High skilled migration through the lens of policy

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Abstract

High skilled migrants and the policies designed to attract and select such individuals are widely championed. In formulating and evaluating such policies, however, policy makers and academics alike face significant challenges, since, from the perspective of policy, what it means to be high skilled remains a fluid concept. The resulting ambiguity stymies meaningful international comparisons of the mobility of skills, undermines the design and evaluation of immigration policies and hinders the measurement of human capital. In this paper, we adopt an inductive approach to examine how high skilled migrants are classified based upon states' unilateral immigration policies, thereby highlighting the difficulties of comparing high skilled policies across countries. We further elucidate the challenges in measuring the outcomes of high skilled migration policies that arise due to differing national priorities in recording high skilled migrants. We conclude by making a number of policy recommendations, which if enacted, would bring clarity to scholars and policy makers alike in terms of being able to meaningfully compare the composition, and assess the efficacy of, high skilled migration policies across countries. In doing so we introduce three datasets comprising: harmonised high skill migration flow data, skilled occupational concordances and high skilled unilateral and bilateral migration policy data, which undergird our analysis and that can be built upon in years to come.

Keywords: skill, human capital, international migration, migration policy

1. Introduction

If indeed we live in the Age of Migration (Castles, De Haas and Miller 2014), then the last two decades or so might best be described as an era of 'high-skilled migration'. As states

increasingly implement *selective* policies (de Haas, Natter and Vezzoli 2014)—reflecting a growing consensus that human capital is integral to economic development—the world has witnessed a meteoric rise in the numbers of tertiary-educated international migrants, which rose to 35 million in 2010, a rise of 70 per cent on the previous decade (Arslan et al. 2014). In the current 'migration crisis', the discussion of who is a 'desirable' migrant has been elevated in public awareness and among policy-makers. Given this current emphasis, it is important for both policy makers and academics to understand what drives high skilled migration, the ways in which the human capital of high skilled migrants can feed into host state economies and the barriers that may impede either of these.

While discussion amongst academics and policy makers has largely revolved around how to attract, select for and capitalize on skilled migrants, there is a more fundamental issue that has yet to be properly acknowledged. Simply put, there is no consensus as to what it means to be 'high skilled'. Although this lack of consensus has been widely noted (Salt 1997; Mahroum 2000: 24; Lowell and Findlay 2001; Milio et al. 2012; Rajan 2015), no authors have sufficiently explored the implications of this omission, in terms of which populations may be wrongly included or excluded within particular definitions. We summarise current approaches in Table A.1, in order to highlight this failure to engage with the issue.

A variety of implicit and explicit definitions of skill have emerged from different contexts, with education, occupational class and income being the most commonplace. Within academia and amongst bureaucrats who endeavour to track the movement or impact of high-skilled migrants, education provides the most popular definition of high skill. This is especially true within quantitative analyses that aim to assess the impact of migration policies. In more descriptive studies, education is often combined with occupational class to capture the high skilled. Meanwhile, occupational class alone is used occasionally, while income is rarely used. Moreover, each of these three measures has been operationalised in very different ways, meaning that even within the same measure, usage is inconsistent. Some researchers distinguish between education obtained in host and origin countries, for example, whereas others do not. Such discrepancies in approaches to capture what it means to be skilled proliferate, but are rarely acknowledged by researchers and authorities more determined to draw clear conclusions than to quibble over definitions, which might influence such conclusions.

To make matters worse, within the actual migration policies of states, an entirely different set of definitions of what it means to be skilled hold sway. Whilst researchers have been primarily concerned with formulating definitions of skill that allow them to identify skilled migrants as a distinct statistical population, policy makers have been driven by a desire to attract migrants who are seen as contributing to economic growth, or other national goals. These differing motivations lead both groups to conceptualise skill in different ways. Indeed, in most policy regimes, definitions of skill are largely implicit—where migration policies select for a range of characteristics, without necessarily being based on an overarching definition of high skill. Yet, at the same time, these implicit definitions used in policy are often more closely linked to questions of migrants' economic and social value, than those measures used by researchers.

Debating definitions of skill may seem trivial, but the consequences of the status quo are serious. Moving between different definitions of skill, we lack the ability to connect policy with research, or indeed, even to meaningfully compare findings between different research

studies. Meanwhile, states strive to identify and privilege migrants of demonstrable value, but remain inconsistent in how this value is implicitly or explicitly defined, leading to the mis-targeting of policy and difficulties in evaluating outcomes.

This article seeks to present an analysis of the prevailing issues in defining high-skilled migration, while simultaneously clarifying their implications for research and policy-making. We identify discordances within three domains: the implicit notions of skill contained within different state policies; framings of skill in terms of education, income or occupation, favoured by researchers; and finally definitions of skill, largely in terms of occupation, used by national and international institutions. Following this, we suggest various ways to overcome these discordances and provide a number of datasets for public use as means of directly addressing the issues we raise. While we acknowledge that these may only be a first step in overcoming the challenges we highlight, we believe they can generate insights leading to a superior categorisation of high-skilled migrants in the future.

2. How do states operationalise their high-skilled migration policies?

In this section we examine how different national governments define 'high skill' implicitly through policy. In doing so, we reveal that what it means to be highly skilled varies widely across the globe and is typically defined in relation to national strategies for growth and development and to the particularities of market demand. In this regard, approaches defining high skill on the basis of predetermined measures of human capital, such as education or income, fail to provide adequate insight into who the highly skilled truly are, and what motivates them to move. The conceptual notions of 'high skill' used in most studies, do not derive from states' own systems of selecting for migrants, but presume a correspondence between markers such as post-secondary education or particular occupational sets and the desires of markets and governments, without making the empirical case for such a correspondence. These conceptualisations are likely to be limited in their capacity to explain or shape global migration today.

By defining 'high skill' inductively, through looking at characteristics selected in policy, we take a novel approach presenting two distinct advantages.[1] First, it defines the highly skilled on the basis of migrants' characteristics at the time of migration, thereby countering concerns of slippage between those that have responded to policy incentives, on one hand, and the pool of migrants within a state possessing particular markers of human capital, on the other (Jasso, Rosenzweig and Smith 1998). Secondly, such an approach focuses upon those migrant characteristics actually selected by policy, rather than starting with an a priori conception of skill; meaning it more closely captures the actual value of skilled migrants to particular states, rather than presuming generic terms of value beforehand. In turn, this allows for comparisons between those worker attributes targeted by migration policy and those attributes that form the basis of academic and regulatory notions of skill as discussed below.

The following section is based upon an analysis of high-skilled migration policies, implemented within 19 OECD states, over timespans ranging between 17–47 years, based on the availability of legal data.[2] Policy data were obtained from the texts of laws, annual SOPEMI reports (OECD 1974–2014), analysis of the UC Davis 'Migration News' data base (UC Davis 1994–2014), national government websites and resources that provide information to would-be migrants. The full, referenced dataset of migration policies discussed here can be found in the online appendix to this article. As Shachar (2006) notes, attracting highly skilled migrants has led to a dynamic of attempting to mirror policies of successful countries whilst seeking to create unique incentives (see also Papademetriou and O'Neil 2004). Common patterns have therefore emerged, which we analyse below.[3]

2.1 Primary modes of entry

Most countries permit immigrants' entry across their borders contingent upon passing a points-based test, or else having secured a job offer. These primary modes of selection map roughly onto the distinction made by Bertoli et al. (2009) and Chaloff and Lemaître (2009), between 'immigrant-driven' and 'employer-driven' systems—or what has otherwise been termed 'supply' or 'demand' driven systems. The former admit all immigrants who meet particular criteria, while the latter admit immigrants only in response to labour market shortages. Points-based systems, however, are rarely wholly supply-driven, nor are job-offer systems wholly demand driven, as both systems typically incorporate additional requirements. Points-test systems can incorporate demand-driven logics and vice versa. Hence, while the supply/demand driven lens is a useful heuristic, it is necessary to delve into the constituent elements of states' immigration policies in more detail in order to understand their impacts on particular groups.

2.2 Points-based systems

Points-based assessments have long been the primary means for granting migrants entry in Australia, Canada and New Zealand. Originating in Canada in 1967 they have more recently been adopted by the Czech Republic (2003), the UK (2002, although substantially reformed in 2008), Denmark (2008) and Japan (2012). In the UK and Japan the points test is not the primary route of entry since they constitute secondary requirements for those already having secured a job offer. Most points-based systems strive to capture a multi-dimensional notion of human capital, typically allocating points along five dimensions: current national demand for particular skills; education level; professional experience (or previous earnings); age; and integration costs (i.e. language ability and previous in-country work-experience). National demand for particular skills is typically expressed in shortage lists. While only Australia makes passing its points-based test contingent upon having a shortage-listed job, Canada, New Zealand and Denmark all have points tests that award points for shortage-listed professions.

Points awarded for education, experience and age, strive to capture a general and more flexible notion of human capital un-tied to a specific role, such that, in most cases, sufficient points across these dimensions may substitute for having a concrete job offer (or else an in-demand profession). The award of points for age represents an attempt to balance

rewarding experience and selecting younger migrants who are more likely to contribute to host countries over greater time horizons. Those in their late-20s to early-30s are awarded the most points, which illustrate the principle of balance between potential and experience.

The final common dimension of value represents attempts to offset integration costs of migration: personally for the migrant, economically in terms of transition costs involved in adapting to the new workplace, and politically in terms of native's attitudes towards immigration. Points are assigned for: being able to converse effectively in the national language, having in-country family members, having studied in the host country and previous in-country (or indeed in-EU) work experience.

2.3 Job-offer systems

The second broad set of immigration policies instead make immigration contingent upon a job offer, thereby constructing a more tautological definition of high-skilled, i.e. those able to meet labour shortages. Job offers alone, however, are rarely sufficient. Instead, they are coupled with a range of secondary requirements which aim to positively discriminate in favour of high-value migrants including: passing a labour-market test, being employed in shortage-listed (entry-categories-listed) occupations, passing a further points-based assessment, having a minimum salary, or holding minimum qualifications.

2.4 Labour market tests

The most common secondary requirement, labour-market tests, typically involve public advertisements to ascertain whether domestic workers are available to work in positions that migrants might otherwise fill. Although their popularity has waned in recent years, they nevertheless constitute the main secondary requirement in Finland, Israel, Poland, Slovakia, Sweden, Switzerland and the USA; while also playing important roles in Germany, Japan, Portugal and the UK. When a labour market test is the main qualifying factor, the *de facto* definition of a 'desirable migrant' is an individual able to redress domestic labour shortages. Labour market tests thus frame migrants' value in terms of satiating short-to-medium term demand, as opposed to attracting human capital with a longer-term view to economic growth (Bertoli et al. 2009); such that immigrants' value-added might ultimately be low given the preferential treatment of native labour. Labour market tests—and thus these stipulations—vary according to their stringency, however. Switzerland, for example, requires both an EU-wide advertisement to be placed for a significant length of time, in addition to allowing trade unions to weigh-in on, and even block, non-EU hires.

2.5 Shortage lists

Substituting for, or indeed complementing, labour-market tests, states variously restrict job-offer holders' entry based on a shortage list or else a set of profession-specific entry categories. Shortage lists enable governments to classify what it means to be highly skilled beyond tautological definitions based on market demand, thereby incorporating particular priorities or values that are not necessarily expressed by prevailing market forces. In Australia, for example, shortage lists tend to include both professions deemed economically

valued as well as those thought to be socially valuable. This approach reflects an attempt to mediate between competing social and economic priorities, while facilitating long-term planning within migration policy; although, as the rhetoric around Australia's immigration debate reflects, longer-term plans are occasionally undermined in favour of short-term political gains.

2.6 Qualifications and earning power

The final supplementary criterion implemented in conjunction with the job offer primary-mode-of-entry (for high-skilled workers), are tests of qualifications or earning power. In Norway and Germany, migration is generally only open to those with undergraduate degrees, or higher-level vocational or professional qualifications. There is a requirement that those admitted into the foreign specialist/skilled-migrant routes to earn double or between three-to-four-times the national average income in Israel and Romania respectively. In Finland, where labour migration is only open to the highly skilled, either a higher qualification or an 'above average' salary are taken as indicators of skill, in which case, qualifications or earnings are taken as proxies for high levels of human capital.

2.7 Demand- vs. supply-driven systems

Points-based systems encapsulate the broadest concept of 'high-skilled', combining various dimensions of skill, such as qualifications or salary, alongside more general measures of human capital, such as linguistic or cultural ability. They may also, however, incorporate considerations of immediate-term economic benefits. This makes them broadly, though not exclusively, supply-driven, in that they primarily envision and evaluate skilled migrants as human capital capable of expanding future economic possibilities. In contrast, demand-driven systems prioritise present economic needs and instead aim to respond to short-term skill shortages, thereby framing skilled migration in terms of renewable short-term stays, contingent upon persistent demand. Bertoli et al. (2009) note that this orientation towards different economic horizons, short or long, will impact upon which selection criteria are privileged within points tests. Meanwhile, arguing in favour of supply-oriented systems, Boeri (2012) note that migration policy is only able to meaningfully attract and capitalise upon human capital—thus addressing economic challenges—when oriented towards the longer-term.

If a key goal of high skilled migration policy is to spur economic growth, then what emerge are two differing approaches to do so. Most national systems combine policies that encapsulate both orientations. What is essential is that the time horizons match the mode of growth in order for migrants' value to be realised. Demand-oriented policies that encourage indefinite, single-employer employment, fail to respond both to changing skill levels of the domestic population and to reassess if migrants skills may be better utilised elsewhere. Meanwhile, supply-oriented policies may fail to provide migrants with adequate time or support to identify market opportunities and adapt their human capital to the host context. They assess the value of migrants at a single point in time therefore likely resulting in migrants being undervalued.

Arguably, the range of common selection criteria reviewed above do not select only for skill. In particular, many criteria appear to select for migrants with *needed* skills[4] rather than for migrants possessing a *high* level of skill according to a particular definition. Our intention here is not to conflate these two categories, but rather to note that states themselves very often do so, under the broad banner of 'skilled migration policies'. Demand driven policies that select *needed* skills and supply-driven policies that select *high* skill, are often enacted within the same laws and policy initiatives. Likewise, migrants entering under skilled work-visas will most often need to demonstrate that they possess both *needed* and *high* skills. It is not that states are incapable of valuing the human capital of migrants in its own right, but rather that this valuation is typically tempered with considerations of short-term market needs and outcomes. As such, scholarly images of high-skilled migrants, which have focused on those markers of high skill typical only of supply-driven policies (education, profession, previous income etc.) risk being overly abstract, creating and analysing an image of high-skilled migrants that states themselves do not see or value in isolation from demand-driven considerations.

2.8 Internal and international contradictions

When looking inductively at how policy systems conceptualise skill, we can not only identify tensions between overarching policy approaches and scholarly definitions, as above, but also *within* the policy systems of particular states or *between* multiple states. Here we discuss: intra-state contradictions between restrictive and permissive policies; inter-state differences between different defections of skill; and general contradictions between the objectives of policymakers vs. the kind of data collected by statistics bureaus.

All policy regimes go some way to balance competing priorities and objectives, broadly between permissiveness and restrictiveness, but within any given national policy system, tensions exist between individual policy components. Given these tensions, states often end up implementing policies that have opposing effects on the same migrant group. As Joppke (2007a,b) notes, these tensions may not always be unintentional. Rather, states must mediate between a range of different demands put forward by different actors and may intentionally pursue somewhat incoherent policy systems as a response. Tellingly, many countries, while recognising the economic need for immigration, have simultaneously denied that they are 'countries of immigration'—which has often been linked to a failure to attract sufficient levels of desired talent (Lowell 2005).

The liberalisation of entry and stay conditions serves to increase a country's proportion of highly educated or high-earning migrants (Bertoli et al. 2009; Kocharov 2011). Incoherent or restrictive policies do not, however, necessarily translate into a lack of (skilled) migration (Mayda 2010), as regimes often offer loopholes or alternative entry channels through which the same migrants may enter the host country. Yet what results is nonetheless a failure to define a 'desirable' migrant as a clear object of law. In each country, bespoke highly skilled migration policies are conflated with broader immigration policies. For instance, skilled migrants may be granted special provisions for expedited entry, but not for long-term stay, or else for stay but not for family reunification rights. Thus policy systems may be giving on the one hand while taking on the other, effectively counteracting incentives with disincentives elsewhere. From a research standpoint, this adds considerable

difficulty to any attempt to unpack a state's migration priorities, and assess policy efficacy. From a policy standpoint, such incoherence may undermine any attempt to attract migrants, by rendering policy systems incomprehensible, preventing them from being seen as either incentives or disincentives. For both research and policy, it thus becomes difficult to evaluate the impact of a specific law when it exists within a broader policy system that may work to undermine, curtail or amplify its efficacy from the start.

Meanwhile, similar inconsistencies apply internationally, between states. While some dimensions of human capital, such as linguistic ability, are measured in internationally standardized ways—i.e. IELTS and TOEFL tests for English—other dimensions such as the recognition of educational or vocational qualifications or industry experience, remain more *ad hoc*. Still other dimensions, used as proxy variables for human and cultural capital, such as family ties or relevant work experience, remain hard to verify. Labour market tests, salary thresholds and shortage occupation lists are all used as different proxy measures of market demand. As noted above, however, each of these conceptualises the demand for labour in different ways and over different time horizons.

These differences in the way skill is measured across countries impede the effective international comparison of policy. Driven by a global 'competition' for talent (Shachar 2006; Basri and Box 2008), states are increasingly investing in comparatively assessing the efficacy of different skilled-migration policies and in mimicking 'best practice'. Yet with so much discordance in terms of how the high-skilled are conceptualised both within and between different national policy regimes, this comparative exercise becomes nearly impossible. For example, it would appear that South Korea has been moderately successful in attracting skilled migrants, until it becomes apparent that their policies have selected primarily for foreign-language teachers and (most likely 'adult') entertainment workers (Park 2013). Often the policies of other states are replicated elsewhere, without an underlying assessment as to whether they've been effective in attracting skilled migrants, and if so why? This can be seen, for example, in the adoption of points tests by Japan and the UK, without incorporating the long-term-oriented provisions that have made them successful in Canada and the Antipodes. Indeed, the few internationally comparative studies that do exist have had to do significant work to harmonise between the ways in which different national regimes define and record skilled migrants, limiting the ability to conduct such studies.

Finally, although evidence suggests that supply-driven systems are more effective in attracting skilled migrants (Czaika and Parsons 2017) the fact that demand-driven systems, contingent upon job offers, are more prevalent is telling. This suggests that most countries prioritise immediate economic value-added above more abstract conceptualizations of the 'human capital' of migrants (Basri and Box 2008; Bertoli et al. 2009; Chaloff and Lemaître 2009). Within academic and institutional studies, however, it is education, not market demand which is most commonly used as the metric for whether migrants possess valuable skills. Moreover, even in supply-driven systems, education is only considered as one particular measure of human capital amongst many. This suggests that most conceptualisations of skill used in research do not reflect the actual priorities of states, and that there is a gap between the priorities of governmental policy makers and the data-gathering systems they may rely on. While researchers do acknowledge different definitions of skill as an issue, this acknowledgement is always limited to the differences between education,

occupational-class and income as frameworks. What our analysis suggests is that an even larger gap exists between the definitions favoured by researchers, and those implicit within policy.

Meanwhile, from both research and policy standpoints, preferences for short-term, demand-driven policies suggest it makes less sense to evaluate if such countries are successful in attracting high-skilled migrants—defined in broader human-capital terms. This is because such policy regimes are ostensibly less concerned about capitalising on the human capital of migrants. Some states even take measures to actively limit migrants' human capital by restricting their entry, tying them to employers or simply imposing undesirable conditions on their stay—such as an inability to attain permanency.

3. How are the skills of immigrants measured and recorded?

The difficulties with assessing the impact of skilled-migration policies are not constrained to the challenges in 'reading' the intent of national migration policy systems. Indeed, both national governments and the international community have put considerable effort into tracking the movements of highly skilled individuals. At this level of observation, we encounter a second set of challenges, where discrepancies in whether and how immigrants' skill levels are recorded create further difficulties. Destination countries have tended *not* to record the characteristics of arriving immigrants, or at least not in particularly detailed ways—even those upon which entry was granted. This has resulted in challenges for both general research and in evaluating the efficacy of policies, regardless of whether policies are directly comparable. In this sub-section, we focus on the ways in which countries *do* record the skills of arriving immigrants and we reveal the discrepancies between prominent methods.

Migrants' skill levels are typically recorded according to one of three definitions based upon their level of formal education; occupation; or salary level; as opposed to cognitive or soft skills that no doubt constitute pivotal elements in individual's overall capabilities and success. The education level of migrants is the most readily available international statistic by which international migrants may have their skill level recorded (Salt 1997). It is thus seemingly by default that this measure of high-skilled mobility proves ubiquitous throughout academia, and especially within quantitative analyses. The difference between these measures is usually reduced to questions of methodology, in terms of which provides the most useful or accessible data. Yet there are important conceptual and quantitative differences between these.

Conceptually, not unlike the difference between demand- and supply-driven migration policies, the difference between education, occupation and income likewise capture different notions of human capital, fungible across different time horizons. Education levels represent the total *potential* of the prevailing human capital stock, whether or not this is being capitalised on, while measures of income represent the *currently used* human capital stock, by measuring the extent to which immigrants are rewarded. Measures of occupation may represent either, depending upon whether past or current occupation is being

measured. Academics and policy makers alike often treat such measures as interchangeable, but they differ both in terms of the populations they actually capture and in the ways they understand human capital as a resource with regard to time.

3.1 Numerical disparities

Beyond conceptual discrepancies, each of these three measures can be shown to pertain to distinct populations, creating issues for empirical analyses. Large differences arise when recording high skilled migration depending upon which definition of skill is used, such that how high-skilled migrants are recorded proves crucial in terms of evaluating policy effectiveness. The following analysis is based on data from the 2015 American Community Survey (see Ruggles et al. 2010). Our analysis includes all immigrants, as identified by their country of birth, of working age (18–64) and in the labour force that arrived in the United States within the last year.

Figure 1 examines the correlations between the three main definitions, plotting, by sub-major occupational category (2-digit)—as identified in the US Standard Occupational Classification (SOC)—the log of wages on the Y-axis and educational attainment of immigrants in the USA on the X-axis. The positive correlation between education and income is evident; on average, better educated immigrants earn higher wages. In terms of the SOC, there is a high-degree of correlation between individuals working in the upper tier, according to the one-digit classification and advanced levels of education—which collectively constitute a definition of highly skilled (Chiswick and Taengnoi 2007)—and those on the highest salaries; since these professions constitute all of the upper-right occupations in Fig. 1. It is no surprise therefore that occupations falling within these categories often feature prominently in destination country occupation lists.

Despite these discernible correlations, it is important to emphasise that different populations will be identified as 'highly skilled' depending upon which definition is prioritised, such that it is crucial to evaluate policy across countries using harmonised data. This is demonstrated in Fig. 2a and 2b, which show the population overlap between different skilled groupings for recently arrived immigrants, and comparable natives respectively – those who possess at least one year of tertiary education, those who work in an occupation in the upper tier of the SOC, and those who earn a salary of at least $100,000.

Both natives and recently arrived immigrants reflect the same overall pattern. Education is by far the most common definition of high skill, since 91 per cent of natives and 97 per cent of immigrants are deemed highly skilled by education level. Thirty-two per cent and 47 per cent of natives and immigrants respectively are deemed highly skilled by both education and occupation, meaning that 48 per cent and 37 per cent of native and immigrants are defined as highly skilled purely on the basis of education; such that these individuals do not work in occupations commensurate with their level of education, nor in jobs that pay high incomes. Notably only 8 per cent of natives and 10 per cent of immigrants can be termed high skilled according to all three definitions.

Despite these differences, researchers' choice of measure has largely tended to be guided by the availability of data. The education level of migrants is therefore the most readily available international statistic by which international migrants may have their skill level
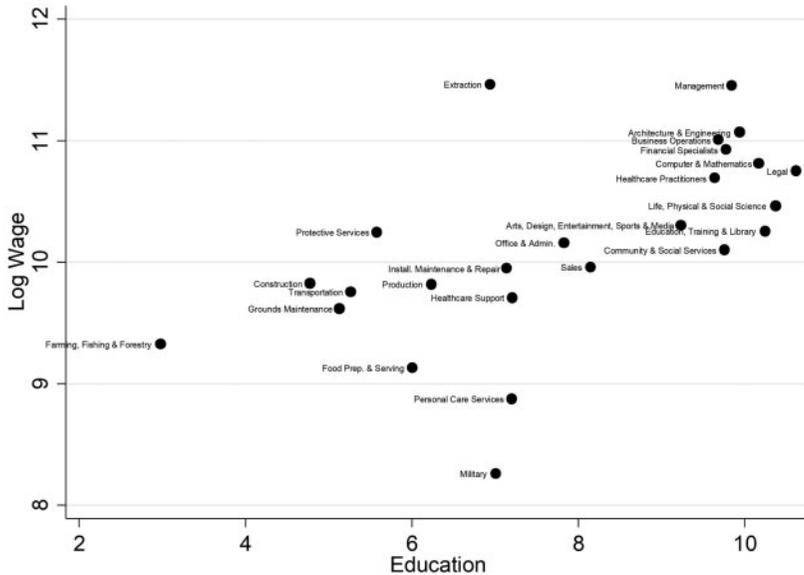
Figure 1. Correlation between earnings as measured by log wages, educational attainment as measured by a categorical variable that is measured from 1 'Nursery school to grade 4' to 11 '5+ years of college' and occupations at the 2-digit level recorded according to the U.S. Standard Occupational Classification. Source: American Community Survey 2015.

recorded (Salt 1997). In turn this availability has resulted in education becoming the most common measure used in academic studies of high-skilled mobility (for example Docquier and Marfouk (2006), Docquier, Lowell, and Marfouk (2009), Arslan et al. (2104) and Artuç et al. (2015)) and Fig. 2a and 2b provide one strong justification in support of their use. Fig. 2a and 2b further highlight that should immigration policies prioritise income only, potentially 87 per cent of otherwise classified HS migrants may be omitted, while if occupation is relied upon in isolation then potentially 53 per cent of otherwise classified high skilled migrants could be omitted.

3.2 Comparing measurements of education, occupation and income

Although many researchers consider tertiary education to be relatively comparable across countries, most employers and government authorities that facilitate migration allow entry based on their own assessment of the value of qualifications obtained in origin countries. For example, Filipinos need to have amassed two years of higher education at home in order to *enter* higher education in Denmark.[5] It matters where migrants receive their education, often in terms of both the country and the specific institution from which a qualification was earned. This points to yet another gap between the notion of skill measured and analysed by academics, and that actually rewarded by states. And, indeed, similar gaps exist between different occupational classification systems across countries, where
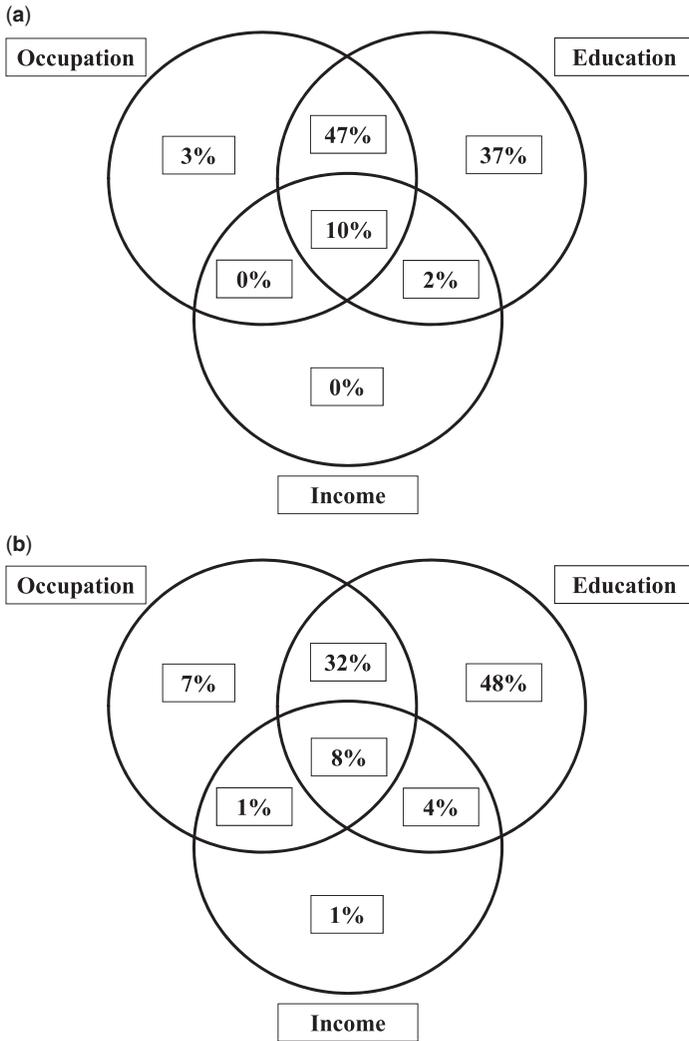
(a)

(b)

Figure 2. (a and b) The proportions of recently arrived migrants - those that arrived within the last year - and natives, respectively, which are recorded as highly skilled according to one or more definitions. Individuals are deemed highly skilled if they possess at least one year of tertiary education, are employed in in an occupation in the upper tier of the U.S. Standard Occupational Classification or earn a salary of at least $100,000. Source: American Community Survey 2015.

occupations falling within skilled categories (such as professional or managerial brackets) within one system do not in others. To some extent the same applies between the ways income is measured in brackets. In each case these gaps hinder both inter-state

comparisons and longitudinal analyses. Income-based measures also suffer from not having a baseline measurement at the time of migration, in part because such data are rarely collected but also because comparing the level of 'reward' represented by different incomes in different countries is a challenging task. This omission makes it difficult to ascertain whether those commanding high incomes were those who moved as skilled migrants, or those who built up their human capital once having migrated.

Education- and income-based measures pose additional challenges: Gaps between migrants' human capital and the ways in which this is represented within particular measures also impinge upon migrants' entry into various labour markets. Evidence suggests that well-educated migrants may ultimately fill unskilled positions, or similarly be employed in positions that do not necessarily pertain to their field of education, resulting in lost productivity or the potential output of migrants, a so-called 'brain waste' (Mattoo, Neagu and Özden 2008). Such brain waste effects, if prevalent, pose opposing problems for education and income-based measures. Education-based measures fail to connect closely to labour market outcomes, failing to account for short-term brain waste, and the longer term devaluation of migrants' qualifications based on changes in technology and knowledge. Meanwhile, income-based measures capture labour market outcomes, but do not provide any indication of latent human capital which may be going to 'waste'. Given that such measures are often collected by different statistical authorities (typically immigration versus labour), it is often difficult to identify where in the income distribution those with higher qualifications have ended up.

The difficulties of recording and measuring skills and the discordances that arise from different measurements of skills are not limited to the migration literature, but are relevant for the labour literature more generally. Most studies on natives in the labour market have also defined skills in terms of formal educational qualifications despite the limitations of education as an indicator—for example, skills are also learned on the job, the benefits of education are heterogeneous (some people gain more out of formal education than others) and the benefits of education depreciate over time. In the labour literature, discrepancies between different measurements of skills are particularly relevant for studies trying to establish whether a skills mismatch exists in the labour market, i.e. whether workers are overqualified or underqualified in the positions they fill (Green and McIntosh 2007; Desjardins and Rubenson 2011; Flisi et al. 2014; Van der Velden and Bijlsma 2016; Pellizzari and Fichen 2017). Although this definitional discordance affects our knowledge of both native and migrant workforces, differing national priorities, reflected in targeted immigration policies, provide a further complication to the measurement of skills among migrant workers.

3.3 National priorities as foundations for occupational nomenclatures

Whether to avoid the complications and limitations surrounding educational framings of high-skill—because they are more interested in particular occupations than in an overall notion of high skill/human capital, or simply because there are well-established internationally applicable classification systems—a number of researchers, as well as (inter)national authorities, have sought to classify skilled migrants on the basis of occupation. In contrast to education, this approach has the advantage of eschewing abstract

categorizations, in favour of focusing upon a level of analysis more closely related to the demand for skilled migrants. Similarly, it allows for a more granular look at labour-market requirements as opposed to measures based upon income. Yet there are significant limitations to the ability to compare individuals recorded as working in the same occupations across countries. The following analysis is based upon a longitudinal analysis of national occupational nomenclatures across 12 OECD countries.[6]

3.4 International standards

Historically, national occupational classifications tended to reflect social strata, but thanks to the wider promotion of international standards, such lists now focus upon the nature of specific work as opposed to worker characteristics. The International Standard Classification of Occupations (ISCO), first developed by the International Labour Organization in 1957, was reviewed three times prior to the current version that was published in 2008. In ISCO, occupations are grouped together based on a two-dimensional concept of skill. Skill level measures the complexity and range of tasks performed. Meanwhile, skill *specialisation* defines the field of knowledge required—for example, the range of tools or machinery used, the materials worked with and the variety of goods and services produced (Elias 1997). Skill level therefore reflects the amount of formal training and education a job requires, whereas skill specialisation reflects the type of work performed.

3.5 Who are classified as occupationally high-skilled?

The ISCO-08 nomenclature comprises four levels, each of which corresponds to a unique number with the equivalent number of digits. At the most aggregate, i.e. the 1-digit level, 10 major groups are identified: (1) legislators, senior officials and managers; (2) professionals; (3) technicians and associate professionals; (4) clerks; (5) service workers and shop and market sales workers; (6) skilled agricultural and fishery workers; (7) handicraft and related workers; (8) plant and machine operators and assemblers; (9) elementary occupations; and (10) armed forces. These 1-digit major groups comprise 43 (2-digit) sub-major groups, 130 (3-digit) minor groups and 436 (4-digit) unit groups. The two-dimensional concept of skill is applied at *alternating* levels, such that the major and minor groups are organised according to skill *level*, whereas the sub-major and unit groups are organised according to skill *specialisation*.

Each of the 10 major (1-digit) groups corresponds to one (or two) of four education levels set out by the International Standard Classification of Education (ISCED) namely: primary (1), secondary (2), university or tertiary (3) and graduate education (4), as shown in Table 1, thereby providing a link between the education and occupational definitions of skill. The ISCED categories commensurate with the major groups *do not imply*, however, that the skills required for specific tasks and duties in a given job can only be acquired through formal education; since they may, and often are, acquired through informal training and experience (ILO 1990).

This was emphasised in the 1995 Canberra Manual on Human Resources in Science and Technology, a joint-initiative of the OECD and the European Commission, which draws

Table 1. Mapping of ISCO-08 major groups to skill levels

ISCO-08 major groups	Skill Level
1—Managers, senior officials and legislators	3 +4
2—Professionals	4
3—Technicians and associate professionals	3
4—Clerks	
5—Service and sales workers	
6—Skilled agricultural and fishery workers	2
7—Craft and related trades workers	
8—Plant and machine operators, and assemblers	
9—Elementary occupations	1
0—Military occupations	1 + 4

upon best national and international practice to develop a common definition of high-skilled workers in Science and Technology (S&T) across various national contexts. The Canberra Manual recognises two types of high-skilled workers, those having successfully completed university or tertiary education in an S&T field of study and those employed, but not formally qualified, in an S&T occupation in which such qualifications are normally required OECD/Eurostat 1995). Based upon these two principles, the Manual recommends that all occupations classified in ISCO major groups 2 (professionals) and 3 (technicians and associate professional) or in management sub-groups 122 (Production and operations department managers), 123 (Other department managers of which: 1,236 Computing services department managers) and 131 (General Managers) should be considered high skilled. The Canberra Manual remains the most popular attempt at producing a common definition of high-skilled workers based on the International Standard Classification of Occupations, but its narrow focus on S&T occupations disregards other highly skilled categories including businessmen, managers, teachers and healthcare providers.

3.6 National classifications of occupations

Although many countries have adopted ISCO's methodology, others have developed their own occupational classifications based on competing principles. We continue by exploring some of the divergences between national occupational classifications and ISCO, thereby highlighting how countries variously define their occupational nomenclatures based upon alternative national priorities.

The most recent edition of the US Standard Occupational Classification (SOC) was released in 2010 (SOC 2010) and uses as its guiding principle *work performed*. No difference is made between occupations based on skill level in the US. Israel's Standard Classification of Occupations (SCO 1994) is instead based upon *education level*. The main guiding principle for the SCO is the amount of *institutional training* required to fill a specific occupation, which is expressed in descending order of education down the major groups. If the

occupation involves several activities at varying skill levels, then it is ranked according to the activity at the *highest* skill level. The practice of classifying occupations at the highest skill level means therefore that workers are generously placed in more senior positions.

The Swiss occupational classification system (NSP 1990) classifies occupations into primary, secondary and tertiary sectors and within these categories occupations are stratified according to the *area of activity* or the economic branch to which they belong, which complicates differentiating between lower and more highly skilled workers and managers. In the Swiss NSP, it is the final product that is prioritised, such that no distinction is made between occupations based on the manufacturing process. High-skilled workers in the Swiss labour market are thus conceptualised based upon what they produce as opposed to how they produce it.

A final factor operationalised in national classifications, is the extent to which occupations rank in seniority. In the Canadian National Occupational Classification (NOC 2011) 'supervisors' for example, are assigned separate codes, because they plan and direct activities and have the authority to hire and fire workers. In the case of Australia and New Zealand, the Standard Classification of Occupations (for example, ANZSCO 2006), 'supervisors' are not assigned separate codes since individuals in these occupations often carry out the same tasks as the workers they oversee. Similarly, whereas ISCO separates Professionals (major group 2) from Associate Professionals (major group 3), in ANZSCO associates are placed alongside the professionals in their field.[7] This suggests that Australia and New Zealand assign greater importance to the area of specialisation relative to education or formal training.

National occupational classifications furnish us with insights as to which high-skilled characteristics are given more prominence within particular national contexts. Ultimately, the same worker may therefore potentially be considered high-skilled or not, depending upon which national classification framework is used. Policy makers and academics alike, therefore, need to be aware and consider these differences when formulating, evaluating and comparing high skilled migration policies, though again the evidence suggests that these discrepancies are typically overlooked.

4. Policy recommendations and conclusion

The situation we have outlined is a complex one. There are discrepancies between how lawmakers frame skill in terms of policy and how academics and national and international bureaucrats chose to. Within states there are gaps between policies that define skilled migrants in terms of demand and others which do so in terms of the (supply-side) human capital they present. There are also conflicts between policies designed to attract skilled migrants and those designed to limit net migration. Between states there are divergences between how seemingly-similar policies are operationalised and who they target, meaning that although states are eager to mimic what seems to be others' best practice, genuinely comparing policy is an enterprise fraught with difficulty. Meanwhile, for academics and bureaucrats there are clear differences between the three most frequently used definitions of skill, based on education, income and occupation. Within each of these three measures there are also gaps between how different state or inter-state bodies define and

measure them. And despite this long list, there is little acknowledgement of the challenges at hand.

In light of this, in this final section, we propose four practicable policy recommendations. The enactment of these recommendations would: collectively serve to provide more meaningful comparisons of high skilled policies between countries; facilitate better assessments of and therefore more adequately formulated and implemented immigration policies; allow more accurate mappings of human capital mobility and, perhaps above all; serve to better inform current and potential migrants in their decision making. Accompanying our four recommendations, we provide an online Appendix comprising three new datasets that were collated in preparation for the current work. Each dataset serves to illustrate a specific policy recommendation, while providing useful foundations for future research.

4.1 Policy systems

Given the frequent contradictions between and within the migration policies that nation states simultaneously implement, high skilled or otherwise, it makes greater sense to conceptualise them not as cohesive bodies of policy but as *policy systems*; a set of policy elements, which collectively provide differing and changing incentives to various types of immigrants over time.

Existing academic studies that have pioneered econometric approaches to analyse the effects of migration policies typically adopt singular measures when assessing the efficacy of nations' immigration policies, which begin at a value of zero in the first time period and which increase or decrease in value due to changes in policy stringency—i.e. they give a single score for the attractiveness of policy as a whole (e.g. Mayda 2010). These are more suited to analyse the overall effect of policies on aggregate immigration flows as opposed to their constituent components. Nevertheless, such approaches are complicated by trying to assign a unique value to a set of policies captured by a single variable, which variously affect different groups that constitute the aggregate flow in varying and unknown proportions. Such policy measures effectively capture the intensive margin of policy changes, but since it is unclear to which level such policy changes are anchored to, it is not possible to compare such measures between countries, only to do so within countries over time.

A more satisfying approach would instead disaggregate policy systems into constituent elements that differentially affect specific groups of migrants. This would be advantageous since the effects of different policies on distinct migrant groups could be meaningfully identified. This approach, by modelling various aspects of policy individually through, say, the imposition of dummy variables, could therefore capture the extensive margin of high skilled policies, which would be comparable across countries and over time; and indeed could additionally capture the intensive margin of policy should the stringency of constituent elements of policy be captured in sufficient detail. In particular, we have argued for the value of separating out policies with demand-orientations from those with supply-orientations.

A particularly crucial advance in this regard is the ambitious International Law and Policy Analysis (IMPALA) project (see, for example, Beine et al. 2016). Under the auspices of the project, legal experts have been working to deconstruct immigration policy from legal texts (i.e. de jure rules) into many hundreds of binary or categorical variables based

upon various entry tracks available to would-be migrants. In turn these variables, the coding of which is typically based upon whether specific statements are in the affirmative or otherwise, can be variously aggregated up to form indices and/or track specific measures along an almost infinite number of dimensions. When completed it is certain that the resulting policy data will represent the Gold Standard in the literature for years to come.

Until then, we provide in an online Appendix a database of unilateral high skilled migration policy instruments for 19 OECD destination countries over the period 1966–2012, although the greatest coverage is the two decades leading up to 2012. In all, the database details 23 individual policy instruments that collectively capture many key dimensions of policy systems.

Given the prevalence of demand-driven policies amongst states, however, we also suggest that researchers pay closer attention to measures of market demand in defining high skill. Many countries publish 'shortage lists' of in-demand professions. For others, wherever labour market tests are in place all migrants admitted are, in principle, there in order to fill labour shortages that cannot be addressed domestically. This makes it possible to evaluate how measures of demand correlate with other measures of skill, and assess whether those with higher education, higher income, or in particular occupational classifications are *actually* those being admitted under skilled-migration policy regimes. This remains an empirical question, but one we would suggest requires immediate attention.

4.2 Disaggregated and harmonised data

Moving from methodology to data, we repeat the call of Santo Tomas, Summers and Clemens (2009) for nation states to collect and publish greater amounts of more disaggregated data in ever greater detail, such that individuals can be more closely tracked in order to allow for migration polices to be evaluated on an equal basis.

Ideally all published data would adhere to international standards and definitions (see, for example, United Nations 1998), but at least for the time being more disaggregated migration data—on both stocks and flows—might at least provide sufficient scope for detailed, if laborious, harmonisations to be constructed. The development of frameworks for systematically collecting data within countries, and for releasing these in a timely manner, would also help researchers to feed more directly into contemporary policy concerns. International organisations, specifically the UNSD, UNPD, World Bank and the OECD have all played significant roles here to date, but given the fundamental coordination difficulties and the collective incentives for all countries to benefit from the improved data of other states, more constructive pressure from international organisations and final data users is needed in the years to come.

One potentially important starting point would be to focus on advancing the capacity of regional statistical agencies. Eurostat already attempts to collate comparable migration data from across the European Union, Afristat from across Francophone Africa, the Economic Commission for Latin America and the Caribbean for Central and South America and the Interstate Statistical Committee of the Commonwealth of Independent States from across the former Soviet Union. Strengthening these institutions makes all the more sense given that most international migration remains intra-regional (Özden et al. 2011). Thus countries, by teaming up with their regional neighbours when compiling data, would have access to data on a large fraction of their emigrants. Understanding a nation state's emigrant

population is crucial for understanding their net position when examining skill mobility. Moreover, since (migration) data collection is a time consuming, expensive and protracted process that often relies on contacting (and indeed the benevolence of) specific individuals within government agencies, economies of scale could also be realised when disseminating relevant migration statistics through regional agencies; thereby potentially reducing the financial costs and time taken for users to obtain such statistics.

It also matters which methodological tools (e.g. censuses, population registers and border statistics) are used to record high-skilled migrants, which in turn lend themselves to alternative analyses. Currently, the available migration data disaggregated by skill level all pertain to a stock definition, which provide nebulous snapshots at a particular point in time; as opposed to flow data which are preferable for appraising migration dynamics. Stock data nevertheless constitute the most appropriate sources for examining the global distribution of skills since despite differences in quality most countries conduct decennial censuses and pose questions regarding individuals' education levels. Education-focused definitions are typically not generally applicable to migration flows however, since migrant's education levels are rarely recorded in the sources used to record entries and exits. In the relatively rare cases that migrants' skills are in fact recorded at point of entry, this is typically in terms of occupations. Such data has the advantage both of relating immigrant arrivals to market demands and of providing a measure that can be used to assess host countries' human capital stocks more generally. Hence we would recommend the wider adoption of recording occupational data at the point of arrival.

4.3 Definition based on ISCO and Canberra Manual

In order for such occupational data to allow for the sort of international comparison that is needed to assess policy efficacy, the best solution would be for all countries to unanimously adopt a similar definition harmonised between countries and over time, with the ISCO representing the obvious candidate. Given international progress to date, however, this seems unlikely to happen in the near future. In the meantime academics need remain pragmatic—although cautious—utilising existing data to the greatest extent possible (Skeldon 2012).

Since countries tend to record migrants' occupations to a significant number of digits, one practical avenue for future research would be to obtain such national data and harmonise them to a standardised definition, the success of which would depend upon the level of detail obtained and the extent to which detailed occupational categories capture the same job across countries—which is presently unknown. The level of disaggregation of occupation data made available by national statistics authorities therefore remains key. The privacy policies that authorities implement to ensure that individuals cannot be identified from the raw data are also important, since these regulations govern the level of detail that institutions are willing to disseminate as well as the quantity of missing or redacted values in any data received.

Given existing efforts, one pragmatic definition to which data could be harmonised would be one based on the *Canberra Manual* that defines as high skilled those occupations comprising ISCO categories 2 and 3 and sub-categories 122 (production and operations department managers), 123 (other department managers of which 1,236 are computing

services department managers) and 131 (general managers). This approach benefits from recognising that an individual need not have formal qualifications to be a professional since one may have acquired experience on the job. Since the *Canberra Manual* specifically relates to S&T, however, a more all-encompassing definition might also consider the additional occupations in category 1: managers in 121 (business services and administration managers), 132 (manufacturing, mining, construction and distribution managers), 133 (information and communications technology managers, 134 (professional services managers), 141 (hospitality and restaurant managers) and 142 (retail and wholesale trade managers). In this, the *Canberra Manual* provides an especially valuable standard, in that it brings together occupational and educational criteria.

The advantage of studying skilled migrants based on occupation over education or income will depend upon the degree to which disaggregated occupational data identifies similar workers across countries; relative to the extent that data capturing immigrants' education level reflects workers of varying abilities. This difference remains difficult if not impossible to quantify, but given the large extent of heterogeneity in education provision both within and across countries, it is not unreasonable to assume that such a definition would certainly prove useful in particular contexts; not least when evaluating flow data by skill level, data which are typically not delineated by education.

To demonstrate our proposed methodology, we provide occupational concordances in our online Appendix, which can be used to aggregate detailed occupational data from six countries to a harmonised definition of skill based on ISCO08. We further provide a database of the resulting bilateral migration flow data delineated by skill level (high skilled or otherwise) for 10 destination countries and over 200 origin countries over the period 1978–2012, although the data set is most complete from the year 2000 onward.

4.4 The roles of bilateral and plurilateral agreements

Our final recommendation with regards being able to better evaluate the efficacy of high skilled migration policies is specifically in relation to agreements on the Recognition of Diplomas, which represent potentially powerful tools for countries to move towards a more harmonised conceptualisation of occupational classifications.

Bilateral agreements, which are typically market-demand-driven, focus upon cooperation between specific Governments on targeted areas of mutual assistance, in some cases even serving to promote the formulation, administration and implementation of migration policies (e.g. CEEC countries, OECD 2004). Agreements on the Recognition of Diplomas, which exist between several states worldwide, serve to acknowledge education acquired abroad as well as accrediting relevant work experience. In some cases, employer organisations further organise training programmes in sending countries, preparing migrants for employment in specific destinations—for example, the agreement between some regions of Italy and Romania, which provides vocational training to Romanians in the health sector (Connell 2010). Recognition of qualification agreements are commonly negotiated between professional organisations or associations and are increasingly plurilateral in nature. Collectively this means that although bilateral agreements have been shown to work to help bridge the gaps in legibility and underlying experience between different transnational qualification frameworks, the development of such frameworks has largely

been ad hoc. There has been discussion within regional bodies such as ASEAN to develop such frameworks more systematically and extensively (Martin and Abella 2014). We suggest such efforts should be extended more generally. At the same time, we suggest existing agreements provide researchers with a valuable indication of the equivalency, or lack thereof, between different educational qualifications.

While numerous bilateral agreements have been signed, globally they are underused and yet their potential has seldom been analysed. To this end, we provide in our online Appendix a new database of bilateral agreements, which covers 19 OECD destinations and comprises some 3,580 observations detailing nine different policy instruments.

5. Conclusion

High skilled migration continues to grow, both in the scale of movement and in terms of the emphasis placed upon it by governments internationally. Despite this, the formulation of high skilled migration policies and efforts at evaluating their efficacy are hindered by differing measurement and interpretations of what it means to be highly skilled. In this paper we have identified a range of discrepancies between different conceptualisations of skilled migration that typically have been overlooked. Moreover, we have attempted both to highlight the practical consequences of these gaps, both for scholars and for policy makers, and to propose a range of solutions.

We call for a more multi-dimensional conceptualisation of what it means to be highly skilled, both within research and policy. As our unpacking of national migration polices has shown, migration policies vary both in their intent and efficacy, both within and between countries. Migration policies often target a range of 'skilled' migrants on different bases, or else provide a broad conceptualization of 'skill', that allows for a varied range of migrants to enter under such policies. Focusing on the various ways in which migrants are selected for, over different time horizons, and towards different ends, will allow us to develop a much more utile concept of high skill. In contrast, continuing to define the highly skilled in broad and unspecific terms impedes our ability to study them and to design effective policy.

Supplementary data

Supplementary data is available at *Migration Studies* online.

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Notes

1. Studies looking at the relationships between policy goals and outcomes deliver a complimentary approach (e.g. Kocharov 2011).
2. Specifically: Australia, Canada, The Czech Republic, Denmark, Finland, Germany, Israel, Japan, South Korea, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Sweden, Switzerland, the USA and the United Kingdom.
3. The analysis in this paper is confined to long-term high skilled economic migrants in conventional employment, who form the primary target of most skilled migration policy. We therefore do not discuss the roles of students, intra-corporate transferees, investors nor entrepreneurs.
4. We are grateful to one of the anonymous reviewers of this piece for suggesting this phraseology.
5. See http://ufm.dk/en/education-and-institutions/recognition-and-transparency/find-assessments/entry-to-higher-education.
6. Namely: Australia, Canada, Israel, Japan, South Korea, New Zealand, Norway, Portugal, Sweden, Switzerland, the USA and the United Kingdom.
7. Unlike ANZSCO, the Australian Standard Classification of Occupations (ASCO, versions 1 and 2) mirroed ISCO since Associate Professionals and Technicians were not separated from Professionals.

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Table A.1. Approaches to defining migrants' skill

Author, article, and journal	Method	Definition of high skill	Mention of definitional challenges?	Solution
Regets 2001	Descriptive statistics/ Correlations	Education, + Occupation	No	
Bauer and Kunze 2004	IZA International Employer Survey 2000 (covering 4 countries)	Education + Occupation	No	
Lowell and Findlay 2001	Descriptive Statistics	Education	No	
Kofman 2000	Theoretical/ Conceptual	Occupation:Argues that a narrow focus on ICT occupations and transnational corporations, which, especially in their higher ranks, remain resolutely male-dominated means HS female migration is underestimated.	Yes	Conceptual: Pay more attention to the presence of migrants in welfare sectors (i.e. education, health and social services), which are strongly feminised.
Faini 2007	Descriptive + Regressions. Docquier and Marfouk dataset.	Education	No	
Mahroum 2000	Literature Review	Occupation (Canberra Manual):(i) Managers & Executives, (ii) Engineers and Technicians, (iii)	Yes.	Broad: Combining several classifications for example education

(continued)

Table A.1. Continued

Author, article, and journal	Method	Definition of high skill	Mention of definitional challenges?	Solution
		Academics and Scientists, (iv) Entrepreneurs, and (v) Students.		or qualification combined with occupation.
Nathan 2014	Literature Review (78 quantitative and qualitative studies)	Education + occupation:'High-skilled migrants' are usually defined in terms of formal qualifications (education to degree level or beyond). In other cases the focus is on occupations requiring advanced training (scientists, engineers, researchers and other professionals)'.	Mentions variety of definitions but not framed as a problem.	
Ryan and Mulholland 2014	In-depth interviews	Education +Occupation: The term 'highly skilled' covers a diverse group but the OECD and EuropeanCommission/Eurostat frameworks define them as those who have either successfully completed tertiary education and/or are employed in occupational roles normally requiring such qualifications.	No	
Salt 1997	Conceptual/descriptive	Occupation:corporate transferees; technicians/visiting'firemen'; professionals; project specialists; consultant specialists; private career	Yes	Broad: 'What is needed for analytical purposes is a typology which accommodates the diversity of the group, the

(continued)

Table A.1. Continued

Author, article, and journal	Method	Definition of high skill	Mention of definitional challenges?	Solution
		development and training movers; clergy and missionaries; entertainers, sportspeople and artists; business people and the independently wealthy; academics, including researchers and students, in institutions of higher education; military personnel; and possibly spouses and children of the above.		subcategories of which may have very different compositions and patterns of mobility'
Milio etal. 2012	Conceptual/descriptive	Occupation + Education	Yes	
Chaloff and Lemaître 2009	Conceptual/descriptive	Education + Occupation (ISCO)	Yes	Broad: Combine occupation, education and qualification.
Zaletel 2006	Descriptive/Policy Overview	Education + Occupation (Canberra Manual)	Yes	
Docquier and Marfouk 2004, 2006	Database of emigration stocks (OECD and Census data)	Education	No	
Mayda 2010	Descriptive + Regressions (OECD Data)	Income	No	