A Menagerie of Rankings: A Look in RePEc's Factory

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Abstract

This paper provides an overview of RePEc a digital platform for the dissemination of research in economics. Specifically, the focus is on RePEc's main author ranking, which aggregates 36 different rankings based on a range of criteria. The paper first describes the logic behind the ranking and then presents some key descriptive statistics on the top 5% of authors. Notably, the ranking is dominated by English-speaking authors, particularly those affiliated with institutions in the USA. Moreover, less than 9% of authors are female, while around 6% are deceased. Among the living authors, the estimated average age is 60, with over 21% of them aged 70 or above. The paper next discusses the aggregation of the 36 rankings using the harmonic mean, which is RePEc's preferred method. Some counterintuitive properties of this approach are highlighted. Finally, I propose a simpler ranking system based on two criteria –number of journal pages and number of citations– that weight journals and citations according to their qualities and also correct for the number of authors.

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Keywords: economists, RePEc, rankings.

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"We do our best, but we cannot exclude errors." RePEc

1 Introduction

Research Papers in Economics or RePEc, in short, is a fabulous resource for economists around the world, see `http://repec.org/`.[1] It is a complex collaborative work with several imbricated webpages and services, all brought to us by a team of dedicated volunteers working on the project on their free time.

Among various projects developed in RePEc's universe, prominent ones are IDEAS, see `https://ideas.repec.org/`, which allows to search the RePEc database through keywords, thanks to Christian Zimmermann.[2] NEP, New Economics Papers, see `http://nep.repec.org/`, a free notification service –thematic newsletters informing subscribers about the last papers.[3] CiTEc, see `http://citec.repec.org/`, which provides citation analysis from items in the RePEc database, thanks to José Manuel Barrueco. As well as, a page dedicated to Co-Authorship Network in Economics, see `https://collec.repec.org`, where beautiful graphs are displayed on demand, thanks to Christian Düben. Overall, RePEc accomodates more than 1.3 million of visitors each month. Last and not least, it is free of charge and free of advertising.

Basically, RePEc is a document (articles and working papers) archive.[4] More precisely, it is an aggregation of archives produced in a decentralized fashion. For example, every quarter after the publication of a new issue of *Annals of Economics and Statistics*, a devoted person, from *Annals* staff, fills a file describing the published articles. This file is then put on a secret server where it is harvested by RePEc. Then in a day or two the articles appear on RePEc. Once on RePEc, the registered authors have to claim it to confirm that they are indeed one of the authors, a wise precaution given the many researchers named John Smith.[5]

It was 1997 when the adventure began –a time when the internet was still in its infancy. Google was yet to be born, and a browser war raged on between Netscape and Internet Explorer. Amazon was being sued by Barnes & Noble for daring to call itself "the world's largest bookstore".[6] It was in this world that RePEc, or Research Papers in Economics, came into being. And now, twenty-five years later, it stands as a venerable institution of the web.

As the archive grew, the idea of using its content to produce rankings naturally emerged. In 1998, a first ranking appeared based on page hits, followed by an author ranking in 2000. The first institution ranking was published in 2001, and by then there were already over 600 authors affiliated with 329 institutions. The motto at the time was clear: "So encourage your colleagues to register!"

Citation counts were added to the rankings in 2004, just as FaceMash was changing its name to TheFacebook. By then, the number of registered authors had swelled to around 4,000. An aggregate score was also introduced based on the harmonic mean of the various ranks (only four in 2004).

By 2009, the number of registered authors had climbed to an impressive 20,000. Nowadays, RePEc boasts a whopping 66,000 registered authors and nearly 8,700 institutions located all over

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[1] In a sense, the paper is in a read and click format. I provide many links to RePEc's webpages to encourage the reader to explore them further, without forgetting to come back to the text! RePEc's code has been rewritten from scratch early 2023, I checked the links are still working but I cannot exclude errors!

[2] See also `https://ideas.repec.org/credits.html`.

[3] The director of NEP is Marco Novarese.

[4] To be complete, it also archives "Software Components", "Chapters", and "Books".

[5] A corollary is that if you once registered to RePEc and never connected again since, no new publication has been added to your profile. Also when you change affiliations you need to connect and enter the new one.

[6] See `https://www.nytimes.com/1997/10/22/business/two-booksellers-settle-lawsuits.html`. Soon Amazon would sue Barnes & Noble for infringing its "one click" checkout patent.

the world. It's an astonishing success story, and one that makes it undoubtedly the world's largest database of economists.

The truth is there are a lot of things to rank according to a lot of criteria and RePEc has kept an open minded approach. This mean a lot of rankings are available, see `https://ideas.repec.org/top/`. Roughly there are four types of items to be ranked: i) Articles and working papers, ii) (working paper) Series and Journals, iii) Authors, and iv) Institutions. They are mainly ranked according to quantity (number of works and number of pages), citations, downloads, and abstract views. The reference period is a key parameter: a ranking can be done for all the items or only for the recent (less than 10 years) items. For authors and institutions, geography is also a key parameter and rankings are provided for different geographic perspectives (region, countries). Finally, rankings by fields are also provided.

RePEc is undoubtedly a tremendous and multifaced resource for economists. It can be used to search the literature, to find the impact of a journal (or a working paper series), to assess the impact of one's own work, to browse rankings, to look at coauthor network, and much more. It is also a (relatively) new resource to study the academic production of scholars in the (broadly defined) field of economics. Thus, it is great news that more and more economists are noticing the usefulness of RePEc in that dimension. Zimmermann (2013) is an early description of the making of the RePEc author rankings and Seiler and Wohlrabe (2012) also discusses the author rankings. In a sense the current paper can be seen as an update of these two pieces. Hausken (2016) compares several citation indexes using RePEc's data on 54 top researchers. Hamermesh (2018) relies more on the Web of Science or Google Scholar for his sources of citations but he makes some use of RePEc's data. Konig, Liu, Hsieh, and Zimmermann (2020) studies the impact of collaboration on research output by analyzing the coauthorship network of economists registered in the RePEc Author Service. Zacchia (2021) relies on RePEc's data to measure women's visibility in rankings of top economists and argues that women are penalised in their academic progresses. Finally, Jelnov and Weiss (2022) study the relationship between age and influence –defined as the rank in RePEc's main ranking. For that purpose they built a panel of top authors present during 100 months (from March 2012 to June 2020) in the top 5% of RePEc's main ranking. They find that the rank of an author peaks at age 60 or 30 years after Ph.D. graduation.

RePEc's success notwithstanding, a casual look at one of the monthly RePEc's rankings leaves most of us with an impression of mystery. There is however a simple logic in how the criteria have been created and how they are aggregated, which I explain in section 2. Next, in section 3, I take a closer look at the population of ranked authors who are among the best (most productive, and/or most cited, and/or most looked for, and/or with the best network) economists in the world.[7] As Hamermesh (2018), I am able to study differences of citations by affiliation and gender. His focus, however, is only on the top U.S. Universities whereas RePEc allows to look at all top economists wherever they are located.[8] In section 4, I discuss how the aggregation of the various criteria is done and what types of problems it creates. Finally, in section 5, I present a simpler (two-criteria) ranking (easily available on RePEc).

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[7]The definition of "economist" is loose. Authors registered with RePEc do not necessarily belong to an economics department. Many Business, Finance, and Statistics folks are included. Many of them (economists or not) are affiliated to an inter/national non academic organization, e.g. a central bank.

[8]A type of study that cannot be done with RePEc's data is the study of the influence of economic publication on other scientific fields, see Angrist, Azoulay, Ellison, Hill, and Lu (2020).

2 RePEc's kitchen

Although it's commonly advised that we shouldn't be too curious about what goes on in a restaurant's kitchen, as economists, we can't help but be intrigued by the inner workings of things. Understanding the production process, even the less glamorous aspects, is essential to our appreciation of the final product. Without such knowledge, we cannot fully enjoy the finished result.

Through the years, RePEc has built as many as 39 criteria each summarizing, in a particular dimension, RePEc's data. Among them 36 are used to compile monthly rankings of Authors as well as Centers.[9] A Center is treated like the aggregation of all its affiliated authors –taking into account the percentage of affiliation chosen by the authors in their RePEc profiles. The three excluded criteria are *Number of Works* –instead *Number of Distinct Works* is used– *Number of Twitter followers*, and *Wu index*.[10] The criteria are briefly described –using RePEc's own words– in Table 19, in the Appendix.

Fact 1 (RePEc's main ranking)**.** *The main ranking is based on the harmonic mean of 32 ranks out of the 36 as the best two and worst two ranks of each author are deleted. This ranking is updated monthly and available for the top 5% at:*

$$\textit{https: // ideas. repec. org/ top/ top. person. all. html .}$$

All 65,674 registered authors are ranked for all criteria and then in RePEc's main ranking but RePEc makes detailed rankings available only for the top 5% –or 3,284– authors by the end of November 2022. From now on, I use the acronym RMR'5 to refer to the top 5% of RePEc's Main Ranking.[11]

The logic of RePEc's criteria recipe: The primary material is all the works of all the registered authors. RePEc stores six types of works: working papers, articles (i.e. journal articles), chapters, books, and programs (e.g. Stata packages). These works have several characteristics that can be used to build a production measure. Among them the following characteristics have been used in the literature:[12] i) the number of authors, ii) the number of pages, iii) the quality of the journal (or working paper series), and iv) the number (and quality) of citations.

Fact 2 (RePEc's quality-weights)**.** *One of RePEc's fundamental contributions is the computation of two sets of quality-weights for journals (and working paper series). Simple Impact Factors, SIF (where each citation counts the same) and Recursive Impact Factor, RIF, (where each citation counts more if it comes from a more cited journal).*

SIF and RIF are (potentially) updated every day. For journals, they can be viewed at

https://ideas.repec.org/top/top.journals.simple.html and
https://ideas.repec.org/top/top.journals.recurse.html.[13]

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[9]RePEc also compiles rankings and weights for journals and working papers series. These weights are very important for the author and center rankings.

[10]An author with a *Wu index* of w has w articles cited $10w$ times or more.

[11]For RePEc's main ranking, Authors in the top 6% (but not top 5%) are listed in alphabetical order, and so on until the top 10%. But the exact rank and affiliation details are known only for the top 5%. Otherwise each author receives privately a monthly email with a link to his/her 39 ranks (and scores).

[12]See Combes and Linnemer (2003) for a survey of the early literature.

[13]For all series https://ideas.repec.org/top/top.series.simple.html and https://ideas.repec.org/top/top.series.recurse.html.

These weights are computed either by using all years (for publications and citations) or only the last ten years.[14] They are essential for distinguishing quality from quantity of works.[15]

SIF is fairly simple to compute. A journal (or a working paper series) has received c citations over the relevant time period for a number n of articles (or working papers), then its SIF is c/n.

RIF is computed recursively. At the first iteration, a citation from journal j counts SIF_j instead of 1, then the total of (weighted) citations c_1 is divided by the number of articles to give the first round RIF which are used to weight the citations in the second iteration of the process. Hopefully it converges after a number of iterations.

The resulting lists are rather convincing (the difference between SIF and RIF is by itself instructive) but of course it cannot please every editors nor authors. Compared to the journal rankings of the *Journal Citation Reports* (Web of Science) or of the *SCImago Journal Rank* (Scopus), RePEc's contribution is primarily to rank (and give a weight to) more than two thousand journals and four thousand series. My personal bias would push me to argue that Microeconomics or Theory journals tend to have (at equal status in the profession) lower weights than Finance/Economic Policy/Geography/Macroeconomics journals. But people in other fields probably have similar complaints.[16]

Finally, the weights themselves have a misleading numerical precision. See Stern (2013) and Konig, Stern, and Tol (2022) for an assessment along this line of thought.[17]

It is now possible to describe how RePEc's criteria are structured.

Fact 3 (RePEc's 36 criteria). *The 36 criteria are organized as follows.*
A) Combining three weighting schemes with/out a correction for the number of authors, leads to

- *six measures of the Nb of Distinct Works (1 to 6 in Table 19),*

- *six measures the Nb of Journal Pages (7 to 12 in Table 19),*

- *six measures of Nb of Citations (13 to 18 in Table 19),*

- *six measures of Nb of Citations Discounted by Citation Age (19 to 24 in Table 19).*

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[14]See https://ideas.repec.org/top/top.journals.simple10.html and https://ideas.repec.org/top/top.journals.recurse10.html. One reason to look at the last ten years is that the length of the history of journals is not the same. *Econometrica* issues are listed from 1969 (yet the journal exists since 1933). On the contrary all issues of the *Quarterly Journal of Economics* (from 1886) seem to be listed. RePEc also ranks journals (and working paper series) by four additional criteria: Discounted impact factors, Recursive discounted impact factors, h-index, Euclidian citation score. Finally, RePEc computes an Aggregate ranking based on the harmonic mean of the individual ranks +1, leaving aside the best and the worst ranks. Also notice that Citation counts are adjusted to exclude citations from the same series.

[15]Nothing really prevents authors to upload working papers (so working paper series accept all papers). The only limit is physical: how many different working papers can an author (pretend to) write? In equilibrium, however, undiscriminatory working paper series (or journals) should receive few citations and should have low SIF and RIF.

[16]For example, the *Journal of the Royal Statistical Society Series B* and the *Journal of the American Statistical Association*, two influential journals in Statistics, have a rank of 128 and 131 respectively in the all years RIF ranking. As a comparison, the *Canadian Journal of Economics/Revue canadienne d'économique* is ranked 132. This is probably due to the fact that not all Statistics journals are included in RePEc, depriving these two journals of more sources of citations.

[17]So, one could argue in favor of grouping journals by class instead of using precise weights. It would also better reflect the way academics tend to think about journals: e.g. a top class of journals could have a weight of 100, followed by a larger 50-weight-class, and so on until a large class of journals weighted 1.

B) Four additional measures of citations (25 to 28 in Table 19). C) Four visibility measures on RePEc's website (29 to 32 in Table 19). D) Four measures of network quality (33 to 36 in Table 19).

These various criteria highlight different aspects of the work done by the authors registered on RePEc. They are not exactly different dimensions and certainly not independent dimensions. In order to have a large score in terms of Recursive Impact Factor one also needs a large enough number of works. But one can have a large number of works which are all in journals (or working paper series) with low Recursive Impact Factors and therefore ends with a modest score when Recursive Impact Factors are taken into account.

RePEc only displays the scores of the top 5% authors of each criterion. But it still allows for interesting descriptive statistics. Table 20, in the Appendix, shows for each criterion the number of authors in the top 5% (usually 3,284 but it can be larger for criteria with tied authors), the mean of the score, the minimum, Q1, Q2, Q3, and the maximum value. The table also shows for each criterion the percentile ratio p90/p10 which gives an idea of the inequality among top researchers. For example, in terms of Nb of Citations the ratio is 5.34. The third column of Table 20 "% in RMR'5" gives the percentage of authors who are both in RMR'5 and in the top 5% of the ranking according to the line criterion. Less than half the authors who are in the top 5% according to Students, Closeness, and Betweenness make it in RMR'5. Slightly more than half the authors in the top 5% according to Nb of Distinct Works and Nb of Distinct Works, Weighted by Nb of Authors are also in RMR'5. On the contrary, the percentages of those in the top 5% of a citation criterion (i.e. 13 to 28 and 36) and in RMR'5 is usually large (about 80%).

Few criteria have a comprehensible score. The first one –Nb of Distinct Works– is transparent, however. On average, the top 5% authors with the largest number of distinct works have 135 of them. To enter this specific top 5% group, an author needs at least 80 distinct works. At a rate of four distinct works per year, a new author would have to wait 20 years to reach this pinnacle.[18] At the very top of this criterion, 14 authors have more than 500 distinct works.[19] Some of them might suffer from publicaholism!

To understand the score of the second criterion –Nb of Distinct Works, Weighted by Simple Impact Factor– requires to be familiar with the SIF themselves. As an arbitrary reference, let's take the SIF of a top field journal like the *RAND Journal of Economics*. As as of early January 2023, its SIF is 52.263.[20] The mean of Score 2 is 3,714. Therefore, these top 5% authors have on average the equivalent of 71 articles in the *RAND Journal of Economics*. Something quite amazing. To enter the top 5% an author needs (at least) the equivalent of 32 articles in the *RAND Journal of Economics*. For example, someone publishing twice a year in the RAND would have to wait 16 years to join the 5% club.[21] The bar is fairly high but 32 is less than 80, so a focus on quality instead of quantity matters.

Imagine an author waking up with an additional publication in the *Quarterly Journal of Economics* (resp. in *Econometrica*). How many ranks would this author gain in the ranking for Nb of

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[18] Wrongly assuming that the entry threshold would remain the same. On the one hand the threshold increases through time as authors mechanically accumulate more works. On the other hand, the number of registered authors also increases which makes the top 5% group larger and might lower the entry threshold.

[19] See https://ideas.repec.org/top/top.person.dnbworks.html, for the current list.

[20] Similar numbers would have obtained if the SIF of the following journals were used instead: *Journal of Monetary Economics*, *American Economic Journal: Macroeconomics*, *Journal of Labor Economic*, *Journal of Accounting and Economics*, or *American Economic Journal: Applied Economics*.

[21] A more successful author publishing twice a year in the QJE instead of the RAND would have to wait only 5 years and a half. Indeed, (as of early January 2023) QJE's SIF is 154.92.

Distinct Works, Weighted by Simple Impact Factor? Would this author start with a score of 1678 (the minimum to be in the top 5% for this criterion) s/he would move to $1678 + 154.92 = 1832.92$ (resp. $1678 + 118.78 = 1796.78$) and this new score would allow the author to gain 365 (resp. 285) ranks. In terms of Nb of Distinct Works, and starting with 80 of them publishing in the QJE would move the score to 81 and to a rank of 3139 (tied with 87 other authors) or a gain of 87 ranks.

Criterion 13 in Table 19 is Nb of Citations, a fairly comprehensible measure. On average, authors in the top 5% for this criterion have received 3,678 citations according to CiTEc. The minimum number of citations required to enter this group is 1,217. Again the bar is high (usually the number of citations found by CiTEc is lower than the one found by Google Scholar.). For example, an author with 80 distinct works would need slightly more than 15 citations per work to reach that bar.

To conclude these examples with another well known criterion: criterion 25 is the h-index. Here the average among the top 5% authors for this criterion is 24 (i.e. 24 works cited at least 24 times) and the minimum needed to be in this club is 16. The top author has 101 works cited more than 101 times each.

Belonging to the top 5% group of authors for one specific criterion is not a guarantee to belong to another such group for another criterion. However, an author with enough citations to be at the top in terms of Nb of Citations (say in the top 1%) should have a good chance to also be in the other 15 citations-based-criteria top 5%. Table 1 shows for all 11,535 authors who are in at least one top 5% group in exactly how many of them they belong. These 11,535 authors represent 17.56% of the 65,674 authors. Among them 1,415 –or 12.3%– are female. Table 1 also shows the distribution of authors in terms of the number of top 1% group they belong to. The 3,093 authors being in at least one such group represent 4.71% of the 65,674 authors. Among them 251 –or 8.1%– are female.

Fact 4 (Number of tops)**.** *Half of the 11,535 authors who are in at least one top 5% are in 5 top 5% groups or less. Half of the 3,093 authors who are in at least one top 1% are in 3 top 1% groups or less. The intersection of all 36 top 5% sets contains 317 (12 –or 3.8%– of them female) authors, that is 0.48% of the 65,674 authors. The intersection of all 36 top 1% groups contains 29 (0 of them female) authors, that is 0.044% of the 65,674 authors.*

In terms of correlation, as many as $36 \times 35/2 = 630$ of them can be computed. Moreover either the Spearman coefficients or the Kendall τ can be used (both are useful for rankings).[22] In addition, the coefficient of correlation between two rankings can only be computed on the intersection of their top 5% populations, and the size of this intersection should also be an interested parameter to look at. This would be a lot to process.

To illustrate, consider two intuitively different criteria. Nb of Distinct Works (criterion 1 of Tables 19 and 20) and Nb of Journal Pages, Weighted by Nb of Authors and Recursive Impact Factors (criterion 12 of Table 19 and 20). The first counts all distinct works (including unpublished working papers) while the second focuses on published articles and takes into account the number of pages, the number of authors, and uses RIF weights. The intersection of these two top 5% populations is 1,168 (35.6% of 3,284 the maximum possible size of the intersection). So indeed, the two criteria are very different. The Spearman coefficient of correlation is 0.1724 and the Kendall τ is 0.1169. The coefficient of correlation between the two scores is 0.1980.

On the other hand, one can expect the criteria Nb of Citations, Weighted by Nb of Authors and Simple Impact Factors (criterion 17 of Table 20) and Nb of Citations, Weighted by Nb of Authors and

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[22]One could be also interested in the correlation of the scores not the ranks.

Recursive Impact Factors (criterion 18 of Table 20) to provide relatively similar rankings. Indeed, the intersection of these two top 5% populations is 3,035 (92.4% of 3,284). The Spearman coefficient of correlation is 0.9563 and the Kendall τ is 0.8353. The coefficient of correlation between the two scores is 0.9861.

Table 1: Number of authors of each gender in exactly n top groups

n	Nb of time in top 5%			Nb of time in top 1%		
	male	female	Total	male	female	Total
1	2,399	357	2,756	838	73	911
2	1,188	202	1,390	410	47	457
3	687	112	799	201	17	218
4	668	117	785	223	27	250
5	434	60	494	126	7	133
6	337	53	390	71	10	81
7	261	35	296	78	7	85
8	262	35	297	71	10	81
9	191	33	224	57	5	62
10	173	26	199	62	0	62
11	172	23	195	49	3	52
12	140	21	161	42	3	45
13	121	22	143	35	4	39
14	141	14	155	31	2	33
15	126	26	152	28	4	32
16	132	10	142	25	3	28
17	121	16	137	38	1	39
18	113	13	126	18	2	20
19	106	20	126	30	2	32
20	120	15	135	25	2	27
21	98	13	111	18	3	21
22	107	11	118	26	1	27
23	104	16	120	17	4	21
24	106	12	118	22	0	22
25	109	16	125	21	3	24
26	125	13	138	22	0	22
27	126	10	136	21	1	22
28	97	10	107	28	3	31
29	161	14	175	32	2	34
30	123	13	136	26	1	27
31	142	16	158	28	1	29
32	157	16	173	48	0	48
33	125	16	141	17	1	18
34	153	9	162	19	2	21
35	190	8	198	10	0	10
36	305	12	317	29	0	29
Total	10,120	1,415	11,535	2,842	251	3,093

Table 2 splits the population of authors who are in at least on top 5% group into two groups: those who are and those who are not in RMR'5.

Fact 5 (Top of the tops). *Authors who are in only one, two, or three individual top 5% groups do not belong to RMR'5.*[23] *They represent a large proportion of those not in the overall ranking: 4,945 authors out of 8,253 –or 59,92%.*

Authors belonging to a number of individual top 5% groups between 4 and 15 are more likely not to be including in RMR'5. The reverse is true for a number between 16 and 21.

As many as 91% of the 3,284 authors in RMR'5 belong to 16 or more individual top groups. Authors who are in 22 or more individual top 5% groups are all in RMR'5. These rather consistent authors account for 2,322 –or 70.7%– of the 3,284 who are in RMR'5.

Figure 1 shows the histograms of the number of top 5% groups for authors in or out RMR'5. Table 2 is a good transition with the next section which focuses on the 3,284 who are in RMR'5
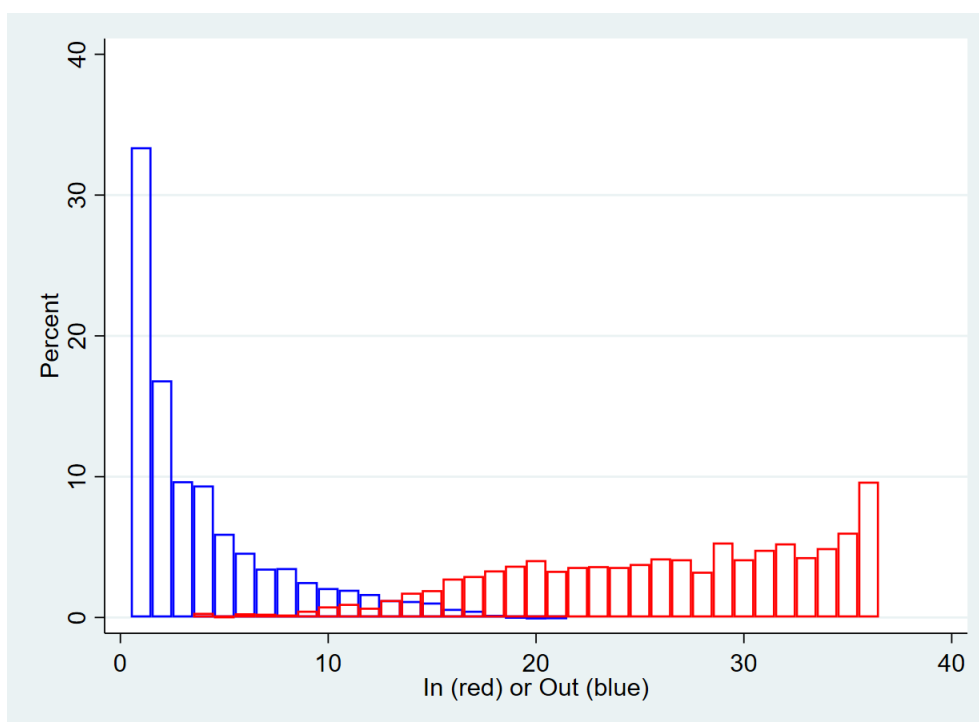
Figure 1: Histograms of the number of top 5% for authors in RMR'5 or out

(obtained by taking the Harmonic mean of 32 ranks after removing from the 36 ranks the best and the worst two ranks of each author).

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[23]This is almost mechanical given the removal of the two best ranks.

Table 2: Number of times in individual top 5%
for authors outside or inside RMR'5

	Not in RMR'5				In RMR'5		
	male	female	Total		male	female	Total
1	2,399	357	2,756	1			
2	1,188	202	1,390	2			
3	687	112	799	3			
4	658	116	774	4	10	1	11
5	431	60	491	5	3	0	3
6	328	52	380	6	9	1	10
7	252	35	287	7	9	0	9
8	255	35	290	8	7	0	7
9	178	30	208	9	13	3	16
10	150	23	173	10	23	3	26
11	141	22	163	11	31	1	32
12	119	20	139	12	22	1	23
13	84	18	102	13	37	4	41
14	88	10	98	14	54	4	58
15	71	17	88	15	55	9	64
16	46	5	51	16	86	5	91
17	32	8	40	17	89	8	97
18	15	1	16	18	98	12	110
19	4	1	5	19	102	19	121
20	1	0	1	20	119	15	134
21	2	0	2	21	96	13	109
22				22	107	11	118
23				23	104	16	120
24				24	106	12	118
25				25	109	16	125
26				26	125	13	138
27				27	126	10	136
28				28	97	10	107
29				29	161	14	175
30				30	123	13	136
31				31	142	16	158
32				32	157	16	173
33				33	125	16	141
34				34	153	9	162
35				35	190	8	198
36				36	305	12	317
Total	7,129	1,124	8,253	Total	2,991	291	3,284

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3 The proof of the pudding: descriptive statistics

Figure 2 is a capture of the top of the top of RePEc's main the ranking (as of the end of November 2022).[24] The top ten is:[25] Andrei Shleifer, James J. Heckman, Daron Acemoglu, Joseph E. Stiglitz,

The rankings

Rank	Author	Score
1	**Andrei Shleifer** Department of Economics, Harvard University, Cambridge, Massachusetts (USA) National Bureau of Economic Research (NBER), Cambridge, Massachusetts (USA)	3.59
2	**James J. Heckman** Department of Economics, University of Chicago, Chicago, Illinois (USA)	4.12
3	**Daron Acemoglu** Economics Department, Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts (USA)	4.32
4	**Joseph E. Stiglitz** Finance and Economics Department, Graduate School of Business, Columbia University, New York City, New York (USA)	6.55
5	**Robert J. Barro** Department of Economics, Harvard University, Cambridge, Massachusetts (USA)	8.61
6	**John List** Department of Economics, University of Chicago, Chicago, Illinois (USA)	9.95
7	**Jean Tirole** Institut d'Économie Industrielle (IDEI), Toulouse School of Economics (TSE), Toulouse, France	10.26
8	**Peter C. B. Phillips** Cowles Foundation for Research in Economics, Yale University, New Haven, Connecticut (USA) School of Economics, Singapore Management University, Singapore, Singapore	11.92
9	**David E. Card** Department of Economics, University of California-Berkeley, Berkeley, California (USA) National Bureau of Economic Research (NBER), Cambridge, Massachusetts (USA)	16.23
10	**Eugene F. Fama Sr.** Booth School of Business, University of Chicago, Chicago, Illinois (USA)	20.16

Figure 2: Capture of RePEc's webpage (end of November 2022 data)

Robert J. Barro, John List, Jean Tirole, Peter C. B. Phillips, David E. Card, and Eugene F. Fama Sr. It might not be the list everyone would agree on but the ten researchers are all well known and reknown economists (5 of them are Nobel Prize Winners).[26] Would you click on the link above to see the updated ranking, chance is that it would still be familiar. For example, in 2012, the top nine authors were (in that order) Andrei Shleifer, Joseph E. Stiglitz, Robert J. Barro, James J. Heckman, Robert E. Lucas, Jr., Peter C. B. Phillips, Martin S. Feldstein, Daron Acemoglu, and Jean Tirole.[27]

The coauthors-networks of the top nine authors of Figure 2 are presented in Figure 6, in the Appendix (the graph of Eugene Fama is not available, maybe because he does not have enough registered coauthors).[28] Roughly, the larger the graph the better the rank in terms of Closeness and

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[24]By the end of December 2022, the list was the same. The ranking is updated each month. The current version is available at `https://ideas.repec.org/top/top.person.all.html`.

[25]Clicking on a name opens the RePEc page of the author, these pages are instructive by themselves.

[26]By chronological order: James J. Heckman shared the 2000 Nobel prize with Daniel L. McFadden (who is 254th in the ranking). Joseph E. Stiglitz shared the 2001 Nobel prize with George A. Akerlof (who is 81st in the ranking) and A. Michael Spence (who is 393rd in the ranking). Eugene F. Fama shared the 2013 Nobel prize with Lars Peter Hansen (who is 67th in the ranking) and Robert J. Shiller (who is 76th in the ranking). Jean Tirole received the prize in 2014. David E. Card received half the prize in 2021 the other half was shared between Joshua D. Angrist (who is 41st in the ranking) and Guido W. Imbens (who is 46th in the ranking).

[27]See Seiler and Wohlrabe (2012), Table 7, column 3. The tenth author is not in their table.

[28]These beautiful graphs are obtained at `https://collec.repec.org/app/collec_app`: just type a name and wait. The graphs are interactive.

Betweenness. John List is first for both criteria, Joseph E. Stiglitz second and fifth, whereas Robert J. Barro is ranked above 1,000 for both of them.

There are few variables describing authors registered on RePEc. Their affiliations give information, besides their university, about the country (even the city) where they work. RePEc also provides a gender (male or female) and (sometimes) the year of terminal degree, which give information about their age.

3.1   Location

Eight of the ten authors listed in Figure 2 are affiliated at a U.S. center. Tirole is affiliated at the Toulouse School of Economics located in Toulouse, France. Peter C.B. Phillips shares equally his affiliations between four centers, three of them outside the USA.[29] So, among the best 10 authors, 80% of them are in the USA. This is not chance, however.

I use the affiliation(s) listed in the RePEc ranking (as shown in Figure 2). First, it transpires that many of these top 5% authors are affiliated in one center only. Indeed, 283 authors –or 8.62%– have no affiliation (among them all the 192 deceased authors), 2,698 authors –or 82.16%– have exactly one affiliation, and 303 authors –or 9.23%– have two affiliations or more (but only the two most important are listed).[30] Consequently, in the following I only use the first affiliation.[31]

Fact 6 (English speaking authors)**.** *RMR'5 is dominated by authors affiliated in English speaking countries: 2,080 out of 3,001 (or 69.3%).[32] In the top 1% they account for 83.3% of the authors with an affiliation.*

Table 3 lists the 17 countries (in total 223 countries are listed in RePEc) with more than 25 registered authors in RMR'5. Together these countries house 2,809 authors – or 93.6%– of the 3,001 for whom a location is known. In the first two columns, countries are sorted by decreasing numbers of authors. In the following two columns countries are sorted by increasing average ranks. In the next three columns, countries are sorted according to the number of authors in the top 5% divided by the number of authors registered in RePEc. In the final three columns, countries are sorted according to the number of authors in the top 5% divided by the total population of the country.

Fact 7 (US dominance)**.** *As shown in Table 3, RMR'5 is dominated by authors affiliated in the USA. This is true in absolute numbers: 1,633 out of 3,001 (54.4%). This is true in terms of average rank: 1,483.7, which is the lowest among all countries with more than 25 authors. This is true in terms of numbers relative to registered authors: 12.98% of the 12,582 registered US located authors are in RMR'5. Finally, this is true in terms of numbers relative to the country population for which the USA is second behind Switzerland.*

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[29]Phillips's affiliations are the Cowles Foundation, Yale, USA; the Business School of the University of Auckland in New Zealand; the Economics Division of the University of Southampton in the United Kingdom; and the School of Economics of the Singapore Management University, Singapore.

[30]Recall that authors choose the percentage they spend at each affiliation. As the example of Peter C. B. Phillips shows some information might be lost for a few authors.

[31]Among the 303 authors with two shown affiliations, these are in the same country 231 times –76.2%– e.g. 132 of them are in the USA for both, 21 in the UK for both.

[32]These countries are (by decreasing number of authors): USA, UK, Canada, Australia, New Zealand, Ireland, and South Africa. Adding India to the list would increase the percentage to 69.5%.

The UK is second in size with 275 affiliated authors compared to 159 in Germany, which is third. In terms of average rank, the UK is 4th as authors affiliated in Canada (2nd) and Switzerland (3rd) are on average ranked better.

Table 3: Countries with more than 25 listed authors, average rank

	Country	Nb5	Country	Average Rank	Country	Nb5/Nb	Nb	Country	Nb/Pop	Pop.
1.	USA	1633	USA	1483.70	USA	12.98	12582	Switzerland	7.59	8.70
2.	UK	275	Canada	1696.59	Israel	9.80	255	USA	4.92	331.89
3.	Germany	159	Switzerland	1698.56	UK	6.08	4526	Netherlands	4.56	17.53
4.	France	114	UK	1702.50	Netherlands	6.07	1319	UK	4.08	67.33
5.	Canada	92	Belgium	1732.17	Switzerland	5.78	1142	Sweden	3.94	10.41
6.	Italy	81	France	1763.79	Sweden	5.11	802	Belgium	3.62	11.59
7.	Netherlands	80	Israel	1804.00	Canada	5.09	1808	Austria	2.79	8.96
8.	Switzerland	66	Italy	1865.99	Austria	4.50	556	Israel	2.67	9.36
9.	Spain	63	Australia	1872.03	Belgium	4.16	1009	Canada	2.41	38.25
10.	Australia	58	China	1907.03	Australia	3.46	1674	Australia	2.25	25.74
11.	Belgium	42	Spain	1910.52	Germany	3.44	4623	Germany	1.91	83.13
12.	Sweden	41	Germany	1935.49	France	2.87	3966	France	1.69	67.50
13.	China	30	Netherlands	1948.79	Spain	2.45	2567	Italy	1.37	59.07
14.	Japan	25	Sweden	2016.00	Italy	2.26	3592	Spain	1.33	47.33
15.	Austria	25	Japan	2062.24	China	2.09	1436	Japan	0.20	125.68
16.	Israel	25	Austria	2152.72	Japan	2.03	1232	China	0.02	1412.36
	Others	192	Others	1856.01	Others	0.85	22585	Others	0.03	5563.59
	Total	3,001	Total	1647.60	Total	5.00	65674	Total	.38	7888.41

Nb5: number of authors in the top 5%
Nb: number of authors in RePEc
Pop: population of the country in millions (World Bank data)
Nb/Pop: number of authors in the top 5% per country inhabitant (1 per million)

In the following three columns, countries are ranked by decreasing ratios Nb5/Nb, where Nb5 is the number of authors in RePEc's main ranking and Nb is the number of authors in RePEc. The USA have 12,582 registered authors (some with a partial affiliation though) and 1,633 of them belong to RePEc's main ranking, that is, almost, 13% of them. If the distributions of authors were the same in all countries, this ratio would be 5% everywhere. The ratio for the UK is also high given its large population of registered authors. Of course a greater ratio might reflect self-selection of authors, with the less productive ones not registering in some countries. For example, Israel is a small country (less than ten millions of people) yet the pool of registered authors –255– is quite small.

In the last three columns, countries with less inhabitants are more likely to show up at the top. Switzerland is first and is the country with the smallest population. The USA is second while its population is one of the largest. The Netherlands with a population of 17.53 millions performs better than smaller countries like Sweden or Belgium.

Table 4 confirms the prominent position of the USA affiliated authors. In the top 1% (i.e. $r < 658$) they weight even more: 69.6% versus 54.4% in the top 5%. In the range $2,628 < r < 3,284$ (i.e. between p4 and p5), there is only 42.2% of USA affiliated authors. The distribution of UK authors is more uniform, with a (small) peak at the end.

Table 21, in the Appendix, splits the USA into States.[33] It emphasizes even more the USA dominance as US States have a smaller population than several European countries. California then

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[33]Those rankings are different from the one provided by RePEc, see https://ideas.repec.org/top/top.country.all.html because they take all authors into account whereas, I focus only on the top 5% authors. The two approaches are complementary.

Table 4: Authors by Country and Rank

Country	$r < 658$	$657 < r < 1,315$	$1,314 < r < 1,971$	$1,970 < r < 2,628$	$2,628 < r < 3,284$	Total
			Rank			
USA	422	342	317	292	260	1,633
UK	52	52	52	52	67	275
Germany	19	25	34	32	49	159
France	15	23	27	26	23	114
Canada	14	23	15	21	19	92
Italy	12	12	16	17	24	81
Netherlands	6	15	18	18	23	80
Switzerland	14	11	11	16	14	66
Spain	6	9	17	17	14	63
Australia	11	9	10	10	18	58
Belgium	5	11	9	7	10	42
Sweden	3	9	4	12	13	41
China	3	6	4	11	6	30
Japan	1	3	8	7	6	25
Austria	2	2	5	7	9	25
Israel	3	6	5	6	5	25
Others	18	33	43	42	56	192
Total	606	591	595	593	616	3,001

has the most affiliated authors, 291. The UK remains second but Massachusetts and New York each have more affiliated authors than Germany. In terms of average rank, the first eleven positions are taken by some US States with Canada being 12. In particular, New Jersey (mostly Princeton U and Rutgers U) has the lowest average rank, 1185.61. In terms of the ratio authors in RMR'5 divided by authors registered, US States are at the top. They occupy the 17 of the first 18 positions, Israel being 14th. Finally, in terms of number of affiliated authors relative to the State population, Switzerland is no longer first but is preceded by six US States: D. of Columbia, Massachusetts, New Hampshire, Connecticut, Illinois, and New York. However, Texas is relatively low in this Table.

Table 22, also in the Appendix, goes at the level of cities. The 26 cities in the Table all have more than 25 affiliated authors and regroup 47% of the 3,001 affiliated authors with a known affiliation. The two largest cities are Cambridge (USA) and Washington. The two could not be more different. Cambridge (USA) hosts three institutions: Harvard U., the Massachusetts Institute of Technology (MIT), and the National Bureau of Economic Research (NBER).[34] On the other hand, no less than 17 institutions located in Washington have at least one author in RMR'5. Among them the World Bank Group, the International Monetary Fund (IMF), Georgetown U., the Federal Reserve Board, and the Brookings Institution. So instead of two world famous universities, a group of international or national policy oriented institutions. The cities not located in the USA present in this top list are: London (rank 3), Paris (rank 9), Oxford (rank 13), Barcelona (rank 19), Amsterdam (rank 20), Frankfurt am Main (rank 21), Stockholm (rank 22), and Milano (rank 25). In terms of average rank, the most impressive city is Princeton, followed by Stanford, and Cambridge (USA). Oxford is the top city outside the USA.

In a similar fashion, Table 23 lists all 37 Universities/Institutions with at least 20 affiliated authors in RMR'5. Together they account for 40.7% of the authors in RMR'5. Among them, 29 are located

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[34]About the NBER: the authors counted here as affiliated at the NBER have the NBER as their first, and sometimes only, affiliation. There might be some sloppiness involved.

in the USA, 3 in the UK, 2 in Canada, and then one in France, Italy, and Spain. Table 23 is quite different from the ranking of institutions given by RePEc–see https://ideas.repec.org/top/top.inst.all.html. Indeed, for its ranking, RePEc counts the production of all authors whether or not they are in the top 5%. In RePEc's ranking, the NBER is first and Harvard second. Chicago is no longer second but sixth. The London School of Economics moved up from sixth to third. Also RePEc's ranking is slightly less dominated by the USA: only 26 centers are located in the USA among the top 37.

3.2   Gender

Although gender is not chosen by the authors themselves when they register, RePEc uses an algorithm based on authors' first names to identify female authors. As RePEc also gives ranking(s) for female authors only, it is possible to retrieve a long list of female authors and then to find female authors in RMR'5.

Fact 8 (Gender). *Among the 3,284 authors in RMR'5, only 291, or 8.90%, are female. Among the 657 top 1% authors, only 35, or 5.33%, are female.*

Moreover the average rank for male authors is 1,622.5 while it is 1,848.3 for female authors. Table 5 details how many female authors are in each percentile between 1 and 5. In the fifth percentile, the percentage of female authors reaches 11.11%. Female authors are not equally distributed

Table 5: Authors by Gender and Rank

Country	$r < 658$	$657 < r < 1,315$	$1,314 < r < 1,971$	$1,970 < r < 2,628$	$2,628 < r < 3,284$	Total
			Rank			
Male	622	595	603	589	584	2,993
Female	35	62	53	68	73	291
Total	657	657	656	657	657	3,284

geographically either. Table 6 lists the number of female authors for each country of Table 3. In percentage, Spain who has 63 authors in the top 5% and 9 of them –or 14.29%– are female, has the greatest percentage of the table. China is second with 13.33% the U.K. third with 11.64 percent. Other countries with more than 9% of female authors are the USA, France, and Australia. Somehow the Netherlands and Israel have no female authors in this top list.

Table 20 shows how many female authors are in the top 5% of each criterion. The lowest point is for Nb of Journal Pages, Weighted by Nb of Authors with only 218 female authors –or 6.64%. The highest point is for the criterion Closeness measure in co-authorship network, with 424 female authors –or 12.91 %.

3.3   Nobel Laureates

A way to look at the quality present in RMR'5 is to focus on the Nobel Prize Laureates. All the 92 Nobel Prize winners are registered on RePEc.[35] About half of them are deceased (45 out of 92). But alive or not most of them are still in RMR'5. The 1969 laureates Ragnar Frisch (1895-1973) and Jan Tinbergen (1903-1994) are not but the 1970 laureate Paul A. Samuelson (1915-2009) is ranked 113.

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[35]Among the oldest, most of them have been registered by Christian Zimmermann.

Table 6: Female authors by countries

	Country	Nb	Female	pct.
1.	USA	1633	174	10.66
2.	United Kingdom	275	32	11.64
3.	Germany	159	11	6.92
4.	France	114	11	9.65
5.	Canada	92	5	5.43
6.	Italy	81	5	6.17
7.	Netherlands	80	0	0.00
8.	Switzerland	66	3	4.55
9.	Spain	63	9	14.29
10.	Australia	58	6	10.34
11.	Belgium	42	2	4.76
12.	Sweden	41	2	4.88
13.	China	30	4	13.33
14.	Israel	25	0	0.00
15.	Austria	25	2	8.00
16.	Japan	25	1	4.00
	Others	192	9	4.69
	Total	3,001	276	9.20

Fact 9 (Nobel Laureates). *Among the 92 Nobel Prize Laureates in Economics, 75 are in RMR'5, and 53 in the top 1%. Their average rank is 506, the median rank is 234, the best rank is 2 and the worst is 2,466.*

Table 24, in the Appendix, lists all the Nobel Prize Laureates in Economics, in chronological order, with their ranks (for those in the top 5%). Table 7 shows all 26 Nobel Laureates who are among the top 100 Authors.

Among the Nobel laureates, an instructive example is John F. Nash Jr.[36] It gives an idea of the order of magnitude of the needed citations to reach an excellent rank (with a rank of 2,424, Nash is in the top 3.7%). RePEc lists eight works for Nash. Among them: one working paper, four articles, one chapter, and two books. With so few works, Nash is ranked 35,387 for Number of Distinct Works and 40,607 for Number of Article Pages. Not a good start to enter the top 5% of authors! Nash's forte is his citations. He is ranked 1,466 for Number of Cites and 327 for the Euclidian criterion. Among Nash's eight referenced works, however, only two have a non negligible number of citations: Nash (1950a) and Nash (1953) with respectively 1,811 and 750 citations.[37] Thanks to these 2,561 citations, Nash is in the top 5% for 16 of the 17 citation based criteria (he misses the h-index criterion).[38]

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[36]Nash' RePEc profile is: `https://ideas.repec.org/e/pna13.html`.

[37]His third famous article Nash (1950b) is not included in the RePEc database.

[38]What is striking is the relative small number of citations found by CiTEc. By comparison, his bargaining piece Nash (1950a) is cited 11,458 in Google Scholar and 3,992 in the Web of Science, which only counts citations in a (short) list of journals. Nash (1953) is cited 4,626 in Google Scholar and 1,492 in the Web of Science. The missing article Nash (1950b) is cited 9,866 in Google Scholar and 3,581 in the Web of Science. RePEc is not responsible for the missing article. It is the responsibility of the journals to reference their articles.

Table 7: Nobel Laureates in the top 100

Rank	Author	Nobel	Country
2	James J. Heckman	2000	USA
4	Joseph E. Stiglitz	2001	USA
7	Jean Tirole	2014	France
9	David E. Card	2021	USA
10	Eugene F. Fama Sr.	2013	USA
12	Gary S. Becker †	1992	
15	Robert E. Lucas Jr.	1995	USA
23	Robert F. Engle III	2003	USA
31	Ben S. Bernanke	2022	USA
35	Thomas J. Sargent	2011	USA
36	Paul R. Krugman	2008	USA
41	Joshua D Angrist	2021	USA
46	Guido Imbens	2021	USA
53	Angus S. Deaton	2015	USA
54	Edward C. Prescott †	2004	
56	Clive W. J. Granger †	2003	
66	Christopher Sims	2011	USA
67	Lars Peter Hansen	2013	USA
74	Abhijit Vinayak Banerjee	2019	USA
76	Robert J. Shiller	2013	USA
79	Esther Duflo	2019	USA
81	George A. Akerlof	2001	USA
85	Paul Milgrom	2020	USA
93	Robert C. Merton	1997	USA
95	Richard H. Thaler	2017	USA
99	Peter A. Diamond	2010	USA

Country refers to the affiliation in RePEc. Deceased authors do not have an affiliation.

3.4 Deceased authors

As alluded to above, not all ranked authors are alive. RePEc maintains the profiles of deceased authors –about 816 (or 1.2%) out of 65,674 registered authors– but they no longer have an affiliation.[39]

Fact 10 (Deceased authors). *In RMR'5, 199 authors are deceased. They represent 6.0% of the 3,284 authors and 24.4% of the 816 deceased authors registered in RePEc. Among them only 8 are female. On average, they passed away at the age of 73.7 with a median at 75. The minimum age was 37 and the maximum 103. As many as 25% of them died past 84 but 25% died before 64.*

Table 8 shows how they are distributed according to their rank. Although one could expect the rank of a deceased author to mechanically decrease, it could theoretically increase because citations continue to be counted. Gary S. Becker (1930-2014) is ranked 12. Jean-Jacques Laffont (1947-2004) was ranked 38 in July 2011 (see Seiler and Wohlrabe (2012), Table 7) and he is ranked 119 in November 2022. Among all the deceased, the 1991 Nobel Laureate, Ronald H. Coase (1910-2013), lived the longest –103 years– he is still ranked 916 in RePEc's main ranking.

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[39]Their ranking is available here: https://ideas.repec.org/top/top.rip.html.

Table 8: Authors by Rank: Deceased and Living

Country	$r < 658$	$657 < r < 1,315$	Rank 1,314 < r < 1,971	$1,970 < r < 2,628$	$2,628 < r < 3,284$	Total
Living	614	609	620	616	626	3,085
Deceased	43	48	36	41	31	199
Total	657	657	656	657	657	3,284

3.5 Age

In addition to the gender issue, it is striking that authors in RMR'5 are not young (even when focusing only on those alive). In a sense this should not be that surprising as an older author had more time to accumulate more works and citations. Yet, at the top, authors are visibly quite senior. To explore seniority in more details, I have followed two complementary strategies. First, I looked on the internet for the year of birth of the 657 authors in the top 1%. Among them 43 are deceased and I could collect their year of birth and of death. Among the 614 living authors, the year of birth was available for 510 of them –or 83%.

Fact 11 (Age in the top 1%). *Living authors in the top 1% with an available year of birth are 66-year-old on average and the median age is also 66. The youngest is 42 year old and the oldest is 98 year old. Female authors are, on average, five years younger than men.*

Table 9: Distribution of Age by gender in the top 1%

	N	Mean	Min	p5	p10	p25	p50	p75	p90	p95	Max
Male	483	66	42	48	52	59	66	73	79	82	98
Female	27	61	49	49	50	52	61	67	76	77	81
All	510	66	42	49	52	59	66	73	79	82	98

Figure 3 shows the histogram of the age distribution of the top 1% living authors.

As it is time consuming to find the age of authors on the internet. I turned to a second strategy using the year of the terminal degree of authors. Indeed, RePEc Genealogy,[40] has collected the year of terminal degree for many authors. In particular, this information is available for 2,085 out of the 3,284 authors in RMR'5. I have manually collected either the year of birth or the PhD year (both when available) for all the other authors in the top 5%. At the end, the information for both the year of birth and the PhD year is available for 842 authors. Figure 4 shows the histogram of the age at Ph.D. year for these authors for whom both the year of birth and the Ph.D. year are available. The three most frequent ages are 26, 27, and 28. One can suspect that ages below 25 do not correspond to a Ph.D. (some authors don't have one). Some authors apparently received their Ph.D. at a rather old age but less than 9 percent received it when older than 33. I used the empirical distribution of PhD year of the 726 authors whose age at PhD year was between 25 and 32 to input a year of birth when it was missing but a terminal degree year was available.[41]

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[40]See `https://genealogy.repec.org/`, this is probably inspired by The Mathematics Genealogy Project, see `https://www.genealogy.math.ndsu.nodak.edu/`. See Dubois, Rochet, and Schlenker (2014) for an analysis of the productivity and mobility of mathematicians.

[41]More precisely, with probability 7.84 (resp. 16.78, 19.81, 18.57, 13.07, 11.42, 7.70, and 4.81) the inputted age is 25 (resp. 26, 27, 28, 29, 30, 31, and 32).

Figure 3: Histogram of age among the top 1% living authors
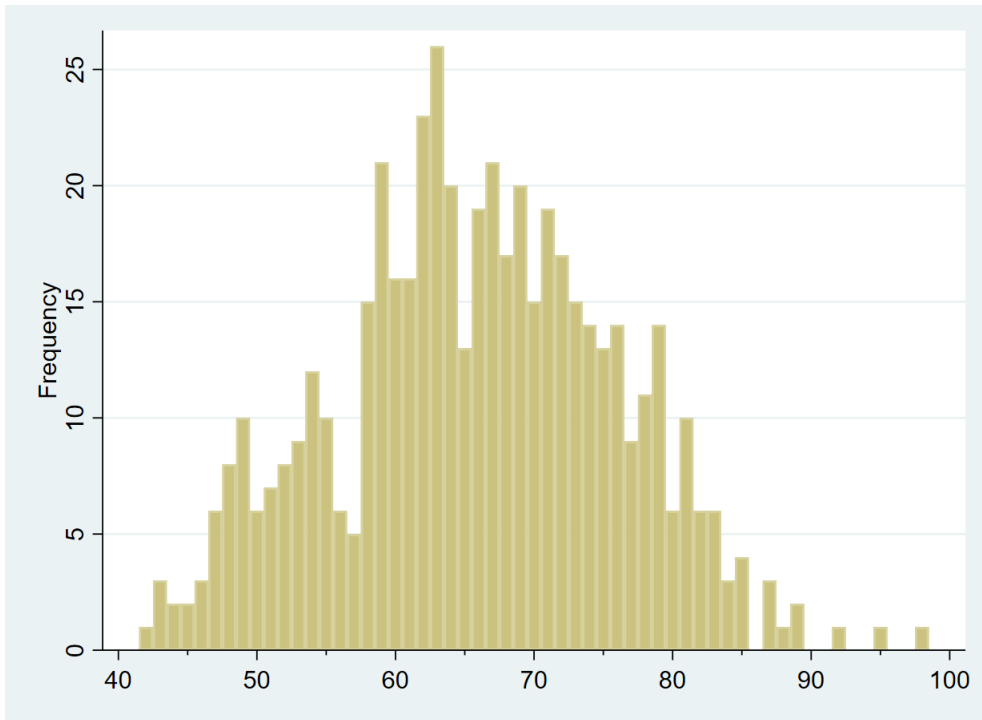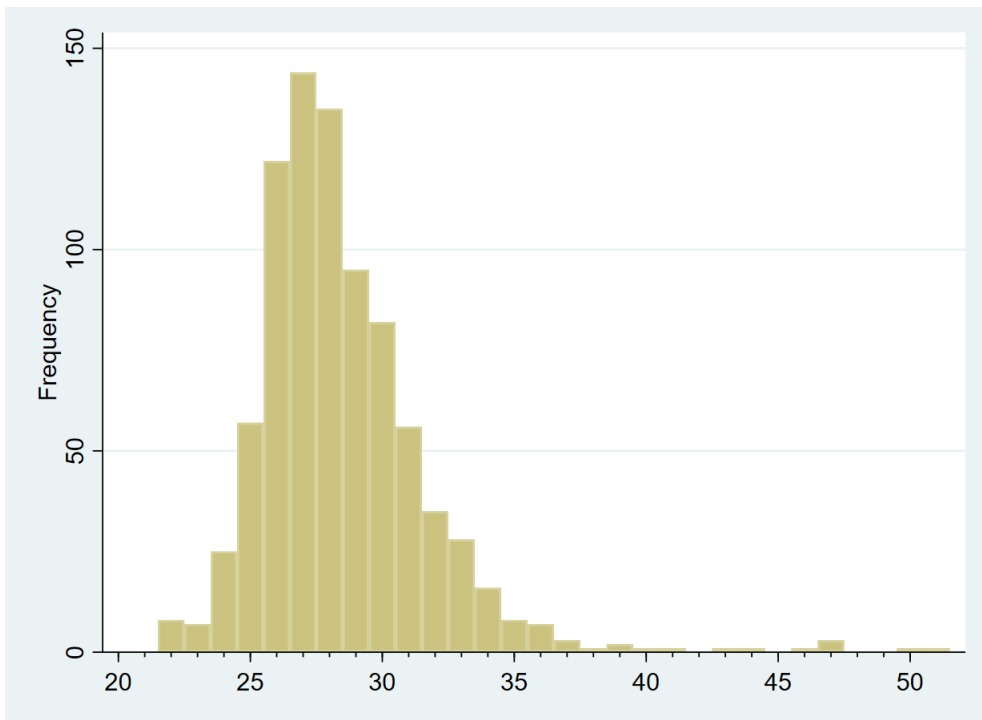

Figure 4: Histogram of age at Ph.D. year

Fact 12 (Estimated Age in the top 5%). *Age is known or inferred for 2,987 authors –or 96.8%– out of 3,085 living authors in the top 5%. On average, they are 60-year-old and the median age is 59. The youngest is 30 year old and the oldest is 98 year old. Female authors are, on average, four years younger than men.*

Table 10: Distribution of estimated-Age by gender in the top 5%

	N	Mean	Min	p5	p10	p25	p50	p75	p90	p95	Max
Male	2709	60	31	42	46	51	60	68	76	80	98
Female	278	56	30	42	45	49	54	63	71	76	82
All	2987	60	30	42	45	51	59	68	76	79	98

Table 11: Distribution of estimated-Age by ranking percentiles

		All	N	Mean	Min	p5	p10	p25	p50	p75	p90	p95	Max
p1	$r < 658$	657	610	64	34	47	50	58	64	72	78	81	98
p2	$657 < r < 1,315$	657	593	61	33	45	48	53	60	69	78	80	98
p3	$1,314 < r < 1,971$	656	603	59	34	42	45	50	58	67	75	78	98
p4	$1,970 < r < 2,628$	657	577	58	32	41	44	49	57	66	73	77	94
p5	$2,628 < r < 3,284$	657	604	56	30	40	43	48	55	64	73	77	93
	All	3,284	2,987	60	30	42	45	51	59	68	76	79	98

Table 11 illustrates Fact 13. I have also run t-tests to check if the means between two subsequent percentiles were equal or not. The differences are significantly different from zero except between p3 and p4.

Fact 13 (Age and Rank). *On average, age decreases with Rank. From 64 years old in p1 down to 56 years old in p5.*

The best ranks are mostly filled with older authors. In particular, Table 11 emphasizes the large number of emeritus professors among the top 5%. Assuming that any author 70 years old or older has the emeritus status, then 21% of the 2,987 living authors, with a known or estimated age, are emeritus scholars. The percentage is even 31 in the top 1% of RePEc's main ranking.

3.6 Wrap up

To summarize the descriptive statistics, I regressed the authors' ranks (more precisely their scores) on the few available variables describing the authors. The coefficient of age (measured in years) is negative and significantly different from zero. This captures the finding that highly ranked authors are older. The coefficient of age square is positive indicating that this relationship is reversed for large values of age. Indeed, starting from 82 (resp. 75, 75, 74, 73) years in column I (resp. II, III, IV, V) being one year older makes the rank increase. Yet, this reversal occurs for authors who are already emeritus professors. Being female increase the rank which is also coherent with the previous findings. The coefficient of the dummy variable for deceased authors is not significant while the coefficient of the dummy variable for being a Nobel Laureate is negative and significantly different from zero.

In column III, I introduced dummy variables to describe the type of authors' affiliation: Academic, Bank (mostly Central Banks and Federal Reserves), Governmental Body, and (international or national) Organizations (which are non academic). Deceased authors have no affiliation and some living authors also have no affiliation. Only the coefficient for Academic is significantly different from zero. It is negative indicating a lower (and thus better) rank for authors affiliated to an academic institution (mostly universities).

In column IV, I introduced dummy variables for country of affiliation. As expected, the coefficients for USA and UK are negative and significantly different from zero. Switzerland is the only other

Table 12: Explaining RePEc's score

	I	II	III	IV	V
Age	-76.951**	-93.955**	-93.674**	-96.905**	-97.023**
	(11.05)	(11.33)	(11.31)	(11.20)	(11.18)
Age2	0.467**	0.624**	0.624**	0.656**	0.661**
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
Female	142.372*	140.707*	138.610*	184.463**	181.969**
	(57.24)	(56.51)	(56.44)	(56.01)	(55.92)
Dead		126.611†	-30.057	-117.750	-106.400
		(71.60)	(106.99)	(87.68)	(106.47)
Nobel		-1033.694**	-1024.977**	-975.782**	-969.103**
		(113.06)	(112.91)	(111.68)	(111.48)
Academic			-180.866*		21.097
			(86.28)		(98.82)
Bank			3.744		278.270*
			(106.62)		(117.79)
Government			187.142		194.885
			(236.42)		(238.81)
Organization			-36.560		175.446
			(133.00)		(141.54)
USA				-362.626**	-389.956**
				(59.67)	(68.84)
UK				-207.816**	-214.294*
				(78.32)	(85.15)
Germany				-34.047	-70.641
				(90.48)	(95.77)
France				-113.541	-127.720
				(100.53)	(105.87)
Canada				-114.463	-121.133
				(108.67)	(114.00)
Italy				-45.274	-52.536
				(114.65)	(118.35)
Netherlands				123.339	113.702
				(115.33)	(121.26)
Switzerland				-291.494*	-331.414*
				(125.50)	(129.58)
Spain				-9.456	-36.020
				(127.90)	(131.76)
Australia				7.640	7.950
				(131.13)	(135.68)
Belgium				-81.907	-99.917
				(151.60)	(155.19)
Sweden				173.571	157.122
				(153.26)	(156.87)
China				-31.373	-38.361
				(198.30)	(200.76)
Israel				141.520	133.519
				(187.30)	(190.83)
Japan				199.804	174.965
				(186.90)	(190.27)
Austria				156.758	155.393
				(190.50)	(191.89)
Constant	4495.962**	4945.522**	5084.315**	5220.477**	5183.972**
	(340.35)	(345.66)	(354.93)	(345.48)	(351.09)
R^2	0.068	0.093	0.097	0.123	0.128
N	3184	3184	3184	3184	3184

country with a significant coefficient. It is also negative. As seen before, authors in Switzerland tend to perform well in the ranking.

Column V includes all variables. Academic is no longer significantly different from zero and Bank

is now significantly positive. The other coefficient are quantitatively very similar to the ones in the previous columns.

4   Questions about aggregation

Looking at a ranking such as RePEc's main ranking, one has many questions. Among them two stand out. First, the selection question: Which criteria should be taken into account? Second, the aggregation question: Which summary statistics should be use? I have discussed the 36 criteria in Section 2 and I will come back to selection in Section 5. In Section 4.1 and 4.2 I discuss the aggregation methods.

4.1   Ways and Means

As explained before RePEc's main ranking aggregates 32 ranks (as from the 36 eligible rankings the the best two and the worst two ranks of each authors are discarded) through the harmonic mean. True to its philosophy, RePEc provides other ways, however. It allows the curious user to aggregate the ranks using either the arithmetic or the geometric mean.[42] RePEc also proposes three other ways: a lexicographic, a graphicolexic, and a percent method.[43] So six aggregation ways are possible.

Does the choice of aggregation matter? In an ideal scenario, the aggregate ranks of some authors would vary but for most of them they would not change in a significant way. This optimistic view is presented by Zimmermann (2013). In particular, his Table 5 (page 275) shows rank correlations between the six aggregation methods. He uses the full sample of authors (at the time only 32,731 authors were registered compared to 65,674 in December 2022) and finds very high Spearman correlation coefficients –larger than 0.99–) between the first three means.[44] Using only the freely available RePEc data –i.e. rankings for the top 5%– I find Spearman coefficients of correlations lower than 0.99 but still larger than 0.9, see Table 25, in the Appendix, for details. Table 26 –also in the Appendix– lists the Kendall rank correlation coefficients. It shows lower values than those of Table 25. This emphasizes that the number of discordant pairs –authors A and A' form a discordant pair if A is better ranked than A' in the first measure but the reverse is true for the second measure. All correlations remain positive and significantly different from zero.

Table 13 summarizes the distribution of the rank changes expressed in percentage[45] between the Arithmetic (resp. Geometric) mean and the Harmonic mean.

Table 13: Ups and downs in percentage

	N	Mean	Min	p5	p10	p25	p50	p75	p90	p95	Max
Arithmetic	2972	30.15	0.00	1.76	3.59	8.81	17.32	27.26	41.67	70.41	2484.51
Geometric	3111	17.18	0.00	1.01	1.99	4.63	9.17	14.09	21.35	34.78	4706.67

Fact 14 (A.G.H.). *When the arithmetic (resp. geometric) mean is used for aggregating the 32 ranks, the final rank of an author change (up or down) by 30% (resp. 17%) compared to the harmonic mean. The change is larger than 27% (resp. 14%) for a quarter of the authors.*

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[42]These three means are called the Pythagorean means. See https://en.wikipedia.org/wiki/Mean.

[43]For formal definitions see Zimmermann (2013) and https://ideas.repec.org/t/rankcodes.html

[44]The other coefficients are in general also high, above 0.9. The percent method gave strange correlations, however.

[45]That is $100\,|r_1 - r_0|\,/r_0$.

Tables 14 and 15 zoom on the first one hundred authors for the three means. They display both small and large movements either up or down. In column 5 and 8 the authors name are in dark blue (resp. black, maroon) when their rank has improved (resp. remained the same, deteriorated). The exact change of rank is indicated in parenthesis next to the new rank. For example, Joseph E. Stiglitz is ranked first according to arithmetic mean. He is up 3 ranks. Stiglitz switched ranks with Andrei Shleifer who is down 3 ranks. Among the first ten harmonic-mean authors, Eugene F. Fama is the most penalized by the use of the arithmetic mean. His rank drops from 10 to 257.[46] The geometric mean induces movements somehow similar to the arithmetic mean but usually less pronounced. In particular, Fama is still down but only by 29 ranks.

4.2 Issues with the harmonic mean

In this section, I expand on a more fundamental issue with the harmonic mean, which I have not found discussed elsewhere.[47]

Zimmermann (2013) writes (bottom of page 263): "In such a mean, very good rankings have a lot of weight; for example, the first rank counts twice as much as the second one. This aggregation method therefore rewards those who are particularly good in some category, but perhaps rewards too much. For this reason, the harmonic mean is dampened somewhat by adding a constant (currently one) to each rank and then subtracting it from the mean."

To get an intuition on the behavior of the harmonic mean, one can begin by looking at its level curves. The following fact highlights a crucial property of such level curves.

Fact 15 (Level curves for the Harmonic mean). *Let $n \geq 2$ be the number of rankings, let $\mathbf{r} = (r_1, \cdots, r_n)$ denote the list of ranks, and for all i let $\mathbf{r}_{-i}$ denote the list of $n-1$ ranks where r_i has been removed, then,*

$$H(\mathbf{r}) = h_0 \;\Leftrightarrow\; \left(r_i - \frac{h_0}{n}\right)\left(\frac{H(\mathbf{r}_{-i})}{n-1} - \frac{h_0}{n}\right) = \left(\frac{h_0}{n}\right)^2$$

In particular, for $n = 2$,

$$H(r_1, r_2) = h_0 \;\Leftrightarrow\; \left(r_1 - \frac{h_0}{2}\right)\left(r_2 - \frac{h_0}{2}\right) = \left(\frac{h_0}{2}\right)^2$$

To illustrate graphically, Figure 5 plots, for $n = 2$, the level curves of the harmonic, arithmetic, and geometric means. The three means are all equal to h_0 when $r_1 = r_2 = h_0$, and they are very much alike around this point. Pairs (r_1, r_2) above (resp. below) the straight line $r_2 = 2h_0 - r_1$ have an arithmetic mean larger (resp. smaller) than h_0. Similarly pairs above the blue (resp. maroon) curve have a harmonic (resp. geometric) mean larger than h_0.[48]

As a consequence,

$$\forall r_1, \; 0 < r_1 < \frac{h_0}{2}, \forall r_2 > 0, \;\; \text{then} \;\; H(r_1, r_2) < h_0$$

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[46] Of course 257 is still an excellent rank (top 0.4% of all authors) but it is not a negligible change. I explain below what causes Fama's drop (more a question of criterion selection than of aggregation method).

[47] I could not find much on the harmonic mean besides its definition and a couple of properties. A Google Scholar search, for example, leads to Ferger (1931) in *Journal of the American Statistical Association* where the author emphasizes which of the arithmetic or harmonic mean is better suited to average different ratios (like speed per hour) depending on the type of data. Wikipedia is not very informative, also.

[48] The level curve of the geometric mean is, of course, the iso-utility curve for a Cobb-Douglas utility function $U = \sqrt{xy}$. Keeping the analogy with utility functions, the arithmetic mean level curve is the analogous of perfect substitutes, and the harmonic mean of a Cobb-Douglas with minimum level of consumption.

Table 14: Rankings (aggregation of 32 ranks out of 36) for each one of the three means (1-50)

	Harmonic			Arithmetic			Geometric	
Rank	Author	Nobel	Rank	Author	Nobel	Rank	Author	Nobel
1	Andrei Shleifer (1961-)		1(+3)	Joseph E. Stiglitz (1943-)	2001	1(+1)	James J. Heckman (1944-)	2000
2	James J. Heckman (1944-)	2000	2	James J. Heckman (1944-)	2000	2(+1)	Daron Acemoglu (1967-)	
3	Daron Acemoglu (1967-)		3	Daron Acemoglu (1967-)		3(-2)	Andrei Shleifer (1961-)	
4	Joseph E. Stiglitz (1943-)	2001	4(-3)	Andrei Shleifer (1961-)		4	Joseph E. Stiglitz (1943-)	2001
5	Robert J. Barro (1944-)		5	Robert J. Barro (1944-)		5	Robert J. Barro (1944-)	
6	John List (1968-)		6(+1)	Jean Tirole (1953-)	2014	6(+1)	Jean Tirole (1953-)	2014
7	Jean Tirole (1953-)	2014	7(+7)	Olivier J Blanchard (1948-)		7(+2)	David E. Card (1956-)	2021
8	Peter C. B. Phillips (1948-)		8(+1)	David E. Card (1956-)	2021	8(-2)	John List (1968-)	
9	David E. Card (1956-)	2021	9(-3)	John List (1968-)		9(+5)	Olivier J Blanchard (1948-)	
10	Eugene F. Fama (1939-)	2013	10(+10)	M Hashem Pesaran (1946-)		10(-2)	Peter C. B. Phillips (1948-)	
11	Kenneth S Rogoff (1953-)		11(+6)	A. F. Alesina (1957-2020)		11(+6)	A. F. Alesina (1957-2020)	
12	Gary S. Becker (1930-2014)	1992	12(+18)	L. H. Summers (1954-)		12(-1)	Kenneth S Rogoff (1953-)	
13	John Y. Campbell (1958-)		13(-5)	Peter C. B. Phillips (1948-)		13	John Y. Campbell (1958-)	
14	Olivier J Blanchard (1948-)		14(+5)	Philippe Aghion (1956-)		14(+6)	M Hashem Pesaran (1946-)	
15	Robert E. Lucas Jr. (1937-)	1995	15(-4)	Kenneth S Rogoff (1953-)		15(+4)	Philippe Aghion (1956-)	
16	M. S. Feldstein (1939-2019)		16(+2)	Richard Blundell (1952-)		16(+2)	Richard Blundell (1952-)	
17	A. F. Alesina (1957-2020)		17(+8)	Alan B. Krueger (1960-2019)		17(+8)	Alan B. Krueger (1960-2019)	
18	Richard Blundell (1952-)		18(+26)	John M. van Reenen (1965-)		18(+4)	Ross Levine (1960-)	
19	Philippe Aghion (1956-)		19(+16)	Thomas J. Sargent (1943-)	2011	19(+11)	L. H. Summers (1954-)	
20	M Hashem Pesaran (1946-)		20(+3)	Robert F. Engle III (1942-)	2003	20(-8)	Gary S. Becker (1930-2014)	1992
21	Peter Nijkamp (1946-)		21(+1)	Ross Levine (1960-)		21(+2)	Robert F. Engle III (1942-)	2003
22	Ross Levine (1960-)		22(-9)	John Y. Campbell (1958-)		22(-7)	Robert E. Lucas Jr. (1937-)	1995
23	Robert F. Engle III (1942-)	2003	23(+26)	Dani Rodrik (1957-)		23(+6)	Robert Ernest Hall (1943-)	
24	B. J. Eichengreen (1952-)		24	B. J. Eichengreen (1952-)		24	B. J. Eichengreen (1952-)	
25	Alan B. Krueger (1960-2019)		25(+12)	Michael Woodford (1955-)		25(-9)	M. S. Feldstein (1939-2019)	
26	J. M. Wooldridge (1960-)		26(+35)	Timothy J. Besley (1960-)		26(+9)	Thomas J. Sargent (1943-)	2011
27	Mark L. Gertler (1951-)		27(+26)	Angus S. Deaton (1945-)	2015	27(+5)	Rene M. Stulz (1952-)	
28	Rangan Gupta (1976-)		28(+19)	Maurice Obstfeld (1952-)		28(+9)	Michael Woodford (1955-)	
29	Robert Ernest Hall (1943-)		29	Robert Ernest Hall (1943-)		29(+15)	John M. van Reenen (1965-)	
30	L. H. Summers (1954-)		30(+13)	Elhanan Helpman (1946-)		30(+1)	Ben S. Bernanke (1953-)	2022
31	Ben S. Bernanke (1953-)	2022	31(+21)	Jeffrey A. Frankel (1952-)		31(+2)	Carmen M. Reinhart (1955-)	
32	Rene M. Stulz (1952-)		32(-16)	M. S. Feldstein (1939-2019)		32(+8)	Raghuram G. Rajan (1963-)	
33	Carmen M. Reinhart (1955-)		33(+41)	Abhijit V. Banerjee (1961-)	2019	33(+8)	Joshua D Angrist (1960-)	2021
34	Robert W. Vishny (1959-)		34(-1)	Carmen M. Reinhart (1955-)		34(+15)	Dani Rodrik (1957-)	
35	Thomas J. Sargent (1943-)	2011	35(+5)	Raghuram G. Rajan (1963-)		35(+1)	Paul R. Krugman (1953-)	2008
36	Paul R. Krugman (1953-)	2008	36(+40)	Robert J. Shiller (1946-)	2013	36(+7)	Elhanan Helpman (1946-)	
37	Michael Woodford (1955-)		37(-1)	Paul R. Krugman (1953-)	2008	37(+10)	Maurice Obstfeld (1952-)	
38	Nicholas Bloom (1973-)		38(+39)	John Haltiwanger (1955-)		38(+8)	Guido Imbens (1963-)	2021
39	James H. Stock (1955-)		39(+31)	Richard B. Freeman (1943-)		39(-29)	Eugene F. Fama (1939-)	2013
40	Raghuram G. Rajan (1963-)		40(+1)	Joshua D Angrist (1960-)	2021	40(+13)	Angus S. Deaton (1945-)	2015
41	Joshua D Angrist (1960-)	2021	41(+5)	Guido Imbens (1963-)	2021	41(+7)	Lawrence F. Katz (1959-)	
42	D. W. K. Andrews (1955-)		42(-11)	Ben S. Bernanke (1953-)	2022	42(-15)	Mark L. Gertler (1951-)	
43	Elhanan Helpman (1946-)		43(-5)	Nicholas Bloom (1973-)		43(+18)	Timothy J. Besley (1960-)	
44	John M. van Reenen (1965-)		44(+39)	Ernst Fehr (1956-)		44(-6)	Nicholas Bloom (1973-)	
45	Nicholas Cox (-)		45(+70)	Hyun Song Shin (1959-)		45(+7)	Jeffrey A. Frankel (1952-)	
46	Guido Imbens (1963-)	2021	46(+10)	C. W. J. Granger (1934-2009)	2003	46(+5)	Whitney Newey (1954-)	
47	Maurice Obstfeld (1952-)		47(+12)	N. Gregory Mankiw (1958-)		47(+12)	N. Gregory Mankiw (1958-)	
48	Lawrence F. Katz (1959-)		48	Lawrence F. Katz (1959-)		48(+26)	Abhijit V. Banerjee (1961-)	2019
49	Dani Rodrik (1957-)		49(-17)	Rene M. Stulz (1952-)		49(+5)	E. C. Prescott (1940-2022)	2004
50	Michael C. Jensen (1939-)		50(+18)	James Poterba (1958-)		50(-11)	James H. Stock (1955-)	

Table 15: Rankings for each one of the three means (51-100)

| Harmonic			Arithmetic			Geometric		
Rank	Author	Nobel	Rank	Author	Nobel	Rank	Author	Nobel
51	Whitney Newey (1954-)		51(+69)	Andrew Kenan Rose (1959-)		51(-9)	D. W. K. Andrews (1955-)	
52	Jeffrey A. Frankel (1952-)		52(+15)	Lars Peter Hansen (1952-)	2013	52(+24)	Robert J. Shiller (1946-)	2013
53	Angus S. Deaton (1945-)	2015	53(+1)	E. C. Prescott (1940-2022)	2004	53(-27)	J. M. Wooldridge (1960-)	
54	E. C. Prescott (1940-2022)	2004	54(+3)	John B. Taylor (1946-)		54(+6)	Mark W. Watson (1952-)	
55	Kenneth R. French (1954-)		55(+63)	Shang-Jin Wei (1964-)		55(+2)	John B. Taylor (1946-)	
56	C. W. J. Granger (1934-2009)	2003	56(+73)	Alan S. Blinder (1945-)		56(+11)	Lars Peter Hansen (1952-)	2013
57	John B. Taylor (1946-)		57(+12)	Emmanuel Saez (1972-)		57(+20)	John Haltiwanger (1955-)	
58	Edward L. Glaeser (1967-)		58(-7)	Whitney Newey (1954-)		58(-2)	C. W. J. Granger (1934-2009)	2003
59	N. Gregory Mankiw (1958-)		59(-47)	Gary S. Becker (1930-2014)	1992	59(+11)	Richard B. Freeman (1943-)	
60	Mark W. Watson (1952-)		60	Mark W. Watson (1952-)		60(-2)	Edward L. Glaeser (1967-)	
61	Timothy J. Besley (1960-)		61(+41)	Janet Currie (1960-)		61(+2)	David Autor (1967-)	
62	Manuel Arellano (1957-)		62(+27)	M. Ravallion (1952-2022)		62(+7)	Emmanuel Saez (1972-)	
63	David Autor (1967-)		63(+60)	Robert C. Feenstra (1956-)		63(+3)	Christopher Sims (1942-)	2011
64	Ben Jann (1972-)		64(-49)	Robert E. Lucas Jr. (1937-)	1995	64(+19)	Ernst Fehr (1956-)	
65	Christopher F Baum (1951-)		65(+98)	A. B. Atkinson (1944-2017)		65(+3)	James Poterba (1958-)	
66	Christopher Sims (1942-)	2011	66(+33)	Peter A. Diamond (1940-)	2010	66(+7)	Luigi Zingales (1963-)	
67	Lars Peter Hansen (1952-)	2013	67(+45)	Guillermo A. Calvo (1941-)		67(+11)	Jerry A. Hausman (1946-)	
68	James Poterba (1958-)		68(+58)	Guido Tabellini (1956-)		68(+23)	Jordi Gali (1961-)	
69	Emmanuel Saez (1972-)		69(+18)	Francis X. Diebold (1959-)		69(+11)	George Borjas (1950-)	
70	Richard B. Freeman (1943-)		70(+21)	Jordi Gali (1961-)		70(+19)	M. Ravallion (1952-2022)	
71	Simplice A Asongu (-)		71(+13)	Alan Auerbach (1951-)		71(+17)	Zvi Griliches (1930-1999)	
72	Drew Fudenberg (1957-)		72(+6)	Jerry A. Hausman (1946-)		72(+14)	Martin Eichenbaum (1954-)	
73	Luigi Zingales (1963-)		73(+49)	Viral V. Acharya (1974-)		73(+14)	Francis X. Diebold (1959-)	
74	Abhijit V. Banerjee (1961-)	2019	74(+37)	Avinash K. Dixit (1944-)		74(+16)	Charles F. Manski (1948-)	
75	Stephen J Turnovsky (1941-)		75(+22)	Bruno S. Frey (1941-)		75(+40)	Hyun Song Shin (1959-)	
76	Robert J. Shiller (1946-)	2013	76(+25)	Asli Demirguc-Kunt (1961-)		76(+26)	Janet Currie (1960-)	
77	John Haltiwanger (1955-)		77(+79)	Stephen Machin (1962-)		77(+4)	George A. Akerlof (1940-)	2001
78	Jerry A. Hausman (1946-)		78(+12)	Charles F. Manski (1948-)		78(+21)	Peter A. Diamond (1940-)	2010
79	Esther Duflo (1972-)	2019	79(-52)	Mark L. Gertler (1951-)		79	Esther Duflo (1972-)	2019
80	George Borjas (1950-)		80(+87)	Joel Slemrod (1951-)		80(+40)	Andrew Kenan Rose (1959-)	
81	George A. Akerlof (1940-)	2001	81(+59)	Michael Kremer (1964-)	2019	81(+37)	Shang-Jin Wei (1964-)	
82	Tim Bollerslev (1958-)		82(+49)	Josh Lerner (-)		82(+19)	Asli Demirguc-Kunt (1961-)	
83	Ernst Fehr (1956-)		83(+3)	Martin Eichenbaum (1954-)		83(-11)	Drew Fudenberg (1957-)	
84	Alan Auerbach (1951-)		84(+80)	David Neumark (1959-)		84(+27)	Avinash K. Dixit (1944-)	
85	Paul Milgrom (1948-)	2020	85(+39)	Luc Laeven (1974-)		85(+27)	Guillermo A. Calvo (1941-)	
86	Martin Eichenbaum (1954-)		86(-47)	James H. Stock (1955-)		86(-1)	Paul Milgrom (1948-)	2020
87	Francis X. Diebold (1959-)		87(-45)	D. W. K. Andrews (1955-)		87(-3)	Alan Auerbach (1951-)	
88	Zvi Griliches (1930-1999)		88(-22)	Christopher Sims (1942-)	2011	88(+21)	Oded Galor (1953-)	
89	M. Ravallion (1952-2022)		89(+69)	David Isaac Laibson (1966-)		89(+16)	James Hamilton (1954-)	
90	Charles F. Manski (1948-)		90(-2)	Zvi Griliches (1930-1999)		90(+17)	Halbert White (1950-2012)	
91	Jordi Gali (1961-)		91(-33)	Edward L. Glaeser (1967-)		91(+9)	L. J. Christiano (1952-)	
92	Michael McAleer (1951-2021)		92(+110)	David McKenzie (-)		92(+5)	Bruno S. Frey (1941-)	
93	Robert C. Merton (1944-)	1997	93(-13)	George Borjas (1950-)		93(+36)	Alan S. Blinder (1945-)	
94	Richard S.J. Tol (1969-)		94(-31)	David Autor (1967-)		94(+29)	Robert C. Feenstra (1956-)	
95	Richard H. Thaler (1945-)	2017	95(+50)	Luigi Guiso (1959-)		95(+13)	Ricardo J. Caballero (1959-)	
96	Rafael La Porta (1962-)		96(+37)	Lutz Kilian (-)		96(+30)	Guido Tabellini (1956-)	
97	Bruno S. Frey (1941-)		97(+3)	L. J. Christiano (1952-)		97(+7)	Lars E. O. Svensson (1947-)	
98	Raj Chetty (1979-)		98(+21)	J.-J. Laffont (1947-2004)		98(+24)	Viral V. Acharya (1974-)	
99	Peter A. Diamond (1940-)	2010	99(+9)	Ricardo J. Caballero (1959-)		99(+25)	Luc Laeven (1974-)	
100	L. J. Christiano (1952-)		100(+7)	Halbert White (1950-2012)		100(-5)	Richard H. Thaler (1945-)	2017
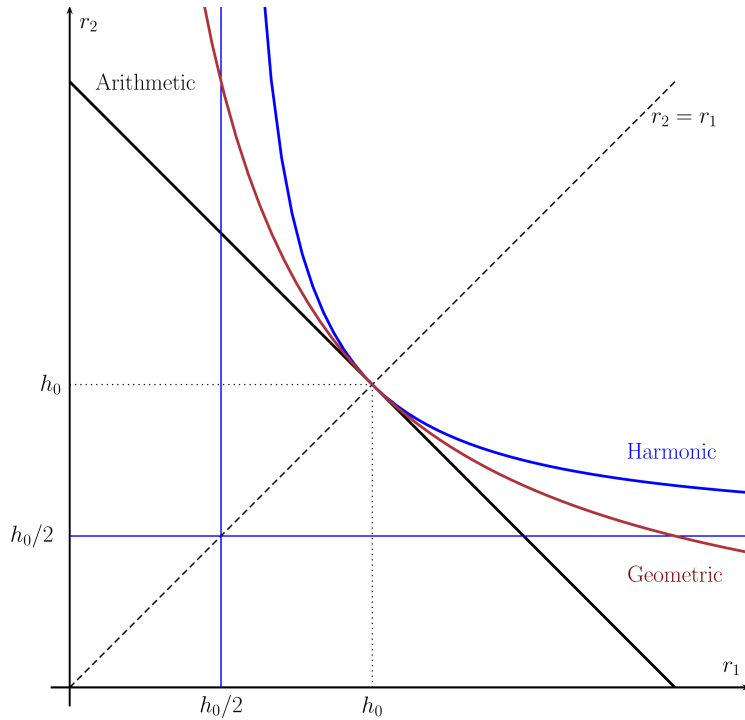
Figure 5: Level curves for the three means

To insist, even if $r_2 \to +\infty$ the harmonic mean $H(r_1, r_2)$ remains lower than h_0. A rank lower than $h_0/2$ for one ranking infinitely protects the mean from a bad outcome in the other ranking. A phenomenon which does not happen with the arithmetic nor the geometric means.

The problem does not disappear when more rankings are aggregated. It seems attenuated as the condition becomes $r_1 < \frac{h_0}{n}$ but with more ranks a group of them can serve to build an infinite protection. Adding 1 to the ranks and subtracting 1 to the mean, as it is currently done by RePEc, is a clever attempt but it does not really change this issue (see the examples below). Another way to look at the same issue is presented in Fact 16.

Fact 16 (Upper bounds for the Harmonic mean)**.** *Let $n \geq 2$ be the number of rankings, let $\mathbf{r} = (r_1, \cdots, r_n)$ denote the list of ranks, and let $\mathbf{b}$ denote the bottom of the list –i.e. the k lowest ranks, and let $\mathbf{t}$ denote the top of the list –i.e. the complementary list of the $n - k$ highest ranks, then,*

$$H(\mathbf{r}) < n\frac{H(\mathbf{b})}{k}$$

In particular, for $k = 1$,

$$\forall i, \ H(\mathbf{r}) < n\, r_i$$

Examples Some examples are in order. First, let me illustrate Fact 16 with a rather shocking example. Any author with a rank of 1 –among his remaining 32 ranks– cannot have an harmonic mean larger than 32 (or 63 the +1/-1 correction). Indeed,

$$H(1, 66000, \cdots, 66000) = 31.9835 \ \text{ and } \ H(2, 66001, \cdots, 66001) - 1 = 62.9339$$

Currently, in RePEc main ranking a score of 63 corresponds to a rank of 49. This not as good as first but it is still in the top 0.1%. When all ranks are 66,000 and one is 1, the outlier is 1 not 66,000.

At least, that would be my intuition. Can someone who is last 31 times out of 32 be ranked 49?[49] What is even more shocking is that 66,000 could be replaced by 66 billions.

Back to real life, Andrei Shleifer is first in RePEc's main ranking. How well is he protected against (imaginary) bad shocks in some rankings? His 32 ranks (once the best 2 and the worst 2 have been removed from the 36 rankings) are:

$$\mathbf{s} = (1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 3, 3, 3, 4, 5, 5, 5, 6, 6, 6, 7, 14, 18, 22, 34, 52, 65, 233, 243, 379, 380)$$

with

$$H(\mathbf{s}) = 2.725 \ \text{ and } \ H(\mathbf{s} + \mathbf{1}) - 1 = 3.522$$

Shleifer is seven times first (i.e. nine times out of 36). These seven ranks alone already secure him an excellent position even if he were to (unrealistically) fall in all the other rankings:

$$H(\overbrace{1, \cdots, 1}^{7 \text{ times}}, \overbrace{66000, \cdots, 66000}^{25 \text{ times}}) = 4.57116 \ \text{ and } \ H(\overbrace{2, \cdots, 2}^{7 \text{ times}}, \overbrace{66001, \cdots, 66001}^{25 \text{ times}}) - 1 = 8.14177$$

This time, a score of 8.14 corresponds to a rank of 5 in the current RePEc ranking. Again such an imaginary author would be ranked first seven times and last 25 times.[50] Keeping more ranks would of course limit even more the fall. Replacing Shleifer's worst rank of 380 by 66,000 barely changes the harmonic mean and he would remain first. But even if he were to be ranked last 9 times he would remain first by keeping his first 23 ranks. This lack of sensitivity to numerous huge negative shocks is a property which can be found counterintuitive.

The arithmetic mean can also lead to counterintuitive results. An author ranked 31 times first and one time last would have a score of 1876, and a rank of 1169. It certainly look unfair, and this one bad outcome (three given that two are removed) might be a measurement error. If not it might question the pertinence of including all these rankings. But in any case, a rank of 1,169 means that the author is in the top 2% (top 1.77 to be precise).

As shown in Table 14 Joseph E. Stiglitz is first when the arithmetic mean is used to aggregate the 32 ranks. Stiglitz's profile is:

$$\mathbf{joe} = (2, 2, 2, 3, 4, 4, 4, 5, 5, 6, 6, 6, 7, 7, 8, 8, 9, 9, 9, 10, 10, 10, 10, 10, 12, 12, 14, 14, 17, 21, 23, 25)$$

Compared to Shleifer's profile, these ranks are more homogenous and Stiglitz's arithmetic mean is 8.69 whereas Shleifer's is 26.57 (making him fourth in the ranking). From the top ten, the most dramatic change when using the arithmetic mean instead of the harmonic is for Eugene F. Fama Sr. who moves from 10 down to 257. This is explained by his third worst rank which is 5,362.[51] But, although disappointing for someone of Fama's caliber, I don't think the arithmetic mean is the culprit here. First, a rank of 257 is still outstanding –i.e. top 0.4%. Second, the problem comes from the inclusion of what I could call (interesting but) noisy criteria.

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[49]To be fair among the initial 36 ranks of this imaginary author three would have to be 1, and 33 would have to be 66,000.

[50]More precisely, nine times first and 27 times last.

[51]Fama does not have a lot of works although his articles are widely cited and very well published. He also does not have a lot of co-authors and he performs badly according the network criteria Closeness and Betweenness. These two bad ranks are eliminated but he keeps relatively bad ranks for Nb of Distinct Works and Nb of Distinct Works, Weighted by Nb of Authors.

Is it much different for authors ranked out of the top ten? At rank 142 of RePEc's main ranking is Edward Lazear[52] with an harmonic mean of 142.268. Already at these ranks the +1/-1 correction has no bite it would move his mean to 142.936. Is Lazear's position in danger if he were to fall in a couple of rankings? Putting his last 16 ranks at 66,000 increases his harmonic mean to 184.213 (or 185.779 with the +1/-1 correction). The change is larger than at the very top but Lazear would only loose about 42 ranks moving him in the company of other legendary economists: Sherwin Rosen, Kenneth J. Arrow, William J. Baumol, and Rudiger Dornbusch. Again, one could argue that such a position is barely compatible with having half of the ranks at 66,000.

Authors registered on RePEc can have very different profiles. A striking one (even more extreme than Nash) is Mark Carhart. Mark is a quant hedge fund manager. He is currently not affiliated to any academic center (he has a 1995 PhD from Chicago Booth). He has one working paper and two articles referenced on RePEc. However, Mark belongs to RMR'5, even the top 2% as his rank is about 900. In fact, he is in 16 of the 36 possible top 5% of Table 19. This is because his 1997 *Journal of Finance* article received more than 4,500 citations. This allows him to perform excellently in all citations-based criteria (except the h-index). In particular he is ranked 72 according to the Euclidian criteria. This case illustrates the issue with aggregating many correlated criteria with a harmonic mean –i.e. Facts 15 and 16. Here the citation dimension is strong enough to discard completely the poor rankings in terms of quantity of publication as well as visibility and network. Using the arithmetic mean of the 32 ranks (removing from the 36 ranks the best two and the worst two) would put him at a rank closer to 12,000 than 900.

5 A simpler customization

To reiterate, there is nothing inherently flawed about the various production measures offered by RePEc, and exploring through different lenses authors' scholarly impact can be a fascinating albeit time-consuming endeavor. However, the challenge of how to consolidate these disparate dimensions into a single, definitive ranking is a daunting one. RePEc's approach involves calculating the harmonic mean of 32 ranks (after excluding the top two and bottom two ranks for each author). In the following section, I offer my own perspective on this issue and propose a simpler and more straightforward alternative.

Although the 36 criteria used for ranking have a strong underlying logic, computing their mean (regardless of the type of mean used) ultimately reflects a particular choice and is not truly agnostic or neutral. To illustrate, consider two journals, J1 and J2, and two weighting schemes, E and R. In E, both journals have a weight of 1, while in R, J1 has a weight of 1 and J2 has a weight $w > 1$. Now suppose there are two authors, A and B. A has n_A articles in J1, while B has n_B articles in J1 and m_B articles in J2. If $n_A = n_B + m_B$, E would assign both authors the same rank, while R would rank B higher. Computing an average of these two rankings would effectively diminish the impact of the weight w.[53]

In my view, it is not advisable to combine rankings that are based on different weighting schemes, as this can obscure the underlying methodology. Rather, I suggest focusing on selecting a coherent

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[52]Lazear (1948-2020) was a hugely influancial U.S. economist, see https://en.wikipedia.org/wiki/Edward_Lazear.

[53]Let $x = n_A = n_B + m_B$, then the score of A in both ranking is x and the score of B is x for E and $x + (w-1)m_B$ for R. Taking the average score keeps A's score at x while B's score becomes $x + (w-1)m_B/2$, which gives less weight to the more prestigious publications.

ranking system that relies on a single weighting structure. Given that the primary goal of research is to publish in high-quality journals, I believe that journal articles should be the only type of publication taken into account for ranking purposes. While working papers are undoubtedly important for economists, they should be excluded from rankings. I understand that many authors may have unpublished working papers that are highly valuable, but it is worth noting that some authors with a high number of distinct works have over 500 working papers and only around 30 articles. Given that it is more difficult to publish in selective journals and that Recursive Impact Factors weights tend to reward such journals, these weights should be the preferred option. Although they are not perfect, they avoid rewarding authors with many articles in less prominent journals. Additionally, focusing solely on journal articles allows me to take into account the number of pages (which is not available for working papers). While this is an imperfect signal, longer articles are generally considered to be more significant contributions than shorter notes.

I propose a straightforward approach that combines only two dimensions: AWScPages –Nb of Journal Pages, Weighted by Nb of Authors and Recursive Impact Factors– and AWScCites –Nb of Citations, Weighted by Nb of Authors and Recursive Impact Factors. The final ranking is obtained by taking the mean of the rank for the criterion AWScPages and the rank for the criterion AWScCites. This method values the quality and size of each publication, as well as its impact, while correcting for the number of authors.

Thankfully, I could use RePEc's sandbox to rank authors according to this combination of criteria. The sandbox produces list of the 3,284 best-ranked authors, which represents the top 5% of all registered authors. Depending on the preference for the type of mean used, three final rankings are possible: arithmetic (which is my preferred choice), geometric, or harmonic.

The intersection of this new set of authors with the ones in RMR'5 contains 2,547 authors. The Spearman correlation coefficient between the simple ranking and RMR'5 is 0.75, and the Kendall tau is 0.57.[54]

Table 16: Rank Changes: RePEc vs simple

		Rank in RePEc's main ranking										
		[1, 100]	[101, 200]	[201, 300]	[301, 400]	[401, 500]	[501, 600]	[601, 700]	[701, 800]	[801, 900]	[901, 1000]	$1000 < r$	Total
Simple ranking	[1, 100]	69	27	4	0	0	0	0	0	0	0	0	100
	[101, 200]	13	43	24	11	7	1	0	0	0	0	1	100
	[201, 300]	5	13	29	21	19	11	1	1	0	0	0	100
	[301, 400]	3	6	8	19	18	19	9	6	5	5	2	100
	[401, 500]	1	3	10	10	10	16	14	13	12	1	10	100
	[501, 600]	1	1	5	7	6	10	16	7	16	8	23	100
	[601, 700]	0	1	3	7	4	4	14	8	13	9	37	100
	[701, 800]	0	0	2	4	3	8	7	8	4	11	53	100
	[801, 900]	0	1	1	1	2	4	6	9	6	13	57	100
	[901, 1000]	0	1	1	1	0	3	5	7	6	2	74	100
	$1000 < s$	8	4	13	19	31	24	28	41	38	51	.	257
	Total	100	100	100	100	100	100	100	100	100	100	257	1,257

Table 16 details some of the differences between the two rankings by looking at the first 1,000 authors for each ranking. Each author is allocated, for each ranking, to a bin of width 100 ranks.

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[54]The comparison with the purely quantitative ranking, Number of Distinct Works, shows a Spearman correlation coefficient with my simple ranking of 0.16, a Kendall tau is 0.11, with an intersection of 1,221 authors. Among the 14 authors with more than 500 distinct works, only Joseph E. Stiglitz remains in the top 100 of my simple ranking, actually Stiglitz is ranked 4th. Six of the remaining thirteen authors are not in the top 5% of my simple ranking while they were in RMR'5.

For example, among the 100 authors ranked from 1 to 100 in RePEc's main ranking (column $[1, 100]$ in the Table) only 69 are still ranked below 100 in the simple ranking, 13 are ranked between 101 and 200, etc. Finally 8 have a rank larger than 1,000.

In terms of statistics descriptive, the population of authors in the top 5% of the simple ranking is not completely similar to the one in the top 5% of RePEc's main ranking. In particular, authors are slightly more affiliated in an English speaking country (76% vs 69%), they are more located in the USA (1,821 authors vs 1,633), and more authors are female (324 vs 291). The Nobel Laureates are also differently ranked. John F. Nash is no longer in the top 5%. Among the recent laureates (after 2000), Robert J. Aumann gains 546 ranks moving from 911 to 365. Both 1996 Laureates William S. Vickrey (+614 ranks) and James A. Mirrlees (+379 ranks) benefit from my choice of ranking. Roger B. Myerson moves from 299 to 79, almost switching ranks with Esther Duflo who moves from 79 to 224. The number of deceased authors increased from 199 to 211. The distributions of the age of living authors are fairly similar.

Tables 17 and 18 display three rankings all based on a different aggregation of the two chosen criteria AWScPages and AWScCites. The arithmetic mean based ranking is presented in the first three columns, followed by the geometric mean, and finally the harmonic mean. The names are in dark blue (resp. black, maroon) when their rank has improved (resp. remained the same, deteriorated). The exact change of rank is indicated in parenthesis next to the new rank. The (estimated) year of birth (and sadly the year of death for some) is shown in parentheses after the name of the author. For example, Daron Acemoglu is first in the arithmetic-mean ranking. He moves to second in the geometric-mean ranking and to third in the harmonic-mean ranking.

6 Conclusion

RePEc is a valuable source of information on researchers in economics, as it collects data on their publications and citations. However, the current data collection process could be improved to provide a better description of the registered authors. For instance, RePEc could ask for additional information such as the author's city and year of birth, citizenship,[55] gender, and Ph.D. university and year. Although RePEc Genealogy provides information on the author's terminal degree, this feature is incomplete, with only about 15,000 authors listed out of the 66,000 registered authors. Moreover, the distinction between Ph.D. and M.A. degrees is not made for all authors.

To incentivize authors to provide their data, RePEc could offer a new service called "RePEc C.V.", which would allow registered authors to generate a beautifully formatted curriculum vitae automatically. To make this service possible, RePEc would need to keep a record of past affiliations, which would also benefit researchers who want to disentangle the effect of an author from that of their center. With RePEc's creativity and expertise, the options for this service could be endless!

RePEc collected information about Twitter (I don't know how). They could (try to) collect information about Google Scholar profiles. Indeed, it would be interesting to compare it the CiTEc data.

One important improvement would be to compute SIF and RIF by period of time. Ideally, SIF_y, the simple impact factor of year y, would be computed using data from $y-5, \ldots, y, \ldots y+5$ (adapting

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[55]Citizenship (past and present) and place of birth could be useful to know more about migration patterns among researchers, and in particular about how many migrants are working in the USA. Did they migrate to do their Ph.D. and then stayed, or did they arrived already with a doctorate?

Table 17: Simpler ranking (1-50): All years
Aggregation of AWScPages and AWScCites

	Arithmetic			Geometric			Harmonic	
Rank	Author	Nobel	Rank	Author	Nobel	Rank	Author	Nobel
1	Daron Acemoglu (1967-)		1(+4)	Robert J. Barro (1944-)		1(+4)	Robert J. Barro (1944-)	
2	Jean Tirole (1953-)	2014	2(-1)	Daron Acemoglu (1967-)		2(+31)	Peter C. B. Phillips (1948-)	
3	James J. Heckman (1944-)	2000	3	James J. Heckman (1944-)	2000	3(-2)	Daron Acemoglu (1967-)	
4	Joseph E. Stiglitz (1943-)	2001	4(-2)	Jean Tirole (1953-)	2014	4(-1)	James J. Heckman (1944-)	2000
5	Robert J. Barro (1944-)		5(-1)	Joseph E. Stiglitz (1943-)	2001	5(-1)	Joseph E. Stiglitz (1943-)	2001
6	Andrei Shleifer (1961-)		6	Andrei Shleifer (1961-)		6(-4)	Jean Tirole (1953-)	2014
7	Robert Ernest Hall (1943-)		7	Robert Ernest Hall (1943-)		7(+6)	Robert E. Lucas Jr. (1937-)	1995
8	Olivier J Blanchard (1948-)		8(+25)	Peter C. B. Phillips (1948-)		8(-2)	Andrei Shleifer (1961-)	
9	David E. Card (1956-)	2021	9(+4)	Robert E. Lucas Jr. (1937-)	1995	9(-2)	Robert Ernest Hall (1943-)	
10	John Y. Campbell (1958-)		10(-2)	Olivier J Blanchard (1948-)		10(+81)	Gary S. Becker (1930-2014)	1992
11	M. S. Feldstein (1939-2019)		11(-2)	David E. Card (1956-)	2021	11(+6)	D. W. K. Andrews (1955-)	
12	Michael Woodford (1955-)		12(-2)	John Y. Campbell (1958-)		12(-4)	Olivier J Blanchard (1948-)	
13	Robert E. Lucas Jr. (1937-)	1995	13(-2)	M. S. Feldstein (1939-2019)		13(-4)	David E. Card (1956-)	2021
14	Maurice Obstfeld (1952-)		14(+3)	D. W. K. Andrews (1955-)		14(-4)	John Y. Campbell (1958-)	
15	L. H. Summers (1954-)		15(-3)	Michael Woodford (1955-)		15(-4)	M. S. Feldstein (1939-2019)	
16	A. B. Krueger (1960-2019)		16(-2)	Maurice Obstfeld (1952-)		16(+48)	Robert J. Gordon (1940-)	
17	D. W. K. Andrews (1955-)		17(-2)	L. H. Summers (1954-)		17(+9)	Kenneth S Rogoff (1953-)	
18	Whitney Newey (1954-)		18(+8)	Kenneth S Rogoff (1953-)		18(-6)	Michael Woodford (1955-)	
19	Christopher Sims (1942-)	2011	19(-3)	A. B. Krueger (1960-2019)		19(-5)	Maurice Obstfeld (1952-)	
20	Thomas J. Sargent (1943-)	2011	20(-1)	Christopher Sims (1942-)	2011	20(+34)	John B. Taylor (1946-)	
21	Joshua D Angrist (1960-)	2021	21(-1)	Thomas J. Sargent (1943-)	2011	21(-6)	L. H. Summers (1954-)	
22	Angus S. Deaton (1945-)	2015	22(+69)	Gary S. Becker (1930-2014)	1992	22(-6)	A. B. Krueger (1960-2019)	
23	George Borjas (1950-)		23(-1)	Angus S. Deaton (1945-)	2015	23(-4)	Christopher Sims (1942-)	2011
24	Elhanan Helpman (1946-)		24(-6)	Whitney Newey (1954-)		24(-4)	Thomas J. Sargent (1943-)	2011
25	A. F. Alesina (1957-2020)		25(-4)	Joshua D Angrist (1960-)	2021	25(+85)	William D. Nordhaus (1941-)	2018
26	Kenneth S Rogoff (1953-)		26(+38)	Robert J. Gordon (1940-)		26(+3)	Paul R. Krugman (1953-)	2008
27	Lars E. O. Svensson (1947-)		27(+2)	Paul R. Krugman (1953-)	2008	27(-5)	Angus S. Deaton (1945-)	2015
28	Rene M. Stulz (1952-)		28(-4)	Elhanan Helpman (1946-)		28(+48)	Mark L. Gertler (1951-)	
29	Paul R. Krugman (1953-)	2008	29(-6)	George Borjas (1950-)		29(-11)	Whitney Newey (1954-)	
30	Raghuram G. Rajan (1963-)		30(-5)	A. F. Alesina (1957-2020)		30(+103)	Stephen J Turnovsky (1941-)	
31	Lars Peter Hansen (1952-)	2013	31(-3)	Rene M. Stulz (1952-)		31(-10)	Joshua D Angrist (1960-)	2021
32	John H. Cochrane (1957-)		32(-5)	Lars E. O. Svensson (1947-)		32(-4)	Rene M. Stulz (1952-)	
33	Peter C. B. Phillips (1948-)		33(+21)	John B. Taylor (1946-)		33(-2)	Lars Peter Hansen (1952-)	2013
34	Robert J. Shiller (1946-)	2013	34(-3)	Lars Peter Hansen (1952-)	2013	34(-10)	Elhanan Helpman (1946-)	
35	Peter A. Diamond (1940-)	2010	35(-5)	Raghuram G. Rajan (1963-)		35(+14)	Eugene F. Fama (1939-)	2013
36	Guido Imbens (1963-)	2021	36(-1)	Peter A. Diamond (1940-)	2010	36(+48)	Ben S. Bernanke (1953-)	2022
37	N. Gregory Mankiw (1958-)		37(-5)	John H. Cochrane (1957-)		37(+52)	P. A. Samuelson (1915-2009)	1970
38	Lawrence F. Katz (1959-)		38(-4)	Robert J. Shiller (1946-)	2013	38(-15)	George Borjas (1950-)	
39	George A. Akerlof (1940-)	2001	39(+10)	Eugene F. Fama (1939-)	2013	39(-12)	Lars E. O. Svensson (1947-)	
40	Charles F. Manski (1948-)		40(+1)	Timothy J. Besley (1960-)		40(-15)	A. F. Alesina (1957-2020)	
41	Timothy J. Besley (1960-)		41(-5)	Guido Imbens (1963-)	2021	41(+24)	E. C. Prescott (1940-2022)	2004
42	Edward Lazear (1948-2020)		42(-5)	N. Gregory Mankiw (1958-)		42(+13)	Alan Auerbach (1951-)	
43	Avinash K. Dixit (1944-)		43(-4)	George A. Akerlof (1940-)	2001	43(-13)	Raghuram G. Rajan (1963-)	
44	Robert F. Engle III (1942-)	2003	44(-6)	Lawrence F. Katz (1959-)		44(+33)	Guillermo A. Calvo (1941-)	
45	Richard Blundell (1952-)		45(+31)	Mark L. Gertler (1951-)		45(-4)	Timothy J. Besley (1960-)	
46	Boyan Jovanovic (1951-)		46(+9)	Alan Auerbach (1951-)		46(+65)	Carmen M. Reinhart (1955-)	
47	R. J. Caballero (1959-)		47(-7)	Charles F. Manski (1948-)		47(-12)	Peter A. Diamond (1940-)	2010
48	Dani Rodrik (1957-)		48(+17)	E. C. Prescott (1940-2022)	2004	48(+3)	Paul Milgrom (1948-)	2020
49	Eugene F. Fama (1939-)	2013	49(+2)	Paul Milgrom (1948-)	2020	49(+25)	James H. Stock (1955-)	
50	Emmanuel Saez (1972-)		50(-8)	Edward Lazear (1948-2020)		50(+31)	Larry G. Epstein (1947-)	

Table 18: Simpler ranking (51-100): All years
Aggregation of AWScPages and AWScCites

	Arithmetic			Geometric			Harmonic	
Rank	Author	Nobel	Rank	Author	Nobel	Rank	Author	Nobel
51	Paul Milgrom (1948-)	2020	51(-7)	Robert F. Engle III (1942-)	2003	51(-19)	John H. Cochrane (1957-)	
52	James Poterba (1958-)		52(+58)	William D. Nordhaus (1941-)	2018	52(-18)	Robert J. Shiller (1946-)	2013
53	James Hamilton (1954-)		53(-7)	Boyan Jovanovic (1951-)		53(+14)	Ross Levine (1960-)	
54	John B. Taylor (1946-)		54(+30)	Ben S. Bernanke (1953-)	2022	54(-18)	Guido Imbens (1963-)	2021
55	Alan Auerbach (1951-)		55(-12)	Avinash K. Dixit (1944-)		55(-18)	N. Gregory Mankiw (1958-)	
56	John List (1968-)		56(+33)	P. A. Samuelson (1915-2009)	1970	56(-17)	George A. Akerlof (1940-)	2001
57	M Hashem Pesaran (1946-)		57(-12)	Richard Blundell (1952-)		57(-19)	Lawrence F. Katz (1959-)	
58	Philippe Aghion (1956-)		58(+19)	Guillermo A. Calvo (1941-)		58(+80)	Robert C. Merton (1944-)	1997
59	Halbert White (1950-2012)		59(-12)	R. J. Caballero (1959-)		59(+31)	Michael P Keane (1961-)	
60	Richard B. Freeman (1943-)		60(+7)	Ross Levine (1960-)		60(-20)	Charles F. Manski (1948-)	
61	Mark W. Watson (1952-)		61(-5)	John List (1968-)		61(-17)	Robert F. Engle III (1942-)	2003
62	Drew Fudenberg (1957-)		62(+12)	James H. Stock (1955-)		62(+87)	Lung-Fei Lee (1948-)	
63	Alvin E. Roth (1951-)	2012	63(-15)	Dani Rodrik (1957-)		63(-21)	Edward Lazear (1948-2020)	
64	Robert J. Gordon (1940-)		64(-2)	Drew Fudenberg (1957-)		64(-2)	Drew Fudenberg (1957-)	
65	E. C. Prescott (1940-2022)	2004	65(+16)	Larry G. Epstein (1947-)		65(-19)	Boyan Jovanovic (1951-)	
66	Alan S. Blinder (1945-)		66(-3)	Alvin E. Roth (1951-)	2012	66(-10)	John List (1968-)	
67	Ross Levine (1960-)		67(-17)	Emmanuel Saez (1972-)		67(-4)	Alvin E. Roth (1951-)	2012
68	David Autor (1967-)		68(-15)	James Hamilton (1954-)		68(-25)	Avinash K. Dixit (1944-)	
69	Xavier Gabaix (1971-)		69(+64)	Stephen J Turnovsky (1941-)		69(-24)	Richard Blundell (1952-)	
70	Jerry A. Hausman (1946-)		70(-13)	M Hashem Pesaran (1946-)		70(-23)	R. J. Caballero (1959-)	
71	Raj Chetty (1979-)		71(-19)	James Poterba (1958-)		71(+16)	L. J. Christiano (1952-)	
72	B. Douglas Bernheim (1958-)		72(-11)	Mark W. Watson (1952-)		72(+37)	Jordi Gali (1961-)	
73	John Haltiwanger (1955-)		73(-15)	Philippe Aghion (1956-)		73(+15)	R. Dornbusch (1942-2002)	
74	James H. Stock (1955-)		74(+37)	Carmen M. Reinhart (1955-)		74(-13)	Mark W. Watson (1952-)	
75	J. J. Rotemberg (1953-2017)		75(+15)	Michael P Keane (1961-)		75(-27)	Dani Rodrik (1957-)	
76	Mark L. Gertler (1951-)		76(-10)	Alan S. Blinder (1945-)		76(-23)	James Hamilton (1954-)	
77	Guillermo A. Calvo (1941-)		77(-18)	Halbert White (1950-2012)		77(+238)	Robert W. Vishny (1959-)	
78	Martin Eichenbaum (1954-)		78(-18)	Richard B. Freeman (1943-)		78(-21)	M Hashem Pesaran (1946-)	
79	Roger B. Myerson (1951-)	2007	79(+8)	L. J. Christiano (1952-)		79(-29)	Emmanuel Saez (1972-)	
80	Abhijit V. Banerjee (1961-)	2019	80(+8)	R. Dornbusch (1942-2002)		80(-14)	Alan S. Blinder (1945-)	
81	Larry G. Epstein (1947-)		81(-3)	Martin Eichenbaum (1954-)		81(-23)	Philippe Aghion (1956-)	
82	Janet Currie (1960-)		82(-11)	Raj Chetty (1979-)		82(-30)	James Poterba (1958-)	
83	Roland J. Benabou (1958-)		83(-14)	Xavier Gabaix (1971-)		83(+2)	Zvi Griliches (1930-1999)	
84	Ben S. Bernanke (1953-)	2022	84(-16)	David Autor (1967-)		84(-6)	Martin Eichenbaum (1954-)	
85	Zvi Griliches (1930-1999)		85	Zvi Griliches (1930-1999)		85(+214)	Michael C. Jensen (1939-)	
86	Guido Tabellini (1956-)		86(+23)	Jordi Gali (1961-)		86(+26)	M. L. Weitzman (1942-2019)	
87	L. J. Christiano (1952-)		87(-17)	Jerry A. Hausman (1946-)		87(-28)	Halbert White (1950-2012)	
88	R. Dornbusch (1942-2002)		88(+50)	Robert C. Merton (1944-)	1997	88(-17)	Raj Chetty (1979-)	
89	P. A. Samuelson (1915-2009)	1970	89(-17)	B. Douglas Bernheim (1958-)		89(-29)	Richard B. Freeman (1943-)	
90	Michael P Keane (1961-)		90(-15)	J. J. Rotemberg (1953-2017)		90(+7)	J.-J. Laffont (1947-2004)	
91	Gary S. Becker (1930-2014)	1992	91(-18)	John Haltiwanger (1955-)		91(-22)	Xavier Gabaix (1971-)	
92	Frederic Mishkin (1951-)		92(-10)	Janet Currie (1960-)		92(+29)	Matthew O. Jackson (1962-)	
93	Michael Kremer (1964-)	2019	93(+4)	J.-J. Laffont (1947-2004)		93(-25)	David Autor (1967-)	
94	Ariel Pakes (1949-)		94(+55)	Lung-Fei Lee (1948-)		94(-24)	Jerry A. Hausman (1946-)	
95	Ch. A Pissarides (1948-)	2010	95(+17)	M. L. Weitzman (1942-2019)		95(-13)	Janet Currie (1960-)	
96	Darrell Duffie (1954-)		96(-13)	Roland J. Benabou (1958-)		96(-21)	J. J. Rotemberg (1953-2017)	
97	J.-J. Laffont (1947-2004)		97(-18)	Roger B. Myerson (1951-)	2007	97(+137)	Kenneth R. French (1954-)	
98	Richard Rogerson (1958-)		98(-18)	Abhijit V. Banerjee (1961-)	2019	98(+102)	Debraj Ray (1957-)	
99	Luigi Zingales (1963-)		99(-6)	Michael Kremer (1964-)	2019	99(-27)	B. Douglas Bernheim (1958-)	
100	David Romer (1958-)		100(-4)	Darrell Duffie (1954-)		100(+43)	Jeffrey A. Frankel (1952-)	

the moving window for years close to the current year). That would capture better the "importance", the "value" of a given journal at year y. An article published in year y would be weighted by SIF_y.

Counting pages of the published articles is important. However, journals have various layouts and this is a source of noise. One way to deal with this problem is to normalize, as in Combes and Linnemer (2003),[56] by the average number of pages in the same journal and year. That way, an article would be longer or shorter relative to its peers. This solution also captures the fact that the length of an article can change through time.

Currently, the sandbox can only be used to rank authors worldwide not at a country level. For example, I could easily ask RePEc for the rankings of Tables 17 and 18 but it is impossible to have the same rankings for France.

Something I could do with the currently available data is study the same rankings as in this paper but based only on the last ten years. This is allowed by RePEc, and it is clearly useful to identify highly productive young(er) authors. I postponed this task to a future working paper as this one is already long.

Appendix

A   Harmonic mean level curves

Assume for all i, $r_i > 0$. I show here that (i.e. that Fact 15 is true)

$$H(\mathbf{r}) = h_0 \;\Leftrightarrow\; \left(r_i - \frac{h_0}{n} \right) \left(\frac{H(\mathbf{r}_{-i})}{n-1} - \frac{h_0}{n} \right) = \left(\frac{h_0}{n} \right)^2$$

Indeed,

$$H(\mathbf{r}) = h_0 \;\Leftrightarrow\; \frac{n}{\frac{1}{r_i} + \frac{n-1}{H(\mathbf{r}_{-i})}} = h_0 \;\Leftrightarrow\; r_i \frac{H(\mathbf{r}_{-i})}{n-1} = \frac{h_0}{n} \left(r_i + \frac{H(\mathbf{r}_{-i})}{n-1} \right)$$

Now it is also true that

$$r_i \frac{H(\mathbf{r}_{-i})}{n-1} = \left(r_i - \frac{h_0}{n} \right) \left(\frac{H(\mathbf{r}_{-i})}{n-1} - \frac{h_0}{n} \right) + \frac{h_0}{n} \left(r_i - \frac{h_0}{n} \right) + \frac{h_0}{n} \frac{H(\mathbf{r}_{-i})}{n-1}$$

or

$$r_i \frac{H(\mathbf{r}_{-i})}{n-1} = \left(r_i - \frac{h_0}{n} \right) \left(\frac{H(\mathbf{r}_{-i})}{n-1} - \frac{h_0}{n} \right) + \frac{h_0}{n} \left(r_i + \frac{H(\mathbf{r}_{-i})}{n-1} \right) - \left(\frac{h_0}{n} \right)^2$$

and therefore

$$H(\mathbf{r}) = h_0 \;\Leftrightarrow\; \left(r_i - \frac{h_0}{n} \right) \left(\frac{H(\mathbf{r}_{-i})}{n-1} - \frac{h_0}{n} \right) + \frac{h_0}{n} \left(r_i + \frac{H(\mathbf{r}_{-i})}{n-1} \right) - \left(\frac{h_0}{n} \right)^2 = \frac{h_0}{n} \left(r_i + \frac{H(\mathbf{r}_{-i})}{n-1} \right)$$

which gives the result.

About Fact 16: Let $n \geq 2$ be the number of rankings, let $\mathbf{r} = (r_1, \cdots, r_n)$ denote the list of ranks, and let $\mathbf{b}$ denote the bottom of the list –i.e. the k lowest ranks, and let $\mathbf{t}$ denote the top of the list –i.e. the complementary list of the $n - k$ highest ranks, then,

$$H(\mathbf{r}) = \frac{n}{\frac{k}{H(\mathbf{b})} + \frac{n-k}{H(\mathbf{t})}} < \frac{n}{\frac{k}{H(\mathbf{b})} + 0} = n \frac{H(\mathbf{b})}{k}$$

which is the result.

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[56] In Linnemer and Visser (2016) the number of citations received by an article are also similarly normalized.

Table 19: Short description of RePEc criteria

1	DNbWorks	Nb of Distinct Works
2	ScWorks	Nb of Distinct Works, Weighted by Simple Impact Factor
3	WScWorks	Nb of Distinct Works, Weighted by Recursive Impact Factor
4	ANbWorks	Nb of Distinct Works, Weighted by Nb of Authors
5	AScWorks	Nb of Distinct Works, Weighted by Nb of Authors and Simple Impact Factors
6	AWScWorks	Nb of Distinct Works, Weighted by Nb of Authors and Recursive Impact Factors
7	NbPages	Nb of Journal Pages
8	ScPages	Nb of Journal Pages, Weighted by Simple Impact Factor
9	WScPages	Nb of Journal Pages, Weighted by Recursive Impact Factor
10	ANbPages	Nb of Journal Pages, Weighted by Nb of Authors
11	AScPages	Nb of Journal Pages, Weighted by Nb of Authors and Simple Impact Factors
12	AWScPages	Nb of Journal Pages, Weighted by Nb of Authors and Recursive Impact Factors
13	NbCites	Nb of Citations
14	ScCites	Nb of Citations, Weighted by Simple Impact Factor
15	WScCites	Nb of Citations, Weighted by Recursive Impact Factor
16	ANbCites	Nb of Citations, Weighted by Nb of Authors
17	AScCites	Nb of Citations, Weighted by Nb of Authors and Simple Impact Factors
18	AWScCites	Nb of Citations, Weighted by Nb of Authors and Recursive Impact Factors
19	DCites	Nb of Citations, Discounted by Citation Age
20	DScCites	Nb of Citations, Weighted by Simple Impact Factor, Discounted by Citation Age
21	WDScCites	Nb of Citations, Weighted by Recursive Impact Factor, Discounted by Citation Age
22	ADCites	Nb of Citations, Weighted by Nb of Authors, Discounted by Citation Age
23	ADScCites	Nb of Citations, Weighted by Nb of Authors and Simple Impact Factors, Discounted by Citation Age
24	AWDScCites	Nb of Citations, Weighted by Nb of Authors and Recursive Impact Factors, Discounted by Citation Age
25	HIndex	Number h of works that each have at least h citations
26	NCAuthors	Nb of Registered Citing Authors
27	RCAuthors	Nb of Registered Citing Authors, Weighted by Rank (Max. 1 per Author)
28	Euclidian	Euclidian citation score
29	AbsViews	Nb of Abstract Views in RePEc Services over the past 12 months
30	Downloads	Nb of Downloads through RePEc Services over the past 12 months
31	AAbsViews	Nb of Abstract Views in RePEc Services over the past 12 months, Weighted by Nb of Authors
32	ADownloads	Nb of Downloads through RePEc Services over the past 12 months, Weighted by Nb of Authors
33	Students	Record of graduates
34	Closeness	Closeness measure in co-authorship network*
35	Betweenness	Betweenness measure in co-authorship network*
36	NEPCites	Breadth of citations across fields

* See Documentation at **https://collec.repec.org/app/collec_app**

Table 20: Descriptive statistics for each score for the criteria of Table 19

Variable	N	% in RePEc's top 5%	Female	Mean	Min	p25	p50	p75	Max	p90/p10
Score1	3304	52.31	283	135	80	92	112	151	1362	2.58
Score2	3284	82.61	303	3714	1678	2085	2743	4208	36678	3.67
Score3	3284	78.11	327	126	53	68	92	143	1160	3.89
Score4	3284	55.18	236	87	49	57	70	99	660	2.74
Score5	3284	79.38	292	1968	834	1049	1414	2166	24976	3.98
Score6	3284	75.49	315	67	27	34	47	74	867	4.28
Score7	3286	59.53	253	1334	792	910	1110	1470	9889	2.48
Score8	3284	77.01	279	34103	15341	19199	25967	39114	371196	3.66
Score9	3284	72.17	303	1117	473	604	827	1284	14178	3.91
Score10	3284	59.65	218	693	407	471	568	785	4183	2.54
Score11	3284	74.39	268	17824	7742	9796	13286	20269	196777	3.86
Score12	3284	70.62	305	587	238	309	425	667	7190	4.14
Score13	3285	84.01	325	3678	1217	1609	2286	3899	70270	5.34
Score14	3284	83.74	334	61338	17664	24214	35875	64683	1264820	6.33
Score15	3284	80.21	353	1791	477	675	1031	1895	30246	6.85
Score16	3284	84.53	323	1915	582	775	1129	1990	31990	5.96
Score17	3284	83.59	342	31886	8338	11722	17759	33259	513964	6.99
Score18	3284	79.96	355	933	233	328	512	975	15549	7.53
Score19	3284	79.63	341	770	278	357	502	829	12786	4.81
Score20	3284	78.96	362	2648	872	1160	1646	2860	47016	5.52
Score21	3284	76.43	382	347	106	145	214	367	5429	6.19
Score22	3284	82.16	346	376	127	163	229	395	5332	5.19
Score23	3284	81.64	357	1279	393	522	762	1355	18830	5.91
Score24	3284	78.01	381	168	48	67	98	175	2584	6.55
Score25	3701	83.47	372	24	16	18	21	27	101	2.19
Score26	3290	82.64	355	1673	694	878	1207	1864	13763	4.13
Score27	3284	82.73	354	1285	536	681	927	1453	10036	4.11
Score28	3284	73.08	343	996	362	458	626	1046	13719	4.84
Score29	3285	64.89	349	2066	929	1128	1486	2231	46757	3.58
Score30	3285	61.57	370	526	239	291	380	569	9383	3.63
Score31	3284	64.22	317	1006	416	508	663	1035	31130	3.88
Score32	3285	62.97	337	244	103	127	165	258	5356	3.86
Score33	3284	47.26	308	1723	4	874	1730	2577	3420	8.32
Score34	3284	49.12	424	5	4	4	4	5	5	1.08
Score35	3284	47.47	330	10	4	5	7	10	192	4.29
Score36	3289	77.5	355	87	78	82	86	91	95	1.18

Table 21: States with more than 25 listed authors, average rank

	State	Nb5	State	Average Rank	State	Nb5/Nb	Nb	State	Nb5/Pop	Pop.
1	California	291	New Jersey	1185.61	New Hampshire	40.98	61	D. of Columbia	229.17	0.67
2	UK	275	Massachusetts	1227.26	Illinois	23.40	594	Massachusetts	31.37	6.98
3	Massachusetts	219	Connecticut	1228.77	California	22.91	1270	New Hampshire	17.92	1.39
4	New York	182	Illinois	1259.61	New Jersey	19.52	210	Connecticut	12.13	3.63
5	Germany	159	California	1364.03	Connecticut	17.67	249	Illinois	11.05	12.58
6	D. of Columbia	154	New York	1379.99	Massachusetts	16.74	1308	New York	9.25	19.68
7	Illinois	139	New Hampshire	1415.56	New York	16.41	1109	Switzerland	7.59	8.70
8	France	114	Pennsylvania	1501.21	Minnesota	14.13	184	California	7.46	39.03
9	Canada	92	Maryland	1592.94	Michigan	13.31	323	Pennsylvania	5.63	12.97
10	Italy	81	Minnesota	1611.31	Missouri	13.11	244	Maryland	5.52	6.16
11	Netherlands	80	Michigan	1642.09	Maryland	13.08	260	Missouri	5.18	6.18
12	Pennsylvania	73	Canada	1696.59	Pennsylvania	12.61	579	Netherlands	4.56	17.53
13	Switzerland	66	Switzerland	1698.56	North Carolina	10.42	336	Minnesota	4.55	5.72
14	Spain	63	UK	1702.50	Israel	9.80	255	New Jersey	4.43	9.26
15	Australia	58	Missouri	1717.13	Indiana	9.39	277	Michigan	4.29	10.03
16	Connecticut	44	Indiana	1721.85	Virginia	8.38	358	UK	4.08	67.33
17	Michigan	43	D. of Columbia	1724.21	Texas	8.16	515	Sweden	3.94	10.41
18	Belgium	42	Belgium	1732.17	D. of Columbia	6.09	2528	Indiana	3.81	6.83
19	Texas	42	France	1763.79	UK	6.08	4526	Belgium	3.62	11.59
20	Sweden	41	North Carolina	1801.86	Netherlands	6.07	1319	Virginia	3.45	8.68
21	New Jersey	41	Israel	1804.00	Switzerland	5.78	1142	North Carolina	3.27	10.70
22	North Carolina	35	Italy	1865.99	Sweden	5.11	802	Austria	2.79	8.96
23	Maryland	34	Australia	1872.03	Canada	5.09	1808	Israel	2.67	9.36
24	Missouri	32	China	1907.03	Austria	4.50	556	Canada	2.41	38.25
25	China	30	Spain	1910.52	Belgium	4.16	1009	Australia	2.25	25.74
26	Virginia	30	Germany	1935.49	Australia	3.46	1674	Germany	1.91	83.13
27	Minnesota	26	Netherlands	1948.79	Germany	3.44	4623	France	1.69	67.50
28	Indiana	26	Texas	1953.52	France	2.87	3966	Texas	1.40	30.03
29	Japan	25	Virginia	2003.43	Spain	2.45	2567	Italy	1.37	59.07
30	Israel	25	Sweden	2016.00	Italy	2.26	3592	Spain	1.33	47.33
31	Austria	25	Japan	2062.24	China	2.09	1436	Japan	0.20	125.68
32	New Hampshire	25	Austria	2152.72	Japan	2.03	1232	China	0.02	1412.36
	Other USA	197	Other USA	1768.20	Other USA	9.05	2177	Other USA	1.39	141.36
	Others	192	Others	1856.01	Others	0.85	22585	Others	0.03	5563.59
	Total	3,001	Total	1647.60	Total	.38	7888.41	Total	.38	7888.41

Nb5: number of authors in the top 5%
Nb: number of authors in RePEc
Pop: population of the country in millions (World Bank data)
Nb/Pop: number of authors in the top 5% per country inhabitant (1 per million)

Table 22: Cities with more than 25 listed authors

	City	Nb	Average Rank	City	Average Rank	Nb
1	Cambridge (USA)	154	1000.62	Princeton	768.31	29
2	Washington	154	1724.21	Stanford	986.46	59
3	London	128	1561.67	Cambridge (USA)	1000.62	154
4	New York City	127	1272.79	Berkeley	1106.17	65
5	Chicago	88	1151.64	New Haven	1107.53	40
6	Berkeley	65	1106.17	Chicago	1151.64	88
7	Los Angeles	63	1484.11	New York City	1272.79	127
8	Stanford	59	986.46	Evanston	1285.30	37
9	Paris	53	1674.60	Hanover (USA)	1415.56	25
10	Philadelphia	48	1452.25	Oxford	1445.76	34
11	New Haven	40	1107.53	Ithaca	1450.67	33
12	Evanston	37	1285.30	Philadelphia	1452.25	48
13	Oxford	34	1445.76	Los Angeles	1484.11	63
14	Ithaca	33	1450.67	La Jolla	1514.40	25
15	Boston	29	1805.21	London	1561.67	128
16	St. Louis	29	1701.48	Ann Arbor	1576.07	28
17	Princeton	29	768.31	Paris	1674.60	53
18	Barcelona	28	1809.46	St. Louis	1701.48	29
19	Ann Arbor	28	1576.07	Durham	1715.20	25
20	Amsterdam	28	1968.32	Washington	1724.21	154
21	Frankfurt am Main	26	2119.62	Milano	1778.56	25
22	Stockholm	26	1863.35	Boston	1805.21	29
23	Durham	25	1715.20	Barcelona	1809.46	28
24	Hanover (USA)	25	1415.56	Stockholm	1863.35	26
25	Milano	25	1778.56	Amsterdam	1968.32	28
26	La Jolla	25	1514.40	Frankfurt am Main	2119.62	26
	Other USA	574	1905.14	Other USA	1905.14	574
	Others	1021	1964.32	Others	1964.32	1021
	Total	3,001	1647.60	Total	1647.60	3,001

Table 23: Universities with more than 20 listed authors

	University	Nb	Average Rank	University	Average Rank	Nb
1	Harvard U.	75	1035.12	Princeton U.	768.31	29
2	U. of Chicago	72	1025.24	Massachusetts Institute of Technology	861.47	49
3	U. of California-Berkeley	65	1106.17	Stanford U.	986.46	59
4	Stanford U.	59	986.46	New York U.	1023.70	44
5	Columbia U.	52	1123.69	U. of Chicago	1025.24	72
6	London School of Economics	50	1433.90	Harvard U.	1035.12	75
7	Massachusetts Institute of Technology	49	861.47	U. of California-Berkeley	1106.17	65
8	New York U.	44	1023.70	Yale U.	1107.53	40
9	Yale U.	40	1107.53	Columbia U.	1123.69	52
10	U. of Pennsylvania	38	1309.45	National Bureau of Economic Research	1141.63	30
11	Northwestern U.	37	1285.30	Northwestern U.	1285.30	37
12	World Bank Group	37	1810.59	U. of Pennsylvania	1309.45	38
13	U. of California-Los Angeles	36	1328.64	U. of California-Los Angeles	1328.64	36
14	Oxford U.	34	1445.76	Brown U.	1381.71	21
15	Cornell U.	33	1450.67	Dartmouth College	1415.56	25
16	National Bureau of Economic Research	30	1141.63	London School of Economics	1433.90	50
17	Princeton U.	29	768.31	Oxford U.	1445.76	34
18	International Monetary Fund	28	1611.71	Cornell U.	1450.67	33
19	U. of Michigan	28	1576.07	U. of California-San Diego	1514.40	25
20	U. of Southern California	27	1691.41	Paris School of Economics	1571.43	23
21	Dartmouth College	25	1415.56	U. of Michigan	1576.07	28
22	U. of California-San Diego	25	1514.40	U. of Wisconsin-Madison	1578.40	20
23	Boston U.	25	1803.32	U. College London	1586.83	23
24	Duke U.	25	1715.20	U. of Maryland	1607.15	20
25	Barcelona School of Economics	24	1788.08	International Monetary Fund	1611.71	28
26	U. College London	23	1586.83	U. of British Columbia	1624.35	23
28	Paris School of Economics	23	1571.43	U. of Southern California	1691.41	27
29	U. of British Columbia	23	1624.35	Università Commerciale Luigi Bocconi	1706.14	21
30	U. of California-Davis	21	1967.00	Duke U.	1715.20	25
31	Federal Reserve Bank of New York	21	1771.76	U. of Toronto	1771.50	20
32	Brown U.	21	1381.71	Federal Reserve Bank of New York	1771.76	21
33	Università Commerciale Luigi Bocconi	21	1706.14	Barcelona School of Economics	1788.08	24
34	U. of Toronto	20	1771.50	Boston U.	1803.32	25
35	Georgetown U.	20	1825.25	World Bank Group	1810.59	37
36	U. of Maryland	20	1607.15	Georgetown U.	1825.25	20
37	U. of Wisconsin-Madison	20	1578.40	U. of California-Davis	1967.00	21
	Other USA	631	1910.80	Other USA	1910.80	631
	Others	1150	1951.87	Others	1951.87	1150
	Total	3,001	1647.60	Total	1647.60	3,001

Table 24: Nobel Laureates in Economics

Year	Laureates
1969	Ragnar Frisch (1895-1973) and Jan Tinbergen (1903-1994)
1970	Paul A. Samuelson (1915-2009) $r = 113$
1971	Simon Kuznets (1901-1985) $r = 1026$
1972	John R. Hicks (1904-1989) $r = 2466$ and Kenneth J. Arrow (1921-2017) $r = 179$
1973	Wassily Leontief (1906-1999)
1974	Gunnar Myrdal (1898-1987) and Friedrich August von Hayek (1899-1992)
1975	Leonid Vitaliyevich Kantorovich (1912-1986) and Tjalling C. Koopmans (1910-1985)
1976	Milton Friedman (1912-2006) $r = 237$
1977	Bertil Ohlin (1899-1979) and James E. Meade (1907-1995)
1978	Herbert A. Simon (1916-2001) $r = 906$
1979	Theodore W. Schultz (1902-1998) $r = 1988$ and Sir Arthur Lewis (1915-1991)
1980	Lawrence R. Klein (1920-2013) $r = 1748$
1981	James Tobin (1918-2002) $r = 296$
1982	George J. Stigler (1911-1991) $r = 342$
1983	Gerard Debreu (1921-2004)
1984	Richard Stone (1913-1991)
1985	Franco Modigliani (1918-2003) $r = 690$
1986	James M. Buchanan Jr. (1919-2013) $r = 792$
1987	Robert M. Solow (1924-) $r = 211$
1988	Maurice Allais (1911-2010)
1989	Trygve Haavelmo (1911-1999)
1990	Harry M. Markowitz (1927-) $r = 1278$, Merton H. Miller (1923-2000) $r = 750$, and William F. Sharpe (1934-) $r = 905$
1991	Ronald H. Coase (1910-2013) $r = 916$
1992	Gary S. Becker (1930-2014) $r = 12$
1993	Robert W. Fogel (1926-2013) and Douglass C. North (1920-2015) $r = 581$
1994	John C. Harsanyi (1920-2000) $r = 1508$, John F. Nash Jr. (1928-2015) $r = 2424$, and Reinhard Selten (1930-2016) $r = 1265$
1995	Robert E. Lucas Jr. (1937-) $r = 15$
1996	James A. Mirrlees (1936-2018) $r = 770$ and William Vickrey (1914-1996) $r = 1883$
1997	Robert C. Merton (1944-) $r = 93$ and Myron S. Scholes (1941-) $r = 820$
1998	Amartya Sen (1933-) $r = 520$
1999	Robert A. Mundell (1932-2021)
2000	James J. Heckman (1944-) $r = 2$ and Daniel L. McFadden (1937-) $r = 254$
2001	George A. Akerlof (1940-) $r = 81$, A. Michael Spence (1943-) $r = 393$, and Joseph E. Stiglitz (1943-) $r = 4$
2002	Daniel Kahneman (1934-) $r = 150$ and Vernon L. Smith (1927-) $r = 264$
2003	Robert F. Engle III (1942-) $r = 23$ and Clive W.J. Granger (1934-2009) $r = 56$
2004	Finn E. Kydland (1943-) $r = 350$ and Edward C. Prescott (1940-2022) $r = 54$
2005	Robert J. Aumann (1930-) $r = 911$ and Thomas C. Schelling (1921-2016)
2006	Edmund S. Phelps (1933-) $r = 557$
2007	Leonid Hurwicz (1917-2008), Eric S. Maskin (1950-) $r = 186$, and Roger B. Myerson (1951-) $r = 299$
2008	Paul Krugman (1953-) $r = 36$
2009	Elinor Ostrom (1933-2012) $r = 882$ Oliver E. Williamson (1932-2020) $r = 398$
2010	Peter A. Diamond (1940-) $r = 99$, Dale T. Mortensen (1939-2014) $r = 361$, and Christopher A. Pissarides (1948-) $r = 171$
2011	Thomas J. Sargent (1943-) $r = 35$ and Christopher A. Sims (1942-) $r = 66$
2012	Alvin E. Roth (1951-) $r = 147$ and Lloyd S. Shapley (1923-2016) $r = 2309$
2013	Eugene F. Fama (1939-) $r = 10$, Lars Peter Hansen (1952-) $r = 67$ and Robert J. Shiller (1946-) $r = 76$
2014	Jean Tirole (1953-) $r = 7$
2015	Angus Deaton (1945-) $r = 53$
2016	Oliver Hart (1948-) $r = 161$ and Bengt Holmström (1949-) $r = 234$
2017	Richard H. Thaler (1945-) $r = 95$
2018	William D. Nordhaus (1941-) $r = 116$ and Paul M. Romer (1955-) $r = 146$
2019	Abhijit Banerjee (1961-) $r = 74$, Esther Duflo (1972-) $r = 79$, and Michael Kremer (1964-) $r = 140$
2020	Paul R. Milgrom (1948-) $r = 85$ and Robert B. Wilson (1937-) $r = 474$
2021	David Card (1946-) $r = 9$, Joshua D. Angrist (1960-) $r = 41$, and Guido W. Imbens (1963-) $r = 46$
2022	Ben S. Bernanke (1953-) $r = 31$, Douglas W. Diamond (1953-) $r = 286$, and Philip H. Dybvig (1955-) $r = 808$

Table 25: Correlations between various aggregation methods, Spearman

	Harmonic	Arithmetic	Geometric	Lexicographic	Graphicolexic	Percent
Harmonic	1					
Arithmetic	0.9143 obs=2,971	1				
Geometric	0.9673 obs=3,110	0.9726 obs=3,135	1			
Lexicographic	0.6573 obs=2,403	0.5938 obs=2,211	0.6246 obs=2,276	1		
Graphicolexic	0.6879 obs=2,537	0.8105 obs=2,773	0.7399 obs=2,654	0.5269 obs=2,036	1	
Percent	0.9807 obs=3,158	0.9273 obs=2,995	0.9740 obs=3,107	0.6251 obs=2,390	0.6951 obs=2,574	1

The number of observations used corresponds to the number of authors in the intersection of the two top 5%. In any top 5% there are 3,284 authors. But, for example, only 2,971 authors (90% of 3,284) are both in the top 5% of the ranking based on the harmonic mean and in the one based on the arithmetic mean.

Table 26: Correlations between various aggregation methods, Kendall

|	Harmonic	Arithmetic	Geometric	Lexicographic	Graphicolexic	Percent
Harmonic	1					
Arithmetic	0.7641 obs=2,971	1				
Geometric	0.8696 obs=3,110	0.8695 obs=3,135	1			
Lexicographic	0.4852 obs=2,403	0.4286 obs=2,211	0.4563 obs=2,276	1		
Graphicolexic	0.5042 obs=2,537	0.6237 obs=2,773	0.5532 obs=2,654	0.3700 obs=2,036	1	
Percent	0.9006 obs=3,158	0.7795 obs=2,995	0.8757 obs=3,107	0.4572 obs=2,390	0.5109 obs=2,574	1
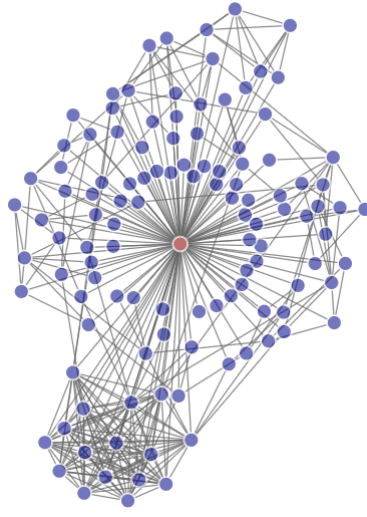
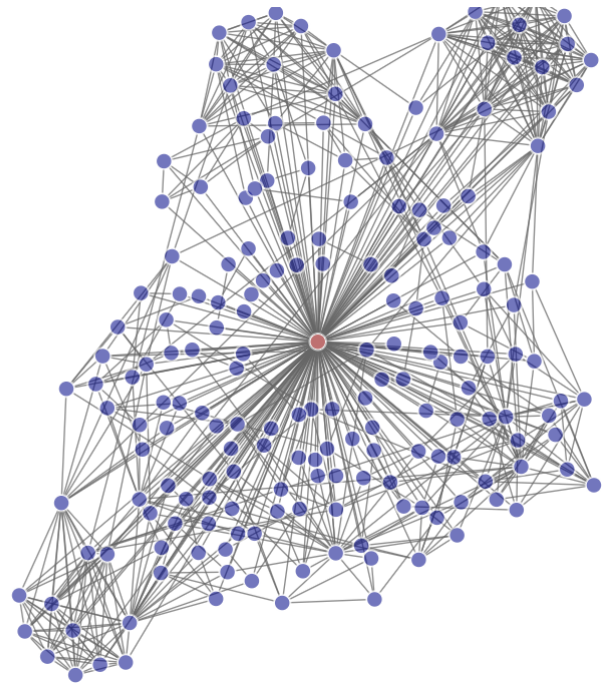(a) Andrei Shleifer   (b) James J. Heckman   (c) Daron Acemoglu
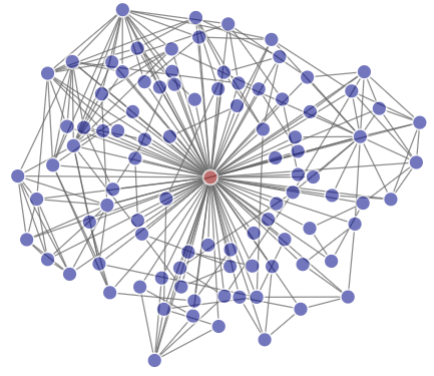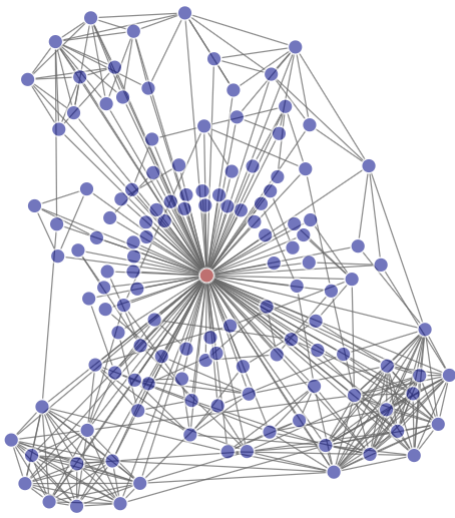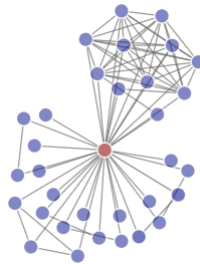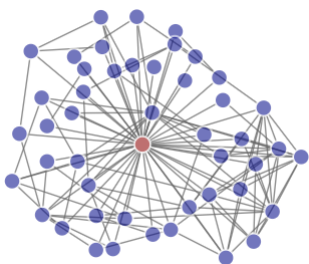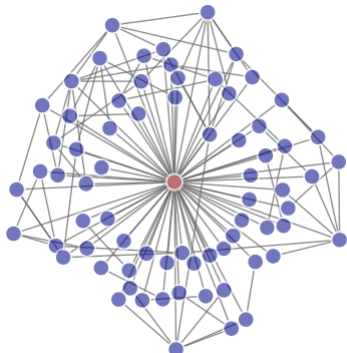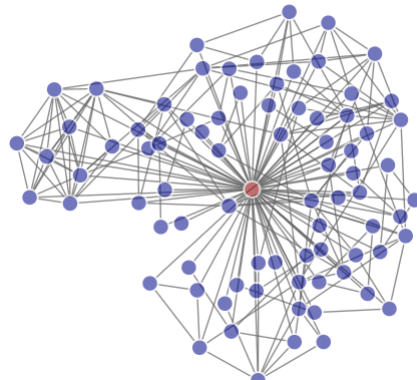
(d) Joseph E. Stiglitz   (e) Robert J. Barro   (f) john List

(g) Jean Tirole   (h) P.C.B. Phillips   (i) David E. Card

Figure 6: Coauthorship networks of authors ranked 1 to 9 in RePEc's main ranking

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