

HELENA



Higher Education Global
Efficiency Analysis

Regional Interaction of HEI: A DEA Industry Funding Analysis for Germany

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1. Introduction

Research Interest

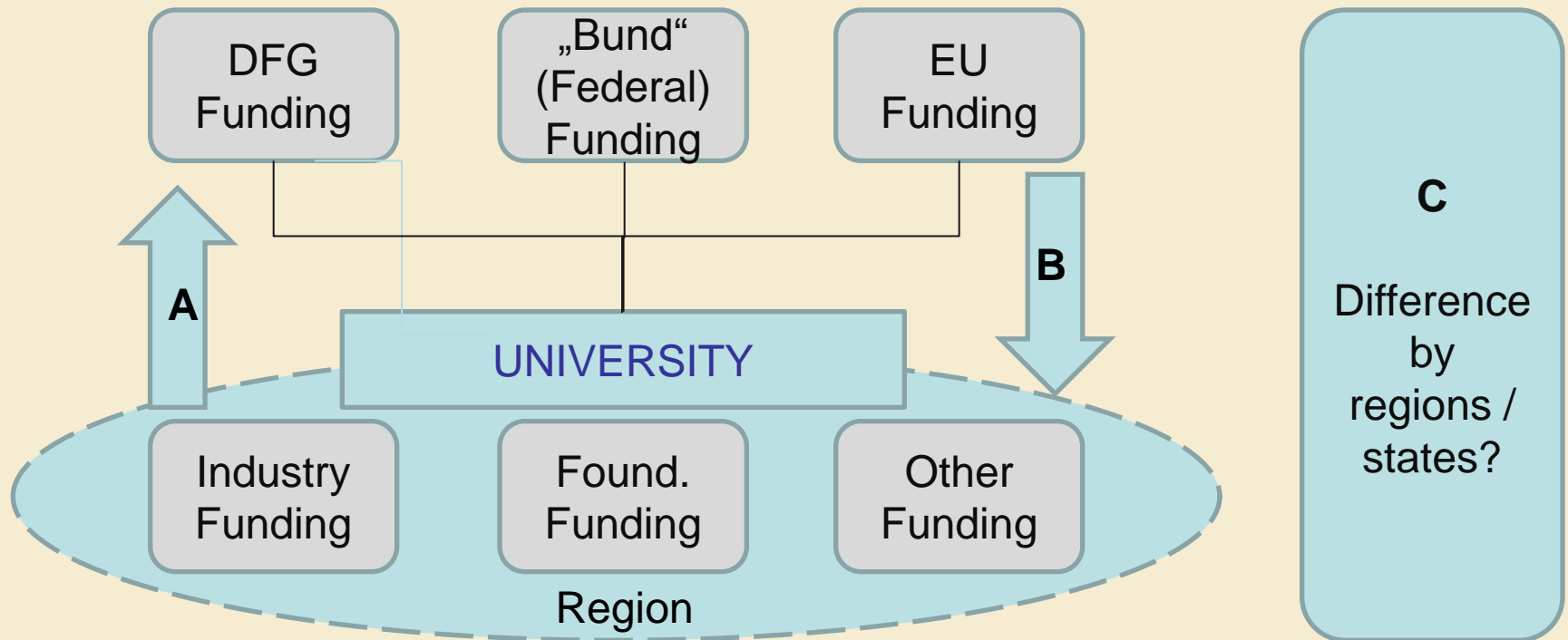
- HEI as regional actors = regional networks & interactions
- HEI management question – NPM & accountability
- Allocation of “optimal” budget and resources to HEI

Research Question

- Can a connection and efficiency of regional third party funding with national and international (EU) research funding be established?

2. Problem Definition

- Regional research budgets as „starting point“ (A) or „transfer direction“ view (B), differences by region (C)?



3. Research Data

- DFG Research Budgets Report 2012, data for **2009** (annual)
- Altogether 87 universities and universities of applied sciences

	DFG	Bund	EU	Foundations	Industry	Other	State / Region
Aachen FH	0,1	4,4	0,5	0,0	4,7	0,5	Nordrhein-Westfalen
Aachen TH	92,4	42,1	13,8	6,3	74,0	21,3	Nordrhein-Westfalen
Augsburg U	6,1	1,2	2,4	5,2	0,0	0,0	Bayern
Bamberg U	3,0	9,0	0,7	2,3	0,0	0,0	Bayern
Bayreuth U	14,3	1,9	2,3	9,2	0,1	0,0	Bayern
Berlin FU	78,5	29,9	13,7	14,9	21,0	7,0	Berlin
Berlin HU	50,7	29,3	11,7	13,5	21,6	12,7	Berlin
Berlin TU	41,5	31,4	21,5	3,0	21,0	6,8	Berlin
Bielefeld U	26,1	8,9	5,7	0,0	7,8	3,8	Nordrhein-Westfalen
Bochum U	32,5	20,4	5,3	6,3	19,5	1,4	Nordrhein-Westfalen
Bonn U	58,9	29,8	12,9	7,8	10,0	5,0	Nordrhein-Westfalen
Braunschweig TU	20,2	21,4	5,6	1,7	16,2	2,0	Niedersachsen
Bremen JU	3,6	2,2	1,5	0,7	1,0	0,2	Bremen
Bremen U	37,8	16,6	7,7	3,6	15,6	4,7	Bremen
Chemnitz TU	10,8	12,5	6,5	0,3	8,6	1,5	Sachsen

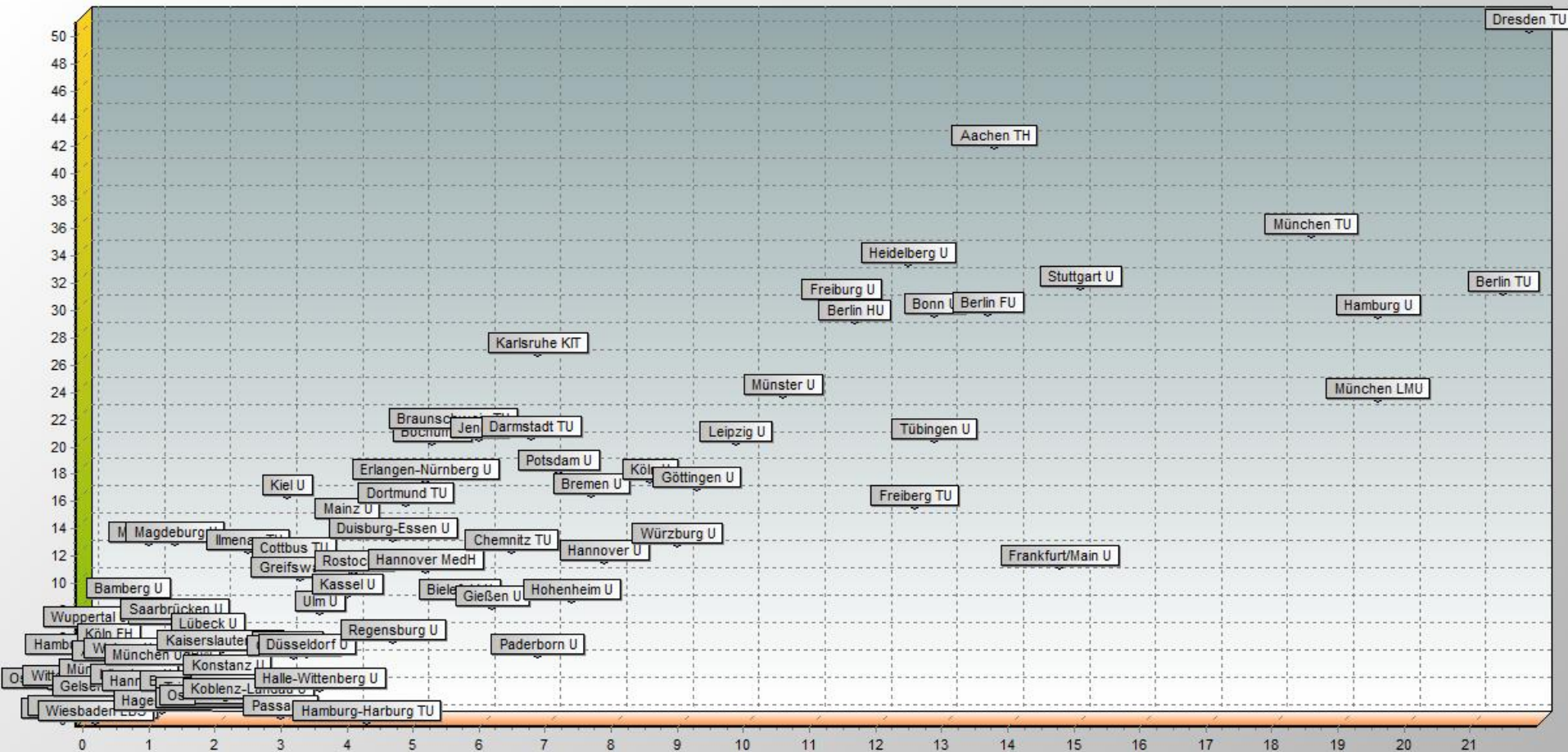
3. Research Data

- Basic data analysis: Correlation among data

	DFG	Bund	EU	Foundations	Industry	Other
DFG	-	0,816	0,794	0,705	0,840	0,507
Bund		-	0,854	0,578	0,741	0,535
EU			-	0,527	0,668	0,413
Foundations				-	0,559	0,348
Industry					-	0,533
Other						-

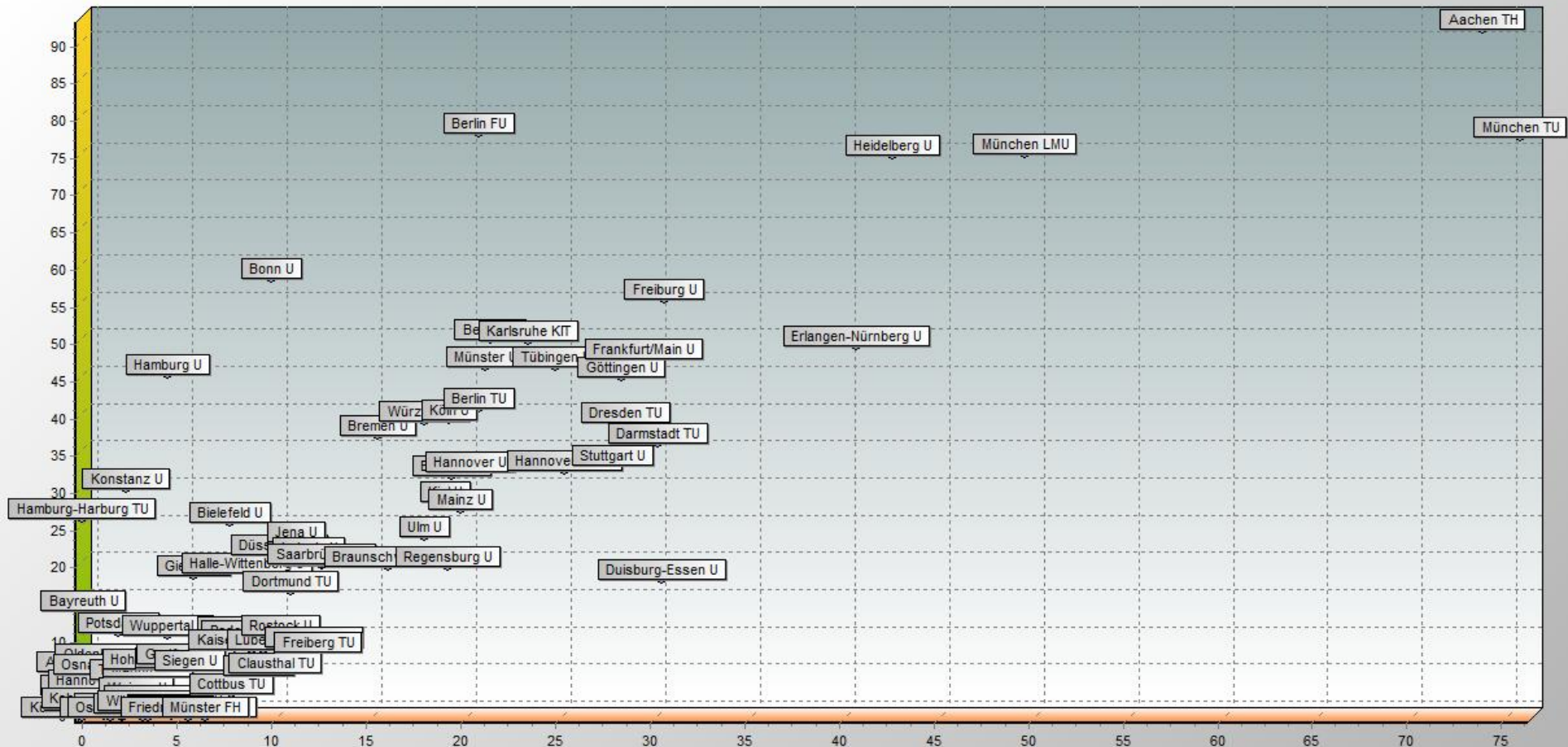
3. Research Data

- Basic data analysis: Correlation among data, EU – Bund $r=0.85$



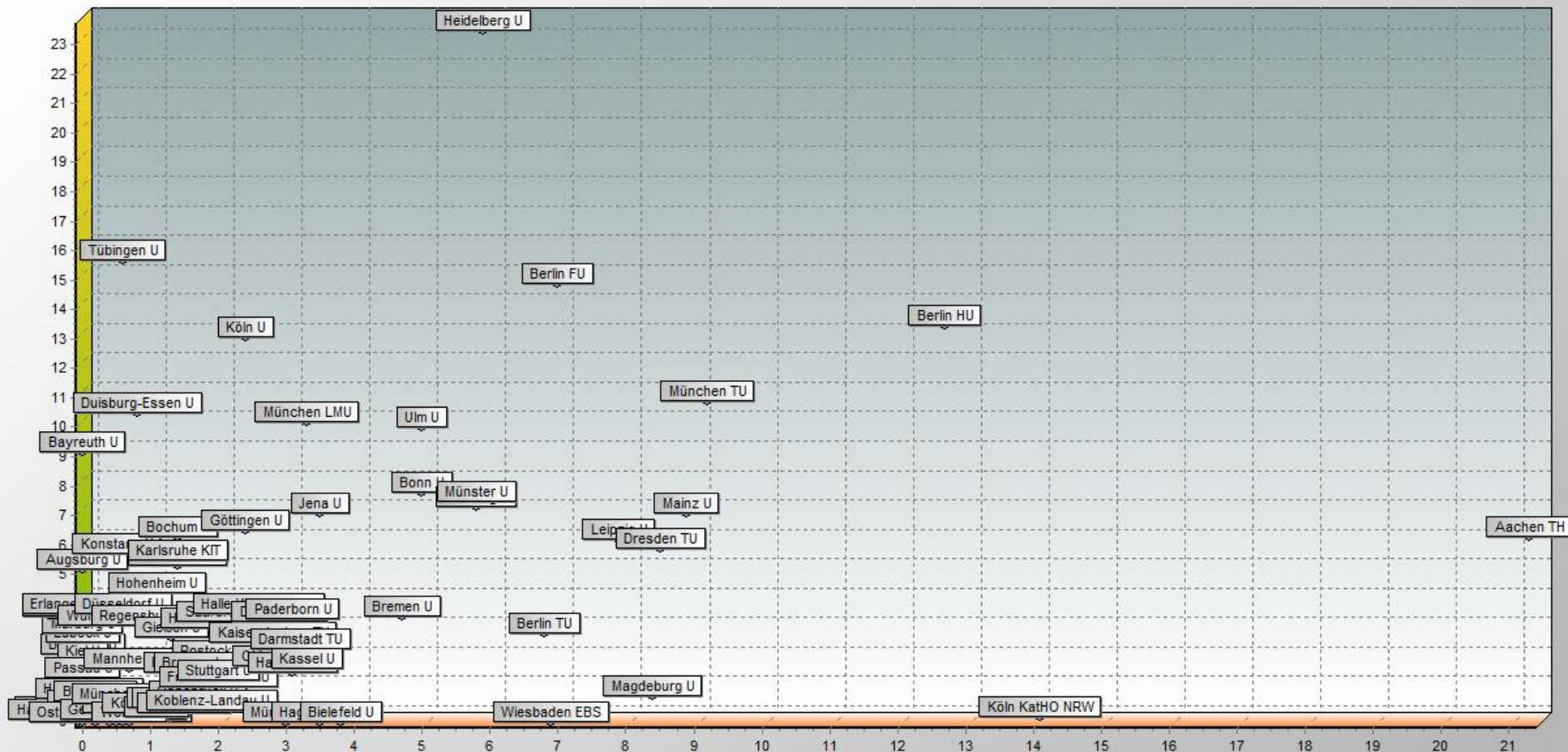
3. Research Data

- Basic data analysis: Correlation Industry – DFG $r=0.84$



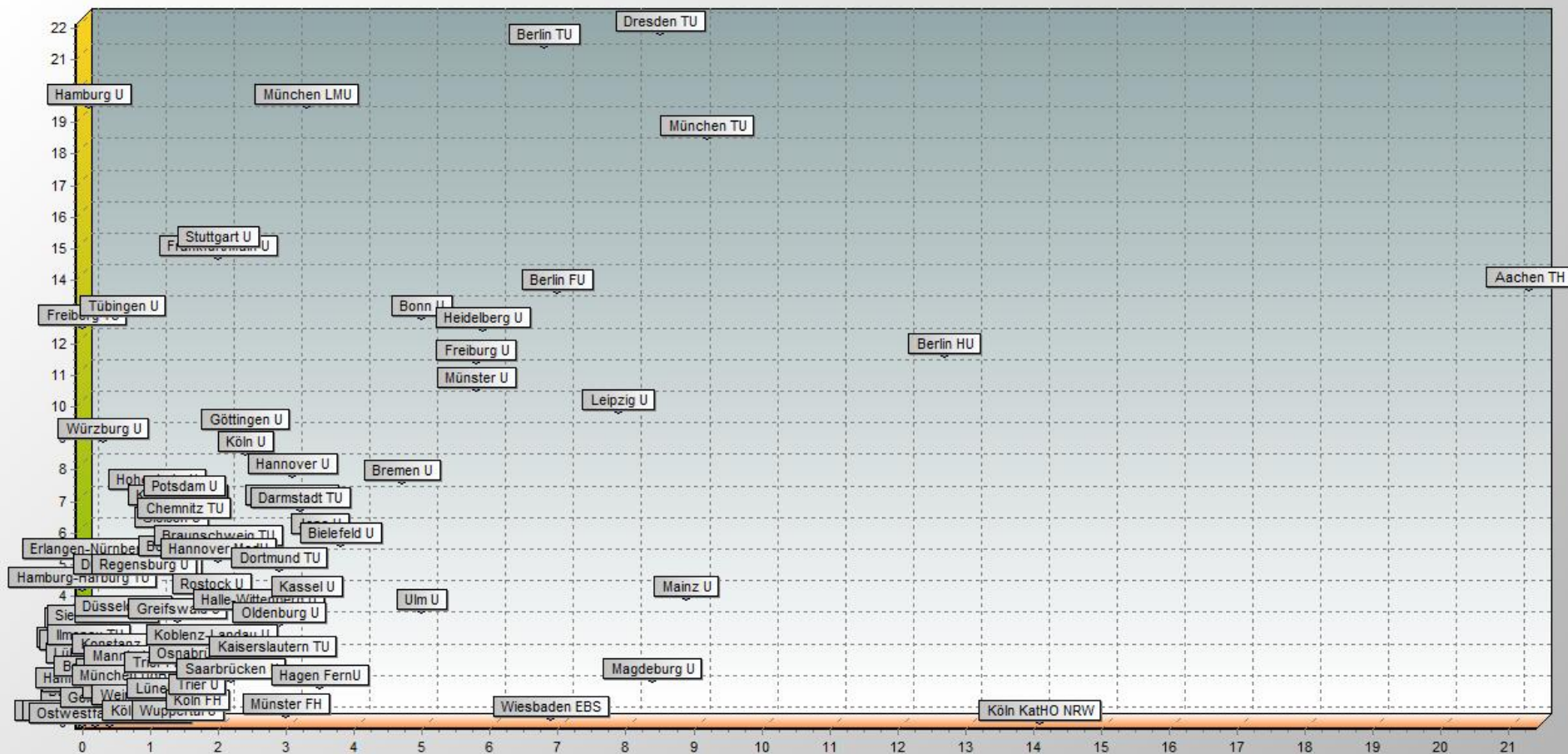
3. Research Data

- Basic data analysis: Correlation „Other“ – Foundations $r=0.35$



3. Research Data

- Basic data analysis: Correlation „Other“ – EU $r=0.41$



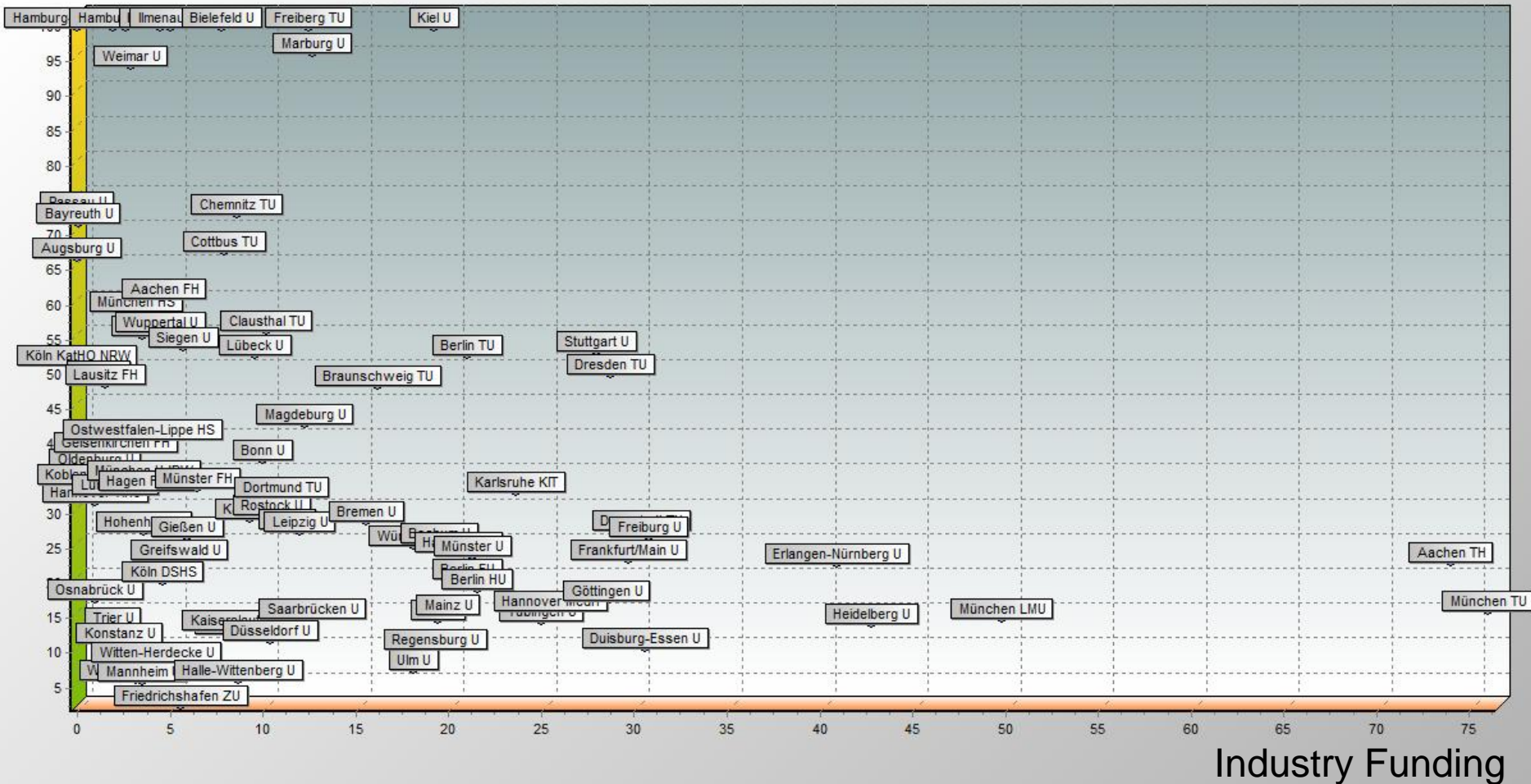
4. DEA Results

	Eff. A	Eff. B			Eff. A	Eff. B	
Bamberg U	100,0%	18,2%	Bayern	Trier FH	49,2%	11,0%	Rheinland-Pfalz
Bielefeld U	100,0%	3,4%	Nordrhein-Westf.	Lausitz FH	48,7%	100,0%	Brandenburg
Freiberg TU	100,0%	2,4%	Sachsen	Braunschweig TU	48,6%	6,2%	Niedersachsen
Hamburg U	100,0%	5,5%	Hamburg	Magdeburg U	43,0%	17,5%	Sachsen-Anhalt
Hamburg UdBW	100,0%	75,0%	Hamburg	Ostwestfalen-Lippe HS	40,7%	100,0%	Nordrhein-Westfalen
Hamburg-H.TU	100,0%	100,0%	Hamburg	Gelsenkirchen FH	38,9%	46,5%	Nordrhein-Westfalen
Ilmenau TU	100,0%	3,5%	Thüringen	Bonn U	37,9%	11,8%	Nordrhein-Westfalen
Kiel U	100,0%	11,2%	Schleswig-Holstein	Oldenburg U	36,6%	18,6%	Niedersachsen
Potsdam U	100,0%	5,8%	Brandenburg	München UdBW	34,9%	12,5%	Bayern
Marburg U	96,4%	22,6%	Hessen	Koblenz-Landau U	34,3%	13,2%	Rheinland-Pfalz
Weimar U	94,4%	8,2%	Thüringen	Münster FH	33,7%	100,0%	Nordrhein-Westfalen
Passau U	73,5%	100,0%	Bayern	Bremen JU	33,6%	14,5%	Bremen
Chemnitz TU	73,2%	2,6%	Sachsen	Hagen FernU	33,5%	11,2%	Nordrhein-Westfalen
Bayreuth U	71,8%	100,0%	Bayern	Karlsruhe KIT	33,2%	12,5%	Baden-Württemberg
Cottbus TU	67,9%	4,4%	Brandenburg	Lüneburg U	32,9%	20,7%	Niedersachsen
Augsburg U	67,0%	100,0%	Bayern	Dortmund TU	32,5%	12,3%	Nordrhein-Westfalen
Aachen FH	61,0%	14,8%	Nordrhein-Westfalen	Hannover TiHo	31,8%	17,1%	Niedersachsen
München HS	59,1%	92,8%	Bayern	Rostock U	30,0%	11,3%	Mecklenburg-Vorpommern
Clausthal TU	56,4%	12,3%	Niedersachsen	Kassel U	29,3%	12,6%	Hessen
Wuppertal U	56,2%	36,3%	Nordrhein-Westfalen	Bremen U	29,1%	10,7%	Bremen
Köln KatHO NRW	55,7%	19,4%	Nordrhein-Westfalen	Jena U	27,9%	18,9%	Thüringen
Siegen U	53,9%	6,7%	Nordrhein-Westfalen	Darmstadt TU	27,8%	9,6%	Hessen
Stuttgart U	53,4%	3,8%	Baden-Württemberg	Hohenheim U	27,5%	28,1%	Baden-Württemberg
Berlin TU	53,0%	5,1%	Berlin	Leipzig U	27,5%	16,5%	Sachsen
Lübeck U	53,0%	23,3%	Schleswig-Holstein	Gießen U	26,9%	14,1%	Hessen
Köln U	51,5%	100,0%	Nordrhein-Westf.	Freiburg U	26,8%	12,7%	Niedersachsen
Dresden TU	50,1%	7,1%	Sachsen	Bochum U	26,0%	17,6%	Nordrhein-Westfalen

4. DEA Results

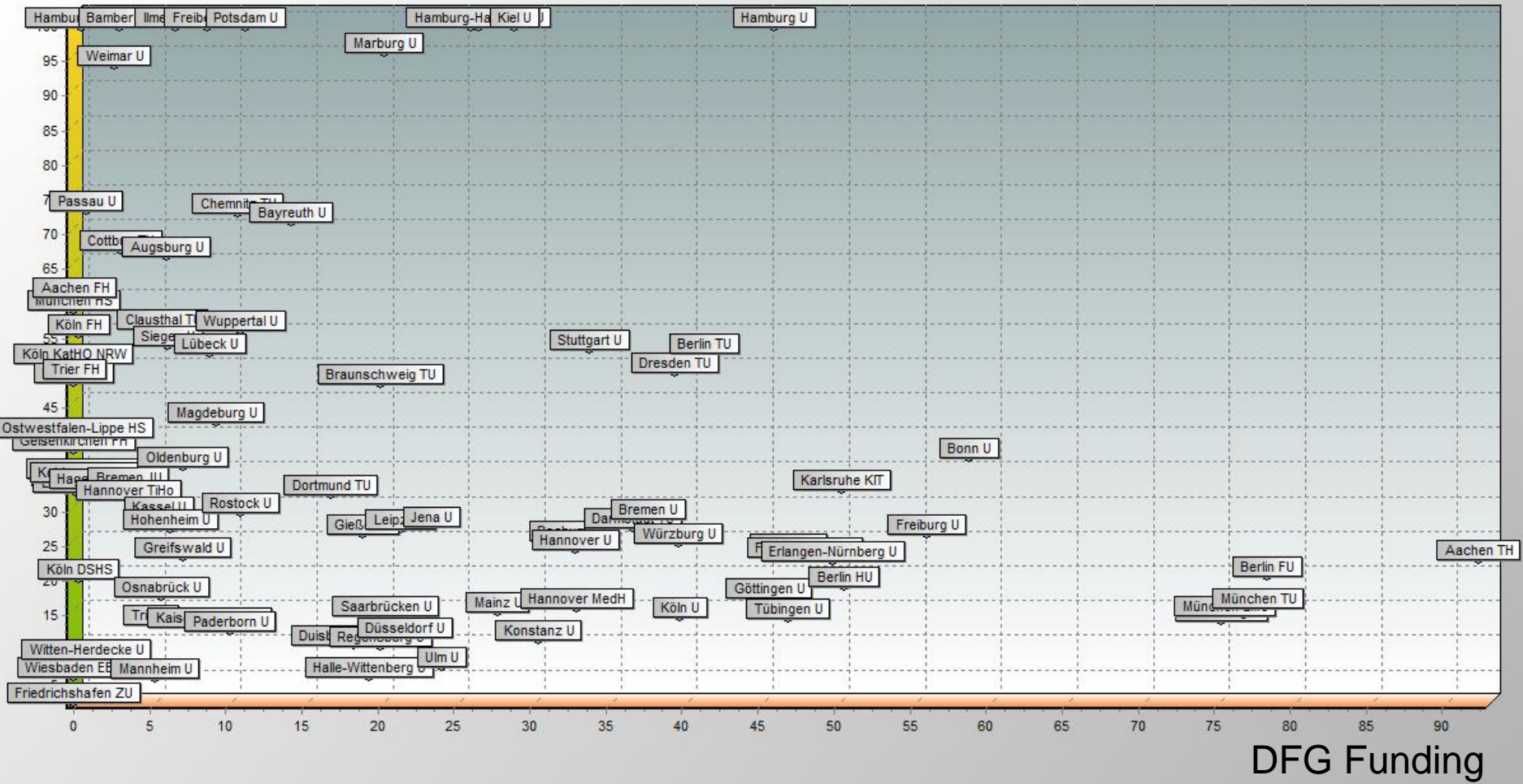
A

DEA: Efficiency Correlation Industry Funding $r = -0.32$



4. DEA Results

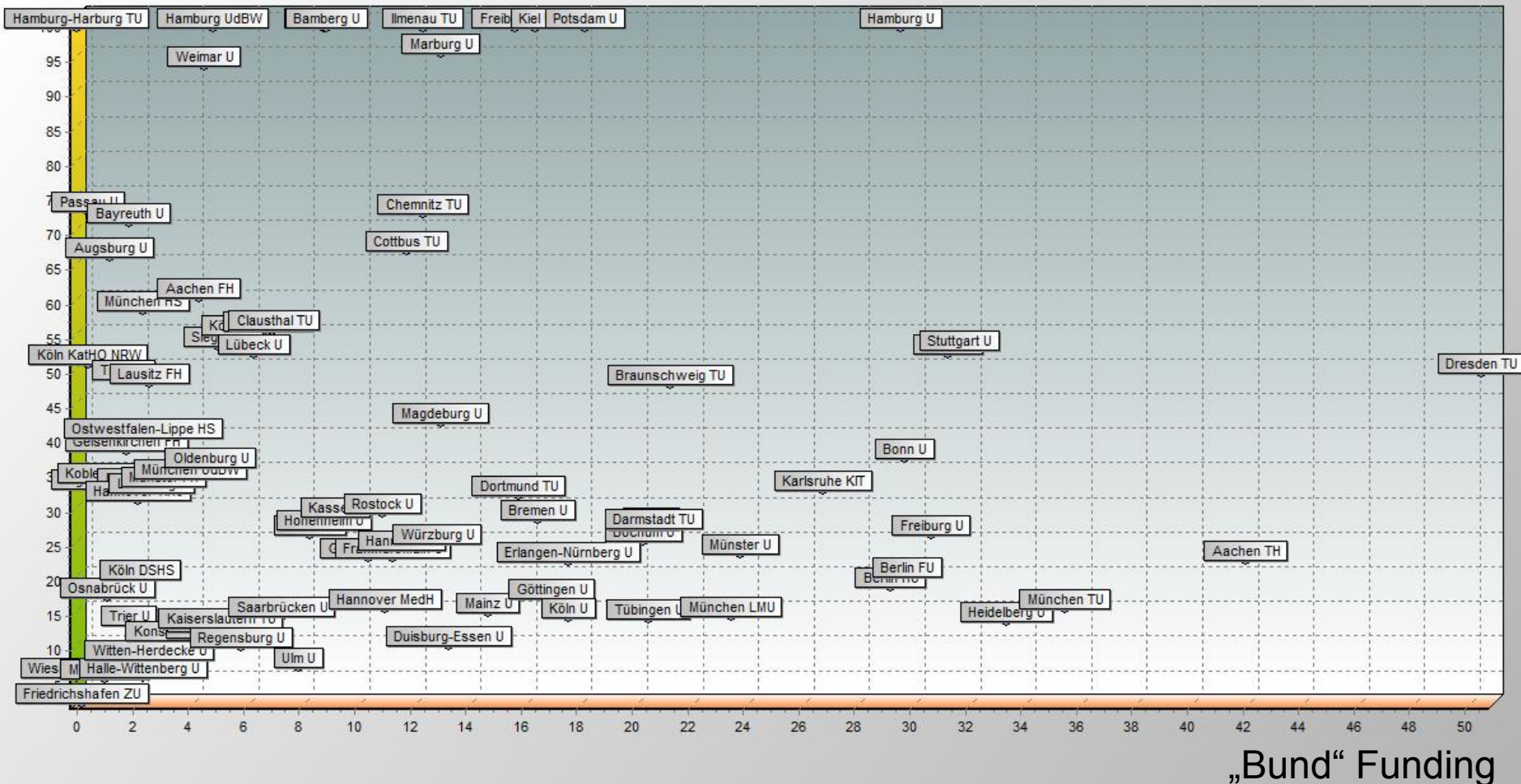
A DEA: Efficiency Correlation DFG Funding $r = -0,25$



4. DEA Results

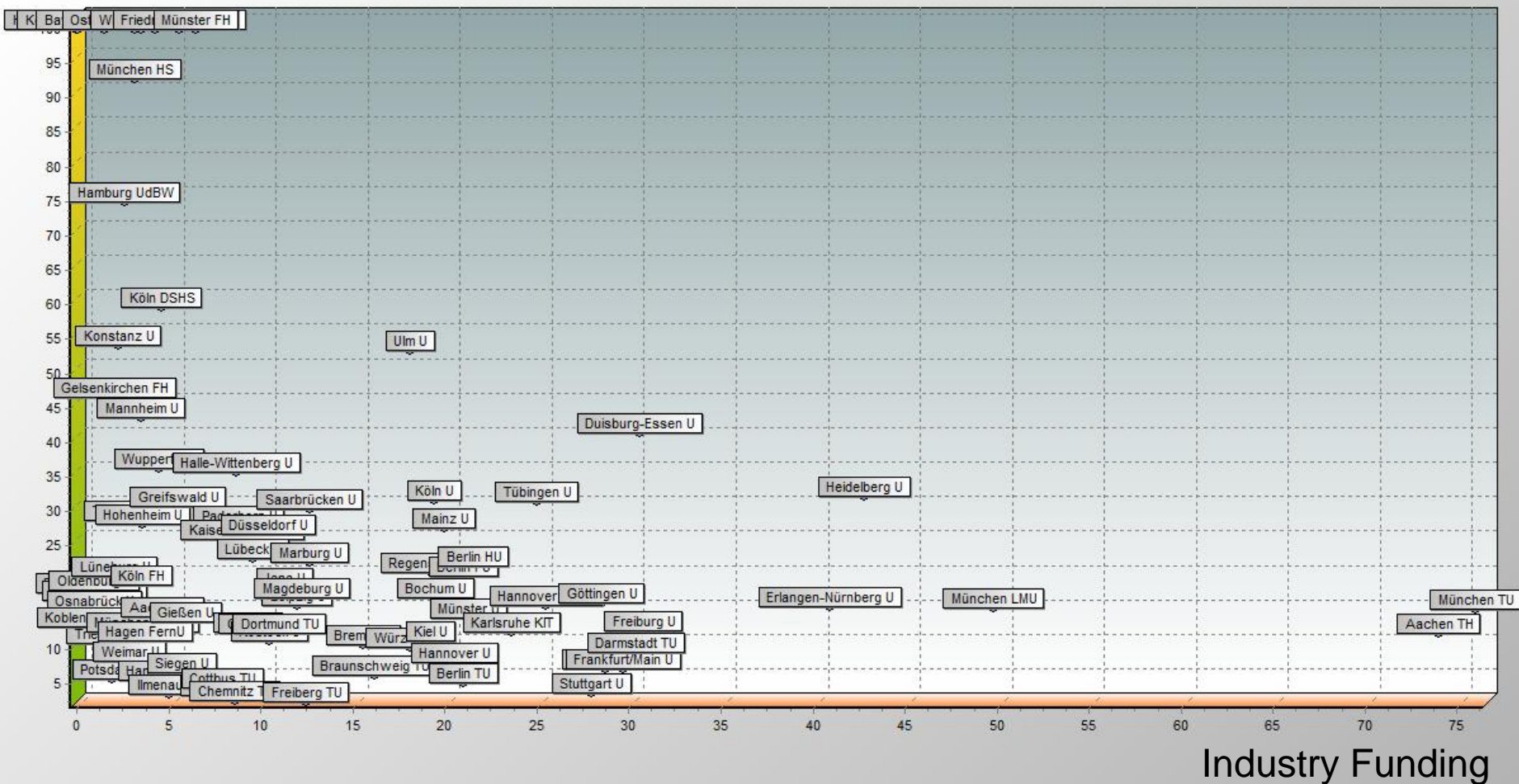
A

DEA: Efficiency Correlation Federal Funding $r = -0,04$



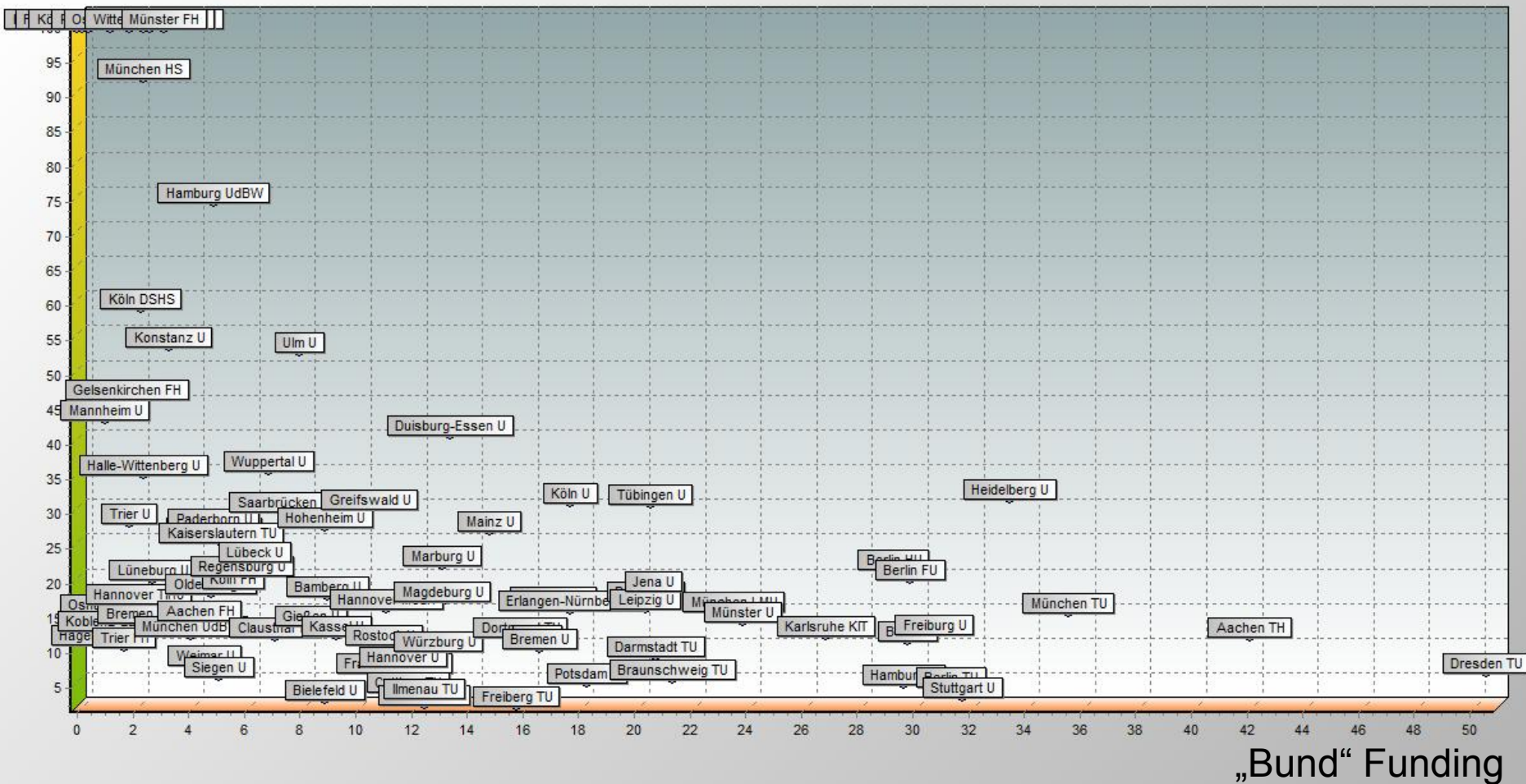
4. DEA Results

B DEA: Efficiency Correlation Industry Funding



4. DEA Results

B DEA: Efficiency Correlation Federal Funding



4. DEA Results

C

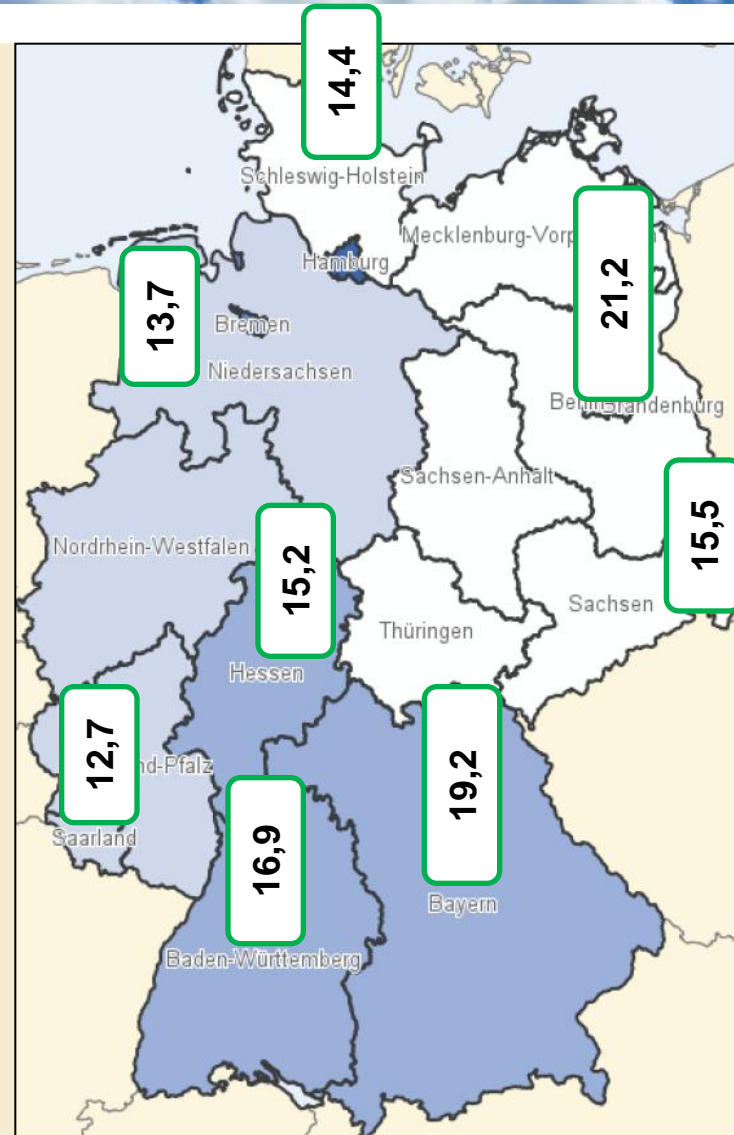
DEA: Efficiency Values for States/Regions on Average

	Total	DFG	Bund	EU	Found.	Industry	Other	Eff. A	Eff. B
Baden-Württemberg	708 M€ - 9 U	30,4	14,9	6,9	7,6	16,9	1,9	19,4%	37,4%
Bayern	746 M€ - 10 U, 1 UAS	26,2	10,4	6,1	4,6	19,2	1,3	45,1%	45,7%
Berlin	430 M€ - 3 U	56,9	30,2	15,6	10,5	21,2	8,8	31,0%	15,9%
Brandenburg	75 M€ - 2 U, 1 UAS	4,8	10,9	3,7	0,8	3,8	0,9	72,2%	36,7%
Bremen	48 M€ - 2 U	3,6	2,2	1,5	0,7	1,0	0,2	33,6%	14,5%
Hamburg	143 M€ - 3 U	24,4	11,5	8,0	1,2	2,4	0,1	100,0%	60,2%
Hessen	345 M€ - 6 U	21,7	10,5	5,5	1,9	15,2	2,8	35,0%	27,7%
Mecklenburg- Vorpommern	74 M€ - 2 U	9,1	10,8	3,7	3,7	8,0	1,7	26,8%	21,1%
Niedersachsen	552 M€ - 9 U, 1 UAS	21,1	11,0	4,8	2,4	13,7	2,2	30,9%	14,5%
Nordrhein-Westfalen	1083 M€ - 15 U, 6 UAS	18,3	10,3	4,0	3,2	12,2	3,5	35,5%	38,9%
Rheinland-Pfalz	141 M€ - 4 U, 1 UAS	8,7	5,0	2,2	2,3	6,7	3,3	25,2%	21,3%
Saarland	48 M€ - 1 U	20,5	7,4	1,4	3,4	12,7	2,2	15,1%	30,3%
Sachsen	81 M€ - 4 U	20,2	24,8	12,7	3,1	15,5	4,5	62,7%	7,2%
Sachsen-Anhalt	86 M€ - 2 U	14,4	7,8	2,5	2,3	10,5	5,5	24,6%	26,7%
Schleswig-Holstein	100 M€ - 2 U	19,0	11,5	2,5	2,4	14,4	0,0	76,5%	17,3%
Thüringen	111 M€ - 3 U	11,0	12,6	3,0	2,5	6,4	1,4	74,1%	10,2%

4. DEA Results

C

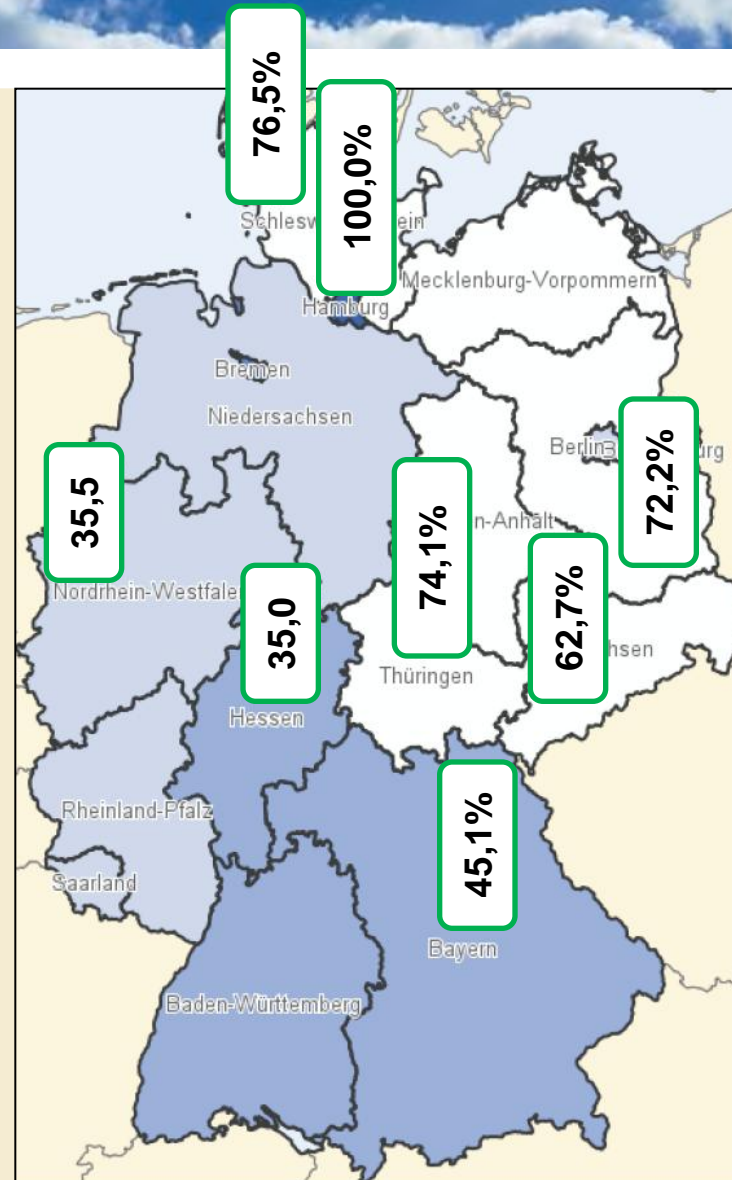
Industry
Income States
/ Regions on
Average per
HEI, Top 8
(50%)



4. DEA Results

C

Efficiency per
HEI on
Average
(**Eff. A**,
„Starting Point
Perspective“),
Top 8 (50%)



5. Implications

“Management Perspective”:

- Institutional processes and performance seems to be much more important than regional location („high“ and „low“ performers in every region / state)
- Further research (institutional research) and management focus needed for supporting and motivation research funding acquisition (e.g. Science Support Centre UDE)

“System Perspective”:

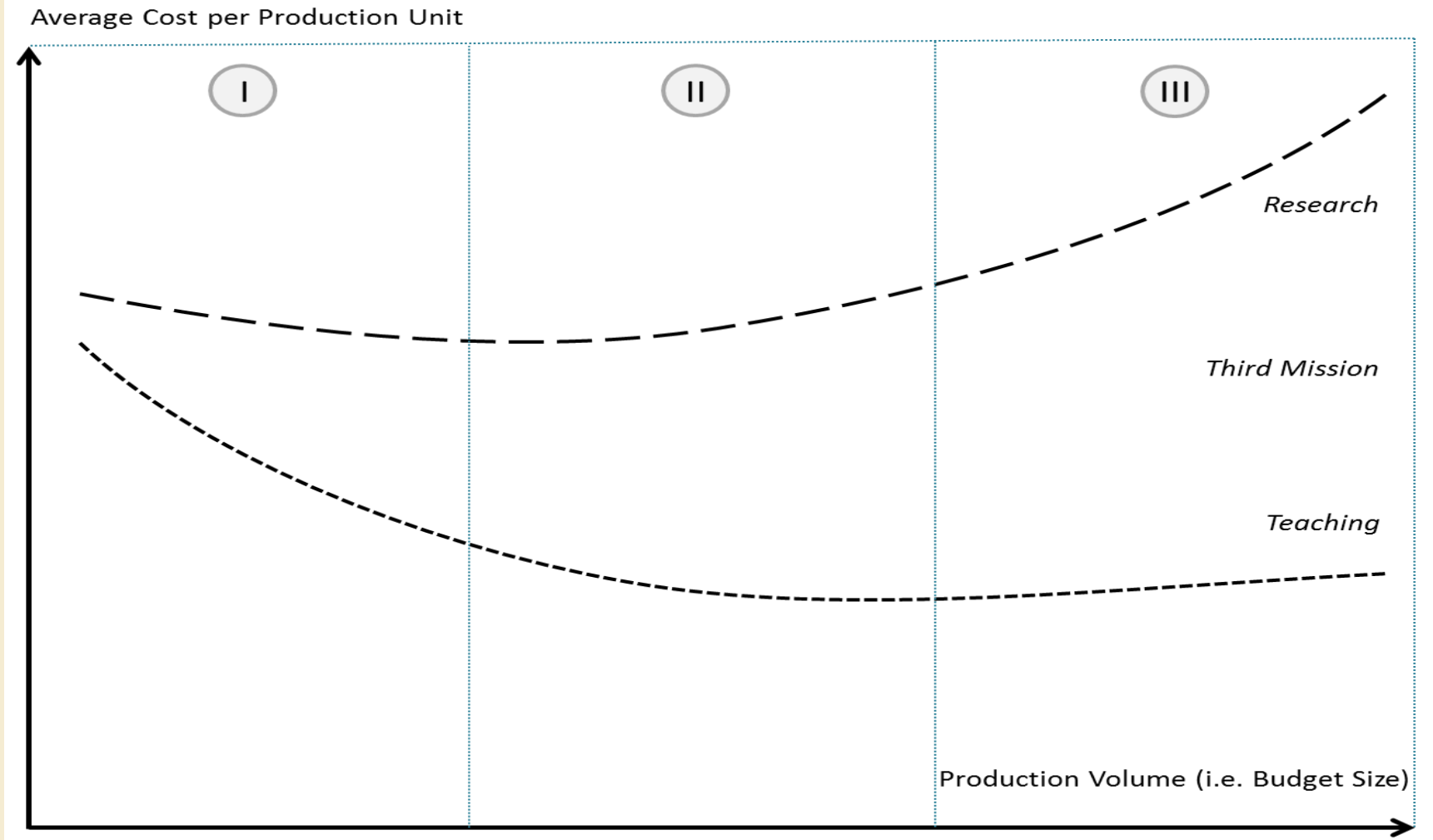
- *Diseconomies of scale* should be a major concern for system funding
- Diversity of funding schemes is a strategic „value“ and has to be enhanced not diminished (e.g. rethinking the GEI allocation to DFG)
- Economic background & supra-regional attraction (Berlin) important

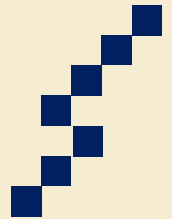
5. Discussion

Suggestions for Further Research:

- **In-depth research for the economies / diseconomies of scale question in higher education**
- **International comparison of German results on regional funding**
- **Re-checking of data quality (e.g. TUHH) and distinction (industry and foundation money really „local/regional“?)**
- **Analysis including state base grants would allow for overall perspective**
- **Integration of regional funding discourse in general research budget acquisition (ethics, influence?) and directions of competitive funding (e.g. not enough long-term thinking and risk-taking research strategies)**

5. Discussion





**Thank you for
your attention!**

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