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SUPPLEMENTARY MATERIAL TO

Evaluating the scientific performance of institutions within the university: An example from the University of Belgrade leading institutions

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As we can see from Table S-Ia, the Institute Vinča leads the way with 2100 published papers. In addition, the quality of the journals in which those papers were published is quite high. The median value of indicator *AVG_JIF_PERCENTILE* is 66.309, meaning that half the Vinča papers came out in journals which are in top 33.691 % in their respective JCR subject category.

TABLE S-Ia. Number of published papers, median and interquartile range for indicator *Average Journal Impact Factor Percentile* for five leading institutes

AVG_JIF_PERCENTILE	Inst.Vinča	ICTM	Inst. Biol. Res.	Inst. Phys	Inst. Mult. Disc. Res.
	No. of papers				
	2100	1163	1109	954	531
Median	66.309	63.057	55.195	74.423	65.382
IQR	35.965	41.114	47.165	33.950	44.056

A remarkable result was achieved by the Institute of Physics. Fully half of its papers were published in journals which are placed in top 25.577 % of the respective JCR subject category. On the other hand, the Institute for Biological Research "Siniša Stanković" has the lowest median value and highest inter-quartile range (IQR) among the top institutes (large variability of the observed indicator), meaning that its performance is weaker than the previously mentioned institutes.

Our results show that the Faculty of Medicine has the largest number of published papers (2456), but they are published in journals with lower ratings on the *AVG_JIF_PERCENTILE* indicator than those of the Institute Vinča and the

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Institute of Physics. A similar conclusion can be deduced for both the Faculty of Veterinary Medicine and the Faculty of Dental Medicine, while the Faculty of Pharmacy with a median value of 51.611 for indicator *AVG_JIF_PERCENTILE* has the best performance in the group of faculties of medical sciences (Table S--Ib).

TABLE S-Ib. Number of published papers, median and interquartile range for indicator *Average Journal Impact Factor Percentile* for faculties of medical sciences

AVG_JIF_PERCENTILE	Fac. Med.	Fac. Pharm.	Fac. Vet. Med.	Fac. Dent.
	No. of papers			
	2456	780	287	312
Median	40.256	51.611	33.784	32.916
IQR	50.676	48.711	41.063	59.661

TABLE S-Ic. Number of published papers, median and interquartile range for indicator *Average Journal Impact Factor Percentile* for faculties of sciences and mathematics

AVG_JIF_PERCENTILE	Fac. Biol.	Fac. Chem.	Fac. Phys. Chem.	Fac. Phys.	Fac. Math.
	No. of papers				
	950	974	602	383	365
Median	44.031	63.057	68.375	76.866	62.071
IQR	44.709	40.626	38.579	24.451	44.967

In the group of faculties of sciences and mathematics, the Faculty of Physical Chemistry and the Faculty of Physics stand out. Half of the papers from the Faculty of Physical Chemistry are published in the top 31.625% of journals, while half of the papers written by authors from the Faculty of Physics are in the top 23.134% of journals (Table S-Ic).

TABLE S-Id. Number of published papers, median and interquartile range for indicator *Average Journal Impact Factor Percentile* for faculties of technology and engineering sciences (top 5 in terms of number of published papers)

AVG_JIF_PERCENTILE	Fac. Techn. Met.	Fac. Elect. Eng.	Fac. Mech. Eng.	Fac. Agr.	Fac. Min. Geol.
	No. of papers				
	1343	697	692	619	378
Median	63.333	60.294	55.455	47.283	49.156
IQR	45.901	41.516	44.625	47.159	48.453

Among faculties of technology and engineering sciences, the Faculty of Technology and Metallurgy leads the way with more than 1300 published papers, half of those having appeared in the top 36.667 % of journals (Table S-Id). Among faculties of technology and engineering sciences with fewer published papers (Table S-Ie), the Faculty of Transport and Traffic Engineering exhibits the best performance, with a median value for the indicator *Average Journal Impact Factor*

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Percentile of 55.532 (meaning that half of its papers were published in the top 44.468 % of journals.

TABLE S-Ie. Number of published papers, median and interquartile range for indicator Average Journal Impact Factor Percentile for faculties of technology and engineering sciences (Faculty of Architecture and faculties of social sciences and humanities group have not been presented due to the relatively small number of published papers)

AVG_JIF_PERCENTILE	Fac. Org. Sci.	Fac. Tech. Bor	Fac. Transport	Fac. Forestry	Fac. Civil Eng.
	No. of papers				
	333	264	224	205	182
Median	39.091	46.019	55.532	28.313	44.815
IQR	46.991	42.420	46.795	37.393	48.895

In our paper, we emphasized the importance of qualitative aspects (percentile-based indicators, which are not influenced by the size of institution) of publication performance of UB institutions. On the other hand, number of papers should be considered cautiously (it is likely that institutions with larger number of academic staff will produce more papers). Still, no official data concerning the number of academic staff employed at each faculty and institute (especially not historically) is publicly available; thus, making it impossible to provide a methodologically sound analysis by incorporating the size of the institutions. If we, as proposed by the reviewer, apply the number of academic staff presented in Zivkovic *et al.* paper*, results (Table S-II) are quite appealing for Faculty of Physical Chemistry and Faculty of Chemistry.

Besides analysing the quality of journals in which UB academic staff publishes, we performed percentile-based analysis in terms of the quality of the published papers from 2009 to 2014. As we can see from Figure S-1a, researchers from the Institute Vinča published a considerable number of cited papers. Namely, 0.2 % of their papers are in the group of highly-cited papers (Top 1 %), 5.1 % papers are in the second group (papers which are in Top 1–10% by citations in research field), 7.82 % of papers are in group of Top 10–20 %, 29.93 % of papers are in the category Top 20–50 %, while 56.94 % are, based on citation, in bottom-half. Among the leading institutes, the Institute for multidisciplinary studies performs quite well with only 49.47 % of papers in bottom-half (the best result among the leading institutes). On the other hand, the faculties of medical sciences are far behind these results, as can be seen from Figure S-1b.

* Zivkovic *et al.* used web site of each faculty for the year 2015 as the source of data for number of employed academic staff; our analysis covered papers published in 2009-2016 period, so the indicator Publications per Researcher should be interpreted with care; the institutes were not included into the *Zivkovic et al.* paper

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TABLE S-II. Publications per Researcher Ratio for the analysed faculties, listed in a decreasing order

Faculties	Number of published papers	Number of researchers	Publications per Researcher
Fac Phys Chem	602	41	14.68
Fac Chem	974	73	13.34
Fac Med	2456	254	9.67
Fac Techn Met	1343	152	8.84
Fac Biol	950	115	8.26
Fac Phys	383	59	6.49
Fac Pharm	780	144	5.42
Fac Elect Eng	697	163	4.28
Fac Min Geol	378	110	3.44
Fac Math	365	111	3.29
Fac Dent	312	95	3.28
Fac Tech Bor	264	81	3.26
Fac Mech Eng	692	214	3.23
Fac Agr	619	261	2.37
Fac Vet Med	287	127	2.26
Fac Org Sci	333	162	2.06
Fac Forestry	205	105	1.95
Fac Transport	224	142	1.58
Fac Civil Eng	182	158	1.15

Although the Faculty of Biology has, besides the Faculty of Chemistry, the largest number of published papers among faculties of sciences and mathematics, they are less cited than the other faculties from the group with 70.14 % of papers from the Faculty of Biology appearing in bottom-half of the citation metrics (Figure S-1c). On the other hand, the Faculty of Technology and Metallurgy (Figure S-1d) is shown to have not only a large number of published papers but also a high citation score of those papers. In particular, 0.43 % of papers are in the group of best papers (Top 1 %), 7.04 % of papers are in second group (papers rated as Top 1–10 % by citation in a certain research field for a particular year), 9.61 % of papers published by researchers from the Faculty of Technology and Metallurgy are in the Top 10–20 %, 28.82 % of papers are in Top 20–50 %, while 54.11 % of papers are placed in bottom-half. The results from the remaining technology and engineering sciences faculties are presented in Figure S-1e.

Particularly impressive is the performance of Faculty of Mathematics and Faculty of Mechanical Engineering which exceed in terms of Top 1% publications, with 2.38 and 2.49 %, respectively.

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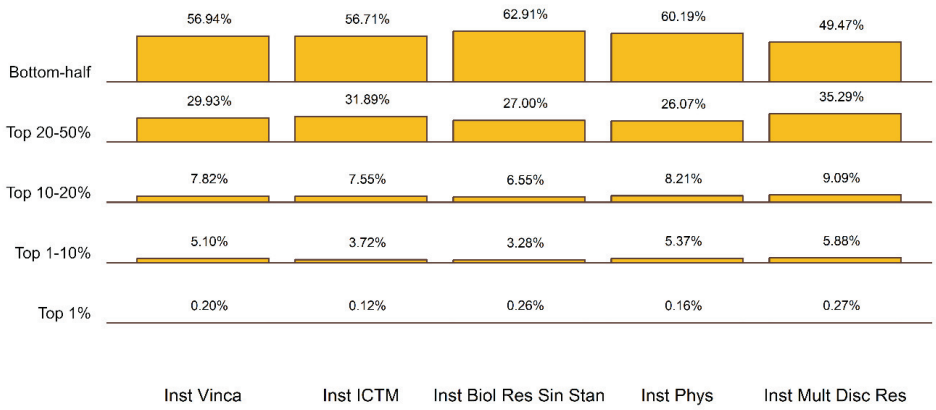

Fig. S-1a. Percentage of papers belonging to certain percentile groups (five leading institutes).

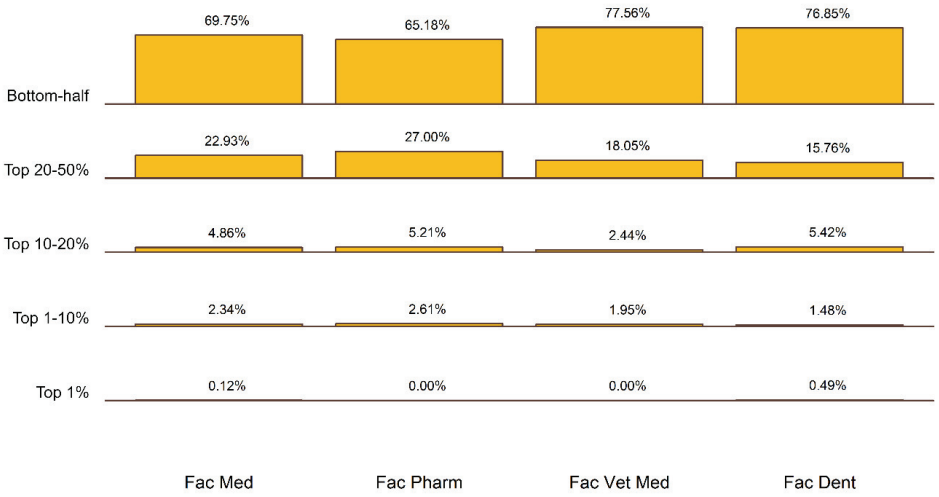

Fig. S-1b. Percentage of papers belonging to certain percentile group (faculties of medical sciences).

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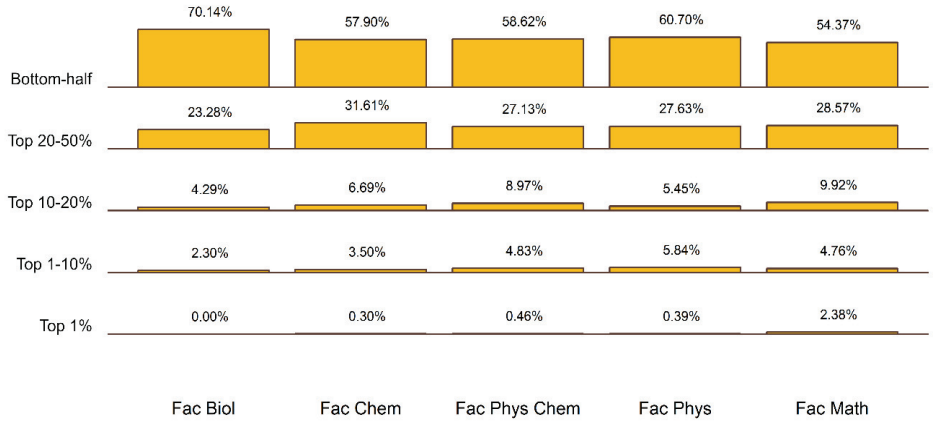

Fig. S-1c. Percentage of papers belonging to certain percentile group (faculties of sciences and mathematics).

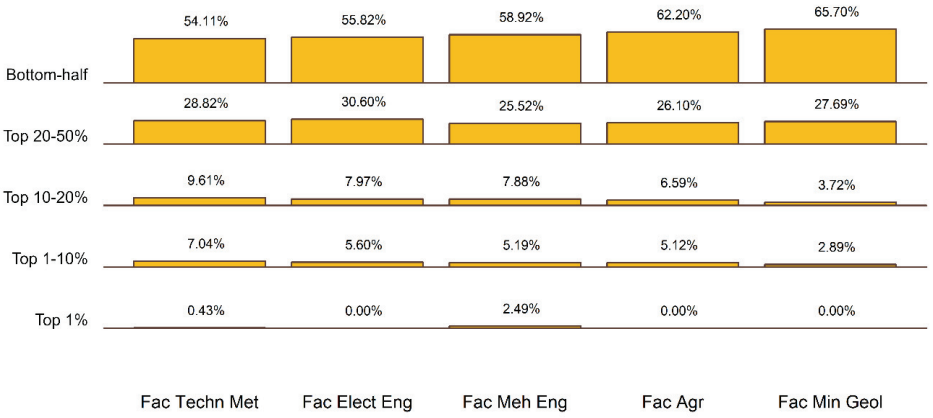

Fig. S-1d. Percentage of papers belonging to certain percentile group (faculties of technology and engineering sciences - top 5).

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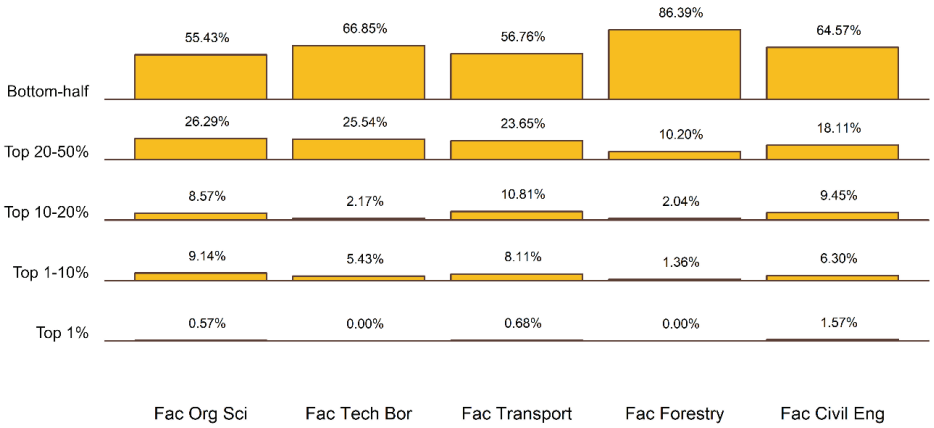

Fig. S-1e. Percentage of papers belonging to certain percentile group (remaining faculties of technology and engineering sciences).

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