Migration in Europe
MigrEU Jean Monnet Module

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The economic approach to migration

Alessandra Venturini

The Economics of Migration, 2019-20

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The economic analyses of migration: focus on three main subjects

The migration choice

- **The effect in the destination country**
  - on the GNP and innovation
  - in the labour market
  - on the welfare
  - integration (wage assimilation)
- **The effect in the sending countries**
  - economic and social remittances,
  - brain drain

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Why people move?
The migration choice

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Methodology

The research in economics is conditioned upon the dataset available,

we use the economic theory and the statistical knowledge to overcome data limitation

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The migration choice

Who does move?

How many people does move?

Why people does move?

- 95% of the research on labour migrants
- Now some research on refugees (Hatton Tim 2019; Dustmann et al 2017)
- Very little of family reunification

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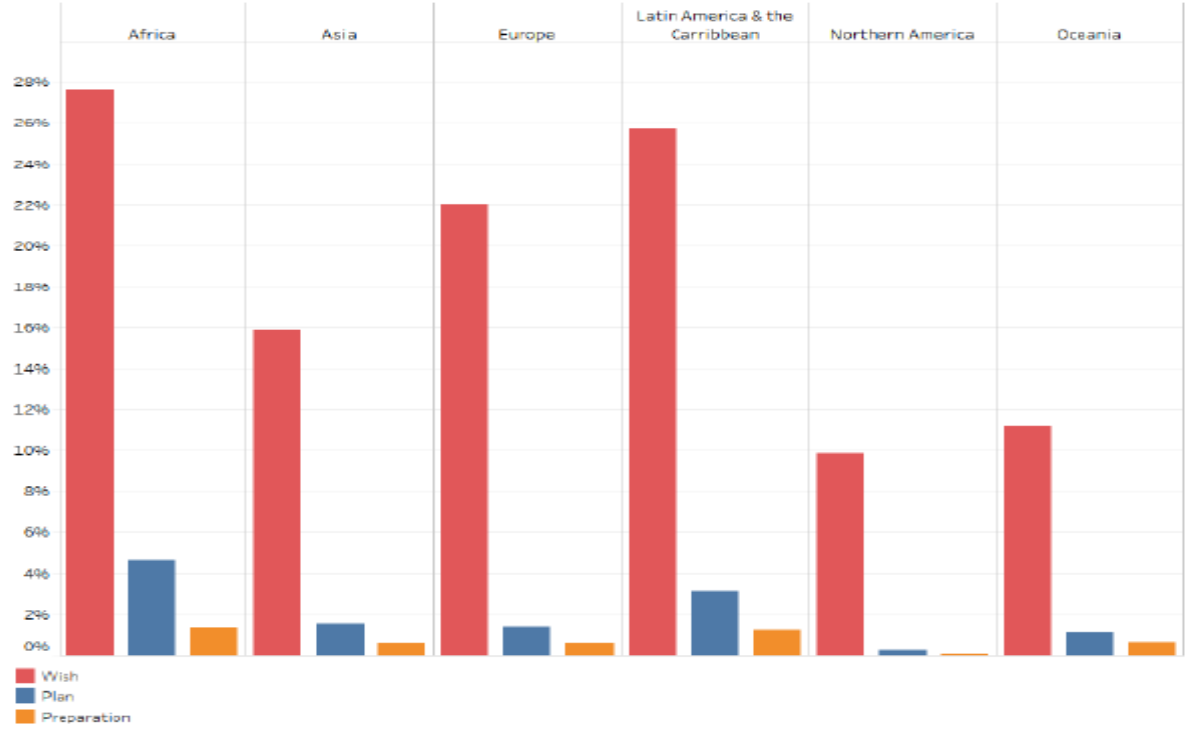
Who migrates: wish → plan → prepare

Figure: Intention to migrate to another country, by geographic area



Source: Migali and Scipioni (2018) using Gallup World Poll Survey 2010-2015 waves

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We cannot base forecast upon Gallup Data on wish!

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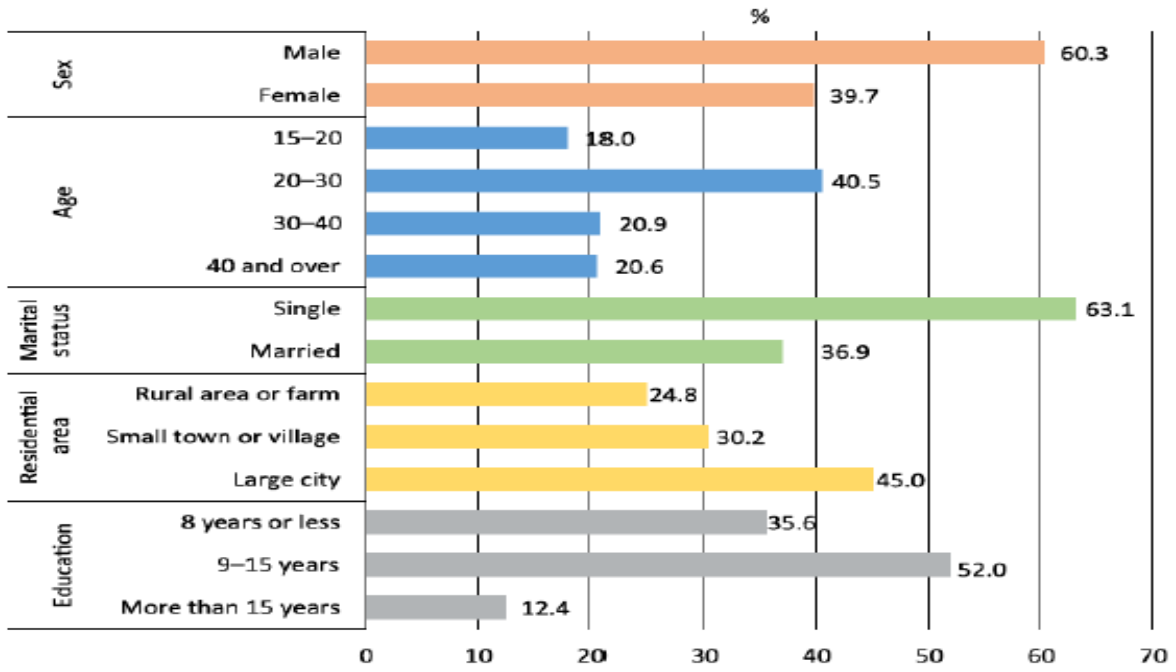
Who migrates: self-selection

Figure: Socio-economic profiles of individuals who plan to migrate to another country



Source: GMDAC (2017) using Gallup World Poll Survey 2010-2015 waves

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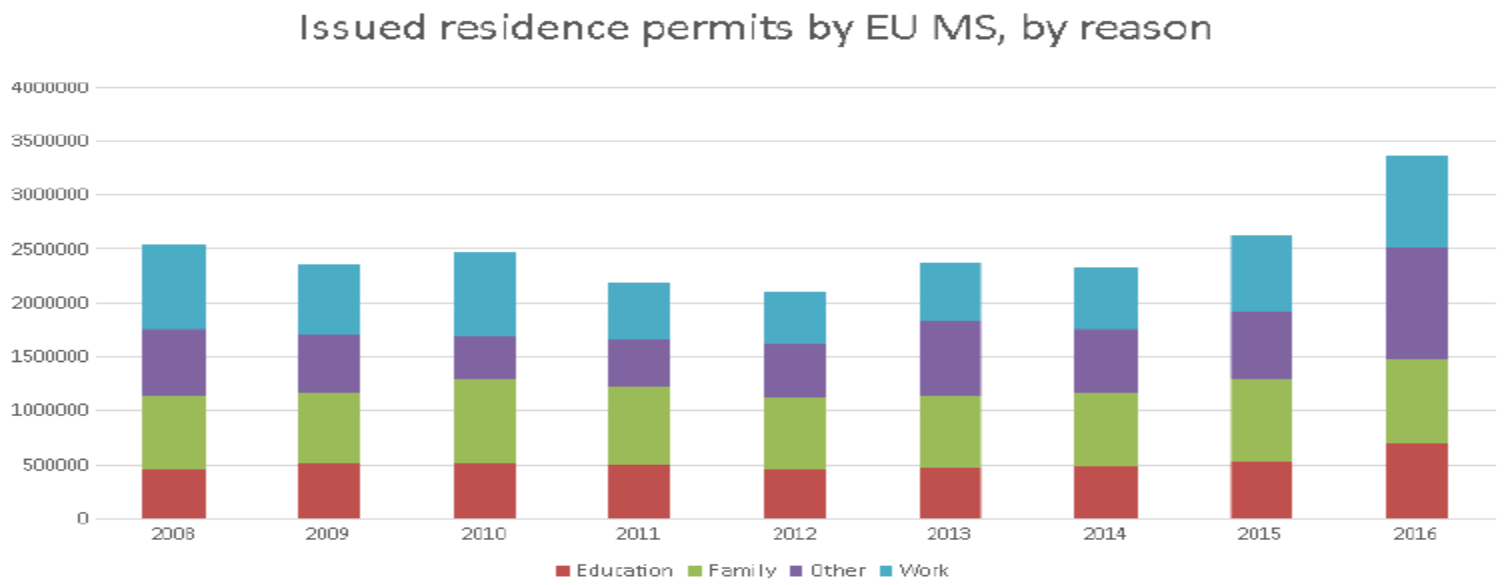
Who migrates: reason



Source: Eurostat, migr_resfirst

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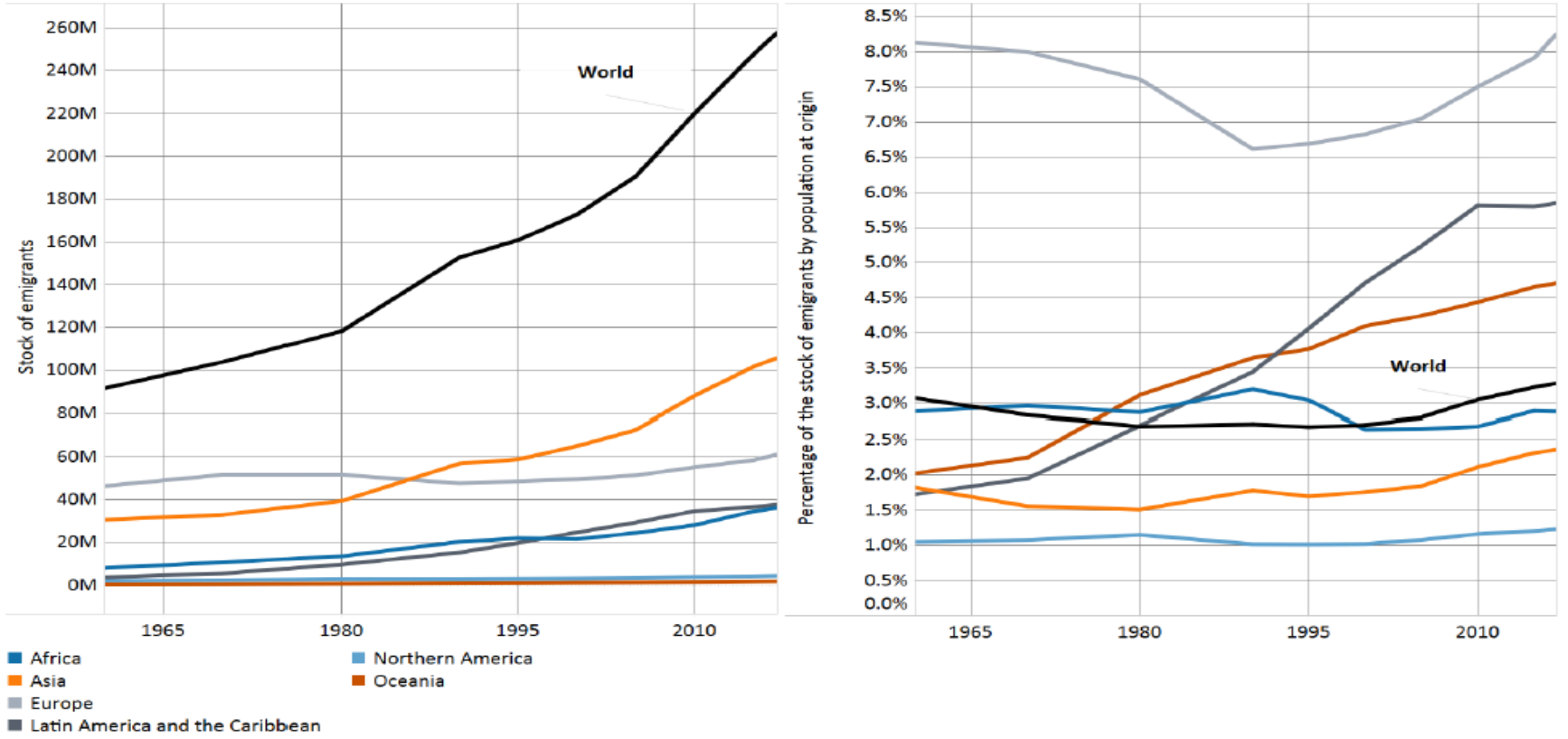

Figure 2 Evolution of the stock of emigrants by continent of origin in absolute numbers (left) and as percentage of the population at the origin (right). Source: own elaboration based on UNDESA and WB.

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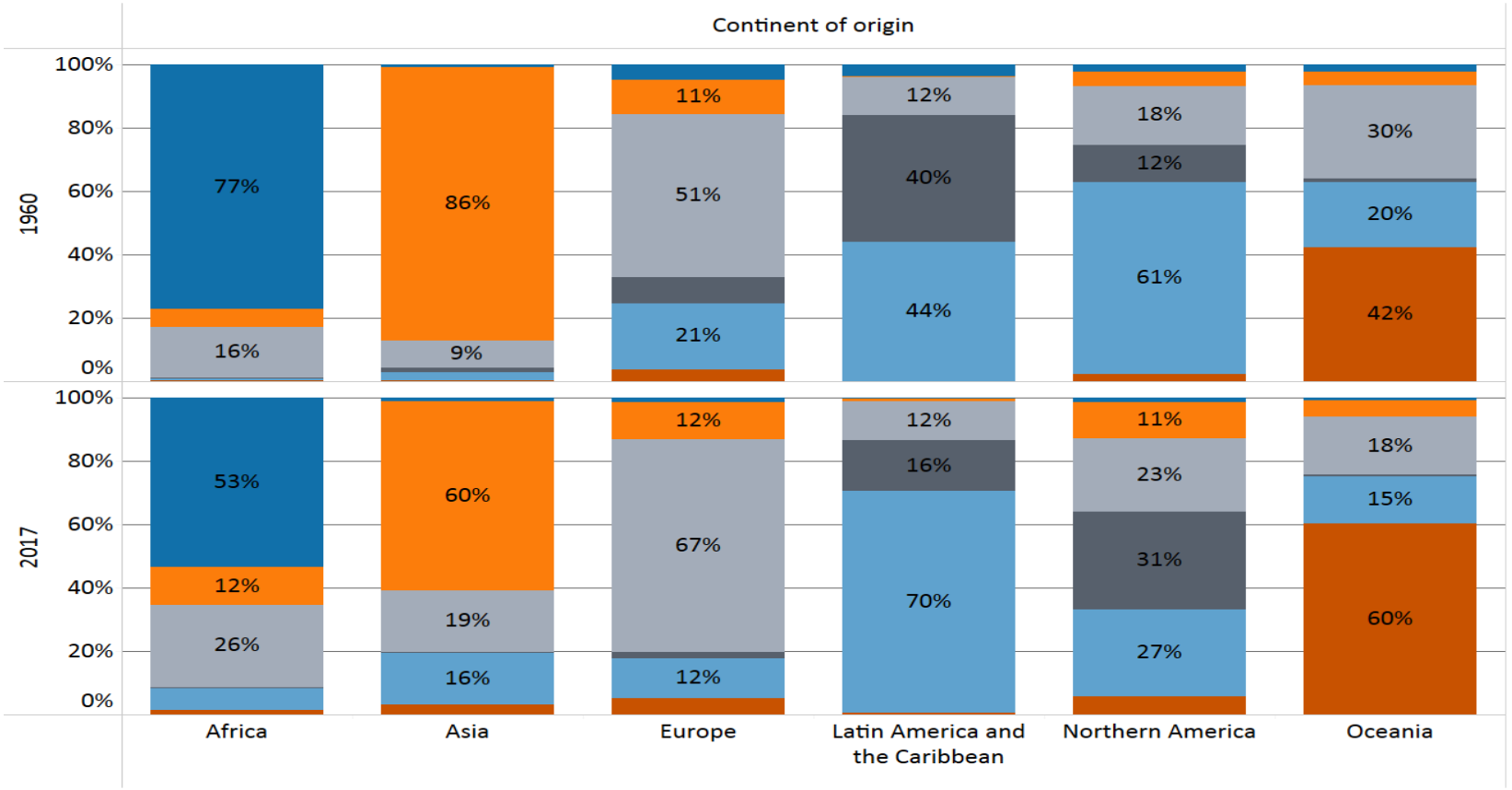

Figure 3. Breakdown of the stock of migrants for each continent of origin (100%) across continents of destination (colours) in 2017 and 1960. Source: own elaboration based on UNDESA and WB.

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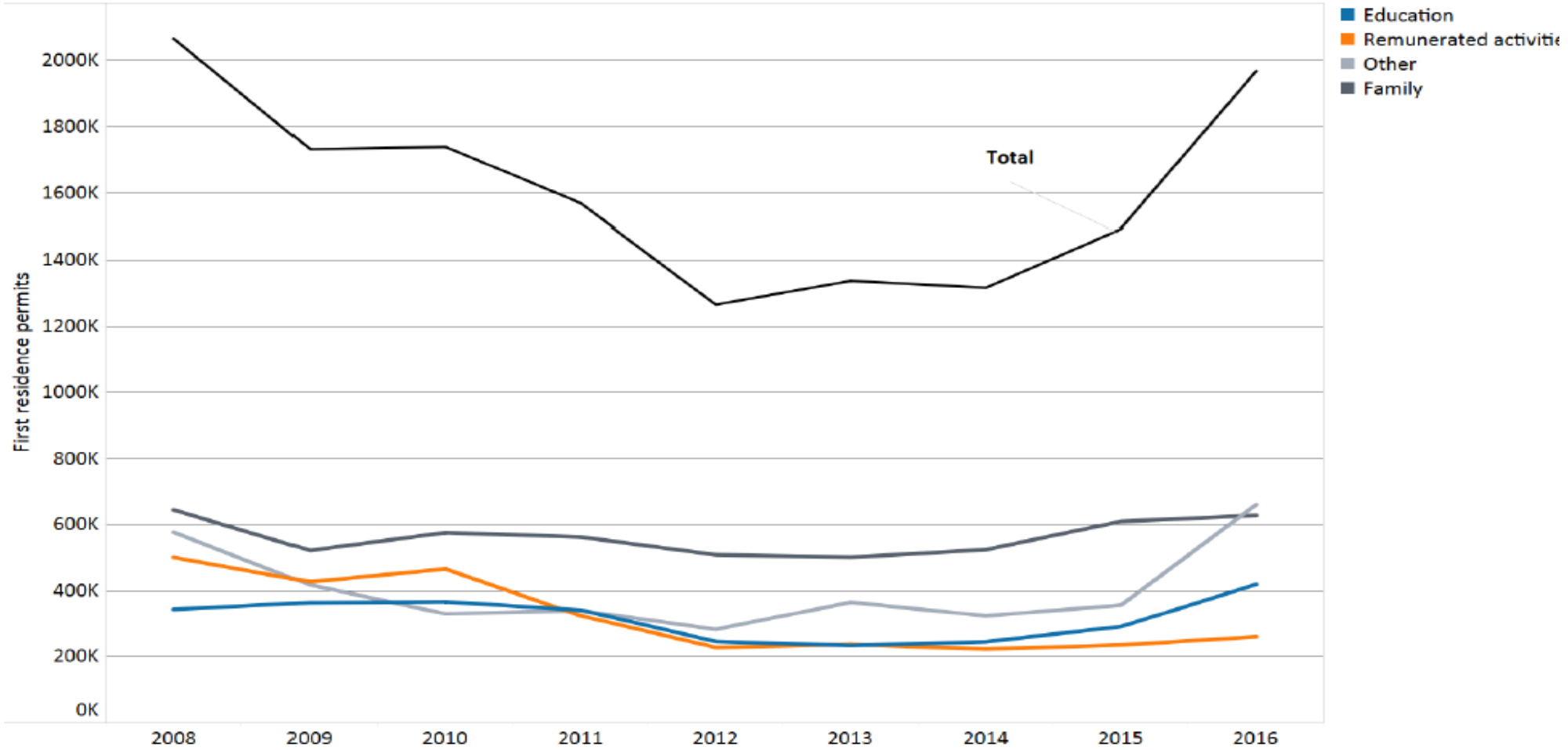

Figure 6 First residence permits by type in EU28, 2008-2016. Source: own elaboration based on EUROSTAT.

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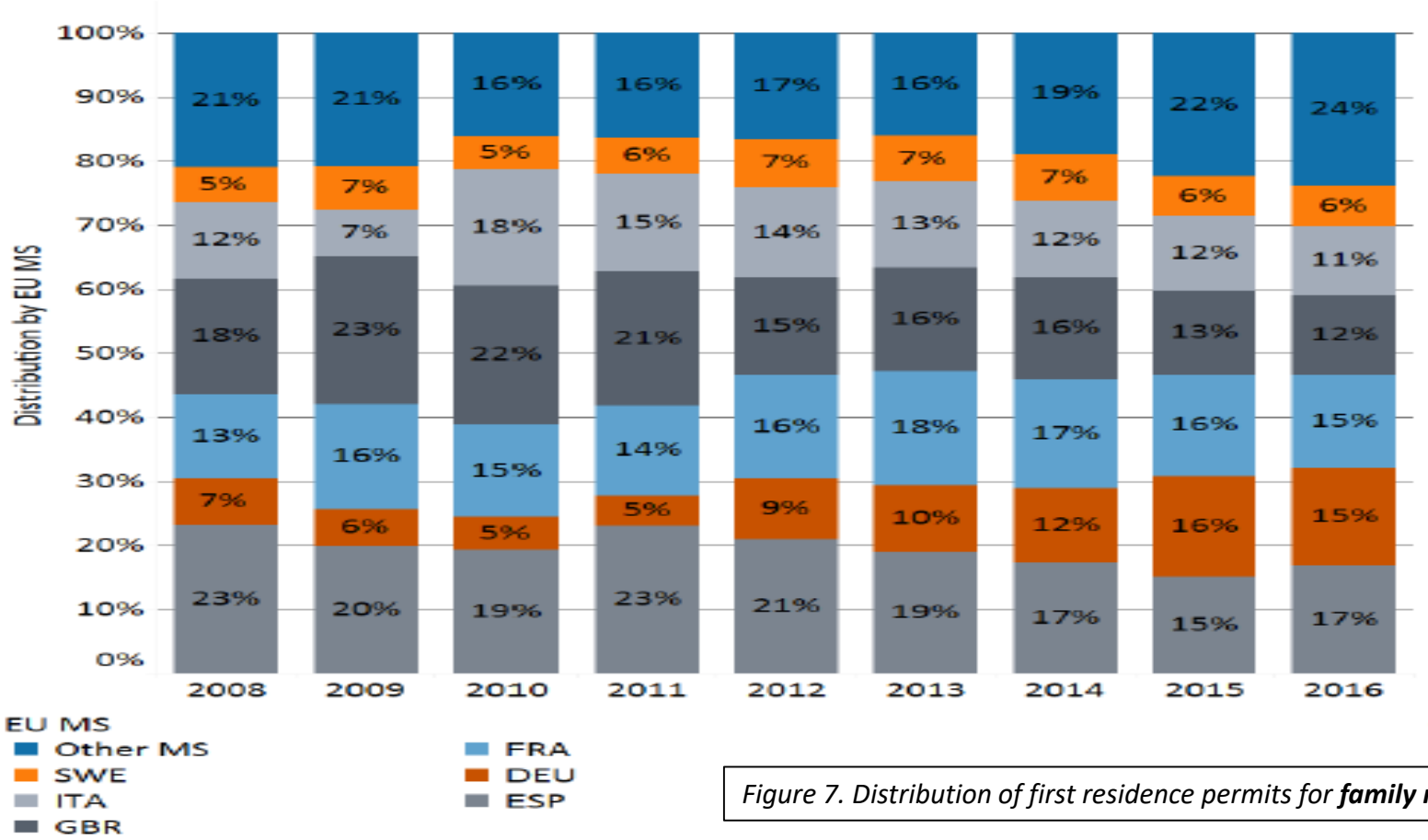

*Figure 7. Distribution of first residence permits for **family reasons** by EU MS of destination*

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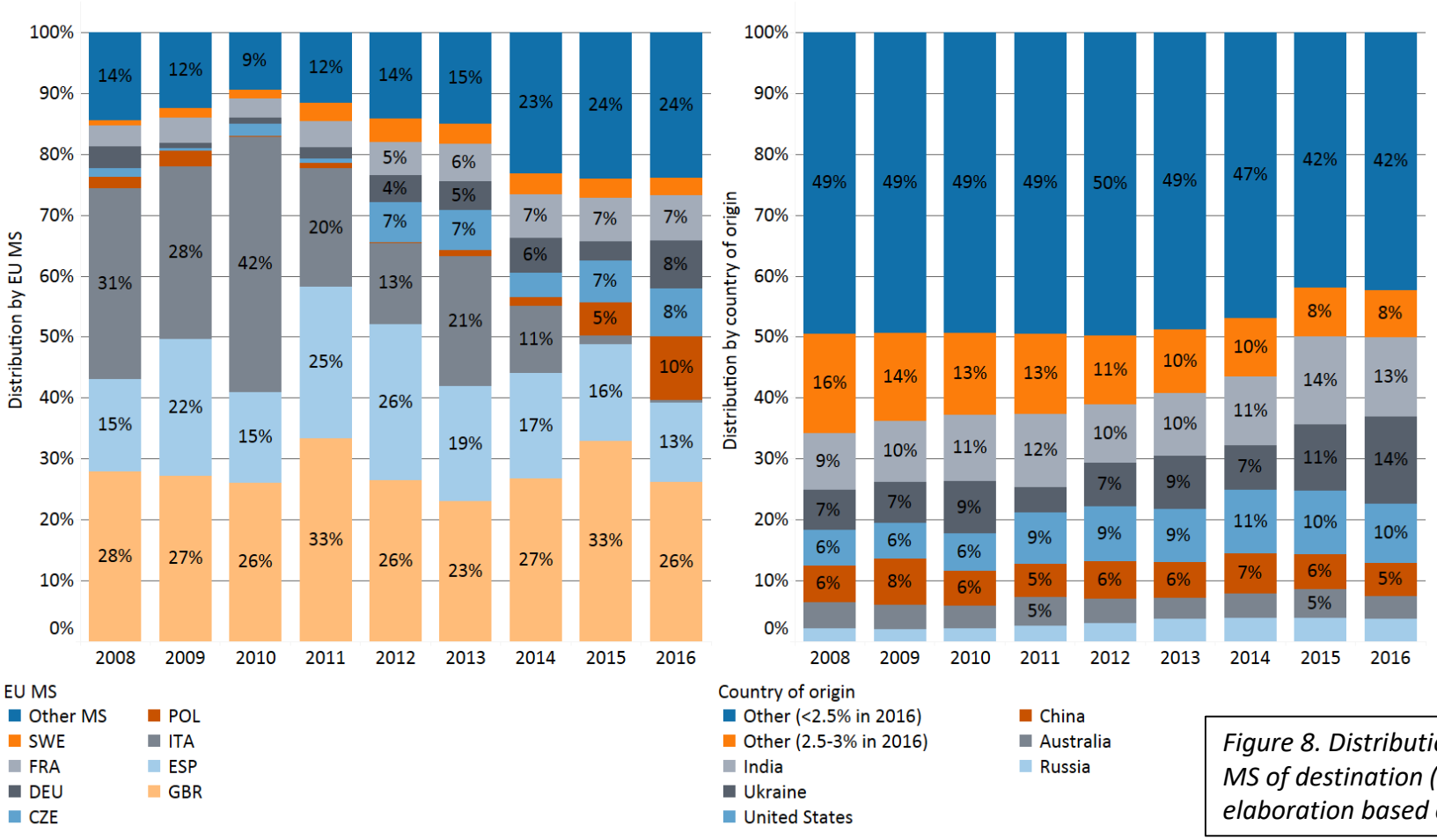

Figure 8. Distribution of first residence permits for work reasons by EU MS of destination (left) and by country of origin (right). Source: own elaboration based on EUROSTAT

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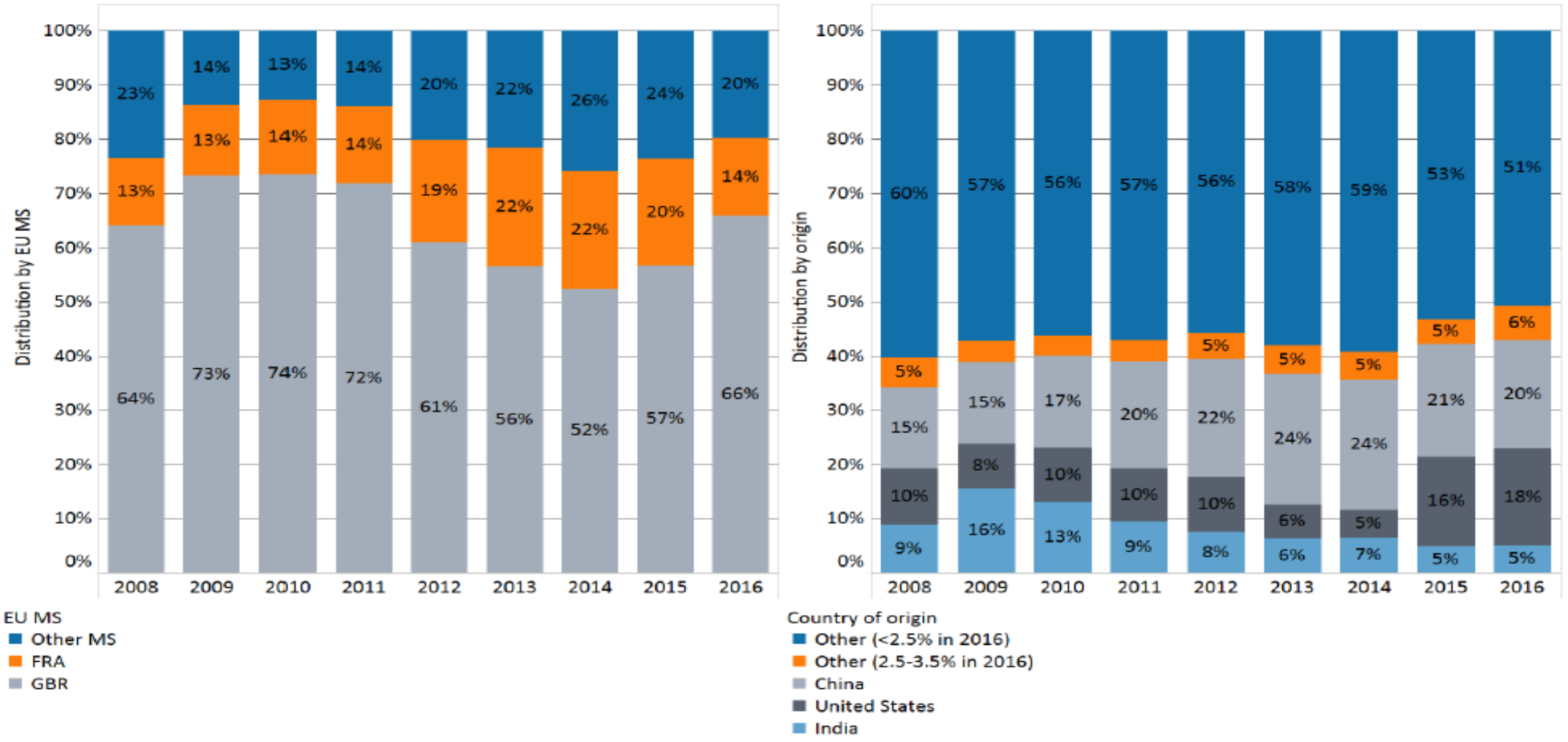

Figure 9 Distribution of first residence permits for education reasons by EU MS of destination (left) and by country of origin (right). Source: own elaboration based on EUROSTAT.

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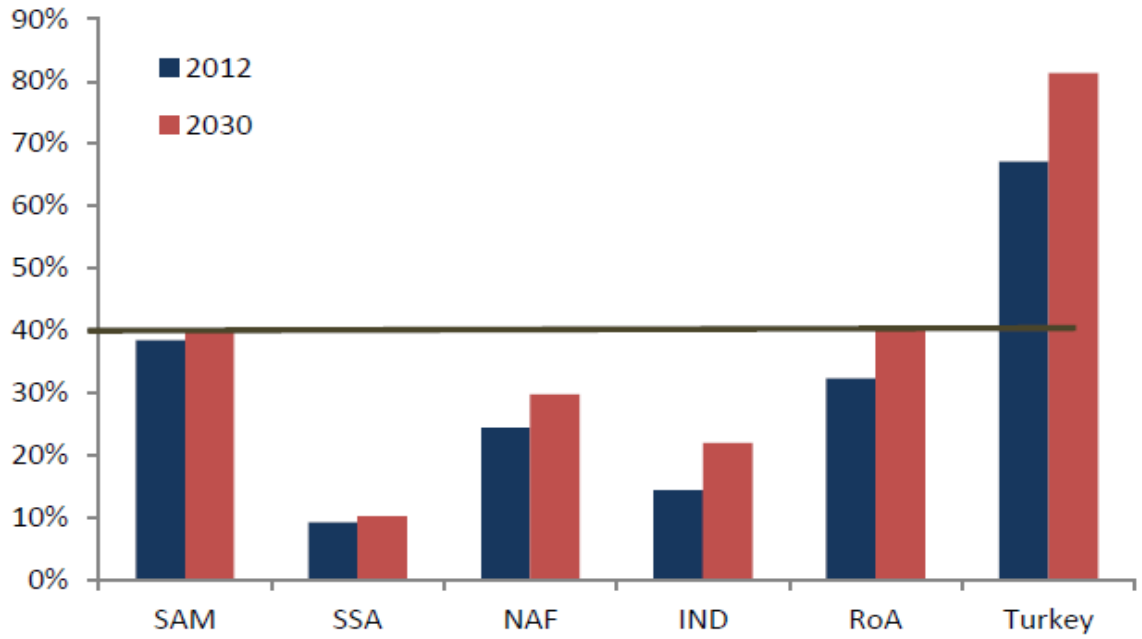
Figure 2.9 Income differentials in 2030: Average GDP per worker as % of EU average in selected regions



Note: SAM = South America, SSA = Sub-Saharan Africa, NAF = North Africa, IND = India and RoA = Rest of Asia.

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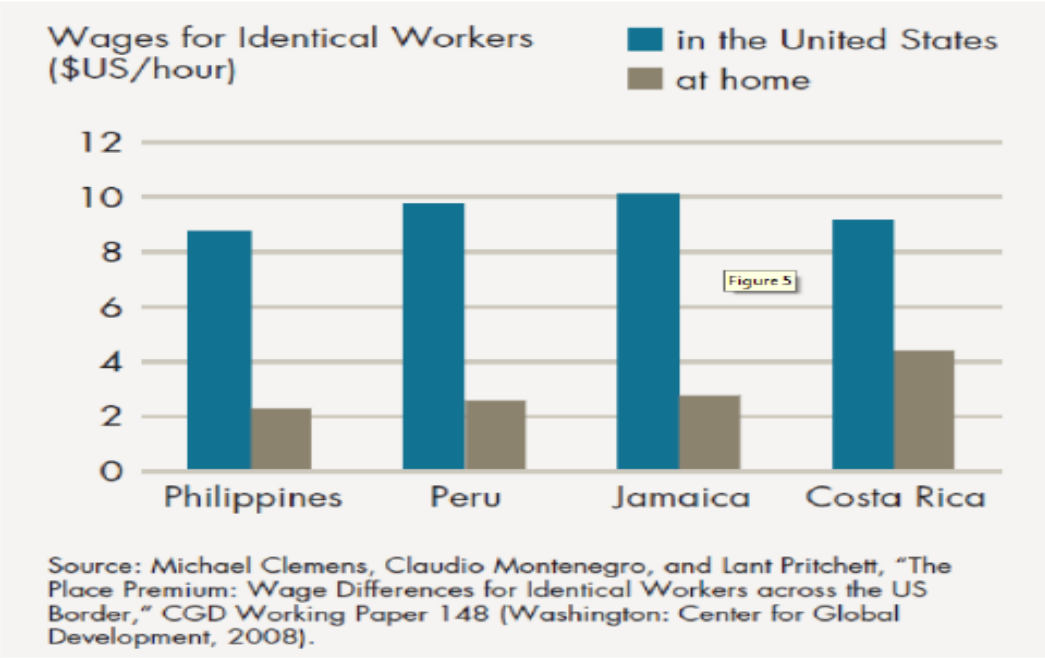
Wage inequality as a driver of migration?

Figure: US wages are the 'economic opportunity of a lifetime' for foreign workers



Source: Michael Clemens, Claudio Montenegro, and Lant Pritchett, "The Place Premium: Wage Differences for Identical Workers across the US Border," CGD Working Paper 148 (Washington: Center for Global Development, 2008).

Source: https://www.cgdev.org/sites/default/files/archive/doc/full_text/CGDBriefs/3120183/time-bound-labor-access.html

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Figure 2.10 Level of urbanisation by region, 2011 and 2030

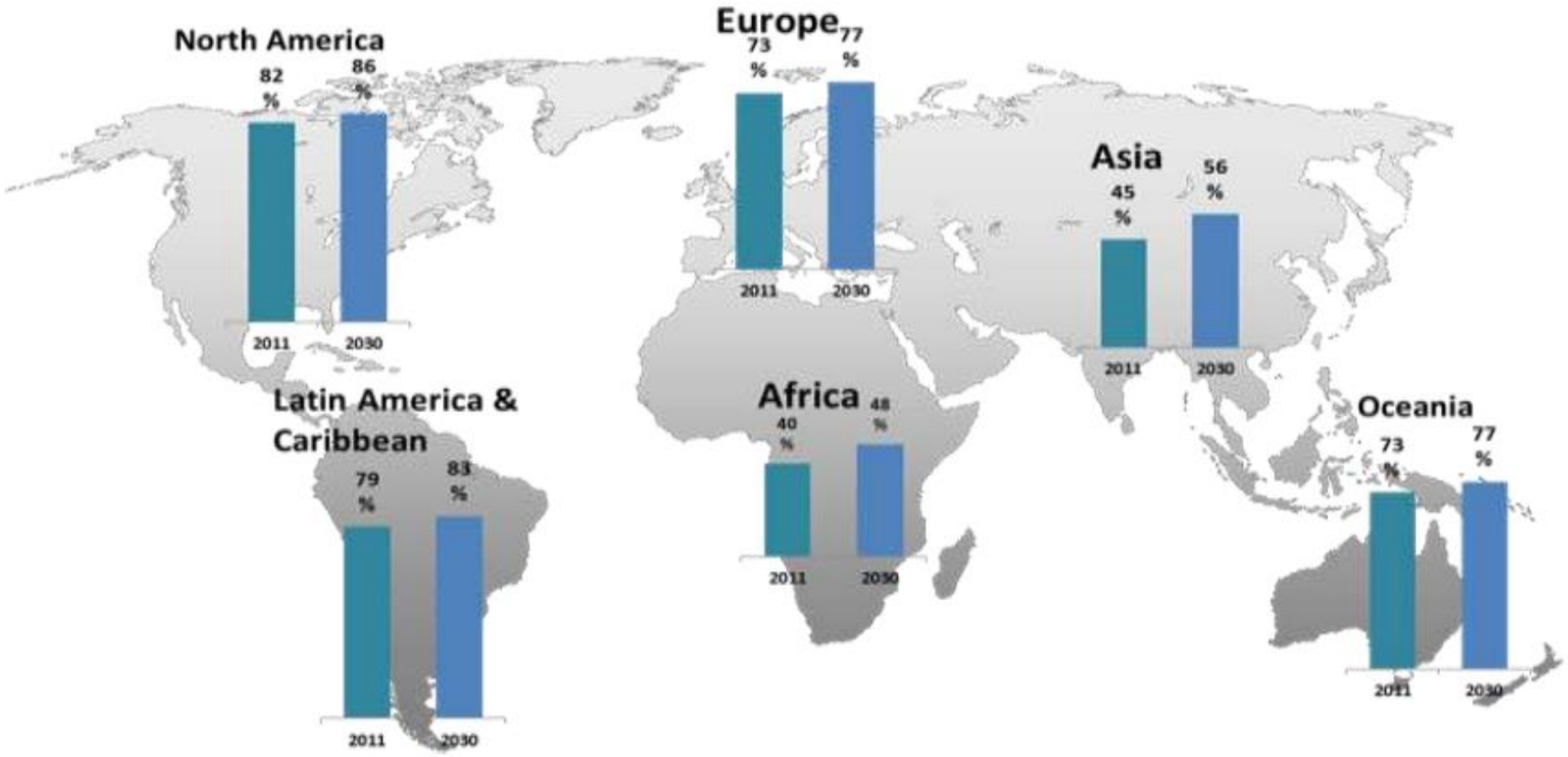

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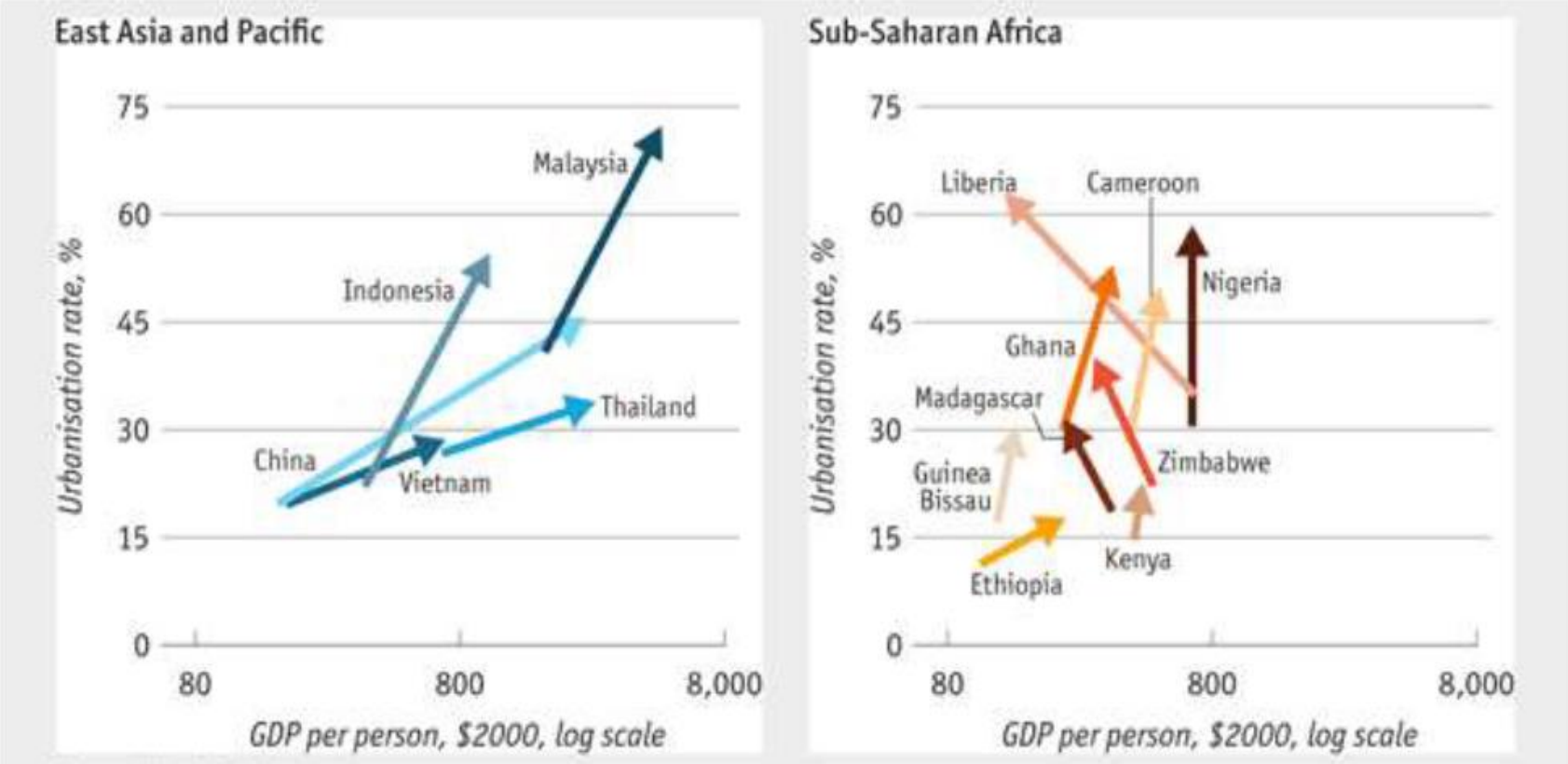
Figure 2.11 Urbanisation and income (change between 1985 and 2010)



Source: World Bank

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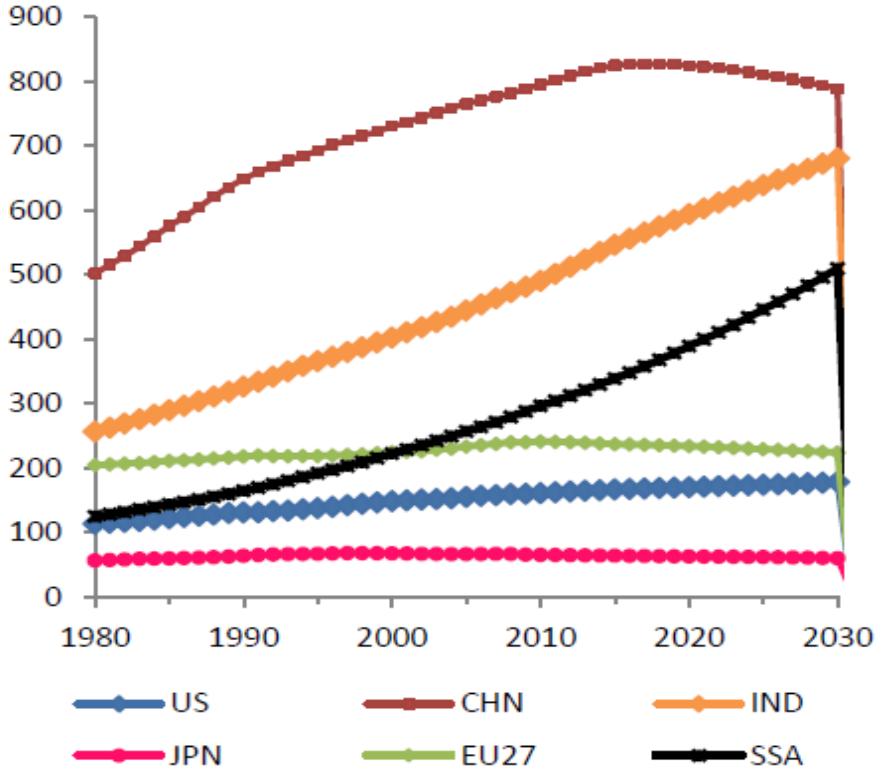
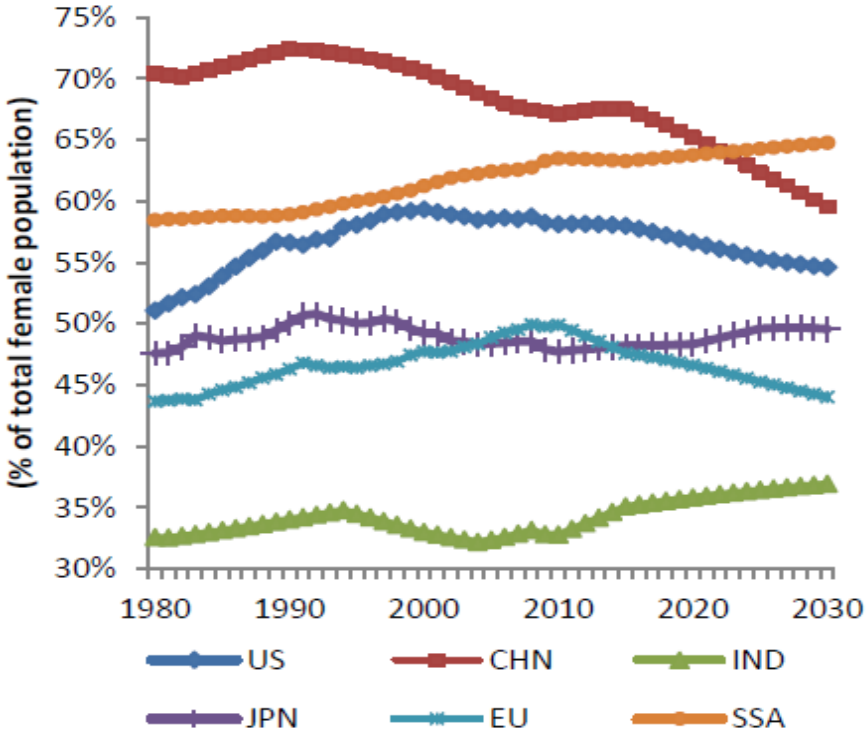
Figure 2.6 Changes in the global labour force (1980-2030)

(a) Total labour force (millions)



(b) Female participation rates



Source: MaGE estimations and projections.

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Figure 2.7 Paths of tertiary education expansion: MaGE Central scenario

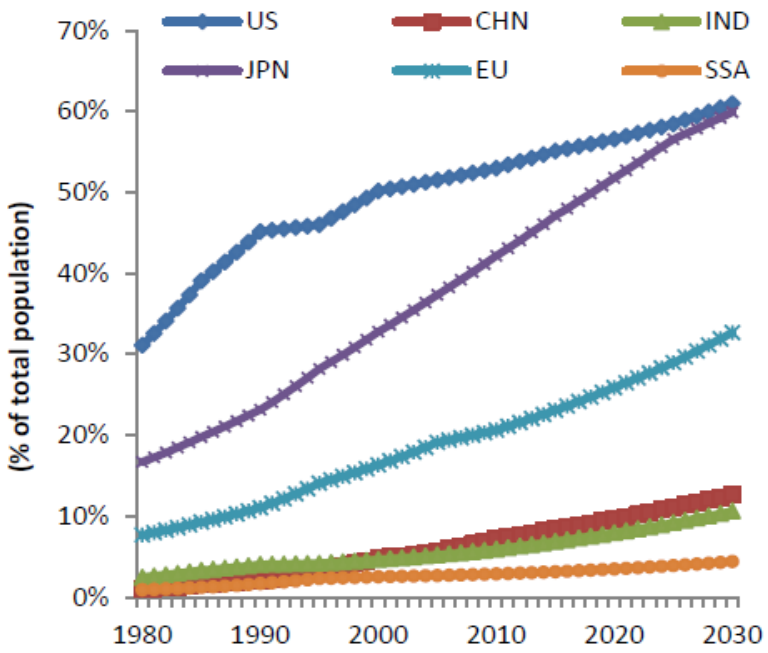
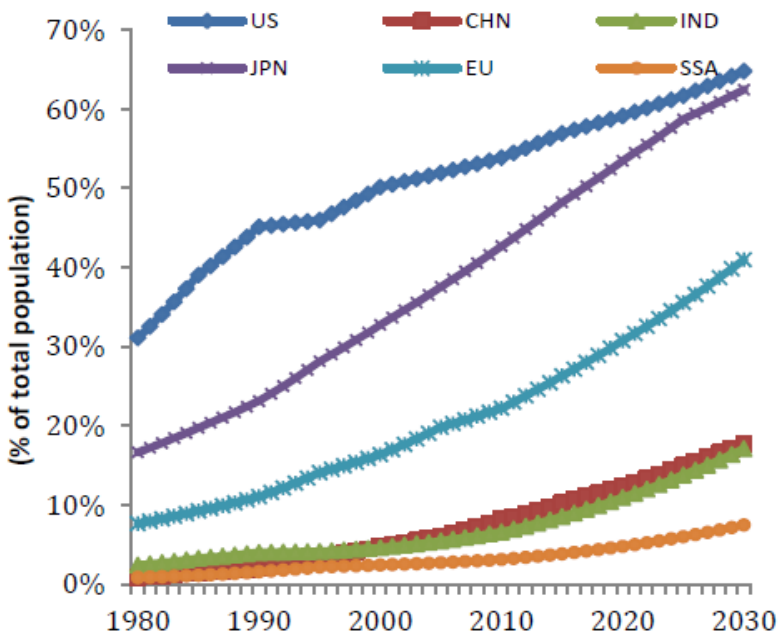


Figure 2.8 Paths of tertiary education expansion: MaGE alternative scenario



Source: MaGE estimations and projections.

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Why people move?

Many theories and many approaches

→ Economic
→ Sociologic
→ Micro/macro

There is no single theory widely accepted by social scientists to account for emergence and perpetuation of international migration

Fragmented set of theories developed in isolation from one another and usually segmented by disciplinary boundaries

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- The theoretical approaches are very rich
- Frequently are based on small surveys
- but the empirical tests are based upon the data available

CROSS SECTION or TIME SERIES

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1- Macro Model → Migration is an adjustment mechanism

2- MICRO Model → theory micro but tests usually aggregate

a) Human capital investment individual decision

b) Roy Model self selection and skill

3-SOCIOLOGICAL model

4-GRAVITY model

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Macro model 1: Hicks

- Hicks (1932: 76): *"differences in net economic advantages, chiefly differences in wages, are the main causes of migration"*

→ *Migration is an adjustment mechanism*

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Assumptions:

- People are rational and tend to maximize their utility;
- People are mobile
- Migration occur without costs
- There is no risk or uncertainty

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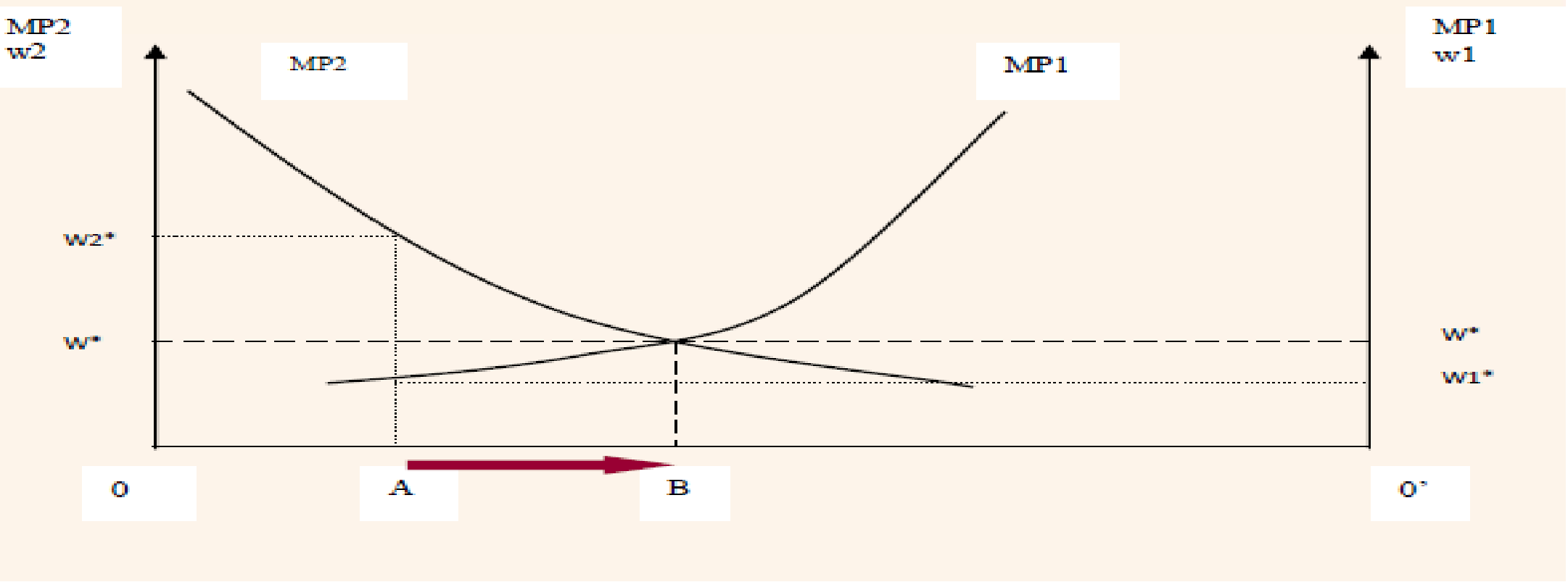

Source: Bhagwati and Srinivasan 1998: 468.

2. Micro

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a) Individual model Investment in migration (Todaro)

Assumptions:

- Individuals behave in a rational way, they gather all information and are capable to compare different locations
- Individuals have costless access to perfect information
- Individuals maximize their utility
- Migration has a temporal dimension – preferences regarding time and risk are important, individuals exhibit a more or less preference for the present

→ Migration decision is taken individually, social context is neglected.

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Labour mobility according to the human capital theory

- Migration as an investment decision met with an intention to find maximal pay for a given level of skills investment which improves the productivity of human capital
- Idea: workers calculate the value of the employment opportunities available in each of the alternative labour markets, net out the costs of making the move
- and choose option which maximizes the net present value of lifetime earnings
- Migration decision is guided by the comparison of the present value of lifetime
- Earnings in the alternative employment opportunities net gain positive
- **Problems:** risk and uncertainty, costs (pecuniary and non-pecuniary)

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Basic assumption human capital model:

1) Migration → higher wage
2) Individuals' choice is based on financial considerations

Investment decision:

- Costs: direct expenses & forgone earnings
- Benefits: higher wage (and employment rate)

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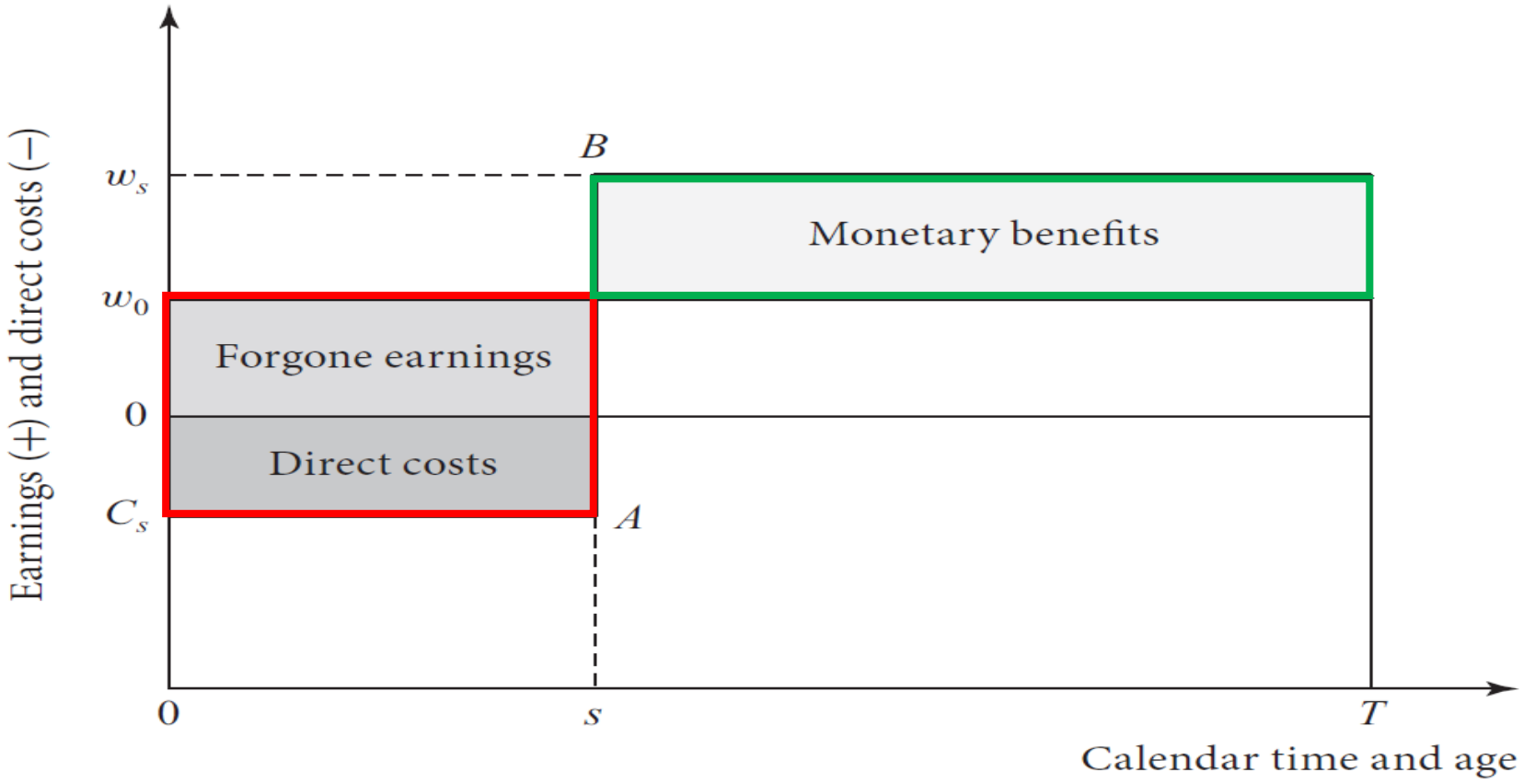

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Moving decision – theory

- $PV_o = w_o + \quad w_o/(1+r)^t \approx w_o + w_o/r$
- $PV_{s+1} = -Cs + \quad w_{s+1}/(1+r)^t \approx -C_s + w_{s+1}/r$
- Benefit is larger than the cost PV_{s+1} larger than PVo

- Migrate until $PV_o = PV_{s+1}$: $(w_{s+1} - w_o)/r = w_o + C_s$
- which means approximately: $\Delta(w_s/w_o) = r$
- It not enough that the two green areas have the same size because the costs are incurred before

r is high present oriented

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year	2000	2001	2002
time	t	t+1	t+2
capital	100		
interest rate r	0.10	110	121
interest rate r	0.20	120	144

at the end of 3 periods the capital is 121 with an interest rate of 10%

at the end of 3 periods the capital is 144 with an interest rate of 20%

The higher the interest rate the higher the return,
the longer the period the higher the return

Ko K1= Ko(1+r) K2=K1(1+r) K2= Ko(1+r) (1+r)

Actualization it is the opposite, the higher is the interest rate the less money you have at the initial time

K2/ (1+r)(1+r) 121/(1,1*1,1)= 100 r=0.1

121/(1,2*1,2)= 84 r=0.2

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More problems:

- ***Potential migrants have perfect and costless information***
- Information is scarce and costly and limited information about economic
- and non-economic factors may lead to second-best solutions – individual may
- decide to stay even if it would be possible to realize a higher level of utility in a
- different location.
- ***Potential migrants behave in unconditionally rational manner***
- Rational behavior in a situation where a decision between different options has
- to be made a decision maker possessing complete and unconstrained information
- opts for the alternative that allows him to realize the highest level of utility
- rather: *Bounded (conditional) rationality* - conditional on the incomplete
- information

The potential migrant is an autonomous human being with no social context

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b) Selection and Sorting - The Roy model

Although it is important to determine the size and direction of migration flows, **it is equally important to determine *which* person finds it most worthwhile to migrate to the receiving country**. Even in the absence of legal restrictions impeding international migrations, only a subset of persons in the host country chooses to move

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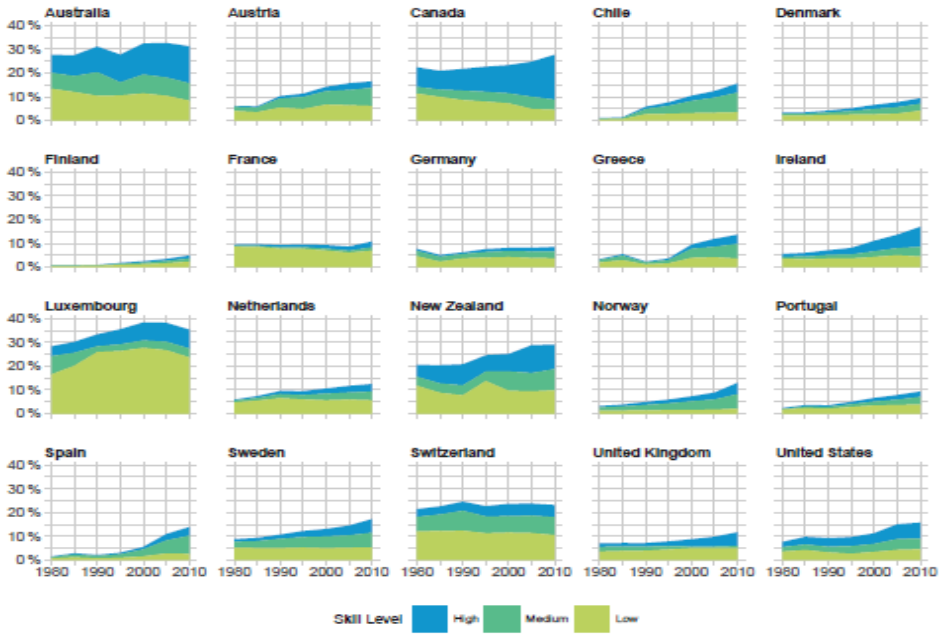
Positive and negative selection of migrants varies across countries

Figure: Immigrant stock as percent of population, 1980-2010, by skill level



Source: MEDAM Assessment report (2017)

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What explains selection and sorting of migrants?

Utility from migration = attractiveness of destination - costs of migration

Individuals' characteristics: education (high- vs. low-skilled), health, risk aversion, etc

Pull and push factors

- Income at destination
- Unemployment rate at destination
- Amenities and institutions at destination
- Poverty vs. credit constraints at origin
- Environment, conflict at origin
- Distance, language, cultural proximity
- Networks
- Immigration policies

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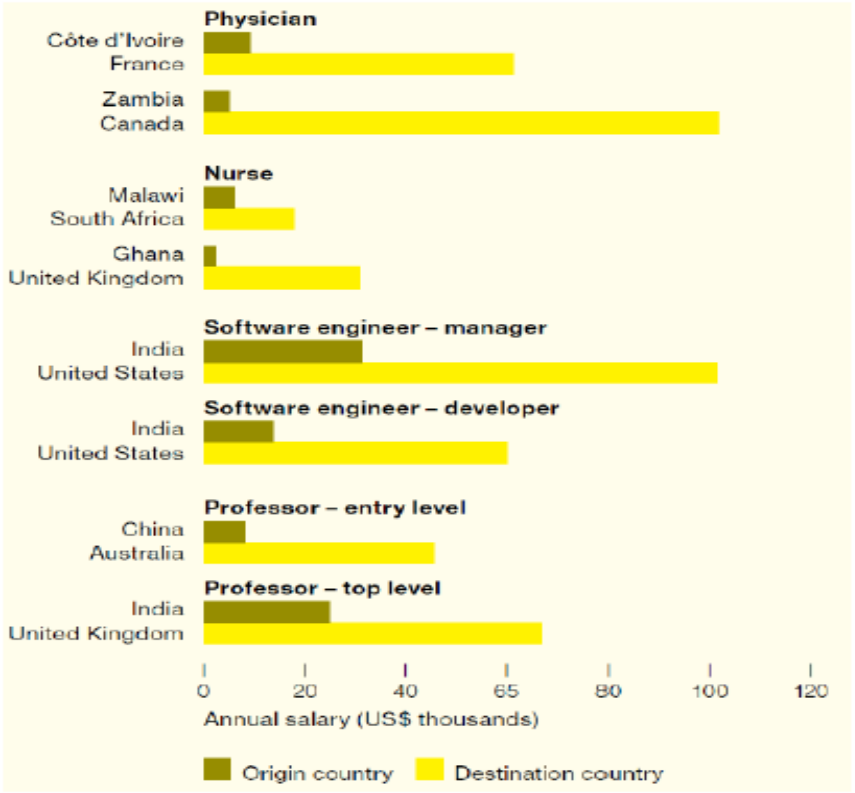
Wage inequality as a driver of migration?

Figure: Wage gains for qualified migrants



Source: Human Development Report 2009, Figure 3.2

The "Roy Model"

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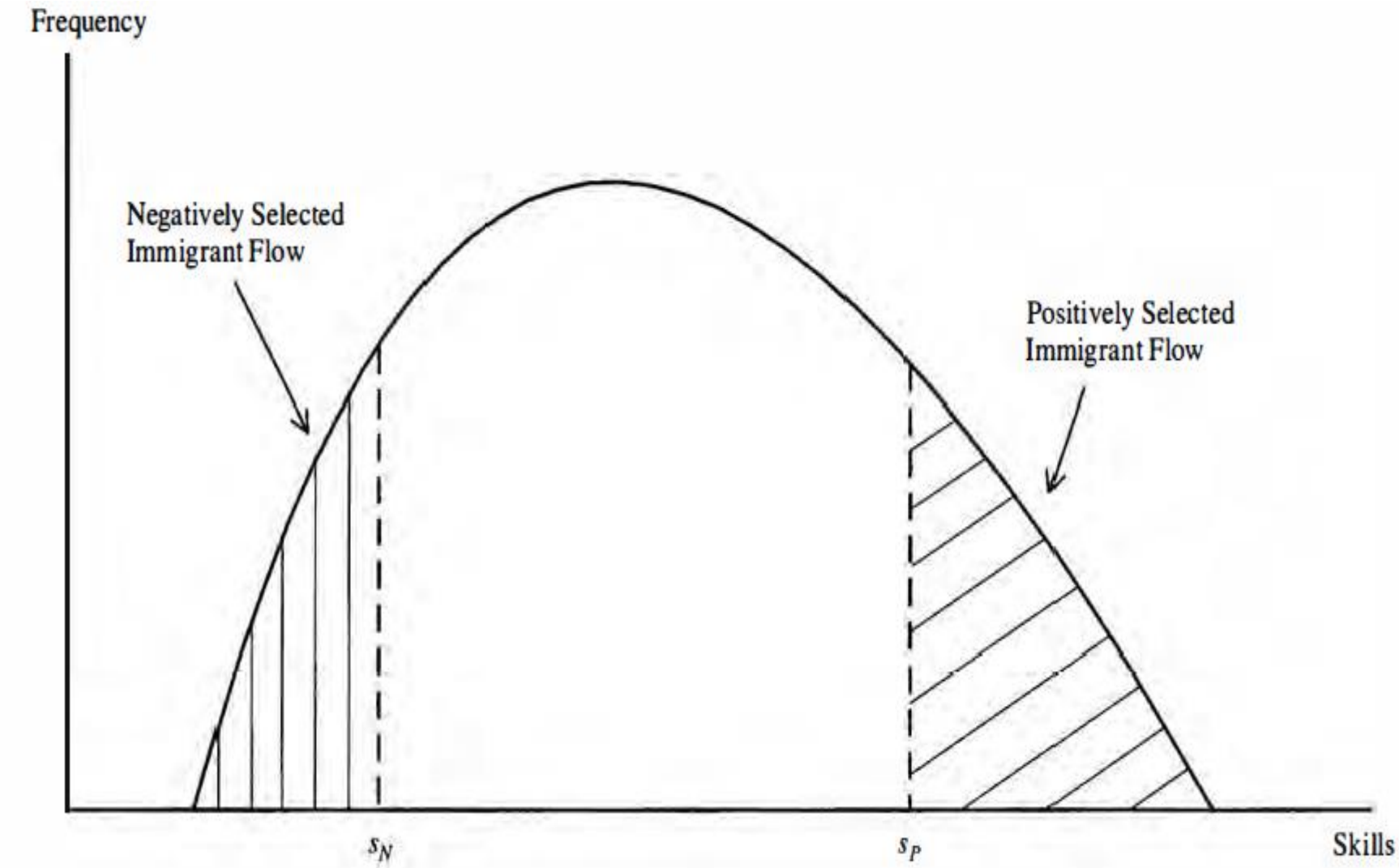

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ro and r1 are the return of skill in the two labour markets if abilities (Skills) are perfectly transferable from one labour market (Wage) to the other

W: wage, S: skill

$$\log w_0 = \alpha_0 + r_0 s,$$

$$\log w_1 = \alpha_1 + r_1 s,$$

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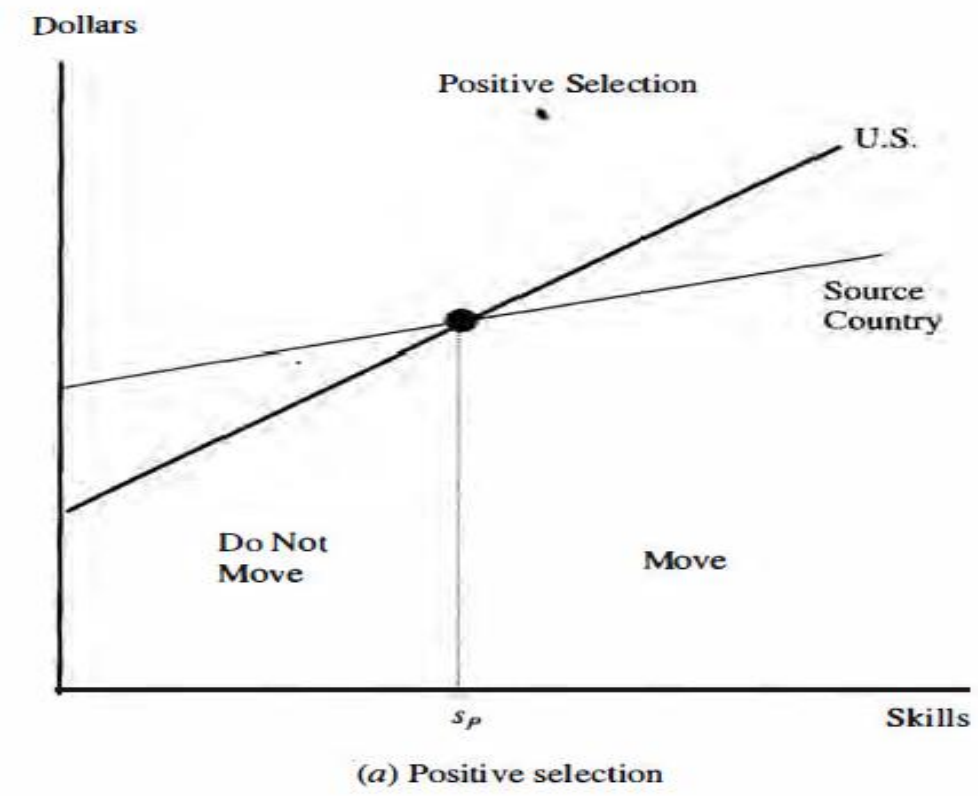
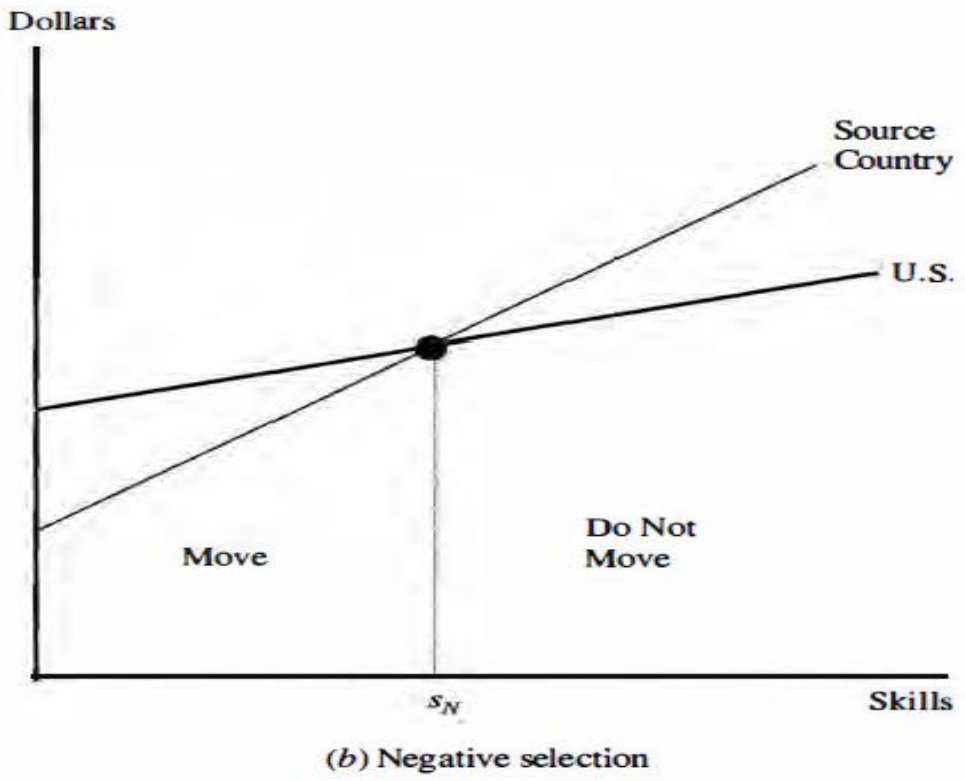
Self Selection



(a) Positive selection



(b) Negative selection

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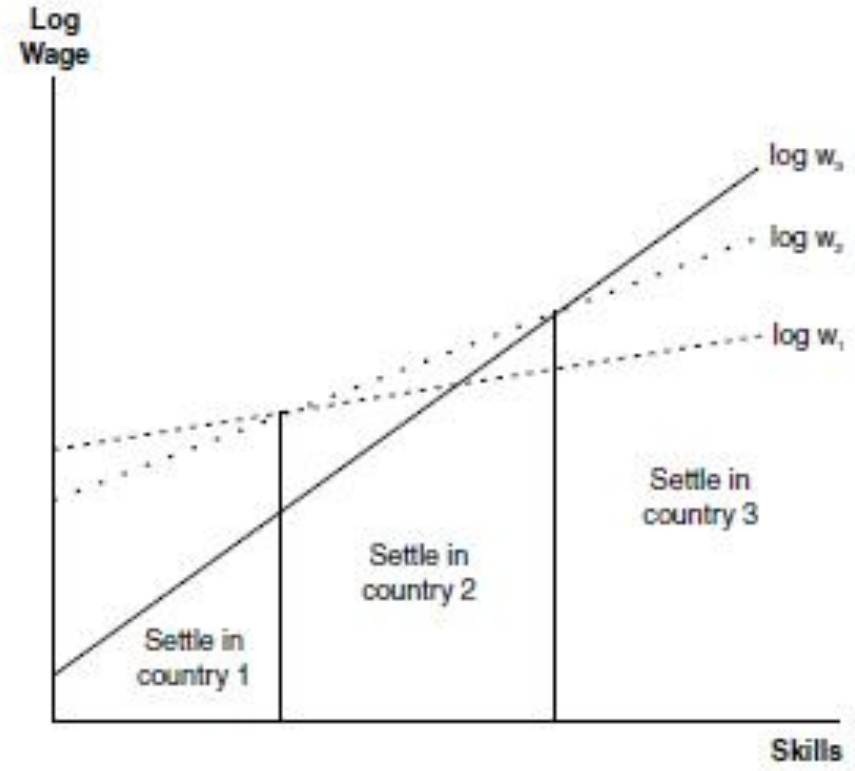

Figure 1.2. Selection in a Roy Model with Multiple Destinations

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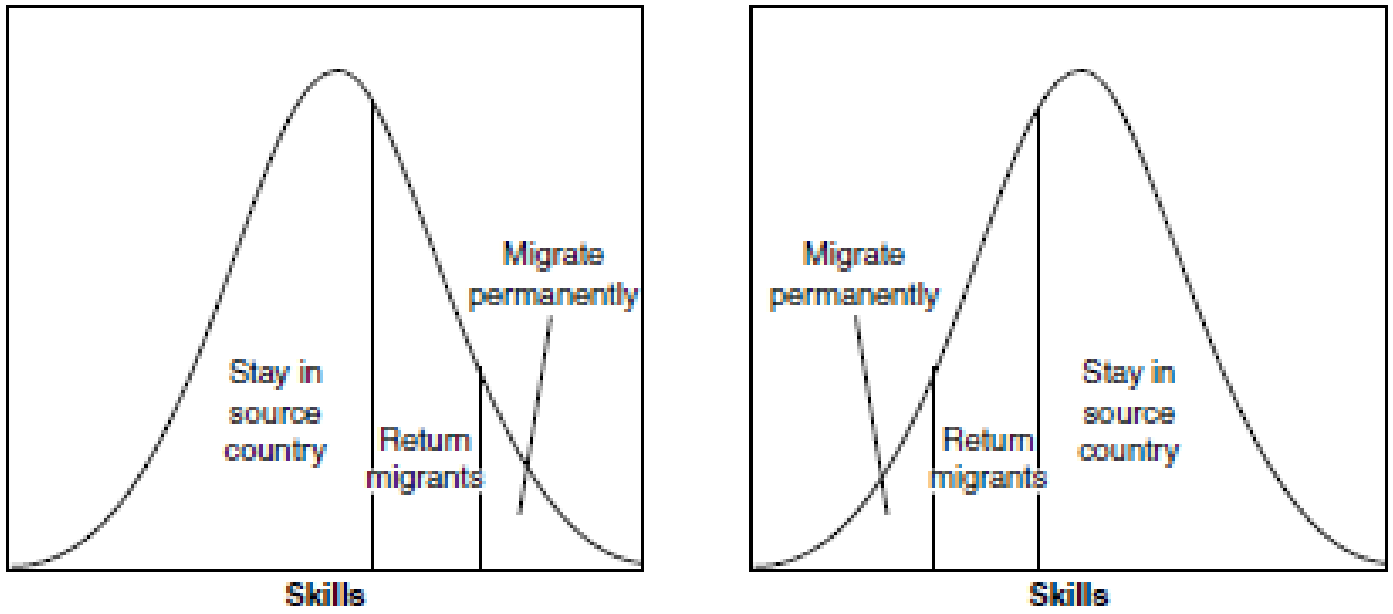

A. Positive Selection

B. Negative Selection

Figure 1.3. Distribution of Skills and Selection in a Roy Model with Return Migration

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Theoretical considerations: economic migration

- People choose their location based on expected returns to skills (net of migration costs)
- Income distributions (inequality) at destination and origin matter
- Countries with high inequality (ex: USA, UK) attract more high-skilled migrants empirically confirmed
- If an origin country has more unequal income distribution than a destination (ex: a pair Mexico-USA), emigrants will be negatively selected and vice versa (ex: a pair Germany-USA) mixed evidence
- Skill-dependence of migration costs + financial constraints attenuate potential negative self-selection

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Push and Pull factors and Migration Cost

- **Not the poorest move**
- **You need resources to invest in migration**
- **Important implication for development: the policies which favour development and growth can favour migration**

Source: Faini e Venturini 1993, Clemens Postel 2019, Lanati Thiele 2017

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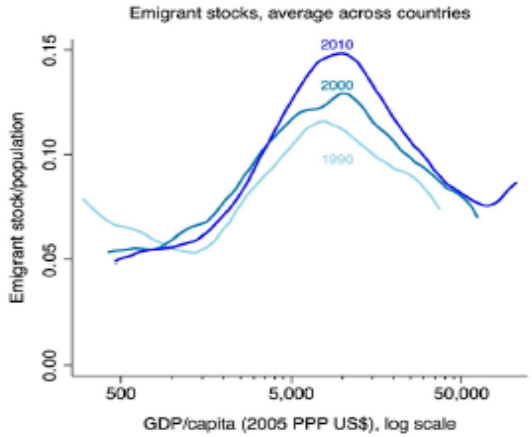
Why don't we observe more migration?

- Migration is costly: monetary and non-monetary costs



Source: https://www.newsdeeply.com/refugees/community/2016/10/31/development-aid-to-deter-migration-will-do-nothing-of-the-kind

- Multitude of other factors shape migration decisions
- Destinations: restrictive immigration policies

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	Greece	Spain	Portugal	Turkey
Constant	-189 (4.17)	-160 (1.44)	-159 (3.87)	-234 (2.6)
LY	45.2 (4.33)	36.7 (1.82)	37.9 (3.77)	57.9 (2.5)
LYSQ	-2.7 (4.40)	-2.1 (1.77)	-2.3 (3.69)	-3.6 (2.4)
LDIF	3.4 (1.68)	4.36 (2.72)	3.12 (3.23)	.39 (.32)
U_i [1]	.03 (1.03)	-.01 (.56)	.42 (3.73)	.01 (.33)
U_n	-.11 (2.30)	-.08 (1.07)	-.09 (1.68)	-.22 (4.1)
EG_n [2]	4.6 (1.62)	10.4 (2.52)	10.3 (2.19)	15.6 (3.1)
$EG80_n$	------	------	------	8.26 (2.0)
ln $(M/P)_{-1}$	.37 (5.90)	.65 (5.97)	.34 (2.45)	.26 (2.3)
D	-.87 (11.2)	------	.84 (13.7)	------
R^2	.96	.94	.96	.91
DW	1.48	2.25	1.92	1.89
SER	.15	.21	.18	.20
LM ($\chi^2(1)$)	2.37	.41	.05	.28
Chow ($F_{1,18}$)	0.17	0.41	0.32	3.37
H ($\chi^2(1)$)	.62	.61	.61	5.87
Sample period	1961-1988	1961-1988	1961-1988	1962-1988

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- The cost of migration is reduced by the diaspora abroad

(I.e. The stock of Moroccans in France)

→ They provide information on the possible jobs, channel of entrance, reduce the psychological cost of being alone abroad

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	Greece	Spain	Portugal	Turkey
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EG_n [2]	4.6 (1.62)	10.4 (2.52)	10.3 (2.19)	15.6 (3.1)
$EG80_n$	------	------	------	8.26 (2.0)
ln $(M/P)_{-1}$	.37 (5.90)	.65 (5.97)	.34 (2.45)	.26 (2.3)
D	-.87 (11.2)	------	.84 (13.7)	------
R^2	.96	.94	.96	.91
DW	1.48	2.25	1.92	1.89
SER	.15	.21	.18	.20
LM ($\chi^2(1)$)	2.37	.41	.05	.28
Chow ($F_{1,18}$)	0.17	0.41	0.32	3.37
H ($\chi^2(1)$)	.62	.61	.61	5.87
Sample period	1961-1988	1961-1988	1961-1988	1962-1988

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3. *Sociological model or network effect*

- The cost of migration and the information of the destination country are diffused by the community abroad, the diaspora

→ The network drives the inflows

- In the empirical version is used the stock of migrants abroad or the sum on the last 10 years inflows

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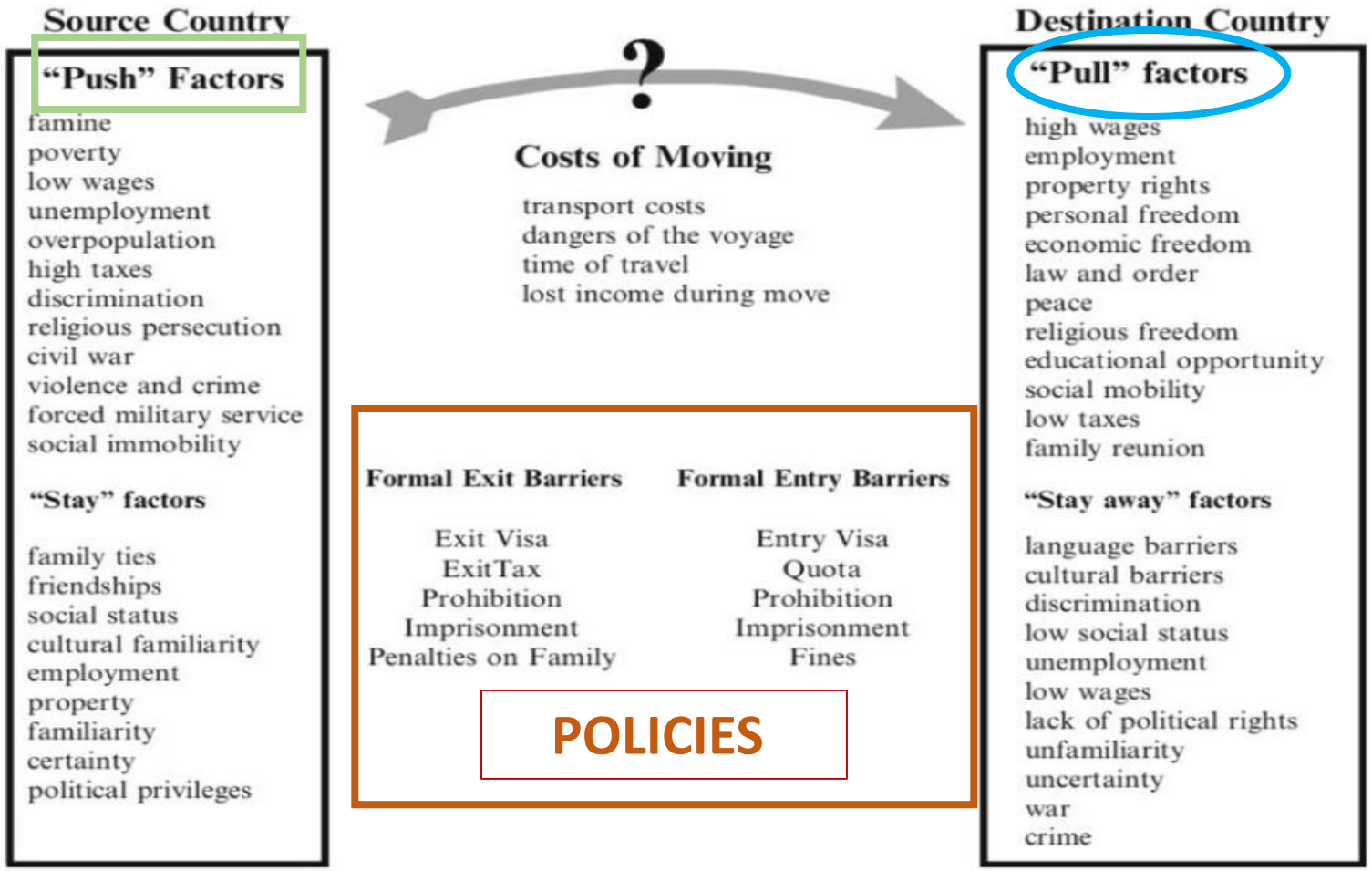

Figure 1 The immigration decision. (Bodvarsson and Van den Berg 2013: 6)

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- **Migration theory (1885), British Geographer Ravenstein**

→ Origin destination migration is function of spatial disequilibria

- H. Todaro (1970): economic disequilibria
- Lee (1966): demographic disequilibria

PUSH-PULL

- Demographic reasons and poverty are not sufficient conditions
- Macro and individual decisions

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Gravity model

- Empirical versions of the gravitational approach to migration do not have a definite standard form, but it is generally represented as [a,b].

$$(a)\ M_{od}/(P_o P_d) = B_o\, A_d\, f(D_{od})$$

$$(b)\ M_{od} = P_o\, P_d\, B_o\, A_d \exp(D_{od})$$

Where:

- M_{od} represents the net flow of immigrants from o to d
- $P_{o,d}$ is the population in o and d ;
- A_d and B_o represent the factors of attraction and expulsion;
- and D is the distance between o and d.

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- Independent variable Migration Mod form the country of origin o (i.e. Morocco) and the country of destination d (i.e. France)
- Explicative variable
- Variables on the country of origin i.e. GNP per capita, unemployment rate, employment growth Xo if we have a time series Xot
- Variables on the country of destination i.e. GNP per capita, unemployment rate, employment growth Xd

  if we have a time series Xdt
- fixed effects for the country of origin ao, of destination ad, fixed effect for time at
- Variables which characterize the relationship O-D in a static way Xod

(Physical distance, colonial ties, linguistic distance……)

- Variables which characterize the relationship O-D in a dynamic way Xodt (stock of migrants, trade ……)
- Policies

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$$ln\left(\frac{Migr.Flow_{odt}}{Pop._{ot}}\right) = \beta \ln(X_{ot}) + \gamma \ln(X_{dt}) + \delta \ln(X_{odt}) + \theta \ln(X_{od}) + \alpha_o + \alpha_d + \alpha_t + \varepsilon_{odt} \qquad (1)$$

where $o = 1, \ldots, O$ indicates the origin country, $d = 1, \ldots, D$ the destination, and $t = 1, \ldots T$ the time. The dependent variable is defined as the ratio of the migration flow from a given origin to a given destination at time t, to the population in the country of origin in the same period. X_{ot} is a vector of time-varying characteristics relative to the country of origin (such as GDP per capita in the origin country). Similarly, X_{dt} is the vector of time-varying characteristics of the destination country. X_{od} is the vector of bilateral (or dyadic) characteristics which do not change over time. This usually includes geographic factors (such as the distance between the origin and the destination countries), and cultural ones (such as the presence of common language or other cultural similarities between the two countries). X_{odt} indicates the set of dyadic and time varying variables, such as the stock of previous migrants from a given origin residing in a given destination country.

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Model 1. General international migration

The analysis of the drivers of general migration is based on the following gravity model:

$$\ln\left(\frac{Migration\ Flow_{odt}}{Pop_{ot}}\right) = \beta_1 \ln(GDP\ per\ capita_{ot}) + \beta_2 \ln(Fertility_{ot}) + \beta_3 \ln(Expenditure\ education_{ot}) + \gamma_1 \ln(Networks_{odt-1}) + \gamma_2 \ln(Distance_{od}) + \gamma_3 \ln(Trade_{odt-1}) + \delta_1(GDP\ per\ capita\ growth_{dt}) + \gamma_4 \ln(Colonial\ link_{od}) + \gamma_5 \ln(Common\ language_{od}) + \alpha_o + \alpha_d + \alpha_t + \varepsilon_{odt}$$

- The dependent variable is defined as the ratio of migration flow from origin *o*, to destination *d*, at time *t* to the population in the country of origin at time *t*. The variables' data sources and their definitions are provided in the Data Annex.
- *Time coverage*: 1980-2015, 5-years frequency[69].
- *Geographic coverage: Origin countries*. 144 countries[70], grouped according to their income level.

Three models are estimated, one for each income group (low, middle, high income). The income level classification adopted in this study is based on GDP per capita (PPP, constant 2011 international $)[71]. Low income countries are those whose GDP per-capita in 2015 is lower than approximately 3000 international dollars[72]. Middle income countries are those ranging between 3000 and 15000 international dollars approximately[73]. High income countries have GDP per capita in 2015 higher than 15000 international dollars[74].

As mentioned in Chapter 3, It should be remarked that this classification is necessary to capture how the relevance of the drivers of migration change with the economic development of a country. This allows us to test migration transition theories[75].

Destination countries: 165 countries.

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Table 1 shows the regression results.

Table 2 General Migration. Regression results, by income level.

Dependent Variable: migration flow (as a share of population at origin, in log)			
	(1) Low income	(2) Middle income	(3) High income
GDP per capita (origin)	-0.0192	0.470***	-0.383***
	(0.189)	(0.132)	(0.112)
Expenditure in Education (origin)	0.0844***	0.0500***	-0.00580
	(0.0188)	(0.0160)	(0.0200)
Fertility (origin)	-0.403***	-0.194***	0.00159
	(0.105)	(0.0744)	(0.0403)
Geographical distance (origin-destination)	-0.235***	-0.154***	-0.149***
	(0.0367)	(0.0170)	(0.0113)
Networks (origin-destination)	0.565***	0.611***	0.433***
	(0.0272)	(0.0214)	(0.0173)
Trade (origin-destination)	0.119***	0.0105	0.0660***
	(0.0242)	(0.0154)	(0.0181)
GDP per capita growth (destination)	0.0637***	0.0386**	0.0360***
	(0.0222)	(0.0180)	(0.0112)
Common language (origin-destination)	0.0773*	0.116***	0.0732***
	(0.0394)	(0.0287)	(0.0281)
Colonial link (origin-destination)	0.0526	0.0994	0.111***
	(0.0701)	(0.0617)	(0.0429)
Observations	2,389	4,790	8,461
R-squared	0.763	0.743	0.617

Notes. Regression results from panel data models for general migration estimated with Least Squares Dummy Variables. Standardized regression coefficients. *, **, *** denote significance at 10%, 5%, 1%, respectively. Robust standard errors clustered at the origin-destination level. All models include origin country dummies, destination country dummies, year dummies, and a constant term.

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$$ln\left(\frac{Residence\ Permit_{odt}}{Population_{ot}}\right) = \beta_1 \ln(GDP\ per\ capita_{ot}) + \gamma_1 \ln(Networks_{odt-1}) + \gamma_2 \ln(Trade_{odt-1}) + \gamma_3 \ln(distance_{od}) + \delta_1 \ln(Unemployment\ rate_{dt}) + \gamma_4(Colonial\ link_{od}) + \gamma_5(Common\ language_{od}) + \alpha_o + \alpha_d + \alpha_t + \varepsilon_{odt}$$

- The dependent variable is defined as the ratio between first residence permits of citizens from origin *o*, issued by *d*, at time *t*. Three versions of the model are estimated, for each of the channels to enter the EU: family, work, education. The variables' data sources and their definitions are provided in the Data Annex.
- *Time coverage:* 2009-2016, annual.
- *Geographic coverage: Origin countries:* 143 countries. *Destination countries:* EU28.

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Table 3 Regression results. Channels of migration to the EU: family, work, education.

Dependent Variable: Residence permits (as a share of population of origin country, in log)			
	(1) Family	(2) Work	(3) Education
GDP per capita (origin)	0.197**	-0.181	0.104
	(0.0891)	(0.169)	(0.129)
Geographical distance (origin-destination)	-0.0222	-0.172***	-0.185***
	(0.0283)	(0.0409)	(0.0408)
Networks (origin-destination)	0.693***	0.623***	0.404***
	(0.0159)	(0.0239)	(0.0242)
Trade (origin-destination)	-0.00113	0.00576	0.0422
	(0.0128)	(0.0260)	(0.0259)
Unemployment rate (destination)	-0.000402	-0.261***	-0.170***
	(0.0116)	(0.0278)	(0.0212)
Common language (origin-destination)	0.126***	0.134**	0.197***
	(0.0317)	(0.0568)	(0.0564)
Colonial link (origin-destination)	0.123**	0.164*	0.271***
	(0.0629)	(0.0979)	(0.0975)
Observations	9,062	6,803	6,300
R-squared	0.878	0.802	0.739

Notes. Regression results from panel data models for legal channels of migration estimated with Least Squares Dummy Variables. Standardized regression coefficients. *, **, *** denote significance at 10%, 5%, 1%, respectively. Robust standard errors clustered at the origin-destination level. All models include origin country dummies, destination country dummies, year dummies, and a constant term.

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Model 3. Asylum applications

$$ln\left(\frac{Asylum\ application_{odt}}{Population_{ot}}\right) =$$
$$= \beta_1 \ln(GDP\ per\ capita_{ot}) + \beta_2(Democracy_{ot}) + \beta_3(Political\ terror_{ot}) + \beta_4(Area\ affected\ \ conflict_{ot})$$
$$+ \beta_5(Population\ growth_{ot}) + \beta_6(High\ intensity\ conflict_{ot-1}) + \gamma_1 \ln(Networks_{odt-1}) + \gamma_2 \ln(Distance_{od})$$
$$+ \gamma_3(Colonial\ link_{od}) + \gamma_4(Common\ \ language_{od}) + \delta_1 \ln(Employment\ rate_{dt}) + \alpha_o + \alpha_d$$
$$+ \alpha_t + \varepsilon_{odt}$$

- The dependent variable is defined as the ratio of new asylum applications of individuals from origin *o*, lodged to destination *d*, at time *t* and the population at origin. The variables' data sources and their definitions are provided in the Data Annex.
- *Time coverage:* 1999-2016, annual.
- *Geographic coverage: Origin countries*: 122 countries. *Destination countries*: EU28 countries and Australia, Albania, Bosnia and Herzegovina, Canada, Iceland, Japan, Liechtenstein, Macedonia, Montenegro, Norway, New Zealand, Norway, Republic of Korea, Switzerland, Turkey, United States.

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Table 4 Regression results, asylum applications.

Dependent Variable: new asylum applications (as a share of population at origin, in log)	
	(1) Asylum
GDP per capita (origin)	-0.551***
	(0.0589)
Democracy (origin)	-0.0752***
	(0.0182)
Political Terror (origin)	0.0701***
	(0.00717)
Area affected by high intensity conflict (origin)	0.0310***
	(0.00458)
Population growth (origin)	-0.0301***
	(0.0114)
High intensity conflict (origin)	0.0688***
	(0.0207)
Networks (origin-destination)	0.458***
	(0.0219)
Geographical distance (origin-destination)	-0.287***
	(0.0320)
Colonial link (origin-destination)	0.0290
	(0.0546)
Common language (origin-destination)	0.0743**
	(0.0332)
Employment rate (destination)	0.105***
	(0.0234)
Observations	29,133
R-squared	0.706

Notes. Regression results from panel data model for asylum seekers estimated with Least Squares Dummy Variables. Standardized regression coefficients. *, **, *** denote significance at 10%, 5%, 1%, respectively. Robust standard errors clustered at the origin-destination level. All models include origin country dummies, destination country dummies, year dummies, and a constant term.

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Empirical evidence: gravity model to explain migration flows between countries

$$Flow_{ijt} = \beta + \beta_0 GDP_{it-1} + \beta_1 GDP_{jt-1} + \beta_2 dist_{ij} + \beta_3 border_{ij} + \\ + \beta_4 comlang_{ij} + \beta_5 colony_{ij} + \beta_6 GDP_{it-1} * immigpol_{jt} + \\ + \beta_7 GDP_{jt-1} * immigpol_{jt} + \beta_8 youngpop_{it-1} + \epsilon_{ijt}$$

- i - origin country, j - destination, t - year
- $Flow_{ijt}$ - number of immigrants from i coming to j in a given year
- β's - important! the coefficients show the sign and magnitude of the effect, i.e. β_1 shows how *Flow* changes if *GDP* at origin changes

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Equation	1	2	3	4	5	6	7	8	9	10
Dependent variable	Emigration rate									
log per worker gdp (destination)	24.62	24.79	29.41	29.34	33.01	52.05	167.41	103.07	17.35	20.66
	11.30*	11.27*	11.48*	11.53*	12.55**	23.09*	57.55**	40.79*	8.15*	9.40*
log per worker gdp (origin)	-0.77	-1.03	3.32	3.94	-9.04	-2.4	-2.98	-1.44	7.63	7.45
	7.23	7.09	8.02	8.22	5.63	2.07	3.19	1.65	8.71	8.73
log distance	-41.01	-40.65	-40.66	-37.94		-9.61	-20.63	-10.94	-41.85	-41.84
	9.50**	9.08**	9.08**	8.00**		3.21**	6.18**	2.57**	8.41**	8.41**
land border	-28.16	-36.97	-36.95							
	19.67	23.23	23.28							
common language		22.05	22.03							
		15.87	15.87							
colony		3.03	2.89							
		16.89	16.93							
share of young population (origin)			242.36	248.25	165.76	292.87	521.77	155.71	281.48	283.68
			110.23*	112.35*	88.77+	118.63*	177.22**	60.80*	118.34*	116.99*
per worker gdp (destination)*immig policy change									7.56	17.17
									2.04**	5.84**
per worker gdp (origin)*immig policy change									-3.37	-3.2
									1.37*	1.44*
log distance*immig policy change									-10.2	-10.18
									2.50**	2.48**
share of young population (origin)*immig policy change									144.47	149.85
									48.43**	48.47**
immig policy change										-106.51
										69.14
number of observations	8010	8010	8010	8010	8010	551	606	650	8010	8010
R-squared	0.24	0.25	0.25	0.24	0.85	0.04	0.07	0.06	0.27	0.27

Source: Mayda, A. (2007). International Migration: A Panel Data Analysis of the Determinants of Bilateral Flows. *Table 1.*

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Table 1 — Benchmark Model (Pooled OLS)

	(1) $\ln(EM_{in,t}+1)$	(2) $\ln(EM_{in,t}+1)$	(3) $\ln(EM_{in,t}+1)$	(4) $\ln(EM_{in,t}+1)$	(5) $\ln(EM_{in,t}+1)$
$\ln(ImpTot_{ni,t-1})$		0.138***	0.144***	0 .138***	0.143***
		(5.83)	(5.85)	(5.84)	(5.81)
$\ln(ImpCultShare_{ni,t-1})$		0.068***	0.070***	0.066***	0.068***
		(6.74)	(6.63)	(6.59)	(6.45)
$\ln(ImpCult)$	0.070***				
	(7.02)				
$\ln(ExpTot_{in,t-1})$	0.062***	0.049***	0.047***	0.050***	0.047***
	(5.18)	(4.29)	(3.84)	(4.28)	(3.84)
$\ln(ImmStock_{in,t-1})$	0.540***	0.534***	0.537***	0.527***	0.530***
	(13.96)	(13.77)	(13.34)	(13.52)	(13.07)
$\ln dist_{ni}$	-0.311***	-0.241***	-0.231***	-0.245***	-0.236***
	(-5.79)	(-4.29)	(-3.97)	(-4.34)	(-4.02)
$Colony_{ni}$	0.572***	0.537***	0.500***	0.551***	0.512***
	(4.29)	(4.12)	(3.80)	(4.20)	(3.87)
$Lang_{ni}$	0.270***	0.279***	0 .290***	0.288***	0.300***
	(2.78)	(2.85)	(2.93)	(2.94)	(3.02)
$Comleg_{ni}$	0.078	0.059	0.055	0.060	0.054
	(1.14)	(0.69)	(0.79)	(0.87)	(0.78)
$\ln GDPppc_{i,t-1}$	-0.847***	-0.881***		-0.859***	
	(-7.01)	(-7.23)		(-6.97)	
$\ln GDPppc_{n,t-1}$	0.541***	0.497***	0.467***		
	(5.59)	(5.19)	(4.27)		
S_i	X	X	X	X	X
S_n	X	X	X	X	X
S_t	X	X	X	X	X
$S_{n,t}$				X	X
$S_{i,t}$			X		X
N	8579	8565	8655	8565	8655
$R\text{-}sq$	0.85	0.85	0.85	0.85	0.87

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Standard Errors are clustered by country pair. The model includes the intercept

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The gravity model is as follows:

$$\ln(EM_{in,t}) = \ln(ImpCult_{ni,t-1}) + \ln(ImmStock_{in,t-1}) + \ln(dist_{ni}) + Colony_{ni} + Lang_{ni} + Comleg_{ni} + S_{i,t} + S_{n,t} + u_{ni,t} \quad (1)$$

Source: Lanati e Venturini (2017)

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Strictness of immigration policy in 12 European countries (1994-2005)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Country	# admission req.	# residence req.	# years to obtain perma residence	# admin. involved	Length of the first stay	Existence of a quota system	Asylum legislation	Overall index
Austria	0	4.5	1	4	2	4	4	2.8
Denmark	0	6	2	4	4	2	4.5	3.2
Finland	4	3	1	2	4	2	3.5	2.8
France	0	0	1	2	2	2	3.5	1.5
Germany	0	6	1	2	2	2	5	2.6
Greece	0	3	4	4	2	2	4	2.7
Ireland	2	4.5	4	4	2	2	2	2.9
Italy	4	4.5	2	2	2	4	3.5	3.1
Netherlands	4	1.5	1	4	4	2	4.5	3
Portugal	4	3	3	2	2	4	3.5	3.1
Spain	6	1.5	1	4	2	4	4	3.2
United Kingdom	2	1.5	4	4	2	2	4.9	2.9