

HELENA



Higher Education Global
Efficiency Analysis

Efficiency Evaluation of Teaching and Learning Strategies using DEA

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1. Background: HE and Efficiency



2. Research Hypothesis and Method

Higher Education - Background

- 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
- HE management concepts \leftrightarrow new public management, internationalisation, rankings (WCU) & policy (Bologna)
- HE specifics in outcome (measurement) e.g. with assumed relations between research & teaching (Humboldt)

Research Question and Method

- What international research results can be found regarding **efficiency in higher education**, especially teaching & learning methods?
- use of data envelopment analysis (DEA) for international data sets from different higher education systems: EUMIDA data for the 98 largest universities in Europe (BA students)

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; Worthington/Higgs 2011)
- data from the EU EUMIDA project (University Micro Data), completed in 2011 and listing >2.000 HEI in Europe
- staff (input) and student (outcome) data (ISCED 5 = BA level as well as ISCED 6 = MA level) for 600 HEI in 23 European countries listed
- use of the largest 98 of them with more than 27.000 BA students (ISCED 5)

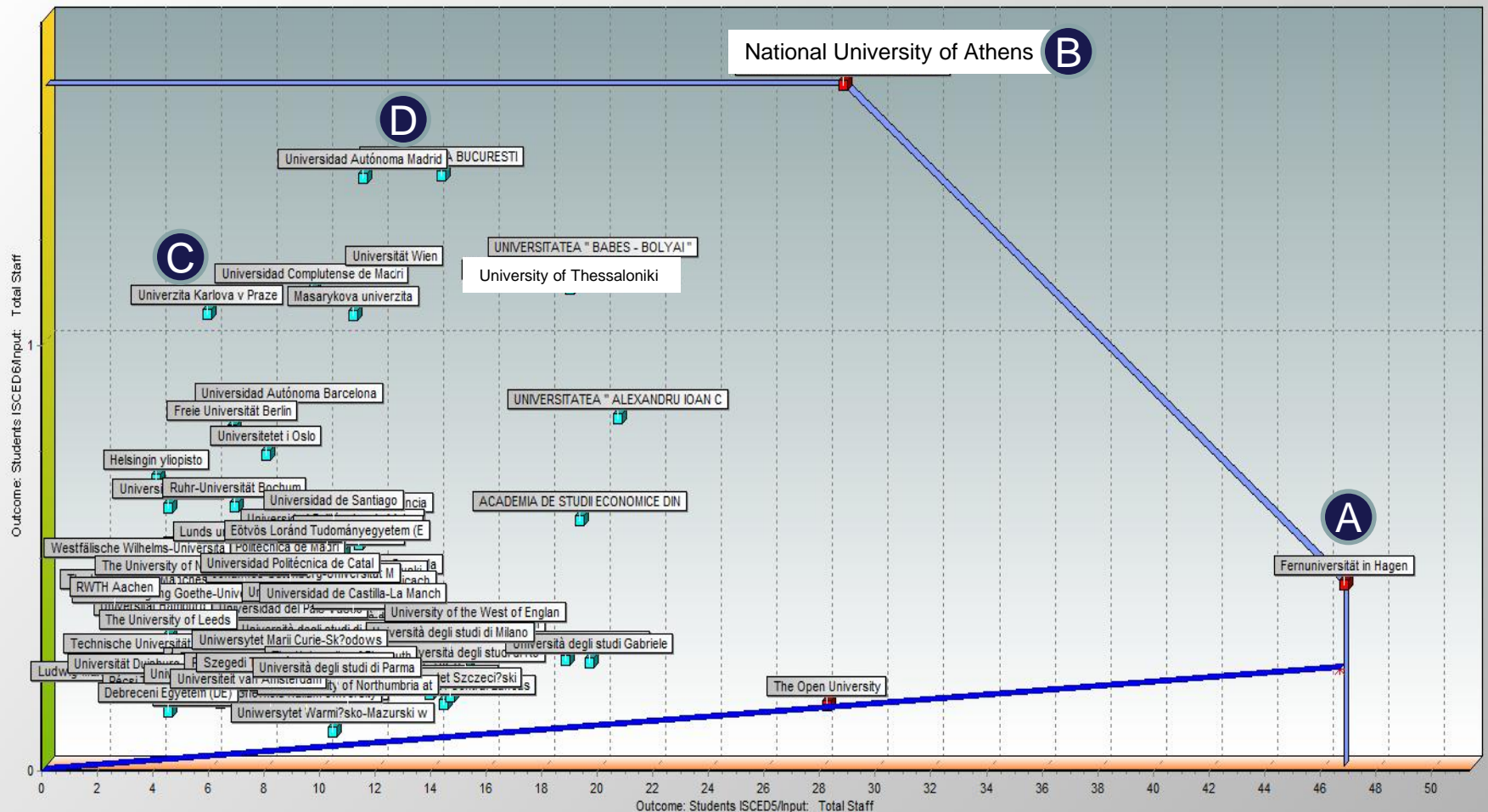
Institution Name	Input: Total Staff	Outcome: Students ISCED5	Outcome: Students ISCED6
The Open University	6430	180772	921
Università degli studi "La Sapienza"	11955	138642	2817
Università degli studi "Federico II"	7983	90550	1782
Università degli studi di Bologna	9222	89658	1882
NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS	3070	88098	4906
Universidad Complutense de Madrid	7983	76318	8863
Università degli studi di Torino	6362	70303	1368
ARISTOTLE UNIVERSITY OF THESSALONIKI	3688	69660	4125
Università degli studi di Padova	6363	68783	1608
Università degli studi di Catania	4437	65208	1288
Università degli studi di Palermo	5684	65334	1253
Università degli studi di Milano	5119	65137	1559
Università degli studi di Firenze	5928	63230	1471
Universität Wien	4924	61788	5669
Università degli studi di Bari	5138	59836	1093
Univerza v Ljubljani	5905	59125	1159
Universidad de Sevilla	5400	57426	2681
Universidad de Granada	4771	56091	2038
Uniwersytet Warszawski	6270	55973	2364
Università degli studi di Pisa	6208	52943	1138
UNIVERSITATEA "BABES - BOLYAI" DIN CLUJ-NAPOCA	2605	51227	3058
Universidad de Barcelona	4443	50915	1613
Uniwersytet im. Adama Mickiewicza w Poznaniu	4741	46817	1328
Uniwersytet Jagielloński w Krakowie	6736	46542	2174
Universidad de Valencia	3976	45323	2275
Universidad del País Vasco	5112	44625	1668
Fernuniversität in Hagen	936	43720	397
Università Cattolica del "Sacro Cuore"	6189	42653	736
Univerzita Karlova v Praze	7009	40619	7435
Ludwig-Maximilians-Universität München	13955	39297	2479
Uniwersytet Łódźski	3884	39231	1015
Università degli studi di Salerno	2087	39010	517
UNIVERSITATEA BUCUREȘTI	2727	38780	3781
Università degli studi di Cagliari	4121	38367	543
Università degli studi di "Tor Vergata"	3168	38352	606
ACADEMIA DE STUDII ECONOMICE DIN BUCUREȘTI	1989	38212	1147
UNIVERSITATEA "ALEXANDRU ION CUZA" DIN IASI	1843	37910	1504
Università della Calabria	2708	37360	454
Università degli studi di Genova	4547	37181	994
Uniwersytet Wrocławski	3330	36674	1376
Universität zu Köln	8345	36725	5057
Politecnico di Milano	9859	36689	685
III Università degli studi di Roma	2426	36570	535
Università degli studi di Messina	3547	35218	976
Universidad Politécnica de Madrid	4592	34375	2156
Università degli studi di Perugia	3501	34228	702
Uniwersytet Warmińsko-Mazurski w Olsztynie	3362	34065	264
The University of Manchester	9498	33640	3720
Universidad Autónoma Barcelona	3843	33622	3185
Universidad de Málaga	2792	33423	962
Universität Hamburg	8671	33247	2861
Uniwersytet Śląski w Katowicach	3125	33136	1223
Maastrichtse universiteit	2994	33087	3185
Università degli studi Gabriele D'Annunzio	1682	32878	405
Johannes Gutenberg-Universität Mainz	3548	32848	1450
Universidad Politécnica de Valencia	3156	32528	1685
The Manchester Metropolitan University	3341	32376	591
Politechnika Wrocławska	3853	32274	614
Stockholms universitet	2873	32271	1497
Vestfälsche Wilhelms-Universität Münster	9566	31594	4462
Akademia Górniczo-Hutnicza im. St. Staszica w Krakowie	3905	31589	549
Technische Universität Dresden	6170	31259	1963
Uniwersytet Mikolaja Kopernika w Toruniu	4041	31216	844
Politechnika Warszawska	4316	31101	803
University of the West of England, Bristol	2012	31065	634
The University of Central Lancashire	2160	30937	310
Universität de Zagabria	3828	30716	1917
Sheffield Hallam University	3281	30676	416
Johann Wolfgang Goethe-Universität Frankfurt am Main	6801	30511	2450
Università degli studi di Milano-Bicocca	2993	30438	561
The University of Leeds	6885	30185	2064
Helsingin yliopisto	7599	30092	5124
Uniwersytet Szczeciński	2070	30079	334
Seconda Università degli studi di Napoli	3538	29881	585
Piłańskie Uniwersytet (PTE)	5715	29729	892
Universität Duisburg-Essen	8318	29665	1623
The University of Northumbria at Newcastle	2722	29601	394
Delaware State University (DE)	6134	29564	654
Uniwersytet Marii Curie-Skłodowskiej w Lublinie	3354	29485	839
Universität Utrecht	5259	29276	906
Colegijs universitet	4101	29257	1748
The University of Nottingham	6229	29185	2643
Politechnika Śląska w Gliwicach	3544	29118	708
Lundsk universitet	4532	29090	2293
Edvics Loránd Tudományegyetem (ELTE)	2960	28925	1463
Universidad Politécnica de Cataluña	3296	28911	1415
The University of Plymouth	2716	28798	578
Uniwersytet Gdański	3596	28584	1125
Ruhr-Universität Bochum	4210	28518	2559
Universidad Autónoma Madrid	2491	28440	3438
Universiteit van Amsterdam	3887	28325	619
Szegedi Tudományegyetem (SZTE)	3139	28160	617
Freie Universität Berlin	4190	28010	3307
Università degli studi di Parma	2963	27896	498
Universität i Oslo	3464	27399	2532
RWTH Aachen	11017	27337	4131
Universidad de Castilla-La Mancha	2460	27202	890
Universidad de Santiago	2623	27094	1516

3. Analysis Results: TOP

Efficiency Listing

Institution Name	Input: Total Staff	Outcome: Students ISCED5	Outcome: Students ISCED6	Efficiency
Fernuniversität in Hagen	A 936	43720	397	100,00%
NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS	B 3070	88098	4906	100,00%
UNIVERSITATEA BUCURESTI	D 2727	38780	3781	86,80%
Universidad Autónoma Madrid	2491	28440	3438	86,40%
UNIVERSITATEA " BABES - BOLYAI " DIN CLUJ-NAPOCA	B 2605	51227	3058	73,50%
Universität Wien	4924	61788	5669	72,00%
ARISTOTLE UNIVERSITY OF THESSALONIKI	3688	69560	4125	70,00%
Universidad Complutense de Madrid	C 7983	76318	8863	69,50%
Univerzita Karlova v Praze	C 7009	40619	7435	66,40%
Masarykova univerzita	2994	33087	3165	66,20%
UNIVERSITATEA " ALEXANDRU IOAN CUZA " DIN IASI	D 1843	37910	1504	62,20%
The Open University	A 6430	180772	921	60,20%

3. Analysis Results: Efficiency Frontier



3. Analysis Results: TOP

Efficiency Listing

Institution Name	Input: Total Staff	Outcome: Students ISCED5	Outcome: Students ISCED6	Efficiency
Politechnika Warszawska	4316	31101	903	19,60%
Akademia Górniczo-Hutnicza im. St. Staszica w Krakowie	3905	31589	549	19,30%
The University of Leeds	6885	30185	2064	18,80%
Universiteit van Amsterdam	3887	28325	619	18,30%
Università Cattolica del "Sacro Cuore"	6189	42653	736	16,40%
Politecnico di Milano	5859	36689	865	16,00%
Universiteit Utrecht	5299	29276	906	15,30%
Technische Universität Dresden	8070	31259	1953	15,10%
Pécsi Tudományegyetem (PTE)	5755	29728	892	14,20%
Universität Duisburg-Essen	8318	29665	1623	12,30%
Debreceni Egyetem (DE)	6734	29564	854	11,90%
Ludwig-Maximilians-Universität München	 13955	39297	2479	11,10%

4. Discussion

Hypotheses

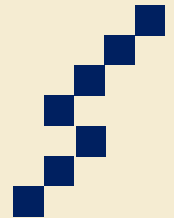
- (A) Distance learning per se more efficient in higher education – but only student and no graduate data yet, also: quality discussion necessary!
- (B) Large mediterranean universities as efficiency leaders – again: missing graduate data (drop-outs) and quality discussion needed, e.g. traditional „lecturing“ and „binge-learning“ methods?
- (C) Existing large „quality & efficiency leaders“ (Madrid, Prague) as benchmarks in Europe?
- (D) Small mediterranean universities as additional efficiency leaders – again: missing graduate data (drop-outs) and quality discussion needed!
- (E) HEI with low efficiencies as quality leaders (Munich, Utrecht, UDE)?

5. Conclusion and Outlook

Further Research

- To discuss: data validity, accessibility, quality
- To include: quality assurance (ENQA, EUA concepts & reports, EQF)
- To validate: teaching & learning methods assumed for university types

Thank you for your attention!



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