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### The global competition for talent: Life science and biotech careers, international mobility, and competitiveness

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THE GLOBAL COMPETITION FOR TALENT: KEY CONCERNS

An article from the Migration Policy Institute (2008) summarized the top ten international immigration issues of that year, and a notable contradiction immediately appears. Number one on the list was the ‘buyer’s remorse,’ or the regrets of countries that have been open for labor migration, while number two on the list involved the ‘race for talent’ and ways to best attract skilled migrants. When talk of economic crisis circles the globe, it is easy to imagine a tendency for more closure of national labor markets, but likely increasing individual interest for seeking better opportunities than what is found locally. It is also plausible that the international demand in certain occupations, and particularly for those which are seen as to trigger innovation and hence job growth over the longer term, could in fact increase even more, despite the recession in other sectors, as governments name these as the engines for sustainable economic growth in the coming decades. These top two global issues and tensions for migration policy are also reflected in the current situation in Europe. On one hand, immigration is a contentious issue in many countries and is very highly politicized; on the other hand support for technological development and the knowledge economy is nearly universally accepted and hence ‘attracting talent’ is often viewed as essential.

Economic changes are often linked to globalization pressures, defined as increasing mobility of capital, goods, and labor. At times there is a need to ‘compete’ to attract and maintain these valuable resources. As traditional manufacturing jobs have largely been relocated from Western Europe or the US to countries with cheaper production costs, and as the destinations with ‘cheaper’ costs also push further outward as emerging economies develop, interest has been focused on how economies can maintain high employment and prevent economic stagnation. As a result, there is increasing interest on creating and targeting industries with the highest productivity gains and added value, and hence more focus on developing knowledge-based industries to thwart the risk of long-term economic decline. Employment patterns continue to change alongside internationalization of companies and the new global division of labor. The growth of the knowledge economy, as seen in industries such as IT, software, and skilled service jobs has offered new economic opportunities, particularly since the 1990s. Yet, global competition has also increasingly involved outsourcing to firms in countries with lower labor costs, including jobs associated with the knowledge-based economy, such as research and development (R&D). With these new pressures, governments have been concerned about ensuring future job growth and economic prosperity; or in other words, international competitiveness and the underlying factors that help a place to maintain its competitive edge.

Since the late 1990s, immigration, and particularly skilled migration, has also become more associated with the growth and development of the knowledge economy, to fill high-skilled labor shortages and as a way to generally gain the ‘best’ employees, largely drawing from analyses done on the IT sector in the US. ‘Skilled migration’ does not have a single definition, but rather is typically defined either by education levels, usually a Bachelor’s degree or higher, or by

occupations seen to contribute to the country or by skills that are in short supply within a national economy. Large amounts of interest have been generated by the particular example of the successful Silicon Valley, California's leading IT cluster, and its use of foreign skilled labor and entrepreneurs, particularly building on the research of Saxenian (2005; 2008). The increase in the US's visa quota allowed extremely high levels of immigrant involvement. For instance, in 1999, 32% of the science and engineering workforce (Saxenian, 1999, p. viii) and 25% of the entrepreneurs in the Silicon Valley were foreign-born (p. 20). The 1990s can therefore be seen as the beginning of an important change, even a paradigm shift, as skilled migration increasingly became associated with economic competitiveness and led to the emergence of subsequent discussions of a 'race' or 'global competition for talent' (for example Kuptsch & Pang, 2006; OECD, 2008; Shachar, 2006; Skeldon, 2009; Zalatel, 2006). However, such phrases seem to presume that skilled immigration has been accepted as necessary for competitiveness by national economies and that mobility of individuals proceeds unrestricted, driven by the personal motivation of highly skilled individuals who choose, on a global scale, where to relocate. While elements of this image are true, the mechanisms that limit and restrict possibilities for global migration are completely ignored. Globalization presents a dilemma for governments in how to best balance participation in international economic systems while protecting their national citizens' interests. These tensions between global economic processes and supporting the well-being of citizens also mean that there is a great room for variation in approaches adopted by governments to support their labor markets and citizens. This variation is illuminated in political-economic literature related the varieties of capitalism (see e.g. Esping-Andersen, 1990; Hall & Soskice, 2001; Schmidt, 2002), which partially discuss the existing models of welfare states and various models of welfare capitalism. This idea has also further led to discussions of how countries can be competitive despite high levels of regulation and costly systems of social protection. These tensions have also further been illuminated by debates surrounding how to deal with the current economic crisis of the early 2000s, with support for protectionist measures on the rise in many countries<sup>1</sup>. The importance of the question is further reflected the rising support for 'right-wing,' politics with anti-immigrant platforms as central to their campaigns, as has happened visibly in 2009 and 2010 in countries long applauded for their 'tolerance', such as the Netherlands and Sweden.

The global economic and financial crisis starting around 2008 further highlights the challenges of finding a balance between concerns about preserving jobs for nationals and concerns about being globally competitive, but perhaps not in the ways expected. Various research reports (see e.g. Cerna, 2010; Dobson, Latham, & Salt, 2009; Ghosh, 2011; International Organization for Migration, DG for Employment, & Social Affairs and Equal Opportunities of the European Commission, 2010; Koser, 2009; OECD, 2009a) have examined the effects of the economic crisis on international labor mobility. The general finding has been that skills shortages persist even during economic recession.

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<sup>1</sup> <http://news.bbc.co.uk/2/hi/business/7866930.stm>, Accessed 4 March 2015

Past theories as well as patterns, of globalization have focused primarily on the aspects of the increasing mobility of capital and goods, and the human mobility aspect has been seen as facing greater limitations in being truly globally mobile (Rodrik, 2001). This study will argue that skilled human mobility and specifically that for occupations linked to innovation, such as for science and technology, has also undergone a rapid and continuing internationalization. This change has theoretical implications and requires a greater merging of theories in diverse disciplines. First, skilled migration theory is too narrowly based on past patterns of labor mobility, and on assumptions of US dominance in attracting skilled migrants, with too few applications analyzing recent changes in skilled mobility in diverse contexts. Second, the change is substantial enough to question the adequacy of skilled migration theory in explaining new trends in skilled mobility. In the economic literature, ‘human capital’ research often narrowly focuses on educational levels as creating economic gain, while the competitiveness literature assesses diverse structural aspects, but often breezes over the personal characteristics of the workforce and their professional experience and qualifications. 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 place 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 and the biotechnology sector in various countries.

What does examining the life science and biotechnology sector in particular add to the discussion of skilled migration? First of all, these sectors are likely to be areas of long-term interest, both for skilled migration policy and also for more general economic and science policies. Much of the initial research related to the knowledge economy workforce has focused on the IT sector, as this sector launched much of the interest related to skilled migration for the knowledge economy. However, beginning in 2007, the pharmaceuticals and biotechnology sector became the sector with the highest corporate R&D spends globally, surpassing the technology hardware and equipment sector (European Commission, 2007c). The overall industrial R&D spends in Europe showed year-to-year growth in 2009, despite the recession starting in 2008 (European Commission, 2009a, p. 1). Although the magnitude of the growth has decreased, there was still a 6.9% nominal growth among the European companies included in the study, compared to 9.0% in 2007 and 10% in 2006.

The life sciences and biotechnology sectors are therefore important both in the global as well as the European Union’s (EU) knowledge economy specifically, and have been selected as the field investigated in this study. The OECD defines biotechnology as “the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services.” Biotechnology involves a range of goals, including for healthcare (the most developed field), agriculture, alternative fuels and environmental solutions such as handling of wastes and pollution, sustainable food production, and improved, more efficient and ‘cleaner’ industrial processes,

clearly a range of issues of global concern and relevant to both developing and developed countries.

Yet predicting future demand for any occupation or skill set is difficult. On one hand, along with the growth of R&D and new sectors such as biotech, questions arise as to whether the supply and skills of the workforce will be available to meet the growing demand. A 2004 report titled *Europe Needs More Scientists* (European Commission, 2004, p. 78) states,

Without the availability of additional, highly qualified research personnel, the aim to double private research investments will merely lead to a tighter labor market and to the ‘poaching’ of personnel from universities and other public research centres or from other European countries, including new member countries or from countries outside the EU that are SET (Science, engineering & technology) rich. Looking at the current labor costs for R&D personnel, realization of the Barcelona objective (part of the Lisbon Agenda which states that R&D should comprise 3% of member state’s GDP) implies a need for an additional supply of researchers between now and 2010 of around 700,000 (Key Figures 2003-2004) full-time equivalents.

On the other hand, due to the high level of funding for R&D and then regulatory approvals needed for new products, the biotechnology sector has also been identified with sudden, massive layoffs and even closures of companies, given the importance of small and medium-sized firms. Identifying the current and potentially changing patterns of mobility and structural, economic and other factors that support or hinder these changes, are therefore crucial to understanding the rise of the knowledge economy as well as an individual country’s structural strengths and weaknesses. It also points to the importance of issues related to utilization of the national labor force versus international mobility and discussions of potential brain drain or brain gain. Little research has addressed whether and how these workforce demands are being met in light of this competition and rapid knowledge economy growth, and more international and European comparison with attention to varying contexts is warranted.

## RESEARCH QUESTIONS

The research questions for this study are listed in Table 1, and their analysis is divided into two parts. More details on the specific methods adopted are described in Chapter 3.

TABLE 1 RESEARCH QUESTIONS

*Main question for exploration:*

Part I: What structures the global competition for talent? How can concepts and data (policies, statistics detailing changes) related to skilled migration and competitiveness be linked to better understand the global competition for talent?

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Part II: Which patterns have influenced the development of the global competition for

talent as observed in the life sciences/biotechnology in particular?	
	<i>Sub-questions</i>
Individual Life Scientists	<p>Explore work history and individual goals related to mobility - How important/prominent is international mobility in life science careers?</p> <p>Which factors are considered and influence life scientists' intentions to move or moves abroad? Which countries are attractive to life scientists and why?</p> <p>Which duration of stay is most desired for moves for life science jobs in the US and in Europe?</p> <p>What effect do life scientists expect international mobility to have, in terms of staying abroad or returning to their home country to work?</p>
Structural factors	<p>How have skilled migration policies and other policies facilitating international mobility of students and scientists developed in Europe? What are the main features of these policies within the European Union?</p> <p>What are the features of the labor market within which life scientists work?</p> <p>Which cities and countries are seen as the most competitive for biotechnology globally?</p>

## RELEVANCE OF RESEARCH ON THE GLOBAL COMPETITION FOR TALENT: RECENT GLOBAL CHANGES

The topic of this study, the global competition for talent, is important for several reasons. Skilled migration trends will likely change based on larger *global* changes in economic performance and the workforce characteristics, two aspects which cannot be seen as acting in isolation. Three of these global changes are assumed in this thesis to apply across a large number of economies, and are discussed in more detail for the broader European (EU) context:

*1. Global economic restructuring:* There is a projected shift in global economic performance and there are concerns that countries currently seen as having a competitive edge in technology and research-intensive fields may lose their edge. The industries that drive national productivity, and hence innovation (OECD, 2010) as well as competitiveness, have undergone substantial changes since the 1970s. It is predicted that in light of the rise of developing countries' strength in not only manufacturing, but also in terms of science and technology, advanced economies will need to anchor their expertise in these areas. For example, a report by the European Commission (2009b, p. 10) states:

Research will develop outside the countries traditionally considered as leaders. If the recent trends continue, in 2025, the United States and Europe will have lost their scientific and technological supremacy for the benefit of Asia (China and India will have caught up with or even overtaken the Triad) even if they will still appear among the principal world powers as regards R&D. However, their relative weight in terms of R&D investments could strongly fall to the profit, in particular, of emerging Asia. India and China could thus account for approximately 20% of the world's R&D, i.e. more than the double of their current share.

The Lisbon Agenda is a response to trying to maintain competitiveness, primarily building on concerns from 'de-industrialization,' loss of manufacturing sectors and other 'traditional' industries, and 'de-localization,' such as through outsourcing.

With more attention on globalization and the related structural economic changes, the concept of competitiveness has come to the forefront of both economic and migration policies. In order to maintain prosperity, it is felt that new economic sectors should be developed. Technology intensive, knowledge-based sectors are seen as a cornerstone of competitiveness for advanced economies and are often of interest for developing countries as well. Within the EU, the Lisbon Strategy was launched in 2000 and set as one of the top priorities for Europe to become the "world's most competitive knowledge-based economy" by 2010. In order to maintain prosperity, new economic sectors should be developed and R&D spends increased to 3% of GDP across all EU member states. However, there are also numerous challenges. The specific areas of growth and employment can be hard to predict as the technology and demand involved changes quickly, the political-economic environment varies across place, and competition to build knowledge-based industries is international. The size and strength of these sectors is also growing in developing countries such as India and China.

*2. Rapid changes in forms, patterns and scale of international mobility.* There have been large-scale increases in international mobility of both university-level students and professionals, coupled with a high increase in the number of university educated individuals within many developing countries as well. These changes, along with cheaper and easier international travel and communication, have brought about possibilities for a more 'global' workforce. Although broad changes are being seen in international mobility patterns world-wide, the dynamics have also faced additional reasons for rapid change in Europe, namely due to the expansion of the number of countries belonging to the EU. Between 2004 and 2007, ten Central and Eastern European countries joined the EU and entails the right of 'free mobility,' including the mobility of individuals to live and work, across all countries in the EU – 27 EU members in total (see Glorius, Grabowska-Lusinska, & Kuvik, 2013). These political and institutional changes can have large ramifications on mobility patterns to and from countries in the EU, as there is greater disparity in incomes and job opportunities between not only individual regions, but when comparing countries within the EU on a whole.

*3. Greater demand for skilled migration:* The ageing of the working population in Europe has led to concerns of not having a young enough workforce to meet the future demand. Alongside a general decline in the size of the working population, there are also concerns about having

shortages of certain skills in the science and engineering workforce. Skilled professionals from abroad are seen as offering a possible solution, and while not all European countries have responded equally to date, it is assumed that the demand for qualified professionals will continue. However, it is important to also note skilled migration is only one potential route to address these issues.

Despite these trends, immigration policy often remains an area where the tensions of globalization in terms of successfully participating and operating in *global economic systems* while simultaneously protecting *well-being and welfare of nationals and others, including immigrant populations already residing in a country* is apparent. On one hand, it is becoming more accepted to see skilled migration as making a positive contribution to the welfare system while also helping to balance the demographic changes associated with the graying of the population and potential workforce shortages. On the other hand, critics of skilled migration argue that training and utilization of the national workforce should be the priority instead of immigration and that skills shortages indicate structural problems, such as those in the education system. Past policies for immigration are often seen as problematic and countries must decide which rights the immigrants should have and whether or when to extend full citizenship. Deciding on which conditions apply and to whom raises moral questions; for instance, when rich investors are favored over other individuals who may be needed economically. Immigration has also been limited due to concerns are also related to national security, especially after the events of 9/11. Furthermore, although policy mechanisms, such as work permits and visas, may be less contentious for high-skilled jobs, the particular laws and mechanisms (for example in quotas by nationality or sector of employment, labor market tests, income requirements, or the degree of power afforded to corporations for offering work or residence permits) vary. In light of the economic crisis starting in late 2007, some countries currently open to skilled migration, the UK and Australia, had announced cuts in quotas for skilled migrants due to economic recession and pressure from the public and trade unions already in the first half of 2008. Similar measures are likely elsewhere when economic woes deepen, as has been observed in past recessions (for discussion of the impact of the crisis on migration policies, see Cerna, 2010; International Organization for Migration et al., 2010; OECD, 2009a).

## CONTRIBUTION TO THE LITERATURE

The global competition for talent is a fairly recent concept in the academic literature and policy (Abella, 2006; Cervantes & Goldstein, 2008; Doornik, Koslowski, & Thränhardt, 2009; Florida, 2005; Kapur & McHale, 2005; Kuptsch & Pang, 2006; OECD, 2008; Papademetriou & Sumption, 2013; Shachar, 2006; Skeldon, 2009; The Partnership for a New American Economy & The Partnership for New York City, 2012). While the phrase is often used, the various elements that have an impact on its development are not fully understood. In addition, very few studies have been able to frame how these new dynamics, that is new forms of mobility and new destinations, actually have an impact on the workforce.

In summary this research projects adds new, topical information to better understand what is meant by the global competition for talent on several levels.

- First, it is situated within current debates surrounding economic competitiveness and pressures from globalization. Furthermore, in light of discussion about the “global competition for workers” the attention to career aspirations and countries’ differences is instructive to better understand the global competition for talent.
- Second, the study will add important empirical analysis by focusing on the life science/biotechnology sector, which is currently being targeted both through policies of the EU and in national economic policies. This topic is therefore of interest to business and governments alike.
- Third, much of the immigration research in Europe has focused on past migrations (guest workers/ post-colonial). This study proposes an innovative way to study new dynamics (beyond brain drain versus brain gain) and mechanisms for skilled migration within the modern context of Europeanization and globalization.
- Fourth, states are currently torn between debates on how to best attract high-skilled migrants, while limiting the number of other economic (often, but not exclusively low-skilled) migrants. This contrast within states between simultaneously aiming to attract certain migrants and exclude others, leads to a number of policy dilemmas, societal tension and debates, and the effects of this debate on attracting and retaining skilled workers, require further research attention. It is therefore important to understand new mobility dynamics within the knowledge economy to better guide these decisions.

The global competition for talent is an idea that pulls on both the hopes and fears of developing and developed countries alike. Advanced, OECD economies purport words like ‘competitiveness,’ often comparing and benchmarking themselves with other advanced economies, in an assumed, measurable ‘competition’ to be the best. At the same time, outsourcing, relocation of facilities to lower cost countries and the growing economic power of emerging economies comes into focus, playing on fears that new, real competition may come from previously unseen rivals. Emerging economies face other issues – those related to facilitating the restructuring of previously uncompetitive economies, of large internal economic and developmental disparities, potential instability, and fears of ‘brain drain,’ as the most educated and driven seek jobs elsewhere. These emerging economies are found across the globe, such as in the large and rapidly expanding countries like India, China, and Brazil, as well as within the borders of the European Union, due to EU-expansion in 2004 to include several Central and Eastern European countries. And, in terms of self-assessment in the ‘global competition for talent’ the country often considered the leader, the US, and their researchers say that the country is at risk of failing to adapt to new global dynamics and therefore is losing its edge (see Florida, 2005; State, Rodriguez, Helbing, & Zaghenni, 2014; The Partnership for a New American Economy, 2012).

## STRUCTURE OF THE STUDY

Given these dynamics, better understanding the ‘global’ aspect almost paradoxically entails a deeper understanding of specific countries’ (or even regions, cities, towns) situations and industry particularities. It entails looking at opportunities and constraints related to the intersections of changing local and global economic dynamics. Despite any commonalities in

terms of global concerns, multiple policy routes are available and diverse outcomes are likely. 'Europe' is not a single entity, but rather is made up of countries with extremely diverse histories, economies, laws, and various social and cultural traditions.

This study utilizes diverse disciplines, including sociology, geography, political-economy, and migration studies to discuss the concept and changes related to the growing 'global competition for talent'. Skilled migration, as a field of study within migration studies, is still expanding, given that the scale of skilled movements in the past was more limited to specific occupations (particularly health care, managers in multinational corporations, artists and athletes, and later IT workers and creative industries), and there were only a few main destinations interested in broadly attracting skilled migrants (largely the US and other Anglo-Saxon countries). Skilled migration as a pressing topic of both European and global importance has only emerged in the past decade or two. This study argues that the emergence of the catch-phrase "the global competition for talent" reflects that skilled migration has entered a new stage with much more diversity in terms of both the individuals migrating and their intended destinations.

The chapters are divided into two main parts, which are organized as follows:

Part I focuses on what structures the global competition for talent on the whole, that is in terms of both theory and policy and from a perspective applicable to multiple countries. This part argues 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. Yet differences also arise 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 the importance of productivity, and then assesses the role of the workforce, while Chapter 2 discusses the concept of the "global competition for talent" linking it with the theoretical literature related to skilled migration. Chapter 3 provides an overview of the research questions and the research methodology adopted. This overview of the study goals is then followed by an analytic framework for assessing the global competition for talent, consisting of *productivity, people, place and policy*. Chapter 4 examines skilled migration and mobility policies and patterns, focusing on Europe but in light of the global context. This chapter argues that in the European policy context, homogenizing EU-level policies facilitate scientific mobility, and these policies have often occurred outside the domain of 'immigration' policy.

Part II looks at the global competition for talent in practice. The focus of this section is on competitiveness, mobility, and opportunities in biotechnology, pointing to variations among various countries by utilizing life scientists' viewpoints. This section of the study utilizes desk research and original data collection, including results from a 30-minute international survey among 594 life scientists conducted from November 2008 to early 2009. The data in Part II represents the views of life scientists across many corners of the globe to illuminate a wide range of situations regarding the global competition for talent, including both economically advanced and developing economies.

The chapters in Part II will use the CiLS data to look specifically at life scientists' career path preferences (Chapter 5), patterns of international scientific mobility and its importance for life science careers (Chapter 6), the desired destinations for moving for work in the life sciences and biotechnology and the reasons used for selecting a destination to move to for scientific work (Chapter 7), and finally a look at biotechnology competitiveness and its potential influence on international mobility in life science careers by comparing data mainly on the country-level as well as looking at the desired duration of stay, and expectations on whether international mobility will lead scientists to stay abroad or later return to their home country (Chapter 8).