



The Global Competition for Talent: Life Science and Biotech Careers,  
International Mobility, and Competitiveness

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## SUMMARY

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This study argues that skilled human mobility and specifically that for occupations linked to innovation, such as for science and technology, has undergone a rapid and continuing internationalization. This change has theoretical implications and requires a greater merging of theories in diverse disciplines. The main premise of the study is that the ‘global competition for talent’ has come into play in media, policy, and migration research, but more as a catchword rather than as an intricately defined concept or theory that pays attention to both the more ‘global’ changes as well as the particularities of career and country or regional contexts. This study’s aim is to begin closing this gap by discussing the theoretical frameworks and changes surrounding international skilled labor mobility, developing a more integrated framework for assessing the now only speculative global competition for talent, and looking at variations through a case study, focusing on life scientists.

**Part I examines skilled migration in global context more generally, answering the question, what structures the global competition for talent?** It is built primarily from desk research, including reviews of academic literature on skilled and student migration, statistical data on international mobility, and a review of policy documents, particularly those focused on comparing migration and mobility in Europe. The analysis addresses how concepts and data (policies, statistics detailing changes) related to both skilled migration and competitiveness be linked to better understand the development of the global competition for talent. The main argument is that implicit in the paradigm of a ‘global competition for talent’ are theoretical debates on the foundations for (national) economic competitiveness arising from processes of globalization, which need to be discussed in a more nuanced way in light of the relative positioning of states in terms of their economic structures, openness to labor migration in general as well as the characteristics of the national labor force, and while considering both global and local dynamics.

Chapter 1 focuses on the concept or theories of international competitiveness and particularly in light of changes related to the knowledge economy and how they relate to the workforce. It draws on three main concepts: Porter’s (1990; 1998; 2003) analysis of the importance of productivity for competitiveness, Drucker’s (1986; 1999) concept of the knowledge worker, and Florida’s (2002; 2005) 3T framework for economic development. In brief, Porter argues that competitiveness must be measured by productivity in order to be meaningful and is best assessed by looking at industries. Drucker found that individuals, who he called knowledge workers, are central to productivity in the knowledge economy and that organizations will need to be able to meet their needs in order to be competitive. Florida argues that technology, talent and tolerance (3Ts) are the core of modern economic development. Florida’s work also expanded recognition that immigration can be linked with the competitiveness of cities or regions, as diversity both fosters creativity and innovation and attracts more of these innovative individuals. Taken together, these theories also point to the reasons for the growing importance of the concept of talent for competitiveness, both in companies’ strategies, as reflected in the human resources literature, and also in immigration studies.

Chapter 2 discusses the concept of the “global competition for talent” linking it with the theoretical literature related to skilled migration. It showed that in the 2000s skilled migration policies were implemented in more countries, where they had not existed before, and new attention was also turned to student migration. It argues that this migration is coming from and going to a wider range of countries, including both developed and developing countries.

Chapter 3 provides an overview of the research questions and the research methodology adopted. It is then followed by an analytic 4P framework for assessing the global competition for talent, consisting of *productivity, people, place and policy*. The framework better combines theories on both immigration and competitiveness, to understand new dynamics. It is unique in that it is relevant for both developing and developed countries, whereas Florida’s 3T framework was mostly based on the urban, US context.

*Productivity* is the overarching support of the 4P framework and incorporates competitiveness. Following the research of Porter, productivity is best assessed on the level of industries or fields of employment. The aspect of *people* examines the workforce dimensions of competitiveness. On one hand, this involves understanding the human capital and demographic characteristics of the workforce, and particularly how these have changed in fields where workers are in high demand. On the other hand it involves the workforce’s motivations, as this is crucial to facilitating the productivity of the individual. Location choice for work is also influenced by individual preferences, and in the 4P framework, is included in the third aspect, *place*. Perceptions are central to understanding the role of place in the global competition for talent – the country and city image, expectations about the opportunity structure and professional opportunities, and the quality of life in a country or city. Finally, drawing from the work of Eggers and Hagel (2012), *policy* is relevant to the global competition for talent and includes that which influences competitiveness in international markets (including innovation and R&D policies, foreign direct investment, and intellectual property law) as well as those which foster development of the workforce (including both education and immigration policies). These policies can be implemented on any level, from the local to the supranational (see Reiner, 2010).

Chapter 4 examines skilled migration and mobility policies and patterns, focusing on Europe. This chapter argues that homogenizing EU-level policies have broadened student and scientific mobility, and many of these policies have often occurred outside the domain of ‘immigration’ policy. Although immigration still largely remains an issue considered to be central to national sovereignty, the EU is increasing its role in setting and harmonizing policies across its member states that relate to international mobility. Some important initiatives include the Bologna Process to harmonize degree recognition and internationalize European education, the Blue Card visa for skilled migration, and the start of the European Research Area. While the ‘competition for talent’ has gained some attention, national policy responses have been fragmented and at times resistant to implementing more migration programs or supporting labor mobility.

**Part II then analyzes: which patterns have influenced the development of the global competition for talent as observed in the life sciences/biotechnology in particular?** This analysis is constructed largely from the CiLS survey on skills and international scientific mobility, which I designed, working together with a team from the Young European Biotech Network (YEBN). YEBN is an umbrella organization, made up of various other organizations,

largely biotech student associations, in various countries in Europe. The survey was conducted online in late 2008-early 2009 and was completed by 594 individuals, including both students and those working in the life sciences or related fields. The responses came from 69 countries. The data is mostly analyzed either by for the total, or by citizens of countries, particularly for countries with highest number of respondents -- Germany, Italy, India, Spain, Switzerland, the EU-10 countries, and a grouping of other developing countries. Scientific mobility in this study is defined as individuals with a higher education in the life sciences who have moved internationally for stays of two months or longer, not including holidays/vacations.

Chapter 5 addresses the research question: what are the features of the labor market within which life scientists work? It shows that large-scale changes are occurring both in the career trajectories and demographic characteristics of life scientists. Life scientists and their education have traditionally been geared towards academia and publishing of results. One of the main findings is that the sample has the highest interest in pursuing careers in research, a career path which often requires high levels of education, but will consider a range of employers, including both academia and industry. Second, demographic characteristics of life scientists have changed. More than half of advanced life science students are female, in countries where data is available. There is also high interest in science careers among people from developing countries. In combination with the increasing global mobility, the internationalization of the sciences is increasing, as evident through looking at published journal articles. These partnerships further reflect international networks among institutions, networks that may lead to future exchange of students and faculty. Finally, postdoc positions have become a more common part of the career trajectory, but this is usually based on aims for academic tenure, and it is not clear whether having a postdoc is an advantage for working in industry. With so many changes, there are also multiple configurations for competitiveness, whether it is viewed in terms of personal career strategies or institutional structures.

Chapter 6 examines the question: how important/prominent is international mobility among life scientists? International mobility is indeed seen as part of the career path for the majority of life scientists answering the survey. It is reflected across a range of questions in the CiLS data, including past mobility (around 60% of respondents), interest in future international mobility (few individuals express low levels of interest to move abroad), and the rating of the importance of international mobility in life science careers (which varies by country). Respondents from most countries found international mobility to be more important to academic careers than other life science career types. Particularly in Europe, with the exception of the UK, international mobility is seen not just as a personal experience, but as a qualification that is helpful, or even essential, in the life science job market. Furthermore, with the high importance and high rates of international mobility, there are also changes in the family structure, with a sizeable number of international couples as well as dual science-career households. Other research has also shown that female scientists often delay having children (Dean & Fleckenstein, 2007, p. 33), and in the CiLS survey, the number of couples with children was low. Further research is needed on how high rates of mobility in the life sciences have impact on families.

Chapter 7 first analyzes: which factors are considered and influence life scientists' intentions to move or moves abroad? This chapter builds from a framework for assessing skilled migration

reasons for destination choice created by Papademetriou, Somerville, and Tanaka (2009, pp. 242-253), and then modifies it for life scientists in particular through the CiLS data, including rating scales and reasons for country choice as an open-ended question. It was found that career-based factors, including research excellence, opportunities, and presence of other talented scientists and good work culture, act in combination with quality of life and lifestyle factors for location choice. Scientists have also been found to generally be driven to move due to their desire to conduct high-quality research, rather than salary. Next, the question, which countries are attractive to life scientists and why, is addressed. For the survey respondents, the United States remains among the most popular destinations and can be seen as a 'magnet' country, attracting scientists based on its reputation for scientific research, but it has a very marginal lead and is mentioned as first choice by 18% of CiLS respondents. Additionally, the UK, Germany, and Switzerland are also seen as highly desirable locations, due to the size of the life science sector and quality of research and job opportunities there. It also is important to realize many life scientists would consider moving to any of a range of different countries where they believe they can have productive careers.

Chapter 8 addresses differences in competitiveness in various countries, and its impact on life scientists' mobility decisions. It shows international statistics that indicate the US is the global leader in biotechnology, but with many countries active in this field. It then presents CiLS data, whereby respondent were asked to name regions and countries that are competitive in the life sciences and biotechnology industry. The highest recognized regions by the CiLS sample were in the US (California and the area around Boston, Massachusetts), UK (London), Switzerland (Basel), and Germany (Munich) as the only regions named by at least 10% of respondents. Next, the chapter examines which duration of stay is most desired for moves for life science jobs in the US and in Europe? Most respondents expect international mobility to improve job opportunities in their home country, and this often applies to individuals from both developing and developed countries. What is also shown is that the intentions for moves often defy conceptions about migration. Permanent moves are typically not the most desirable, regardless of the country of origin. This is even in light of academic careers sometimes involving tenure, or permanent positions. Among citizens of European countries, there is higher interest in longer-term relocations for moves within Europe than to the US. Most individuals view international mobility as improving their job prospects in their home country or as leading to additional international moves. This chapter argues that the competitiveness of countries alone is not enough to understand the retention of life scientists, but that the opportunity structure, which is in part due to cultural norms and practices, including work culture, has a large influence. Generally the dynamics of scientific mobility within the global competition for talent are more complex than that which can be defined as a relative gain or loss the country being studied.

In conclusion, with both changing demands of the knowledge economy and from globalization processes, advancing understanding of the global competition for talent, the focus of this research, is essential. This shifting interest to immigration as global is new, as immigration studies to date have mostly taken the view of the nation-state as the main context and ties between two specific countries, rather than of dynamic globalized systems. Although the situations of nation-states will continue to frame much of the skilled migration discussion, there

will be a need to also compare the attractiveness across countries, which can also be viewed as competitiveness on an international scale, as well as to understand how and why new international skilled mobility patterns are appearing. It also involves understanding the local contexts which support or hinder their development, or variations in the broader opportunity structure, and includes shifts when policies change and organizations adapt. Although elements such as 'knowledge' and 'human capital' are seen to be crucial to modern-day competitiveness as well as to skilled migration, they are not easily measured in a way that keeps the human dimension alive, that is by including career aspirations and personal motivations.

Competitiveness and immigration, in terms of destination selection, are mutually reinforcing. In other words, economic competitiveness has some influence on the destination chosen, and attracting 'talent' through immigration can also boost the attractiveness of these destinations further. There are a range of other studies and findings that relate to this assumption – for instance, the idea of being able to build critical mass of professionals in core clusters and the ideas of Florida that diversity and tolerance increase the attractiveness of a location. The 4P framework of productivity, people, place and policy can reveal a wide range of information to better understanding the global competition for talent. This approach allows a better fit within the competitiveness perspective, including with a focus on specific industries, and, importantly, it frames this within changing global and local contexts.