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# Why Top Experts Are Paid So Much: Economics-Based Explanation

Julio C. Urenda
*The University of Texas at El Paso*, jcurenda@utep.edu

Vladik Kreinovich
*The University of Texas at El Paso*, vladik@utep.edu



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# Why Top Experts Are Paid So Much: Economics-Based Explanation

Julio C. Urenda[1,2] and Vladik Kreinovich[2]
[1]Department of Mathematical Sciences
[2]Department of Computer Science
University of Texas at El Paso
500 W. University
El Paso, TX 79968, USA
jcurenda@utep.edu, vladik@utep.edu

**Abstract**

At first glance, it seems that people should be paid in proportion to their contribution, so if one person produces a little more than the other one, he/she should be paid a little more. In reality, however, top performers are paid dis-proportionally more than those whose performance is slightly worse. How can we explain this from an economic viewpoint? We show that actually there is no paradox here: a simple economic analysis shows that in many area, it makes perfect economic sense to pay much more to top performers.

## 1 Formulation of the Problem

**Top experts are well paid.** Whatever area we take, top experts are paid much much more than those who are almost on the same level:

- top athletes get multi-million dollar contracts while those who can run, swim, etc., only slightly worse, get paid (if at all) several orders of magnitude less;
- top managers get millions of dollars, while managers who seem to have almost similar skills – but somewhat worse success rate – get paid much less: the difference between the salaries of the highest paid manager and the next highest is usually huge.

The same phenomenon occurs in many areas of activity such as book publishing, movie making, etc.; see, e.g., [1, 2, 4] and references therein. Even university professors – although their salaries are much more equal – follow this trend: the salary of the highest-paid professor is more than an order of magnitude higher than the salary of the lowest-paid US professor.

**From the economic viewpoint, this seem to be paradoxical.** At first glance, from the economic viewpoint, this seems to be a paradox: in economics, everyone's pay should be proportional to this person's contributions, so why should a small different in performance lead to such a huge difference in salary?

If a company pays \$100K a year to a highly qualified worker, and then an even more qualified worked who is 10% better applies for the job, a reasonable ideas seems to pay this new person 10% more, i.e., \$110K per year – but not 10 times more. So why such a seeming overpayment of top professionals consistently happens in businesses where economy should be the main driving force? Even if we discard public universities which have other criteria of success, there are plenty of other examples where top professionals are seemingly overpaid. How can we explain this?

**What we do in this paper.** In this paper, we show that very high salaries of top experts actually make economic sense. Specifically, we provide a simplified model of this phenomenon – simplified enough so that it can be easily analytically studied – and we show that already in this simplified model, reasonable behavior leads to exactly the "overpayment" phenomenon – that top experts who are even slightly better get paid much more than their nearest competitors.

## 2 Our Explanation

**How this phenomenon can be explained in the idealized case.** As an example, let us consider investment fund managers. The quality of a money manager is determined by the return on investment that this person can achieve: better managers invest smarter and thus, provide a better return on investment, while not so good managers provide smaller return on investment.

In real life, returns on investment vary from one year to another. So, when we talk about quality of money managers, we need to take into account their average return on investment over a certain period of time.

The fund usually gets, every year, a certain percentage $p$ of the invested money. Let us consider an ideal situation, in which every potential investor known the average return on investment $r_i$ of each money manager $i$. Then, for each dollar invested with the $i$-th manager, the investor will get, on average, the additional amount $r_i - p$.

Each investor wants to maximize his/her amount of money. So, each investor will invest in a fund with the largest possible value of $r_i - p$. So, in this idealized situation, everyone will invest in the fund whose money manager is the superstar – i.e., the fund $i_0$ for which the value $r_i$ is the largest: $r_{i_0} = \max\limits_{i} r_i$. This fund will earn money from all these investments, while all other funds will have no money to manage at all and thus, will not survive. A money manager for which $r_i$ is almost the same as $r_{i_0}$ but slightly smaller will earn nothing, while the find that hires the superstar money manager will earn billions. Because of this difference, it pays to provide a huge salary to the superstar manager.

Similarly, a top engineer who come up with a slightly better and/or slightly cheaper design will help the company take over the whole market for the corresponding gadgets – while others, whose gadgets are slightly worse or slightly more expensive, will not survive.

**What happens in more realistic situations.** In reality, e.g., for money managers, their rates of return vary so much that it is difficult to accurately estimate the average rate of return. We can compute the arithmetic average of the past rates of return, but, as is well known, for small samples, the sample average is somewhat different from the expected value; see, e.g., [5]. In addition to arithmetic average, there are other possible statistics that estimate the expected value – e.g., for symmetric distributions, we can take the median, or we can take some robust method; see, e.g., [3].

In such case, all we can do is select a manager with the largest value of the estimated return. For a finite sample, for which the sample-based estimates differ from the actual expected value, based on different estimates, we may select different managers as the best. Thus, the managers who are slightly worse than the best one do have a chance to be selected – so the situation is not that catastrophic for them as in the idealized situation. However, the more accurate our estimates, the smaller the chance that they will be selected – and so, the smaller the average salary of such managers.

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