

CHAPTER

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**World Intellectual
Property Organization**



WIPO

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The mission of the World Intellectual Property Organization (WIPO)¹ is to promote innovation and creativity for the economic, social and cultural development of all countries through a balanced and effective international intellectual property (IP) system.

In 2007 the Member States of WIPO adopted the decision that formally established the WIPO Development Agenda with the aim of placing development at the heart of the Organization's work. The decision included the adoption of a set of 45 Development Agenda recommendations and the establishment of a Committee on Development and Intellectual Property (CDIP).

In May 2011 the seventh session of WIPO's Committee on Development and Intellectual Property (CDIP 7) was presented with a thematic project on "Intellectual Property and Brain Drain" to address WIPO Development Agenda Recommendation 39 that "requests WIPO, within its core competence and mission, and in cooperation with relevant international organizations, to assist developing countries, especially in Africa, by conducting studies on brain drain and make recommendations accordingly." The project implements this recommendation.

1. Migration and development activities since the 2006 High-level Dialogue

The 2011 project on "Intellectual Property and Brain Drain" seeks to make a first step in understanding, through empirical evidence, the relationship between intellectual property and the brain drain phenomenon.² The project consists of two activities:

- (a) A research project that seeks to exploit information on inventor nationality and residence in patent applications to map the migration of scientists. This mapping exercise would establish a partial geography of migration flows and innovations, insofar as the phenomenon can be traced through patent documents.

¹ WIPO is the UN agency dedicated to the use of intellectual property (patents, copyright, trademarks, designs and others) as a means of stimulating innovation and creativity. The roots of WIPO go back to 1883, with the birth of the Paris Convention for the Protection of Industrial Property, and 1886, with the Berne Convention for the Protection of Literary and Artistic Works. In 1893, these two small bureaux united to form an international organization called the United International Bureaux for the Protection of Intellectual Property (best known by its French acronym, BIRPI). In 1960 BIRPI moved from Berne to Geneva to be closer to the United Nations and other international organizations in that city. A decade later, following the entry into force of the Convention Establishing the World Intellectual Property Organization, BIRPI became WIPO, undergoing structural and administrative reforms and acquiring a secretariat answerable to the Member States. In 1974 WIPO became a specialized agency of the UN system of organizations. For further information, visit www.wipo.int.

² For further information about the project, visit www.wipo.int/edocs/mdocs/mdocs/en/cdip_7/cdip_7_4_rev.pdf.

- (b) The convening of an expert workshop bringing together academia, relevant international organizations and policymakers, with a view to developing a research agenda on IP, migration and associated knowledge flows.

2. Support provided to the Global Forum on Migration and Development

WIPO has thus far not provided any direct support to the Global Forum on Migration and Development (GFMD), but this is likely to change with the growing awareness of the importance of intellectual property, patent data, mobility of inventors, among others, for knowledge-based national and global economies, as well as the policies needed to underpin them. The above research projects should also assist in growing the awareness and knowledge around this emerging issue.

3. Identified good practices

Preliminary results of the mapping exercise seem to suggest that inventors' international mobility, as reflected in patent data, is congruent with the overall international mobility of highly skilled persons. For instance, immigrant inventors contribute greatly to the patent production of countries of the Organisation for Economic Co-operation and Development (OECD). This is especially true in the case of the United States of America, as well as, to a lesser extent, Australia and Canada, as compared to European countries. Additionally, a large proportion of African and Latin-American inventors – around 40 to 50 per cent in some years – live outside their countries of origin.

The WIPO research project seeks to shed light on the relationship between intellectual property and brain drain, and set out a research agenda on the topic for the future.

4. Challenges identified in carrying out WIPO work

Although the first waves of economic papers on the brain drain date back to the late 1960s and the 1970s, and despite numerous studies and anecdotal evidence, there has been no systematic empirical assessment of the magnitude of this phenomenon until recent years. Behind this lack of comprehensive understanding of the phenomenon as a whole is the severe lack of data on international migration of skilled workers.

The influential contributions by Carrington and Detragiache (1998³, 1999⁴) constitute the first attempts to provide comparable international data on the emigration rates of tertiary educated workers for 61 developing countries. More recently, the works by

³ W.J. Carrington and E. Detragiache, "How big is the brain drain?" (WP/98/102), IMF working paper.

⁴ W.J. Carrington and E. Detragiache, "How extensive is the brain drain?," *Finance and Development*, 36(2):46–49.

Dumont and Lemaître⁵ and, especially, the contribution by Docquier and Marfouk,⁶ as well as subsequent refinements introduced in the second half of the 2000s, represent critical advancements in the empirical analysis of the brain drain.

Patent data introduce the opportunity to complement above-mentioned data efforts by providing information on the international mobility, among other things, of inventors. Patent documents disclose a wide range of information about the applicants of the patent, the technological classes of the patent, as well as the inventors of the patent, including the inventor's place of residence and, in some cases, nationality. Contrary to the migration data mentioned, inventors' information in patents is not restricted to OECD country census data, and, therefore, (1) is retrieved on a yearly basis, and not every 10 years; and (2) includes all migrant-receiving countries, not only OECD countries, thus providing a more nuanced perspective of migration patterns of skilled workers – in particular, South–South movements, which are increasingly important.

Mapping the mobility patterns of inventors using patent information is not, however, straightforward. In reality, the world's largest patent offices (the US Patent and Trademark Office, the European Patent Office and the Japan Patent Office) do not include this information in their inventors' data records. The exception is collecting patent information under the Patent Cooperation Treaty (PCT) when patents are in the international phase.⁷ While a useful source, the use of inventors' data retrieved from PCT filings may present certain shortcomings which must be taken into consideration when doing empirical analysis on brain drain issues using these data:

- (a) Patent data are, in general, skewed to a few firms that apply for a disproportionately large number of patents, and, therefore, the migrant structure of their inventors is overrepresented in the total population of inventors. In general, these firms are based in a few developed or emerging countries.
- (b) One should keep in mind the specificities and major trends in international patenting. Some countries may have a preference for using the PCT procedures rather than alternative national procedures, introducing biases when computing measures of international migration.
- (c) Patent data do not provide a unique identification number to inventors irrespective of the number of patents they file. Therefore, cleaning, harmonizing and disambiguation processes are required to know “who's who” in patents.

⁵ J.-C. Dumont and G. Lemaître, “Counting immigrants and expatriates in OECD countries: A new perspective,” OECD Social, Employment, and Migration, Working paper No. 25.

⁶ F. Docquier and A. Marfouk, “International migration by educational attainment (1990–2000),” in: C. Ozden and M. Schiff (eds.), *International migration, remittances and the brain drain*, Chapter 5, Palgrave-Macmillan.

⁷ Visit www.wipo.int/treaties/en/registration/pct for more information on the Patent Cooperation Treaty.

5. Gaps evident within the migration and development sphere

When conducting empirical analysis of the international mobility of skilled workers and the associated brain drain, two salient features stand out:

- (a) Hidden heterogeneity within the skilled migrant population; and
- (b) A neglected relationship between intellectual property policies and the international mobility of skills.

First, in general discussions about highly skilled migration, the implicit definition of a highly skilled migrant is one with a university degree. In references to the “best and the brightest,” however, and to the need to attract such migrants to ensure continuing innovation and international competitiveness, the underlying impression conveyed is of a relatively small elite, covering perhaps persons with doctorates, researchers, and high-level engineers. With few exceptions, however, the available data on migration of skilled people correspond to the individuals with university degrees only.

Only recently have selected studies focused on specific groups of highly skilled workers, such as doctors and nurses,⁸ PhD holders and IT engineers⁹ and inventors.¹⁰ Following this avenue of research, WIPO’s project focuses on the international mobility of high-tech workers, i.e. inventors applying for PCT patents, and complements the above-mentioned literature. As asserted elsewhere, a huge heterogeneity even among skilled workers may remain, and it is therefore worth examining the specific case of one of the most skilled sub-groups of workers.

Indeed, in the Docquier and Marfouk (2006) dataset mentioned above, the overall share of immigrant population over the native working-age population (25 years and older) was around 1.8 per cent in 2000 (census data); while it stood at 1.1 per cent for the unskilled population, 1.8 per cent for the population with secondary education, and 5.4 per cent for the population with tertiary education. Inventors appear to be, broadly speaking, more mobile. Migrant inventors constituted 4.91 per cent of PCT patent applications in 1990, 8.62 per cent in 2000, and 9.83 per cent in 2010, reflecting the high importance of international migration among the skilled and educated. Further,

⁸ A. Bhargava, E. Docquier, and Y. Moullan, Modeling the effects of physician emigration on human development, *Economics & Human Biology*, 9(2): 172-183; A. Bhargava and F. Docquier, AIDS pandemic, medical brain drain and economic development in sub-Saharan Africa, *World Bank Economic Review*, 22, 345-366.

⁹ F. Docquier and H. Rapoport, documenting the brain drain of ‘la crème de la crème’: Three case studies on international migration at the upper tail of the education distribution, *Journal of Economics and Statistics*, 229 (6): 679–705.

¹⁰ A. Agrawal, D. Kapur and J. McHale, “How do spatial and social proximity influence knowledge flows? Evidence from patent data,” *Journal of Urban Economics* 64: 258-269; Agrawal, A., Kapur, D., McHale J. and Oettl A., (2011). “Brain drain or brain bank? The impact of skilled emigration on poor-country innovation,” *Journal of Urban Economics* 69: 43-55; Kerr, W.R., (2008). “Ethnic Scientific Communities and International Technology Diffusion,” *The Review of Economics and Statistics*, 90(3): 518-537; Oettl, A. and Agrawal, A., (2008). “International labor mobility and knowledge flow externalities,” *Journal of International Business Studies* 39: 1242-1260.

these patent application rates are especially large for countries such as Switzerland (35.86 per cent), the United States of America (17.76 per cent) and the Netherlands (12.47 per cent).

Following this line of enquiry, the WIPO research project contributes to the knowledge and empirical evidence around the links between migration and patent applications by focusing on the upper tail of the skills distribution.

A second topic which has been largely neglected is the potential relationship between IP rights and the international mobility of talent, with two-way causality. IP protection may affect the decisions of scientists and engineers about where to exercise their profession, in light of the degree of protection of their scientific and technological output. In this sense, changes in the level of IP protection may influence the outward flows of inventors, or the number of returnees, thereby ameliorating the damaging effects of the brain drain. Conversely, outward migration of knowledge workers can impact the effectiveness of the IP system in reaching its goals of promoting innovation in their home countries and international technology transfer. Broadly speaking, migrants have been shown to influence the quality of public and private institutions of their country of origin, among which IP protection and its effect on innovation are pivotal.

6. Recommendations for the 2013 High-level Dialogue

WIPO recommends that the 2013 HLD recognize the importance of the international mobility of skilled and knowledge workers for development at the interface of migration and development, and take this into account in guiding the international system in its future work.

