Forced Migration:

The Effects of the Magnitude and Scope of Fighting

By

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ABSRACT

Civil war and other forms of generalized violence have been identified as the main determinants of forced migration. Yet, there are still large variations across armed conflicts that have not been accounted for. In this paper we introduce new measures of armed conflict that indicate the magnitude and scope of fighting. We find that the geographical scope of fighting and the extent to which urban centers are affected does determine a significant portion of the variation in the expected number of forced migrants across conflicts. Contrary to our expectations, we also find that the intensity of the armed conflict is not significantly related to the number of forced migrants, that is, we find no significant difference in the effects of intrastate wars compared to minor intrastate armed conflicts on the magnitude of forced migration. These findings suggest that the threat perceived by potential forced migrants is more related to where the fighting is taking place, than to the overall intensity of the fighting.

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1. Introduction

Forced migration is arguably one of the worst scourges that torment humankind. The magnitude of the problem of forced migration can be gauged from numbers provided by two authoritative organizations that concern themselves with refugees and internally displaced persons (IDPs). The Office of the United Nations High Commissioner for Refugees (UNHCR) reports that at the start of 2003 there were 20.6 million people of concern to the UN refugee agency – an increase of nearly one million persons compared to the previous year. This included 10.4 million refugees, one million asylum seekers, 2.5 million returned refugees, 5.8 million internally displaced persons, and 1 million others of concern.[1] Meanwhile, the US Committee for Refugees (USCR) estimate that there were 13 million refugees and asylum seekers and 21.8 million internally displaced persons (IDPs) in the world at the end of year 2002, and that 4.28 million people were uprooted in the year 2002 alone.[2]

According to the UNHCR a refugee is a person that: "owing to a well founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable, or owing to fear, unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside of his former habitual residence as a result of such events, is unable or, owing to such fear, unwilling to return to it (UNHCR 1999)." The UNHCR defines an internally displaced person similarly as "people [who] are also forced to flee these [same] dangers, but they either

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[1] See http://www.unhcr.ch/cgi-bin/texis/vtx/goto?page=basics

[2] See http://www.uscr.org/downloads/wrs03/SSKeyStatistics.pdf

cannot or do not wish to cross an international border (UNHCR nd)". We refer to refugees and IDPs as forced migrants.

While war and state repression have been identified as two of the main causes of forced migration in previous research, a substantial variation across cases remains (Hakovirta 1986; Zolberg et al. 1989; Schmeidl 1997, Davenport et al 2003). Previous research has tried to account for this variation by including other types of generalized violence, such as genocide and dissident violence (e.g. Schmeidl 1997, Davenport et al 2003), and by developing better measures of the location of international wars (Moore & Shellman 2002a, 2002b, Melander & Öberg 2003). Previous studies have also developed a better understanding of the temporal variations in forced migrant flows (Melander & Öberg 2003). In spite of these improvements, a considerable variation in forced migrant flows remains to be explained. We believe that an important but previously overlooked source of the remaining variation is the geographical scope and location of the fighting in intrastate conflicts. We therefore introduce measures for the geographical scope affected by fighting in intrastate armed conflicts. Theoretically we should also expect that the magnitude, or intensity of armed conflict should affect threat perceptions, and hence increase the likelihood and magnitude of forced migration. We therefore introduce a crude measure of conflict intensity, distinguishing between minor armed conflicts and wars. Compared to previous research we also employ better controls for temporal dependence that we introduced in a previous report (Melander & Öberg 2003).

We find that the geographical scope of fighting significantly and strongly influences the magnitude of forced migration. These effects hold in the presence of a large number of other determinants of forced migration that have been identified in the literature. We also find that both

intrastate wars and intrastate minor armed conflicts significantly increase the expected number of forced migrants. Contrary to our expectations, however, we do not find significant differences in the number of forced migrants between intrastate wars and minor intrastate armed conflicts. These findings suggest that the threat perceived by potential forced migrants is more related to where the fighting is taking place, than to the intensity of the fighting.

We start with an overview of the literature in the field and present how our contributions in this paper relate to previous research. In this connection we also introduce our control variables. In the following section we discuss research design and measurements. Next we present the results, followed by a summary and our conclusions.

2. Previous Research & Hypotheses

The literature on forced migration consists largely of descriptive case studies. To date only a handful of theoretically informed comparative studies on the etiology of forced migration have been published (Clark 1989; Zolberg, Suhrke, Aguayo 1989; Edmonston 1992; Schmeidl 1995, 1997; Gibney, Apodaca & McCann 1994; Weiner 1996; Apodaca 1998, Wallensteen & Öberg 1998, Davenport et al 2003). Many of these studies look only at cases generating forced migration (e.g. Hakovirta 1986, Edmonston 1992, Gibney et al. 1994, Zolberg et al 1989, Apodaca 1997, 1998) and thus have problems with selection bias. Others only look at bivariate relationships (e.g., Hakovirta 1986, Edmonston 1992, Gibney et al. 1994, Wallensteen & Öberg 1998, Apodaca 1998). We have identified only five studies that use appropriate research designs, multivariate analysis and modern statistical techniques (Schmeidl 1997, Moore & Shellman 2002a, Moore & Shellman 2002b, Davenport et al 2003, Melander & Öberg 2003).

The basic mechanism explaining forced migration in previous research is a simple decision theoretic model (Schmeidl 1997, Moore & Shellman 2002a, Moore & Shellman 2002b, Davenport et al 2003). In this model, most clearly stated by Davenport et al, potential migrants use observable information in their environment to assess the threat to their person and to form and revise beliefs about their personal security. They then base their decision to stay or leave on these beliefs or threat assessments (Cf Davenport 2003:31-32). On this model, the determinants of forced migration are the observable conditions perceived as threatening to the personal security, weighted against the costs and risks of re-locating. In previous large-N research the costs and benefits for relocating have been treated as being uniformly distributed, that is basically the same for all people living in a country. In a previous study we extend the basic model by relaxing this assumption, assuming instead that the costs and benefits for relocating vary across the population of a country (Melander & Öberg 2003). The implication is that some people more readily relocate than others. Over time this produces a selection effect in the population that remains behind, such that the remaining population will become increasingly unwilling or unable to relocate. The implication being that there is duration dependence in forced migrations flows that needs to be controlled for.

In a similar fashion, previous large-N research has treated the determinants of forced migration as if they affected the population of a country uniformly. The main determinants of forced migration identified in previous research are war, genocide, dissident violence, and state repression, with economic, non-violent political and demographic factors playing a decidedly lesser role. Or as Susanne Schmeidl put it when reflecting on her findings in relation to previous research, "the overall pattern remains: refugees flee from generalized violence" (Schmeidl 1997:302). Armed conflict is the most obvious cause of forced migration and is consistently found to have

significant effects on the magnitude of forced migration. However, not all armed conflicts are alike. Whereas intrastate armed conflicts are consistently found to significantly increase the flow of forced migrants, findings for interstate armed conflict suggest that only countries directly affected by the fighting experience significant increases in forced migration (Moore & Shellman 2002a). These findings are supported by the theoretical argument since where the conflict takes place should affect people's perception of the seriousness of the threat. A person living in a country involved in armed conflict is much less likely to feel threatened if the fighting is taking place abroad rather than at home. Consequently, previous studies only find significantly increased flows of forced migration in countries directly affected by international war (Moore & Shellman 2002a). We believe that a similar logic should also hold in intrastate armed conflicts. People in a country at civil war will be differently affected by the war depending on where they live, relative to the fighting. More specifically, we argue that the number of people affected by the violence, and hence the number of people who might feel threatened enough to flee, is related to the geographical scope and location of the violence. Therefore we expect (H_1) the number of forced migrants to increase the larger the area affected by the fighting and the more urban centers are affected.

To measure the geographical scope of the fighting and the extent to which urban centers are affected by armed conflict we use two indicators from the State Failure Project (Goldstone et al. 2000) measuring the scaled proportion of a country affected by ethnic war and revolutionary war respectively. The scale for both indicators ranges from 0-5 (0=no conflict), and the area affected ranges from <10% of the area and no significant cities affected (1) to >50% of the area affected (5).

To obtain rough measures of the intensity of fighting we include variables indicating intrastate war, intrastate minor armed conflict, international war over territory, and international minor armed conflict over territory. Unlike most previous research who use Correlates of War data (Singer & Small 1994; Sarkees 2000) to measure armed conflict, we use data from the Uppsala Conflict Data Program (Gleditsch et al 2002) to measure intrastate armed conflict. The Uppsala data has the advantage of making a distinction between minor armed conflicts and wars. This provides a rough measure of the intensity of armed conflicts that may affect forced migration (Cf. Melander & Öberg 2003).

To capture the importance of location suggested above, we use two measures for the location of interstate armed conflict, called international war over territory and international minor armed conflict over territory, respectively. Both are derived from Uppsala data and indicate whether the warring country claims and violently contests a disputed territory or not (Melander 2003). An example of an international war over territory is the border war between Ethiopia and Eritrea in 1998-1999. Both states are coded as involved in international war over territory for both years. State involvement in the type of international war that does not qualify as international war over territory can be exemplified with the participation of Norway in the coalition that liberated Kuwait from Iraqi occupation in 1991; Norway had no claim to Iraqi or Kuwaiti territory. This conflict is coded as international war over territory only for Kuwait and Iraq. Most of the instances of states waging international war that we weed out by using this measure belong to the great coalitions of states that fought in Vietnam in the 1960s and 1970s, and against Iraq in 1991. The assumption is that the threat of armed conflict is mostly felt in the disputed territory, both because that is the likely place of most of the fighting and because the territory is disputed per se and hence the security of its inhabitants may depend also on the uncertain outcome of the contest.

We argue that this measure addresses the problem, encountered by Schmeidl (1997), that many countries involved in intra-state conflict are not directly affected by the fighting, while also adding a territorial dimension that might be important in the etiology of forced migration.[3] Generally, we expect that (H_2) both wars and minor armed conflicts will generate significant flows of forced migrants, but that (H_3) wars will produce significantly larger numbers of forced migrants than minor armed conflicts.

3. Control Variables

As control variables we include those variables that have been found to affect the likelihood and/or magnitude of forced migration in previous research.[4] In addition to the measures of armed conflict described above, we also include two measures of one-sided government violence. The first is genocide and politicide (hereafter genocide), which has been found to significantly increase the magnitude of forced migration flows in several earlier studes using a variety of measures (Johansohn 1993, Rummel 1994, Johansohn & Björnsen 1998, Schmeidl 1997, Moore & Shellman 2002a, Davenport et al 2003). We include the State Failure indicator for genocide and politicide as a control variable (Harff & Gurr 1996, Goldstone et al. 2000), and expect that it should significantly increase both the likelihood and magnitude of forced migration flows. Several authors have also argued that state repression, including human rights violations, lead to forced migration (Aga Khan 1981, Hakovirta 1986, Gibney et al 1986, Apodaca 1998, Moore & Shellman 2002a, Davenport et al. 2003). Like several earlier studies we use the *Political Terror Scale* (Gibney and Dalton 1997) to control for government repression and human rights

[3] In an unpublished study Moore and Shellman have developed a more direct measure of the location of international war based on COW data called "war on territory" (Moore & Shellman 2002a). Since we do not have access to this data we could not include it, but their findings with regard to international war is very similar to what we find using a different measure.

[4] A detailed description of measures and data sources for all variables in this study can be found in Appendix 1.

violations (i.e. imprisonment, torture, disappearances and murder on political grounds by state agents), expecting that it should increase both the likelihood and magnitude of forced migration flows.

Some previous research also looks at one-sided dissident violence (Moore & Shellman 2002a, Davenport et al 2003). The contention is that threats come from three different sources: state violence (repression and genocide), dissident violence (riots and guerilla attacks), and state-dissident interaction (armed conflict). The measures of dissident violence in previous research are derived from Bank's *Cross-Polity National Survey* data (Banks 1998). Although we are sympathetic to the idea that dissident violence and activities also may induce forced migration, we have problems with the validity of the measures used in previous research and serious problems with the poor reliability and clear Western bias of the data employed.[5] Since no alternative data on one-sided dissident violence is available we have elected not to include a measure of dissident violence in this study.

A few non-violent factors have also been argued to affect forced migration flows, including the degree of democracy and population size (Weiner 1996, Schmeidl 1997, Moore and Shellman 2002a, Davenport et al 2003). The observed effects of these measures vary. Population size has rarely shown any significant effects in previous research. Nevertheless, it stands to reason that countries with greater populations at least have the potential to generate larger flows of forced migration than countries with small populations. Therefore, we include a measure of population size based on World Bank data (Easterly & Sewadeh 2001). The results for measures of democracy are somewhat stronger, but still very mixed in previous studies. We include a control

[5] For an extensive discussion of the problems see Melander and Öberg (2004).

for the level of democracy, employing the polity2 score from the Polity IV data set along with indicators of regime collapse and regime transition from the same source (Marshall & Jaggers 2000).

Whereas research on (voluntary) migration consistently identifies income per capita differentials as a main cause of emigration decisions, research on forced migration has so far been unable to establish a strong empirical association between poverty and forced migration flows (Schmeidl 1997, Moore & Shellman 2002a, Davenport et al 2003). Yet, several researchers argue that refugee migration, like other migration, is driven in part by poverty, or economic insecurity, in the country of origin (Zolberg et al. 1989, Edmonston 1992, Wood 1994). Thus, to control for the potential effects of poverty we include log-transformed GDP per capita in constant U.S. dollars with the base year 1985. This data is based on the Penn World Tables 5.6, but uses additional sources and imputation techniques to reduce problems with missing values (Gleditsch 2002).

Finally, previous research has found temporal dependence in the data that need to be controlled for. Most studies include some form of lagged dependent variable or the lagged stock of forced migrants (Schmeidl 1997, Moore & Shellman 2002a, 2002b, Davenport et al 2003). We include the lagged stock of forced migrants, i.e. the accumulated number of forced migrants lagged one year. However, as we show in an earlier study, these controls are insufficient to capture the dependence structure in the data. The lagged stock does not capture duration dependence in episodes of forced migration in armed conflict. Theoretically we expect that some people more readily relocate than others. Over time this produces a selection effect in the population that remains behind, such that the remaining population will become increasingly unwilling or unable to relocate (Melander & Öberg 2003). To model this we include a variable that counts the number

of years with forced migrations flows in conflict. Moreover, we control also for dependence between years without forced migration flows. To do this we add a variable counting the number of years with no forced migration flows and (in the inflation equation) qubic splines that approximate the discrete time hazard rates for no flow (Beck, Katz, & Tucker 1998).

4. Research Design

4.1. Measuring the Dependent Variable

We are interested in investigating how different factors affect the decision to flee. Therefore we look at both internal and international displacement (IDPs and refugees). Looking at only one of them would introduce a form of censoring creating potential biases in our results. Our dependent variable – forced migration flow – is the net count of refugees and internally displaced people from a country in a given year. This is obtained by summing the number of refugees and internally displaced persons from each country each year, subtracting the sum for the previous year and truncating the negative values at zero. This is common practice in the literature and arguably the best possible way to do it (cf e.g. Wallensteen & Öberg 1998, Moore & Shellman 2002a). However, it does mean that flows are undercounted if there exist a number of forced migrants from one country and re-settlement occurs alongside new refugee flows. There is one alternative measure used in the literature. Davenport et al. (2003) argue that to capture both the push and the pull factors at work in the decision to flee we should look at what he calls the *net* forced migration stock. The net stock of displaced persons is obtained by taking the difference between the number of forced migrants hosted and the number of forced migrants displaced. We believe that the net stock is less appropriate because it will necessarily underestimate the number of decisions to leave by a wide margin. To see why this is so, consider a forced population exchange between two countries or territorial units, e.g., that which took place in the late 1980's

between Armenia and Azerbaijan. Suppose that a hundred thousand people leave country A and go to country B, while in the same year one hundred thousand people decide to flee country B and go to country A. That would sum to two hundred thousand decisions to flee using a forced migration flow measure, but it would be counted as zero decisions to flee using a *net* forced migrant stock measure. 

We use official UNHCR figures for refugees, and data on internally displaced people from the US Committee for Refugees. Our UNHCR refugee data differs from that used in previous studies in one important respect: it is not truncated at 500 refugees. In previous studies refugee stocks smaller than 500 people are left out. Including cases with less than 500 forced migrants means that the number of country years with positive refugee flow nearly doubles compared to studies based on earlier data.

4.2. Temporal and Spatial Domain

The results reported in Table 1 cover 96 to 147 countries and the time period 1977 to 1995. The temporal domain is limited chiefly by the state repression data. If the state repression variable is dropped, the time period covered extends backward to 1964 and forward to 1999. Dropping the state repression variable leaves the results for the remaining variables largely unchanged. Because the results do not change substantially, and because we think state repression belongs in the model, the results reported below are based on the 1977 to 1995 time period.

4.3. Statistical Model and Estimation

Our dependent variable is an event count ranging from zero to some positive integer and the events are not independent because the decision of one person to flee is not independent of other

people's decisions to stay or leave. Hence, we have a problem of over-dispersion in the data.[6] For data with these properties a negative binomial model is appropriate (Long 1997:230-236; King 1989:126).

Another feature of our data is that it contains a large number of observations with 0's on the dependent variable. Although we have nearly twice as many observations with a flow of forced migrants as earlier studies, the number of observations with forced migration flows is still low compared to the number of observations without flows. Consequently, there is reason to believe there is some unobserved heterogeneity (Long 1997:242-245). To account for this feature of our data we use a zero-inflated negative binomial regression model (ZINB) to estimate our models.[7] A Vuong test confirms that the zero-inflated model best fits data.[8]

5. Findings

5.1. Overview of results

The results for the zero-inflated negative binomial regression are presented in Table 1. The zero-inflated negative binomial model consists of two equations: an inflation equation in the lower part and a count equation in the upper part. The inflation equation is a logit regression of the independent variables on the probability that there is *no* flow of forced migration in a given year. The count equation in the upper part is a negative binomial regression of the independent

[6] The positive and significant coefficient of the over-dispersion parameter (α) in all models indicates that events are not independent and that the negative binomial distribution is appropriate.
[7] For the same reasons Moore and Shellman (2002a) also use the ZINB model.
[8] The results of the Voung test (Zinb vs. Neg. Bin) for Model 1 (complete model) without robust standard errors are: Std. Normal = 6.14, Pr> Z =0.00.

variables on the net number of forced migrants flowing out of a country in a given year (after adjusting the mean structure for zero-inflation).

The effects of the independent variables on the probability that a country will not produce any flow of forced migration in a given year are reported in the lower part of Table 1. Notice that the coefficients are different in the upper and lower parts of Table 1. In the upper part, the count equation, we report incidence rate ratios (IRR). IRR represents the change in forced migrants given a unit change in the independent variable, holding all others constant. Thus, an IRR of 1.0 indicates no change in the expected count of forced migrants, an IRR greater than 1.0 indicates an increase in the expected count, and an IRR lower than 1.0 indicates a decrease in the expected count. In the lower part of Table 1, the inflation equation, we report logit coefficients. Note also that a negative sign in the inflation equation means that the variable increases the risk that at least one person will be displaced.

Table 1 reports the results for two models. The Extended Model contains all control variables whereas four controls have been dropped in the Baseline Model. In order to arrive at the Baseline Model we stepwise dropped independent variables that failed to reach the 0.05 level of significance in both steps, i.e., in the count equation as well as in the inflation equation. This means that all independent variables that remain in the Baseline Model are statistically significant in at least one of the two steps of the zero-inflated negative binomial regression. The results for the variables that make it to the Baseline Model are similar to the results that were obtained for these variables in the Extended Model. When we comment and illustrate the results in what follows we will focus on the Baseline Model.

Table 1. Zero-Inflated Negative Binomial Regression Results

	Extended Model		**Baseline Model**	
Log likelihood	-8301.933		-8303.945	
Number of observations	2259		2259	
Nonzero observations	798		798	
Zero observations	1461		1461	
Wald chi2	203.25		189.94	
Prob > chi2	0.0000		0.0000	
No. of forced migrants in flow (count equation)	**Incidence Rate Ratio**	**Standard Error**	**Incidence Rate Ratio**	**Standard Error**
No. of Years w/ Forced Migration	.841	.0900	.819*	.0775
Accumulated no. of Forced Migrants $_{t-1}$	1	1.98e-07	1	1.61e-07
No. of years w/o Forced Migration	.941***	.015	.937**	.0212
Intrastate War	4.115***	1.953	4.951***	2.047
Intrastate Minor Armed Conflict	2.868***	.888	3.048***	.857
Geographical Scope of Ethnic Fighting	1.360*	.167	1.376**	.149
Geographical Scope of Revol. Fighting	1.243*	.114	1.198*	.104
Interstate War	1.022	.805		
Interstate Minor Armed Conflict	1.662	.691		
Regime Type	.953	.0276	.933**	.0253
Regime Transition	.633	.307		
Regime Collapse	2.517*	1.125	3.169**	1.242
State Repression	1.425*	.207	1.475*	.230
Genocide	1.152	.189	1.121	.124
Log of GDP per capita	.821	.237		
Log of population $_{t-1}$	1.041	.145	1.009	.133
Probability of zero forced migrants (inflations equation)	**Coefficient**	**Standard Error**	**Coefficient**	**Standard Error**
No. of Years w/ Forced Migration	-.638	.334	-.486	.263
Accumulated no. of Forced Migrants $_{t-1}$	3.10e-06	4.18e-06	1.40e-06***	4.34e-07
No. of Years w/o Forced Migration	.621	.491	.498*	.227
Intrastate War	-7.201	18.699	.0505	1.366
Intrastate Minor Armed Conflict	-.995	.536	-.599	.488
Geographical Scope of Ethnic Fighting	.0508	.825	.103	.171
Geographical Scope of Revol. Fighting	-.299	.242	-.531*	.240
Interstate War	-3.845	2.93		
Interstate Minor Armed Conflict	-.203	.789		
Regime Type	-.0129	.0279	-.00803	.0211
Regime Transition	-.396	.697		
Regime Collapse	.227	3.321	1.250	1.583
State Repression	-.652*	.307	-.591**	.194
Genocide	-2.827	3.185	-1.353*	.603
Log of GDP per capita	.192	.344		
Log of population $_{t-1}$	.175	.117	.118*	.0602
_spline1	.00116*	.000501	.00111**	.000420
_spline2	.00798	.0101	.00643	.00649
_spline3	-.00322	.00288	-.00299	.00219
_cons	-5.073	5.469	-2.173*	1.0683
ln α	2.518	.178	2.425	.0815
α	12.400	2.213	11.302	.921

* significant at 5%; ** significant at 1%; *** significant at 0.1%

All independent variables are significant in at least one of the two equations and have the expected signs, except logged population that somewhat surprisingly reduces the likelihood of forced migrants. Most importantly given our focus in this paper, both measures of the geographical scope of fighting significantly influence the number of forced migrants in the predicted way. The greater the geographical scope of the fighting and the more urban areas affected, the larger the expected flow of forced migrants. However, the magnitude of the effects of full-scale internal war and minor internal armed conflict are not significantly different. This means that the geographical scope of the fighting is more important for the resulting number of forced migrants than the intensity of armed conflict in terms of the number of battle-related deaths. In addition, the variables measuring the geographical scope of fighting also capture episodes of fighting that fail to meet the criteria for armed conflict as defined by the Uppsala Conflict Data Program but that give rise to substantial numbers of forced migrants, e.g., the overthrow of the military regime in Haiti in 1993, and the interethnic fighting in Zaire in 1991.

Furthermore, ethnic conflict and revolutionary conflict are equivalent in the degree to which the geographical scope of fighting drive forced migration flows. This is in line with several previous studies that similarly have failed to find any noteworthy differences between ethnic wars and other types of armed conflict in terms of the numbers of forced migrants (Scmeidel 1997, Moore and Shellman 2002a, Melander & Öberg 2003).

If we turn to the effects of armed conflicts between states we find that wars over territorial claims significantly increase the risk that forced migration will occur (i.e., in the inflation equation), but that the more interesting number of expected forced migrants is not significantly increased (i.e., in the count equation). To be sure, interstate territorial wars have resulted in appalling numbers of

forced migrants as, e.g., in the Iran-Iraq war in 1970-1988, but there are also many examples of intrastate wars that give rise to no or very small flows of forced migration, such as the Falklands War in 1982 and the so-called Soccer War between El Salvador and Honduras in 1969. Minor armed interstate conflict is significantly associated with higher numbers of forced migrants, a relationship that perhaps can be exemplified with border clashes between China and Vietnam in the 1980s, which were accompanied by a fear of renewed war and an outflow of ethnic Chinese for Vietnam.

Confirming our earlier results, we find that temporal dependence in forced migration significantly affect the magnitude of forced migration flows (Melander & Öberg 2003). To be more precise, the number of prior years without a flow of forced migration decreases the expected number of forced migrants. Also the duration of forced migration in ongoing flows decreases the expected number of forced migrants in intrastate armed conflict. Moreover, the size of the accumulated stock of forced migrants decreases the risk of further flows. Also the positive and significant coefficient of the over-dispersion parameter (α) indicates that events are not independent. As we would expect, the first forced migrant increases the probability of a second forced migrant and so on.

Three indicators measuring the status of the political system were included. First, we find that regime type influences the number of forced migrants, but not the likelihood of a forced migrant flow. More democratic regimes tend to have larger flows of forced migrants, all else being equal. This finding is new and perhaps a bit surprising. Our interpretation is that the population in more democratic countries have lower barriers for relocating because travel tend to be less regulated, means of travel more widely distributed, and travel documents such as passports are easier to

obtain. This would increase the number of people who can leave in more democratic countries, but not the likelihood that we se a forced migration flow. Second, and third, we find that regime collapse but not regime transitions are associated with forced migration flows. Both the likelihood of flows and the number of forced migrants in a flow increase in the wake of state collapse.

The two final control variables, state repression and genocide, behave as expected except that genocide only is significant in the inflation equation, and thus does not significantly increase the numbers of forced migrants although the risk that some flow will occur is heightened. State repression increases both the risk of a flow of forced migration and the expected number of forced migrants in flows.

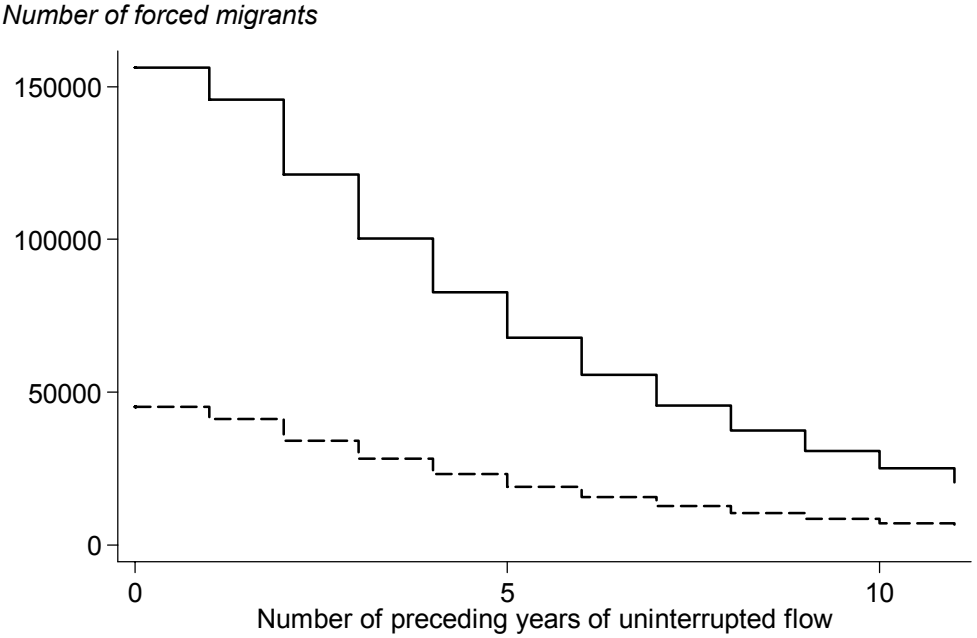
6.2. Determining the Magnitude of Forced Migration Flows

From a policy perspective the effects of the independent variables on the expected number of forced migrants in a flow are what matters most. Since the count equation is nonlinear it is not possible to convey the magnitude of the effects in very concise statements and the effect of one variable depends on the values of all other independent variables. We therefore provide a few examples and graph the most important findings to make clear the substantial implications of the coefficients.

Figure 1 shows how the predicted number of forced migrants varies as a function of time and the geographical scope of ethnic fighting. The top curve represents the predicted number of forced migrants given maximum geographical scope, i.e., when more than half the country is affected by the ethnic warfare as, e.g., in Bosnia-Herzegovina in 1992-1995. The bottom curve corresponds

to the most limited geographical scope of ethnic warfare as, e.g., in the war involving the Free Aceh Movement in Indonesia in 1990.[9]

Figure 1. The expected number of forced migrants in intrastate war as a function of geographical scope of fighting and the number of preceding years of uninterrupted forced migration



The geographical scope of fighting has a very strong and significant effect on the magnitude of forced migration flows. Consider the widening of the geographical scope of ethnic warfare from less than ten percent of the territory and no significant cities being affected, to more than 50 percent of the country being engulfed in the fighting. In the case of ethnic war confined to less than 10% of a country, the predicted flow of forced migrants is just under 50.000 in the first year, falling to less than half that number the tenth year of a flow. In comparison, the predicted flow in the first year is more than 150.000 when more than half the country is affected by the fighting,

[9] The remaining variables were set at their means with the following exceptions: No. of Years w/o Forced Migration= 1 if No. of years w/ Forced Migration is 0, otherwise 0; Intrastate War=1; Intrastate Minor Armed Conflict=0; Geographical Scope of Revolutionary Fighting=0; Regime Collapse=0; Genocide=0.

falling to less than 50000 in the tenth year. This means that the number of forced migrants we can expect from a geographically confined conflict (<10% of the area affected) is less than one third of the number we can expect from the most geographically encompassing conflicts in the initial year of a flow. The corresponding effect of the geographical scope of revolutionary fighting is very similar.

6. Summary and Conclusions

The point of the departure for this study is the large remaining variation in forced migrant flows across countries experiencing armed conflict. In particular, there are large unexplained variations across intrastate armed conflicts even when taking into account the type of armed conflict as well as other forms of collective violence, i.e., state repression, and genocide. In this paper we argue that people in a country in armed conflict will be differently affected by the conflict depending on where they live, relative to the fighting. More specifically, we propose that the number of people affected by the violence, and hence the number of people who might feel threatened enough to flee, is related to the geographical scope and location of the violence. This expectation is born out in our empirical investigation, showing that the larger the geographical scope of the fighting, the higher the number of forced migrants. This effect is quite substantial and holds when controlling for the other causes of forced migration identified in previous research.

Using new data that differentiate between minor armed conflict and wars we also investigate whether some of the outstanding variation in forced migration flows can be explained by the intensity of armed conflict. Contrary to our expectations we did not find significant differences between minor armed conflicts and full scale wars, suggesting that where the fighting is taking place is more important in determining the magnitude of forced migration flows.

Previous studies gradually introduced additional measures for various types of violence so as to more completely capture the threats driving forced migration. In this paper we have shown that violence has very different effects on the magnitude of forced migration depending its geographical scope and location. In other words, we conclude that the challenge facing future research forced migration is not just to measure all types of violence, but also to specify how different types of violence have different impact depending on its intensity, scope and location. We believe that further refinement of theory and data in this regard is an important task for future research in this field. Our findings also suggest that the impact of economic factors and other non-violent factors deserves greater attention in future research on forced migration. For example, given that poverty is an important driving factor also behind forced migration it would be interesting to investigate whether, e.g., humanitarian aid, can mitigate threatening forced migration disasters.

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Appendix 1. Data on the Independent Variables

Minor intrastate armed conflict. This is a binary variable adopted from the Uppsala Conflict Data Program, coded 1 if a minor intrastate conflict is ongoing and 0 otherwise. Minor intrastate armed conflict is a contested incompatibility that concerns government or territory where the use of force between two parties, of which one is the government of a state, results in at least 25 but less than 1000 battle-related deaths per year (Gleditsch et al 2002). We consistently follow the Uppsala project so that when we use the term "minor armed conflict" (intrastate or interstate) we always refer to a conflict at this intensity level. In the Uppsala data, a country can experience several intrastate conflicts during one year. If another intrastate armed conflict in the same country claimed at least 1000 battle-related deaths then that country year is coded as intrastate war only. In other words, if more than one intrastate armed conflict is ongoing we code the highest level of intrastate armed conflict. We consistently follow the Uppsala Conflict Data Program and reserve the term "war" (intrastate or interstate) for conflicts that result in at least 1000 battle-related deaths per year.

Intrastate war. This is a binary variable adopted from the Uppsala Conflict Data Program, coded 1 if an intrastate war is ongoing and 0 otherwise. Intra-state War is a contested incompatibility that concerns government or territory where the use of force between two parties, of which one is the government of a state, results in at least 1000 battle-related deaths per year (Gleditsch et al 2002).

Geographical *Scope of ethnic conflict* and geographical *Scope of revolutionary conflict.* Scaled portion of country affected by ethnic war and revolutionary war respectively, from the State Failure Project (Goldstone et al. 2000).

International war *over territory*. *This is binary variable adopted from the Uppsala Conflict Data Program. It is coded 1 if an interstate conflict at the intensity level of war was coded in the Uppsala data and the country in question also was listed as being the "location" of that conflict. A state in interstate conflict is listed as the location of the conflict if it has "a claim over the territory being disputed" (Armed Conflict Dataset Codebook, 6). If either of these two conditions is unfulfilled this variable is coded 0.*

International minor armed conflict *over territoty*. *This variable is coded in the same way as the preceding variable, but indicates those instances of involvement in interstate conflict where territorial claims are disputed by force but where the intensity level is that of a minor armed conflict.*

Genocide *is an indicator measuring the magnitude of genocide and politicide from 0 (no genocide/politicide) to 5 (>256,000 killed), developed by the State Failure Project (Harff & Gurr 1996).*

State repression *indicates the extent of state violations of its subjects' personal integrity rights, i.e., political imprisonment, dissapperances, torture and murder. This measure, called the Political Terror scale by its creators, is an ordered scale ranging from 1 to 5. Higher values indicate more widespread and more severe state-sponsored human rights violations (Gibney and Dalton 1997).*[10]

Regime type are the polity2 measure from the Polity Project, Phase IV (Marshall & Jaggers 2000).

[10] Following Moore and Shellman (2002a) we report results obtained using the state repression values that are based on US State Department reports. A very similar set of values based on Amnesty International reports is also included in the Political Terror Scale.

Regime transition is a dummy variable derived from the Polity Project, Phase IV (Marshall & Jaggers 2000). It is coded 1 if the value of the polity measure is -88(interruption), indicating that the political system is undergoing transition.

Regime collapse is a dummy variable derived from the Polity Project, Phase IV (Marshall & Jaggers 2000). It is coded 1 if the value of the polity measure is -77(collapse), indicating that central authority is not functioning.

Accumulated number of forced migrants$_{t-1}$, counts the accumulated number of refugees and IDPs from a given country for the previous year based on UNHCR data for refugees and USCR data for IDPs.

Number of years without forced migration, counts the number of years since the last year with a flow of forced migration.

Log of total population measures the total population of the country log-transformed, from World Bank data (Easterly & Sewadeh 2001).

Log of real GDP per capita is the log-transformed GDP per capita in constant prices, in constant U.S. dollars with the base year 1985 (Gleditsch 2002).