

Civil War, Ethnicity, and the Migration of Skilled Labor

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Abstract: *We investigate the impact of internal conflict on skilled emigration rates to six major destinations in the OECD over the period 1975-2000. Controlling for source country characteristics, we find that the presence of civil war increases skilled emigration by about 3-6 percentage points. Further, the impact of internal violence on skilled emigration depends on the precise nature of conflict being experienced: While brain drain from countries with ethnic conflict is about 5-8 percentage points greater than that from countries without conflict, it is less for countries with nonethnic conflict and not significantly different from countries without conflict. Additionally, each year of ethnic conflict increases brain drain by 0.4-0.7 percent on the average, but an additional year of nonethnic conflict has an insignificant impact. The results reinforce the need to separate ethnic and nonethnic conflict into distinct conceptual categories.*

Keywords: Brain drain; conflict; discrimination; institutions

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1. INTRODUCTION

The last decade and a half has seen the emergence of a vast literature on the causes and consequences of *brain drain* or the international migration of tertiary skilled labor.¹ Yet the role of conflict as a determinant of skilled migration remains relatively unexplored. This paper is an attempt to fill this void. We investigate the impact of civil war in the countries of origin on the magnitude of brain drain to six major destinations in the OECD over the period 1975-2000. Controlling for economic and institutional characteristics of the source countries, we find that the

presence of civil war increases the emigration of high skilled labor on the average. Further, the consequences of civil war on the migration of tertiary skilled labor depend critically on the type of conflict occurring in the country of origin. While *ethnic* civil war increases the fraction of tertiary skilled emigrants in the total emigrant pool, *nonethnic* civil war does not have a robustly significant impact on the magnitude of brain drain, and its impact is significantly less than that of ethnic war.

Further, conditional on the presence of ethnic civil war, an additional year of conflict has a significant positive impact on brain drain. However, the marginal impact of an additional year of nonethnic civil war on brain drain is statistically insignificant. Interestingly, the salience reverses when we consider the intensity of violence: Conditional on the presence of conflict, a unit increase in the intensity of ethnic conflict has a statistically insignificant impact on brain drain, while a unit increase in the intensity of nonethnic conflict has a significant but small negative impact.

In providing a more nuanced analysis of the role of internal conflict on skilled migration, our study contributes to the literature that investigates the causes and consequences of brain drain. Further, it contributes to a recent literature that looks at the formation of *diasporas* and their impact on economic outcomes in the countries of origin.² Recent evidence has revealed that skilled diasporas may facilitate the flow of foreign direct investment to the source countries [Kugler and Rapoport 2007]; help in the transfer of technology [Lodigiani 2008]; and contribute towards the adoption of needed institutional reforms [Li and McHale 2006]. Significantly for our purpose, they may contribute considerably to the post-conflict reconstruction of a society [Fair 2007; Koser 2007]. Since the nature of diasporic intervention depends critically on the historical experiences which constitute them [Natali 2007; Fair 2007], our exploration of the role of

conflict in forming immigrant communities contributes towards a better understanding of the impact of diasporas.

Lastly, our study contributes to an emerging interdisciplinary literature that urges the recognition of ethnic and nonethnic conflict as conceptually distinct phenomena.³ There is considerable evidence that ethnic civil wars tend to be of greater duration [Kirschner 2009];⁴ exhibit a greater probability of recurrence [Kreutz 2010];⁵ lead to a greater intensity of violence; and bear a greater risk of escalation [Eck 2009] than nonethnic civil wars.⁶ Evidence also shows that ethnic and nonethnic conflict may arise from fundamentally different motivations, in that the former are predominantly fueled by political grievance [Gurr 2000; Sambanis 2001; Reynal-Querol 2002], while the latter arise either due to the lack of economic opportunities [Sambanis 2001] or due to the desire for loot [Reynal-Querol 2002]. Our study contributes to this literature by documenting a differential impact of the two forms of conflict on economic outcomes; in our case, the migration of skilled labor.

The paper is organised as follows: Section 2 presents the conceptual foundations of our analysis; Section 3 introduces the empirical model and data; Section 4 presents the results of our inquiry; and Section 5 concludes the paper by providing a brief summary of our analysis and indicating directions for further research.

2. CONCEPTUAL FOUNDATIONS

Internal conflict reduces expected returns to educational investment. Hence, given the presence of conflict, an individual who has invested in education will have a greater incentive to migrate than an individual who has not. Controlling for economic and other differences, on the average, one may therefore expect to see a greater fraction of skilled migrants from an economy devastated by civil war than one at peace. This is the first hypothesis explored in the paper.

The second hypothesis pertains to the nature of conflict. Existing studies have argued that an ethnic coalition is better mobilized for waging conflict than one formed along other lines [Weinstein 2007; Esteban and Ray 2008; Eck 2009]. Hence, a civil war where contestants are unified on the lines of ethnicity is likely to see a greater destruction of economic infrastructure and reduce the expected returns to education more than a revolutionary civil war. As such, an economy experiencing ethnic civil war is likely to suffer a greater magnitude of brain drain on the average than one experiencing nonethnic civil war. The remainder of this section will be devoted to a brief review of arguments in favor of our second hypothesis.⁷

Ethnic mobilization increases the ability to wage conflict. Any organization engaged in conflict faces the need to identify and recruit individuals who would either participate directly in violence or provide other forms of support to the cause. In an ethnic conflict, the target group for recruitment is defined by ethnicity and therefore easier to identify. As noted by Eck [2009], this allows the organization to focus its resources on individuals who are most likely to join. Hence, the same expenditure of resources allows a higher level of recruitment than if the organization was engaged in ideological or revolutionary conflict.

In addition to identifying the target group for recruitment, successful mobilization requires the leaders of an insurgent organization to make credible commitments to potential recruits about the distribution of conflict rents. As noted by Weinstein [2007], shared ethnic affiliation between the leaders of the organization and the recruit pool may aid recruitment by enhancing the credibility of the promises made by the organization.

Even if the promises made by the organization are not credible, Eck [2009] points out that ethnicity may aid recruitment via the *security dilemma* faced by an individual.⁸ Just as ethnic affiliation makes it easier for an organization to identify the pool of potential recruits, it gives the

rival a means to identify the pool of potential combatants it may face in the future. Even if an individual finds the promises of the organization purporting to represent his ethnic group incredible or is unsympathetic to the cause, fear of being targeted by the rival simply by virtue of his ethnicity may force him to join. For exactly the same reason, the problem of defection is reduced for an organization engaged in ethnic conflict. An individual who wishes to dissociate from conflict may find himself forced to continue his support if only to ensure his own security.

In addition to aiding recruitment, ethnic mobilization leads to greater cohesion within the insurgent coalition. Collier and Hoeffler [2002] observe that ethnic heterogeneity increases the diversity of preferences within the organization and hence reduces the ability for decisive cooperative action. Recruitment within a single ethnic group allows the insurgent organization to achieve a greater internal unity and hence improves military capability.

Lastly, Esteban and Ray [2008] note that the rich and the poor generally contribute different inputs to the production of violence. While the poor are more likely to be active combatants, the rich are more likely to contribute financially. The two forms of contribution are complementary and a group requires both in order to have a reasonable probability of success. An ethnic coalition includes both rich and poor and therefore avails of both types of conflict inputs. Hence, it represents a more efficient form of organization (in the sense that the resulting coalition has a greater destructive capacity) than a class coalition, which includes either the rich or the poor.

3. EMPIRICAL MODEL AND DATA

To measure the impact of civil war on the emigration of high skilled labor, we estimate the following equation:

$$(1) \quad high-skill_{it} = X_{it}\beta + Z_{it}\gamma + e_{it}.$$

The dependent variable, $high-skill_{it}$, denotes the fraction of tertiary educated immigrants from country i in year t in the *total combined* foreign born population in the six major destination countries in the Organization for Economic Cooperation and Development (OECD), namely, Canada, the United States, Australia, the United Kingdom, France, and Germany.⁹ Note that the elements of our sample are not bilateral observations between the sending countries and each individual destination countries, but rather the total combined emigrant population in all six destinations from each source country, i , at the end of each five year time interval, t . The data is compiled by Defoort [2008] and is available at five-year intervals over the period 1975-2000,¹⁰ yielding a time series of six observations. While the original dataset accounts for immigrants from 147 source countries, limitations in the availability of explanatory variables restrict our sample to an unbalanced panel of 419 observations from 109 different source countries over the six five-yearly periods for which the skilled emigration data are available.

The Control Variables

The matrix of controls X includes constant terms that capture both region and year specific fixed effects and a set of source country characteristics commonly used in the brain drain literature. For each of the six years in our sample, we include the natural logarithm of gross domestic product (GDP) per capita, population, and the consumer price index (CPI) inflation rate from the World Development Indicators (WDI). We also include the average years of education in each source country from Barro and Lee [2001]. Additionally, in order to control for network effects in international migration, we include the total combined foreign-born population from each source country in the six recipient OECD countries. This data is taken from Defoort [2008].

Prior to describing the other variables, it may help to clarify why we include the natural logarithm of GDP per capita rather than GDP per capita itself: Recent evidence on international

migration reveals a nonlinear impact of GDP per capita in the source country and the incentive to migrate [Vogler and Rotte 2000; Pedersen, et al. 2004; Mayda 2008].¹¹ This is generally captured by introducing both GDP per capita and its square as regressors. However, this specification is not suited to our context due to the potential endogeneity between GDP per capita and the institutional controls described subsequently. With the relatively small size of our sample, instrumenting for both GDP per capita and its square is problematic. Hence, we capture the potential nonlinearity by considering the log of GDP per capita.¹²

Since the influence of poor institutions has been found to confound the impact of conflict on selection, we also control for institutional quality in the source countries [Bang and Mitra 2011]. Although there are many recently developed measures that capture one or more aspects of institutional structure, much of this data is unavailable for a significant part of our sample period. To preserve the consistency of our estimators, we focus on three widely-available measures to capture the impact of institutional structure. First, we include dummy variables for different types of political systems (*presidential*, *parliamentary*, or *assembly-elected president*) from the Database of Political Institutions (DPI) compiled by Beck, et al. [2001].¹³ We then include dummies for the type of effective executive (*monarch*, *president*, *premier*, *military*, or *other*) from the Cross-National Time Series (CNTS) Data Archive [Banks 2010].¹⁴ Finally, we include the composite democracy-autocracy index from the Polity IV project. While these variables may not capture the full impact of institutions on brain drain, they appear to do a good job of controlling for the general effects of institutional character.¹⁵

The Conflict Variables

The matrix Z contains variables that capture civil war in the countries of origin, depending on the particular question we wish to explore. Our initial exercise investigates whether civil war

increases the selection of emigrants on the average. Accordingly, in this specification Z includes a simple dummy for the presence of civil war in general. We then investigate whether the impact of civil war on selection depends on the nature of conflict. In this case, therefore, Z contains separate dummies for the presence of ethnic and nonethnic civil war.

It is reasonable to expect that the duration of conflict will influence the selection of migrants. Given the evidence cited in Section 2, it is also plausible that the impact of duration on selection may differ according to the nature of civil war a country is experiencing. Accordingly, our third exercise includes separate dummies for ethnic and nonethnic civil war along with terms that interact the presence of each type of civil war with a measure of duration based on the number of years since the onset of the current conflict. We thus interpret the coefficients on these interaction terms as the marginal effect of an additional year of ethnic or nonethnic conflict on the fraction of tertiary educated emigrants, given that the country is experiencing the relevant type of civil war.

Finally, we investigate if the intensity of conflict plays any role in the selection of migrants. Analogous to the previous model, Z includes separate dummies for ethnic and nonethnic civil war along with interaction terms for each type of civil war with alternative measures of intensity based on the number of battle related deaths. The coefficients on the interaction terms thus capture the marginal effect of an increase in intensity of conflict on the fraction of tertiary educated emigrants given that there is already conflict present. Finally, we introduce the duration and intensity of conflict in the same model. In this case, Z contains dummies for the two types of civil war and both sets of interaction terms described previously. Descriptive statistics for all variables are reported in Table 1.

<<Table 1 here>>

Measuring Conflict

Any empirical inquiry into the causes and consequences of civil war faces the problem that the literature is hardly unanimous on the operational definition of the phenomenon. Most studies are, however, based on one of two identification criteria, namely that of the Uppsala Conflict Data Program (UCDP) [Gleditsch, et al. 2002] and that of the Political Instability Task Force (PITF). To establish the robustness of our results, we adopt both of these definitions.

According to the identification criteria proposed by UCDP, a civil war is a contested incompatibility between the government of a state and one or more internal opposition groups, with or without external intervention, concerning either government or territory or both, and resulting in at least 25 battle-related deaths per year.¹⁶

The PITF, however, defines a civil war as an episode of political violence between the government of a state and either political or ethnic challengers internal to the state, where each contestant mobilizes at least 1,000 combatants, there is at least 1000 direct conflict-related deaths over the full course of the armed conflict, and where there is a minimum of one year when the death toll exceeds 100 fatalities.¹⁷

Given the difference in fatality threshold imposed by the two datasets and the additional imposition of a mobilization threshold in the PITF definition of civil war, there is a slight difference in the list of conflict events identified by the two datasets. Table 2 provides a list of countries that experienced civil war over our sample period according to both definitions.

The definition of an ethnic civil war is a contested topic in its own right [Sambanis 2001; Eck 2009]. The PITF explicitly distinguishes between *ethnic* and nonethnic or *revolutionary* wars, with the former being defined as civil wars where sovereign governments confront ethnic, religious, or linguistic minorities who seek major changes in their status. Revolutionary wars, on

the other hand, occur between governments and politically organized groups that ‘*seek to overthrow the central government, to replace its leaders, or to seize power in one region.*’

The PITF definition of ethnic civil war implicitly assumes the existence of a political agenda shared by an ethnic group as a whole. However, the totality of an ethnic group may be co-opted into violence by political entrepreneurs who invoke the rhetoric of ethnicity to garner popular support for their personal political aims [Horowitz 2000]. As an alternative to the PITF definition, Fearon and Laitin [2003] focus on the more easily observed process of mobilization and define an ethnic war as any civil war where contestants mobilize either partially or entirely along the lines of ethnicity. Following Eck [2009], we apply the identification criterion of Fearon and Laitin [2003] to disaggregate the UCDP dataset which otherwise does not distinguish between civil wars by type. As a robustness check, we have also used the PITF identification criteria to disaggregate the UCDP list of conflict events, following Cederman, *et al.* [2010]. While this exercise is not included in the paper, it confirms all of the reported results.

As mentioned previously, data on our dependent variable is available at 5-year intervals. This raises the question of merging the annual conflict data with the other variables. Following the current praxis in the conflict literature, conflict dummies in our base specification are coded as 1 if the particular countries experienced civil war in any of the preceding 5 years [Collier and Hoeffler 2004]. In the PITF dataset, this yields 76 observations in our panel for which ethnic conflict was present and 32 observations for which nonethnic conflict was present. For the UCDP dataset, we have 85 observations with ethnic conflict and 50 observations with nonethnic conflict. Given the presence of civil war, the average ethnic war in our sample period lasts about 22 years and the average nonethnic war lasts about 21 years based on the UCDP dataset using the Fearon and Laitin [2003] criteria.¹⁸ For the PITF dataset, the corresponding figures are 10

and 12 years, respectively. The countries experiencing different types of conflict are reported by year in Table 2.

<<Table 2 here>>

Lastly, as a robustness check, we use the alternative convention of coding a conflict dummy as 1 if and only if the relevant country experienced civil war in the year for which we have the migration data. While this reduces the number of observations experiencing conflict in our sample considerably (to 57 ethnic and 17 nonethnic conflicts for the PITF data and 61 ethnic and 22 nonethnic conflicts for the UCDP data), all of our results go through with this procedure.

Estimation Issues

One problem that may arise in estimating equation (1) using the classical regression model is the fact that GDP per capita may be endogenous, and may, in fact, depend on some of the other factors that are of interest in explaining the brain drain, notably the institutional variables [Knack and Keefer 1995; Alesina, et al. 1996]. To address this, we estimate equation (1) using a generalized method of moments (GMM) procedure, with per capita energy consumption and agricultural value added from the WDI as excluded instruments for log GDP per capita.

4. RESULTS AND ROBUSTNESS

As a first look at the data, we consider the effect of the ordinary presence of civil war in a given country in a given year on the fraction of tertiary educated emigrants. Columns 1 and 2 of Table 3 report our initial results with the PITF and UCDP data, respectively. The presence of civil war increases the fraction of tertiary educated emigrants by about three percentage points when we use the PITF data and by about six percentage points when we use the UCDP data, and the impact for each is statistically significant.

<<Table 3 here>>

As noted previously, however, our initial investigation may not reveal the full impact of certain types of civil war because the consequences of internal conflict could depend critically on the nature of conflict in question. Indeed, the results presented below confirm our hypothesis that ethnic conflict has far more dire consequences on the migration of highly skilled labor. As a second step in our analysis, therefore, we differentiate civil war by type. The results of this exercise are reported in Columns 3 and 4 of Table 3. Including separate dummy variables for the two types of civil war based on the PITF criterion for ethnic civil war [Sambanis 2001; Reynal-Querol 2002], we find in Column 3 that the presence of ethnic conflict increases the fraction of tertiary educated emigrants by about five percentage points and the effect is significant at the 0.01 level. Nonethnic conflict actually decreases the fraction of tertiary educated emigrants, but by less than one percentage points and its impact is statistically insignificant. Moreover, our partitioning of the conflicts into ethnic and non-ethnic dimensions is further supported by the log-likelihood and Akaike Information Criterion statistics reported at the bottom of Table 3.

We subsequently replicate our results using the UCDP dataset disaggregated for type of civil war according to the identification criterion proposed by Fearon and Laitin [2003]. As seen from Column 4, the presence of ethnic conflict in a country increases the fraction of tertiary educated emigrants to the OECD by about eight percentage points and the effect is significant at the 0.01 level. By contrast, the presence of nonethnic conflict increases the fraction of tertiary educated emigrants by about three percentage points and the effect is statistically significant at the 0.05 level.

As mentioned previously, we might expect the duration and intensity of conflict to affect selection. Further, these impacts may vary according to the type of civil war being experienced.

To address these questions, we first consider the impacts of duration and intensity in isolation and then take up both aspects simultaneously in the same model.

The next step in our analysis is, therefore, to introduce separate measures of duration for ethnic and nonethnic civil war, as captured by the number of years since the onset of the current conflict. Recall that the coefficients on these variables are interpreted as the marginal effects of an additional year of ethnic or nonethnic conflict on the fraction of tertiary educated emigrants, given that the country is already experiencing the relevant type of civil war. Columns 1 and 2 of Table 4 report the results of this exercise with the PITF and UCDP data respectively: Based on the former, an additional year of ethnic conflict increases the fraction of tertiary educated emigrants by more than a half a percentage points and the impact is significant at the 0.01 level. An additional year of nonethnic conflict, by contrast, has a nearly equal negative effect that is statistically significant at the 0.05 level.

<<Table 4 here>>

With the UCDP data, an additional year of ethnic conflict is seen to increase the fraction of tertiary educated emigrants by just under a half a percentage points and the result is significant at the 0.01 level, while an additional year of nonethnic conflict now has a positive but very small and statistically insignificant impact. Interestingly, the coefficient on the *presence* of ethnic conflict turns negative when we introduce duration into the model, although the negative impact is small, and statistically insignificant. This negative impact for the onset of ethnic war is negated by about the third year of its duration for the PITF definition of conflict and by the second year of duration for the UCDP definition. To sum up, therefore, the duration of ethnic conflict has a significant positive impact on the migration of high skilled labor but the duration of nonethnic conflict plays little or no role. Thus, we conclude that while the longer duration of

some ethnic wars may matter more than their mere presence, the type of conflict as ethnic or nonethnic also still matters.

We now take up the question of intensity in isolation to the duration of civil war. The PITF dataset provides three indices of intensity based on the annual number of battle related fatalities; the number of rebel combatants; and the part of the country affected by violence, respectively.¹⁹ The results presented in Column 3 of Table 4 are based on the first index, even though the conclusions are robust to the use of the other two indices of intensity.²⁰ Neither an additional battle death from either type of conflict nor its ordinary presence has a significant impact on selection.

For the UCDP data, we actually have a more direct measure of intensity in the form of the annual number of battle-related deaths. This is available from version 3.0 of the UCDP/PRIO Battle Deaths Dataset [Lacina and Gleditsch 2005] which cover cases of conflict listed in the main UCDP dataset. In this case, therefore, the coefficients on the interaction terms described previously directly capture the marginal effects of an additional death from the relevant type of conflict on the fraction of tertiary educated emigrants. As seen from Column 4 of Table 4, the presence of both ethnic and nonethnic conflict has a significant positive impact on selection at the 0.01 level. However, while the impact of an additional battle death is insignificant for ethnic conflict, an additional battle death from nonethnic conflict has a small negative impact on selection that is statistically significant at the 0.10 level.

This begs the question as to why do we see a significant negative impact of intensity on brain drain for nonethnic conflict when the intensity of ethnic conflict has a weakly positive impact. A reason for this could be that ethnic and nonethnic conflict give rise to different expectations on the part of educated elites, who play a vital role in mobilizing the population for conflict

[Horowitz, 2000]. Also, Sambanis [2000] argues that nonethnic conflict arises due to economic grievances, either over the lack of economic opportunities or over the division of social surplus. Given that civil war tends to break out in societies with weak governments, an increase in the intensity of revolutionary conflict may signify an escalation involving greater mobilization on the part of the rebel. This will increase the probability of success for elites responsible for mobilization and consequently, give them less incentive to migrate. Ethnic conflict, on the other hand, often takes the form of deliberate coercion of ethnic minorities and it is often the case that educated elites suffer disproportionately more [Docquier and Rapoport 2003]. Hence, an increase in duration or intensity of ethnic violence may increase the incentive to migrate for the highly skilled. However, the effect is weak, given that it also the case that ethnic elites may willfully manipulate the rank and file into conflict to pursue their own instrumental needs.

As a final exercise, we include both the duration and the intensity dimension in a single model, presented in Columns 5 and 6 of Table 4 for the PITF and UCDP data respectively. With the PITF data, we find that an additional year of ethnic conflict increases the fraction of tertiary educated emigrants by about 0.6 percentage points and the result is significant at the 0.01 level, while an additional year of nonethnic conflict has a negative impact that is significant at the 0.05 level. As before, intensity of violence does not have a significant impact on selection for the PITF dataset. However, the UCDP data again gives us a positively significant impact of an additional year of ethnic conflict at the 0.01 level; a small and insignificant impact of an additional year of nonethnic conflict; an insignificant impact of an additional battle death from ethnic civil war; and a significant negative impact of an additional battle death from nonethnic war at the 0.10 level. Again as before, the positive impact on selection from the duration of ethnic conflict is overwhelms the negative (but insignificant) impact of the onset of civil war

very shortly after the conflict begins. Overall, the signs and significance levels obtained when we include the full host of conflict variables (Columns 5 and 6 of Table 4) are consistent with those obtained when we include duration and intensity separately (Columns 1 through 4).

We should also mention that the impacts of the control variables remain robust to changes in the source of conflict data and specifications of the empirical model. From the institutional variables, the extent of democracy (measured by the Polity Index) does not have a strong or significant impact on the brain drain. However, presidential systems do experience significantly lower rates of brain drain than parliamentary systems or systems with an assembly-elected president. This hints at the conclusion that elites may not fare as well in countries with more democratic institutional structures (controlling for other factors), and hence have a relatively higher incentive to migrate. This is also consistent with the conjecture that democracies are more susceptible to radical swings to the left, especially in developing countries. Finally, countries with monarchic executives have the highest rates of brain drain, followed by those with “other” types of executive, military executives, and presidents, while countries that have a premier as an executive have the lowest rates. Thus, the incentives may not be monotonic: the most repressive regimes (those presided over by a premier, for example) are likely to be more effective at choking off the opportunities of highly skilled workers to migrate.

In addition, the population of the sending country has a positive impact as consistent with the literature on international migration. However, the stock of foreign born population in the OECD from a particular country remains negatively significant, confirming the recent evidence documented by Docquier, *et al.* [2007] and Beine, *et al.* [2011b], who show that while larger diasporas increase the size of migration flows, they reduce the average educational level of migrants. Hence, while larger diasporas might mean greater *numbers* of skilled migrants, they

represent a lower *proportion* of the total migrants when that country's total emigrant population is large. Further, average educational attainment in the source country remains positively significant, again in line with the existing literature. Finally, consistent with recent evidence [Mayda, 2008], log GDP per capita in the source countries did not show up as significant in any of the specifications. We attribute the insignificance of the logged GDP term to the fact that it is endogenously determined by institutions and industry mix. When we account for this using our instruments, its statistical significance vanishes.²¹

5. CONCLUSION

This paper investigated the impact of civil war on the magnitude of brain drain from a country. Specifically, we explored the hypothesis that the consequences of civil war on the migration of tertiary skilled labor may depend critically on the type of conflict being experienced in the country of origin: While *ethnic* civil war was seen to increase the fraction of tertiary skilled emigrants in the total emigrant pool, *nonethnic* civil war did not have a robustly significant impact on the magnitude of brain drain.

Further, the impact of duration and intensity of conflict was also seen to depend on the nature of conflict: While an additional year of ethnic conflict positively and significantly impacted brain drain, the marginal impact of an additional year of nonethnic civil war on brain drain was either negative or statistically insignificant. However, a unit increase in the intensity of ethnic conflict has a statistically insignificant impact on brain drain, while a unit increase in the intensity of nonethnic conflict has a significant but small negative impact.

These findings help to shed light on the relatively unexplored phenomenon of migration from societies in conflict. In emphasizing the caveats to considering civil war as a unified phenomenon, it provides a more nuanced analysis of the role of conflict as a determinant of

skilled migration; and at least partially, helps to explain why studies based on the conception of civil war as a unified category may have failed to obtain a robust impact of internal conflict on the magnitude of brain drain [Beine, *et al.* 2008b]. Lastly, our study brings up an interesting policy question: Given the significant difference in the impact of ethnic and nonethnic conflict on the structure of migration, should migration policy in host countries be sensitive to the nature of conflict raging in the countries of origin? The ethical dilemma aside, if skilled migration has a beneficial impact on the host country, it may be in the best interest of the latter to pursue a less restrictive migration policy towards a country plagued by ethnic conflict than one experiencing nonethnic civil war. Further, given the role of skilled diasporas in directing foreign direct investment to the countries of origin; facilitating transfers of technology; and ushering in needed institutional reform; a more favorable migration policy towards countries experiencing ethnic war may significantly help post conflict recovery, especially since the devastation from ethnic conflict is considerably greater than other forms of civil war. These and other questions comprise important areas of inquiry for further research.

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Notes

1. See Commander, *et al.* [2004], Docquier and Rapoport [2008], and Beine, *et al.* [2008a] for an idea of recent trends in the brain drain literature.
2. See Beine, *et al.* [2011b] and the references therein.
3. See Sambanis [2001] and the references in Eck [2009]. For an argument against the separation of ethnic and nonethnic conflict, see King [2001].
4. Kirschner [2009] finds that 80% of civil wars that last longer than 15 years are ethnic conflicts.
5. Kreutz [2010] estimates that ethnic civil wars are 11% more likely to recur on the average than nonethnic civil wars.
6. Eck [2009] finds that episodes of political violence where participants mobilize along the lines of ethnicity are 92% more likely to escalate into civil war than nonethnically mobilized conflicts.
7. See Sambanis [2001] and Eck [2009] for more detailed discussions.
8. See Posen [1993] as the key reference on the security dilemma and its role in ethnic conflict.
9. Focusing on the six major OECD destinations is less restrictive than may appear to be: The six countries considered accounted for 77% of the OECD skilled immigration stock in the year 2000 [Beine, *et al.* 2011a]. This is significant considering that 90 percent of all high skilled international migrants were found to be living in the OECD in that year [Docquier, *et al.* 2007]. Further, the United States, Germany, France, Canada, and the United Kingdom were, in descending order, the five largest remittance-sending countries in 2005; together accounting for approximately half of the global remittance flow [Ratha and Shaw 2007]. Australia was the ninth largest, being further superseded by Saudi Arabia, Spain, and Hong Kong in descending order. For other studies based on the Defoort [2008] dataset, see Beine, *et al.* [2011a] and Dutta and Roy [2011].
10. This data set may be accessed at <http://perso.uclouvain.be/frederic.docquier/oxlight.htm>.
11. On one hand, an increase in GDP per capita in the source country reduces international income differentials and hence the incentive to migrate. On the other hand, it increases the ability to incur the costs of migration and hence, increases the incentive to migrate. Together, the two effects induce a non-monotonic response of skilled migration to GDP per capita. See Rotte and Vogler [2000].
12. We reach the same conclusions when we bring in the two GDP terms. These results are available on request.
13. These data are made available by the World Bank (<http://go.worldbank.org/2EAGGLRZ40>).
14. For a more detailed description of the CNTS data see <http://databanksinternational.com> or Banks [2010].
15. As a robustness check, we have also estimated our model using additional institutional variables that capture more fully the various dimensions of institutional quality, albeit using a more restrictive sample. The results are nearly identical to the results obtained with fewer institutional controls.
16. This includes the categories *internal armed conflict* and *internationalized internal armed conflict* in the UCDP/PRIO Armed Conflict Dataset. For more information, refer to the UCDP codebook: http://www.pcr.uu.se/research/UCDP/data_and_publications/datasets.htm.

17. This includes the categories *revolutionary war* and *ethnic war* in the PITF State Failure Problem Set. For more information, consult the PITF codebook available at <http://www.systemicpeace.org/inscr/inscr.htm>

18. This conditional mean can be calculated by dividing the mean duration of ethnic (nonethnic) conflict for the entire sample by the proportion of countries experiencing ethnic (nonethnic) conflict.

19. The fatality index (MAGFATAL) used in this paper takes the value 0 for less than 100 fatalities; 1 for 100-1000 fatalities; 2 for 1000-5000 fatalities; 3 for 5000-10,000 fatalities; and 4 if the number of battle related deaths exceed 10,000. See page 8 of the PITF Problem Set Codebook for this and the other indices MAGFIGHT and MAGAREA.

20. The calculations are available on request.

21. When we estimate the model using ordinary least squares, the effect of per capita GDP is negative and statistically significant at the 0.05 level. However, not surprisingly, this does not have a noticeable impact on the measured effects of conflict. Results from this exercise are available on request.

Tables

Table 1: Descriptive Statistics

	Mean	Std. Dev.	Min	Max
High-Skill Emigrants	0.404	0.149	0.062	0.713
GDP per Capita	6,564.043	8,329.463	84.946	37,472.350
Conflict (PITF)	0.216	0.412	0	1
Conflict (UCDP)	0.266	0.442	0	1
Ethnic Conflict (PITF)	0.158	0.365	0	1
Ethnic Conflict (UCDP)	0.177	0.382	0	1
Ethnic Duration (PITF)	1.563	4.655	0	31
Ethnic Duration (UCDP)	3.563	9.834	0	55
Ethnic Battle Deaths (UCDP)	1,461.765	7,593.414	0	112,750
Nonethnic Conflict (PITF)	0.067	0.249	0	1
Nonethnic Conflict (UCDP)	0.104	0.306	0	1
Nonethnic Duration (PITF)	0.744	3.478	0	31
Nonethnic Duration (UCDP)	1.923	6.993	0	47
Nonethnic Battle Deaths (UCDP)	126.268	965.880	0	16800
Inflation (CPI)	81.879	669.046	-3.846	11749.640
Population	45,400,000	134,000,000	346,997	1,260,000,000
Polity 2 Index	2.911	7.169	-10	10
Observations	481			

Table 2: List of Countries Experiencing Conflict during the Sample Period by Year and by Type of Conflict.

	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000
Algeria					PN, UN	PN, UN
Angola					PE, UE	PE, UE
Argentina	UN					
Azerbaijan					PE, UN	
Bangladesh				PE, UE		
Cambodia					UN	
China				PE	PE	
Colombia	UN	UN	PN, UN	PN, UN	PN, UN	PN, UN
Congo, Dem. Rep.					PE	PE, UE
Croatia					PE, UE	
Egypt					PN, UN	
El Salvador				PN, UN		
Ethiopia			PE, UE	PE, UE	UE	PE, UE
Guatemala	PE, UE	PE, UE	PE, UE	PE, UE	PN, UE	
India			PE, UE	PE, UE	PE, UE	PE, UE
Indonesia	PE, UE	PE, UE	PE, UE	PE, UE		PE, UE
Iran		PE, UE	PE, UE			UN
Malaysia	UN					
Mozambique				PN, UE		
Nepal						PN, UN
Pakistan	PE, UE	PE	PE	PE, UE	PE, UE	
Peru				PN, UN	PN, UN	
Philippines	PE, UE	PE, UE	PE, UE	PE, UE	PE, UE	PE, UE
Russia					PE, UE	PE, UE
Senegal					PE, UE	UE
South Africa	UN	UN	PN, UE	PE	PE	
Spain		UE				
Sri Lanka			PE, UE	PE, UE	PE, UE	PE, UE
Sudan			UE	PE, UE	PE, UE	PE, UE
Thailand	PN, UN	PN, UN				
Turkey			PE, UE	PE, UE	PE, UE	PE, UE
United Kingdom	PE, UE	PE, UE	PE, UE			
Zimbabwe	PN, UE					

PE = Experienced ethnic conflict according to the PITF conflict definitions.

PN = Experienced nonethnic conflict according to the PITF conflict definitions.

UE = Experienced ethnic conflict according to the Fearon and Laitin disaggregation of the UCDP conflict definitions.

UN = Experienced nonethnic conflict according to the UCDP conflict definitions.

Table 3: Conflict and the Brain Drain (Dep. Variable = Proportion of High-Skill Emigrants)^a

VARIABLES	(1)	(2)	(3)	(4)
	PITF	UCDP	PITF	UCDP
Conflict	0.0305*	0.0596***	...	...
	(0.0157)	(0.0139)	...	...
Ethnic Conflict	...	...	0.0482***	0.0804***
	...	...	(0.0185)	(0.0163)
Nonethnic Conflict	...	...	-0.00504	0.0395**
	...	...	(0.0221)	(0.0185)
ln(GDP per capita) ^b	0.0136	0.0146	0.0136	0.0133
	(0.00950)	(0.00931)	(0.00943)	(0.00915)
CPI Inflation Rate	6.57e-06	7.61e-06	7.22e-06	7.57e-06
	(7.99e-06)	(7.87e-06)	(7.97e-06)	(7.78e-06)
Population	1.04e-10**	1.20e-10***	9.11e-11**	1.18e-10***
	(0.000)	(0.000)	(0.000)	(0.000)
Total Immigrants	-1.42e-08***	-1.55e-08***	-1.44e-08***	-1.61e-08***
	(1.99e-09)	(2.00e-09)	(1.99e-09)	(2.00e-09)
Average Years Education	0.0248***	0.0263***	0.0249***	0.0276***
	(0.00440)	(0.00433)	(0.00440)	(0.00429)
Polity Index	-0.00117	-0.00135	-0.00126	-0.00165
	(0.00133)	(0.00131)	(0.00133)	(0.00130)
President ^c	-0.0871***	-0.104***	-0.0949***	-0.114***
	(0.0330)	(0.0327)	(0.0331)	(0.0324)
Premier ^c	-0.123***	-0.143***	-0.128***	-0.149***
	(0.0381)	(0.0378)	(0.0380)	(0.0373)
Military Executive ^c	-0.0842**	-0.102**	-0.0976**	-0.116**
	(0.0417)	(0.0412)	(0.0420)	(0.0409)
"Other" Executive ^c	-0.0727	-0.0845*	-0.0825*	-0.0929**
	(0.0475)	(0.0467)	(0.0476)	(0.0462)
Assembly-Elected President ^d	0.0810***	0.0824***	0.0828***	0.0808***
	(0.0209)	(0.0205)	(0.0209)	(0.0202)
Parliamentary ^d	0.0661***	0.0702***	0.0692***	0.0748***
	(0.0231)	(0.0228)	(0.0231)	(0.0225)
Observations	419	419	419	419
Adjusted R ²	0.465	0.481	0.468	0.492
F Statistic	16.84	17.96	16.34	17.87
Akaike Information Criterion	-617.362	-630.627	-618.607	-638.472
Log-Likelihood	331.681	338.314	333.304	343.236
Anderson Canon. Corr. Statistic ^e	415.8	415.8	415.8	415.8
P-Value	0.000	0.000	0.000	0.000
Sargan Statistic ^e	1.499	2.037	1.391	1.948
P-Value	0.221	0.154	0.238	0.163
Ethnic – Nonethnic			0.0532	0.0410
P-Value			0.0600	0.0765

a. Standard errors in parentheses; ***p<0.01, **p<0.05, *p<0.1; constant and region and year dummies not reported.

b. Excluded instruments: logs of energy consumption per capita and agricultural value added as a percentage of GDP.

c. The base category for the type of effective executive is "Monarch".

d. The base category for the type of system is "Presidential".

e. The Anderson canonical correlation test confirms that the first stage equation is identified; the Sargan statistic does not find evidence that the first stage is over-identified.

Table 4: Duration and Intensity of Conflict and the Brain Drain (Dep. Variable = Proportion of High-Skill Emigrants)^a

VARIABLES	(1) PITF	(2) UCDP	(3) PITF	(4) UCDP	(5) PITF	(6) UCDP
Ethnic Conflict	-0.0151 (0.0275)	-0.00780 (0.0239)	0.0494 (0.0323)	0.0817*** (0.0173)	-0.0232 (0.0402)	-0.00267 (0.0240)
Ethnic Duration	0.00662*** (0.00214)	0.00422*** (0.000856)	...	...	0.00656*** (0.00216)	0.00422*** (0.000864)
Ethnic Intensity	...	...	-0.000894 (0.0155)	-1.85e-07 (7.96e-07)	0.00483 (0.0155)	-7.14e-07 (7.82e-07)
Nonethnic Conflict	0.0594 (0.0381)	0.00726 (0.0320)	0.0365 (0.0419)	0.0541*** (0.0200)	0.112** (0.0555)	0.0132 (0.0320)
Nonethnic Duration	-0.00519** (0.00264)	0.00107 (0.00136)	...	...	-0.00571** (0.00267)	0.00142 (0.00137)
Nonethnic Intensity	...	...	-0.0231 (0.0197)	-1.09e-05* (5.70e-06)	-0.0255 (0.0198)	-1.00e-05* (5.63e-06)
ln(GDP p.c.) ^b	0.0151 (0.00932)	0.0145 (0.00890)	0.0141 (0.00943)	0.0132 (0.00917)	0.0157* (0.00932)	0.0141 (0.00891)
CPI Inflation Rate	6.15e-06 (7.89e-06)	7.40e-06 (7.56e-06)	7.42e-06 (7.97e-06)	9.21e-06 (7.79e-06)	6.19e-06 (7.89e-06)	9.05e-06 (7.57e-06)
Population	1.10e-10** (0.000)	9.73e-11** (0.000)	9.36e-11** (0.000)	1.19e-10*** (0.000)	1.11e-10** (0.000)	1.01e-10** (0.000)
Total Immigrants	-1.49e-08*** (1.97e-09)	-1.55e-08*** (1.95e-09)	-1.43e-08*** (1.99e-09)	-1.62e-08*** (1.99e-09)	-1.48e-08*** (1.97e-09)	-1.57e-08*** (1.94e-09)
Average Years Educ.	0.0236*** (0.00437)	0.0264*** (0.00417)	0.0249*** (0.00440)	0.0273*** (0.00429)	0.0235*** (0.00436)	0.0262*** (0.00416)
Polity Index	-0.00124 (0.00131)	-0.00151 (0.00126)	-0.00131 (0.00133)	-0.00164 (0.00129)	-0.00129 (0.00131)	-0.00152 (0.00126)
President ^c	-0.0919*** (0.0327)	-0.121*** (0.0316)	-0.0928*** (0.0331)	-0.115*** (0.0323)	-0.0895*** (0.0327)	-0.124*** (0.0315)
Premier ^c	-0.130*** (0.0376)	-0.156*** (0.0364)	-0.125*** (0.0381)	-0.151*** (0.0372)	-0.126*** (0.0376)	-0.159*** (0.0362)
Military Executive ^c	-0.0974** (0.0415)	-0.123*** (0.0399)	-0.0957** (0.0420)	-0.118*** (0.0408)	-0.0952** (0.0415)	-0.125*** (0.0397)
"Other" Executive ^c	-0.0718 (0.0473)	-0.112** (0.0451)	-0.0764 (0.0479)	-0.0943** (0.0461)	-0.0666 (0.0475)	-0.115** (0.0450)
Assembly-Elected Pres. ^d	0.0813*** (0.0207)	0.0956*** (0.0199)	0.0784*** (0.0212)	0.0807*** (0.0202)	0.0767*** (0.0210)	0.0964*** (0.0199)
Parliamentary ^d	0.0743*** (0.0228)	0.0855*** (0.0221)	0.0670*** (0.0231)	0.0750*** (0.0225)	0.0721*** (0.0229)	0.0862*** (0.0220)
Adjusted R ²	0.477	0.517	0.466	0.494	0.476	0.520
F Statistic	15.80	18.32	15.08	16.69	14.69	17.25
Anderson Statistic ^e	415.8	415.8	415.8	415.9	415.8	415.9
Sargan Statistic ^e	1.702	0.386	1.363	1.548	1.623	0.251

a. Standard errors in parentheses; ***p<0.01, **p<0.05, *p<0.1; constant and region and year dummies not reported.

b. Excluded instruments: logs of energy consumption per capita and agricultural value added as a percentage of GDP.

c. The base category for the type of effective executive is "Monarch".

d. The base category for the type of system is "Presidential".

e. The Anderson canonical correlation test confirms that the first stage equation is identified; the Sargan statistic does not find evidence that the first stage is over-identified.