



What Have Empirical Models Taught Us About Forced Migration?

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Empirical Studies

- 11 recent large-N studies of forced migration
 - Which countries produce?
 - Violence, Politics, Economics?
 - Why Refugees rather than IDPs?
 - Which countries attract?
 - Violent push or economic pull?
 - Among all countries
 - Among OECD countries



Question One

- What characteristics of countries explain the variation, across countries and over time, in forced migration movements?



Kosovar children in Quatrom Refugee Camp, Albania, 1999



Question Two

- What characteristics of countries lead refugees to seek asylum in one country rather than another?



Somali children, IFO Refugee Camp near Dadaab, Kenya, 1991



1. Why Flee?

- We observe country-year aggregates: N people fled their homes in country X in year $19yy$.
- Framework to explain variance: individual responses to aggregate level information influence forced migration flows at the country level.



Assumptions

- People choose to stay or go.
- Decision largely a function of expected victimization, p .
- National information environments exist.
- A normal distribution across individuals for each belief given the information set.
- People use information in the environment to evaluate value of p .



Fear of Persecution

- The violent behavior of 3 actors influences p :
 - State [+]
 - Dissidents [+]
 - Foreign Soldiers [+]



Other Determinants

- Socio-cultural networks (Diaspora culture)
[+]
- Expected income [-]
- Institutions that produce freedom [-]



2. Whither Will They Go?

- Those who choose to go abroad must decide whether to relocate in:
 - bordering country 1
 - bordering country 2
 - ...
 - bordering country N
 - non-bordering country 1
 - ...
 - non-bordering country N





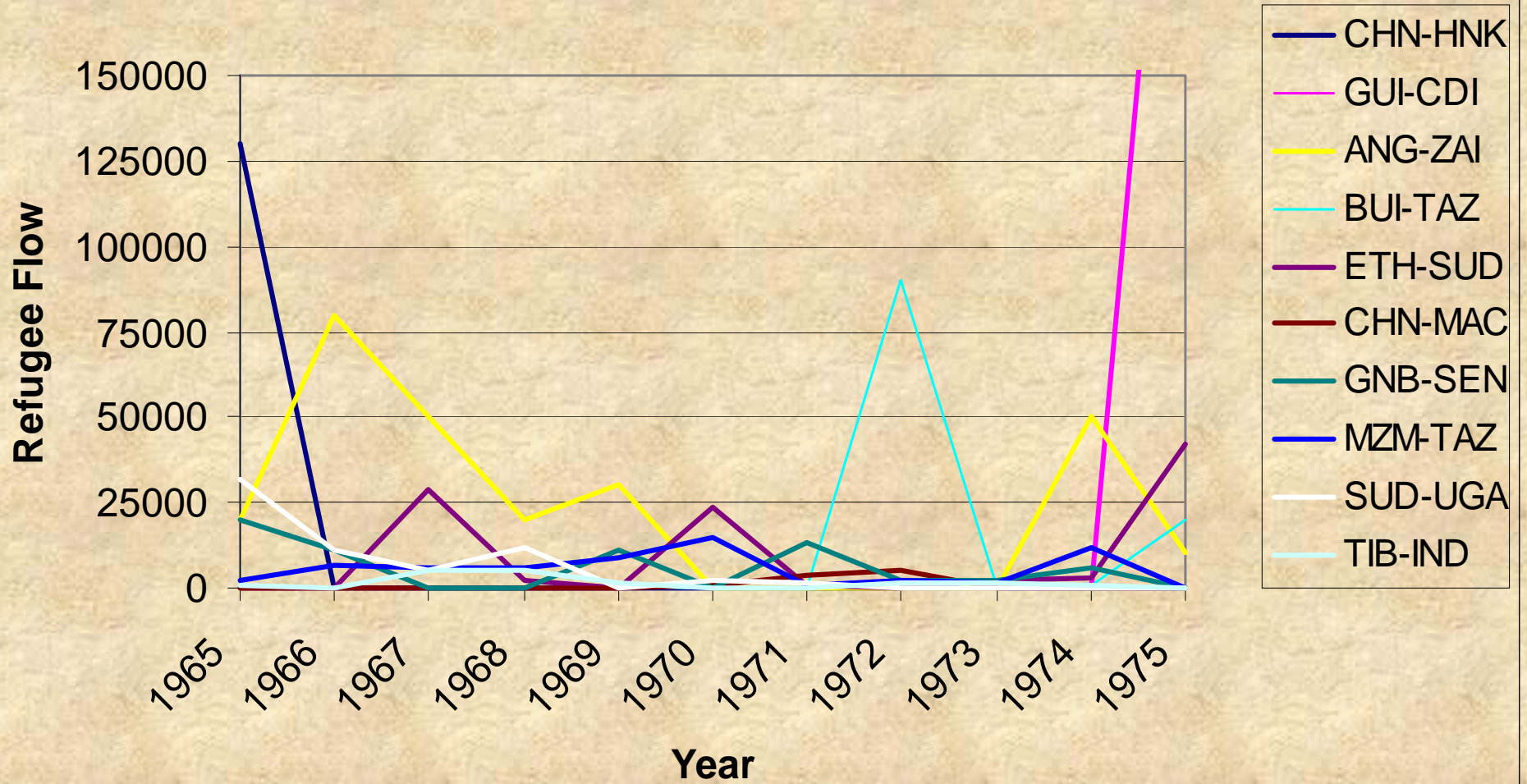
Two Caricatures

- Refugees are victims, pushed away by violence: they seek nearest safety.
- Refugees are opportunists, pulled by a better economic future.

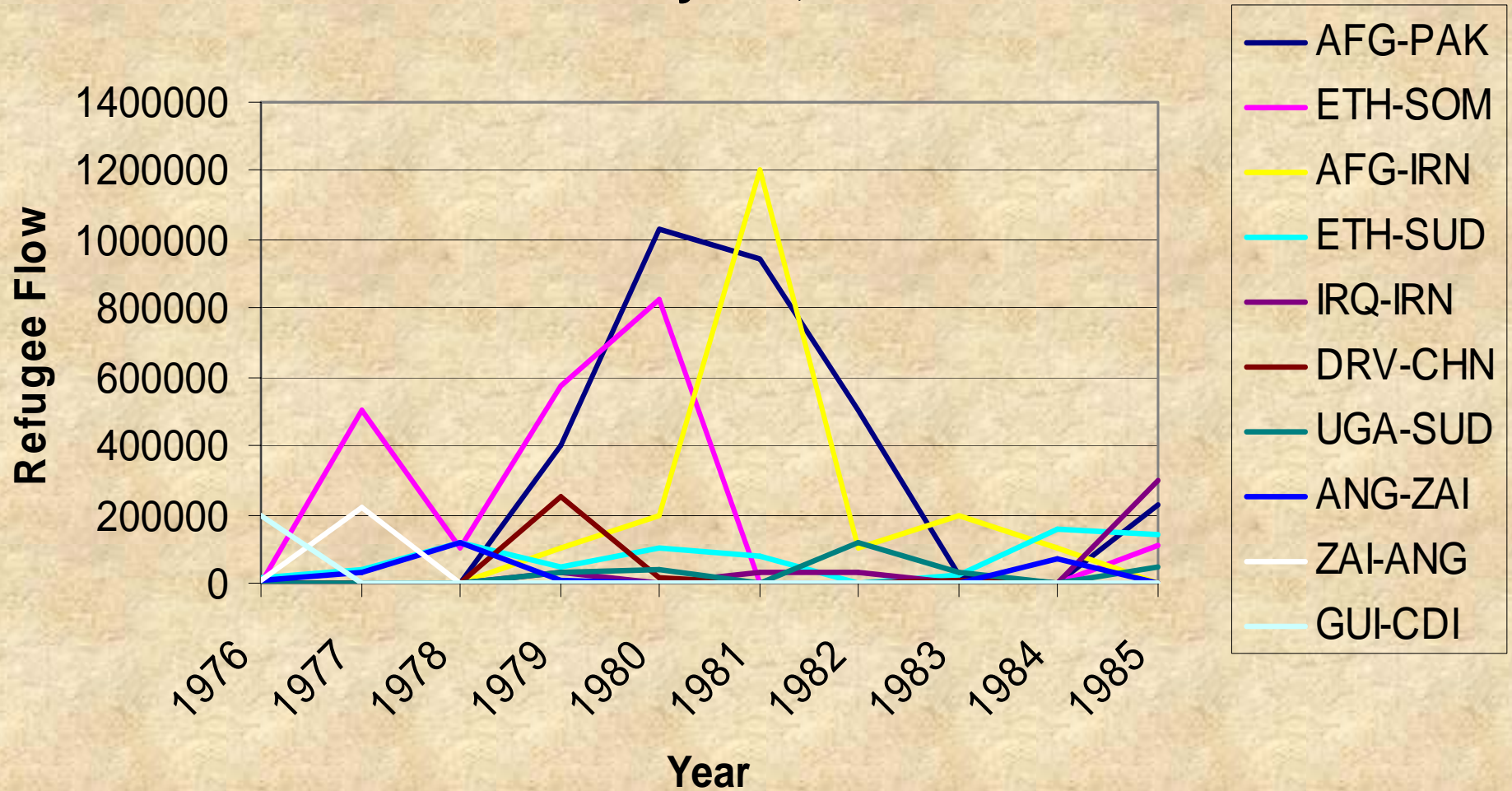
Table 1: Top 10 Refugee Flows, 1955-95

Rank	Destination	Directed Dyad
1	Iran	Afghanistan → Pakistan
2	Pakistan	Afghanistan → Iran
3	Zaire	Ethiopia → Somalia
4	Somalia	(E) Europe → (W) Germany
5	Sudan	Rwanda → Zaire
6	United States	Iraq → Iran
7	(W) Germany	China → Hong Kong
8	Tanzania	Mozambique → Malawi
9	Hong Kong	Ethiopia → Sudan
10	Ethiopia	Indochina → United States

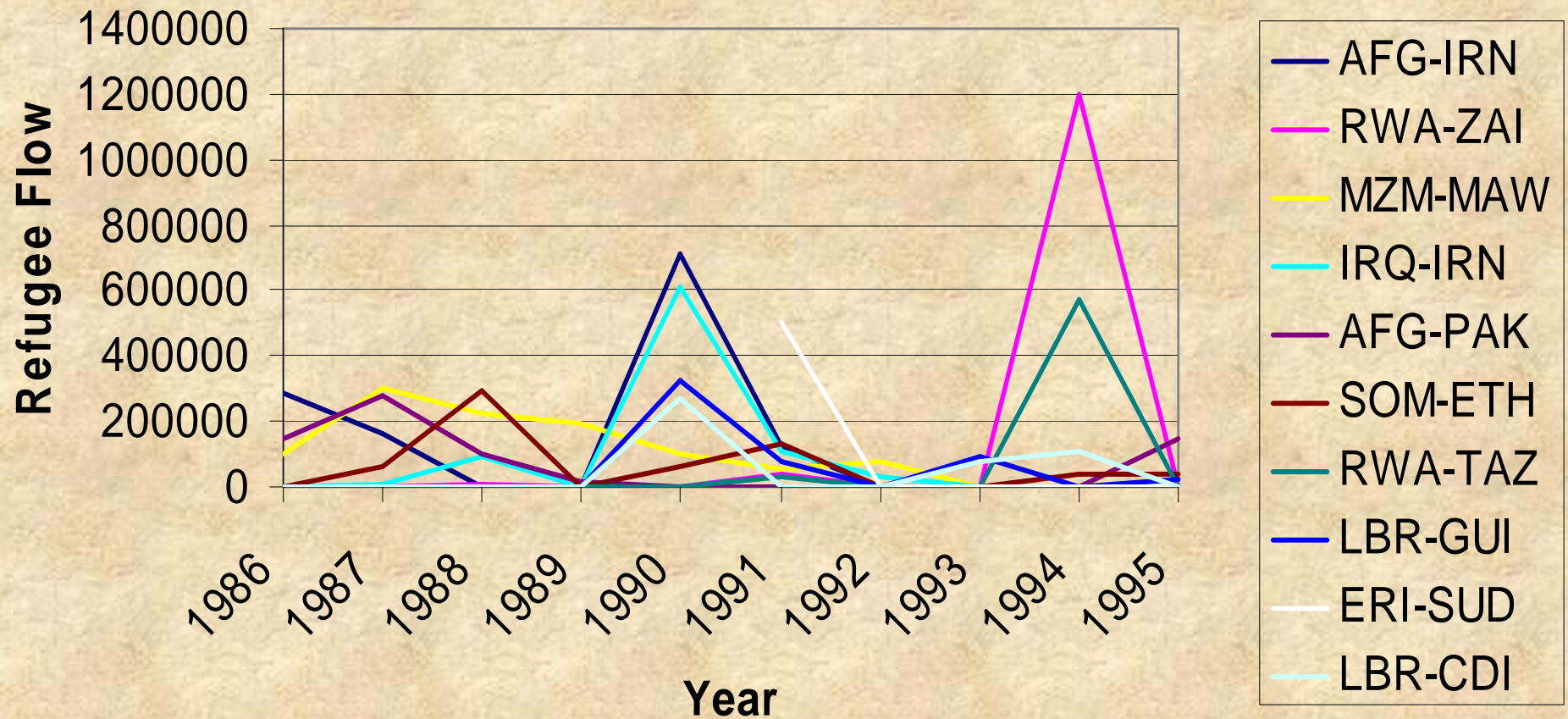
Top Ten Refugee Producing Directed Dyads, 1965-1975



Top Ten Refugee Producing Directed Dyads, 1976-1985



Top Ten Refugee Producing Directed Dyads, 1986-1995





Stylized Facts

- Refugees do not appear to be maximizing income.
- Borders and violence appear to play major roles.
- The set of refugees fleeing a given country appear to be distributed across multiple destinations.



Push from Origin

- Four Sources of Violence:
 - State (Sponsored) Violence
 - Dissident Violence
 - Civil War
 - International War (on territory)
- Socio-Econo-Political Factors:
 - Cultural Networks
 - Expected Income
 - Political freedom (institutions)



Pull to Asylum

- Socio-Econo-Political Opportunity will pull
 - Cultural Networks, Expected wages, Political Freedom (institutions)
- Violence will deter
 - State (Sponsored), Dissident, Civil War, International War (on territory)



Other Variables

- Transactions Costs
 - Distance
 - Border
- Opportunity Costs
 - Alternatives
- 1951 Convention Signatory



Design & Sample

- Temporal Domain: 1964-1995
- Units: Directed-Dyad-Years (N=631,880)
 - 80,891 cases at risk (have a + flow from origin)
 - 79,743 of them have 0 flow from A to B
 - 1,148 of them have a + flow from A to B.
- Heckman 2-step Zero-Inflated Negative Binomial regression.

Heckman Two-Step Sample Selection Zero-Inflated Negative Binomial Model: Refugee Flows, 1964-1995

Variable	Selection Equation Coefficient (Standard Error)
Origin Violent Dissent	0.005* (0.002)
Origin Genocide	0.758** (0.015)
Origin Civil War	0.883** (0.013)
Origin War on Territory	0.252** (0.031)
Origin Democracy	-0.008** (0.000)
Origin Transition Regime	0.443** (0.017)
Origin GNP per capita	-9.03×10^{-05} ** (.003)
Constant	-1.00** (0.025)
N	631,880
Statistical significance (one-tailed test): ** < .01, * < .05	



FM Results Summary

- Violence has expected effects:
 - Dissident Violence & Human Rights Violations have largest impacts.*
 - Genocide/Politicide, Civil War non-trivial.*
- Democratic Institutions & Average Income also have expected effects:
 - Size of these effects is small.*

* Substantive effects from different study.

Heckman Two-Step Sample Selection Zero-Inflated Negative
Binomial Model: Refugee Flows, 1964-1995

Zero-Inflated Negative Binomial Regression		
Variable	Inflate Equation (Standard Error)	Negative Binomial Coefficient (Standard Error)
Asylum Violent Dissent	0.000 (.009)	0.016 (.037)
Asylum Genocide	-0.213 (.135)	-0.863** (.302)
Asylum Civil War	0.136 (.101)	0.448 (.249)
Asylum War on Territory	-0.044 (.228)	1.24** (.529)
Asylum Democracy	-0.007** (.003)	-0.026 (.017)
Asylum Transition Regime	-0.137 (.115)	0.984* (.501)
Asylum GNP/capita	2.7×10^{-05} ** (2.0×10^{-06})	2.87×10^{-06} (1.09×10^{-05})
Asylum UNHCR 1951	-0.058 (.052)	-0.600** (.178)
Asylum Border	-1.58** (.066)	1.044** (.217)
Number of Asylum Borders	0.031** (.010)	-0.073** (.031)
Relocation Costs	0.017** (.003)	0.011 (.008)
Refugee Stock _{t-1} (Origin to Asylum)	-0.007*** (.001)	3.89×10^{-06} ** (6.11×10^{-07})
Constant	2.23** (.097)	9.433** (.283)
Inverse Mills Ratio	0.177** (.045)	-0.913** (.169)
Over-dispersion Parameter		14.201** (.257)
N	Zeros = 79,743	Positive Counts = 1,148

Statistical significance (one-tailed test): ** < .01, * < .05



Pull Results

S-E-P _{Asylum}	Prob of None	#, Given \emptyset
GNP/c	-	...
Democ	-	...
Trans	...	+
Network	-	+



Violence Results

Viol _{Asylum}	Prob of None	#, Given \emptyset
Genocide	...	-
Diss Violence
Civil War
Int'l War	...	+

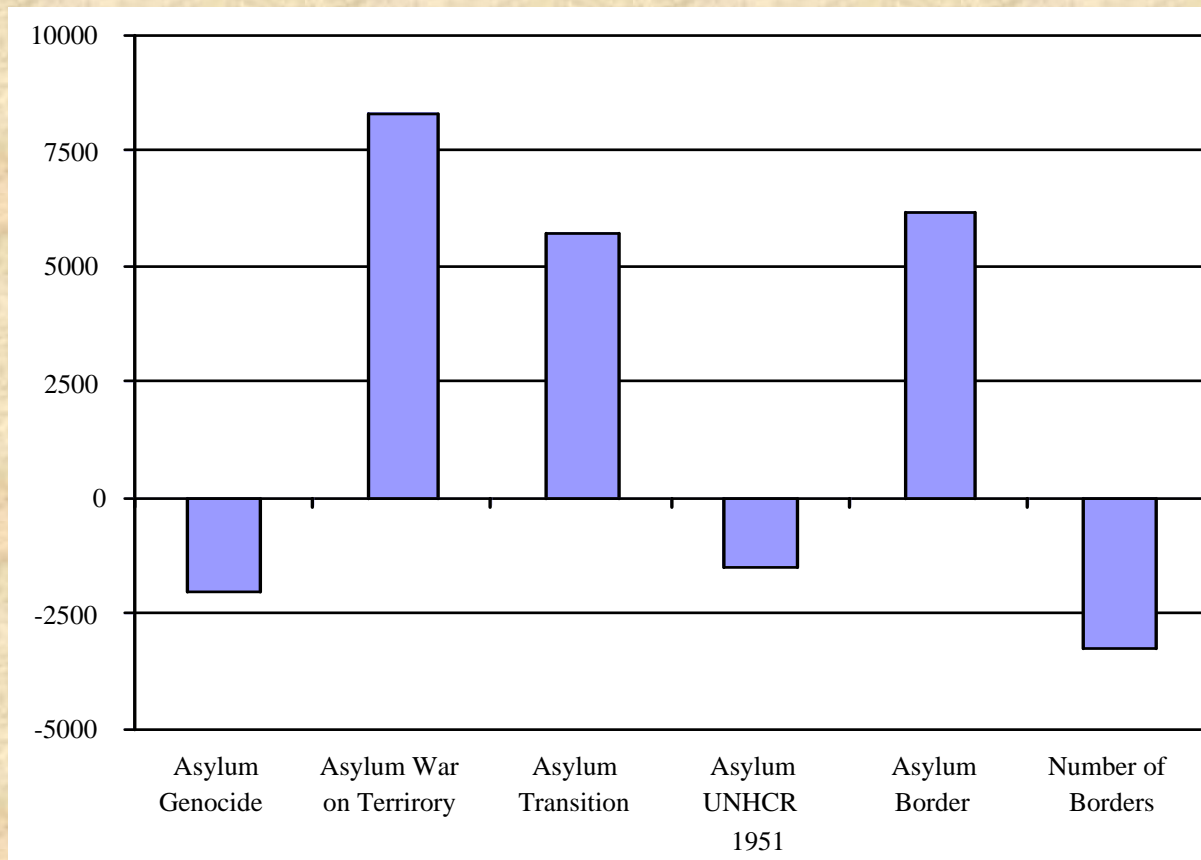


Other Asylum Results

	Prob of None	#, Given \emptyset
Distance	+	...
Border	-	+
# of Borders	+	-
1951 Cnvntn	...	-

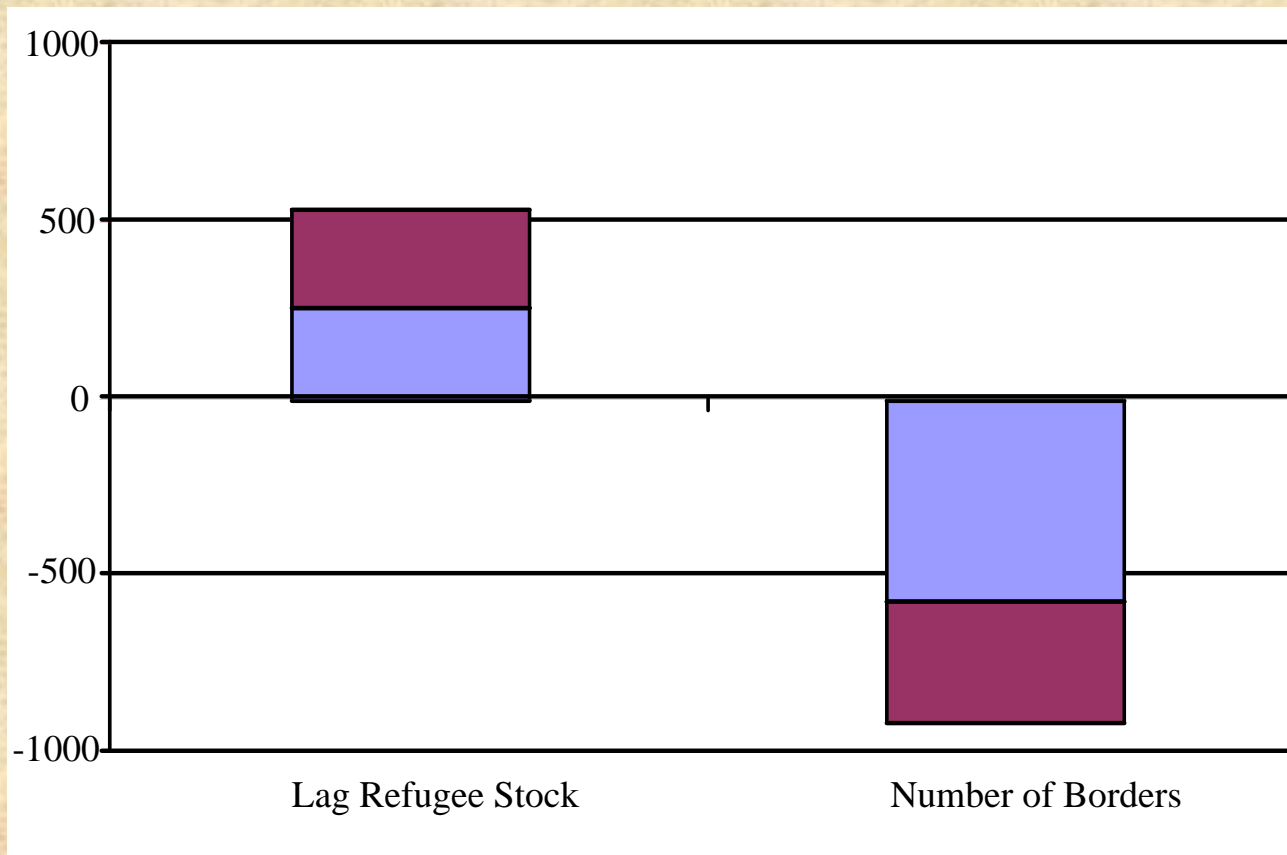


Change from Min to Max





+1, +2 Std Dev's





Victims or Opportunists?

- Refugees are:
 - Pushed by local violence
 - Pulled--not by wealth or freedom--but low transportation costs and cultural gravity



What We Know I

- Which countries produce?
 - Violence
 - State, Dissident, Civil War, Foreign Soldiers, Geographic Scope of Conflict*
 - Politics
 - Regime Type, Failed States*
 - Economics
 - GNP/capita

* Melander & Oberg (2004)



What We Know II

- Why More Refs than IDPs?
 - Civil war, genocide, rights violations, dissident violence, and large rights violations *coupled with* low dissident violence.
 - Wealthy neighboring countries with large Diasporas, absence of genocide, **low democracy**, and **foreign soldiers**.



What We Know III a

- To which countries do people flee?
 - Violence
 - All: No genocide; **foreign soldiers**
 - OECD: Rights violations, violent conflict
 - Political
 - All: None
 - OECD: Former colonial metropole, low right-populist vote share
 - Economic
 - All: None
 - OECD: GNP/capita, GNP growth



What We Know III b

- To which countries do people flee?
 - Transportation Costs
 - All: Border, distance
 - OECD: Distance
 - Cultural Gravity
 - All: Diaspora culture
 - OECD: Asylee population, same language



Future Directions

- Location of Population
- Location of Violence
- Distance to Borders
- Time-Series Case Studies



Credits

World Map

http://media.maps.com/magellan/Images/mdc_wor_wa_th.jpg

Kosovars in Quatrom Refugee Camp, 1999

Photo: Bobbie Lord (<http://www.bobbielord.com/qatrompics.htm>)

Somali children, IFO, Refugee Camp near Dadaab, Kenya, 1991

Photo: Bobbie Lord (<http://www.bobbielord.com/IFOpics.htm>)

Afghanistan Map

http://www.bayinsider.com/shared/news/afghanistan_history.gif



Concepts & Variables I

- Forced Migrants (1st difference of the annual stock, truncated at 0)
 - Refugees: UNHCR Data
 - IDPs: Schmeidl & Jenkins
- State Violence
 - Genocide/Politicide (Harff)
 - Political Terror Scale
- Dissident Violence
 - Frequency of demonstrations, general strikes, riots, and guerrilla war attacks (Banks)



Concepts & Variables II

- Civil War (COW intra-state and extra-systemic list)
- War on Territory (Coding from COW interstate list)
- Economic Opportunity
 - GNP per capita (World Bank/Banks/Fearon & Laitin)
- Political Freedom
 - Democracy – Autocracy (Polity IV)



Concepts & Variables III

- Networks
 - Lag of Forced Migrant (or Refugee, or IDP) Stock
- Cost of relocation includes:
 - Distance; Miles between capitals (weighted by wages; COW)
 - Borders (Shellman, 2001)
- # of Substitutes
- Technological Change: Year counter



Study 1 Descriptives

	Mean	Standard Deviation (SD)	Minimum Value	Maximum Value
Genocide	0.156	0.954	0	10
Dissident Violence	0.790	2.32	0	55
Civil War	0.076	0.265	0	1
International War on Territory	0.011	0.104	0	1
Government Terror (PTS)	2.58	1.12	1	5
Democracy	-.359	7.55	-10	+10
Transition	0.038	0.192	0	1
GNP	$1.18 \times 10^{+11}$	$5.37 \times 10^{+11}$	$4.04 \times 10^{+07}$	$8.54 \times 10^{+12}$
Forced Migration	91,421	466,096	0	8,337,550



Study 1 Results

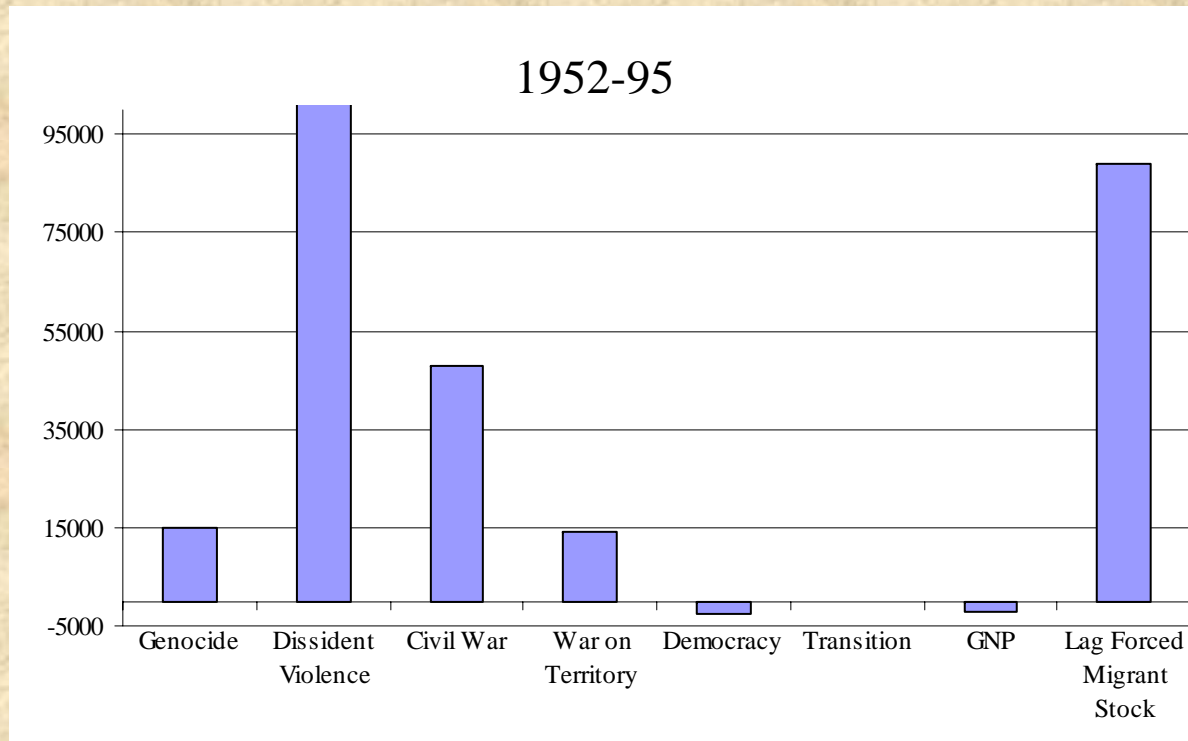
Zero Inflated Negative Binomial Regression for Forced Migrant Flows

	Model 1 (1952-1995)					Model 2 (1976-1995)				
	NBRM Forced Migration (R+IDP)			Inflate Equation Forced Migration (1, 0)		NBRM Forced Migration (R+IDP)			Inflate Equation Forced Migration (1, 0)	
	coef	IRR	Z	coef	Z	coef	IRR	Z	Coef	Z
Genocide	0.07	1.07	1.76**	-0.18	-5.16**	0.09	1.09	2.09**	-0.14	-2.91**
Dissident Violence	0.11	1.11	4.98**	-0.03	-1.63*	0.14	1.16	4.46**	-0.04	-1.39*
Civil War	1.63	5.14	8.96**	-1.94	-14.36**	1.23	3.41	5.88**	-1.11	-6.26**
International War on Territory Government Terror (PTS)	1.04	2.82	3.01**	-1.23		-0.15	0.86	-0.37	-0.68	
Democracy	-0.03	0.97	-2.44**	0.03	4.38**	-0.01	0.99	-0.80	-0.01	-0.78
Transition	-0.03	0.97	-0.12	-0.00	-0.00	0.40	1.49	1.19	0.49	1.75**
GNP	-6.65 x10 ⁻¹³	1.00	-1.85**	4.30x10 ⁻¹³	1.60*	-6.77x10 ⁻¹³	1.00	-2.30**	6.30x10 ⁻¹³	1.56*
Forced Migrants _{t-1}	5.32x10 ⁻⁰⁷	1.00	3.23**	-2.96x10 ⁻⁰⁷	-2.82**	5.55x10 ⁻⁰⁷	1.00	3.16**	1.09x10 ⁻⁰⁷	0.93
Constant	10.22	-	85.65**	2.70	2.70**	8.61	-	35.63**	3.62	17.65**
α	-	-	-	3.03	16.37**	-	-	-	2.53	14.88**
χ ²		173.74**					207**			
Log likelihood				-7,402.28					-5,417.79	
N	Total	5,196				Total	2,279			
	Zero	4,686	-	-	-	Zero	1,889			
	Nonzero	510				Nonzero	390			



FM Results I

Expected Change in Forced Migrants

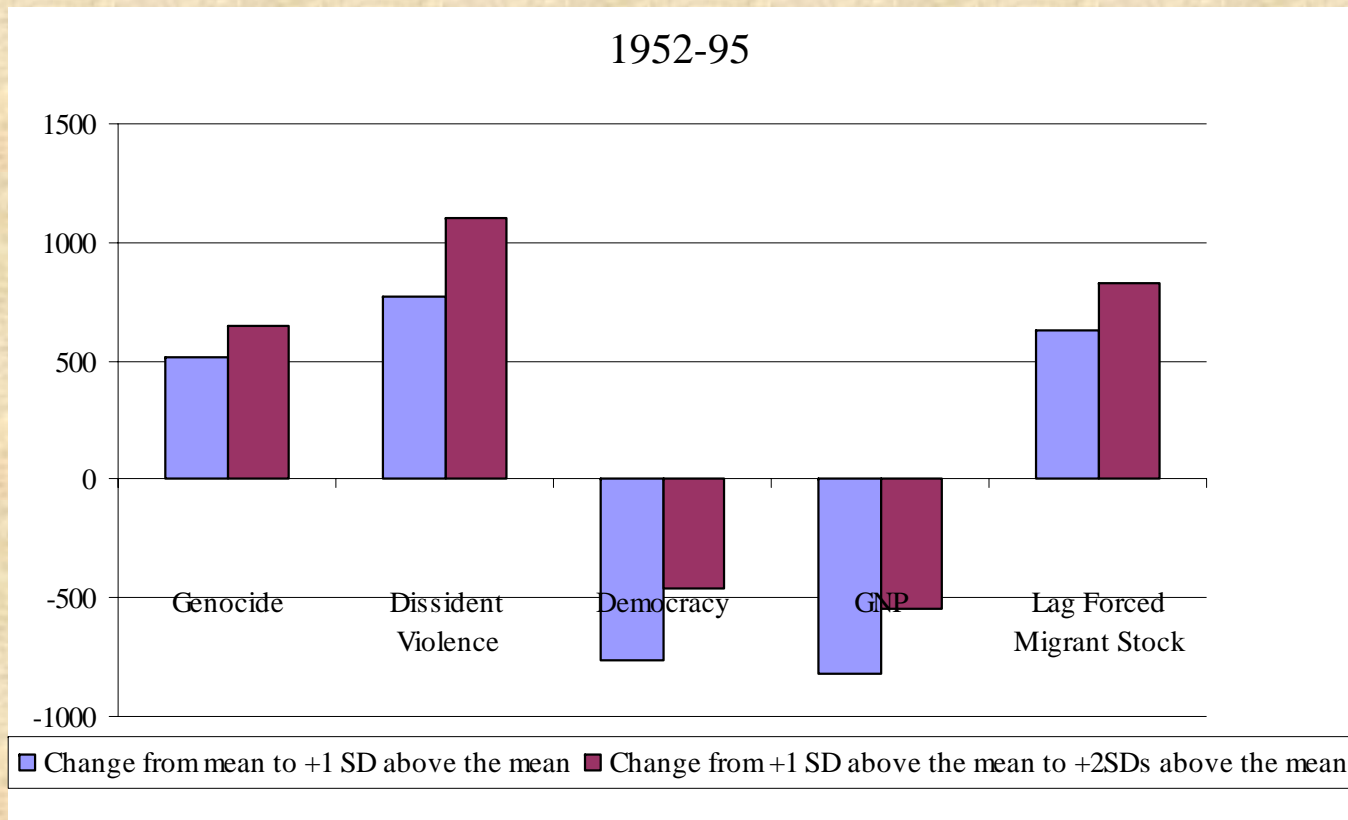


Change From Minimum to Maximum Value



FM Results II

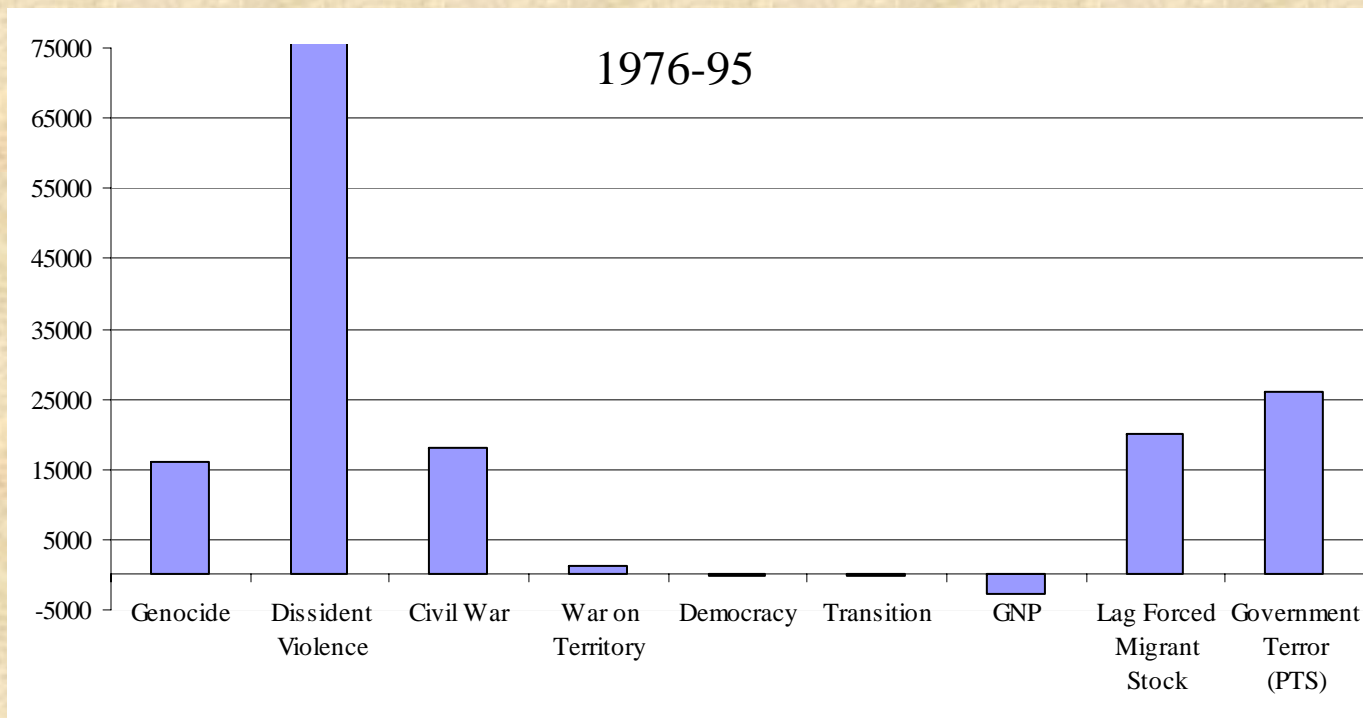
Expected Change in Forced Migrants





FM Results III

Expected Change in Forced Migrants

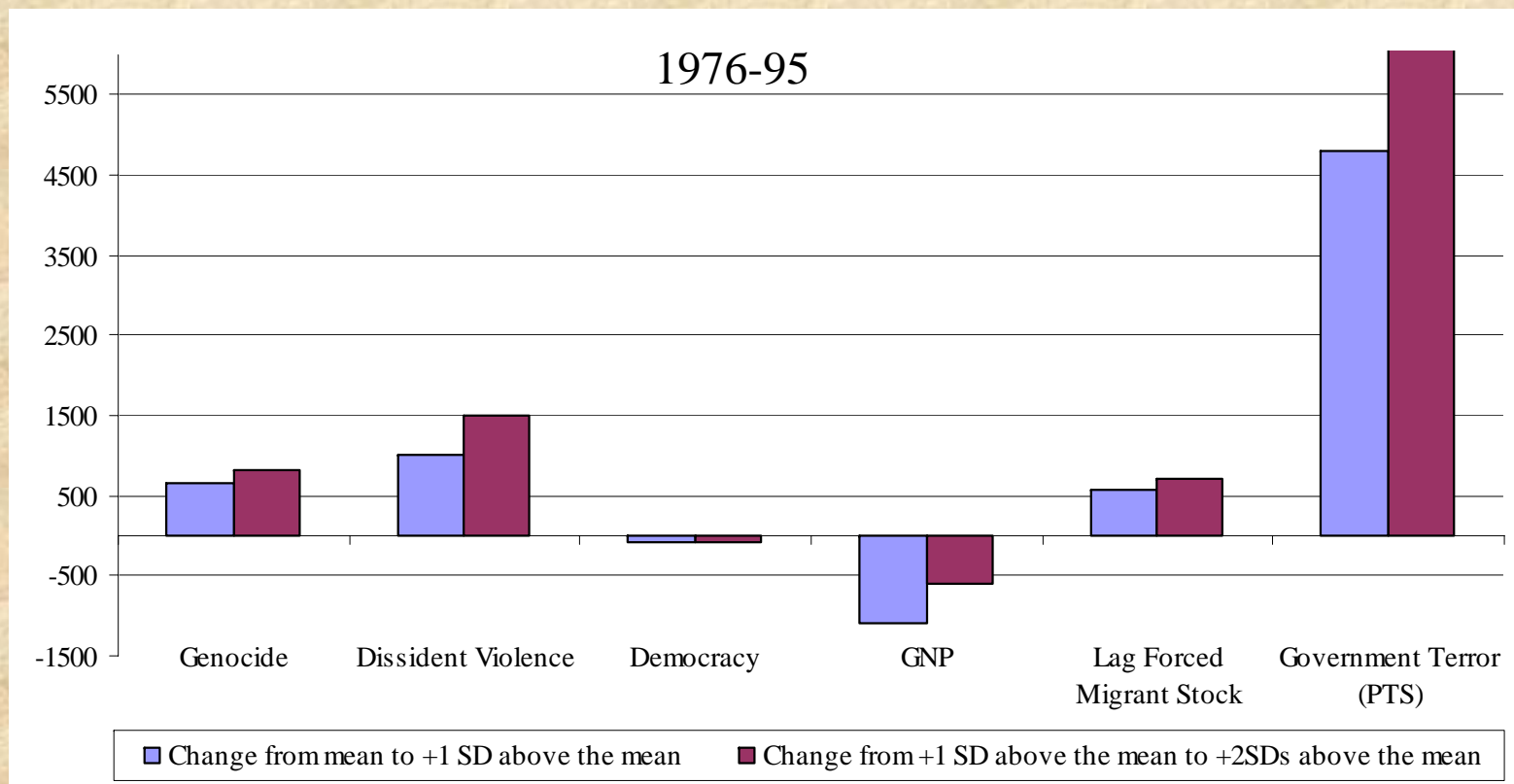


Change From Minimum to Maximum Value



FM Results IV

Expected Change in Forced Migrants





Prop of Refs to IDPs

Value	Frequency	Percentage
0	126	15.38%
0.01 to 0.09	57	6.9%
0.1 to 0.19	15	1.8%
0.2 to 0.29	12	1.4%
0.3 to 0.39	8	1.0%
0.4 to 0.49	11	1.3%
0.5 to 0.59	10	1.2%
0.6 to 0.69	4	0.5%
0.7 to 0.79	2	0.2%
0.8 to 0.89	1	0.1%
0.9 to 0.99	2	0.2%
1	571	69.7%
0 to 1	819	100%



Study 2 Descriptives



Acrobat Document



Study 2 Results

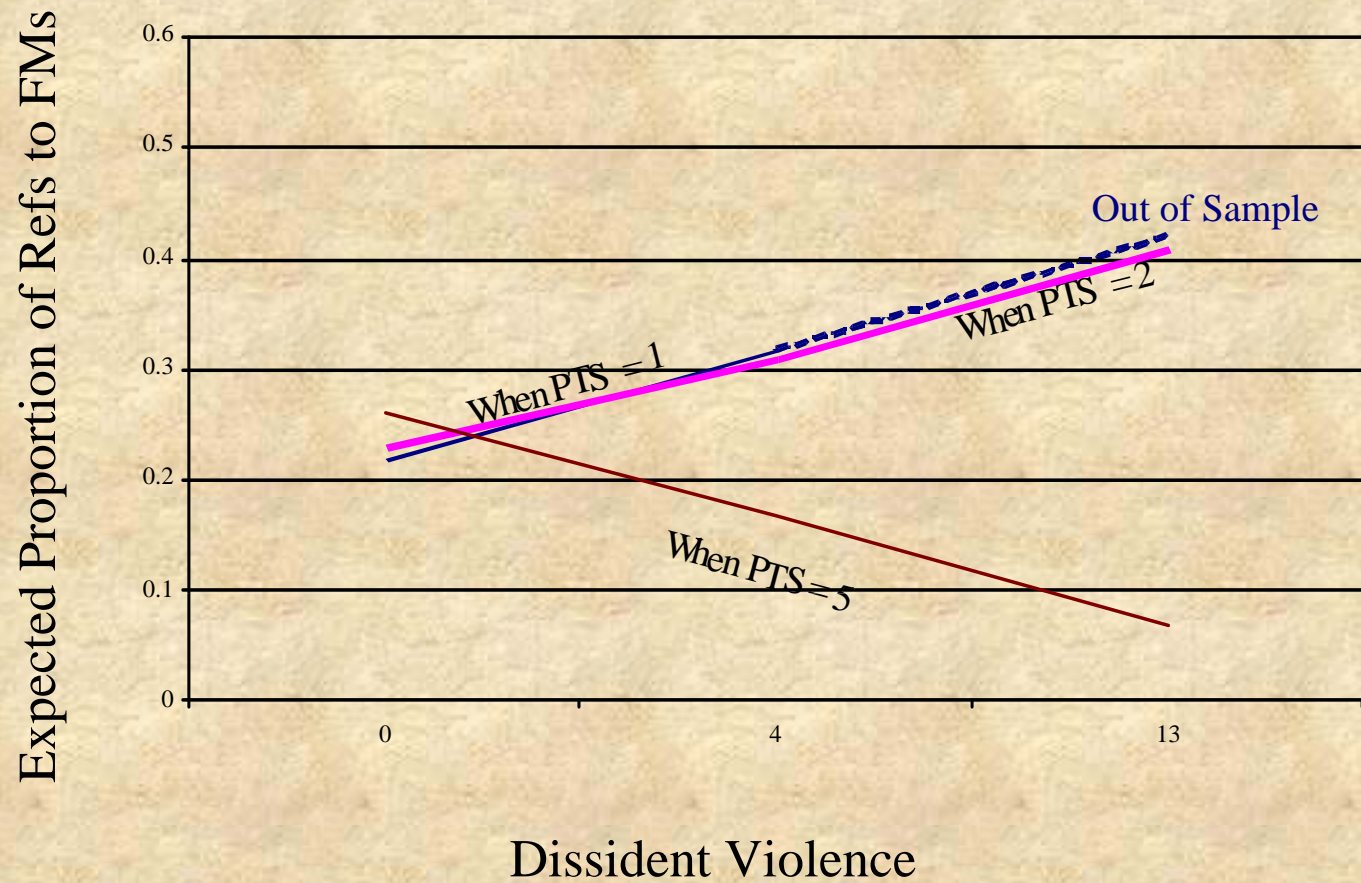
Variable	Forced Migrant	Refugee Flow	
		FM Flow	ME ^a
Origin Genocide	0.30*** (0.17)	0.12**** (0.05)	0.05
Origin Dissident Violence	0.17* (0.11)	0.08** (0.04)	0.04
Origin Civil War	0.83*** (0.16)	-0.22**** (0.05)	-0.42
Origin IWOT ^b	0.28 (0.24)	-0.08 (0.10)	-0.14
Origin Political Terror (PTS)	0.27*** (0.06)	0.08**** (0.03)	0.012
Origin Dissident Violence X PTS	-0.04* (0.02)	-0.02**** (0.01)	-0.014
Origin Democracy	1.9e ⁻⁰⁵ (0.01)	-0.004 (0.01)	-0.004
Origin Transition	-0.03 (0.25)	-0.06 (0.08)	-0.05
Origin GNP/c	-8.67e ⁻¹⁵ *** (1.64e ⁻¹⁵)	1.35e ⁻⁰⁵ ** (8.38e ⁻⁰⁵)	7.61e ⁻⁰⁵
Lag Forced Stock	1.99e ⁻⁰⁷ **** (7.21e ⁻¹⁵)	--	--
Neighborhood Genocide	--	-0.46**** (0.18)	--
Neighborhood Dissident Violence	--	0.01 (0.01)	--
Neighborhood Civil War	--	-0.19** (0.12)	--
Neighborhood IWOT ^b	--	0.32** (0.14)	--
Neighborhood Political Terror (PTS)	--	0.03 (0.03)	--
Neighborhood Democracy	--	-0.01**** (0.00)	--
Neighborhood Transition	--	0.11 (0.16)	--
Neighborhood GNP/c	--	4.96e ⁻⁰⁵ (6.36e ⁻⁰⁵)	--
Mountains	--	0.04 (0.05)	--
Lag Refs/FMs Stock	--	0.09** (0.04)	--
Constant	-1.69*** (0.21)	0.06 (0.15)	--
Rho - Selection Effect		0.70**** (0.09)	
Sigma		0.44**** (0.03)	
N (uncensored)		1972 (417)	

^aME represents "marginal effect." The effects of variables only contained in the proportion equation can be interpreted as the marginal effect of a one unit change in that variable on the proportion. However, if the variable enters both equations, the coefficient for the proportion equation is affected by its presence in the selection equation. The formula used to calculate the marginal effect for each variable is $\frac{\partial E(y^* | z^* = 0, x)}{\partial x_i} = \beta_i - \alpha_i \sigma_u \delta(-w\alpha)$. Sigelman & Zeng (2000, 179) note that this calculation produces an estimate for each observation and that one must take the mean of all estimates to produce the "average" impact of the independent variable.

^bIWOT = International War on Territory
 Note: Robust standard errors appear in parentheses. One tailed tests: ****. .01 level; *** .05 level; ** .10 level.



Interaction II





Study 3 Descriptives

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
Origin Violent Dissent	0.755	2.38	0	1
Origin Genocide	0.049	0.216	0	55
Origin Civil War	0.094	0.292	0	1
Origin War on Territory	0.015	0.120	0	1
Origin Democracy	-0.545	7.58	-10	10
Origin Transition Regime	0.036	0.186	0	1
Origin GNP per capita	4,533	7766	33	47,851
Asylum Violent Dissent	0.675	2.07	0	55
Asylum Genocide	0.044	0.206	0	1
Asylum Civil War	0.098	0.297	0	1
Asylum War on Territory	0.012	0.108	0	1
Asylum Democracy	0.126	7.58	-10	10
Asylum Transition Regime	0.036	0.187	0	1
Asylum GNP/capita	4,939	8164	33	47851
Refugee Stock _{t-1} (Origin to Asylum)	940	18963	0	2,000,000
Asylum UNHCR 1951	0.61	0.488	0	1
Asylum Border	0.033	0.178	0	1
Number of Asylum Borders	4.78	2.56	0	15
Relocation Costs	16.12	21.286	0.002	285.07
Inverse Mills Ratio	1.24	0.479	0.180	3.030



