





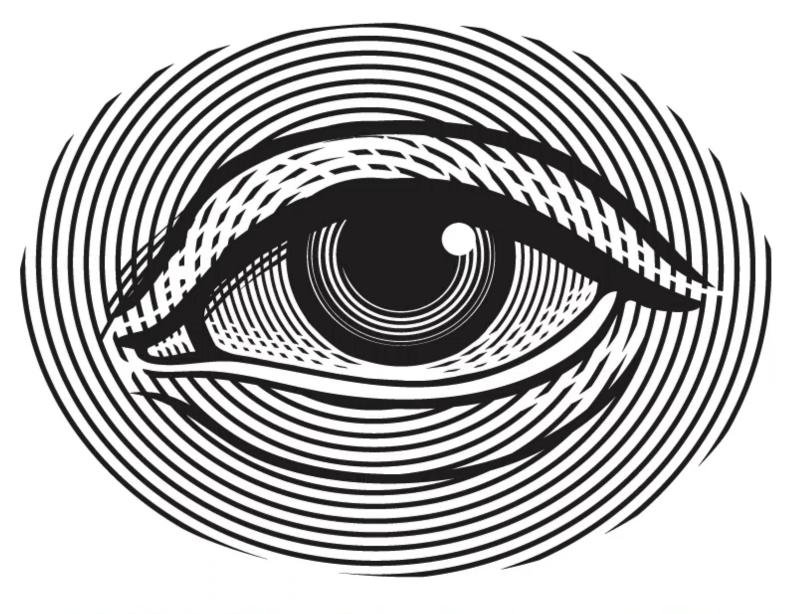
#### Research Evaluation in the Czech Republic

Prof. Ing. Petr Dvořák, CSc.

Department of Biology, Faculty of Medicine, Masaryk University First Vice-Chairman of the R&D Council of the Czech Republic

The training is aimed at the researchers of the Institute of Mathematics of the Czech Academy of Sciences.

The cost of the training is covered from the OPVVV project CZ.02.2.69/0.0/0.0/18\_054/0014664 "Institute of Mathematics CAS goes for HR Award — Implementation of the professional HR management."



## JUDGEMENT DAY

#### M17+ has five modules and step-wise implementation

#### Implementation period 2017-2019; complete application of 5-year cycle by 2020/2021

#### • MODULE 1 - Quality of Selected Results

In 2018, results not subject to bibliometric treatment, evaluated by external evaluators according to their social relevance; limited to 10% of 2016 results; 2019 - Excellence and/or social relevance in 2017 and 2018; in 2020 any top-level results, including results subject to bibliometric treatment over a 5 year period

#### MODULE 2 - Research Performance

The overall research performance profile; disciplinary and institutional bibliometry using AIS and international benchmarking; 2019 bibliometry will be cumulative (2017 + 2018); large consortium papers separated out; international cooperation will be monitored and the comparison will be with the EU15

#### MODULE 3 - Social Relevance

**Economic or social impact of research**, applied research grants; transfer of results into practice, cooperation with the applications sphere, institutional system of technology transfer; training in IP knowledge, soft skills

#### MODULE 4 - Viability

Institutional research environment - i.e. research management, HR, career in research, PhD, instrument infrastructures and sharing, mobility of PhD students and academics, successful engagement of academics in an international research environment, best research practice

#### MODULE 5 – Ambitions and Strategy

Research strategy, mission and vision, national and international research context, research strategy implementation tools, placement/transfer strategy in university rankings or other external evaluations, effort/tools to increase international reputation

Central panels

Providers/ROS

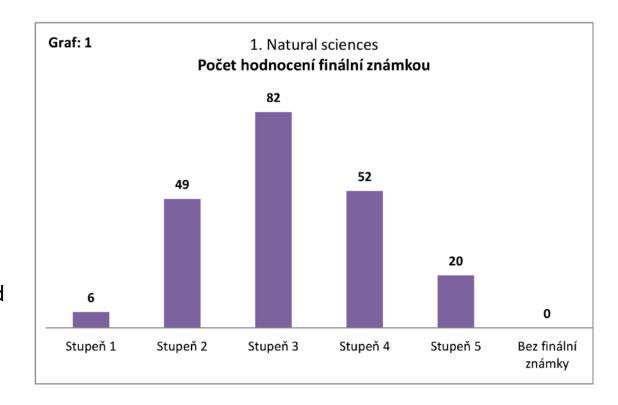
#### 1. Natural sciences

Tab.: 1 - Počet hodnocení finální známkou za oborovou skupinu

#### **Module 1 in 2018**

Finální známka	Suma	Stupeň 1	Stupeň 2	Stupeň 3	Stupeň 4	Stupeň 5	Bez finální známky	
Počet hodnocení	209	6	49	82	52	20	0	
Podíl	100%	3%	23%	39%	25%	10%	0%	

- Time shift in the impact of research outputs
- Only outputs for 2016 evaluated short time window
- Difficulty of evaluating separately from the point of view of social relevance without a scientific quality context
- Evaluators must be better educated
- Recruitment of additional high quality evaluators needed
- Existing evaluators were stringent enough



Question of international reviewers for 5-year evaluation is critical!!!

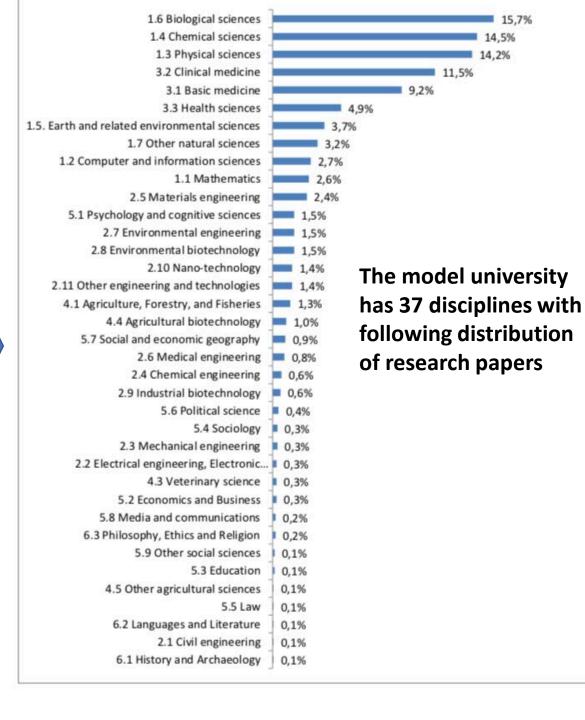
Distribution of all university publication outputs (for 2016) in FORD disciplines (Fields Of Research and Development; Frascati manual)

Field-specific publishing frequencies are clear and must be considered!

#### **Module 2 in 2018**

#### **Institutional Report**

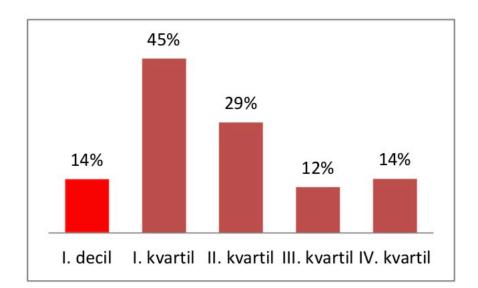
Obor	Počet	Podíl
1.6 Biological sciences	226	16%
1.4 Chemical sciences	209	14,51%
1.3 Physical sciences	204	14,17%
3.2 Clinical medicine	166	11,53%
3.1 Basic medicine	132	9,17%
3.3 Health sciences	70	4,86%
1.5. Earth and related environmental sciences	53	3,68%
1.7 Other natural sciences	46	3,19%
1.2 Computer and information sciences	39	2,71%
1.1 Mathematics	37	2,57%
2.5 Materials engineering	35	2,43%
5.1 Psychology and cognitive sciences	22	1,53%
2.7 Environmental engineering	22	1,53%
2.8 Environmental biotechnology	22	1,53%
2.10 Nano-technology	20	1,39%
2.11 Other engineering and technologies	20	1,39%
4.1 Agriculture, Forestry, and Fisheries	18	1,25%
4.4 Agricultural biotechnology	14	0,97%
5.7 Social and economic geography	13	0,90%
2.6 Medical engineering	12	0,83%



Distribution of all model university outputs in the first decile and quartiles is strongly dependent on the structure of multidisciplinary university

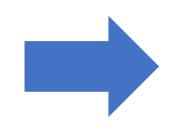
By journal ranking

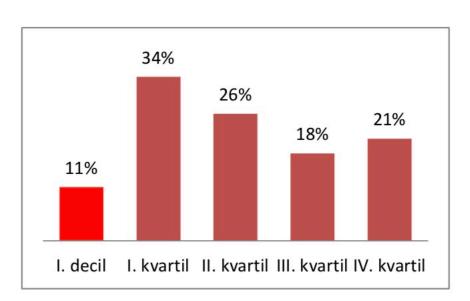
Percentil	Počet	Podíl
I. decil	154	14%
I. kvartil	499	45%
II. kvartil	316	29%
III. kvartil	131	12%
IV. kvartil	155	14%
Celkem	1101	100%



#### By ranking of individual papers

Percentil	Počet	Podíl
I. decil	123	11%
I. kvartil	376	34%
II. kvartil	291	26%
III. kvartil	200	18%
IV. kvartil	234	21%
Celkem	1101	100%



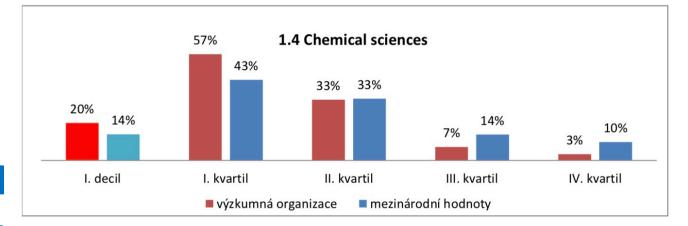


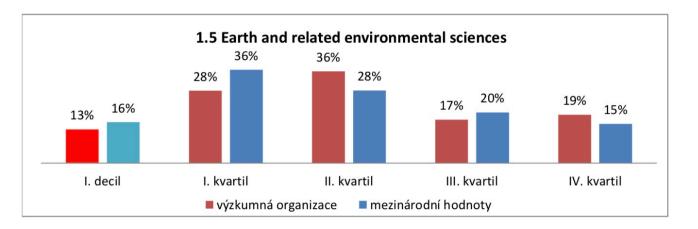
## Bibliometry must be applied and interpreted consistently by disciplines!!!!

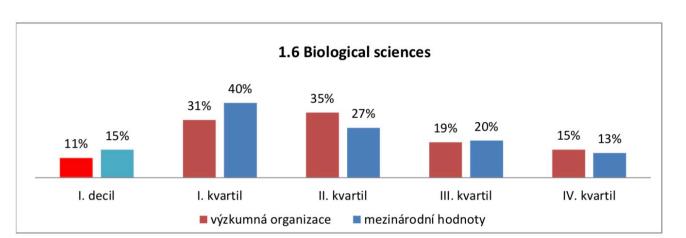
Three frequently publishing disciplines in international benchmarking (according to AIS and journal ranking)

- Discipline 1.4. "Chemical sciences" is relatively good, the other two are....!









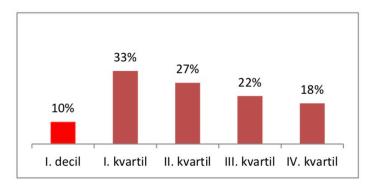
#### + Bibliometric reports by disciplines for the whole CR, including CAS...

#### AN EXAMPLE FOR BIOLOGICAL SCIENCES

**Tabulka a graf 02a:** Rozčlenění národních výsledků v oboru v prvním decilu a v kvartilech podle mezinárodního pořadí časopisů.

1.6 Biological sciences

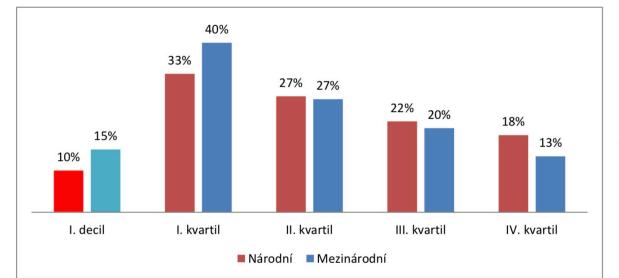
Pásmo	Počet	Podíl
I. decil	243	10%
I. kvartil	805	33%
II. kvartil	674	27%
III. kvartil	528	22%
IV. kvartil	448	18%
Celkem	2455	100%



#### Discipline 1.6. Biological Sciences

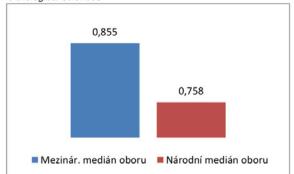
**Graf 02b:** Srovnání podílů národních a mezinárodních výsledků (článků) oboru v prvním decilu a v kvartilech podle AIS časopisu.

#### 1.6 Biological sciences



Tabulka a graf 02c: Porovnání národního a mezinárodního oborového mediánu podle pořadí AIS článků.

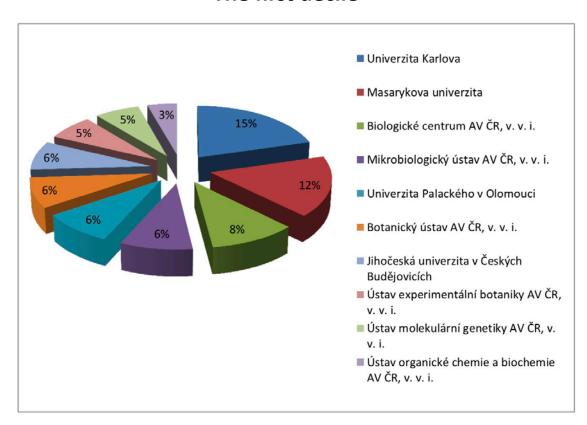
1.6 Biological sciences



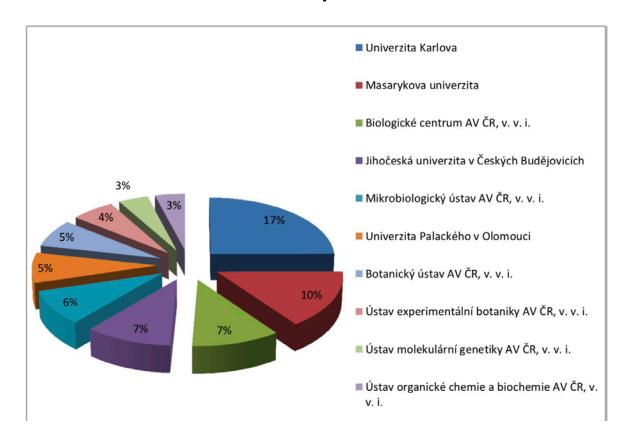
l		Národní medián oboru	Poměr k mezinár. mediánu
	0,855	0,758	89%

#### Dominant (likely according to manpower) research organizations Discipline 1.6. Biological Sciences

#### The first decile



#### The first quartile

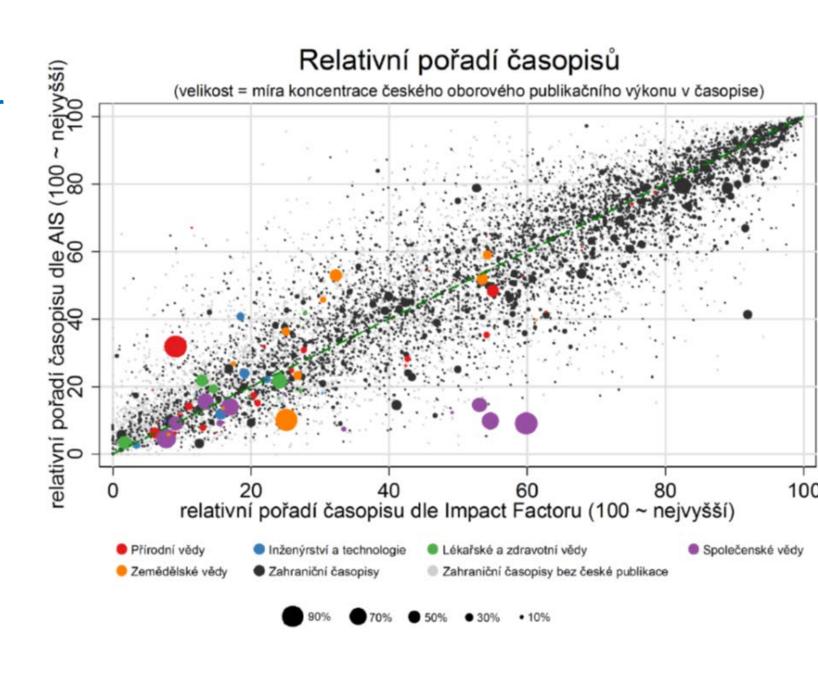


## The preliminary ranking (based on Module 1 and Module 2 only) of Czech universities caused almost earthquake...

	Tab.: Souhrnná zpráva pro poskytovatele - segment vysoké školy																																			
Vstupní	údaje výzkumné organizace		Poi	čet výsled	dků								В	Bibliom	netric	ká anal	ýza									Vybrané výsledky							IND	Refer	renční údaje	e VO
Poskytovatel	Název výzkumné organizace	⊼ ≜	Celkem	NPV	νď	, b	WoS	Wos%vJ	FORD 10+	FORD D1	<b>■</b> Exc D1	■ Exc Q1	<b>■</b> Exc Q2	◀ Median Svět+	✓ Median ČR+	D1 poř. čas.	Q1 poř. čas.	Q2 poř. čas.	Q3 poř. čas.	Q4 poř. čas.	■ D1 poř. člán.	4 Q1 poř. člán.	Q2 poř. člán.	3 0		kem vybr. vysl.	Stupeň 1	Stupeň 2	Stupeň 3	■ Stupeň 4	Stupeň 5	Bez známky	IND VŠ	Fixace v tis Kč ◀	Ħ	Počet studentů ◀
	České vysoké učení technické v Praze	68407700	5 764	1929	3 835	1572	888	56%	20	15	3	4	8	4	5	10%	42%	29%	15%	13%	8%	34% 2	22% 24	1% 20	<u> </u>	.08	7	41	65	50	41	4	A	734 026	1 994,92	18 253
	Jihočeská univerzita v Českých Budějovicích	60076658		66	1389	984	535	54%	10	9	2	5	4	6	7		41%		_	_				5% 24		15	0	1	6	5	0	3	Α	226 647	739,30	9 384
MŠMT	Masarykova univerzita	00216224		1922	4 422	2 788	1 397	50%	24	20	9	16	11	15	12		43%		_	_			26% 1			85	4	21	29	15	3	13	Α			30 457
MŠMT	Univerzita Karlova	00216208		873	8 3 3 6	6 3 7 3	3 608	57%	27	25	10	12	16	9	18				_	_						10	2	19		31	18	2	A	1 610 428	4717,09	45 955
MŠMT	Univerzita Palackého v Olomouci	61989592		345	3 322	2 237	1 101	49%	20	18	8	9	10	9	13		45%		_	_				3% 21		48	1	8		12	3	13		584 313	1 588,59	19 823
MŠMT	Vysoká škola chemicko-technologická v Praze	60461373		214	1 025	677	500	74%	15	12	3	6	12	5	8			36%		_				7% 29		32	0	11	12	7	1	1		311 908	689,26	3 943
MŠMT	Česká zemědělská univerzita v Praze	60460709		213	1349	977	558	57%	14	9	3	2	6	1	2			24%	_	_			18% 20			25	0	4	12	5	4	0	B+	255 552	747,43	19 401
	Mendelova univerzita v Brně	62156489		201	1 466	760	317	42%	10	4	0	2	4	2	2	_		23%	_	_				2% 43		45	0	2		18			B+	187 501	677,08	8 700
	Ostravská univerzita	61988987		42	957	546	216	40%	10	7	2	1	4	3	2	_		21%	_	_				9% 38		25	1	6	10	4	3		B+	106 814	528,40	8 355
	Slezská univerzita v Opavě	47813059		15	472	206	58	28%	2	1	0	2	0	1	1	_		17%	_	_				9% 12		16	0	4	3	4	4		B+	65 845	266,55	4 766
MŠMT	Veterinární a farmaceutická univerzita Brno	62157124		10	481	329	220	67%	7	6	1	2	2	1	2	_		22%	_	_				1% 45		10	0	1	1	2	1		B+	64 008	283,40	2 863
MŠMT	Vysoké učení technické v Brně	00216305		1 034	2 956	1 197	523	44%	19	16	1	2	10	2	2			25%	_	_				3% 37		72	1	7	22	21	21		B+	460 900		18 728
MŠMT	Západočeská univerzita v Plzni	49777513		728	1 250	620	228	37%	9	8	1	3	6	3	3	_	30%	_	_	_				3% 23		36	0	15			18		B+	274 051	1 021,98	10 722
MŠMT	Univerzita J. E. Purkyně v Ústí/Labem	44555601		55	483	288	113	39%	4	1	0	1	3	0	0	_		30%	_	_				L% 30		25	0	2		10	2	0	В	62 850	446,10	7 596
	Univerzita obrany	60162694		123	603	277	99	36%	4	3	0	0	4	1	2			26%	_	_				0% 41		5	0	0	2	0	3	0	В	80 366	437.00	1 622
	Univerzita Pardubice	00216275		155	1 107	498	269	54%	7	4	0	0	4	0	0		19%		_	_				9% 43		21	1	7	8	3	2	0	В	197 054	587,47	7 111
	Univerzita Tomáše Bati ve Zlíně	70883521		155	992	425	134	32%	6	4	2	2	4	1	3			32%						2% 35		24	0	4	9	5	4	2	B	127 678		8 657
MŠMT	Vysoká škola báňská Tech. univerzita Ostrava	61989100		565	1855	658	263	40%	13	6	1	0	4	1	2			24%		_						31	0	9	29	25	14	4	B	287 983	1 074,24	12 688
	Technická univerzita v Liberci	46747885		443	726	301	136	45%	5	2	0	0	2	0	1			30%	_	_				1% 51		55	0	5					B-	135 538	577,24	5 782
	Univerzita Hradec Králové	62690094		12	643	340	116	34%	6	0	0	2	4	0	1		19%			_				7% 43		2	0	0	1	0	1	0	B-	64 258	352,59	6 195
MŠMT	Vysoká škola ekonomická v Praze	61384399		74	1 230	572	97	17%	2	1	0	0	0	0	0	4%			_	_			11% 7			14	0		13				B-	74 069	533,48	13 919
MŠMT	Akademie múzických umění v Praze	61384984		26	68	19	3	16%	0	N/A	N/A	N/A		N/A			33%		_	_				% 67		7	0	2	2	1	0		N/A	16 003	271,65	1 413
	Akademie výtvarných umění v Praze	60461446		10	8	5	2	40%		•		•		•				50%	_	_				0% 09		2	0	0	0	1	0		N/A	4 163	69,48	320
	Janáčkova akademie múzických umění v Brně	62156462		11	24	5	0	0%	_	,,,,	,,,	14//		.,,,,	.,,,,	0,0	0,0	5070	3070	0,0	0,0	0,0	,0,0 5	,,,		1	0	0	0	1	0		N/A	4 380	156,20	657
	Metropolitní univerzita Praha, o.p.s.	26482789		0	136	58	6	10%	0	N/A	N/A	N/A	N/A	N/A	N/A	0%	17%	17%	17%	50%	0%	17% 1	17% 1	7% 50		-				-			N/A	13 699	111,31	4 184
MV	Policejní akademie České republiky v Praze	48135445		0	44	30	3	10%		•		•	•	•				0%	_	_				% 100		4	0	1	1	0	2		N/A	6 709	112,00	2 196
	Univerzita J. A. Komenského Praha s.r.o.	46358978		0	12	5	0	0%	_	,	. 47. 1			,	,			0,0	- , , ,	-0/1	2,0	-,,	- / 0	0	•			_	-		_		N/A	1 163	57,40	1889
MŠMT	Vysoká škola finanční a správní, a.s.	26138077		1	154	93	5	5%	0	N/A	N/A	N/A	N/A	N/A	N/A	0%	20%	0%	0%	80%	0%	20%	0% 0	% 80	%	2	0	0	2	0	0		N/A	4 222	90,91	3 755
MŠMT	Vysoká škola polytechnická Jihlava	71226401		22	150	78	13	17%			•		•	•										5% 77	-	3	0	0	2	1	0		N/A	2 283	80.21	2 265
	Vysoká škola technická a ekonomická v ČB	75081431		7	418	134	16	12%		•		•	N/A	•		_		0%	_	_	0%			% 94		23	0	0	_	12		1		4 762	80,58	3 615
	Vysoká škola uměleckoprůmyslová v Praze	60461071		33	56	25	0	0%	-	,	,			,	,,,,	-/-	-70	- 70	/ 0	327	-,0	3.0				3	0	0	1	1	0		N/A	7 094	75,30	484
				9 284				_,,																					347	299	186			6 704 500	22 303	

# Approved for Module 2 (performance by bibliometry) in 2019 as additional information for panel:

- Comparison of Impact Factor (IF) and Article Influence Score (AIS)
- Counting of publication shares
- Productivity per FTE
- Large consortium papers will be considered separately
- Corresponding authorship
- Degree and type of collaboration
- Comparison to EU15



#### M17+ has five modules and step-wise implementation

#### Implementation period 2017-2019; complete application of 5-year cycle by 2020/2021

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MODULE 2 - Research Performance

The overall research performance profile; disciplinary and institutional bibliometry using AIS and international comparison; 2019 bibliometry will be cumulative (2017 + 2018); large consortium papers separated out; international cooperation will be monitored and the comparison will be with the EU15

MODULE 3 - Social Relevance

Economic or social impact of research, applied research grants; transfer of results into practice, cooperation with the applications sphere, technology transfer

MODULE 4 - Viability

**Institutional research environment** - i.e. research management, HR, career in research, PhD, instrument infrastructures and sharing, mobility of PhD students and academics, successful engagement of academics in an international research environment, best research practice

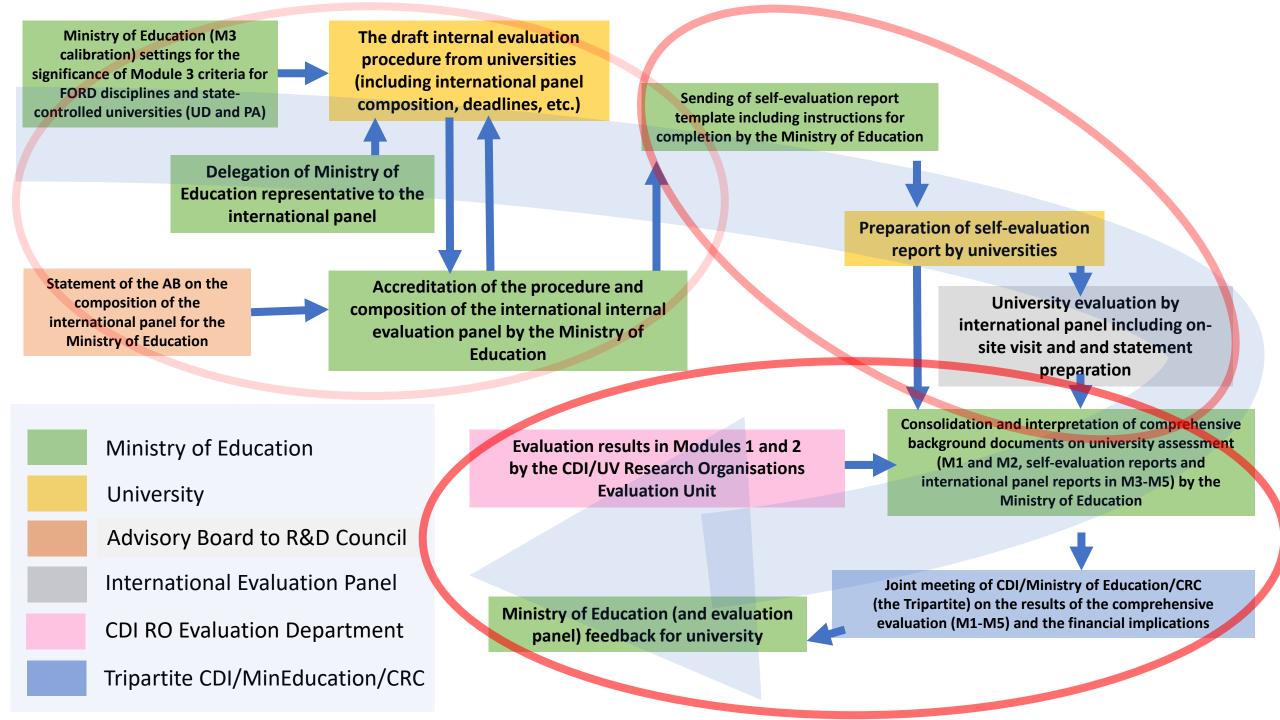
MODULE 5 – Ambitions and Strategy

Research strategy, mission and vision, national and international research context, research strategy implementation tools, placement/transfer strategy in university rankings or other external evaluations, effort/tools to increase international reputation

National level Central panels

Providers/RO

Qualitative assessment based on self-evaluation report and on-site visit



#### **MODULE 3 SOCIAL RELEVANCE**

#### SOCIAL CONTRIBUTION OF FACULTY UNDER EVALUATION

3.1. Own evaluation of the social contribution of research in the fields developed at the faculty under evaluation and the faculty as a whole

#### **APPLIED RESEARCH PROJECTS**

- 3.2. Commentary on the list of applied research grants (Annex Table 1)
- 3.3. Commentary on the list of contract research projects (Annex Table 2)
- 3.4. Commentary on non-public research revenue (excluding contract research) obtained through research activities (e.g. licences sold; Annex Table 3)

#### **APPLIED RESEARCH RESULTS**

- 3.5. Commentary on significant applied research results with an existing or prospective economic impact on society (Annex Table 4)
- 3.6. Commentary on significant applied research results with an impact on society other than economic (Annex Table S)

#### COOPERATION WITH THE NON-ACADEMIC ENVIRONMENT AND TECHNOLOGY TRANSFER

- 3.7. Overview of the most important academic research interactions with the non-university application/business community (max. 10)
- 3.8. System and support for technology transfer and intellectual property protection
- 3.9. Strategy for establishing and supporting spin-off companies (can relate to the whole university, but with an emphasis on faculty specifics)

#### **RECOGNITION BY THE RESEARCH COMMUNITY**

- 3.10. Overview of the most important individual research awards
- 3.11. Recognition by the international community in the field of research (elected memberships in professional societies, major editorships, invited lectures at foreign institutions, etc.; max 20)

#### **RESEARCH POPULARISATION**

3.12. Overview of major activities in research popularisation and communications with the public (max. 10)

## 12 parameters + tables

#### **MODULE 4 VIABILITY**

#### RESEARCH ORGANIZATION, MANAGEMENT AND SUPPORT

- 4.1. Research Organization and Management
- 4.2. Research support system and stimulus measures for top-level science
- 4.3. Institutional rules for the use of institutional support (Long-term research organisation development plan)
- Strategy for the establishment, funding and long-term development of INTERNAL RESEARCH ASSESSMENT AND START-UP STRATEGY 4.4. research centres
- Training system for intellectual property protection and technology 4.5.

#### PhD TRAINING

- Doctoral study organisation 4.6.
- 4.7. Internationalisation of Doctoral Studies
- Follow-up careers for doctoral graduates (support, examples) 4.8.
- Funding rules for doctoral students, including foreign students 4.9.

#### INTERNATIONAL AND NATIONAL RESEARCH CO-OPERATION AND MOBILITY

- Significant research collaboration at national level 4.10.
- 4.11. Significant research collaboration at international level
- 4.12. Mobility of academic and research staff
- 4.13. Internationalisation of the internal environment

#### RESEARCH HUMAN RESOURCES AND CAREER PROMOTION

- Career prospects system for academic and research staff 4.14.
- System of evaluation for academic and research staff and for filling key 4.15. résearch positions
- System for recruiting external research and academic staff 4.16.

- 4.17. Human resources structure commentary (Annex Table 6)
- 4.18. Gender issues

#### RESEARCH FINANCIAL RESOURCES\*

- 4.19. Commentary on the structure of research financial resources (Table 7 + additional tábles)
- 4.20. Support for the acquisition of foreign research projects

- 4.21. Internal evaluation system for research units (groups, teams, departments, institutes)
- 4.22. Conditions for the creation of new teams and the introduction of new research topics (so-called start-up strategy)
- External research advisory bodies 4.23.

#### RESEARCH INFRASTRUCTURE

- System for acquisition and renewal of research instruments and equipment (Annex Table X) 4.24.
- 4.25. System for sharing instruments and equipment for research

#### RESEARCH INTEGRITY (CODE OF CONDUCT FOR RESEARCH INTEGRITY, OPEN ACCESS, DATA MANAGEMENT, ETHICAL ISSUES ... )

- Internal rules and measures for maintaining best research practice (e.g. Code of Conduct for Research Integrity, Research Ethics)
- Open Access Strategy for Research (Open Access) 4.27.
- 4.28. Research Data Management Strategy
  - \*Except applied research projects that are covered by Module 3

#### 28 parameters + tables

#### **MODULE 5 STRATEGY AND CONCEPT**

#### MISSION AND VISION IN RESEARCH

5.1. Mission and vision of the institution being evaluated in research

#### **RESEARCH OBJECTIVES AND STRATEGIES**

5.2. Research objectives and strategies for the period up the next evaluation

#### NATIONAL AND INTERNATIONAL RESEARCH CONTEXT

- 5.3. Link to higher national and multi-national strategic objectives and research actions
- 5.4. Strategies and measures for placement or shift in international university rankings (including field rankings) and other significant external assessments of research-related institutions

#### RESEARCH STRATEGY IMPLEMENTATION TOOLS

5.5. Institutional tools for research strategy implementation with an emphasis on promoting high-quality research and an innovative environment

#### **SWOT ANALYSIS**

5 parameters+ SWOT analysis

# Relevance of the criteria (M3) 5\* Highly relevant 4\* Significantly relevant 3\* Relevant 2\* Somehow relevant 1\* Marginally relevant

Assessment so	cale (all three modules)
5 points	Excellent
4 points	Very good
3 points	Good
2 points	Average
1 point	Below average
0	Unsatisfactory

5 degrees of relevance (for M3 only) and 5 quality grades (for all three modules) will make it simple and aggregable as "quantitative assessment" (on the top of qualitative assessment)

PARAN	METRY/KRITÉRIA	KATEG	KATEGORIE FORD									
		Natural Science	Engineering and Technology	Medical and Health Sciences	Agricultural and Veterinary Sciences	Social Sciences	Humanities and the Arts					
3.2.	Projekty aplikovaného výzkumu (Tabulka a komentář)	4*	5*	3*	5*	4*	3*					
3.3.	Projekty smluvního výzkumu (Tabulka a komentář)	4*	5*	4*	5*	3*	1*					
3.4.	Výnosy z neveřejných zdrojů (Tabulka a komentář)	5*	5*	4*	5*	2*	1*					
3.5.	Výsledky aplikovaného výzkumu s ekonomickým dopadem na společnost (Tabulka a komentář)	4*	5*	3*	5*	2*	1*					
3.6.	Výsledky aplikovaného výzkumu s jiným než ekonomickým dopadem na společnost (Tabulka a komentář)	3*	3*	5*	3*	5*	5*					
3.7.	Interakce akademického výzkumu s aplikační/firemní sférou	4*	5*	5*	5*	4*	4*					
3.8.	Systém a podpora transferu technologií a ochrany duševního vlastnictví	5*	5*	4*	5*	1*	1*					
3.9.	Strategie zakládání a podpora spin-off firem (Ize vztáhnout k celé VŠ s fakultními specifiky)	4*	5*	4*	4*	1*	1*					
3.10.	Významná individuální ocenění za výzkum	5*	5*	5*	5*	5*	5*					
3.11.	Uznání mezinárodní komunitou v oblasti výzkumu (volená	5*	5*	5*	5*	5*	5*					
	členství v <u>odborných</u> společnostech, editorství, zvané přednášky atd.)											
3.12.	Významné aktivity v oblasti popularizace výzkumu a komunikace s veřejností	5*	5*	4*	5*	5*	5*					
CELKO	VÁ INDIKATIVNÍ RELEVANCE	48*	53*	46*	52*	37*	32*					

- Determining the significance of individual criteria in the FORD disciplines defines the importance of the whole of Module 3 for a particular type of school, and sets its excellence boundary for that module;
- The relative significance and information value of modules can be set by the number of criteria;
- The quantitative assessment (unsatisfactory to excellent; 0 5) can be aggregated;
- Qualitative evaluation of individual criteria is optional, qualitative evaluation of the whole module is mandatory;
- Point bands for "Excellent" to "Below average" in aggregate rating cases for entire modules are for discussion and can be tuned.



## The purpose and mission of AS CR and Czech universities and suitability of individual modules

	Module 1	Module 2	Module 3	Module 4	Module 5
A.C. C.D.			Dl		-!!l
AS CR	+++	+++	Phase	e II is quite s	similar
Multidisciplinary universities	+++	+++	++	+++	+++
Technical universities	+++	++	+++	+++	+++
Agricultural and veterinary universities	+++	+++	+++	+++	+++
Business schools	+++	++	+++	+++	+++
Art universities	++	+	++	+++	+++
State universities (Military and Police)	++	++	++	+++	+++

## QUESTIONS ????