

Determinants of International Migration

Evidence from United States Diversity Visa Lottery

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- Motivation/objective and preview of results
- Contribution
- Conceptual Framework
- Data
- Results
- Limitations and Extension

Not all aspirants of migration can actually migrate!

- Recognized in academic literature: (Borjas 1989, Hatton and Williamson 2002, Castles and Miller 2003, Ratha and Shaw 2007, Paul 2011, and many others)
- Newspaper/TV accounts

Similar motivation behind Docquier, Peri, and Ryussen 2014.

There is a pool of 'willing to migrate' who may or may not be able to migrate suggesting two stages of migration process:

- form willingness based on utility maximization
- migrate if able to overcome the hurdles (credit and policy constraints)

To analyze migration as a two step process:

- Form willingness
- Take action subject to constraints

and calculate

- estimates of the impact of changes in various socio-economic factors on people's willingness to migrate
- estimates of the impact of relaxing constraints on people's ability to migrate

A two-step analysis of migration process shows that:

- Better financial access in source countries results into higher actual migration rate
- Improvements in income level and political and civil liberties of source countries significantly reduce the pool of willing to migrate
- Rise in income level and fall in unemployment rate of the destination country significantly raise the pool of willing to migrate

- Conceptualizes migration explicitly as a two step process with emphasis on role of policy and credit constraints
- Calculates elasticities of potential emigration rate from a panel data
- Evaluates the role of credit constraint in limiting international migration by using a multi-country panel data

Conceptualizing migration as a two step process

$$WTM_i = f_1(\Theta_i, X_0, X_1, g_i) \quad (1)$$

$$Pr(AM_i | WTM_i = 1) = f_2(Cr_0, P_0, P_1) \quad (2)$$

- WTM_i : Individual i 's willingness to migrate, can be 0 or 1
- Θ_i : Vector of individual characteristics
- X_0 : Vector of source country characteristics
- X_1 : Vector of destination country characteristics
- g_i : i 's home affiliation parameter
- $Pr(AM_i | WTM_i = 1)$: prob. of i 's actual migration given $WTM_i = 1$
- Cr_0 : Credit constraint faced by i
- P_0 and P_1 : Policy constraints in source and destination country

Aggregate reduced forms

$$\Phi_{j,t} = \alpha_1 + \gamma_1 * \Phi_{j,t-1} + X'_{0jt} * \beta_0 + X'_{1t} * \beta_1 + \mu_j + u_{jt} \quad (3)$$

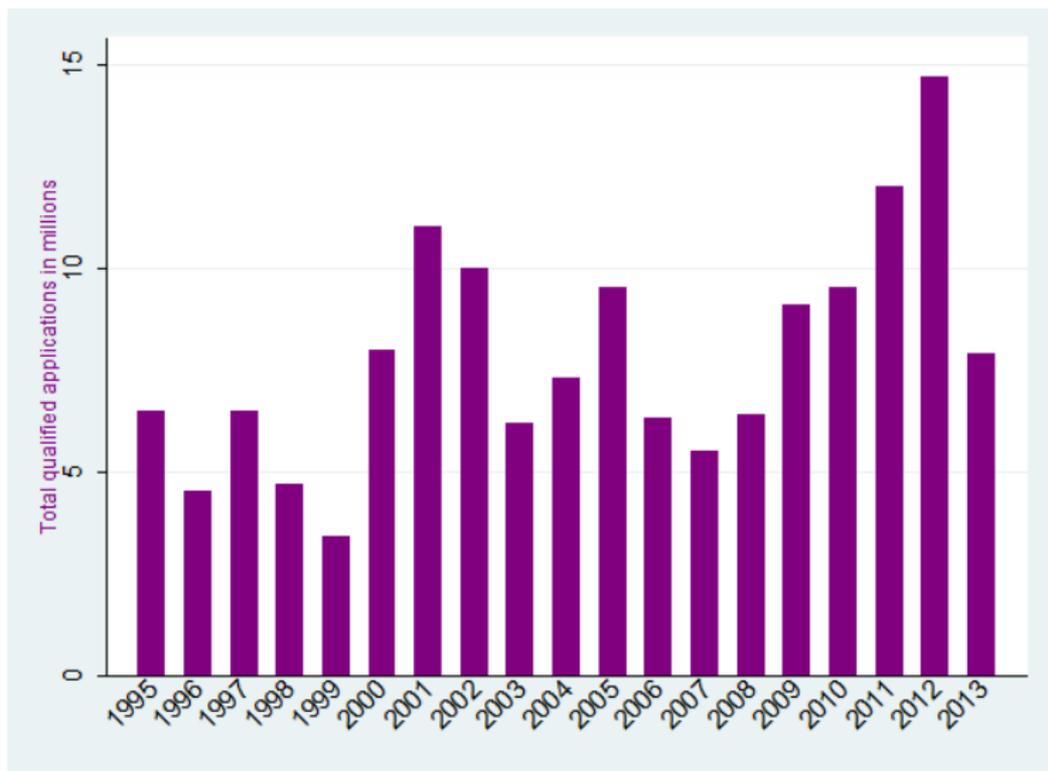
$$\Psi_{j,t} = \alpha_2 + \gamma_2 * \Phi_{j,t} + Cr'_{0,jt} * \lambda_1 + P'_{0,jt} * \lambda_2 + P'_{1,t} * \lambda_3 + \nu_j + \epsilon_{jt} \quad (4)$$

- $\Phi_{j,t}$: Potential emigration rate of country j at time t
- μ_j : Source country fixed effects
- u_{jt} : Measurement error
- $\Psi_{j,t}$: Actual emigration rate of source country j at time t
- ν_j : Source country fixed characteristics
- ϵ_{jt} : Measurement error
- $\alpha, \gamma, \beta, \lambda$: parameter vectors

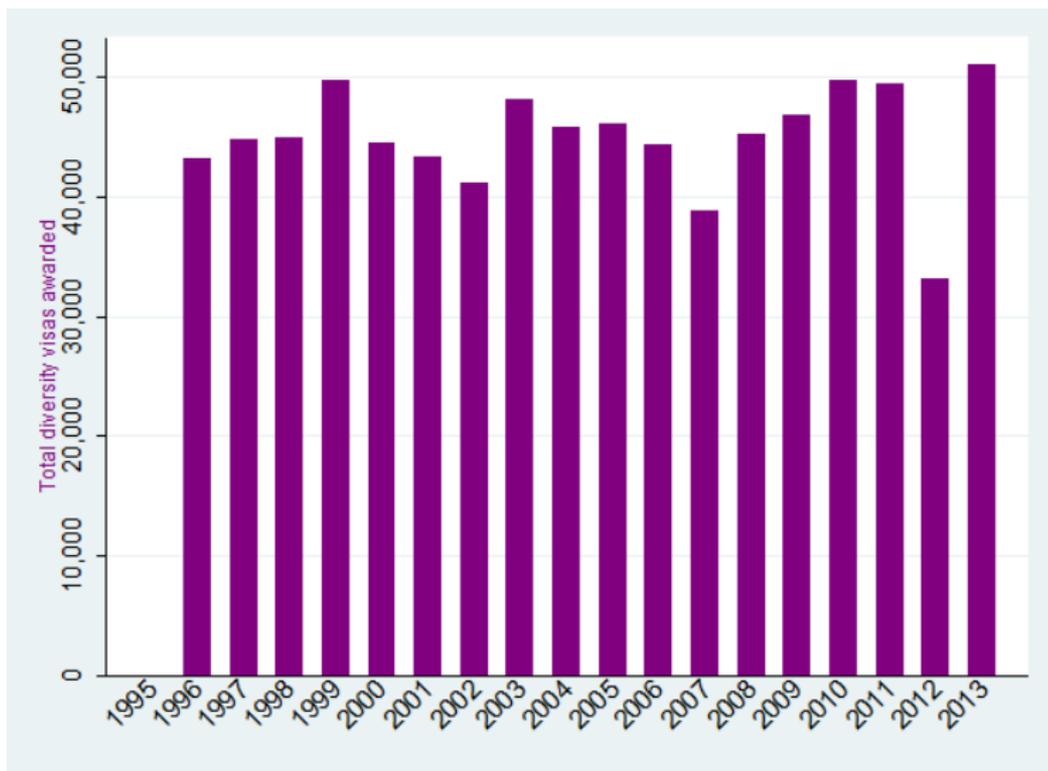
- Number of applicants for DV 2007 to DV 2013 by country from travel.state.gov(applications sent from 2005 to 2011)
- per capita gdp in 2005 USD, annual growth rate and population data from Penn Tables, Political and civil liberties from Freedom House, US unemployment rate from BLS, internet users per 100 and Gini coefficients from The world bank, education data from Barro and Lee, population by age group o from UN, financial access from annual reports of World Economic Forum, actual migration data estimated from ACS PUMS

- Popularly known as the Greencard Lottery
- Makes up to 55000 Permanent resident visas to people worldwide annually
- No fee to sign up
- Must be chargeable to a country that has sent less than 50000 immigrants in previous 5 years
- Need to show secondary education or two years experience in a job if selected

Total qualified DV applications



Total diversity visas awarded



One-step Difference GMM estimates for potential emigration rate

Regressor	Coefficient	Robust Std. Error	$P > z $
Log of source per capita GDP	-1.219	0.396	0.002
Source political and civil liberties	-0.143	0.065	0.027
Log of US per capita GDP	18.216	5.624	0.002
US unemployment rate	-0.038	0.016	0.019
Source internet users per 100	0.002	0.005	0.597
Source/US gini ratio	-0.618	0.446	0.166
% of Source popn w/ secondary education	-0.049	0.036	0.175
% of 15 to 29 age group	0.000	0.000	0.222
Φ_{t-1}	0.716	0.156	0.000

Dep var Φ_t (=No. of Dv applicants/Total adult popn), N=161, Groups=42, Instruments=20. AB test for AR(1) in first diff=0.001, for Ar(2)=0.482, Sargan test of overid: $Pr > \chi^2=0.16$, Hansen test of overid : $Pr > \chi^2=0.576$. Economic variables lagged one period

Two-step Difference GMM estimates for potential emigration rate

Regressor	Coefficient	Robust Std. Error	$P > z $
Log of source per capita GDP	-1.200	0.375	0.001
Source political and civil liberties	-0.119	0.066	0.072
Log of US per capita GDP	18.36	5.433	0.001
US unemployment rate	-0.043	0.018	0.020
Source internet users per 100	0.001	0.004	0.685
Source/US gini ratio	-0.821	0.527	0.119
% of Source popn w/ secondary education	-0.042	0.041	0.304
% of 15 to 29 age group	0.000	0.000	0.222
Φ_{t-1}	0.716	0.156	0.000

Dep var Φ_t (=No. of Dv applicants/Total adult popn), N=161, Groups=42, Instruments=20. AB test for AR(1) in first diff=0.001, for Ar(2)=0.482, Sargan test of overid: $Pr > \chi^2=0.16$, Hansen test of overid : $Pr > \chi^2=0.576$. Economic variables lagged one period, data spans 2008 to 2010 only

Fixed effects estimates for actual emigration rate

Regressor	Coefficient	Standard Error	$P > t $
ϕ	0.716	0.163	0.0005
Financial access	1.135	0.510	0.042
Annual gdp growth	0.084	0.039	0.048
Constant	-7.782	6.848	0.274

Note: Dep. var is $\Psi_{j,t}$ (=annual inflow into US of above 15/source country adult popn) $N=56$, Groups=38, R^2 within=0.416 and R^2 between=0.011 .

Limitations and possible extensions

- Major migrant sending countries like India, China, Philippines not included in the analysis
- Robustness check for second stage regression limited due to scarce data on financial access
- Future work: focus on writing a dynamic model of migration where agents make location choices under credit and policy constraints

Thank you!



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Notational Index

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- Countries used in first stage regression: Albania, Argentina, Armenia, Bangladesh, Bolivia, Cambodia, Chile, Costa Rica, Croatia, Egypt, Egypt, Honduras, Hungary, Indonesia, Jordan, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Malawi, Malaysia, Mali, Mauritania, Moldova, Niger, Panama, Paraguay, Romania, Russian Federation, Serbia, Slovak Republic, South Africa, Sri Lanka, Tajikistan, Thailand, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Venezuela, Zambia
- Countries used in second stage regression: Argentina, Austria, Bangladesh, Belgium, Chile, Czech Republic, Denmark, Egypt, Finland, France, Germany, Hongkong, Hungary, Indonesia, Ireland, Italy, Jordan, Kazakhstan, Kuwait, Malaysia, Netherlands, Nigeria, Norway, Panama, Russian Federation, Saudi Arabia, Singapore, Slovak Republic, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Ukraine, Venezuela

Countries not eligible for DV 2013: Bangladesh, Brazil, Canada, China (mainland-born, excluding Hong Kong S.A.R., Macau S.A.R., and Taiwan), Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, India, Jamaica, Mexico, Pakistan, Peru, the Philippines, South Korea, United Kingdom (except Northern Ireland) and its dependent territories, and Vietnam