Geographies of educational mobilities: exploring the uneven flows of international students

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A growing number of individuals are choosing to study abroad although, like other manifestations of globalisation, the sources and destinations of these migratory flows are highly uneven. Within the context of ongoing debates about the motives for overseas study, the reproduction of class advantage, and countries' competitive advantage for internationally mobile students, this paper seeks to improve understanding of these variations. We situate international student mobilities within a theoretical framework which connects recent work in geography, emphasising the differentiation advantage derived from foreign study, with insights more commonly applied to labour migration which emphasise costs and benefits. Our findings, based on a statistical analysis of a large sample of country pairs, call into question the central importance commonly ascribed to countries' university quality in shaping the mobilities of international students. Far more influential is income in destination countries, together with relational ties created by colonial linkages, common language and pre-existing migrant stocks. Unique to the literature, we not only demonstrate important differences in the determinants of international student mobilities between developed and developing countries, but also between different sub-groupings of developing countries. Indeed, an important insight from our study is that it may be useful to move beyond binary classifications, and to deploy more refined country categorisations in seeking to understand contemporary corporeal mobilities.

KEY WORDS: education, international students, mobilities, migration, universities, quantitative analysis

Introduction

More and more students are choosing to study abroad. These migratory flows can be interpreted as constitutive of an internationalising geography of consumption, with individuals crossing borders to take advantage of services and other opportunities located outside of their own state territory (Hanson Thiem 2008; Waters *et al.* 2011). They are also bound up with a reconfiguration and rescaling of education, as universities transform themselves from providers of domestic public goods to export-oriented, entrepreneurial agents, increasingly catering to a private market of fee-paying international students (Olds 2007; Pandit 2009; Findlay 2010; Jöns and Hoyler 2013).

The internationalisation of education has stimulated a wide-ranging debate. Among others, this has touched on questions about the degree to which international student mobilities (ISMs) follow non-associational economic and other capital-enhancing opportunities available abroad (Waters *et al.* 2011), or whether they are more closely mapped onto existing social and other relational ties between particular countries (Collins 2008); how more globalised, marketised forms of education provision may be instrumental in reproducing advantage and disadvantage (Waters 2006; Findlay *et al.* 2011); and, from a policy perspective, the implications of countries' university quality for their competitive advantage in the market for internationally mobile students (Alberts 2007; Pandit 2009; *The Economist* 2010; Findlay 2010).

This paper engages with these debates by investigating the determinants of inflows and outflows of international students. Our contribution is fourfold. First, we provide a conceptual bridge between recent work in geography, which has primarily focused on the differentiation advantages derived from overseas study (e.g. Waters 2006), with more conventional accounts of labour migration (Mayda 2010), which have highlighted the costs and benefits which constrain and incentivise cross-border mobility. To this

end, patterns of student flows are theorised using a framework which models spatial decisions over international study as a function of both the benefits and costs of particular cross-border mobilities.

Second, we expand the geographic scope of the analysis, moving beyond the existing literature's predominant focus on ISMs from either developed or developing countries to developed economies (Agarwal and Winkler 1985; Lee and Tan 1984; Thissen and Ederveen 2006; van Bouwel and Veugelers 2010). Our sample is also significantly larger than the 64 sending/recipient countries featured in the network analysis of Chen and Barnett (2000) which, in common with the present study, makes use of UNESCO data. Indeed, the present research is unique in that it is the first to employ anything approaching a truly 'global' sample of both source and destination countries.

Third, we use quantitative techniques to explore not only whether particular attributes have an influence over patterns of student outflows and inflows, but also to evaluate their relative substantive importance. Of note, this allows us to address questions such as whether the quality of destination countries' tertiary education institutions exerts a greater influence over prospective students' spatial choices than, say, physical distance? Our quantitative approach also enables us to address an important gap in current understanding into whether the influence of these respective factors varies over space. In doing so, it provides an opportunity to contribute to debates about the extent to which usual geographic categories, such as the oft-used binary between developed and developing countries, remains relevant in understanding contemporary mobilities (Vanolo 2010; Sidaway 2012).

A final contribution is that we investigate two factors which have largely been ignored in the existing large sample, quantitative literature: pre-existing migrant stocks and political conditions. Both factors are of particular interest from a geographic perspective. Within the frame of relational geography, understanding the influence of migrant stocks helps to shed light on the role of social ties in the cross-border movement of people (Alberts 2007; Collins 2008). The study of political conditions, however, is revealing about the influence of contexual factors in shaping migratory patterns (Neumayer 2005).

Our results are instructive. We show that, despite the importance often ascribed to university quality in debates about countries' ability to attract foreign students (*The Economist* 2010), the number of domestic universities in international league tables has a comparatively small impact on country inflows. Considerably more influential are levels of income in destination countries, together with relational ties created by colonial linkages, common language and pre-existing migrant stocks. Unique to the literature, our findings not only reveal important differences in the determinants of ISMs between developed and

developing countries, but also between different sub-groupings of developing countries.

Mapping the uneven patterns of ISMs

While there is nothing new about cross-border student mobilities (Pandit 2009; Gürüz 2011), the number of individuals studying outside their country of origin has expanded significantly over recent decades. From 0.6 million in 1975, international student numbers grew to 1.3 million in 1990, more than doubling again to reach 3.4 million in 2009 (UNESCO 2011). Yet, as shown in Figures 1 and 2, like many manifestations of internationalisation, the origins and destinations of cross-border student flows are highly spatially uneven (Baláz and Williams 2004; Findlay 2010).

The largest dyadic (country-to-country) student flows reflect the dominance of certain countries as sources and recipients (Table 1). As of 2009, the predominant pattern, at least for the largest flows, is from developing countries (and especially the newly industrialising economy (NIE) sub-grouping) to developed ones (where, following the World Bank's classificatory scheme, we define developed countries as those above an income threshold of US$12 276 per capita in 2010). Taken together, developing to developed country flows accounted for 56% of the global total in 2009, while the equivalent figures for developing to developing and developed to developed country dyadic flows were 18.3% and 24.6%. Developed to developing country flows are minimal, representing just 0.9% of the global total. The NIEs, which we define here as Brazil, China, India, Malaysia, Mexico, Philippines, South Africa, Thailand and Turkey, accounted for almost 28% of international student outflows to developed countries and two-fifths of all outflows to any destination country in 2009. By comparison, the group of 35 least developed countries (LDCs) (defined, using the World Bank classification again, as countries below an income threshold of US$1005 per capita in 2010) accounted for only 4% and 6.6% of these flows, respectively.

In terms of recent temporal dynamics, the most striking trend has been the dramatic rise in the absolute number of international students originating in developing countries, and particularly China and India. Between 1999 and 2009, developing countries as a whole increased their global share of outgoing students from 54.8% to 69%. Turning to destination countries, developed economies have maintained their dominant position, with the most notable trend being the increasing importance of a number of rapidly industrialising economies (such as the Republic of Korea, Malaysia and South Africa) as recipients.

Previous contributions and their shortcomings

Within geography, a major emphasis of recent scholarship concerned with understanding ISMs has been
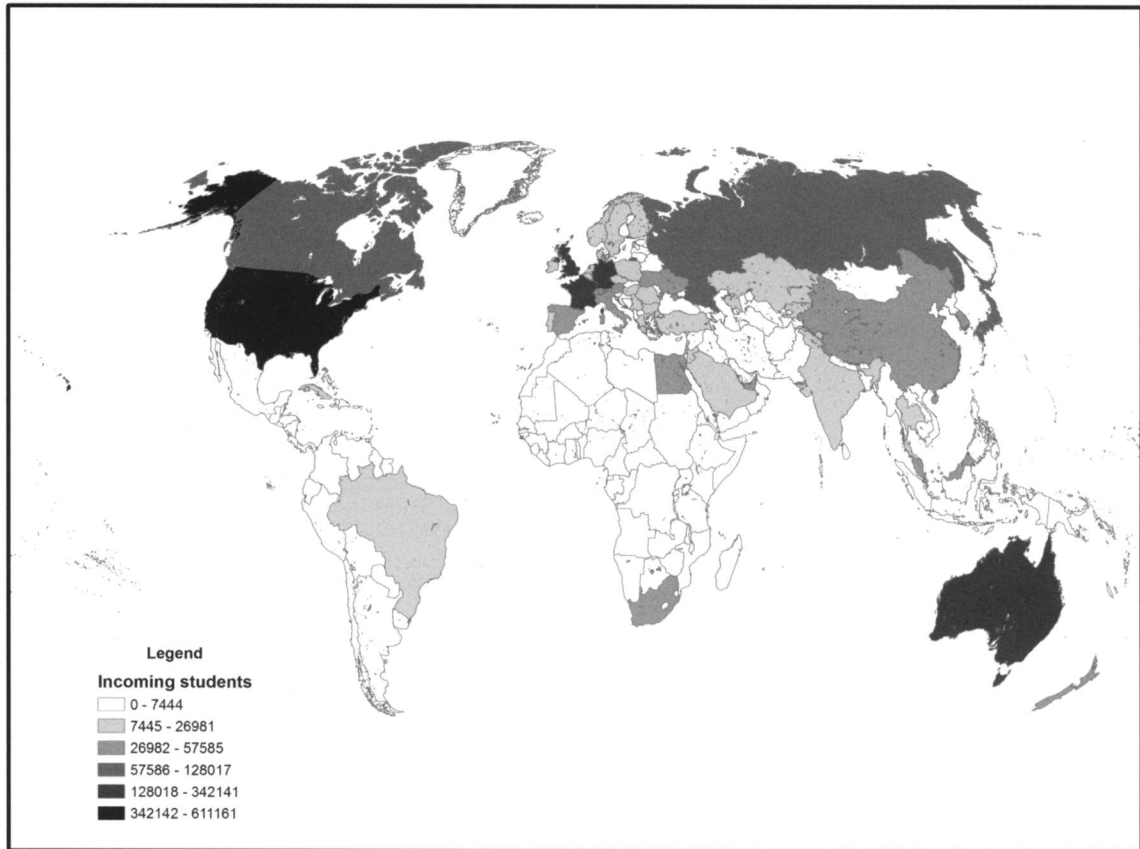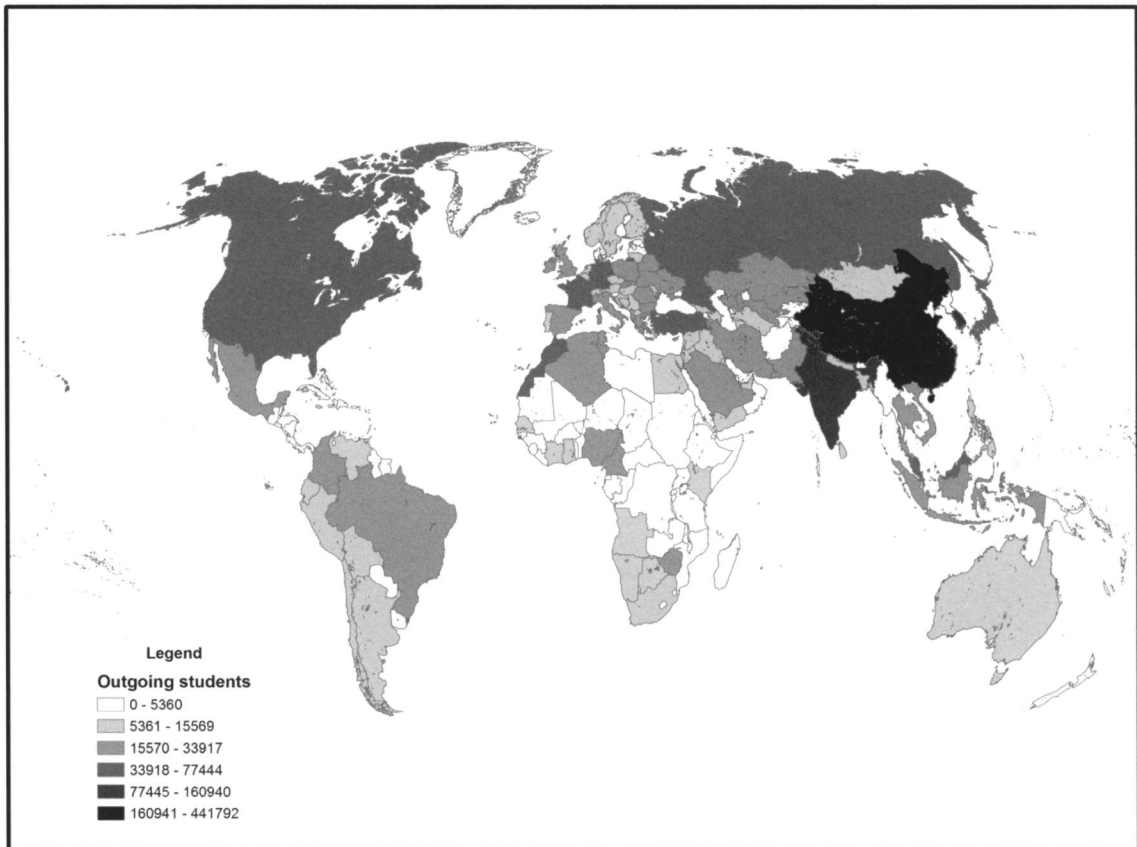
Figure 1 Number of incoming international students (2005–9 average)
Source: Authors based on data from UNESCO (2011)

on the motives for studying abroad (e.g. Hazen and Alberts 2006). A particular theme of this work has been how ISMs can be understood as constitutive of a spatial strategy whereby individuals seek to appropriate various forms of 'symbolic' and 'cultural' capital (Bourdieu 1994) in order to enhance their credentials, labour market prospects and earnings (Waters 2006). Moreover, rather than a one-off movement, it is suggested that ISM is often 'embedded in an individual's life-course aspirations and plans for mobility over the longer run' (Findlay *et al*. 2011, 127). Hence, the decision to study abroad may be linked to plans for post-graduation settlement or labour migration, with implications for potential students' locational choices (Hazen and Alberts 2006; Robertson 2011).

Another closely related theme to run through the recent literature is how more globalised forms of educational provision may be instrumental in (re-) producing various socio-spatial inequalities (Waters 2006). More specifically, by creating new opportunities for differentiation, study abroad may allow already privileged individuals to maintain their class status. Indeed, underpinned by neoliberal reforms and the prospect of increased revenue, it is suggested that these demand-side processes have gone hand in hand with supply-side ones to purposely expand higher educational provision for foreign students (Findlay 2010). Within this context, a growing number of universities (and national governments) have sought to market themselves to applicants from abroad, emphasising their elite credentials within an emerging, socially constructed global hierarchy of world-class institutions (Alberts 2007; Olds 2007; Pandit 2009).

Yet, despite the emphasis on differentiation through educational mobility, the recent literature in geography has made far less progress exploring the wider set of factors which constrain, enable and condition patterns of ISMs. To be fair, geographers have not ignored these outright, identifying several different motives, referents and relational dynamics shaping spatial choices. Amongst others, these include the desire to study at a well recognised university (Findlay *et al*. 2011), the ease of acquiring a visa (Alberts 2007) and relational ties created by transnational migrant

Figure 2 Number of outgoing international students (2005–9 average)
Source: Authors based on data from UNESCO (2011)

communities (Collins 2008). However, different
studies have tended to focus on different factors, as
well as typically focusing on a small number of dif-
ferent source (e.g. the UK) or destination (e.g. New
Zealand) countries. As a result, the literature leaves
unanswered questions about the relative importance
of particular attributes in shaping outward and inward
ISMs, and how these vary across different countries.

Previous larger sample studies outside of geography
similarly suffer from shortcomings. To begin with, they
have been based on comparatively small samples,
with highly variable geographic coverage. Early quan-
titative studies focused on single developed country
destinations (e.g. the USA), with samples of source
countries ranging from 15 for Agarwal and Winkler
(1985) to 103 for Lee and Tan (1984). Barnett and
Wu's (1995) and Chen and Barnett's (2000) work
expanded on these samples, respectively analysing
student flows between 50 and 64 countries, albeit
using network analysis and (fairly rudimentary) bivari-
ate correlation analysis. More recent studies which
have made use of multivariate econometric analysis

similar to the present study have analysed up to 18
(European) country pairs (van Bouwel and Veugelers
2010). Previous quantitative studies have also over-
looked a number of variables, including existing
migrant ties and political conditions, which might
have a potentially significant impact over outflows
and inflows. Morover, they have had comparatively
little to say about the substantive importance of
hypothesised determinants, and how they differ across
space. We address these shortcomings by examining
the role of a wide range of domestic and relational
factors on the uneven flows of international students
for a large sample of country pairs – and by investi-
gating the influence of these determinants across dif-
ferent country groupings.

A framework for understanding ISMs: gains and costs

Our theoretical starting point in the present study is
the human capital approach, which in broad terms,
models migration, whether permanent or temporary

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Table 1 The top 20 dyadic international student flows, 2009 and 1999

	2009		1999	
Rank	Dyad	Flow	Dyad	Flow
1	China → US	124 225	China → US	46 949
2	India → US	101 563	Japan → US	42 719
3	China → Japan	79 394	Republic of Korea → US	36 085
4	Republic of Korea → US	73 832	India → US	34 504
5	China → Australia	70 357	Greece → UK	30 186
6	China → UK	47 033	Turkey → Germany	26 583
7	China → Republic of Korea	39 309	China → Japan	25 655
8	India → United Kingdom	34 065	Canada → US	20 939
9	Canada → United States	29 209	Morocco → France	18 849
10	Japan → United States	28 783	Republic of Korea → Japan	18 330
11	Morocco → France	27 051	Singapore → Australia	17 082
12	India → Australia	26 573	China→ Macao, China	16 817
13	Republic of Korea → Japan	24 850	Malaysia → Australia	16 482
14	Kazakhstan → Russia	24 772	Ireland → UK	16 192
15	China → France	23 590	Kazakhstan → Russia	15 300
16	China → Germany	21 198	Hong Kong → Australia	14 705
17	Germany → Austria	20 704	Algeria → France	14 559
18	Belarus → Russia	20 063	Germany → UK	14 146
19	Slovakia → Czech Rep.	20 057	France → UK	13 795
20	Malaysia → Australia	19 970	Malaysia → UK	12 924

Source: Authors based on data directly provided by UNESCO staff

in nature, as a function of the relative costs and benefits for individuals domiciled in one particular country moving to another country (Sjaastad 1962). While critiqued for oversimplifying and naturalising social distinctions such as those regarding ethnicity and gender (e.g. see Samers 2010), we would nevertheless submit that the human capital approach is well suited to understanding the generalised determinants of ISMs. Like counterparts such as labour migration, student-based migration involves potentially significant financial costs, as well as psychic (or psychological) ones. Similarly, student mobilities are likely to depend on some kind of offsetting benefit, financial or otherwise.

The gains from ISMs

Much of the literature on ISMs seems to converge on the idea that study abroad is often an instrumental activity which individuals pursue to acquire jobs, which are either better paid, more interesting or offer more scope for professional development (Hazen and Alberts 2006). Viewed through the conventional lens of human capital theory, a foreign university education might support these goals by providing valuable knowledge and skills which are not readily appropriable domestically. More recently, geographers have argued that the economic advantages from ISMs centrally derive from the accumulation of 'cultural

capital'. That is, through a symbolic association with a cosmopolitan experience at a world-class institution, internationally mobile students may profit from differentiation advantage in labour markets (Waters 2006; Findlay *et al.* 2011).

Either way, the degree to which studying abroad provides individuals with economically valuable human and/or cultural capital may well vary, depending on the 'quality' of higher education institutions (Baláz and Williams 2004; Waters 2006; Findlay *et al.* 2006). For example, an individual who has attended a prestigious elite university (e.g. Cambridge, Harvard or Nanjing University) might well find it easier to obtain a graduate job, or a position with a higher salary. University quality, of course, is a highly subjective construct. Yet one potentially important signifier of quality to emerge over recent years is publicly available worldwide university rankings (Hoyler and Jöns 2008). According to Hazelkorn (2008, 194), such rankings 'provide a cue to students – who are increasingly seen/behaving as clients, consumers and customers – regarding the potential monetary and "private benefit" of university attainment and the occupational/salary premium they are expected to acquire'.

In reality, the universities which occupy the top tier of league tables represent a small share of the total number of tertiary education institutions, both nationally and internationally. Indeed, elite universities have

limited places and highly selective entry policies, meaning that the vast majority of prospective international students are unlikely to be admitted to these institutions. Yet league tables may have a wider signalling value, both to students themselves and prospective employers, in that a higher number of universities in popular rankings may be taken as an indication of the general quality, prestige and superiority of a country's tertiary education system. We therefore argue that, faced with complex pre-purchase decisions for what is an intangible good, prospective students concerned with maximising the return on their investment in higher education are likely to demonstrate a preference for country destinations with more highly ranked universities. It is at this scale (i.e. the country level) that we focus our attention in the present paper.

As well as higher quality as an attractor, pulling international students toward particular countries, lower quality may be instrumental in pushing domestic students to study abroad. More specifically, in countries with a limited number of 'good' tertiary level institutions providing opportunities for differentiation, demand for places at high-quality universities may far exceed supply. Within this context, the gains from foreign study may be greater for prospective students, resulting in higher outflows of students from such countries.

Previous survey evidence supports these assertions about university quality, suggesting that opportunities to attend a 'better' and/or 'world-class' university is an important motivating factor for studying abroad (Hazen and Alberts 2006; Mpinganjira 2009; Findlay *et al.* 2011). The importance of university quality, as measured by popular university rankings, is also endorsed by recent quantitative studies. Thissen and Ederveen (2006) find evidence that 'relative' quality influences flows of students for a sample of 15 old European Union (EU) states; while van Bouwel and Veugelers (2010) show that the number of highly ranked universities has a statistically positive influence on numbers of incoming students from or to 18 European countries.

The instrumental returns from a period of foreign study might also be greater in English-speaking countries. Survey evidence reveals that improving language skills is an important motivation for study abroad (Baláz and Williams 2004). As a global language of business, English is likely to assume particular significance in this respect, such that countries whose first language is English might well attract more internationally mobile students.

Returning to the idea that ISM is often part of a longer-term life strategy, we argue that other contextual factors are likely to influence destination choices. One such factor is economic conditions, with destinations characterised by better salaries, career prospects and standards of living more likely to attract individuals who strategically use foreign study as a

route to increasing their prospects of working and living in the country afterwards (Findlay *et al.* 2011; Gürüz 2011; Macready and Tucker 2011; Robertson 2011). Likewise, destinations with greater civil and political freedoms might provide a better quality of life for student-based migrants, which again could result in greater inflows. For similar reasons, we might expect outflows to be greater from countries with more repressive political regimes, in that the benefits of studying in another country as a means to escape such conditions may be greater[1] (Rowlands 1999).

The costs of ISMs

A frequently discussed cost associated with student mobilities stems from travel. A common assertion, which finds support in the previous empirical literature, is that distance impedes bilateral flows in that it is more expensive to travel to distant study destinations (Lee and Tan 1984; Thissen and Ederveen 2006; Van Bouwel and Veugelers 2010). However, there are many other factors which could affect the costs of migrating, both of a financial and psychic nature.

One is migrant stocks. Building on insights from an established body of work concerned with long-term migration patterns (e.g. Allen 1972), a number of scholars have argued that students may preferentially move to spaces where there exists a pre-existing social network comprising family, friends or like-minded people with a similar background (Khadria 2006; Hoyler and Jöns 2008; Macready and Tucker 2011). An existing network of migrants from the student's homeland should facilitate movement by lowering informational costs, for instance, by providing details about living arrangements and education institutions. More generally, pre-existing migrant communities could offer valuable security, support and regular assistance to individuals when they eventually move to the country in question (Guerassimoff 2003; Robertson 2011). Migrants might also lower psychic costs to the extent that spending time around individuals with a similar language, culture and background should lessen the unfamiliarity of particular foreign study destinations. A possible counter-argument is that pre-existing migrants may act as a deterrent to the extent that individuals may wish to avoid mixing with others from their homeland (e.g. see Gill and Bialskib 2011) – although we do not believe that this is likely to outweigh the pull effect of social ties. Unfortunately, previous evidence regarding the influence of migrant stocks is restricted to a small number of case studies (Collins 2008), with previous large-N, quantitative studies overlooking their potential role. We address this gap in the present paper by making use of a geographically extensive dataset on migrant stocks.

Another relational attribute which has been identified as facilitating student mobility is the existence of a common language (Lee and Tan 1984). Moving abroad to study in a destination where the spoken

language is the same as in prospective students' home countries is likely to be easier, less daunting, and as such, involve fewer monetary (e.g. language training) and psychic (e.g. feelings of alienation) costs. Countries which were once linked through a colonial tie might also experience higher levels of inter-county student mobility if the relationship lowers migratory costs (Lee and Tan 1984). One way in which this could take place is if students from former colonies have preferential access to study abroad scholarships provided by governments of ex-colonisers or other bodies. Another way is that, because of ongoing commercial, social or cultural ties (e.g. via the media), students have more information about countries to which they were linked through a colonial relationship. It could also be that colonial ties could affect the cultural capital associated with particular study destinations with students, employers, etc. in ex-colonies, possibly perceiving universities located in their former colonial 'masters' as more prestigious (Cummings 1984; Agarwal and Winkler 1985; Gürüz 2011).

Yet, as well as relational aspects impacting absolute costs, geographic variations in ISMs might reflect the effective ability of individuals to shoulder these costs. Study abroad is expensive, and with the lion's share of financing for overseas study coming from students and their families, limited per capita income in the source country may reduce outflows (Khadria 2006; Findlay *et al.* 2006). Relative differences in wealth between countries may also matter (Lee and Tan 1984). A higher ratio of per capita income in a particular destination country to a particular source country means that the cost of living for students will be higher – possibly impeding flows of students from the latter (Macready and Tucker 2011). Yet it also implies that the economic benefits are greater in the destination country *vis à vis* the source country, potentially attracting more utility-maximising students from the latter to study in the former with the intention of living and/or working there longer term.

Spatialising student mobilities

An important issue is whether the determinants of ISMs vary spatially. There are many possible ways to think about such geographic questions of difference – such as the world-systems perspective. Yet a common way of conceptualising the geo-map, including in the wider migration literature (e.g. Mayda 2010; Neumayer 2005), has been to divide states according to their level of 'development' into developed and developing country grouping. Yet, against a backdrop of divergent paths followed by different developing countries, questions have been raised about the extent to which it is possible to sustain the idea of a single developing area.

In response to these changes, new and/or refined classifications have been deployed over recent decades which seek to better describe common fea-

tures of countries, and capture ongoing economic, social and political transformations (Sidaway 2012). One particular sub-classification that has captured the imagination is newly industrialising economies (NIEs). Although definitions vary, they are generally taken as developing countries which have experienced rapid rates of economic growth over recent decades, typically as a result of industrialisation and integration into global markets (Dicken 2011). More recently, considerable attention has been focused on another subset of developing economies whose economic fortunes are frequently contrasted with NIEs, the LDCs. With low levels of per capita income, LDCs are portrayed as occupying a marginal position in the evolving geo-economic map, and are characterised by a number of 'unfavourable' characteristics (such as poor quality governance) which have prevented them from emulating the experience of the NIEs (Bigman 2007).

As recognised by geographers, categories such as NIEs and LDCs not only describe aspects of a material reality, but also serve as powerful imaginaries which help to perpetuate old and promote new geographical divisions (Vanolo 2010; Sidaway 2012). Nevertheless, they offer one way to think about the (re-)ordering of the world system, and to explore its implications. The particular question addressed in the present paper is whether there are meaningful differences between these country sub-categories in the importance of different determinants of ISM. This is important because it is revealing about the analytical value of particular classifications in understanding the spatialities of contemporary mobilities.

The existing literature has had surprisingly little to say about variations across countries or, for that matter, categories of countries, in the influence of particular determinants of ISM. What evidence exists, however, tentatively points to the possibility that particular factors might be more important for students from some types of countries than others. For example, case study evidence suggests that the opportunity to study at a better quality university is a more important factor for students from outside the developed world, with a wider set of considerations (e.g. lifestyle ones) likely to enter the calculus of the latter (Hazen and Alberts 2006; Findlay *et al.* 2011; Waters *et al.* 2011).

Research design

To analyse the determinants of spatial variations in numbers of international students 'sent' and 'received' by countries, we make use of multivariate, quantitative techniques.

Dependent variable

Our main dependent variable is the annual number of students at the tertiary level enrolled in foreign higher education institutions coming from a specific source

country and studying in a specific destination country over the period 2004–2009. The data were provided to us directly by UNESCO staff. They are not without their shortcomings. First, the data exclude students on exchange programmes of one school year or less, meaning that our findings may not be readily generalisable to all types of international student flows. Second, while the majority of countries define foreign students according to citizenship, others define them according to their country of residence (Richters and Teichler 2006). However, these measurement differences are likely to be randomly distributed across our sample, such that they are unlikely to significantly bias our overall findings. Third, UNESCO does not report bilateral international student flow data on all recipient countries, meaning that some important destinations (e.g. Singapore) are missing from our sample of 105 recipients. Our dependent variable nevertheless does appear to be fairly representative in covering countries from all regions. The list of countries of origin in our sample is much more extensive (151 in total), only restricted by data availability on the explanatory variables.

Explanatory variables

Our main source for university quality is the *World University Rankings* (WUR) (QS 2010). The ranking has been compiled and published annually since 2004. Universities are ranked on the basis of six criteria: academic peer review; employer review; faculty student ratio; citations per faculty; international faculty; and international students. We take the number of universities in the top 200 in a destination or source country, respectively, as our measure of perceived quality. This variable is lagged by one year since this will be the most recent ranking available to individuals when making their study choices. Note, even though we take the absolute count of universities a country has in the WUR as our explanatory variable, our results are robust to weighting the number of universities by their respective position in the rankings.

The WUR is not without its problems. For example, the indicators can be accused of having been selected largely on the basis of data availability, while the constituent measure of citations grants countries which predominantly publish in English an advantage in the rankings (van Raan 2005). The ranking also says comparatively little of direct relevance about the actual quality of education received by students. We would nevertheless argue that the use of the WUR is valid within the present context. What matters more for students' choices are perceptions, and not necessarily the true underlying quality of universities, however this is defined. Moreover, it seems likely that these perceptions will be shaped (or else reflected) by well publicised league tables, of which the WUR is a leading example (Hoyler and Jöns 2008; BBC 2011). We also examine, as a robustness check, the other

leading international league table, the *Academic Ranking of World Universities* (ARWU), compiled by Shanghai Jiao Tong University (Shanghai Ranking Consultancy 2010). Published on an annual basis since 2003, the ranking places more emphasis on academic research excellence than the WUR, and is based on six indicators: the number of alumni and staff winning Nobel Prizes and Fields Medals; the number of highly cited researchers selected by Thomson Scientific; the number of articles published in the journals *Nature* and *Science*; the number of articles indexed in the Science Citation Index and Social Sciences Citation Index; and per capita performance with respect to the size of an institution. The ranking includes a larger number of universities (*N*=500) but is highly correlated with the WUR. For a useful discussion of the differences between the WUR and the ARWU, see Jöns and Hoyler (2013).

As a measure of political regime type, we use the *polity2* variable from the Polity IV project (Marshall *et al.* 2011). Based on expert assessment of the competitiveness of elections and constraints on executive decisionmaking, this variable puts countries on a 21-point scale that runs from −10 (the most autocratic) to 10 (the most democratic). To measure the attractiveness of the macroeconomic environment in destination countries, we make use of data on GDP per capita from World Bank (2010). These GDP per capita data are also used for source countries to capture differences in source country wealth. We also take the ratio of GDP per capita in the destination country to the origin country so as to capture income differential effects. A dummy variable with a value of one is used for destination countries in which English is the first spoken language.

To model spatial proximity, we use data from www.eugenesoftware.org on physical distance, measured according to kilometres between the two countries' capital cities. Common language is captured using a dummy variable which is set to one if one of the main languages spoken in both countries is the same. A dummy variable equal to one is used to capture whether the destination country was previously a coloniser of the origin country. Data for both variables are from CIA (2009). Our measure of migrants is the number of individuals born outside their current country of residence from a source country residing in a destination country, with data taken from Parsons *et al.* (2007). The data only record aggregate pre-existing migrant stocks around the time of the 2000 national censuses. Even though migrant stocks will have continued to change over the course of the following years up to the start of the sample period, they are unlikely to have done so much as to invalidate our findings.

As well as variables capturing the gains and costs from study abroad, we control for the size of countries' sub-population who are studying or capable of studying at the tertiary level. On the sender side, the

number of such people should be positively corre-
lated with outflows, in that there is a larger pool of
individuals who can consider studying abroad. On the
recipient side, greater numbers of students implies a
larger tertiary education sector, which should attract
more foreign students because of the greater number
of places and diversity of institutions. Data from
UNESCO (2011) are used to construct these two
population variables, respectively capturing the
number of tertiary level students in the origin and
destination country.

Estimation technique

The count nature of the dependent variable, together
with over-dispersion in this variable, leads us to use a
negative binomial regression model. Year-specific
fixed effects are included to account for the general
upward trend in student numbers over time and stand-
ard errors are clustered on country dyads.

Results

Main estimations

Table 2 shows our estimation results. The reported
coefficients can be interpreted as semi-elasticities, but
we provide a more detailed and intuitively under-
standable assessment of substantive importance
further below. Model 1 includes the WUR ranking,
whereas model 2 includes the ARWU ranking.

Table 2 Main estimation results

	Model 1	Model 2
No. of universities in WUR top 200 rankings (destination)	0.0161**	
	(0.00560)	
No. of universities in WUR top 200 rankings (origin)	0.00845	
	(0.00535)	
No. of universities in ARWU top 500 rankings (destination)		0.00378*
		(0.00180)
No. of universities in ARWU top 500 rankings (origin)		0.00474*
		(0.00217)
ln stock of existing migrants from origin in destination	0.357**	0.359**
	(0.0269)	(0.0270)
ln distance	−0.978**	−0.982**
	(0.0873)	(0.0877)
Colonial link	0.710**	0.797**
	(0.195)	(0.205)
Common language	1.467**	1.440**
	(0.246)	(0.245)
English first language in destination country	0.0350	0.0981
	(0.164)	(0.154)
ln GDP per capita (destination)	0.924**	0.933**
	(0.0505)	(0.0504)
ln GDP per capita (origin)	0.0188	0.0119
	(0.0392)	(0.0397)
Ratio GDP per capita destination to origin	−0.00705**	−0.00701**
	(0.00118)	(0.00117)
Democracy (destination)	−0.0268**	−0.0267**
	(0.00989)	(0.00991)
Democracy (origin)	−0.0340**	−0.0343**
	(0.00963)	(0.00967)
ln students at tertiary level (destination)	0.389**	0.397**
	(0.0452)	(0.0464)
ln students at tertiary level (origin)	0.233**	0.227**
	(0.0354)	(0.0357)
Dyads	14 401	14 401
Observations	85 001	85 001

Statistically significant at *$p < 0.05$, **$p < 0.01$. Standard errors clustered on countries in brackets. Year-specific time fixed
effects included, but not reported

We begin with our variables capturing the benefits derived from overseas study. The estimated effect of university quality in the destination country is positive and statistically significant. That is, consistent with expectations, our results suggest that international students gravitate towards countries with a larger number of universities ranked in the WUR or ARWU. The effect of university quality in origin countries is not statistically significant for the WUR, but significantly positive for the ARWU. What this suggests is that a higher number of ranked universities at home does not deter the outflow of students for studying abroad, but is more likely to facilitate it. A possible explanation is that students coming from such countries are better educated and thus better able to find a study place abroad.

Novel to the literature, we also find a role for political regime type, in that the estimated effect for our democracy variable in the source country is negative and statistically significant. A lack of democracy seemingly provides an additional incentive to study abroad, allowing individuals to escape repressive conditions at home, or search out a better quality of life elsewhere. However, contrary to expectations, controlling for other factors, more democratic countries receive fewer international students. Readers should keep in mind, however, that our models include many variables that are correlated with democracy in the destination country. Furthermore, as discussed below, there are important differences across origin country groupings in the effect of a destination country's political conditions. Controlling for other factors, and challenging orthodox thinking, internationally mobile students do not have a higher propensity to study in English-speaking countries. By contrast, our finding that more students go to higher income destination countries is entirely unsurprising.

Turning to variables capturing the hypothesised costs of overseas study, we find that the estimated effect for distance is statistically significantly negative, confirming previous findings. Our measure of migrant stocks has a statistically significant positive effect which, in line with recent case study work (Collins 2008), indicates that the cross-border movements of students follow the prior crossings of migrants from the same country of origin. A positive and statistically significant effect is estimated for same language, suggesting that international students demonstrate a higher propensity to study in countries whose citizens speak the same official language as their own. We similarly find that destination countries which have previously been colonisers receive more incoming students from their former colonies. In contrast to the effect of income in destination countries, we find that GDP per capita in the origin country has no statistically significant effect. This does not mean that per capita income in origin countries does not matter. The significant negative effect of the income ratio between destination and origin country demonstrates that a larger gap between average incomes of source and destination countries deters outflows. One interpretation of this finding is that the relatively higher exchange rate converted expense of study in (comparatively) richer countries – arising from the cost of living, but also possibly from tuition fees – acts as a deterrent on student flows from (comparatively) poorer countries. Finally, consistent with expectations, countries with larger tertiary level populations emerge as both the sources and destinations of larger numbers of foreign students.

Evaluating substantive effects

To examine the relative substantive importance of variables, we now look at the percentage change in expected international student flows following from specified changes in the explanatory variables, holding other variables constant. Evaluating the influence of individual determinants in this way is not without its problems. It assumes that one could hold other variables constant when changing one factor, which is unrealistic since many factors are correlated with each other (e.g. democracy and GDP per capita), and also assumes that one could smoothly change a variable, whereas in reality political variables in particular are lumpy. The predicted substantive effects are therefore best interpreted as what would happen hypothetically if one could change a variable as specified below, holding all other factors constant.

Substantive effects refer to model 1, but are very similar for model 2. Starting again with university quality, one additional university in the WUR rankings is estimated to increase the expected count of incoming students to a destination country by 1.6%. This is a substantively important but not dramatic effect. Our measure of political freedoms has no intuitively meaningful unit of measurement. We therefore look at the effect of a substantively important change in this variable, as measured by a 1 standard deviation (SD) increase in its value. A 1 SD increase in the democracy variable in origin countries reduces the outflow of students by 19%, while an equivalent increase in democracy in the destination country reduces the inflow by 16%. The estimated effect of a conceptually similar 1 SD increase in university quality, at 12%, is roughly similar. Markedly more important is GDP per capita in the destination country. A 1 SD increase in this variable is estimated to raise incoming student numbers by 336%.

How do these figures compare with our variables capturing the costs of overseas study? In short, compared with university quality and political conditions, many of these factors turn out to be far more important. A one SD increase in spatial distance reduces by three-quarters the expected number of international students between the country pair. Underscoring the importance of relational variables, a 1 SD increase in the bilateral stock of pre-existing migrants is estimated

to raise the subsequent flow of students coming from the migrants' country of origin by 184%, while a colonial linkage between a country pair doubles such flows. Common language, meanwhile, more than quadruples the incoming flow of students from an origin country speaking the same language. Barnett and Wu's (1995) cluster analysis of the student exchange network in 1970 and 1989 suggested that linguistic and colonial ties were becoming less important over time. Our analysis suggests that they nevertheless remain highly influential in shaping the geography of ISMs.

A 1 SD increase in the ratio of destination to origin country GDP per capita reduces incoming students between these two countries by an estimated 19%. That the effect of the GDP per capita ratio is not even larger most likely stems from the fact that incomes are unequally distributed in many origin countries such that, even in relatively poorer economies, there will be significant numbers of potential (middle-class and

upper-class) students with sufficient financial resources to study abroad in relatively richer countries.

Differences between country groupings

The results reported above capture the average effect across all country dyads pooled together. They therefore potentially mask disparities in the influence of individual factors across different sets of countries. Table 3 shows estimation results for different origin country grouping samples comprising developed (i.e. high income countries); developing countries (i.e. low income, lower middle income and upper middle income countries); NIEs; and LDCs (low income countries)[2].

On the whole, despite significant contextual differences, there are many similarities in the determinants governing the outflows and inflows of international students across different country groupings. That said, variations do exist between country groupings,

Table 3 Variations in the effect of determinants by groups of countries of origin

	Developed	Developing	NIEs	LDCs
No. of universities in WUR top 200 rankings (destination)	0.0307** (0.00778)	0.0173** (0.00633)	0.0678** (0.0188)	0.00680 (0.0113)
No. of universities in WUR top 200 rankings (origin)	0.00936 (0.00706)	0.328** (0.0648)	0.0283* (0.0115)	
ln stock of existing migrants from origin in destination	0.342** (0.0410)	0.350** (0.0274)	0.410** (0.0392)	0.352** (0.0316)
ln distance	−0.661** (0.0882)	−1.180** (0.111)	−0.592** (0.135)	−1.243** (0.179)
Colonial link	0.718* (0.339)	0.778** (0.218)	0.241 (0.500)	−0.0138 (0.298)
Common language	1.000** (0.299)	1.520** (0.256)	0.536 (0.326)	1.961** (0.428)
English first language in destination country	0.0129 (0.164)	−0.185 (0.173)	0.447 (0.269)	−0.00360 (0.267)
ln GDP per capita (destination)	1.075** (0.0857)	0.938** (0.0569)	0.660** (0.125)	1.232** (0.0896)
ln GDP per capita (origin)	−0.00296 (0.164)	0.147* (0.0609)	−0.0505 (0.0754)	0.557* (0.247)
Ratio GDP per capita destination to origin	−0.434** (0.0669)	−0.00426** (0.00123)	−0.000432 (0.00962)	−0.00378* (0.00182)
Democracy (destination)	0.0631** (0.0126)	−0.0476** (0.00999)	−0.0207 (0.0192)	−0.0815** (0.0131)
Democracy (origin)	−0.0508** (0.0142)	−0.0216* (0.0109)	−0.0645** (0.0140)	0.0461** (0.0117)
ln students at tertiary level (destination)	0.362** (0.0599)	0.403** (0.0517)	0.122 (0.0650)	0.400** (0.0793)
ln students at tertiary level (origin)	0.154 (0.0833)	0.192** (0.0404)	0.110* (0.0553)	0.177* (0.0779)
Observations	18 926	51 029	10 485	16 377

Statistically significant at *$p < 0.05$, **$p < 0.01$. Standard errors clustered on countries in brackets. Year-specific time fixed effects included, but not reported. University quality in origin dropped from the least developed country sample as no such country has a university in the WUR

including the developed and developing ones. While domestic university quality does not exert a statistically significant effect on student outflows for developed countries, we find that it is positively correlated with numbers of outgoing students from the group of developing countries as a whole and the NIEs. This result might be explained by the fact that (the few) developing countries with universities listed in the WUR 200 produce students who are more qualified, capable and therefore likely to study abroad. The positive impact of university quality in destination countries is no stronger for students from either developed or developing countries – although, as explained below, it does matter significantly more for those originating in NIEs. Not surprisingly, geographical distance is a stronger deterrent to developing-country students than their counterparts from developed countries who can better afford to overcome the tyranny of spatial distance. The most striking difference is that, whereas students from developing countries are more likely to go to more autocratic destinations, students from developed countries have a higher propensity to study in more democratic ones. Interestingly, the income ratio between the destination and origin country has a larger effect for outflows from developed countries. A possible explanation is that the mobility constraint imposed by lower levels of income in developing countries are outweighed by high income inequality within these countries, which allows the upper and upper middle classes to afford the costs of foreign study.

Additional differences among groups of countries of origin emerge when further disaggregating the broad grouping of developing countries. University quality in destination countries exerts a much greater pull for students from NIEs than those from LDCs or, for that matter, developed economies. Its substantive effect for student flows from NIEs is almost double that of developed origin countries and almost four times as strong compared with the full developing origin country sample. This may well reflect the peculiar importance of credentials associated with studying in a country with well known 'global' universities for labour market success in NIEs (Waters 2006).

Turning to cost-related factors, distance is less of a deterrent for students from NIEs than those from LDCs or developing countries as a whole, possibly because the human/cultural capital-enhancing attributes of the destination play a greater role for the former. While the sharing of a common language increases outflows from LDCs and developing countries as a whole, it does not matter in the case of students from NIEs, which could reflect their greater linguistic capabilities. Along similar lines, a larger ratio between GDP per capita of the destination to the origin country deters student flows from LDCs and developing countries as a whole, but not from NIEs. Again, consistent with the idea that the mobilities of individuals from NIEs are less subject to the tyranny of geography, this

result might be indicative of the superior ability of individuals from these countries to finance the costs of studying abroad.

Conclusions and discussion

Compared with other forms of corporeal mobility, comparatively little is known about the factors underlying the uneven flows of international students. In this paper, we make a series of contributions towards improved understanding of the evolving geography of ISMs. First, we seek to bridge recent work in geography (Waters 2006; Findlay *et al.* 2011) with more orthodox models of labour migration (Mayda 2010), conceptualising choices governing individual mobilities as a function of benefits and costs. Second, we have sought to address limited empirical understanding of the relative importance of different contextual and relational factors in explaining spatial variations in numbers of outgoing and incoming international students, making use of a dataset which is larger and more inclusive than the ones used in previous quantitative work (e.g. Chen and Barnett 2000; van Bouwel and Veugelers 2010).

An important insight from our study is that countries' university quality, frequently mentioned within debates about the 'competitiveness' of economies in the market for internationally mobile students (Hoyler and Jöns 2008; *The Economist* 2010; BBC 2011; Jöns and Hoyler 2013), has a comparatively small influence over student-based migration patterns. Far more important is per capita income in the destination country, together with a number of relational variables which affect the monetary and psychic costs of particular cross-border mobilities. Distance, common language, colonial linkages, and previously ignored in other quantitative studies, pre-existing migrant stocks are therefore all found to exert a substantively large impact on spatial patterns of international student mobilities. That is, student-based migrations would appear to be enabled and constrained by many of the same factors as other forms of migration, pointing to the value of conceptual frameworks which emphasise the costs and benefits of particular cross-border mobilities.

A third major contribution has been to show that, while there are many similarities in the determinants of student mobilities across space, there are also important differences. We therefore find notable variations across conventional groupings respectively comprising developed and developing countries. More interesting still, however, we identify important differences within the group of developing economies. In particular, the spatial choices of students from NIEs would appear to be more strongly influenced by university quality in destination countries, and therefore shaped by capital-enhancing opportunities elsewhere. The mobilities of students from LDCs are more likely to be

influenced by physical distance, linguistic differences and income differentials.

These results have wider implications. For debates about educational inequalities (Hanson Thiem 2008), they indicate that students originating in the very poorest countries are more constrained by geographic barriers (of distance, etc.). To the extent that this may impede individuals' ability to acquire various forms of economically beneficial capital derived from an overseas education, our findings suggest that concerns about a more globally scaled, marketised educational regime sustaining, or even exacerbating, existing inequalities may be warranted (Waters 2006; Baláz and Williams 2004; Hoyler and Jöns 2008).

The results presented in this paper also have resonance for debates about unitary conceptions of a developing world (e.g. Sidaway 2012). Notable differences exist between NIEs and LDCs in the influence of various geographic factors which influence ISMs, possibly reflecting differences in the motives and capacities of individuals from these countries for foreign study. From the perspective of understanding corporeal mobilities, therefore, there would appear to be analytical value in disaggregating the diverse group of developing countries into categories which might better reflect shared characteristics.

Finally, our findings have implications for policy, suggesting that investments to improve the standing of domestic universities in league tables *may* have a payback in terms of fee-paying international students. Yet the importance of quality should not be overstated: it is far from being the most substantively important factor influencing countries' attractiveness to international students. Hence the idea that adding a few more universities to the tier of highly ranked universities, which in itself is by no means an easy task, will lead to a large surge of foreign applicants to particular destination countries is not supported by our work.

Acknowledgements

Notes

1 It could be that emigration and other policies make it more difficult and costly for prospective students originating in these countries to study abroad. Yet we believe that, with the exception of extreme cases (e.g. North Korea) where regimes effectively close off their borders to emigration, these controls are likely to be outweighed by the strength of the incentive factor.
2 Note, we use the World Bank's income classifications.

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