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Graduate migration and regional development

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Why do we care about graduate migration?

- Graduates bring human capital into a region/country
- **Human capital** is essential for growth and development (Corcoran et al., 2010; Faggian and McCann, 2009).
  - A region's human capital is one of the strongest predictors of sustained ***economic vitality*** (Abel and Deitz, 2012)
  - It is linked to increases in ***economic and population growth, wages, income and innovation*** (Florida et al., 2008)
  - Skilled labour pool generates ***knowledge spill-overs*** and ***externalities*** in turn increasing productivity and high-technology activities Consoli et al., 2013).

- The ability of a region/country to maintain its competitiveness depends crucially on its capability to **retain** its own human capital, especially in the form of advaned tertiary education graduates, but also **attract graduates** from other regions
- This 'human capital' effect is a **long-term effect**, far more important than the traditional income-expenditure multiplier effect of universities (Faggian and mcCann, 2009)

- Moreover, graduate migration is not slowing down and in fact, migrants are an 'increasingly numerous and strategically important' fraction of the population (King and Ruiz-Gelices, 2003)
- The number of students seeking education abroad continues to increase.
- In 2013, over 4.1 million people were studying abroad, meaning that **2 in 100** students globally were enrolled at a tertiary institution outside of their home country (UNESCO Institute for Statistics, 2016)

- In this process there are "losers" and winners"...
- While the English speaking countries remain popular destinations, student-based immigration is spreading to new countries and to regional hubs trying to expand their intellectual capital by attracting international students (UNESCO Institute for Statistics, 2016).
- Attracting international students is critical because many of these highly educated individuals remain in their host countries at the conclusion of their studies, increasing the human capital of the country and providing economic and intellectual gains. Within each host country, regions that have higher rates of education, such as the larger cities, may gain additional benefits (e.g. London in the UK...)

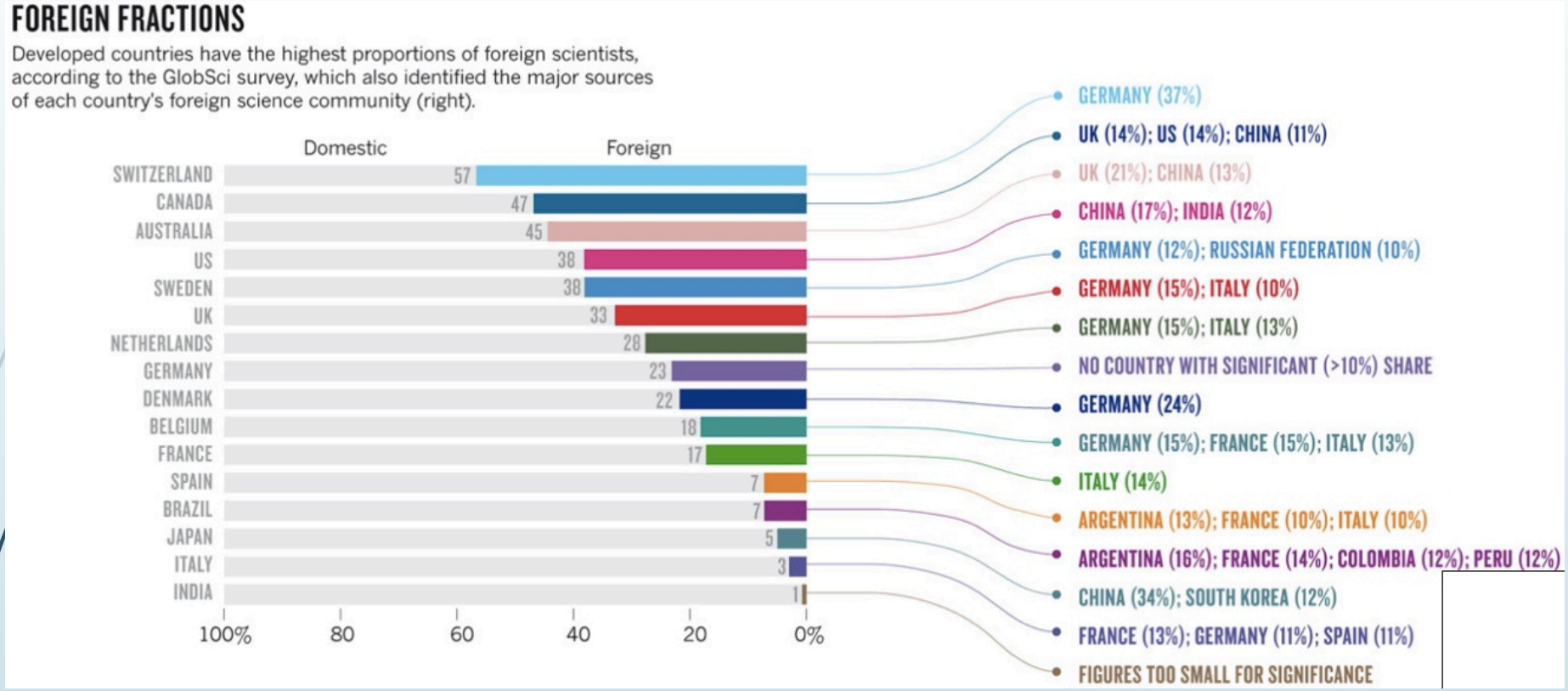
GlobalSci Survey

- Franzoni et al. (2012) is the 'first systematic study of the mobility of scientists engaged in research in a large number of countries' (p. 2). The article is just descriptive, but the value added is in their data…
- The findings are based on primary data collected via a survey which became known as GlobSci Survey
- The survey was also featured in an issue of 'Nature' http://www.nature.com/news/global-mobility-science-on-the-move-1.11602

- Aim: providing comparable cross-country data on scientists mobility
- Coverage:
  - Countries: 16 'core' countries - Australia, Belgium, Brazil, Canada, Denmark, France, Germany, India, Italy, Japan, NL, Spain, Sweden, Switzerland, UK, USA – Main problem: China is missing
  - Fields: 4 scientific fields – Biology, chemistry, earth and environmental sciences, materials
- 47,304 questionnaire sent, 19,183 answers of which 16,827 complete (35.6% response rate)

- **Scientists are highly mobile** (*note: as expected given the human capital migration theory*)
- Few facts:
  - In 2009, 41.6% of PhDs working in a science and engineering occupation in the USA were born outside the USA
  - 48% of PhDs awarded in the USA go to either temporary or permanent residents (not citizens!)
  - 60% of postdocs in the USA are on a temporary visa
- Moreover, **the most productive** scientists are also **the most mobile**.

Proportion of scientists coming from outside…



Question: What are the reasons for these differences???

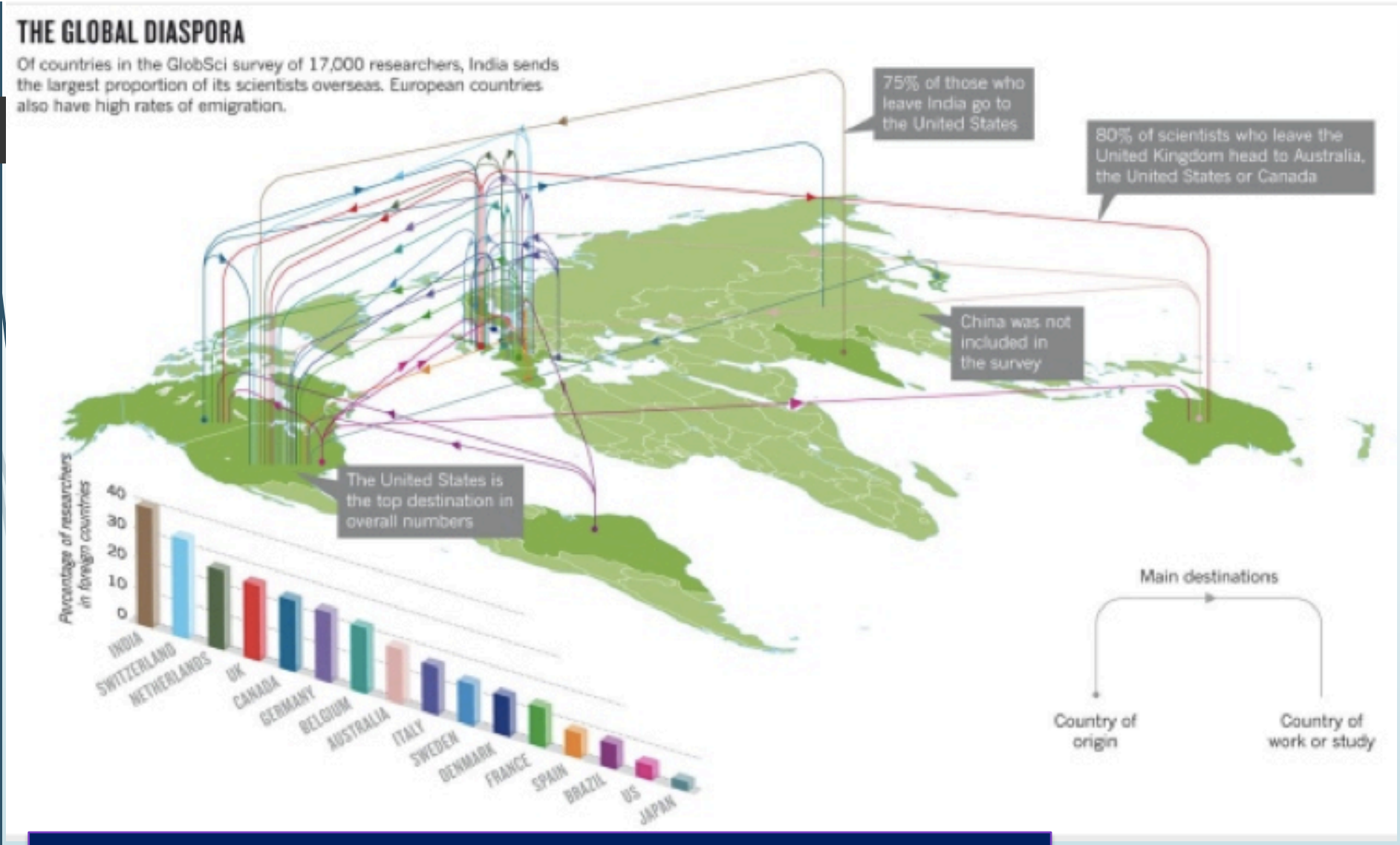
They mention:

Geography: Being 'neighbors' (e.g. Germany provides scientists to Belgium, Denmark, Sweden and Switzerland; the USA to Canada; Argentina, Colombia and Peru send scientists to Brazil)

Cultural/language ties

However, they also point out that in some cases geography and culture do not matter (top origin country for the USA is China and for the UK are Germany and Italy)

Note: they underplay the language factor. Countries with English as primary language have lower 'barriers to entry'



Countries ranked by % of scientists abroad…

Interregional graduate mobility

- There is another dimension of highly educated individuals' mobility which regional scientists have been focusing on and that is the **"regional re-allocation"** of these individuals within countries **(interregional mobility)**
- Even within the same national economy, there exist sometimes massive differences in the ability to attract and retain graduates and highly skilled individuals (e.g. both Italy and the U.K. Suffer from a huge North-South divide, although "reversed"...)

Studies on interregional graduate mobility

- The availability of micro-data on graduate mobility increased greatly over the last 10/15 years
- The U.K. was one of the first country to collect sistematically data on students and graduate mobility thanks to the coordination of the Higher Education Statistical Agency (HESA)
  - Very extensive micro-data covering all the student population at the point of entry into higher education and then following them with extensive graduate surveys 6 months after graduation and later on 3 and a half years after graduation

- ✓ Now similar databases (even though not completely identical) are available for other countries
- ✓ Corcoran and Faggian (2017) book is an attempt to collect all the different contributions from different countries and see where the state-of-the-art is in terms of graduate data collection. The countries covered are:
  - ✓ The Netherlands (Venhorst)
  - ✓ Spain (Ramos and Royuela)
  - ✓ Australia (Tang et al.)
  - ✓ Mexico (Maldonado)
  - ✓ Italy (Iammarino and Marinelli)
  - ✓ France (Detang-Dessendre and Piguet)
  - ✓ U.K. (Comunian et al.)
  - ✓ U.S.A. (Faggian et al.)
  - ✓ Canada (Newbold)
  - ✓ Finland (Haapanen and Kahrunen)

- Although classifying a body of studies is always difficult, broadly speaking, the studies on graduate migration can be grouped in two big "themes"

A. **Causes** of graduate mobility

- **"Push"** and **"pull"** factors
- Graduate **mismatch** in the labour market (over-education)…

B. **Consequences** of graduate mobility

- Consequences on **origin** (brain-drain…)
- Consequences on **destination** (innovation, entrepreneurship…)
- Consequences on people: **migrants** and **natives**

A. Causes of graduate migration

FACT: Graduates are more mobile than the general population!

Question: WHY???

First of all, to answer this question, we have to recognize that there are two broad categories of reasons why graduates, or in general highly skilled/highly educated individuals, move:

- **1. INDIVIDUAL** DETERMINANTS
- **2. AGGREGATE** (REGIONAL) DETERMINANTS

1. Individual determinants

Question: what differentiates graduates from the rest of the population???

1. First, people are *most mobile* after completing *LENGTHY INVESTMENT IN HUMAN CAPITAL* (e.g. after University or high school) – life cycle…

2. Second, graduates are generally YOUNG. The younger individuals are, the more mobile they are for different reasons:

i. *More years* to recoup the migration costs;
ii. Lower level of *SPECIFIC (non-transferrable) human capital*;
iii. Lower *psychological costs* (network of friends, family);
iv. Often *lower migration costs* (e.g. no need to hire professional mover, move your possessions yourself)

3. More educated people have a superior ability to process and find information efficiently

LOWER INFORMATION COSTS

(Schultz, 1975)

4. Generally, less educated people rely more on family and friends than the better educated

LESS PSYCHOLOGICAL COSTS

(DaVanzo, 1981)

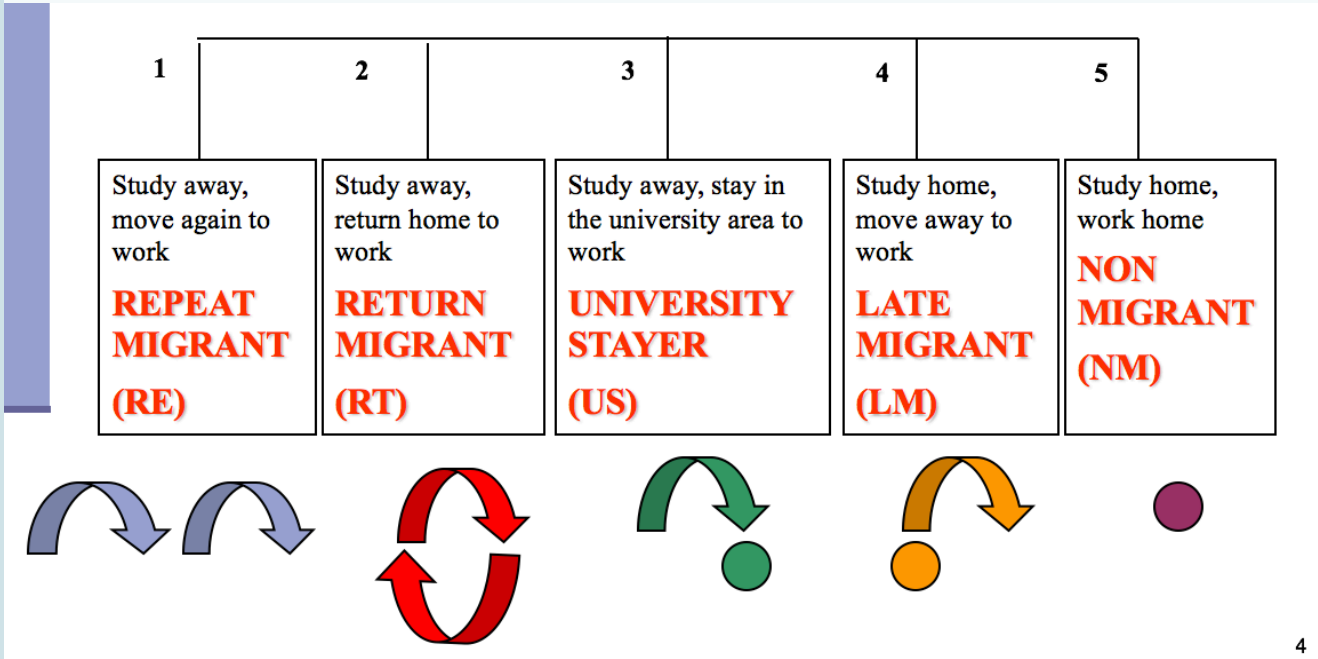
5. Educated people typically have already moved for their studies and so they are more incline to move again to find a job ("path-dependency", "perspicacious peregrinators" *Polachek and Siebert 1993)*

REPEAT MIGRATION

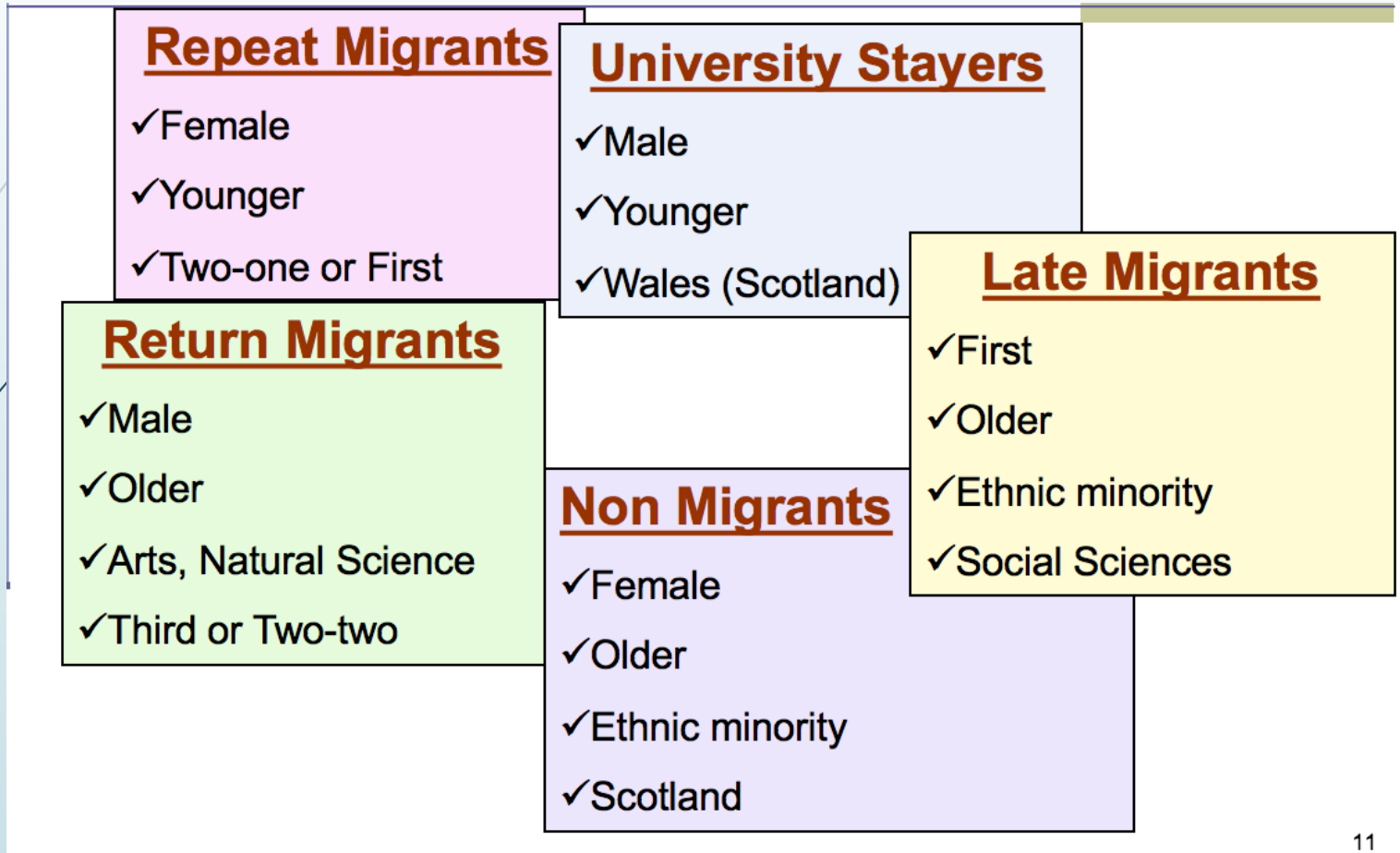
(DaVanzo, 1983)

Graduate migration heterogeneity…

- Obviously **not all graduates are the same** and, even within this rather "homogenous" group there are substantial differences which affect their migration behaviour
  - Faggian et al. (2007) study the "sequential" migration (from home to university & then from university to first job location) behaviour of 12 million students in the UK for the period 1995/96 to 2005/06



- There are significant differences in the characteristics of these five groups…

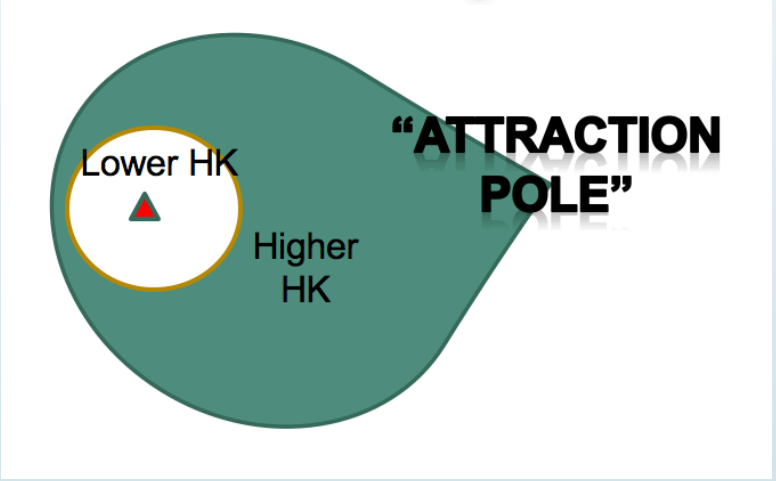


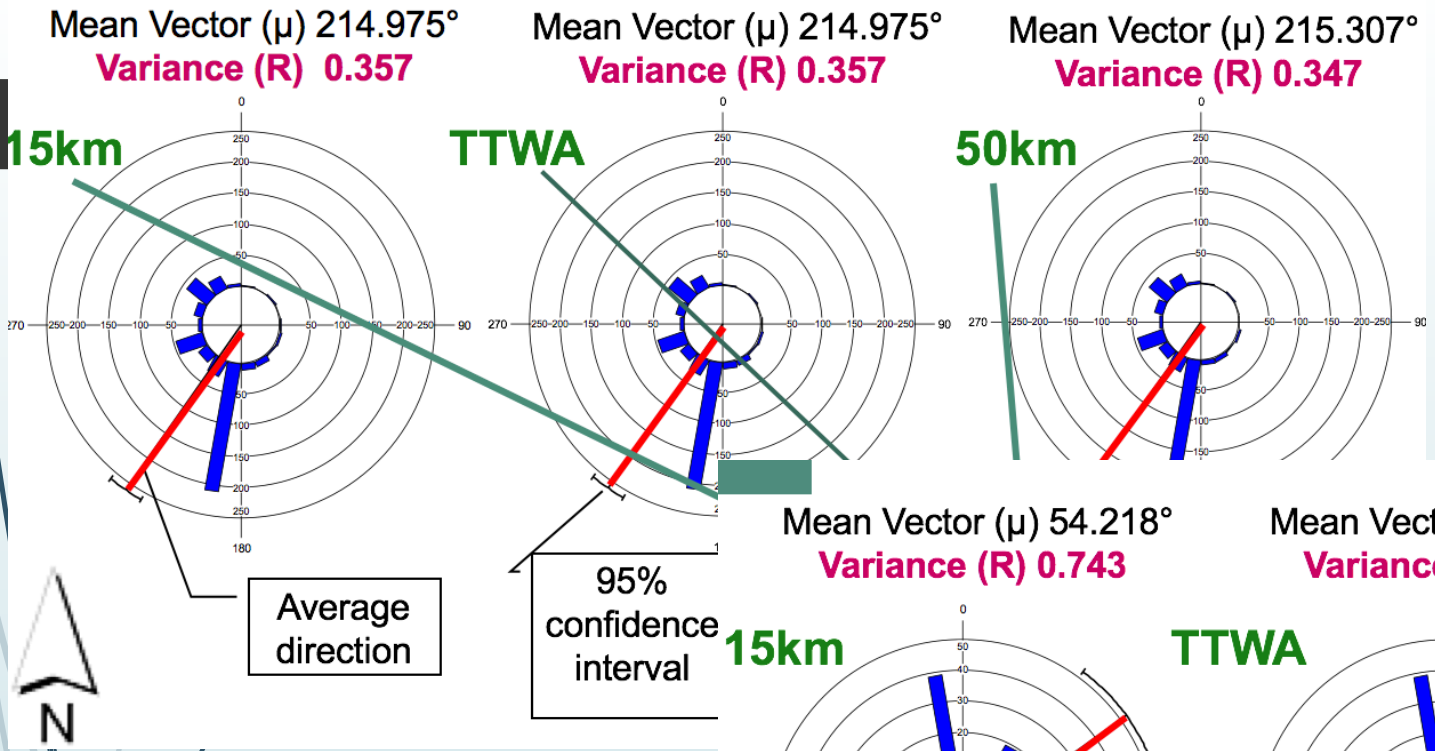
2. Regional determinants

JOBS MORE SPARSELY DISPERSED but generally MORE "CENTRALLY LOCATED" (cities...)

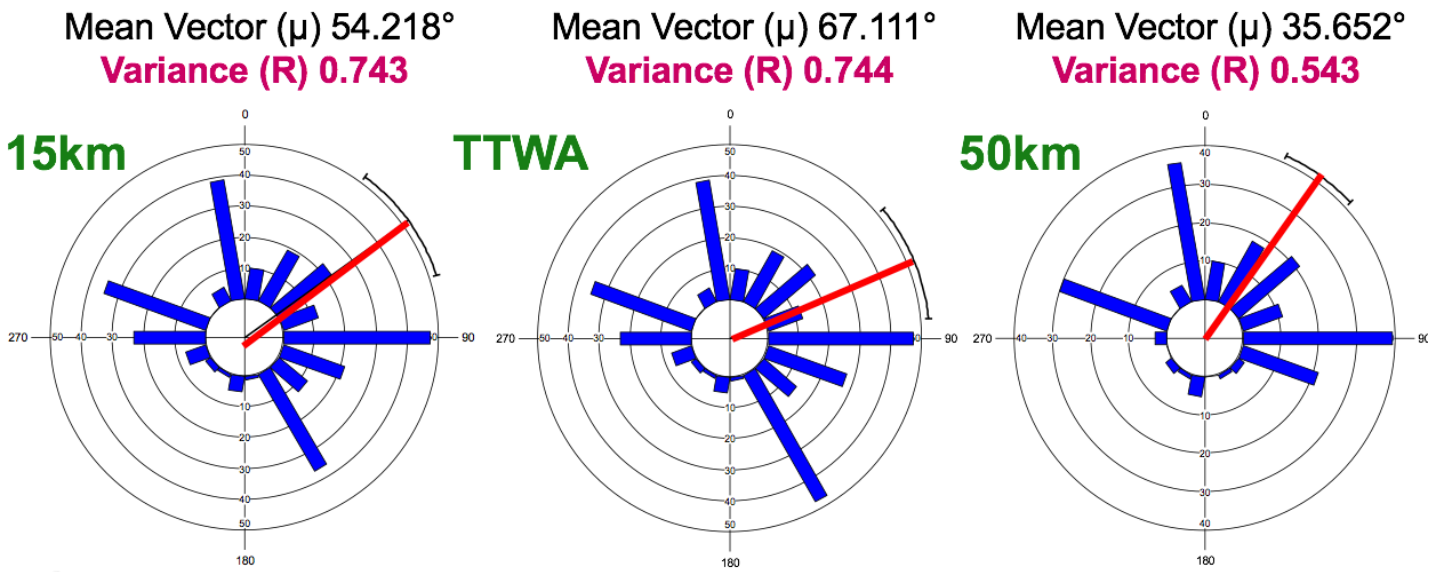
Faggian et al (2013) find that graduates migrate longer distances (as predicted by the job search theory) but towards more specific locations...

The assumption of jobs being randomly distributed over space is a better approximation for less qualified job seekers





SELECTIVE UNIVERSITY (high human capital): UNIDIRECTIONALITY



LOWER RANKED UNIVERSITY (low human capital): MULTIDIRECTIONALITY

Faggian et al. (2013)

- AMENITIES (Dotzel, 2017)
  - Early work by Graves (1979, 1980) uncovers a positive relationship between household preferences for natural amenities and income level.
  - More recent studies have explored how natural and built amenities influence the migration decisions of **high-skilled internal migrants** specifically (Dotzel, 2016; Fiore et al., 2015) and they find a positive relationship.

B. Consequences of graduate migration

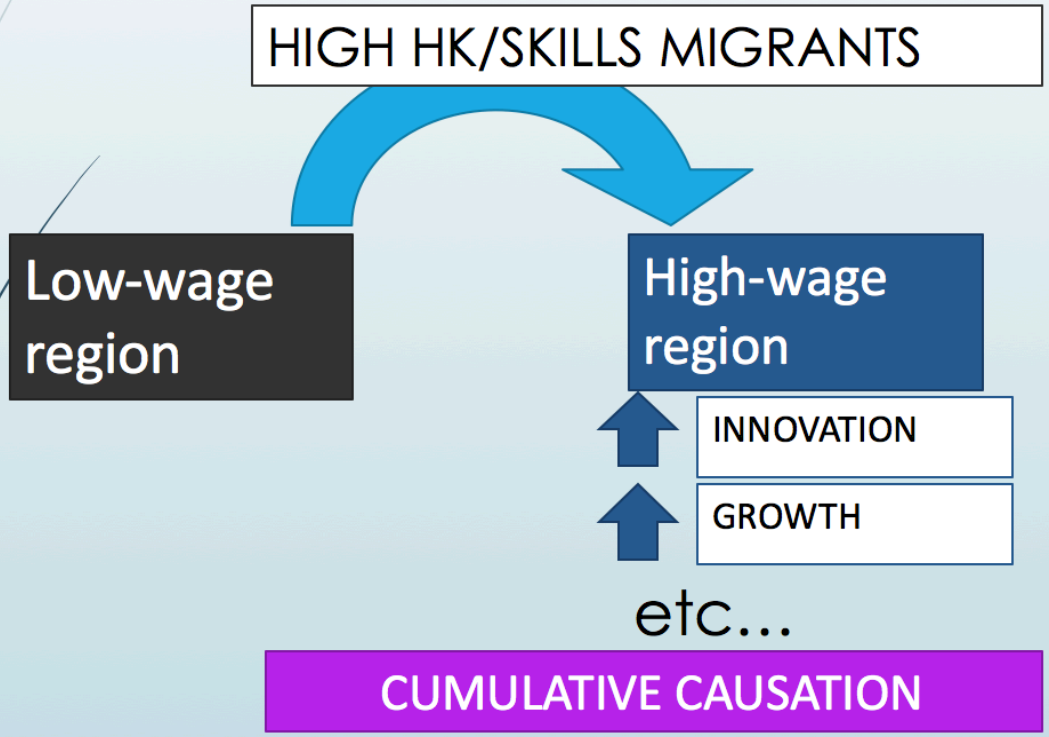
- Faggian et al. (2017) review the consequences of high skilled migration
- They divide the consequences according to what or whom is affected...

DESTINATION

- The majority of studies examining the consequences of high-skilled migration focus on the **destination region** (Borjas, 1999)
- The consequences on the destination can, in turn, be **positive** or **negative**. However, if we focus on high human capital migration only, the literature highlights the positive consequences rather than the negative (opposite of refugee migration…)
- Among the **positive consequences**:
  1. ***Innovation***
  2. ***Natives' wages***
  3. ***Cultural and ethnic diversity***

Innovation

- Basic idea…instead of the neoclassical view of migration as a



High skilled migration creates **endogenous growth**

- Several contributions have indeed found a relationship
  - Using data on British graduates, Faggian and McCann (2009) model the **interrelationship between migration flows** and **regional innovation** using a simultaneous equations framework, and find evidence that internal human capital in-migration is significantly related to regional patenting productivity in the UK, with the strongest results for high technology industries.
  - Gagliardi (2015), using firm-level data from the Community Innovation Survey (CIS) for British travel-to-work areas, finds that **skilled immigration** has the largest positive effect on **process innovation**.

- Hunt and Gauthier-Loiselle (2009) link **skilled migration** to state-level **patenting activity** in the United States finding that a 1% increase in a state's share of immigrant college graduates increases the state's patenting rate by 6%.
- This positive relationship between skilled immigration and **patenting productivity** is supported by other studies (Chellaraj, Maskus, & Mattoo, 2008 ; Le, 2008 ; Ozgen, Nijkamp, & Poot, 2011).
- Trippl' s (2013) study on interregional and intraregional movements of 'star scientists' shows that there is also a '**follower phenomenon**', meaning that the movement of star scientists encourages future movements of their students and colleagues (cumulative effect...)

Natives' wages

The ultimate effect on natives' wages depends on the degree of substitutability or complementarity between immigrants and natives.

Dustmann, Glitz, & Frattini (2008) Nathan (2011, 2013); Ottaviano & Peri (2006) show that **high-skilled migrants** contribute to technological development in the host region through the introduction of new skills that are **complementary** to those of the existing workforce.

Generally speaking, the belief is that low skilled are worse because they "steal" natives' jobs (see the current political discourses in Europe on refugee migration) and/or depend on the benefit system; while high skilled immigrants are more complementary and/or produce new ideas, jobs and potentially increase productivity

Two regions: A and B. Initially they are in equilibrium $w_A=w_B$ and $L_A=L_B$

The SALARY GAP causes workers to move (contraction in supply from S_A to S_{A1}). However, if the workers who moved are THE MOST PRODUCTIVE (**POSITIVE SELF SELECTION**) firms are now less productive and require less labor in the origin (contraction in demand from D_{A1} to D_{A2}) – downward spiral..the opposite in the destination

Suppose demand for labor decreases in A from D_A to D_{A1}.

What happens???

Suppose on the opposite that demand for labor increases in B from D_B to D_{B1}.

McCann, p. 217

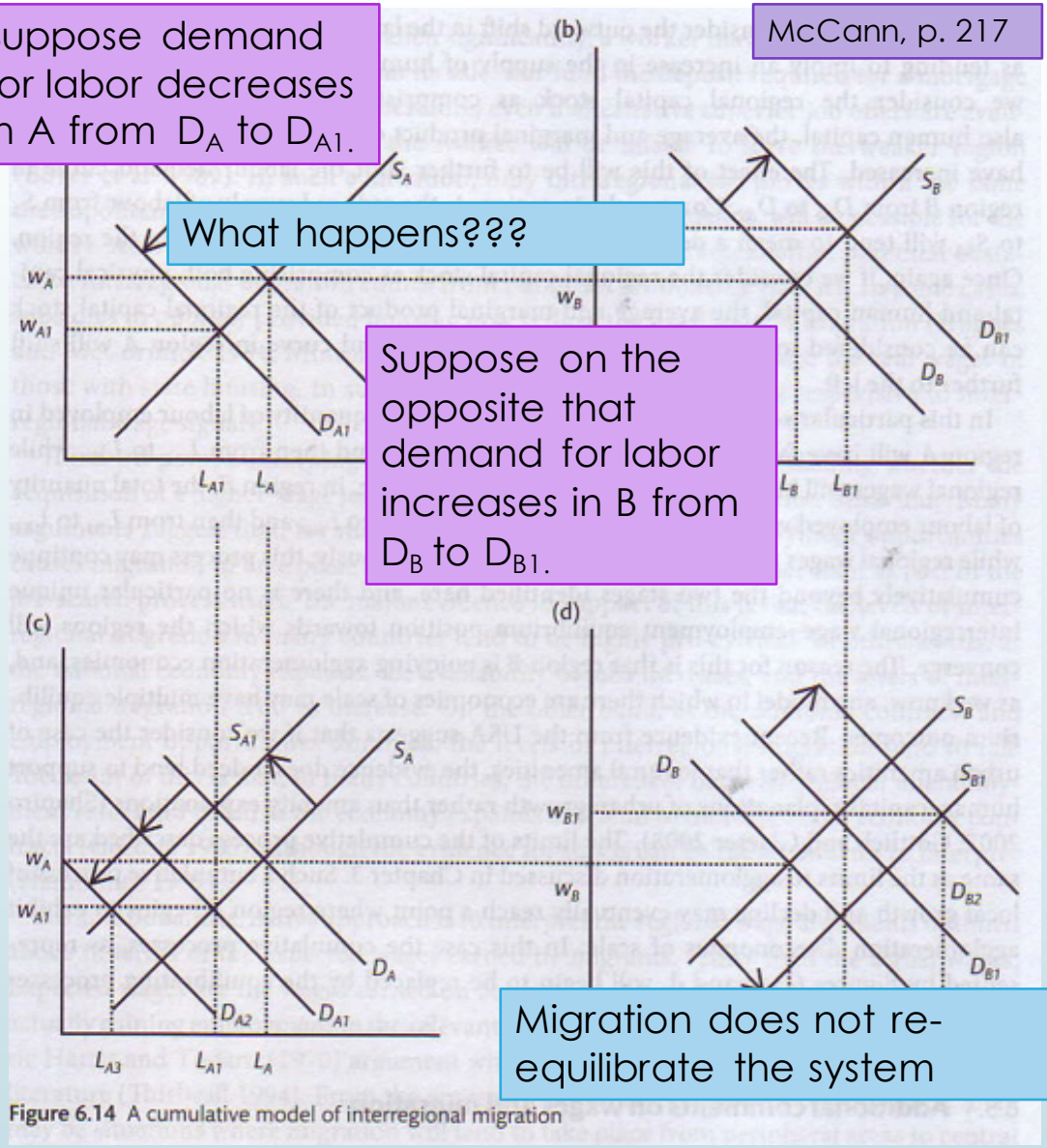


Figure 6.14 A cumulative model of interregional migration

Migration does not re-equilibrate the system

Cultural and ethnic diversity

- **Increased ethnic and cultural diversity** resulting from high-skilled migration may be viewed as a **positive amenity** by the local workforce and ultimately attract additional high-skilled workers to a given region (Florida, 2002 ; Wang, De Graaff, & Nijkamp, 2016).
- Moreover, a more diverse workforce could increase demand for 'hybridised' goods and services, **increasing consumption opportunities** for regional populations (Lee & Nathan, 2010 ; Nathan, 2015 ; Syrett & Sepulveda, 2011).

- Although the **negative consequences** of high-skilled inmigration for the destinations are less obvious, some authors point out that at least some groups of the population in the destination may lose from influxes of high-skilled migrants. For example…
  - **Increase in prices** of **goods** with **inelastic supply** – such as housing – (Nathan, 2015 ; Ottaviano & Peri, 2006 ; Saiz, 2003)
  - Some authors then question the complementarity between high-skilled immigrants and natives and think that overall **natives' wages** go down.
    - Behrens & Sato (2011) find native high-skilled workers lose from influxes of high-skilled immigrants (endowment effect dominates productovoty gains)
    - Borjas (2003) finds that an increase in the supply of workers in a given skill and experience group decreases wages for that group of native workers.

ORIGIN

- The literature on the effects on the origin of high-skilled migration is the mirror image of that on the destinations, i.e. the studies looking at the effects of migration on origins tend to focus on the **negative** (rather than positive) **consequences** of out-migration on the source region.
- **Brain drain** is the most significant and widely cited consequence of high-skilled outmigration.
  - The term is generally used to designate ***transfer of human capital*** from developing to more developed areas, with the idea that the current and future economic performances of an area are negatively influenced by the **depletion of its stock of human capital** (Kanbur & Rapoport, 2005).

- Skilled out-migration has been found to have a negative impact on employment and growth (Beine, Docquier, & Rapoport, 2001)
- However, an important assumption in these contributions is that the **pre-migration stock of human capital in the origin is exogenous to international migration**, i.e., the incentives to invest in education domestically are not influenced by emigration (Docquier & Rapoport, 2012).

- Recently some studies have questioned this…

- The few studies that believe high-skilled out-migration could have also **positive consequences** on the origin point out that– under certain circumstances – **out-migration could incentivise other people in the origin to invest in their education**, increasing their own human capital and promoting regional growth.
  - Beine et al. (2001 , 2008), Beine, Docquier, and Oden-Defoort (2011), Stark (2004), Stark and Wang (2002) argue that ex-ante migration prospects could foster investment in education in the origin, provided that origin– destination wage differentials exist. These studies assume that a region's **pre-migration human capital stock is endogenous to the prospect and realization of migration**.

- Other positive consequences for origins:
  - **Remittances**
    - Although, it is unclear whether high-skilled emigrants remit more or less compared with their low-skilled counterparts. Based on their cross-country analyses, Faini (2007) and Niimi, Ozden, and Schiff (2010) find that ***high-skilled migrants remit less***.
  - **Return migration** (after additional skills have been acquired in the host region)
  - The **creation of networks** that facilitate trade, capital flows and knowledge diffusion (Rapoport, 2004).

- Kanbur and Rappaport (2004) argue that there are two possible effects of high-skilled outmigration on origins:
  - **DIASPORA EXTERNALITIES**: emigration creates **trade an business networks** and promotes **technology diffusion**
    - Gould (1994) shows that indeed immigration increases **bilateral trade**
  - **GROWTH EFFECT** OF BRAIN DRAIN: if there are **large inter-country wage differentials**, this **influences the choices about investment in education** of people in the origin. They model the conditions under which this happens...
    - The basic mechanism is that ***people in the origin make their decision about education based on 'expected' salaries where they factor in also the probability of migrating to the richer country multiplied by the higher salary***
      - Example: if the expected salary in the home country is $5,000 and in the destination country is $30,000 even a relatively small probability of emigrating to the USA (say 20%) would have a large effect on the expected return to human capital and hence would push people to invest more in education…

INDIVIDUALS: MIGRANTS

- The fact that individuals migrate is already a sign that, overall (and *on average*) migration is "convenient", i.e. the positive consequences outweight the negative consequences
  - Jewell and Faggian (2013) estimate a Mincer equation where the **wages** of graduates are not only a function of their ability (and a series of other controls) but also of their "migration behaviour". They found that repeat migration is associated with about **10% salary increase** (at the entry point in the labour market) followed by late migration (6.7%). Return migration is, on the opposite, associated with a salary penalty (1.4% less than not moving at all!).
    - When controlling for self-selection (using propensity score matching) the gain even increases...
    - Obvious differences by subject studied (e.g. STEM vs. creative arts)

- Aside from the effect on wages, migration is also a means to a better allocation of resources and **skill matching** (ultimately resulting in highyer job satisfaction).
  - Iammarino and Marinelli (2017) analyse **the impact of inter-regional mobility on education–job match** in the early stage of a graduate's professional career in Italy. Results from this study demonstrate that there are important regional differences in the probability of over-education and a mismatch of the graduate's skills and capabilities.
  - Abreu et al. (2015) find that, all other things equal, **graduates who migrate** have a **higher career satisfaction.** They also find that changing job/industry in the *same* location does not positively affect satisfaction.

Overall on the "system"...

- Graduate migration is a process of "re-allocation" and, as such, it implies that resources (human capital) should be better exploited and reach their potential...
- Does it mean everybody is winning? No...but it means that, overall, there should be a positive gain on the system overall and that it helps with growth.
- However, this poses the problem of what to do with more peripheral areas who are unable to retain and attract human capital... (another talk!)

Thank you!

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