%	72,70%	100,0%	66,85%
GR	UNIVERSITY OF PIRAEUS	42,40%	92,80%	51,50%	51,50%	57,80%	57,80%	58,50%	58,50%	94,70%	94,70%	66,02%
GR	ATHENS UNIVERSITY OF ECONOMICS A	33,00%	64,70%	48,10%	48,10%	74,40%	74,40%	75,30%	75,30%	82,60%	82,60%	65,85%
DE	Ruhr-Universität Bochum	46,50%	14,50%	19,40%	66,90%	67,70%	100,0%	69,50%	100,0%	69,50%	100,0%	65,40%

Country	Unit name	Case 1	Case 2	Case 3a	Case 3b	Case 4a	Case 4b	Case 5a	Case 5b	Case 6a	Case 6b	Average
DE	Westfälische Wilhelms-Universität Münster	11,40%	5,80%	14,90%	22,70%	35,10%	41,30%	37,80%	43,20%	37,80%	43,20%	29,32%
GR	AGRICULTURAL UNIVERSITY OF ATHEN	9,80%	13,30%	15,80%	15,80%	37,30%	37,30%	37,60%	37,60%	37,60%	37,60%	27,97%
DE	Albert-Ludwigs-Universität Freiburg	3,20%	6,90%	3,90%	3,90%	40,60%	43,60%	40,60%	43,60%	40,90%	43,60%	27,08%
DE	Friedrich-Schiller-Universität Jena	4,30%	4,30%	5,60%	5,60%	38,60%	38,60%	38,60%	38,60%	38,60%	38,60%	25,14%
GR	TECHNICAL UNIVERSITY OF CRETE	8,20%	38,30%	15,90%	15,90%	21,30%	21,30%	22,20%	22,20%	42,90%	42,90%	25,11%
GR	UNIVERSITY OF WESTERN MACEDONIA	21,60%	19,00%	21,60%	24,30%	24,10%	24,10%	25,20%	25,70%	26,50%	27,40%	23,95%
DE	Julius-Maximilians-Universität Würzburg	3,10%	4,00%	5,10%	5,10%	35,10%	35,10%	35,10%	35,10%	35,10%	35,10%	22,79%
DE	Martin-Luther-Universität Halle-Wittenberg	3,40%	5,00%	6,50%	6,50%	28,20%	28,20%	28,40%	28,40%	28,40%	28,40%	19,14%
GR	THE ATHENS SCHOOL OF FINE ARTS	7,10%	24,20%	7,10%	7,10%	7,10%	7,10%	7,10%	7,10%	24,20%	24,20%	12,23%
GR	UNIVERSITY OF PELOPONNESE	14,50%	8,00%	10,60%	10,60%	4,30%	4,30%	10,60%	10,60%	11,20%	11,20%	9,59%

Facts

- universities in Greece **on average more efficient** (51,23% versus 43.94%), but **correlation** efficiency with country code **only 0,184**
- minimum and maximum values in Greece (100,0% and 9,59%)
- variance in Greece larger (5,5% versus 2,4% in Germany)
- most indicators (student numbers) only „weak“ for efficiency measurement (needing further assumptions as e.g. identical drop-out rates) → research problem of data need and data availability (inst. level)
- quality comparison unknown

Further Research

- Further evaluation and separation of distance learning universities for efficiency evaluations in higher education; possibly other specific clusters necessary (e.g. technical universities; pedagogical universities)?
- Universities in Greece on average more efficient for the included indicators – research hypothesis falsified; but quality comparison and assurance needed (are BA/MA/PhD degrees really comparable?).
- Quality and variance (coherence) have to be included into the discussion, only efficiency values allow no economic or ethical claims.

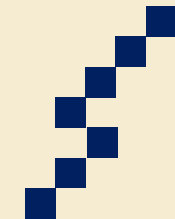
**Thank you for
your attention!**



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