

'Hard' science provides no salary advantages compared to 'soft' science at any career stage

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HSE University economists question whether Russian STEM specialists are better paid than non-STEM specialists. They compare wages of professionals with STEM and no STEM majors, and those working in

STEM and no STEM jobs and explore how the gap evolves over the life cycle. They find that there is no advantage of STEM major and STEM job over their no STEM alternative. They present their findings in a paper published in the *Voprosy Ekonomiki* journal.

There is a consensual view that STEM (Science, Technology, Engineering and Math) related education and occupations play a key role for productivity growth and ultimately in providing the wealth of nations. Though all developed countries expand STEM education, they often keep complaining that these specialists are still in short supply. As a reflection of this situation, there is a loudly voiced criticism that the composition of university graduates does not fit the actual demand, and in suggestions to increase the number of students in STEM majors and decrease in social sciences and humanities. The perceived shortage should positively affect wages for STEM workers compared to specialists with the same level of education but alternative majors. This story is well known in many countries. Is Russia among them?

STEM education differs from that in humanities and social sciences, as it is usually more specialized and provides more practical skills than that in 'soft sciences'. On the one hand, this helps graduates to start working earlier, but on the other hand, their skills face much higher risk of becoming obsolete since the technological frontier is moving very fast. A recent study in the US has found that STEM professionals start their careers with higher wages but the difference evaporates as they get older. Professionals without STEM diplomas have lower wages in the beginning but they benefit from a longer period of wage growth as they are less affected by the technological race. In the end, STEM wage advantage appears to be questionable.

The scholars from HSE University explore the issue exploiting all available data sources. These are aggregate data from the official statistics, micro-data from a few large-scale Rosstat administered

household and enterprise surveys, and the HSE Russian Longitudinal Monitoring Survey. One of limitations of all these data sources is that they do not have information on data on individual abilities, and this does not allow to account for selection in STEM occupations.

On the supply side, they document very large annual outflow of graduates with STEM degrees from the educational system. Over the last two decades, on average about 300,000 people with STEM degrees, or between 28% and 40% of the total number of university graduates, annually enter the labor market.

On the demand side, the fraction of STEM professionals among all professionals remains at about one quarter. It decreases over age, making about 40% in 25-29 years old, about 30% among those of 40–44 and about 20% at the age of 60. Some professionals move to managerial positions, while others leave STEM for other fields. The study suggests that even after accounting for all explanations (such as the fact that not all graduates work in the field), STEM supply is likely to exceed STEM demand.

The authors in their analysis exploit different data sets and different econometric specifications for checking the robustness of the results. The main finding that a STEM degree and/or a STEM job do not offer any wage advantages compared to non-STEM options remains robust. Furthermore, as individuals get older, they are likely to earn even less than non-STEM majors, all other things being equal. Generally, in STEM jobs, newly acquired skills are valued higher than long time experience: skills get older and obsolete too fast. Those who are willing to stay in the profession for a long time have to retrain continuously and run faster than recent graduates.

The data suggest that tech and science jobs in Russia remain male-dominated: women make up only one fourth of those with a STEM

degree and in professional STEM jobs. Women in STEM earn also less than men—particularly at older ages—and their earnings decrease relatively faster. One of the tentative explanations can refer to the fact that public sector institutions are female dominated and pay more in line with experience. The study rejects the assumption that there is a shortage of STEM professionals and shows that appeals to increase the number of students in STEM fields do not get the empirical support.

If there is a shortage in the market, this is a shortage of STEM skills, not a shortage of STEM graduates.

More information: V. E. Gimpelson et al, "Physicists" and "lyricists": Whom the Russian labor market values higher?, *Voprosy Ekonomiki* (2021). [DOI: 10.32609/0042-8736-2021-8-5-36](https://doi.org/10.32609/0042-8736-2021-8-5-36)

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