

Chapter 5 - Physicists in the Private Sector: Finance

Employers

This chapter is based on the responses from 46 mid-career physicists who reported that they worked in the world of finance at the time of the survey. A large number of these physicists worked for trading companies, investment groups and firms that managed investment funds. The second largest group of them worked for large national and international banks. Some physicists worked for companies that produced and sold financial information, business news, and investment advice. Some worked for companies that provided portfolio management analytics, that is, they provided quantitative tools, numerical models, and investment research. Finally, some mid-career physicists worked for companies that provided software designed to optimize financial decisions in real time.

Job titles

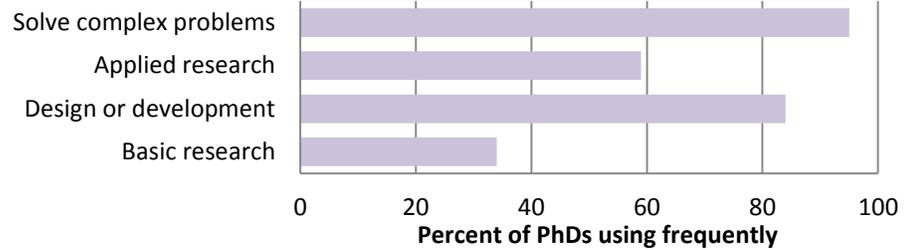
Table 5.1 lists common job titles of mid-career physicists who were working for financial institutions 10 to 15 years after earning their PhDs. Job titles were often preceded by words like “senior” to indicate levels of experience and responsibility.

Table 5.1: Common Job Titles of Physicists Working in the Private Sector in Finance, 2011
Portfolio Manager
Partner
Director of Research
Quantitative Analyst
Financial Analyst
Software Engineer
Financial Software Developer
Vice President
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Job duties

A small but notable number of physicists applied their knowledge of high-level mathematics, software, and modeling to the field of finance. Some physicists were employed as investment managers and market risk managers; some worked on teams or led teams that built financial risk models or developed financial modeling software. These models and algorithms are often used for the buying and selling of financial instruments and predicting movement in prices in a broad set of arenas including: futures and equity markets, bonds, currency markets, bank commodity trading, hedge fund strategies, and mortgage refinancing rates.

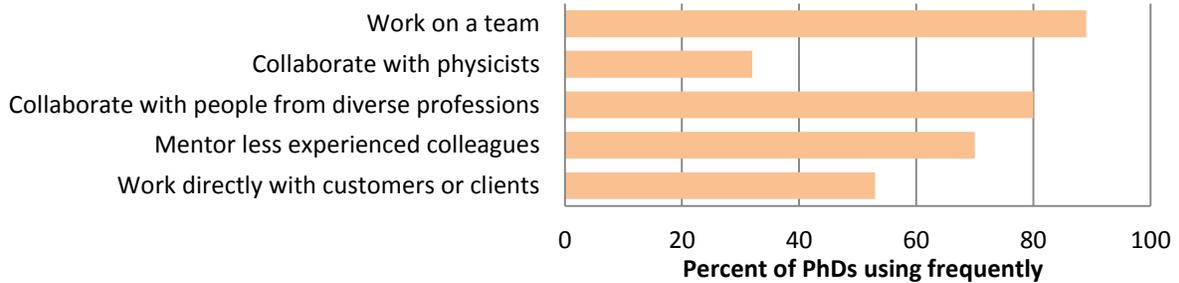
Figure 5.1: Cognitive Skills Used Frequently by Physicists Working in Finance



“Frequently” combines response of “daily”, “weekly”, and “monthly” from a 5-point scale to the question “How often do you use the following in your current job?” Data include US-educated physicists who earned their PhDs 10-15 years earlier, who were working in the US in 2011, and whose primary field of employment was finance.

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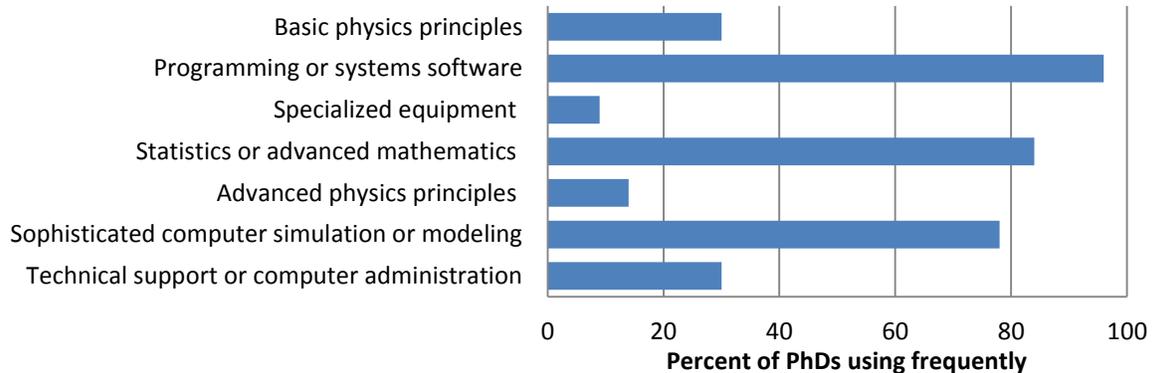
Figure 5.2: Interpersonal Skills Used Frequently by Physicists Working in Finance



“Frequently” combines response of “daily”, “weekly”, and “monthly” from a 5-point scale to the question “How often do you use the following in your current job?” Data include US-educated physicists who earned their PhDs 10-15 years earlier, who were working in the US in 2011, and whose primary field of employment was finance.

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Figure 5.3: Scientific and Technical Knowledge Used Frequently by Physicists Working in Finance



“Frequently” combines response of “daily”, “weekly”, and “monthly” from a 5-point scale to the question “How often do you use the following in your current job?” Data include US-educated physicists who earned their PhDs 10-15 years earlier, who were working in the US in 2011, and whose primary field of employment was finance.

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Knowledge and skills used on the job

Programming and software development was an integral part of the knowledge that virtually all of the physicists in finance used regularly (Figure 5.3). A significant percent of these mid-career physicists noted that they frequently used advanced mathematics and computer simulations and modeling. Despite the scientific and technical knowledge they used on the job, the vast majority categorized their work as not in STEM.

About 90% reported that they worked on a team and nearly as many worked with professionals from diverse backgrounds (Figure 5.2). A significant percent reported that they regularly mentored less experienced colleagues. Managing projects (Figure 5.4), design and development, and solving complex problems (Figure 5.1) were often cited as important aspects of this type of career.

Communication skills are important in the world of finance. The mid-career physicists in this study often had to write for technical as well as non-technical audiences (Figure 5.5).

Most rewarding aspects of their jobs

Mid-career physicists in finance were asked to describe the aspects of their work that were the most rewarding. The verbatim comments written by these physicists were consistent with the knowledge and skills data in Figures 5.1 through 5.5. The following were the most common stated themes:

- Solving complex problems was identified by most physicists in finance. They wrote phrases like “working at the cutting edge”, “intellectually stimulating projects”, and “interesting challenges.”
- Money and high remuneration were the next most commonly cited rewards of this work.
- Working with smart people was a very common theme. These physicists also wrote phrases like “working with great people”, “capable people”, and “researchers from different backgrounds.”
- The working environment was mentioned often with comments like a very flexible environment, freedom to innovate, and a great environment.

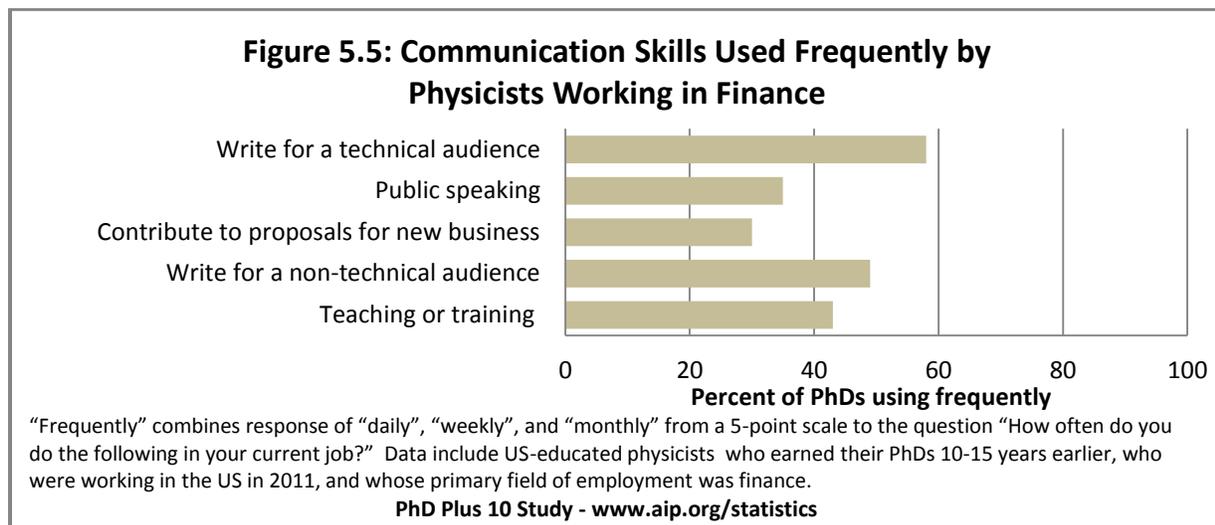
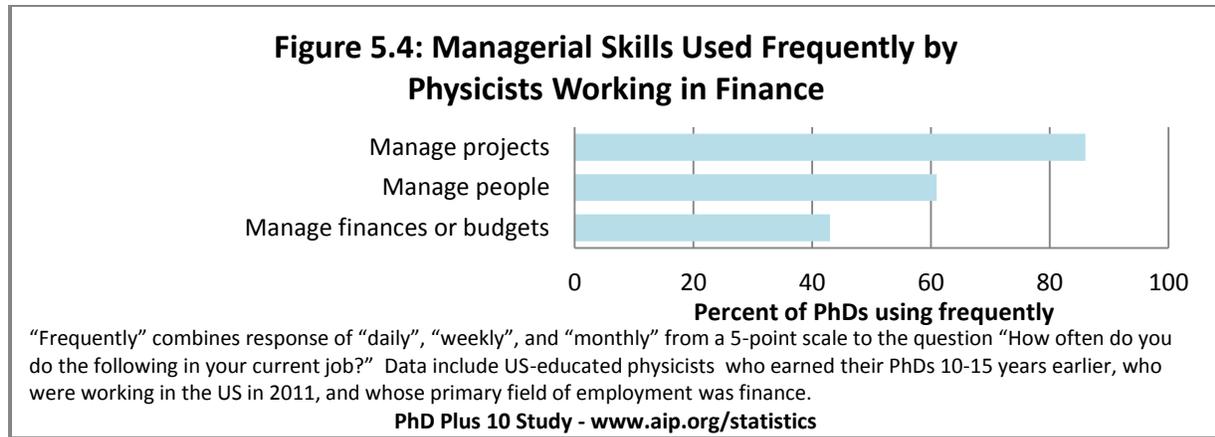


Table 5.2: What Are the Most Rewarding Aspects of Your Job?
Selected verbatim comments from PhD physicists working in finance, 2011
<i>Successful problem-solving against a backdrop of highly-variable conditions. Explaining complex goals and ideas in clear terms that can allow hundreds of people to collaborate effectively.</i>
<i>Since I work to support a global trading organization, the environment is very dynamic. The traders are always looking to trade new commodities / contracts that keep us quite challenged to make sure that those contracts are modeled properly in our systems.</i>
<i>Interesting and challenging work, good balance of math and computational work, exciting work environment, financially rewarding.</i>
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