LONG-TERM IMMIGRATION PROJECTION METHODS: Toward a Driver-Based Model

presentation by

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CSIS Immigration Projections Project

- Project undertaken for Social Security Administration under a Retirement Research Consortium grant
- Goal 1: Assess the state of long-term immigration projection practice at projection-making agencies worldwide
- Goal 2: Explore how the theoretical and empirical literature about international migration might be harnessed to improve projection practice
- Goal 3: Outline a methodology for developing a "driver-based" projection model

The State of Projection Practice

- We surveyed the long-term immigration projection methods of 15 national and international agencies
- Current practice remains largely ad hoc and judgmental:
  - most agencies base their assumptions on current or recent immigration experience
  - a few base their assumptions on current policy
- Few if any agencies use assumptions that are grounded in a theory of how or why immigration happens

Migration: Contribution of Six Theoretical Frameworks

- **Neoclassical Framework:**
  central driver is "pure economics"—supply and demand in the global labor market

- **World Systems Framework:**
  central driver is sociocultural—the historical forces of development and "globalization"

- **New Economics Framework:**
  central driver is microeconomic—choices made in the context of family and local relationships

Migration:
Contribution of Six Theoretical Frameworks

- **Social Network Framework:**
  central driver is social capital—path-dependent community networks creating migration momentum

- **Dual Labor Market Framework:**
  central driver is the two-tiered demand for immigrant labor in destination countries

- **Policy Framework:**
  central driver is legislation & enforcement in face of relentless "immigration pressure"

The new empirical literature

- Over last fifteen years, the explosion in computing power and refinement of statistical techniques allow systematic testing of theory against evidence using postwar global data
- Economists are also using statistics to re-examine long-term historical data, including the "Great Migration" of the 19th and 20th centuries—an ideal laboratory for evaluating competing theories
- Bottom line: Social scientists now broadly agree on both the direction and rough magnitude of a large number of causative migration drivers

Framework of Entire Model

- Entire model in three equations
- First equation provides overall structure:

$$M_{NET} = I_V - E_V + \sum_{i=1}^{n} M_{CATi}$$

where M_{NET} = *net migration*
I_V = *voluntary immigration*
E_V = *voluntary emigration*
M_{CAT} = *net involuntary migration*

- Development of comprehensive & consistent historical data is critical prerequisite for model

Framework of I_V Model

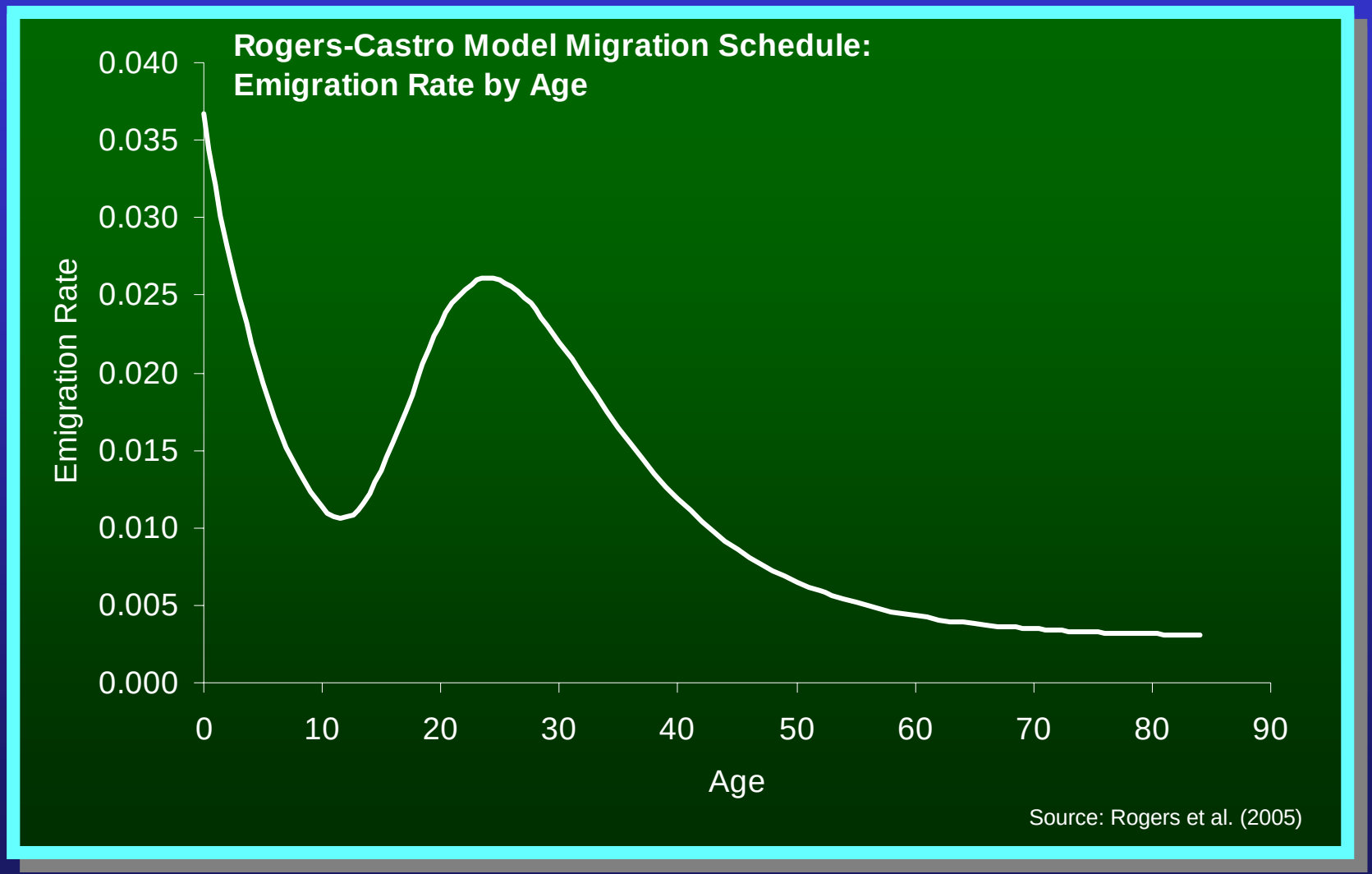
- I_V model consists of two equations
- First equation handles "built-in" demographic & age-structure drivers (module A):

$$PN_{jt} = (PT_{jt})(AGE_{jt})(ADJ_{jt})$$

for origin country j and year t

where PN = *age-normalized population*
PT = *unadjusted population*
AGE = *age-weighted probability of migration per capita*
ADJ = *other population multipliers*

Module A: Built-In Origin-Country Demographic & Age Structure Drivers



Framework of I_V Model

- Second equation handles all other "modeled" drivers (modules D, E, O, P, X):

$$(Iv_{jt}/PN_{jt}) = \alpha + \sum_{i=1}^{d} \beta_i D_{ijt^*} + \sum_{i=1}^{e} \gamma_i E_{ijt^*} + \sum_{i=1}^{o} \delta_i O_{ijt^*} + \sum_{i=1}^{p} \varepsilon_i P_{ijt^*} + \sum_{i=1}^{x} \zeta_i X_{ijt^*} + e_{jt^*}$$

for origin country j and year t

where
- D → *demographic drivers*
- E → *economic drivers*
- O → *other nonpolicy drivers*
- P → *policy drivers*
- X → *dummy variables*

Framework of I_V Model

- Together, these three equations can be used to model, test, and backcast estimators over historical time periods—and then to project or build scenarios over future time periods
- In equation 3, OLS modeling is assumed for convenience only
- Modeling assumptions (behavioral, feedback, statistical, forecasting) are discussed in our paper

Modules in I_V Model

- Note that the order in which the modules are included reflects the relative certainty of the driver dynamics and the driver assumptions

built-in

modeled

(A) age-structure drivers
(D) demographic drivers
(E) economic drivers
(O) other nonpolicy drivers
(P) policy drivers
(X) dummy variables

more certain

less certain

Module D: Modeled Demographic & Foreign-Born Stock Drivers

- Strongest candidate for "modeled" demographic driver: relative size of foreign-born stock (to capture *network effect*, a.k.a. *cumulative causation* or *migration momentum*); powerful empirical linkage
- Requires construction & projection of yearly stock values; independent variables are internally generated; vintage effects and nonlinear dynamic modelable
- Other possible "modeled" demographic drivers: growth rate of youth population; relative size of government transfers to the elderly

Module E: Modeled Economic & Development Drivers (1)

- First and strongest candidate: relative wage level; possibly adjusted for noncash benefits, skill, unemployment, taxation, or wage-growth expectations

  John Hicks (1932): "Differences in net economic advantages, chiefly advantages in wages, are the main causes of migration."

- Second candidate: relative education level; can be combined with wage level and modeled additively; in some studies, % change in relative years of schooling has a greater impact on migration than % change in relative wages

Module O: All Other Modeled Nonpolicy Drivers

- Candidate one: relative income/wealth inequality; two main theoretical frameworks: Stark-Taylor's *relative deprivation*; Borjas' *Roy Model* theory, which requires nonlinear test; challenge: how to project the future of inequality—follow the Kuznets inverted-U hypothesis?
- Candidate two: relative volume of trade; problematic conflict between (Heckscher-Ohlin) theory and empirical evidence
- Candidate three: technology; to date does not test well
- Candidate four: political, social, environmental catastrophes; problematic except in special cases

Module P: Destination Country Policy Drivers

- Policy drivers attempt to explain legal/regulatory changes in the demand for immigrants in the destination country
- Assuming no policy drivers (i.e., unchanged policy), we can only project *immigration pressure*; with policy drivers, we can model public responses to pressure
- Candidates for drivers with most historical and empirical support: relative size of total foreign-born stock (to track noneconomic impact); and stock weighted by education gap between immigrants and natives (to track economic impact on wages); stock vintages and sizable time lags would need testing

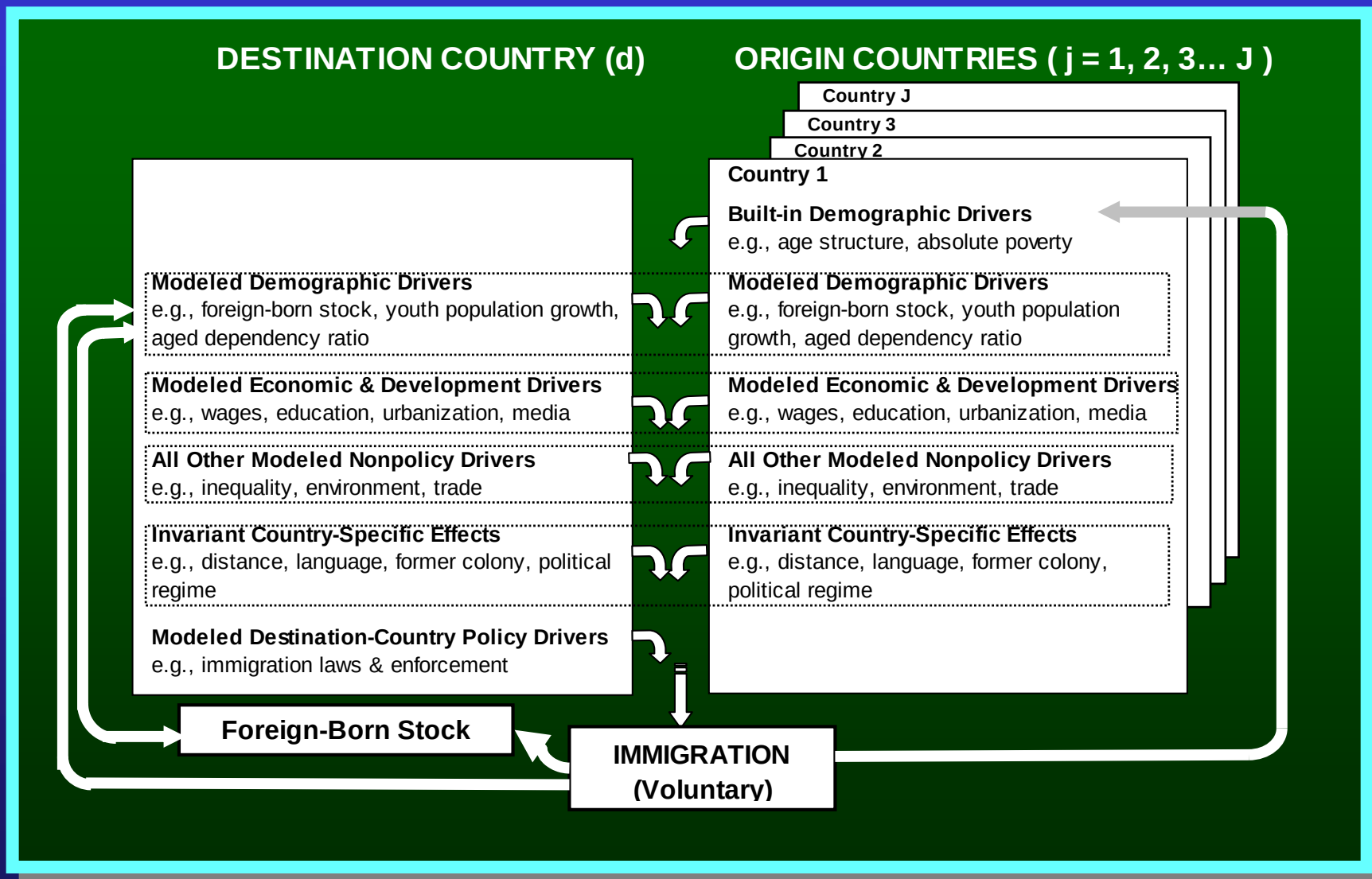
Module X:
Eras and Country-Specific Effects

- Intercept dummies for eras would be needed to normalize results for unique policy/regulatory regimes
- Intercept dummies for origin regions or countries would be needed to normalize for hidden country-specific effects; these effects can be minimized by adding additional drivers (distance, common language or border, trade volume, etc.)
- Intercept values can be helpful in developing rest of model or in scenario building

Projecting E_V and M_{CAT}

- Voluntary emigration in developed countries largely an issue of foreign-born migrating back to origin country; primary drivers should thus be migration rates for vintaged stocks of foreign-born, by origin country
- Subsequent re-immigration rates can also be estimated; ultimate steady state can be determined through Markov Chain analysis
- Net involuntary migration: Best driver is perhaps a constant share of total origin-country population; country weights would be difficult to estimate; no elegant method

Projection Model Flow Chart



Conclusion

Howe & Jackson (2006): "We have tried to show that… it is possible to identify connections between immigration and other social, economic, and political variables that can be projected with some confidence. We have also explained how these insights about the underlying drivers of immigration can be consolidated and integrated into a useable projection model."

A "driver-based" immigration projection model could have enormous policy payoffs:

- provide "best estimates" of future values
- allow "high-low" ranges of plausible outcomes
- enable stochastic "forecasts" if desired
- allow "scenario building" to study policy