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Migration

Migration and education

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Abstract

This paper covers six aspects of the relationship between migration and education, as initially agreed with UNESCO: (1) data sources; (2) definitions; (3) effects in the home and host countries; (4) open questions about migration and education; (5) Australia's approach to migration; and (6) the influence of migration and migrants on educational curricula. The discussion summarises research to date and identifies gaps where additional evidence is needed.


1 Introduction

There is a strong relationship between migration and education. Migrants typically leave their country of origin to improve the returns to their productive skills, which in turn reflect their level of education. In some cases migration takes place to gain education, while in other cases becoming a student in the host country is the preliminary step to gain admission as a migrant later on. Migrating can also have indirect effects on education. For instance, remittances can be used to fund education of family members in the country of origin, or success migrant stories may create incentives to undertake further education in the home country. This mutual influence intertwining migration and educational choices poses practical problems in unraveling the causal links between them, and estimating their effects.

This paper covers six aspects of such links, as initially agreed with UNESCO: (1) data sources; (2) definitions; (3) effects in the home and host countries; (4) open questions about migration and education; (5) Australia's approach to migration; and (6) the influence of migration and migrants on educational curricula.

2 Migration statistics

Migration statistics inevitably reflect international differences in the definition of who is migrant (see below under separate heading), the place at which data is collected (whether household or workplace), and the purpose of data collection. The most basic data address questions on the volumes of migrants, and their demographic characteristics. This approach produces measures of the stock of migrants by country of birth at particular points in time and estimates of the net migration flows between intervals using net



changes between them. These data are typically sourced from household surveys, such as population censuses and registers, and nationally representative surveys.

Table 1 summarises the most common data sources regarding the volume and demographic characteristics of migrants (details are in the Appendix). A separate column reports whether the data include information on the educational level of migrants.

Table 1 – Summary of the main sources of information about migrants

Source	Database	Country and Time coverage	Demographic information	Education information
International Organisations				
United Nations	<i>World Population Prospects</i>	232 countries for 1950-2015 at 5-year intervals	Age, gender, country of birth	No
	<i>International Migrant Stocks</i>	Stock of migrants for 1990-2015 at 5-year intervals	Age, gender, country of birth	No
	<i>International Migration Flows</i>	Annual data for 43 countries for 1980-2013	Age, gender, country of birth, citizenship and residence	No
	<i>Global Migration Database – not yet available</i>	200+ countries	Age, gender, country of birth and citizenship	No
	<i>Migration Profiles Common Set of Indicators</i>	200+ countries for 1990, 2000 and 2013	Age, gender, top 5 countries of origin and destination	Has information on international students
World Bank	<i>Özden et al (2013)</i>	Bilateral stocks for 226 x 226 geographically consistent countries at 5-year for 1960-2000	Gender	No
OECD	<i>International Migration Database</i>	Stocks and flows annual data for 1975-2015	Country of birth	No
	<i>Database on Immigrants in OECD countries (DIOC)</i>	Cross-sectional tables for 2000	Age, gender, duration of stay	ISCED (0-2; 3-4; 5+) and field of study. Labour force status and sector
	<i>OECD Statistics</i>	Annual data for 2000-2015	Gender, country of birth, labour force status	Employment rates by education and country of birth
	<i>International Migration Outlook</i>	Annual data 1997-2015	Age, gender	Education, labour force status in percentages
	<i>Connecting with Emigrants</i>	Stocks for 2010	Age, gender	Education

<i>Other</i>				
Other	<i>Abel and Sander (2010)</i>	Bilateral flows at 5-year for 196 countries for 1990-2010	Country of residence	No
Other	<i>Brucker, Capuano and Marfouk (2013)</i>	195 countries of origin and 20 OECD destinations at 5 year for 1980-2010	Age, gender, country of origin	Low, medium and high: ISCED 0-2; 3-4; 5+

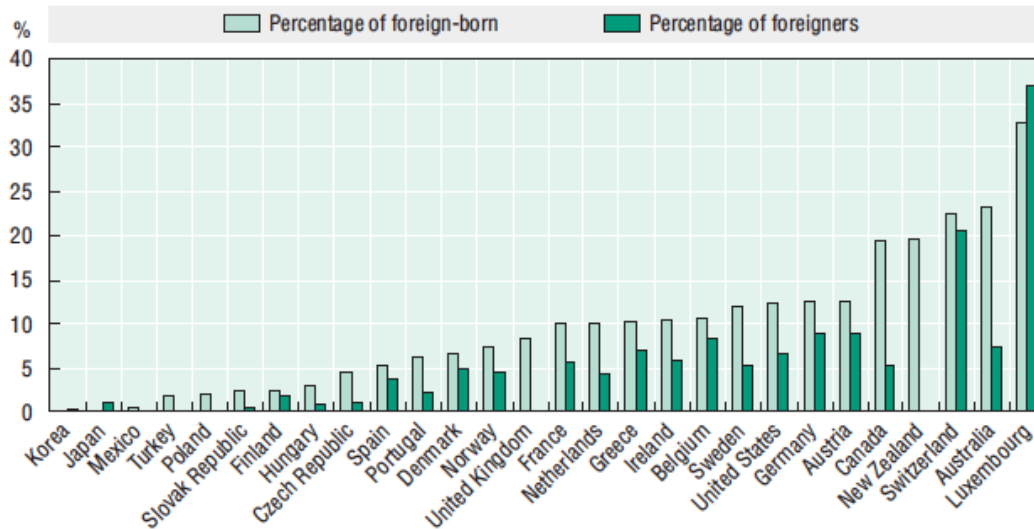
Official estimates on the stock and net flows of international migrants by country of birth and destination, age and gender are provided by the United Nations. This information is used across international organisations, and so UN data on the stock of migrants can also be accessed via the International Organization for Migration¹ and the World Bank’s World Development Indicators² (these include additional data on the stock and net flows of refugees). UN-based information is useful to generate statistics on the volume and demographic composition of migration stocks and flows, but these data do not report migrants’ educational attainment. This prevents their use in analyses focusing on subgroups by skill.

In estimating the international migrant stock, the UN generally equates international migrants with the foreign-born population, as this information is available in most countries. For more than 40 countries this is not possible, and in such cases data by country of citizenship are used, so that international migrants are equated with foreign citizens. This approach can generate inconsistencies in both the number of immigrants and their age distribution. Citizenship conferred on the basis of *jus sanguinis* cannot prevent people born in the country of residence to be accounted for as international migrants even though they may have never lived abroad, like migrants’ children, and it excludes persons born abroad but naturalized in the country of residence. In countries where citizenship is conferred on the basis of *jus soli*, migrants’ children acquire the country of birth’s citizenship and are therefore accounted for as natives. Those discrepancies can be large, as illustrated with the figure below sourced from Lemaître (2005).

¹ <http://www.iom.int/world-migration>

² <http://data.worldbank.org/indicator/SM.POP.TOTL>

Chart 1. Percentage of foreign-born persons and of foreigners in the total population in OECD countries, 2001



Source: Chart 1, Lemaître (2005).

As shown above, the discrepancy between using foreigners by citizenship or country of birth can be substantial. For instance, in the case of Australia, which has one of the largest shares of foreign-born across OECD economies, the foreign-born account for almost 25% of the total population in 2001, but this proportion reduces to less than 10% if one instead uses the citizenship criteria. This discrepancy is a reminder that the criterion used to classify migrants should always be specified when presenting and using migration data to avoid confusion and misunderstanding.

3 Typology of migrants

3.1 Definition of migrant

At present, there is no internationally agreed definition of who a migrant is. This poses problems with respect to data collection and analysis. Perhaps more importantly, the absence of an agreed definition distorts public perceptions and debates, as these typically relate to “imagined immigration” (i.e. how each individual imagines immigration to be and whom is perceived as a migrant), rather than actual immigration (Blinder, 2012).

The official definition provided by the UN³ identifies an international migrant as any person who changes his or her country of usual residence for a minimum period of time. In particular:

1. A “long-term migrant” is a person who does this “for a period of at least 1 year (12 months), so that the country of destination effectively becomes his or her new country of residence” (para 32-37).
2. A “short-term migrant” is a person who moves to a country other than that of his or her usual residence for a period of at least three months but less than one year, except in cases where the movement to that country is for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage.

As pointed out by Lemaître (2005), the nature of the duration measure – whether it is the expected duration of stay, the duration of the administrative permit granted upon entry or the actual duration of stay in the host country – is not specified. The Framework for the Compilation of Migration Statistics presented in the UN recommendations allows every type of movement to be accounted for as migration as long as it satisfies the duration criteria regardless of purpose. Similarly, the views of the receiving state as to what reasons or durations define long-term movements or as to whether the movement is intended to be permanent or temporary are not considered. These limitations imply that the current UN definition covers flows that are not interchangeable such as settlement, employment, family reunification, study, or finding refuge from persecution. This confusion affects not only the international comparability of migration flows but also the accuracy of statistical analyses, the conclusions of research, and the policy recommendations proposed by these studies.

Besides the definition of migrant described by UN, which applies to data collected by national statistical offices, alternative definitions that do not depend on duration of stay have been put forward, and are used by other international organisations, like the International Organisation for Migration (IOM) and the OECD.

In particular, the IOM defines migration as “the movement of a person or a group of persons, either across an international border, or within a State. It is a population movement, encompassing any kind of movement of people, whatever its length, composition and causes; it includes migration of refugees, displaced persons, economic migrants, and persons moving for other purposes, including family

³ 1998 UN recommendations on the statistics of international migration: https://unstats.un.org/unsd/publication/SeriesM/SeriesM_58rev1E.pdf

reunification.”⁴ This definition is very broad and suffers from the same limitations as the UN’s in aggregating flows that are not interchangeable with reference to employment rights and economic consequences.

The OECD tends to use the UN definition but since 2005 it has started to organise information according to the purpose of movement, as also perceived by the country of destination⁵. As pointed out by Lemaître (2005) and Fron, Lemaître, Liebig, and Thoreau (2008) knowing the reason for migration is critical for understanding the nature and composition of international migrations. Lemaître (2005) proposes crucial practical changes to data collection to generate harmonized international migration data like the application of an actual-stay duration criterion ex post in order to identify the flows that would be counted as long-term migration, and limiting the scope of the statistics to regulated flows, as these are the main object of policy interest and tend to leave a “paper trail”. Since 2005 the OECD’s International Migration Outlook provides additional information incorporating these changes in the data reported.

3.2 Other international movements of people not classified as migrants


3.2.1 Refugees and asylum seekers

Data on migration by purpose can also alleviate another international data anomaly relating to the classification of “refugees” as international migrants. Refugees are persons fleeing armed conflict or persecution and are unable or unwilling to return because of a well-founded fear of being persecuted due to their race, religion, nationality, or membership of a particular social group or political opinion.⁶ Their situation is often so perilous and intolerable that they cross national borders to seek safety in nearby countries, and thus become internationally recognized as “refugees” with access to assistance from States,

⁴ <http://www.iom.int/key-migration-terms>

⁵ <http://www.oecd.org/els/mig/41281008.pdf>

⁶ Refugees are defined and protected under international law. The 1951 Refugee Convention and its 1967 Protocol as well as other legal texts, such as the 1969 Organisation of African Unity Refugee Convention, remain the cornerstone of modern refugee protection. The legal principles they enshrine have permeated into countless other international, regional, and national laws and practices. The 1951 Convention defines who is a refugee and outlines the basic rights that states should afford to refugees. One of the most fundamental principles laid down in international law is that refugees should not be expelled or returned to situations where their life and freedom would be under threat.



UNHCR, and other organizations. From a migration statistics viewpoint, when refugees have been granted refugee status and allowed to integrate they are normally included in population censuses as international migrants. This is however not the case in several developing countries, where refugees lack freedom of movement and reside in camps or other designated areas, which are overlooked by population censuses. In such cases, estimates of the refugee population collected from the Office of the United Nations High Commissioner for Refugees (UNHCR) and the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNWRA) are added to the estimates of the international migrant stock.

“Asylum seekers” are individuals seeking international protection, but the country in which they submitted their claims has not yet finally decided on whether or not to accept them as refugees. “Internally displaced persons” (IDPs) refer to individuals or, at times, communities moving within a country due to conflict or natural disaster. If they cross international borders, they can become asylum seekers, and if asylum is granted under the UN Convention Relating to the Status of Refugees (1951), they become known as refugees.

3.2.2 Business visitors and international commuters

With reference to movements by purpose, some relevant labour flows are unregulated though they carry substantial economic outcomes. “International business trips” are accounted for as “visits” if they last for less than one year (or three months if they involve a change of usual residence as occurs for short assignments and academic visits). They are not regulated but have been shown to make substantial contributions to economic growth (Andersen and Dalgaard, 2011; Dowrick and Tani, 2011; Tani, 2014a; Hovhannisyanyan and Keller, 2015).

“International commuters” are not accounted for in migration statistics as they travel only for the day while their place of residence, defined as where the night is spent, does not change and is in another country. They however regularly cross borders, contributing to expenditure and tax revenues in both places of residence and work (Cheshire and Magrini, 2009).

4 Challenges and benefits of migrations

There is a large literature focusing on international migrants⁷, and economic studies in this stream are concerned with two fundamental questions: (i) who migrates, and (ii) what is the effect of migration. Both are reviewed separately with an emphasis on the implications for education. It should be noted that education is generally viewed by this literature as a proxy for skills, and so both words are used interchangeably, though they have distinct meanings in other contexts.

4.1 Who migrates?

Starting with Sjaastad (1962) economists view migration as an investment decision, similarly to education (Becker, 1962). In the most basic simplification, people compare the net expected benefits that can be gained by staying in their home country versus those obtained by moving abroad, and decide to migrate if the latter are greater than the former. As individuals differ in innate and demographic characteristics and circumstances, migrating and educational achievement do not occur at random in the population, but are the result of conscious decisions. Some self-select into migration, while others decide to stay in their country of origin - similarly, some decide to complete university and others choose to leave school as soon as possible. As each individual makes a migration decision based on expected net benefits it is possible to observe simultaneously some people living in A moving to B while some from B move to A. This results in gross migration flows being typically much larger than net migration flows.

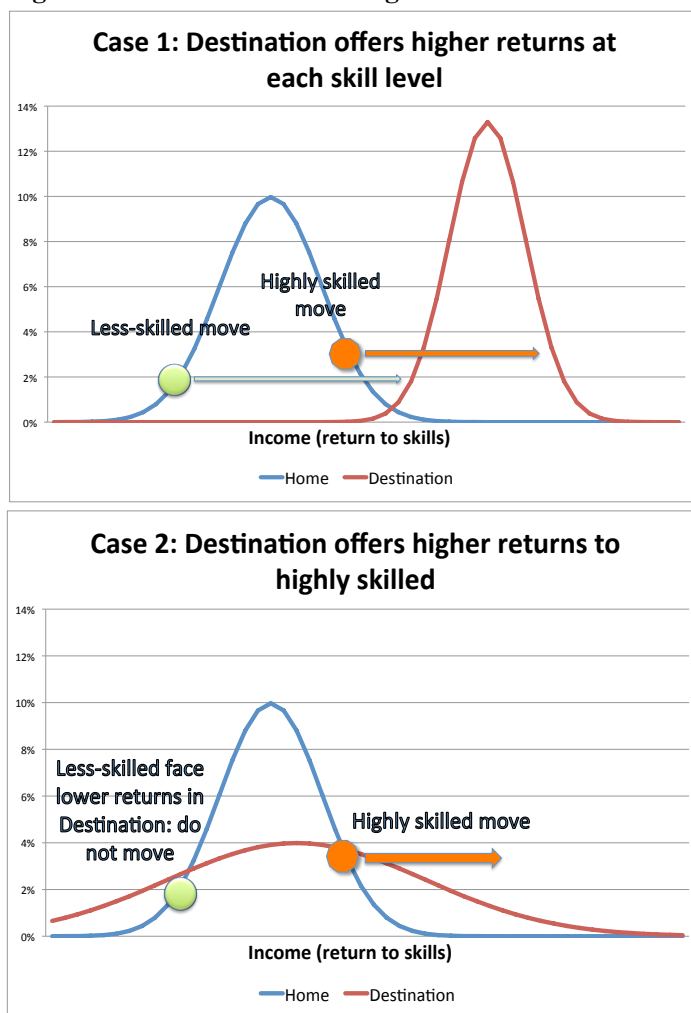
⁷ Three separate handbooks series, each collecting several essays, have recently been published offering comprehensive reviews. They are:

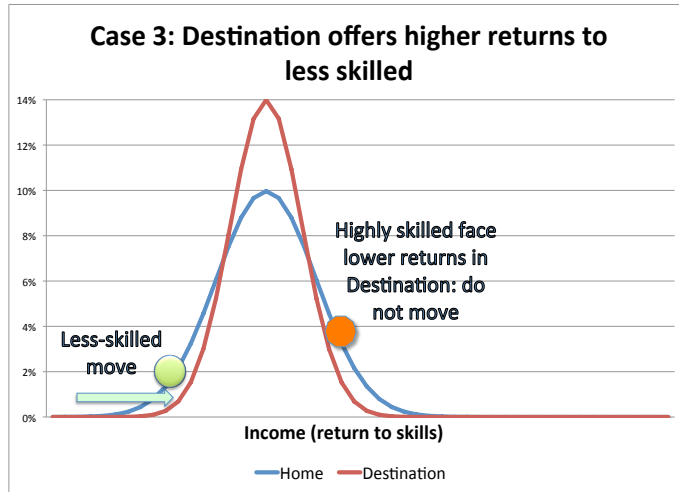
- HEIM: Handbook of the Economics of International Migration (2015): 2 volumes edited by Barry Chiswick and Paul Miller - Elsevier. It summarises research focusing on immigrants as individuals and the decisions they undertake in the host country including investing in human capital (Smith) and language (Chiswick and Miller). It reviews research on highly skilled migration (Dustmann and Görlac) and the impact of international migrants on the income distribution of the host country (Blau and Kahn), growth (Brunow, Nijkamp and Poot), and future generation (Sweetman and van Ours). It covers the role of migration policies in country-specific studies covering the US (Cadena, Duncan and Trejo), Europe (de la Rica, Glitz and Ortega), and Australia (Gregory);
- HEE: Handbook of the Economics of Education (2011): 5 volumes edited by Eric Hanushek, Stephen Machin, and Ludger Woessman - Elsevier. It contains several essays related to migrants and schooling decisions in both countries of birth (Smith) and destination (Dustmann and Glitz), and over-education (Leuven and Oosterbeek);
- IHEM: International Handbook of the Economics of Migration (2013): 1 volume edited by Amelie Constant and Klaus Zimmermann – Edward Elgar. It summarises research on migrants' over-education (Piracha and Vadean), migration in the EU (Kahanec), and highly skilled migrants (Aydemir).

4.1.1 Self-selection into migration

The literature has exploited the notion of self-selection into migration to identify the type of migrants attracted to different countries using Roy's model (Roy, 1951; Borjas 1987 and 1991). The model portrays individuals comparing their income at home with their expected income in a potential host country prior to deciding where to live. The income an individual expects is viewed as reflecting that person's skills, which in turn is viewed as reflecting the level of education, so that higher education implies a higher position along a country's income distribution. Figure 1 drawn from Tani (2014b) illustrates the mechanics of the decision to self-select into migration.

Figure 1. Self-selection and migration





Source: Tani (2014b).

Of course, average differences in incomes between home and host countries play a critical role in determining who migrates where, as does the quality of the information set facing migrants. If information is complete and average incomes at home are below those of the host for each level of skill, then every home citizen will have an incentive to emigrate (Case 1). However, if home and host countries place a similar value on skills, average incomes per capita will be similar, and the most skilled individuals will migrate to the country with the higher income inequality to increase the economic benefit they receive for their skills (Case 2). Conversely, the least skilled will migrate to the country with a compressed income distribution to maximize the economic benefits for their skills (Case 3). If the information is incomplete or imperfect then ‘irrational’ migration behaviours may be observed (e.g. Mbaye, 2014).

In practice not everyone migrates, as implied by Case 1 in Figure 1, partly because some countries limit the inflow of immigrants who do not possess a university degree, as is the case in Australia, Canada, and New Zealand. More commonly, self-selection seems to work as per Case 2 in Figure 1. Estimates of the emigration rates of tertiary educated workers for 61 developing countries obtained by Carrington and Detragiache⁸ (1998 and 1999), support the hypothesis that migrants tend to be much better educated than those left behind in the country of origin, and that

⁸ This work spurred subsequent efforts to expand migrants’ data collection to include the level of education.

the highest migration rates occur among individuals with university education in almost all cases. Later work provides compelling evidence that migrants tend to be highly educated relative to both those left behind (Docquier and Marfouk, 2004; Docquier, Lohest, and Marfouk, 2005) and natives of the countries of destination (Docquier, Ozden, and Peri, 2014). This occurs because more educated individuals obtain the largest absolute economic gains from migration (Grogger and Hanson, 2011). The literature also finds that more educated migrants are also less likely to return to their country of origin but also more likely to move on to another destination country than less educated migrants (DaVanzo, 1983). Return migration among the highly educated is in fact strongly associated to lifestyle and family reasons rather than income or employment opportunities (Gibson and McKenzie, 2009; Dustmann and Kirchkamp, 2002).

4.1.2 Selective versus non-selective migration policies

Several countries limit the inflow of migrants using, among others, criteria based on educational achievement, but their effects are highly debated⁹, especially with reference to the determinants of selection on education (McKenzie and Rapoport, 2010; Beine et al., 2011) and the influence of immigration policies on migrants' selection on education, both from a theoretical (Docquier et al., 2008; Bertoli and Brucker, 2011; Bertoli and Rapoport, 2015) and an empirical perspective (Antecol et al., 2003; Jasso and Rosenzweig, 2009; Aydemir, 2011; Belot and Hatton, 2012). In general, this literature finds that imposing minimum educational requirements raises the educational profile of immigrants but does not guarantee better labour market outcomes. This counterintuitive fact is at the core of recent work on the limited international transferability of human capital (section 4.1.3), and the use of a point system to screen prospective migrants¹⁰.

⁹ Examples are Borjas (1987), Antecol et al. (2003), Chiquiar and Hanson (2005), Jasso and Rosenzweig (2009), Moraga (2011), Ambrosini and Peri (2012), Dequiedt and Zenou (2013), and Kaestner and Malamud (2014).

¹⁰ The selected criteria of a point system typically arise from the findings of applied research on migration and surveys of immigrants to determine the ingredients for successful economic assimilation. Thus, points are assessed based on short-term labor market criteria, such as having skills in high demand domestically, and desirable individual characteristics, such as youth, education, and language proficiency. Once applicants pass the point test, they must still meet additional minimum standards in such areas as health and good character. The economic principle underpinning the point system is to identify prospective immigrants' net benefit to the host country (their

As suggested by Tani (2014b) a point system becomes relevant if the host country has a relatively high average income compared with the home country (most home citizens would want to emigrate), a compressed income distribution (low-skill home citizens want to emigrate), and possibly a comprehensive welfare system for its low-income earners. Keeping out low-skill immigrants in favor of skilled immigrants may not only “protect” the host country’s welfare system and address its domestic employers’ needs, but also offer an automatic mechanism to stabilize income inequality trends between skilled and unskilled native workers. This is because the earnings growth of skilled immigrants will be constrained (as there will be plenty of them), whereas unskilled (native) workers will be in shorter supply and therefore will command higher wages.

With reference to selective policies, Bertoli, Dequiedt and Zenou (2015) warn that screening potential migrants on the basis of observable characteristics, especially education, may reduce admitted migrants’ quality because education also influences migrants’ self-selection on variables that are not measured, like ability and motivation. An increase in selectivity based on education may lead to admitting less able and motivated migrants. Clemens and Pritchett (2016) test the idea, gaining traction in several policy circles, that restricting migration could be efficient because it prevents migrants from low-income countries from ‘transmitting’ low productivity to high-income countries, finding that restrictions to migration are excessive on the basis of current data.

The ongoing debate on whether or not migration should be regulated using observed characteristics such as educational attainment would benefit from additional research relating migrants’ outcomes to their educational as well as other variables related to cognitive and motivational characteristics. Such variables

effect on gross domestic product or public finances), which has to be positive. As a result, points are awarded to younger immigrants, who can potentially contribute for longer to the public finances through income taxes and are less likely to need welfare assistance in the short term. Points are also given to applicants with high levels of formal education or vocational training, as their human capital can be employed without further training costs for the host country. These characteristics are also associated with high levels of adaptability and mobility, which help to minimize time out of the labor force. Furthermore, points are awarded for proficiency in the host country’s language, as this reduces retraining costs and facilitates rapid economic and social integration. Canada, Australia, and New Zealand each award points to prospective immigrants in different ways, assigning different weights to desired characteristics that reflect the evolution of migration policy objectives.

are nowadays covered in detailed longitudinal databases of migrants and non-migrants, such as Germany's Socio-Economic Panel (GSOEP) and Australia's Household, Income and Labour Dynamics in Australia Survey (HILDA). The main reason to contextualise the role of educational attainment is that educational success does not necessarily translate into successful economic assimilation - a fundamental determinant of modern immigration policy. Restricting migration to those who benefited from schooling may omit other potentially desirable would-be migrants who for circumstances or choice do not meet the educational cut-off criterion, like those with high ability and motivation.

The existing debate would also benefit from research addressing the long-run economic effects (e.g. on income inequality across educational groups) of immigrant selection policies where education was used as a criterion, which would use the recent experience of Canada, Australia, and New Zealand, which have applied selective policies over the past 30 years and carry out detailed surveys of the population, as well as any relevant historical experiences (e.g. Bandiera et al, 2016; Abramitzky and Boustan, 2016).

Research on the quality or type of information used by migrants in their decision-making, and the relative effectiveness of alternative channels through which this information is conveyed (e.g. web, peers, teachers) is completely missing. Yet, targeting the information set of migrants could potentially lead to substantial behavioural changes, as already emerged in students' choices of major and expectations (e.g. Zafar, 2011; Wiswall and Zafar, 2015)

4.1.3 The returns to migration

Along with the identification of who migrates, a parallel literature focuses on quantifying the returns to migration, by relating the wage earned in the host country with the migrant's demographic and educational characteristics. Education is perhaps the most important determinant of an individual's human capital and is viewed as a signal of its productivity¹¹ (Becker, 1962). As a result, the returns to education tend to be used as indices of migrants' economic assimilation and the efficiency of the host country's labour market.

This literature finds that migrants experience positive returns to education in the host country, but this

¹¹ An alternative theory supports the hypothesis that education is not a mechanism to raise productivity but is a signal of individual ability: more education underpins lower costs in achieving it and hence higher ability (Spence, 1976). As for the human capital theory started by Becker (1962), the signaling theory of Spence supports that more education is associated with higher wages because it implies higher ability and productivity.

result varies depending on where education is acquired. Migrants acquiring education in their home countries generally experience lower returns to education than when schooling is completed in the host country¹². In an influential study on migrants to Israel, Friedberg (2000) was able to distinguish education obtained in the home and host country, finding that an additional year of schooling obtained in Israel had an 8% return (10% for natives) while the equivalent schooling in the home country had a return of only 7.1%: a penalty of more than 10%. Such different returns by country of education have also emerged in other studies, which find that the returns to foreign education are comparable or, at times, higher than those obtained from schooling in the host country only when education is acquired in high-income countries.

The lower returns to foreign schooling tend to be addressed with a *laissez-faire* approach relying on the efficiency of the host country's market forces in eventually recognizing education as a signal of productivity. This is however sub-optimal if it takes a long period of time. Migrants' temporary under-use in the country of destination may cause long-term loss of earnings and taxable income, and affect other behaviours related to earnings – apart from health and psychological conditions. Migrants may also remit lower amounts, reducing the potential benefits of emigration for countries of origin and families left behind¹³.

¹² Early evidence starts with Chiswick (1978) in a study focusing on the economic assimilation of immigrants, where he documents the lower returns to schooling completed abroad relative to the United States. Lower returns to home country education have been found by other studies using US data (Carliner, 1980; Schoeni, 1997; Bratsberg and Ragan, 2002) and in several other destination countries including Australia (Beggs and Chapman, 1988a, 1988b; Chan, Heaton and Tani, 2013), Canada (Baker and Benjamin, 1994; Schaafsma and Sweetman, 2001; Ferrer and Riddell, 2008), Spain (Sanroma, Ramos and Simon, 2015), and Germany (Basilio and Bauer, 2010).

¹³ The majority of the studies have confirmed two stylized facts in relation to the impact of over-education on pay, as suggested initially by Sicherman (1991). Over-educated workers suffer from a wage penalty in relation to matched individuals with the same level of education, but they earn a premium over their matched colleagues in the same job. Relative to matched workers with similar levels of schooling, the average wage penalty associated with over-education has been estimated at around 15% on the basis of a dummy variable in a standard wage regression (McGuinness, 2006). Though over-educated people work below their potential, they still enjoy some benefit from the additional years of education (Rumberger, 1987). Another approach (known as the ORU approach) breaks down the educational level into three constituent components (over-, required- and under-education) (Duncan and Hoffman, 1981). Based on this methodology, Groot and van der Brink (2000) produce meta-analytical estimates of an average rate of return of 5.6% for attained years of education. Importantly, the return to surplus (3%) or deficient (-1.5%) years of education is significantly lower compared to the comparable return for required years of education (7.8%).

4.1.3.1 *Over-education and skill wastage*

Filling a job requiring a level of education below the one achieved is an example of ‘over-education’ (Chiswick and Miller, 2009, 2008, Green et al., 2007, Chevalier, 2003; Leuven and Oosterbeek, 2011). The main findings from this literature show that immigrants are more likely to be over-educated than natives but that with time in the host country this difference in over-education relative to natives decreases.

Evidence that over-education occurs even in host countries where selective immigration policies are in place¹⁴ is counterintuitive, as these restrict entry to individuals possessing characteristics that should positively affect subsequent labour market outcomes like minimum qualifications, host country language skills, young age, and good health. In practice, however, destination countries’ employers appear to systematically under-utilise the skills of those who have been selected.

The literature has advanced a number of possible explanations for this, pointing towards the characteristics of immigrants¹⁵ (Dustmann, 1999; Piracha et al, 2014; Chiswick and Miller, 2009; Basilio and Bauer, 2010), including their ability in mastering the host country language (Dustmann and Glitz, 2011; Chiswick and Miller, 2002 and 2007; Dustmann and Fabbri, 2003), and host country employers’ discrimination¹⁶ (Battu and Sloane, 2004; Altonji and Pierret, 2001; Lange, 2007). More recent work has

¹⁴ Over-education rates among migrants holding foreign university degrees in Australia, Canada and New Zealand are as high as 40-50% versus 10-20% among comparable natives (Green et al, 2007; Wald and Fang, 2008; Poot and Stillman, 2010).

¹⁵ Authors focusing on labour supply suggest that foreign education is less transferable than the one acquired domestically because it contains elements that are specific to the country of education (e.g. norms, practices), which make it less productive when applied in different institutional settings (Duleep and Regets, 1997) or has lower quality. Overcrowded classrooms, poorly paid teachers, and inadequate public investments in schooling make inefficient the delivery of education, and this slows down the formation of human capital (Betts and Lofstrom, 2000; Bratsberg and Terrell, 2002; Schoellman, 2012). As a result, migrants educated in less efficient systems receive lower returns to schooling than comparable people educated in more efficient environments because they actually possess less human capital. Recent work using international data on student learning outcomes gives credit to this hypothesis (OECD, 2010), supporting the hypothesis that poor literacy and numeracy scores in many sending countries are positively related to the lower earnings of their emigrants and vice-versa (Sweetman, 2004; Chiswick and Miller, 2010).

¹⁶ Authors focusing on labour demand suggests that foreign education provides an imprecise signal of productivity, leading host country employers to offer wages that penalize individuals’ qualifications in favour of group indicators of human capital such as gender and race (Arrow, 1973; Phelps, 1972; Aigner and Cain, 1977; Lundberg and Startz, 1983), age (Altonji and Pierret, 2001), or height (Wang, 2015). More recently the literature has used experiments by sending fictitious curricula to prospective employers and testing their responses to the ethnicity of the applicant (Fershtman and Gneezy, 2001; Carlsson and Rooth, 2007; Oreopoulos, 2011; Kaas and Manger, 2012; Booth, Leigh and Varganova, 2012). With respect to secondary data there are only very few studies (Siniver, 2011; Grand and

started to address the potential role of institutional frictions in causing over-education, such as occupational licensing in the host country (Peterson et al, 2013; Tani, 2017¹⁷). This line of research

Szulkin, 2002; Grytten, Skau, Sørensen, 2013). Both Siniver (2011) and Tani (2015) find evidence of statistical discrimination with significantly higher earnings for those undertaking a formal assessment of their qualifications.

¹⁷ Tani (2017) uses Australian data to explore the effect of occupational licensing in the host country's labour market on the incidence of over-education among the tertiary educated, and in particular occupational licensing. He finds that licensing in the host country discourages migrants previously working as professionals from carrying out their occupation after settlement (right box in Figure N1), in favour of jobs for which they over-qualify (right box in Figure N2).

Figure N1: Employment sorting after migration, by licensing status in home and host country

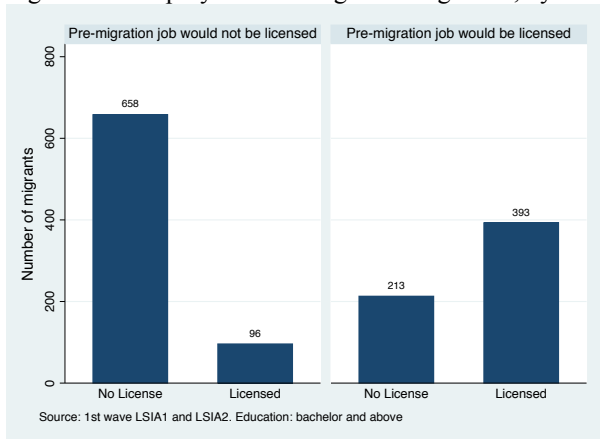
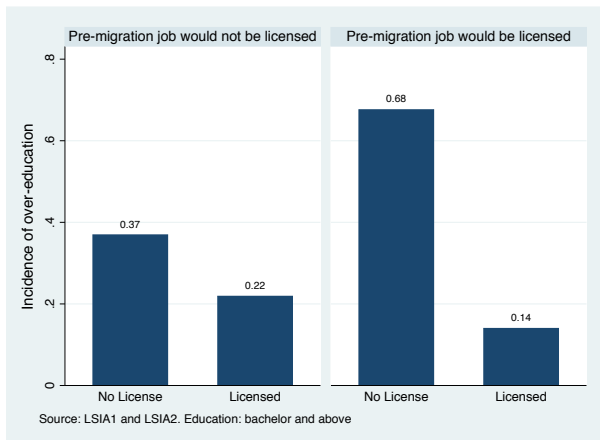


Figure N2: Over-education after migration, by licensing status in home and host country



suggests that institutional settings governing the host country's labour market are responsible for some of the mismatch between migrants' education and occupation. As a result, labour market rather than migration policy arises as the natural regulatory environment to address the inefficient use of migrants' human capital.

4.1.3.2 Other consequences of over-education

Notwithstanding what discussed in the previous section, the research on the effect of over-education on other economic behaviours and especially the educational choices of children of over-educated parents is just at the beginning. Evidence of this phenomenon is limited (Urban, 2012), but it points to over-education as having far deeper and longer-lasting effects than what researchers have found to date, especially with reference to schooling choices and educational investments.

The imperfect transferability of human capital across borders and evidence of over-education call for new research to identify causes and devise suitable policy responses aimed at improving the efficiency of migration as a solution to spatial imbalances in skill endowments. Research has shown that not doing so is costly for both migrants and natives (forgone taxes) but short political cycles in many host countries, as well as general ignorance about the effects of migration, may limit the incentives to undertake this research. Three topics appear in critical need of new evidence. The first is to assess the relative strength of the forces that cause an imperfect transfer of human capital shortly after migrating. While there is substantial research on individual possible causes of over-education, how much of the education-occupation mismatch is due to poor language skills, employer discrimination, institutional settings, poor information or other causes is unclear. Yet, studying combined potential causes can provide essential information on the actual cost of inefficient international transfers of human capital and identify areas of possible intervention (e.g. whether on migrants, employers, or institutional settings). This type of analysis is possible nowadays thanks to ongoing detailed longitudinal surveys, like the GSOEP or HILDA, or combining different database covering multiple facets of everyday life.

The second area in critical need of new research is the long-term effect of the education-occupation mismatch. Little is known about how it affects the educational choices of the household members: does it lead to subsequent under-investment in education among children, or behavioural changes in finding

employment, investment in further education, and in re-emigration? As current research focuses on the short-term effects of the education-occupation mismatch, there is a risk of over-emphasising calls for active policy when perhaps there is only a limited need for doing so in the context of short and long-term effects. This area of research can be carried out using existing databases containing household identifiers. The third priority area for research is policy design. In particular to estimate the welfare gains of a more efficient international transfer of human capital. There seem to be a general disinterest on efficiency as opposed to other targets of policy-making. Yet efficiency can free up extra resources to be devoted to other areas of need. The research should address the link between policy design and subsequent effect on the transferability of human capital. For example, cases where migration policy targeted younger cohorts, which then complete education in the country of destination, or the employment effect of joint international provisions of educational services (e.g. co-tutelle). This type of targeted research can be carried out using existing information on the outcomes of students graduating from international universities and academic collaboration programmes, and from industry-specific studies focusing on the effect of international qualifications (e.g. CFA or CPA) and collaboration among national professional bodies.

4.2 Measuring the effect of migration on receiving and sending countries

A large literature has developed to measure the effect of immigration on both sending and receiving countries. The bulk of existing work focuses on migrant inflows in high-income economies and, to a lesser extent, outflows from middle- and low-income economies. The vast majority of empirical studies accounts for self-selectivity in measuring the impact of migration, recognising that it is a phenomenon that does not randomly distribute across the population of the country of origin¹⁸. Two different traditions

¹⁸ The main reason to make this adjustment is that some unobserved characteristics of migrants, like motivation or ability, may relate to an outcome of interest, such as the wage enjoyed in the host country. Not making the adjustment may lead to the erroneous interpretation that a $x\%$ increase in migrants' education affects the wage by $y\%$ when instead most of the effect is due to the omitted variable (ability). The 'endogeneity' of migration and education indicators, which contravenes one of the key requirements of the basic tools of quantitative analysis (regression by Ordinary Least Squares), is addressed by using other estimators, notably the Two-Stage-Least-Squares estimator in the case of an instrumental variable and the endogenous switching model. In the case of instrumental variable, a new variable correlated with the endogenous one but unrelated to other determinants of the outcome studied is used. For example, one could use a model to estimate the probability of migrating (1 for migrants and 0 for stayers). Then from this model of migration, obtain predicted probabilities of migrating for the entire

have developed with reference to measuring the effect of an inflow of migrants. The literature refers to them as ‘traditional’ (or ‘canonical’) and ‘new’ approaches.

4.2.1 The traditional approach

Under the traditional approach, migrants compete directly with natives with the same education level because they raise the skills supply in the host country, compressing relative wages downwards¹⁹. Natives have effectively no other labour market alternative to respond to the competitive pressure due to immigration but move to different parts of the country (Card, 2001; Hatton and Tani, 2005). As a result, an increase in a certain type of labour (e.g. mandatory schooling only) results *by construction* in a decrease of the wage of natives of the same type relative to other types of labor (e.g. those with higher level of education) and in higher returns to other inputs that have become relatively scarcer. Indeed, as reported by Borjas (2015) “it is mathematically impossible to manipulate the canonical model of the competitive labor market so as to yield a large net gain from immigration” (p. 151).

The key feature of the traditional approach is its exclusive empirical focus on the direct effects of the change in labour supply as a result of an immigration inflow, without taking into consideration other adjustments that may occur in the economy, like an increase in consumption spending or higher labour demand as new firms may enter the now more populous economy.

sample of migrants and non-migrants. Then use these predicted probabilities in place of the indicator of migration status to estimate the effect of migration on the outcome of interest. In the case of endogenous switching model, one splits the sample into migrants and non-migrants and estimates the outcome of interest for each subsample. If being a migrant is the only potentially endogenous variable in the model, the two separate outcome equations may be estimated via OLS, accounting for the fact that each sample is a nonrandom sample of the entire population. This is accomplished via Heckman’s selection correction model, which is standard in most statistical software packages.

¹⁹ The traditional analysis of migration flows historically stems from analyses of international trade whereby countries are initially endowed with different resources, which underpin different relative costs of use. If trade is possible then countries abundant in a factor on a global scale will tend to specialise in producing tradable items that use intensively the abundant resource, as that production enjoys an international cost advantage - ‘comparative advantage’.

Analogously to the case of trade, countries are differently endowed with people of different levels of education, which in turn maps a heterogeneous geographic distribution of skills usable for production. Since this heterogeneity in skill endowments reflects corresponding differences in the returns to skills, there are potential ‘gains from trade’ from the international reallocation of people embodying those skills: for instance, people with low levels of education in a country relatively abundant in this resource will have an incentive to migrate to countries where their skills are relatively scarce, and this will increase their returns to education, and vice-versa (Wong, 1995).

4.2.2 The new approach

More recently a new approach to study migration has emerged, building on the expanded notion that the distribution of skills is more heterogeneous than what is captured by classifying individuals as skilled or unskilled²⁰. This new literature suggests that education enables people to supply skills that can be used in a variety of tasks. Migrants raise the supply of certain skills and hence the range of potential tasks associated with them, but natives can limit the effect of the increased competition brought by migrants by moving onto different tasks that are less easily supplied by immigrants. For example, they may specialise in tasks that require a more intimate knowledge of the host country language or a deeper network of social contacts than what migrants can access. As a result, migration does not imply a reduced set of opportunities for natives²¹.

The key feature of the new approach is its emphasis on measuring both direct and indirect effects on the rest of the economy of an inflow of immigrants. In particular, the new approach estimates the elasticity of substitution across partitions of the population by education, age, and place of birth as these characteristics determine skills, and then uses the results to obtain the effects of the direct competition from immigrants in the same subgroup and the indirect complementarity from immigrants in other subgroups. In this way it captures the effects of immigration on the whole working population rather than just on specific subgroups.

²⁰ As highlighted by Card and Peri (2016), the new approach takes into account recent developments in the literature, which puts forward increasing returns to scale from human capital accumulation (e.g., Lucas, 1988; Romer, 1990; Moretti, 2004a, 2004b), more granularity and scope for specialisation in skills and tasks (Alesina, Harnoss, and Rapoport, 2013; Grossman and Rossi-Hansberg, 2008), market integration (Rivera-Batiz and Romer, 1991), and potential gains from rising numbers of scientists and engineers (Jones, 2002). These advancements expand the effect of immigration beyond the direct effects estimated by the traditional model to include the indirect effects of immigration on the rest of the economy. In particular, the new approach views immigrant workers as providing differentiated inputs in production ('tasks'), where the level of education, especially between those with some tertiary education and those with secondary schooling or less, is a crucial aspect differentiating labour (Card and Lemieux, 2001; Card, 2009; Goldin and Katz, 2008; Ottaviano and Peri, 2012). These two groups of workers are different with respect to their occupation, productive abilities, and use of technology, yet complementary (Autor, Katz, and Kearney, 2008).

²¹ In addition, the new literature builds on the notion that migration can operate under a regime of increasing (rather than decreasing), returns to scale, whereby the link between size and returns to skills is positive: the more people engage in an activity the higher the returns. This is the case of knowledge production in which a new idea enhances the productivity of inputs used in other industries, generating externalities that cannot be captured by the original developers of the new knowledge, and spurring economic growth. Typical examples relate to information and communication technologies (ICT) and their applications.

4.2.3 The need for a unified approach

The migration literature has applied a variety of estimation approaches in the analysis of the effect of migration, which has led to very different and contradictory results. As highlighted by Dustmann and Glitz (2011), the measure of change in labor supply due to immigration is a very important input for calculating correlations between the growth of the immigrant population and the change of native average wages or employment across labor markets. The measure that should be used is the change in foreign-born workers (or hours worked) divided by the total *initial* labor force (or total hours worked). This variable captures the labor supply change in a local market due to immigrants in percentage points of the reference labor force. Often the literature following the traditional approach uses the *change in the immigrant share* of the labor force. That measure combines changes in immigrant and in native employment, building into the explanatory variable potentially spurious correlations with native wage and native employment changes. Card and Peri (2016) show that the specification with immigrants as the share of labor force can be strongly biased and should be avoided.

Another issue of contention is the reliance of existing estimates on shocks occurring within a given age-education-countries of origin subgroup (cell). Yet, in reality many tertiary educated immigrants work in occupations filled by natives with secondary or lower education levels. As studied by Dustmann, Frattini, and Preston (2013), this phenomenon, known as ‘occupational downgrading’²² can seriously bias the wage and employment effects of immigration on techniques that assign the change in labour supply induced by migrants to groups with similar levels of education and experience, and then exploit variation in the relative density of immigrants across those skill groups. This pre-allocation of immigrants according to their *observed* skills places them at different locations across the native wage distribution from where one finds them in reality: a migrant with tertiary education is placed in the corresponding cell of people with tertiary education by assumption, though the migrant actually works in a job requiring only education. This pre-allocation by cell may be problematic when estimation is based on differences between time periods, as only recent arrivals will affect estimates. When migrants are allocated to skill

²² Friedberg (2001) and Eckstein and Weiss (2004) study directly the type of jobs immigrant workers perform after arrival, using data for Israel. They find substantial occupational downgrading of Russian immigrants who arrived in Israel in the 1990s. While these immigrants worked in Russia predominantly as engineers, managers, physicians and teachers, their most important occupations in Israel turned out to be occupations such as service workers, locksmiths/welders, and housemaids. However, over time, particularly highly educated immigrants climb up the occupational ladder. Eckstein and Weiss (2004) show that the proportion of highly-educated immigrants working in high-paid professional occupations rises from about 30 percent at arrival to about 70 percent twenty years later, compared to an increase from 60 percent to 80 percent for equally-educated natives over the same time interval.

groups according to their *actual* position in the native wage distribution rather than the pre-allocation based on their educational attainment it is possible to obtain unbiased estimates of the wage effects of immigration across the entire distribution of native wages.

The use of alternative approaches in the analysis of migration, and the resulting set of results pointing to very different policy interventions, suggest that it has become critical to develop a unified approach combining the insights of both approaches in a single theoretical model that can be empirically tested. In that respect, the model should include the substantive developments in determining causality using cross-sectional and panel data that have occurred over the past two decades. In that regard, a targeted call to review existing knowledge on direct and indirect effects of migration flows across education levels with the aim of generating a unified theoretical framework and the preferred applied methodologies is needed.

4.2.4 Effects on the receiving country

4.2.4.1 *Effects on the labour market*

A constant preoccupation of the migration literature has been measuring the labour market effects of migration, and principally on native workers' wages. The literature generally finds small effects under both the traditional and new approach.

In the case of the traditional approach the controversy is still alive (Card, 1990; Altonji and Card, 1991; Butcher and Card, 1991; Borjas et al., 1997; Card, 2001; Borjas, 2003; Dustmann et al., 2005; Manacorda et al., 2006; Ottaviano and Peri, 2008 and 2012; Dustmann et al., 2008; and Glitz, 2011). For example, Borjas (2003) finds that immigrants significantly harm native wages in the US, while the effect in Card (2009) is minimal and positive in Ottaviano and Peri (2012). At the origin of the empirical controversy is the source of variation used to measure the effect of migration, which identifies effects that are not comparable among them²³ (Dustmann et al., 2016).

²³ Some studies use variation in immigrant inflows across education-experience groups (or 'cells') at the national level, measuring the effect of immigration of one cell relative to another. Others use variation in the total immigrant inflow across regions within the country, measuring the overall effect of immigration. Finally, some others use variation in immigrant flows both across regions and education-experience groups, measuring the effect of immigration on one experience group versus another within education groups. A fundamental problem of cells-based studies is the assumption that natives do not respond to additional labour supply from immigrants, or respond

In the case of the new approach, the change in the relative supply of productive skills brought by immigrants results in native workers tending to move towards complementary tasks. The adjustment may involve additional educational investments or choosing different areas of study. However, it mostly takes place as native workers respond to immigration by moving towards occupations that specialize in abilities complementary to those of immigrants. This response, together with the change in relative wages, accentuates the complementarity between foreign and native labour, reducing further the competition between immigrants and natives of similar educational levels (Peri and Sparber, 2009 and 2011; D'Amuri and Peri, 2010; Amuedo-Dorantes and de la Rica, 2011; Steinhardt, 2011; Røed and Schøne, 2012; Diette and Uwaifo Oyelere, 2012; Foged and Peri, 2016). Studies in the new approach find that immigration has no or positive effects on natives' labour market outcomes.

Immigration may also generate productive externalities, either via the creation of new productive knowledge especially in science and engineering, (Kerr and Lincoln, 2010; Hunt and Gauthier-Loiselle, 2010; Peri, Shih, and Sparber, 2015), or contribution to economic activity in urban centres via agglomeration (Moretti 2004a, b; Iranzo and Peri, 2009; Moretti and Thulin, 2013; Ciccone and Hall, 1996) and more efficient labor markets (Ellison, Glaeser, and Kerr, 2010; Greenstone, Hornbeck, and Moretti, 2010; Chassamboulli and Palivos, 2014).

4.2.4.2 Effects on growth

Highly educated labour generates new productive knowledge, technology and more efficient organizations of resources. There is evidence of a positive causal relationship between the agglomeration of highly skilled individuals, especially with a scientific, engineering and technological background, and economic growth. For example, Moser et al. (2011) show how Jewish scientists seeking refuge from Nazi Germany at the beginning of the 20th century were responsible for a significant growth in US patenting activity in several fields. An influential study by Hunt and Gauthier-Loiselle (2010) finds that the large number of immigrants with science and engineering degrees in the U.S. adds significantly to the number of patents granted: a 1 percentage point increase in the immigrant college graduates' population accordingly leads to an increase in patents per capita by 9 to 18 percent. Hunt (2011) and Kerr and

in the same fashion across all skill groups, which later empirical literature does not support. If natives across the various cells can respond differently, the only approach that generates meaningful estimates is the one based on regional variation in immigration rates.

Lincoln (2010) find complementary evidence regarding immigrants' contribution to general productivity-increasing activities such as patenting, publishing and company start-ups. These findings support the stance, common in the immigration policies of several high-income destination countries, to actively compete to attract highly skilled foreign labour. Over the past 20 years, the migration rate of highly skilled labour has been as much as 5 times that of migrants without university education, bypassing the growth rate of international trade (Freeman, 2010; Docquier and Rapoport, 2012).

The literature has also highlighted that the generation of new productive knowledge is favoured when highly skilled labour operates in a creative environment, as is the case when different cultures mix (Sassen, 1991; Florida, 2002), or when there are opportunities to interact (Dowrick and Tani, 2011). Ethnic diversity per se seems to generate productivity benefits (Audretsch and Feldman, 1996, Glitz, 2014, Suedekum et al., 2014, Trax et al., 2015), especially if diversity implies that no immigrant group constitutes the "majority" in a given region and immigrants do not segregate into enclaves. As found by Akay, Constant, Giulietti and Guzi (2015), in such case migrants communicate using the language of the host country. This contributes to increased economic interactions between natives and immigrants, and promotes the emergence of reciprocal spillovers: immigrants enjoy higher job opportunities; natives access a more diverse set of skills, consumption goods, and networks.

Besides solving the inherent dichotomy in the approach used to measure the effect of a flow of immigrant, research on the effects of migration in the host country could expand evidence of long-term effects. While most policy discussions seem to cater for short-term needs, it is increasingly important to balance out the existing evidence with effects spanning the course of migrants' working lives. This type of research is nowadays possible thanks to detailed longitudinal dataset covering multiple generations, as in the case of Germany's GSOEP.

4.2.5 Effects on country of origin

Against the traditional view that emigration generates a net loss for the sending country, especially if emigrants are highly skilled (Bhagwati and Hamada, 1974), recent work takes a more nuanced view of the effects of emigration especially with respect to skill accumulation (Stark et al., 1997, Vidal, 1998, and Beine et al., 2001). This revision emerges from several studies finding a positive feedback between emigration and investment in education. For example, emigrants typically redistribute some of the migration surplus they capture to family members left in the country of origin by means of remittances,

which are used for educational investments that would otherwise be impossible due to a lack of available funds and credit constraints (Rapoport and Docquier, 2006; Piracha and Vadean, 2013).

It has also been shown that the possibility of migrating in future also generates incentives to invest in further education in the home country. While higher returns to education in the host country have a negative direct effect on the home country's skill base by inducing skilled emigration, it encourages human-capital formation in the longer-run. Mountford (1997) shows that this can potentially be beneficial for the country of origin ("beneficial brain drain"), as long as there is a non-zero probability of actually migrating in future. In a series of empirical studies, Beine et al. (2001, 2008, and 2010) assess the possibility of a beneficial brain drain using both cross-sectional and panel data for a large set of developing countries, finding that higher emigration rates seems indeed to have a positive effect on average human capital levels in the countries of origin.

If emigration is selective, as is the case when emigrants are predominantly highly educated, emigration may affect the skill acquisition in the origin country by changing the returns to education of the remaining skill base. The emigration of highly skilled people reduces the relative supply of high-skilled workers in the home country, and this in turn leads to an increase in skilled workers' wage rates and enrollments in tertiary institutions.

Furthermore, emigration and return migration may increase the productive human capital stock in the sending country when a large proportion of migrants leave only temporarily and those returning have accumulated human capital during their stay abroad (Dustmann et al, 2011). Empirical evidence suggests however that return migration of high-skilled workers – in particular the most educated such as PhD recipients – is limited.

Compared with the literature focusing on the country of destination, research is much scarcer on the effects of migration on the country of origin. Particularly scarce are studies addressing public policy questions about the benefits enjoyed by educational institutions in the home country following the emigration of highly educated individuals. These are nevertheless necessary to motivate and maintain investing in these infrastructures over time.

4.3 The effects of other migration flows on education

4.3.1 The second generation

As highlighted by Dustmann and Glitz (2011), immigrants remain in the host country for a considerable amount of time, their children are likely to spend a large fraction or possibly their entire childhood in the host country, going through its educational system and making educational decisions along the way. These decisions have wider consequences for the performance of the second generation of immigrants in both host and home country in the case of return migration, as well as the host country at large, via immigrants' impact on the fiscal balance (Storesletten, 2000; and Algan et al., 2010b) or their integration prospects (Constant and Zimmermann, 2008). The literature focusing on migrants' children tends to find a strong relationship between their outcomes and their parents'. For example, Algan et al. (2010) shows that after some initial convergence, immigrant groups starting with the biggest disadvantage relative to natives in the first generation continue to be the most disadvantaged in the second generation. Card et al. (2000) and Borjas (2006b) show that native-born children of immigrants can expect to close only between 50 and 60 percent of the gap in relative earnings experienced by their fathers' generation. Card et al. (2000) also estimate the correlation in the years of education between parents and children to be in the range of 0.41-0.47. Dustmann and Glitz (2011) obtain similar figures for a sample of immigrant groups in France, Germany and the UK. These intergenerational correlations suggest that the linkages between immigrants and their native-born children tend to work through educational choices.

Migrant children's educational choices seem to have repercussions on the educational choices of natives. For example, Betts and Fairlie (2003) find that for every four immigrants who arrive in public high schools, one native student switches to a private school, and that this "native flight" is particularly pronounced among white native students and in response to the arrival of non-English speaking immigrant children. Gould et al. (2009) show that the presence of immigrants during elementary school has a negative long-term effect on the probability of passing the high school matriculation exam in Israel, which enables students to attend college. In contrast, Neymotin (2009) finds that immigration into the US (namely California and Texas) does not negatively affect the SAT-scores of native high school students.

Evidence discussed in the case of Australia in Section 5 also suggests that migration has important intergenerational effects. The literature is placing increasing attention on the performance and outcomes of migrants' second generation to assess the relative influence of institutional settings and culture. Work

in this area will become more important especially for the increasing number of displaced and asylum seeking families resulting from unrest and wars in several parts of the Middle East and Africa.

4.3.2 International students

Some countries have specialized in the production of education, transforming this service in a successful export industry. Educational services are among the top export industries in several countries, including the US, the UK, and Australia. They are generally viewed as having a positive impact on the host country economy. As a result, international student flows are generally uncapped.

The desire to acquire skills that have a high return in the country of origin is an important reason for migrating, as is the desire to gain qualifications that the host country values in assessing a subsequent application for permanent migration. Dustmann and Glitz (2011) show that foreign students constitute a significant fraction of the student population, with their share often exceeding 10 percent, for the 10 largest immigrant-receiving countries in the OECD. Foreign students are the fastest-growing group of migrants, contributing to making tertiary education services a sector of significant growth for jobs. There seems to be a link between student and subsequent permanent migration, supporting the hypothesis that host countries are moving towards ‘two-step migration’. Namely, facilitating an on-shore period of temporary migration, often as a student gains qualifications and work experience, prior to assessing applications for permanent residence. There is a growing literature on international students and their effects on home and host countries. Dreher and Poutvaara (2010) find that an increase in the number of students by 10% increases immigration to the United States by about 1%, implying that student flows result in a significant addition of highly qualified people for the host country.

There is a growing literature focusing on the effects of foreign students on natives’ performance. The findings are however mixed. Brunello et al. (2013) and Hardoy and Schöne (2013) suggest that foreign students have a negative influence on natives’ schooling performance. In contrast, Hunt (2016) and McHenry (2015) find the opposite: migration raises natives’ completion rates.

With reference to tertiary education Borjas (2007) warns that admitting foreign students to doctoral programs has a negative effect on the earnings of native doctoral recipients in the corresponding field: a 10 percent increase in the supply of doctorates in a specific field reduces earnings of competing workers by 3-4 percent, half of which is due to a shift towards lower-paid postdoctoral appointments. In contrast, Orrenius and Zavodny (2015) find no effect of crowding out. Hunt (2011) and Hunt and Gauthier-Loiselle (2010) also find that international PhD students contribute disproportionately to US patenting

activity, and to employment via new start-ups.

The existing debate on the role of international students on native students suffers from similar methodological issues characterising the debate on the effects of migration on natives' labour market outcomes. As part of future research priorities, it is increasingly relevant to address the methodological issues underpinning empirical work in order to devote more attention to the findings and the potential policy implications. As several host countries have experienced substantial changes in their attitudes towards attracting foreign students it is nowadays possible to understand the causal effect of such inflow (e.g. Kato and Sparber, 2013) and their consequences. Research using experimental evidence may also prove highly relevant to determine causal effects of changing flows of international students, and the sensitivity of their choices to changes in their information set.

5 Australia's immigration policy

Australia's approach has evolved into one that is highly utilitarian, emphasizing specific skills that can be used immediately by domestic employers and contribute to public finances. As a result, not only does it adjust the cap of the annual intake of immigrants according to the state of the economy, but it also streams prospective immigrants through a pre-assessment of their skills and work experience using an online Expression of Interest form. Skills must be on a skilled occupations list set by a government agency. The highest-ranked candidates are invited to submit a formal application where (young) age, good English proficiency, and formal education at the time of the invitation (rather than when completing the Expression of Interest form) receive broadly similar weights.

5.1 Background to current immigration policy

Australia formally ended a migration policy based on ethnicity ('white Australia policy') in 1972, replacing it with a focus on internal economic conditions. Eliminating racial discrimination from

immigration selection resulted in higher volumes of applicants and refugees from non-European countries and consequently higher stocks of immigrants with non-English speaking background (NESB)²⁴.

In 1996, a new government began a series of reforms affecting all immigration streams aside from political refugees. The reforms abolished social security benefits to new immigrants in the first two years after their arrival, passed to immigrants the cost of accessing the Adult Migrant English Program and attending specialist labour market programs (in this case after securing work), allocated the highest point weighting to ‘employability’²⁵ and outsourced pre-migration qualification screening to professional bodies. As from 1 July 1999, the minimum number of points set for migrants who had applied through the Concessional Family and Skilled Independent visa streams was substantially raised²⁶. The restrictions resulted in tougher conditions to earn points towards the minimum required to be eligible for migration and intended to favour migrants with skills immediately usable in Australia’s labour market. These included higher language proficiency requirements, occupational skills, education and younger age. This

²⁴ Two major trends have characterised Australia’s immigration policy between 1972 and the early 1990s. One is the development of systematically selective immigration policies based on the needs of domestic employers. It started with the introduction of the Numerical Multifactor Assessment System (NUMAS) (1979-1982), which selected immigrants on the basis of family ties and occupational and language skills, and continued with the introduction of a points test system in 1988, which was set annually. The minimum pass mark to be eligible for migration reflected the educational qualifications, work experience, age and English language proficiency of the potential immigrant. Extra points could be gained if the applicant was qualified to work in one of the occupations listed in a Priority Occupation List, which summarized employers’ views and recent recruitment difficulties.

The other trend in Australia’s immigration policy is the development of publicly-funded activities aimed at facilitating the active participation of immigrants, especially those with non-English-speaking backgrounds (NESB), in Australia’s economic life. These were accompanied by instruments and targeted data collections to study migrants’ economic performance (e.g. the Longitudinal Survey of Immigrants to Australia). Thus NESB immigrants were provided with financial incentives to attend English language courses to make them more employable in Australia (Adult Migrant English Program - AMEP); private sector employers were encouraged to adopt Equal Opportunity principles towards NESB immigrants; and specialist labour market programs were implemented to prepare NESB professionals for mandatory entry exams in a range of traditionally ‘closed’ professions such as medicine, engineering and nursing (Hawthorne, 2005).

²⁵ Age-related points for applicants over the age of 45 were abolished while bonus points were awarded to those with relevant Australian or international professional work experience, a job offer, a spouse meeting the skill application criteria, an Australian sponsor who had to provide a guarantee, and carrying \$A100,000 or more in capital.

²⁶ There are three broad visa categories of entrants to Australia: (1) independent skills, family concessional and employer nomination schemes, (2) family reunification, and (3) refugee/humanitarian. Only independent skills and family concessional are tested through the point system. See Richardson *et al* (2004), Green *et al* (2007).

policy change did not apply to the Humanitarian, Family Preferential, Business and Employer Nomination streams.

Over the past decade, Australia has intensified its preference for Business and Employer Nomination applicants among visa categories, and moved to a two-step immigration process where applicants tend to spend time in Australia as temporary immigrants with some working rights (for up to four years) prior to apply for permanent migration. As of December 2015 the population of temporary visa holders with some form of working right was about 10% of Australia's working population.

5.2 Rights to education

Migrants and refugees admitted to Australia have the same rights as natives, and this includes the ability to enroll in education at subsidised costs. Australia also provides a number of migration assistance and settlement support services related to education. The most important is the Adult Migrant English Program, started after the end of WW2, which is available to eligible migrants from the humanitarian, family and skilled visa streams and provides free English language courses for those who do not have functional English. Up to 510 hours of English language courses are provided in the first five years of settlement in Australia. A Settlement Grants Program provides funding to assist humanitarian entrants and migrants with low levels of English proficiency settling in rural and regional Australia to equip them to work or study as soon as possible after arrival. No other educational programme is currently being offered.

Against this openly inclusive and welcoming setting, refugees holding a Temporary Protection Visa (TPV) constitute a notable exception. The TPV category was reintroduced in Australia on 5 December 2014 for all people arriving without a prior valid visa, such as those arriving 'illegally' by boat or plane. This visa category allows temporary stay for a maximum of three years, after which time the protection claim must be reassessed. In contrast to the original TPV introduced during 1999-2008, the new policy restricts holders found in need of protection to apply for another temporary visa but not for permanent residence. As highlighted by the Refugee Council of Australia²⁷, TPV visa holders can work and have access to health services, income support and English language tuition but are not eligible for government-funded programs assisting students to finance university studies. Specifically, TPV holders

²⁷ <http://www.refugeecouncil.org.au/publications/recent-changes-australian-refugee-policy/>

receiving income support can keep such benefit only if they undertake a vocational course lasting up to 12 months geared towards better employment prospects. As a result, TPV refugees cannot receive income support if they pursue longer-lasting education, de facto limiting their incentives to access tertiary education.

6 How migration influences education: the Australian case

Education services represent Australia's third largest export, behind iron and coal and ahead of tourism. Many migrants come first to Australia as undergraduate or postgraduate students (Hugo, 2004; Baas, 2006; Hawthorne, 2010). Economic research on immigrants' influence on education is virtually non-existent. This reflects economists' recent general disinterest in Australia for immigration-related topics, partly motivated by the fact that immigrants' economic performance is above that of comparable Australians along several dimensions (Antecol et al, 2003). The influence of immigration on Australia's education is nowadays mostly confined to education policy debates about resourcing primary and secondary schools to improve the teaching of English among immigrant children, and, for tertiary education, teaching in a culturally diverse class.

With reference to mandatory schooling, the 2012 OECD's Programme for International Student Assessment (PISA) results reveal that immigrant children either born in Australia or abroad perform slightly better (about 2-3%) than their native counterparts, especially in mathematics and science (Thomson, De Bortoli, and Buckley, 2013). This result contrasts the experience of several other OECD countries. The same report however shows that immigrant children speaking a language other than English at home achieve slightly lower scores than those using English (about 2-3%), especially in science and literacy. This difference is generally seen as a determinant of economic and social disadvantage in later life, and underpins calls for additional resources to foster teaching English to non-English speaking children (Matthews, 2008; Woods, 2009; Lo Bianco and Freebody, 2001).

More muted, perhaps due to current political sensitivities reflecting negative attitudes towards unregulated inflows of asylum seekers experienced in the 2000s, is the topic of leveraging the bilingual background of immigrant children and children of the many multicultural families to strengthen Australia's economic ties with its most important non-English trading partners (Lo Bianco, 2009; Adoniou, 2017). Learning a foreign language is relatively novel in Australia, as the federal government


began funding the teaching of secondary languages in mandatory schooling only in June 1987, after adopting an explicit national language policy²⁸ (Lo Bianco, 2003).

With reference to higher education, teachers and administrators across Australian universities have been preoccupied throughout the 1990s for the large inflows of foreigner students from Asia, which followed dramatic reductions in public funding for Australia's tertiary sector. The fear was that a surge in international students from Asia could upset the teaching and learning dynamics operating in lecture and tutorial rooms, where students' interactions and participation are consolidated learning practice. As a result, a large predominantly qualitative literature focusing on teaching in ethnically or culturally diverse classrooms has developed, mostly focusing on Asian students, whose quiet in-class behaviour was a novelty in university classes. The literature responded to the challenge by analysing the learning characteristics of the new students, who were predominantly focused on 'achieving' outcomes by reproducing information (Biggs, 1996; Entwistle and Ramsden, 1983), in order to design teaching strategies that could exploit such learning features and turn them in desired learning behaviours (e.g. Samuelowicz, 1987; Ballard and Clanchy, 1997; Kember, 2000 and 2001). It then investigated the broader context in which students decide to learn, informing Australian teachers about the characteristics of Asian learners (e.g. Volet and Tan-Quigley, 1999; Cheng, 2000; Liu and Littlewood, 1997; Liu, 2002). Finally, it provided opportunities to exchange thoughts and strategies for both teachers and students via support groups, mentoring, and formal courses focused on ethics in research and plagiarism. This initial preoccupation has abated, in parallel with the rapid adoption of online and distance teaching across the university sector.

7 Conclusions

This paper has reviewed some aspects of the links between migration and education as requested by UNESCO, and highlighted potential priority areas for future research. The definitions of migration and the principal data sources were discussed, and the review focused in particular on studies of who migrates and the effect of migration on sending and receiving countries. Australia's approach to and experience of migration and education was also discussed.

²⁸ http://www.govtilr.org/Publications/ILR_papers01.htm



Three research priorities stand out. The first is the development of a unified theoretical and empirical approach to analyse the effects of migration flows, including by education levels, taking into account recent innovations in econometrics to identify causal effects, which can serve as a blueprint for future research.

The second priority is to undertake research focused on the long-term effects of migration (time horizon: 10-15 years). Most studies in the literature address predominantly short-term effects, and this bias may over-weigh resulting concerns in the policy debate. Long-term effects should not be confined to the migrant's private benefit from migrating but include intergenerational aspects concerning educational choices of the second generation, as well as social welfare implications about resources allocation in the education sector in both sending and receiving countries.

The third priority is a better understanding of the impediments that reduce the international transferability of human capital, and evidence of policy initiatives that can improve the returns to education acquired in a different country from that of residence. These could include identifiable policy changes, international collaborations among professional associations, and evidence collected through experiments on would-be migrants or prospective employers varying the amount and quality of information available to them and the channels mediating such information. Important but overlooked policy aspects of over-education include whether selecting migrants on observed educational achievement attracts the desired individuals with respect to target economic outcomes, and whether over-educated parents transmit educational preferences to their children, affecting the outcomes of the second generation.

Carrying out research in these three areas is feasible thanks to databases covering detailed information about households, like Germany's GSOEP and Australia's HILDA, and information collected by international organisations.

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8 Appendix 1 – Data Sources

8.1 United Nations

The United Nations collects data from national statistical offices. Its population division (department of economic and social affairs) offers several sources:

1. World Population Prospects²⁹: it provides information on the stock of migrant at 5-year intervals between 1950 and 2015 (World Population Prospects: The 2015 Revision, DVD Edition) for 232 countries, and growth projections up to 2100. Net migration flows are estimated from difference between rate of growth of overall population and natural population. This database provides information about the number of migrants by country of birth and destination, age group and gender;
2. International Migrant Stock - the 2015 Revision³⁰: it contains estimates of international migrant stocks by age, sex and origin for the period 1990-2015 measured at five-year intervals. This database contains separate estimates of the stock of refugees during 1990-2015;
3. International Migration Flows to and from Selected Countries – the 2015 Revision³¹: this dataset contains annual data on the total in- and out-flows of international migrants for 43 countries that gather this information systematically. Information is by citizenship, residence and birth, and it covers the period 1980-2013 (for some countries, like Australia and New Zealand only up to 2010);
4. Global Migration Database³² (UNGMD): currently being tested and not publicly available, it collects information on the number of international migrants by country of birth and citizenship, sex and age for more than 200 countries and territories around the world;
5. Migration Profiles Common Set of Indicators³³: it is developed by the Global Migration Group and sources data from 18 international agencies³⁴. The database provides common indicators

²⁹ <https://esa.un.org/unpd/wpp/>

³⁰ <http://www.un.org/en/development/desa/population/migration/data/estimates2/estimates15.shtml>

³¹ <http://www.un.org/en/development/desa/population/migration/data/empirical2/migrationflows.shtml>

³² <https://esa.un.org/unmigration/>

³³ <https://esa.un.org/unmigration/>

³⁴ As of January 2017, the GMG is comprised on 18 entities: Food and Agricultural Organization (FAO); International Labour Organization (ILO); International Organization for Migration (IOM); Office of the High Commissioner for Human Rights (OHCHR); United Nations Children's Fund (UNICEF); United Nations Conference on Trade and Development (UNCTAD); United Nations Department of Economic and Social Affairs (DESA); United Nations Development Programme (UNDP); United Nations Educational, Scientific and Cultural

related to international migration for more than 200 countries³⁵. For each country, indicators include the aggregate stock of migrants by age and gender at three points in time (1990, 2000, and 2013), and the top 5 countries of origin and destination for international migrants, refugees, and international students, respectively (data up to restricted to 2012 or 2013).

8.2 World Bank

The World Bank uses the UN data, but it has also developed 226 x 226 country matrices of bilateral migrant stocks at five-year intervals covering the period 1960-2000, disaggregated by gender and based primarily on the foreign-born concept³⁶ using consistent definitions and geographic boundaries, and filling missing data (Özden et al, 2011). The result is a consistent and complete set of origin–destination matrices of international migrant stocks.

8.3 Others

Some academics have also generated international migration data statistics to either improve international comparability while filling missing data. Abel and Sander (p. 1520) have constructed a set of global bilateral migration flows estimated from sequential stock data in 5-year intervals between 196 countries from 1990 through 2010. The bilateral flows are estimated from sequential stock tables, are comparable across countries and capture the number of people who changed their country of residence over five-year periods. As migration flow data are often incomplete and not comparable across nations, they estimate the number of movements by linking changes in migrant stock data over time using statistical missing data methods, therefore estimating the migrant flows that within a five-year period are required to meet differences in migrant stock totals. Country-specific net migration flows closely match the net migration estimates published by the United Nations.

Brücker, Capuano, and Marfouk (2013) have developed a database covering 20 OECD destination countries³⁷ for the period 1980-2010³⁸ adding migrants' educational achievement. Information covers the level of education (low, middle and high) of the stocks of native and immigrants from 195 countries of origin, by gender. Data are presented in 5-year intervals.

Organization (UNESCO); United Nations Entity for Gender Equality and the Empowerment of Women (UN Women); United Nations Institute for Training and Research (UNITAR); United Nations High Commissioner for Refugees (UNHCR); United Nations Office on Drugs and Crime (UNODC); United Nations Population Fund (UNFPA); United Nations Regional Commissions; United Nations University (UNU); World Bank (WB); World Health Organization (WHO).

³⁵ <http://www.globalmigrationgroup.org/content/data-and-research-data-sources>

³⁶ <http://data.worldbank.org/data-catalog/global-bilateral-migration-database>

³⁷ They are: Australia, Austria, Canada, Chile, Denmark, Finland, France, Germany, Greece, Ireland, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

³⁸ <http://www.iab.de/en/daten/iab-brain-drain-data.aspx#Sources>

Statistics from the OECD provide additional information on international migrants with respect to their labour force status, occupation, and main sector of activity.

8.4 Organisation for Economic Cooperation and Development (OECD)

International migration data collected by the OECD from its 35 member states (OECDStatistics³⁹) include several economic indicators in addition to demographic characteristics (age and gender), and the countries or regions of origin. They hence enable one to gauge the economic impact of international migration and draw comparisons with the native population, particularly with respect to labour market outcomes. These data also contain details on the type of migrants (whether temporary, seasonal, permanent, naturalised, refugees, international students) by country of birth or citizenship. The OECD maintains the following database on international migration:

1. International Migration Database: it contains annual data for the period 1975 (for the US, for most other member states is from the early 1980s) up to 2015 covering the stock as well as the gross in- and outflows of either foreign population or workers by nationality or country of birth. It also contains information on the gross inflows of refugees and those acquiring the nationality of the country of destination, by nationality.
2. Database on Immigrants in OECD Countries (DIOC)⁴⁰: it contains cross tabulations based on the year 2000 on the stocks of immigrants by nationality and:
 - a. age and level of education grouped by ISCED 0-2, 3-4, and 5-6;
 - b. occupation grouped by ISCO 1;
 - c. education, gender, and duration of stay grouped as <5, 5-10 and 10+ years;
 - d. education, labour force status, gender, and field of study;
 - e. education, gender, and sector of employment;

As of January 2017, OECDStatistics provides time series for the period 2000-2015 on (i) employment, unemployment and participation rates by gender and place of birth; and (ii) employment rates by level of education and place of birth.


It also provides information on the stock of international students by country of origin, gender, level of education in which they are enrolled and field of study for the years 2013 and 2014. This information is collected in the annual publication Education at a Glance⁴¹.

Migration-specific data are also available through the annual International Migration Outlook publication, formerly known as SOPEMI Report, which is available online from 1997 to 2016. The 2016 edition

³⁹ <http://stats.oecd.org/?lang=en#>

⁴⁰ <http://www.oecd.org/migration/mig/40136955.pdf>

⁴¹ <http://www.oecd.org/edu/education-at-a-glance-19991487.htm>



includes 2015 data covering stocks and flows of migrants by origin and destination, gender and age group as well as labour force status and level of education, albeit only as percentages rather than in absolute value. Since 2005 this publication includes information on international migrants based on the type of permit held rather than the length of stay (see Lemaître, 2005).

Published data on the stock of international migrants by age group, gender, and level of education is available through the publication *Connecting with Emigrants*⁴². This publication was completed in 2011 and so the most recent information covers up to the year 201

⁴² http://www.keepeek.com/Digital-Asset-Management/oecd/social-issues-migration-health/connecting-with-emigrants_9789264239845-en#.WHiERGXP5_U#page430