A Comparative Overview of Trends in Payment and Performance in Academic Careers / Professoriate

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1. Introduction

- Academic salaries across Europe and beyond
- Research productivity
- Productivity – salary links
- Skewed distribution of productivity
- Top perfomers vs. top earners (the 10/50 rule)
- Final words

2. Academic Salaries

- **In general, academic salaries across Western Europe are decent, compared with the class of "professionals".** They are on average lower than salaries of professionals in the private sector and higher than salaries in lower levels of education.
- **One issue is the comparison of salaries across the public sector and another issue is the comparison within the higher education**, or the so-called salary compression in HE (the difference between salaries for academics in different positions).
- **Generally, comparisons to the average salary in the industry are not made** and there seem to be no calculations guiding academic salary levels based on industrial averages.
- **Increases in salary levels in most countries**, except for the United Kingdom and Germany, are negotiated at the national level. In Germany, they are negotiated at the level of each Lander.

3. Academic Salaries

- **Salary levels in HE are strongly historically determined—for** instance, in some countries, like Switzerland and the Netherlands, they have always been higher than in other countries, like Belgium and Norway.
- **Apart from comparing salaries it is important to remember about different levels of taxes, and complicated systems of taxes in the case of families** and families with children, and other associated social contributions.
- Therefore it is very **difficult to compare net salaries as received by academics** in their pockets, after taxation and social contributions.

4. Academic Salaries

- **No matter how compressed salaries within universities are, two levels are especially important: these are entry-level salaries**, or salaries for young entrants to the university sector, **and salaries for full professors**, or salaries that academics receive after 20 years of service or so. The entry-level salary is of critical importance to attract talents to the university, and full professor salaries are important to keep scientists in the university and to avoid attrition and brain drain. Both are extremely important, for different reasons.
- **Across Europe, there are some variations between salaries received by field and by institution within the country**— but they are not as large as in the United States.

5. Academic Salaries

- **Generally, it has to be assumed that salaries in schools of management, business schools, schools of medicine, and law schools are slightly higher** than in other parts of the university (probably no more than 10-20% higher). A large-scale survey data on academic salaries are provided below but I am not quite sure it is helpful, even though taxes are also given.
- It has to be assumed that **salaries for the full professors across Europe suffice to have a middle-class lifestyle** while salaries for assistant professors are lower and generally regarded as too small.

6. Academic Salaries

- Overall, across Europe, as previous surveys show, **salaries increase with academic ranks by the factor of 1.8- 2.0 or so**. You can see it from the data on the United Kingdom, Germany, Sweden, and the Netherlands.
- **If the compression is high, then salaries have to be higher**; but if the compression is low, that is, if the difference between entry-level salary and full professor salary is high, then salaries might be lower in the beginning.
- **Full professor salary is what is generally compared across countries**— allowing to compare **the attractiveness of the academic profession** between European systems.

7. Academic Salaries

- **If there is an opportunity to increase academic salaries now, it is good to do it using this very rare window of opportunity**.
- There are many arguments to have higher rather than lower salaries in HE and certainly **bringing new talented young people to the profession** is one of them.
- Also **research productivity of academics** cannot be maintained without **satisfying salaries**.

8. Academic Salaries

- Across Europe more often **factors by which salaries of assistant professors are multiplied to have salaries of full professors are discussed**— than factors by which academic salaries are compared with salaries in the industry or in other sectors of employment.
- If there are going to be four stages in academic careers, there needs to be an idea:
  - how salaries across the stages compare with one another;
  - should there be any differentiation by field;
  - and what is the role of seniority or years passed in academic employment in setting salary levels.
- **In many countries, 1% increase per year is provided based on seniority, or just years passed in the sector, up to the total increase of 20%** after 20 years of service. There are no increases based on seniority after 20 years.

9. Academic Salaries

- **So in general, every country needs to judge what is the full professor salary that it can afford and regarded as fair first**; if you **divided it by half**, more or less, you can set the entry-level salary.
- And between the two, there will be variations for the other two stages of academic development.
- This is more or less how it works **across Western Europe— salaries in the United States are much more individualized**, the issue of seniority does not generally emerge.
- In the US it may happen that **newcomers have comparable or even higher salaries than those already working**, especially if they are research stars bringing in research funding, prestige or academic reputation to the institution.

10. Academic Salaries

- The natural suggestion is that **the median full professor salary is at least 1.5-1.8 of the median salary in the industry** and that it is certainly higher than salary in other education sectors.
- Certainly, **salaries of top professionals in the private sector, including lawyers, legal and management consultants, are beyond the reach for full professors** and no comparisons should be made generally with professionals in the private sector.
- Any reforms should in principle involve some **incentives for academics, including incentives in the form of (some) salary increases**, as they increase the tolerance for other aspects of reforms which may be harsh.

11. Built-in Inequality in Science

- **The world of science utterly unequal** (Ruiz-Castillo and Costas 2014; Stephan 2012): the intrinsic property of science is what Derek J. de Solla Price (1963) termed "**essential, built-in undemocracy**" (59).
- Individual performance in science tends **not to follow a Gaussian (normal) distribution**. Instead, it follows **a Paretian (power law) distribution**.
- Distributions of different social phenomena—such as income, wealth, and prices—show "**strong skewness with long tail on the right, implying inequality**" (Abramo et al. 2017a: 324).
- Academic knowledge production is **not an exception** because **unproductive** scientists work alongside '**top researchers**' in academic units, universities, and national systems (Piro et al. 2016).
- The growing scholarly interest in **research top performers** comes from the growing **policy interest in research top performance** itself—and the increasing emphasis on the role of universities in global competition.
- Academics are at **the center** of the global knowledge production and global academic enterprise. No outsourcing possible (today).

12. The Skewness of Science

- **Scientific productivity is highly skewed.** Its skewness widely studied in terms of two standard measures of individual performance: **publication numbers** and **citations** of publications.
- **Scholarly interest in the skewness of science and high individual research performance** growing exponentially in the last few years.
- Highly productive academics have been studied **mostly intra-nationally and in single fields of knowledge** (particularly in economics and psychology), sometimes also cross-nationally (Kwiek 2015).
- Recent studies on high research performers—based either on publication data or citation data—include research on:
  - star scientists (Abramo et al. 2009; Yair et al. 2017),
  - star performers (Aguinis and O'Boyle 2014),
  - the most productive scholars (including rising stars) (Copes et al. 2012),
  - the best versus the rest (O'Boyle and Aguinis 2012),
  - academic stars (Long et al. 2011),
  - productivity stars (Aguinis et al. 2014),
  - the most prolific female scholars (and female academic stars) (Weir and Orrick 2013),
  - high-performing researchers (White et al. 2012), and
  - superstars (Agrawal et al. 2017; Serenko et al. 2011).

13. Skewed Distribution of Research Output

- Three quotations from the last half century show roughly the same phenomenon:
  - "**the majority of scientific work is performed by a relatively small number of scientists**" (Crane 1965: 714),
  - "no matter how it is measured, there is **enormous inequality in scientists' research productivity**" (Allison 1980: 163); and most recently,
  - "**inequality** has been, and will always be, **an intrinsic feature of science**" (Xie 2014: 809).
- **The relative importance of scientists in the right tail of the output distribution** —increasingly termed *stars* recently—has endured over time (Agrawal et al. 2017: 1).
- **The Matthew effect** (Cole and Cole 1973; Merton 1968) refers to the **science system**:
  - a small number of scholars produce most of the works, attract huge numbers of citations, hold prestigious academic positions, and form the disciplines' identity (Cortés et al. 2016; Serenko et al. 2011).

Figure 1: The percentage of peer-reviewed journal articles (and book chapters) produced in the three-year reference period by research top performers in the total national knowledge production, by country.

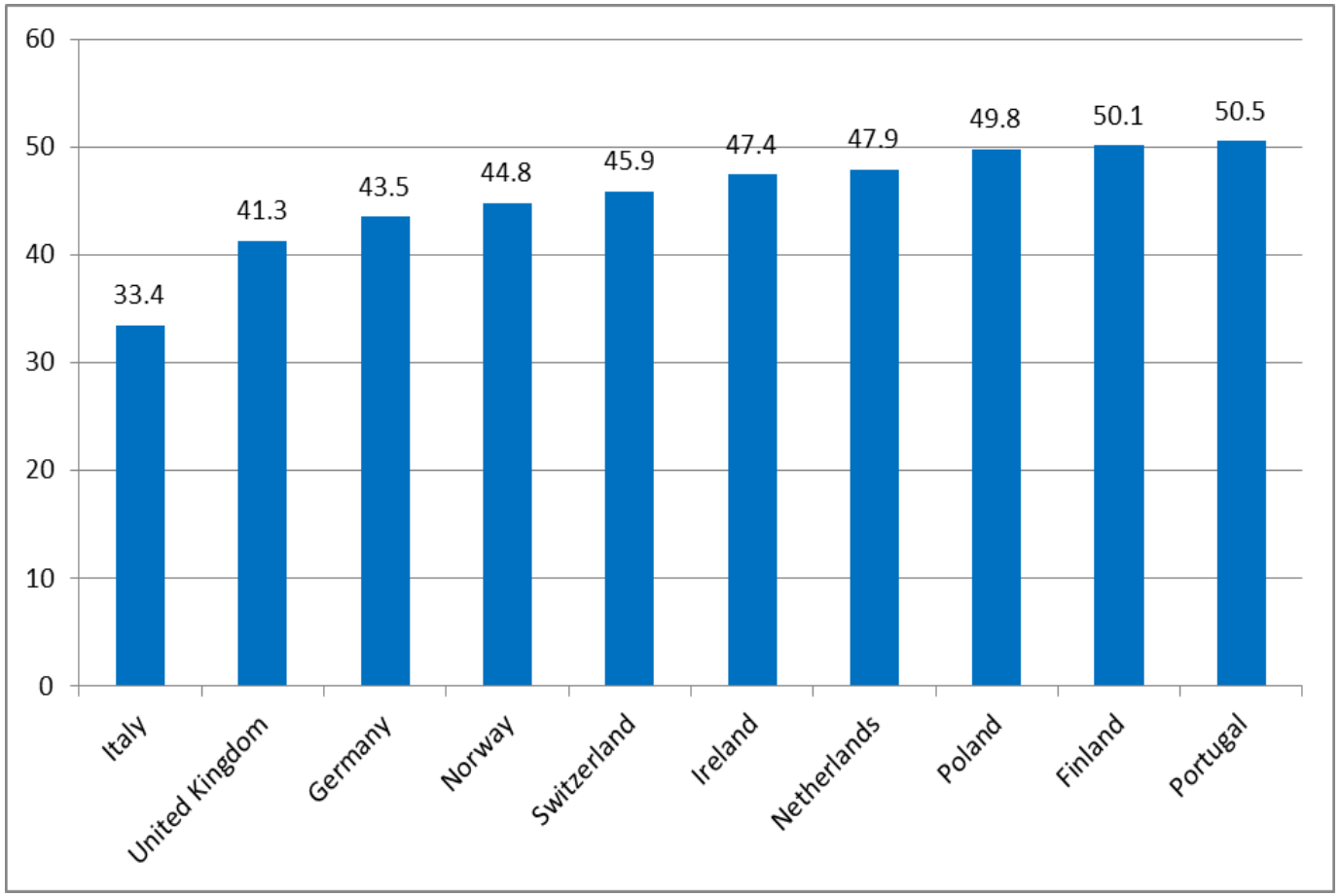
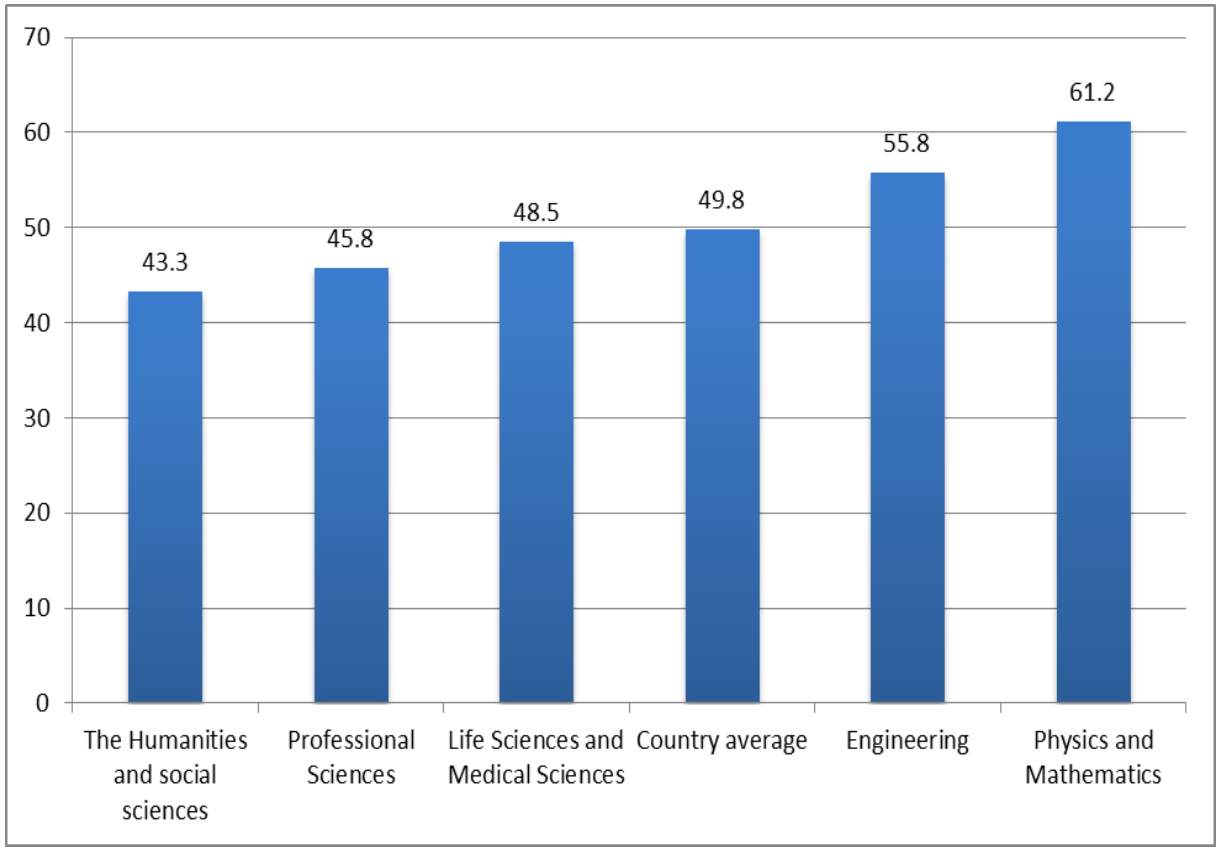


Figure 2. Example, Poland: the percentage of the peer-reviewed journal articles (and book chapters) produced in the three-year reference period by Polish research top performers in the total Polish knowledge production in the sample, by cluster of academic discipline.



- As in other countries, Polish top perfomers (10%) produce on average **up to 60% of peer-reviewed papers** (in physics and mathematics).
- Similar **cross-disciplinary patterns** in different European countries.

16. The 10/50 rule

- What we may term **the "10/50 rule of academic knowledge production"** holds strongly across Europe >>> 10% of academics carry the burden of producing on average 50% of all publications >>.

- Highly productive academics constitute:
  - a **highly homogeneous group**. Their high research performance is driven by **structurally similar factors –** which cannot be easily **replicated:** factors are mostly **individual-level** („sacred-spark theory" works well)
  - From **whichever** (country, institution) **context** they come, they work
    - according to **similar working patterns,** and
    - share similar **academic attitudes (strong preference for research over teaching)**. No exceptions, hard rules! Good advice to newcomers!
  - They are:
    - **similar** (from a European cross-national perspective),
    - and they **substantially differ intra-nationally** from their **lower-performing** colleagues.
  - Therefore they may be thought of as **a universal academic species**!

17. Top Performers and Top Earners Across Europe

- Two strongly **interrelated** themes:
  - research **productivity** and
  - academic **incomes**.
- The characteristics of the two classes of academics:
  - **highly productive academics** (or “top performers”) and
  - **highly paid academics** (or “top earners”), across countries, academic ranks, and age cohorts.

18. General Context: The *Mass* Academic Profession…

- **The massification of the academic profession >>>>** dramatic consequences in terms of **its social and financial standing** (growing interest: research and policy).
- Academic salaries **under-valued as a research topic**.
- Recent research on salaries driven by**: the financial instability of the academic profession**.
- **Larger picture: the number of highly paid positions in HE is limited,** despite expansion of HE (towards Marginson's HPS!).
- Academic salaries are **context-sensitive.**
- **The context, the frame of reference –** our colleagues **professionals**… (traditionally: upper middle classes)
- Our (academics') **dissatisfaction** and **disappointment:** the changing **attractiveness** of the academic profession…

19. Data (CAP & EUROAC)

- **11 European countries studied**:
  - Austria, Finland, Germany, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Switzerland, and the UK (England).
  - For Ireland, no incone data.
- **Cleaned, weighted and integrated** into **a single European data set** by the University of Kassel team (Ulrich Teichler)
- The total number of **returned surveys: 17,211** (**400 variables**)
  - included 1,000 and 1,700 returned surveys in all European countries studied, except for Poland where it was higher.

20. Methods

- **The subsample of all academics who reported their incomes** in the 10 countries **divided** into '**top earners**' and '**the rest**'.
- **Top earners** defined as **those in the 80th percentile of gross academic income – or the upper 20%** of academics
  - in each of the five major **clusters** of academic fields (separately),
  - in each **country** (separately), cut-off points permitting.
- Analysis of **all the systems** and examination of **national top earners cross-nationally (not: only Swiss academic lawyers…).**
- **Highly paid academics** (N=649) contrasted with **the remaining 80 percent of academics** (N=2,937).
- The subsample further **restricted**: **at least 40 years old** and **10 years of academic experience**.
- To avoid comparing academics **across radically different age cohorts with different job characteristics (a relatively homogenous cohort).**
- **"The rest"** defined as **the remaining 80% of academics at least 40 years old and 10 years of academic experience.**

Figure 1: Academic productivity and high academic income: top earners vs. the rest of academics.
The average number of 'peer-reviewed article equivalents' published in a three-year reference period (top earners in blue, the rest of academics in red).
Only countries with statistically significant results are included (averages from clusters of academic disciplines)

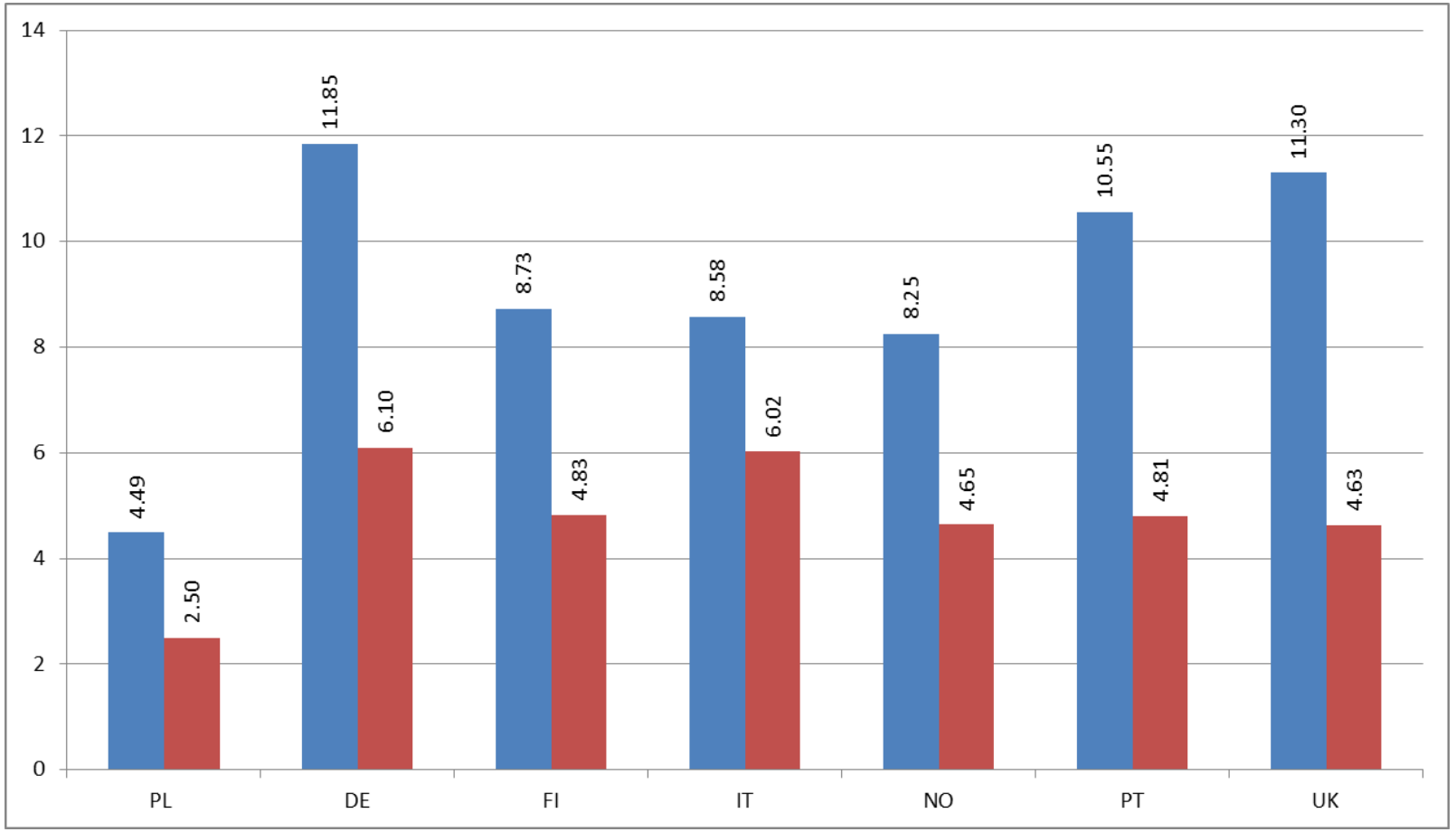
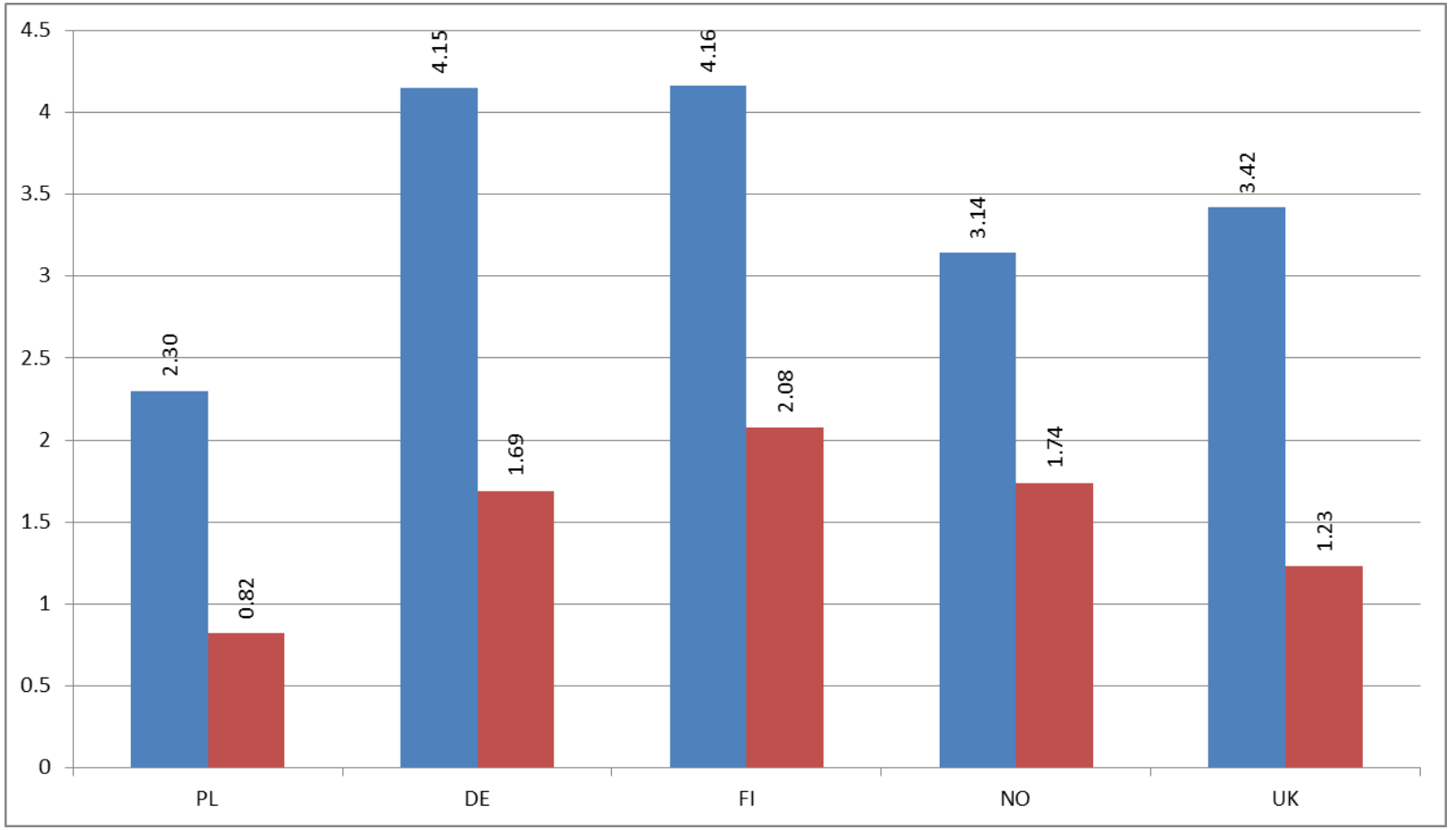


Figure 2: Academic productivity and high academic income: top earners vs. the rest of academics. The average number of 'internationally co-authored article equivalents' published in a three-year reference period (top earners in blue, the rest of academics in red).
Only countries with statistically significant results are included. (averages from clusters of academic disciplines)



23. Final Words

- **Salaries and productivity powerfully linked.**
- **Both time** and **money** made available **matter ever more** for top academic minds, globally and across Europe!
- **Attractiveness of the academic profession** includes salaries.
- Any **reforms need to keep it in mind** all the time.
- Most productive scientists (10%) produce 50% of publications: **the 10/50 rule.**
- **Overlap of high productivity and high income: top earners overlap with top perfomers.**
- **Critically important: full porfessors' salaries.**
- Most productive scientists will always seek **top conditions for their research**, including a **mixture** of:
  - high academic **earnings**,
  - preferred working **time distribution (good mix: research/non-research)**,
  - high **individual autonomy** in research.