

#### **Migration**

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**References:** 

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#### Outline

• The migration transition

– Weeks 2015, Chapter 7, pp. 251–297

- Measurement of migration
  - Amaral 2008
  - Rogers and Castro 1981

# The migration transition

(Weeks 2015, Chapter 7, pp. 251-297)

- What is the migration transition?
- Defining migration
- Internal and international migrants
- Measuring migration
- The migration transition within countries
- Migration between countries
- Migration origins and destinations
- Forced migration
- Consequences of migration

# What is the migration transition?

- The permanent movement of people from one place to another
- Usually in response to resource scarcity, typically caused by population growth, in the area of origin relative to perceived resources in the destination area
- Now closely related to the urban transition because most migrants are moving to urban areas, no matter where they are from

# **Defining migration**

- Permanent change of residence (residential mobility), moving a great enough distance that all activities are transferred from one place to another
- International migrants move between countries (either legally or without documentation)
- Internal migrants move within national boundaries (usually without constraint, but not always)

# **Measuring migration**

- "Permanence" usually means that you have been gone at least one year from the old place
- "Distance moved" in the U.S.—the Census Bureau defines a migrant as a person who has moved to a different county within the U.S.
- From the standpoint of a local school district, for example, a migrant would be someone moving into or out of the school district's boundaries

#### **Stocks versus flows**

- The migration transition involves a process and a transformation
- The process is that people move from one place to another and this represents the migration flow
- The transformation is that the migrant stock changes as people move into and out of a given place

#### Migration flow, 2003–2012



#### Migration stock, 2012



#### Percent that is foreign stock, 2013







# Why do people migrate?

- Push-pull theory
  - People move because they are pushed out of their former location, or because they have been pulled someplace that seems more attractive than where they are

- Implementing strategy
  - A goal (education, a better job, a nicer house, a more pleasant environment, and so on) might be attained by moving

#### More on push-pull factors

- The study of internal migration determinants dates back to classical economic development theory
- Migration is considered to be a mechanism that establishes regional spatial-economic equilibrium (Ravenstein 1885, 1889)
- Migrants move from low income to high-income areas and from densely to sparsely populated areas
- Population streams are expected to occur between the poorest and wealthiest places and countries
- Migration decisions are determined by "push" and "pull" factors in areas of origin and destination

#### **More on push-pull factors**

- Intervening obstacles (such as distance, physical barriers, immigration laws), as well as personal factors also influence migration flows (Greenwood et al. 1991; Lee 1966; Passaris 1989)
- Economic, environmental, demographic, and economic factors are assumed to drive migrants away from their places of origin and attract them to new places of destination
- Although there are limitations in regards to the "push-pull" models, this concept is still popular in migration literature (de Haas 2007, 2009; McDowell and de Haan 1997)

## **Gravity models**

- Based on the regional equilibrium framework, distance is expected to play an intervening role on the levels of population streams
- Gravity models use population at the beginning of the period  $(P_i)$ , population at the end of the period  $(P_j)$ , and distance between areas  $(d_{ij})$  to estimate migration flows (Head 2000; Lowry 1966; Poyhonen 1963; Tinbergen 1962; Stillwell 2009)

$$M_{ij} = exp(b_0 + b_1 \log P_i + b_2 \log P_j + b_3 \log d_{ij}) + \varepsilon_{ij}$$

 Distance is constant over time in this Poisson regression, but population growth affects out- and in-migration trends

# Key generalizations about migration

 Migration is selective: only a selected portion of the population migrates

 The heightened propensity to migrate at certain stages of the life cycle (age) is important in the selection of migrants

# Conceptual model of migration decision making



# Who migrates?

- Young adults are more likely to migrate than people at any other age
- In most societies, it is expected that young adults will leave their parents' home, establish an independent household, get a job, marry, and have children
- In the U.S., women have virtually the same rates of migration as do men, reflecting increasing gender equity

#### Migration rates by age groups



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# **Internal migration**

- Over time internal migration is a story of rural population growth leading to a redundancy of that population, so people look for jobs and life elsewhere
- When the population is almost entirely urban (as in the U.S. and most of western Europe), people move between urban places
  - We might call that <u>migration evolution</u>, influenced especially by individual characteristics

#### **International migration**

- Influenced especially by opportunity structures in place of origin and desired place of destination
- Important processes include
  - Step migration (e.g., from rural to town to city to another country)
  - Chain migration (pioneer migrants get established and then are followed by family and friends)

# **Theories of international migration**

- Theories focused on initiation of migration patterns
  - Neoclassical economics
    - Supply-demand framework
  - The new household economics of migration
    - Diversify income sources (remittances)
  - Dual labor market theory
    - Primary sector (well-educated, good salary, benefits)
    - Secondary sector (low wages, unstable conditions)
  - World systems theory
    - Peripheral countries are most likely to send migrants to core nations

# **Theories of international migration**

- Theories focused on explaining flows between countries
  - Network theory
    - Migrants establish interpersonal ties
    - Once started, migration sustains itself through diffusion
  - Institutional theory
    - Institutions facilitate or profit from the continued flow of migrants
    - Organizations help perpetuate migration in the face of government attempts to limit the flow of migrants
  - Cumulative causation
    - Migration has an impact on social environments of sending and receiving regions

# Massey's laws of international migration

- Immigration is a lot easier to start than it is to stop
- Actions taken to restrict immigration often have the opposite effect
- The fundamental causes of immigration may be outside the control of policymakers
- Immigrants understand immigration better than politicians and academicians
- Because they understand immigration better than policymakers, immigrants are often able to circumvent policies aimed at stopping them

# The contradictory U.S. policy

- Restrictions on work permits turn legal migrants into unauthorized migrants
- However, maintain family preference system which encourages non-workers to migrate
- Border enforcement discourages circularity
  - Circular flow of male workers in few states (TX, CA, IL)
- Undocumented immigrants are encouraged to stay
  - Settled population of families in 50 states

# Major origins and destinations of international migrants, 2010–2015



Annual Net Migrants 2010–2015 (thousands)

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# **Origins of immigrant to the U.S.**

Period		Region of Origin:						0/
	Total Immigrants	N/W Europe	S/E Europe	Latin America	Asia	Africa	Elsewhere	Foreign born
1820 to 1829	128,502	95,945	3,327	4,297	34	15	24,884	
1830 to 1839	538,381	416,981	5,790	8,238	55	50	107,267	
1840 to 1849	1,427,337	1,364,950	4,309	4,428	121	61	53,468	9.7
1850 to 1859	2,814,554	2,599,397	20,283	7,527	36,080	84	151,183	13.2
1860 to 1869	2,081,261	1,851,833	25,893	3,563	54,408	407	145,157	14.4
1870 to 1879	2,742,137	2,078,952	172,926	6,415	134,128	371	349,345	13.3
1880 to 1889	5,248,568	3,802,722	835,955	4,638	71,151	763	533,339	14.8
1890 to 1899	3,694,294	1,825,897	1,750,514	2,772	61,285	432	53,394	13.6
1900 to 1909	8,202,388	1,811,556	5,761,013	53,782	299,836	6,326	269,875	14.7
1910 to 1919	6,347,380	1,112,638	3,872,773	240,964	269,736	8,867	842,402	13.2
1920 to 1929	4,295,510	1,273,297	1,287,043	558,481	126,740	6,362	1,043,587	11.6
1930 to 1939	699,375	257,592	186,807	49,539	19,231	2,120	184,086	8.8
1940 to 1949	856,608	362,084	110,440	95,955	34,532	6,720	246,877	6.9
1950 to 1959	2,499,268	1,008,223	396,750	392,466	135,844	13,016	552,969	5.4
1960 to 1969	3,213,749	627,297	506,146	791,138	358,605	23,780	906,783	4.7
1970 to 1979	4,248,203	287,127	538,463	1,015,200	1,406,544	71,408	929,461	6.2
1980 to 1989	6,244,379	339,038	329,828	1,748,824	2,391,356	141,990	1,293,343	7.9
1990 to 1999	9,775,398	405,922	942,690	3,938,231	2,859,899	346,416	1,282,240	11.1
2000 to 2009	10,299,430	418,743	930,866	4,205,180	3,470,835	759,734	514,072	12.9

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# **Forced migration**

- Refugees
- "Solutions" to the refugee population problem
  - Repatriation to the country of origin
  - Resettlement in the country to which they initially fled
  - Resettlement in a third country
- Internally displaced persons
- Slavery (including all kinds of human trafficking)

# Individual consequences of migration

- Impact on migrants themselves
  - Xenophobia, discrimination, enclaves, ethnic sorting
- Types of incorporation
  - Adaptation
  - Acculturation
  - Assimilation (or segmented assimilation)
  - Integration
  - Exclusion
  - Multiculturalism (pluralism)
  - Children of immigrants face special issues

# **Societal consequences of migration**

- Impact on receiving and sending communities
  - Donor area typically loses young adults, which can slow down population growth in those areas
  - Host area gains those young adults, which can increase population growth and augment youth bulges
  - Remittances from migrants back to sending communities have become important to the economies of those places, and encourage continued migration

#### **Migration indices**

Crude or gross rate of out-migration
OMigR = OM / p \* 1,000

Crude or gross rate of in-migration
*IMigR* = *IM / p* \* 1,000

Crude net migration rate
CNMigR = IMigR – OMigR

#### **Migration indices**

- Total or gross migration rate: *TMigR* = *IMigR* + *OMigR*
- Migration effectiveness: *E* = *CNMigR* / *TMigR* \* 100
- Migration ratio: MigRatio = (IM OM) / (b d)
- Percent of total growth due to migration

$$MigPct = \frac{IM - OM}{(IM - OM) + (b - d)} * 100$$

#### **Migration data across countries**

- Bell (2005) investigated migration data for 165 countries
  - 162 collected internal migration information in some form
  - 141 collected such information from Censuses
  - 115 of them have information on place of birth (within the country)
  - 126 collected place of residence at some other prior date
  - 82 have information on duration of residence
- Previous place of residence at some prior time (transition)
  - 28 countries collected residence at a fixed interval of five years
  - 56 utilized a five year interval
  - 34 countries did not specify an interval (captured last transition)
  - 29 countries had some other length interval

#### Last-move, duration vs. Fixed prior date

- Last-move data (previous residence) & duration of residence: best approach to measure migration (Xu-Doeve 2006)
  - The exact date of the move is reported by the duration of residence, which provides the full reconstruction of migration processes as they took place in real time
- Place of residence at a fixed date in the past: highlighted as the one suited to estimate internal migration (UNECE 2005)

#### Last-move & duration of residence

- **1.** Estimation of consistent instantaneous migration rates, along cohort lines, as a function of continuous time and age
- **2.** Estimation of probabilities to make several moves within specified times intervals (multiple moves, trajectories)
- **3.** Estimation of migrant stocks (absolute numbers)
- 4. Calculation of period rates
- Adjustment of migration data for incompleteness of enumeration
- 6. Computation of transitions in any arbitrarily specified discrete interval of time and age

#### **Residence at some fixed prior date**

- **1.** Impossibility to estimate cohort instantaneous migration rates as a function of continuous time/age (analysis in discrete time)
- 2. No proper data to estimate multiple moves, trajectories
- **3.** Estimation of migrant stocks and flows is not properly identified
- **4.** Migration rates obtained are not consistent with the standard definition of occurrence/exposure rates (denominator is not the number of person-years exposed to the risk of migration)
- 5. No correction for undercount migrant enumeration can be done
- 6. Only estimation of migration transitions in discrete time and age between fixed date in the past and date of enumeration

# Age-specific out-migration rate

- (last-move & duration of residence)
- $ASOMR_{x,ij}$  from region *i* to region *j* for age group *x*

 $ASOMR_{ij}^{x} = \frac{\sum_{t=0}^{4} K_{t,ij}^{x}}{0.5K_{0,i}^{x} + 1.5K_{1,i}^{x} + 2.5K_{2,i}^{x} + 3.5K_{3,i}^{x} + 4.5K_{4,i}^{x} + 4.5K_{0,i}^{x} + 3.5K_{1,i}^{x} + 2.5K_{2,i}^{x} + 1.5K_{3,i}^{x} + 0.5K_{4,i}^{x} + 5K_{nm,i}^{x}}$ 

- *t*: duration of residence in current place of residence (years)
- $K_{xt,ij}$ : migrants from *i* to *j* for age group *x*
- $K_{xt,i}$ : migrants from all regions different than *i* to region *i* for age group *x*
- $K_{xt,i}$ : migrants from region *i* to all regions different than *i* for age group x
- $K_{xt,nm}$ : non-migrants for age group x
- Sum of weights of immigrants ( $K_{xt,i}$  destination) and emigrants ( $K_{xt,i}$  origin) equals 5 years (length of period)

# **Age-specific out-migration rates**

(place of residence at some fixed prior date)

•  $ASOMR_{x,ij}$  from region *i* to region *j* for age group *x* 

$$ASOMR_{ij}^{x} = \frac{\sum K_{ij}^{x}}{t * \sum \left[\frac{\left(K_{i.}^{x} + K_{ii}^{x}\right) + \left(K_{i}^{x}\right)}{2}\right]}$$

- *t*: years between date of reference and fixed prior date
- *K<sub>x,ij</sub>*: migrants who lived in region *i* at the beginning of period and moved to region *j* at the end of period for age group *x*
- $K_{x,i}$ : migrants who lived in region *i* at the beginning of the period and live in another region at the end of period for age group *x*
- $K_{x,ii}$ : population who lived in region *i* at the beginning, as well as at the end of period for age group *x*
- $K_{x,i}$ : population who lived in region *i* at the end of period for age group x

#### **Some considerations**

(place of residence at some fixed prior date)

•  $K_{x,i}$  +  $K_{x,ii}$ Population at the beginning of period for age group *x* 

•  $[(K_{x,i} + K_{x,i}) + (K_{x,i})] / 2$ Population at the middle of period for age group *x* 

Assumption

Rate of migration is the same between those who died and those who survived during the period

# **Total out-migration rate**

 Total non-out-migration rate (TNOMR<sub>ij</sub>) for each time and combination of areas of origin and destination

$$TNOMR_{ij} = exp(-\Sigma ASOMR_{x,ij})$$

- It is analogous to the relationship between the survivor function and the force of mortality
- Total out-migration rate (*TOMR*<sub>ii</sub>)

$$TOMR_{ij} = 1 - TNOMR_{ij}$$

#### **ASOMR**, Northeast to Southeast, Males, Brazil

(last-move & duration of residence)



#### **ASOMR, Northeast to Southeast,** Females, Brazil

(last-move & duration of residence)



#### Age-specific in-migration rates (place of residence at some fixed prior date)

- $ASIMR_{x,ij}$  from region *i* to region *j* for age group *x*
- Denominator is adjusted to estimate the population at the middle of the period for the region of destination

$$ASIMR_{ij}^{x} = \frac{\sum K_{ij}^{x}}{t * \sum \left[\frac{\left(K_{j.}^{x} + K_{jj}^{x}\right) + \left(K_{j}^{x}\right)}{2}\right]}$$

- This rate is misleading
  - The denominator refers to people living in area of destination, which is not the group of people at risk of moving in
  - These people are precisely the ones who are not at risk of moving in, because they are already there

# **Modeling migration schedules**

- Mathematical models smooth migration rates and assist in understanding patterns of population flows among areas
- The mathematical proposition by Rogers and Castro (1981) establishes that
  - Migration is highly influenced by economics because the curves designate different moments of an individual's entrance into the labor market
  - The migration schedule is composed of four components related to the labor market

#### Four components of migration schedule

- **<u>Pre-labor curve</u>** is a negative exponential curve from 0 to 19 yearsof-age ( $\alpha_1$  as the descendent indicator;  $a_1$  as the level indicator)
- <u>Labor-age curve</u> has a parabolic shape ( $\mu_2$  as the mean age indicator;  $\lambda_2$  as the ascendant indicator;  $\alpha_2$  as the descendent indicator;  $a_2$  as the level indicator)
- **Post-labor curve** is a small parabola signifying the individuals around 65 years-of-age ( $\mu_3$  as the mean age indicator;  $\lambda_3$  as the ascendant indicator;  $\alpha_3$  as the descendent indicator;  $\alpha_3$  as the level indicator)
- <u>A constant</u> is the last parameter of the model schedule (*c*), which adjusts the level of migration rates to the mathematic expression

#### **Model migration schedule**



#### **Basic model migration schedule**

- It has a parabola in post-labor ages
- This equation has 11 parameters

$$M(x) = a_1 * exp(-\alpha_1 x)$$

+ 
$$a_2^* exp\{-\alpha_2(x-\mu_2)-exp[-\lambda_2(x-\mu_2)]\}$$
  
+  $a_3^* exp\{-\alpha_3(x-\mu_3)-exp[-\lambda_3(x-\mu_3)]\}$ 

+ C

#### **Basic migration model**



# Migration model schedule with an upward slope

- It has a linear function in post-labor ages
- This equation has 9 parameters

$$M(x) = a_1^* exp(-\alpha_1 x)$$

+ 
$$a_2^* exp\{-\alpha_2(x-\mu_2)-exp[-\lambda_2(x-\mu_2)]\}$$
  
+  $a_3^* exp(\alpha_3 x)$ 

#### Migration model schedule with an upward slope



#### **Reduced model**

- It has a constant value in post-labor ages
- This equation has 7 parameters

$$M(x) = a_1 * exp(-\alpha_1 x)$$

+ 
$$a_2^* exp\{-\alpha_2(x-\mu_2)-exp[-\lambda_2(x-\mu_2)]\}$$

+ C

#### **Reduced model**



#### ASIMR, Northeast to Southeast, Males, Brazil



#### ASIMR, North to Southeast, Males, Brazil



Source: Amaral et al. 2016.

