Will the Best Leave? Salaries, Selection and International Location Choices of US-trained International STEM PhDs

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Extended Abstract

For decades, the US has been a prominent destination for international STEM PhD students, attracting top talent. The majority of these students choose to remain in the US after graduation, contributing to innovative sectors in both academia and industry. However, increasing research opportunities in home countries, restrictive US policies, and less stable US political conditions raise questions about where top international scientists will locate in the coming years. Prior research has shown that scientists prioritize the environment for research when making location choices[1], and there are signs that this is deteriorating in the US.

In addition to research environment, salary is also a critical factor in location choices for most people, particularly the choice to return home (Zeithammer and Kellogg 2013, Borjas 1987, Borjas and Bratsberg 1994) and anecdotal evidence suggests that the US pays high salaries to scientists compared to almost all other countries. Yet accurate estimates of the variation in the salaries of comparable scientists across countries is not well documented. Without a better understanding of how much income US-educated scientists can expect to forgo when choosing to locate outside of the US, and how income interacts with other factors shaping location decisions of scientists, it is difficult to predict whether the current moment is truly a "golden opportunity" for other countries to recruit top US-based scientists—or whether salary differentials might be too wide for them to compete effectively.[2]

In order to inform this question, in this project we analyze salary and location of 25,818 foreign-born US PhD graduates using the 2010–2023 NSF Survey of Doctoral Recipients (SDR) that tracks US-educated scientists post-PhD irrespective of location (with response rates averaging 95% for

[1]E.g. Franzoni et al. (2015); Azoulay et al. (2017)

[2]Although not specifically referring to scientists, European Central Bank president Francine Lagarde has argued that "Maybe it is also time to import a few of the talents that would be disenchanted, for one reason or the other, from another side of the sea." (Fleming 2025).

US residents and 75–85% overall.) We provide the first comprehensive information on what US-based scientists could expect to earn if they moved to another country. Although our estimates reflect the average salaries of movers compared to non-movers, rather than the causal effect of moving, we condition on key observable characteristics to provide information on average earnings of those who move after accounting for variation due to university program rank, research productivity and field.

The SDR tracks US PhD recipients longitudinally whether they remain in the US or move abroad. Unlike publication- or patent-based studies, the SDR dataset provides direct information on current salaries, location, employer type, PhD institution, demographics, job preferences for STEM PhDs people whether they publish/patent or not, and whether they have entered industry, government or academic jobs. We incorporate country-level measures of economic and political conditions (World Bank, Penn World Tables) and urban purchasing-power adjustments (from numbeo.com).

We find that median salaries of US-trained PhD scientists of foreign origin who remain in the US are 46.6% higher than salaries of those who move abroad, 40.6% higher adjusting for purchasing power. Of course, these average differences are likely to be confounded by many factors. To account for observable differences across people, we estimate logged salaries controlling for field, university rank publications, gender/family, work sector, and career age. These controls reduce the gap in unadjusted salaries between US-based scientists and those abroad to 41.7%, while the purchasing power-adjusted salary gap falls to 25.6%. The purchasing-power salary gap controlling for observables is starkest for those entering industry (29.0% and somewhat more muted in academia (22.7% adjusted).

Most (78%) of those who leave the US return to their home countries. Simple average salary differences relative to the US for those returning to low income countries are much larger than the median differences. For instance, controlling for observables, US-trained PhDs who relocate to China earn 52% less than otherwise similar scientists in the US and those in India earn 66% less than the US. For these countries, however, adjusting for purchasing power changes estimates substantially (reducing the salary gap to 20% for China and 3% for India.) For the two countries with the lowest unadjusted gaps – Canada (15%) and Australia (8%), purchasing-power adjustment actually makes gaps somewhat larger. The small salary differences between these higher income countries and the US suggest that these countries may indeed have a “golden opportunity” to

recruit US-trained internationally mobile PhDs if they can match the research environment and funding rates these individuals could obtain in the US.

In addition, in both academia and industry, we find that the US does *not* pay a larger salary premium to top talent, measured by PhD institution rank, than most other countries. In fact, we find that China pays statistically significantly more than the US for those from top universities and for those with more publications in industry in particular,but in academia as well. Several other countries/regions also have a higher quality premium than the US in industry, particularly Europe and Australia. Perhaps as a result, we find that foreign-origin US STEM PhDs who *leave* the US for these countries are disproportionately drawn from higher-ranking PhD institutions and have on average more publications.

We also investigate non-salary factors correlated with the decision to locate in the US, one's home country, or another high income third country (negligibly few locate in low income third countries.) Those graduating from more prestigious schools and employed in academia are more likely to be located in high income third countries than in the US *ceteris paribus*, while those with more publications at the time of PhD graduation are more likely to remain in the US if employed in academia. Preferences for characteristics of jobs mirror locational choices in many ways: for instance, those whose survey responses imply that they prioritize salary are more likely to remain in the US, those interested in independence are more likely to return home, and those who prioritize intellectual challenge are more likely to go to high income third countries. As the per capita GDP of home countries increases, scientists in our sample are more likely to return home. There is an additional interaction effect in which scientists from top-ranked institutions become significantly more likely to return home than those from lower-ranked institutions as political stability relative to the United States increases.

Our findings shed light on whether top foreign-born scientists educated in the US will choose to locate in the US, and what factors might influence them to leave. This research has broad implications for the future likelihood of retaining the most able new scientists, as changing immigration policies, scientific priorities, and political stability fluctuate. This in turn is likely to have long-term implications for the competitiveness of the US innovation ecosystem.

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