



Human Costs of Migration

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I. Introduction

The term, “human costs,” is often used to refer to those migrants who do not safely reach the destination country and are recorded as missing or dead on publicly available databases.¹ In 2013, more than 360 migrants drowned off the coast of Lampedusa, and in response to that, the European Council strengthened its “border security co-ordination system, Frontex”² to prevent any more tragedies. And since then, more than 14,500 migrants have lost their lives travelling through the Central Mediterranean.³

This is considered the most dangerous migration route in the world: 1 in 36 migrants are reported missing or dead in 2017.⁴ These numbers have been increasing more than before as more countries are experiencing civil wars, such as Syria, Iraq and others. Understanding the causes of this phenomenon is the first step countries should take to devise possible new measures that prevent the human costs of migration.

In this paper, I will investigate the factors that contribute to the human costs of migration. Are migrants losing their lives because of stricter policies? Intensified border control leading to human costs is a relevant issue that should be considered in policy-making decisions and debates regarding migration policy, because according to previous studies, combating irregular migration with stricter policies does not result in lower border deaths.⁵ If policy is not strongly related to migrant deaths, what other explanations are there? Analyzing the determinants of migrant deaths can help with encouraging destination countries to adopt new policies that reduce the human costs of migration. This paper also advocates for more improvements on how data on border deaths is collected and contributes to the small existing group of studies looking at border deaths besides those near the United States and Mexico border.

II. Related Literature

Several studies on the human costs of migration have focused on investigating its relationship with migration policy. Wayne Cornelius in “Death at the Border: Efficacy and Unintended Consequences of US Immigration Control Policy” finds that enforcement on the U.S.-Mexico border does not reduce migrant flows, but instead channels them to more hazardous areas.⁶ These migrants are willing to risk their lives in hopes of acquiring “economic improvement or family reunification” in the U.S.,⁷ and with more policy toughening, the risk is greater. Cornelius mentions that smugglers, also known as “coyotes,” tend to abandon migrants who slow down the group; however, the increase in migrant deaths may be due to coyotes taking greater risks when facing more border patrol enforcements. Coyotes continue to have strong financial incentives to bring migrants safe and sound to the U.S. since most of their pay is given at the time of arrival.⁸ However, with more border enforcement operations, coyotes find it hard to smuggle migrants to the U.S. safely.

Thomas Spijkerboer in “The human costs of border control” investigates the relationship between migration, increased border control and migrant deaths near the European Union (EU).⁹ He finds that as the EU’s border control policies become stricter, the following two events occur: migrants decide to use alternative migration routes that are potentially more dangerous, and the number of migrant deaths increases with no change in migrant flows. Spijkerboer points out that with increases in sea patrols, which occurred in the seas of Albania and Apulia during the 1990s, migrants departed in boats during harsh weather conditions and without the brightly-colored lifejackets to prevent apprehension by border

guards. These risky decisions contributed to an increase in the number of accident deaths among migrants.

Spijkerboer also states that increased border controls do not cause deaths, but may be a contributing factor by forcing migrants to use riskier routes. These deaths differ from deaths that are directly tied to “measures, such as shooting at migrants who attempt to cross the border or placing landmines at the border.”¹⁰ Finding that migrant deaths are related to stricter border control measures, Spijkerboer encourages authorities to make extra efforts in safeguarding the lives of migrants at risk.

Although Timothy Hatton in “60 Million Refugees Refugees, Asylum Seekers, and Policy in OECD Countries” does not focus on the human costs of migration, his results still provide some insight on policy’s effect on migrants.¹¹ Hatton uses bilateral data from 48 origin countries to 19 OECD destination countries between 1997 and 2012. He investigates the determinants of asylum applications by looking at push and pull factors and provides strong results for showcasing the negative effect of tougher policy on asylum applications. Access and processing policies both give strong negative coefficients whereas the coefficient of welfare policy is positive and marginally significant.¹² A larger network increases asylum applications while greater distance decreases asylum applications, reflecting “the costs and risks of irregular migration.”¹³ These migrants respond slightly to the increase in their origin country’s GDP per capita, but strongly to the social and political conditions of their origin country.¹⁴

Therefore, Hatton argues that these migrants are not economic migrants¹⁵ because they are focused on trying to get away from danger as far as possible. In his final thoughts, Hatton advocates for policy changes by stating that “The results presented here suggest that such policies would need to be draconian, as illustrated by Australia in 2001 and 2013 (Hatton and Moloney 2015), in order to substantially reduce the numbers attempting the hazardous sea crossing. Such policies would reduce the incentive for illegal migration and help to prevent people from drowning at sea.”¹⁶

My paper relates to these studies by having a common interest variable: policy. These studies sought to investigate how policy affects migration, whether it be effects on asylum applications or migrant deaths. However, this paper will make new contributions to this area of study by providing empirical results on the human costs of migration and exploring both land and sea borders other than the U.S.-Mexico border.

III. Data

For the empirical analysis, I gather data on 187 country pairs – 17 origin countries and 11 destination countries - over the years 2000-2012.¹⁷ The data on missing and dead migrants from origin to destination for each year comes from two databases: The Migrants' Files,¹⁸ which provides information on migrant deaths surrounding European borders, and the Australian Border Deaths Database,¹⁹ which has recorded more than 1,997 border deaths near Australia since January 2000. The data on migrant deaths is collected by what information the news retrieves about large incidents near the borders. Since the news does not report small incidents, many deaths are not reflected in the database of The Migrants' Files. Therefore, the database requires more attention and improvements on how migrant deaths are recorded

and what information is retrieved. Note that not all possible country borders are represented in this study because there are no databases for them, or they simply do not experience any border deaths; therefore, Australia and ten European countries represent the destination countries that are experiencing these events. This is the main limitation of the data used for this research paper; however, there is still enough data to analyze for empirical research. The data on non-dead and non-missing migrants from origin to destination for each year was taken from The UN Refugee Agency (UNHCR)'s

Statistics Database.²⁰ This database captures different types of migrants: refugees, asylum seekers, returned refugees, internally displaced persons (IDPs), returned IDPs, stateless persons and others of concern. I combine these different types of migrants into one group named UNHCR migrants.

Most of the explanatory variables come from the dataset used by Timothy Hatton in his journal article, “60 Million Refugees Refugees, Asylum Seekers, and Policy in OECD Countries.”²¹ I use his dataset for this empirical study to see if the variables may also offer explanation on what impacts human costs, and most importantly, because this research paper is interested in looking at the variable, policy.²²

Hatton’s dataset covers the social and political conditions of origin countries broken down into political terror, civil liberties, political rights and civil war battle deaths; a policy index for destination countries broken down into access policy, processing policy and welfare policy; economic factors, such as GDP per capita for both origin and destination countries, the unemployment rates at destination countries and network; applications; and distance.

The social and political conditions of the origin countries for each year are measured by the Political Terror Scale,²³ Freedom House indices of civil liberties and political rights²⁴ and the Uppsala Conflict Data Program’s index of civil war combat deaths.²⁵ The political terror scale is measured from 1 to 5, where higher values mean more terror, and civil liberties and political rights are measured on a scale of 1 to 7, where higher values mean less freedom.²⁶ The total policy index for destination countries is divided into three policy indices: access policy, which are policies that limit access to territory, processing policy, which are policies concerning the application process for asylum seekers, and welfare policy.²⁷

The policy indices were created from the annual country reports of three sources: the OECD’s *International Migration Outlook*, the European Council on Refugees and Exiles and the United States Committee for Refugees and Immigrants.²⁸ Each component of the total policy index “starts at zero in the first quarter of 1997 and increases by 1 for a significant toughening of policy and decreases by 1 for a significant loosening.”²⁹ In my dataset, the policy indices start at zero in the year 2000, and increase by one for policy toughening and decrease by one for policy loosening.

The data on log of GDP per capita for destination countries for each year was gathered from the OECD.Stat³⁰ and for origin countries for each year, from the Penn World Tables³¹ and the International Monetary Fund³² for the years 2011 and 2012. For the unemployment rates at the destination countries for each year, the data was found in the OECD.Stat³³ database, and for log of network of migrants from

origin to destination, using 2000 as the base year and capturing adults aged 25 and over, from the website of Frederic Docquier.³⁴ The data on log of applications from origin to destination for each year was collected from the UNHCR’s Statistics Database,³⁵ and log of distance between origin and destination country capital cities from the website of Kristian Skrede Gleditsch.³⁶ The unemployment rates at the origin countries for each year, which were not found in Hatton’s dataset, comes from The World Bank under indicators.³⁷

Information on the different routes heading to European destination countries was taken from the Frontex: European Border and Coast Guard Agency.³⁸ This agency lists all possible routes: Western African route, Western Mediterranean route, Central Mediterranean route, Apulia and Calabria route, Circular route from Albania to Greece, Western Balkan route, Eastern Mediterranean route and Eastern Borders route.³⁹ Because Greece is not among the destination countries in the dataset, the Eastern Mediterranean route and the Circular route from Albania to Greece are not studied in this paper. Furthermore, the Apulia and Calabria route is included as part of the Central Mediterranean route, and the Western African route as part of the Western Mediterranean route.

IV. Descriptive Statistics

The summary statistics of all the variables in the dataset are illustrated in Table 2. The total migrant population is summed as the missing and dead migrants plus the UNHCR migrants. The share of migrant death represents missing and dead migrants out of the population in percent. Hatton's variable on the number of battle deaths from civil wars was converted into thousands.

Each country pair varies in how many of their migrants are recorded as missing or dead. Table 3 states total missing and dead migrants and total UNHCR migrants for each country pair. For example, Australia and Afghanistan have 938 migrants that are missing or dead (top number), and 84,995 UNHCR migrants (bottom number). Seventeen country pairs do not have the total number of UNHCR migrants recorded, and many of them have zero missing or dead migrants, indicating that perhaps they do not experience border deaths or there is a lack of an established database. From the grand totals, Italy has the highest number of border deaths at 31,419, and Germany has the highest number of UNHCR migrants going to its country at 3,028,196. Guinea has the highest number of its fleeing people missing or dying at 17,486, and Iraq has the highest number of people from the UNHCR migrant group at 1,473,407. Graph 1 shows all the origin countries and their total log of number of fleeing people that have been recorded as missing or dead by the databases mentioned earlier. Similar to the findings of the previous table, Guinea is indicated as the origin country with the highest number, which is colored with the darkest shade of blue on the map. Most migrants failing to make it to the destination countries come from origin countries located in the western part of Africa as well as Bangladesh.

As mentioned earlier, Spijkerboer's study finds a relationship between human costs, policy and the chosen migration route. I visualize the relationship between the total log of number of missing and dead migrants and the three policy indices for each route on Graph 2. For the Central Mediterranean route including the Apulia and Calabria route, loosened access policy decreases border deaths. However, the number tends to increase when processing policy toughens, and slightly when welfare policy slightly toughens. For the Eastern Borders route, both processing and welfare policies have no relationship with border deaths; however, when access policy toughens, there is a slight increase in border deaths. For the Western Balkan route, both stricter access and welfare policies slightly decrease migrant deaths while stricter processing policy decreases migrant deaths more. For the Western Mediterranean route including the Western African route, stricter access policy slightly decreases migrant deaths whereas loosened processing policy increases the number, and more loosened welfare policy slightly increases migrant deaths. This graph indicates that policy may be a strong contributing factor to the increasing number of migrant deaths, particularly for the routes going through the Central Mediterranean and the Western Mediterranean. The results of the Western Balkan route may suggest that the decrease in the number of migrant deaths can be due to migrants using other routes in response to stricter policies.

Graph 3 shows the unemployment rate at the origin country on the x-axis and the total migrant population on the y-axis. Most of the migrants come from origin countries that have higher than 5 percent unemployment rates. This may highlight the fact that these migrants are economic migrants. Graph 4 shows the log of GDP per capita of the destination country on the x-axis and the total migrant population on the y-axis. Most of the migrants are going to destination countries that have higher than 9.5 as their log of GDP per capita. Similar to the analysis of Graph 3, migrants are attracted to the economic conditions of the destination countries, indicating that they are economic migrants.

V. Empirical Model

I run three ordinary least squares regressions for this empirical study. The first equation looks at log of total migrant population as the dependent variable and, among the explanatory variables, political terror, civil liberties, political rights, civil war battle deaths, access policy, processing policy, welfare policy,

unemployment rates at both origin and destination countries, as well as log of GDP per capita, log of network and log of distance. The second equation looks at the log of missing and dead as the dependent variable, using the same explanatory variables with an additional one, log of total migrant population. The third looks at log of share of migrant death, using the same explanatory variables as the first equation. In all equations, origin country (Ocode), destination country (Dcode) and time (Year) fixed effects are added to control for unobservable factors.

The basic empirical specifications thus look as follows:

$$\begin{aligned} \text{LogTotalMigrantPopulation}_{ijt} = & \beta_0 + \beta_1 \cdot \text{PoliticalTerror}_{it} + \beta_2 \cdot \text{CivilLiberties}_{it} + \beta_3 \cdot \text{PoliticalRights}_{it} + \\ & \beta_4 \cdot \text{CivilWarBattleDeaths}_{it} + \beta_5 \cdot \text{AccessPolicy}_{jt} + \beta_6 \cdot \text{ProcessingPolicy}_{jt} + \beta_7 \cdot \text{WelfarePolicy}_{jt} + \\ & \beta_8 \cdot \text{OriginUnemp}_{it} + \beta_9 \cdot \text{DestUnemp}_{jt} + \beta_{10} \cdot \text{LogOriginGDP}_{it} + \beta_{11} \cdot \text{LogDestGDP}_{jt} + \beta_{12} \cdot \text{LogNetwork}_{ij} \\ & + \beta_{13} \cdot \text{LogDistance}_{ij} + \beta_{14} \cdot \text{Ocode}_i + \beta_{15} \cdot \text{Dcode}_j + \beta_{16} \cdot \text{Year}_t \end{aligned}$$

$$\begin{aligned} \text{LogMissingandDead}_{ijt} = & \beta_0 + \beta_1 \cdot \text{PoliticalTerror}_{it} + \beta_2 \cdot \text{CivilLiberties}_{it} + \beta_3 \cdot \text{PoliticalRights}_{it} + \\ & \beta_4 \cdot \text{CivilWarBattleDeaths}_{it} + \beta_5 \cdot \text{AccessPolicy}_{jt} + \beta_6 \cdot \text{ProcessingPolicy}_{jt} + \beta_7 \cdot \text{WelfarePolicy}_{jt} + \\ & \beta_8 \cdot \text{OriginUnemp}_{it} + \beta_9 \cdot \text{DestUnemp}_{jt} + \beta_{10} \cdot \text{LogOriginGDP}_{it} + \beta_{11} \cdot \text{LogDestGDP}_{jt} + \beta_{12} \cdot \text{LogNetwork}_{ij} \\ & + \beta_{13} \cdot \text{LogDistance}_{ij} + \beta_{14} \cdot \text{LogTotalMigrantPopulation}_{ijt} + \beta_{15} \cdot \text{Ocode}_i + \beta_{16} \cdot \text{Dcode}_j + \beta_{17} \cdot \text{Year}_t \end{aligned}$$

$$\begin{aligned} \text{LogShareofMigrantDeath}_{ijt} = & \beta_0 + \beta_1 \cdot \text{PoliticalTerror}_{it} + \beta_2 \cdot \text{CivilLiberties}_{it} + \beta_3 \cdot \text{PoliticalRights}_{it} + \\ & \beta_4 \cdot \text{CivilWarBattleDeaths}_{it} + \beta_5 \cdot \text{AccessPolicy}_{jt} + \beta_6 \cdot \text{ProcessingPolicy}_{jt} + \beta_7 \cdot \text{WelfarePolicy}_{jt} + \\ & \beta_8 \cdot \text{OriginUnemp}_{it} + \beta_9 \cdot \text{DestUnemp}_{jt} + \beta_{10} \cdot \text{LogOriginGDP}_{it} + \beta_{11} \cdot \text{LogDestGDP}_{jt} + \beta_{12} \cdot \text{LogNetwork}_{ij} \\ & + \beta_{13} \cdot \text{LogDistance}_{ij} + \beta_{14} \cdot \text{Ocode}_i + \beta_{15} \cdot \text{Dcode}_j + \beta_{16} \cdot \text{Year}_t \end{aligned}$$

where i is the origin country, j is the destination country and t is the time.

The first empirical specification serves to provide a general view on the effects of the explanatory variables on migration, not accounting for human costs. The social and political conditions of the origin country might increase the migrant population. The intensity of these conditions can force people to leave in hopes of attaining safety somewhere else.⁴⁰ On the other hand, migration policy of the destination country can hinder migrant flows as fewer and fewer migrants get their applications approved or have access to the borders.⁴¹ Economic conditions of the origin country that are unfavorable may drive people out to seek better economic opportunities at the destination countries, where the economy is thriving and perhaps, a large network of migrants exists. Network is an economic advantage because migrants can receive job referrals and guidance from older generations of migrants.⁴² Distance is a migration cost; lower migration costs would experience more migration patterns compared to higher migration costs.⁴³

There are four groups of explanatory variables that may contribute to the human costs of migration. The first variables – political terror, civil liberties, political rights and civil war battle deaths – are used to see if the urgency of leaving the origin country due to the social and political conditions is what causes there to be migrant deaths. Migrants leaving in a hurry to escape the hardship in their home countries may experience pressure to make decisions abruptly without considering risks that they may face as a migrant, resulting in high human costs. The second set of variables – access policy, processing policy and welfare policy – are used to investigate if the behavior of destination countries is what leads to more migrant deaths. Migrants that face stricter policies or fail to gain refugee status may take on more risk as they try to cross borders by hiring smugglers or using dangerous routes to avoid interceptions.⁴⁴

The third variables – unemployment rate, GDP per capita and network – are used to study whether missing or dead migrants are economic migrants and if so, to what extent the economic conditions of origin and destination countries matter. Finally, distance is used to measure the accessibility of the destination country, and to investigate if the length of travel is related to migrant deaths. Migrants who do not have enough resources to safely get to the destination country may face obstacles that endanger their lives, especially if the journey is physically intense.

VI. Empirical Results

Table 4 presents fixed effects regressions, showing all three dependent variables. In the first column, seven independent variables are statistically significant. The civil liberties coefficient is strongly positive, meaning that a one-point increase in civil liberties leads to a 17.8 percent increase in total migrant population. Processing policy gives a positive coefficient while welfare policy gives a negative coefficient. A one-point increase in processing policy, which indicates that the policy has toughened, increases total migrant population by 24.2 percent, and a one-point increase in welfare policy decreases total migrant population by 26.5 percent. In terms of the economic factors, the unemployment rate at the destination country gives a strong negative coefficient. A one percentage point increase in unemployment rate decreases total migrant population by 3.1 percent. Log of GDP per capita of the origin country is marginally significant and has a negative coefficient. A ten percent increase in GDP per capita decreases total migrant population by 6.9 percent. Log of network gives a positive coefficient, meaning that a ten percent increase in network increases total migrant population by 2.68 percent. Finally, the coefficient on log of distance is negative and marginally significant. A ten percent increase in distance decreases total migrant population by 9.93 percent.

In the second column, five explanatory variables are statistically significant. Processing policy gives a negative coefficient whereas welfare policy is positive. A one-point increase in processing policy decreases migrant deaths by 12.5 percent, and a one-point increase in welfare policy increases migrant deaths by 10.7 percent. Log of network gives a strong positive coefficient, meaning that a ten percent increase in network increases migrant deaths by 0.31 percent. Log of distance has a negative coefficient and is marginally significant. A ten percent increase in distance decreases migrant deaths by 2.99 percent. Finally, log of total migrant population gives a positive coefficient, meaning that a ten percent increase in total migrant population increases human costs by 3.03 percent. In the third column, only four independent variables are statistically significant. Processing policy has a strong negative coefficient whereas welfare policy gives a strong positive coefficient. A one-point increase in processing policy decreases share of migrant death by 5.3 percent, and a one-point increase in welfare policy increases share of migrant death by 5.3 percent. Log of network gives a positive and marginally significant coefficient, meaning that a ten percent increase in network increases share of migrant death by 0.98 percent. Log of distance is negative and marginally significant. A ten percent increase in distance leads to a 3.1 percent decrease in share of migrant death.

There is clear indication that the social and political conditions of the origin country do not significantly contribute to the human costs of migration; however, all regressions show that the policy decisions of the destination country matter. Stricter processing policy may prevent migrant deaths by perhaps accommodating more migrants for application processing or reducing migrant flows, leading to lower human costs. However, stricter welfare policy increases human costs, perhaps because migrants are still determined to migrate even when facing larger obstacles. Looking at the economic variables, the coefficient of network suggests that these dead and missing migrants are economic migrants, and willing to risk their lives for economic opportunities. However, distance is clearly a more important variable than network. This may be because migrants who must travel farther away from their origin country are less inclined to take risks. Finally, as the population increases, human costs increase as well, which is appropriate to have assumed before running the regression.

When comparing the results of the human costs regressions to Hatton’s results, the effects of both processing and welfare policies, network and distance show similar patterns. Political rights, civil war battle deaths and GDP per capita of the destination country are insignificant in both studies. However, the following explanatory variables – political terror, civil liberties, access policy, unemployment rates at both origin and destination countries and GDP per capita of the origin country – are insignificant in this study whereas they are significant in Hatton’s study.

The second regression may have some bias due to endogeneity in that migrant flows, known as the log of total migrant population, can be correlated with the other explanatory variables. For example, stricter processing policy reduces human costs; however, this may be due to migrant flows decreasing when facing tougher processing policy. This adds complications in figuring out if tougher processing policy is directly reducing migrant deaths, or only the migrant flows that lead to lower migrant deaths. In trying to see if these results change, a third regression is run, which looks at the log of share of migrant death. The results resemble the results of the second regression; therefore, endogeneity does not play a role in the empirical model.

VII. Additional Results

Table 5 serves to test the previous findings of Graph 2, and study whether there is a heterogeneous effect of policy on different routes. For example, access policy in Table 4 was insignificant and close to zero. An explanation for this is that the effect of access policy may vary across routes.

The estimating equation looks at log of missing and dead as the dependent variable and, among the explanatory variables, political terror, civil liberties, political rights, civil war battle deaths, access policy, processing policy, welfare policy, unemployment rates at both origin and destination countries, as well as log of GDP per capita, log of network and log of total migrant population. I run one regression for each route: Central Mediterranean, Eastern Borders, Western Balkan and Western Mediterranean. The estimating equation is the following:

$$\begin{aligned} \text{LogMissingandDead}_{ijt} = & \beta_0 + \beta_1 \cdot \text{PoliticalTerror}_{it} + \beta_2 \cdot \text{CivilLiberties}_{it} + \beta_3 \cdot \text{PoliticalRights}_{it} \\ & + \beta_4 \cdot \text{CivilWarBattleDeaths}_{it} + \beta_5 \cdot \text{AccessPolicy}_{jt} + \beta_6 \cdot \text{ProcessingPolicy}_{jt} + \beta_7 \cdot \text{WelfarePolicy}_{jt} \\ & + \beta_8 \cdot \text{OriginUnemp}_{it} + \beta_9 \cdot \text{DestUnemp}_{jt} + \beta_{10} \cdot \text{LogOriginGDP}_{it} + \beta_{11} \cdot \text{LogDestGDP}_{jt} + \beta_{12} \cdot \text{LogNetwork}_{ij} \\ & + \beta_{13} \cdot \text{LogTotalMigrantPopulation}_{ijt} \end{aligned}$$

where i is the origin country, j is the destination country and t is the time.

All four routes have statistically significant variables. For the Central Mediterranean route, access policy has a strong negative coefficient. A one-point increase in access policy leads to a 164.1 percent decrease in human costs. The unemployment rate at the destination country has a negative coefficient and is marginally significant. As unemployment rate increases by one percentage point, human costs decrease by 26.2 percent. Log of total migrant population gives a strong positive coefficient, meaning that a ten percent increase in total migrant population increases human costs by 13.94 percent. For the Eastern Borders route, civil liberties give a strong negative coefficient whereas political rights give a strong positive coefficient. A one-point increase in civil liberties decreases human costs by 58.6 percent, and a one-point increase in political rights increases human costs by 64.1 percent. The unemployment rate at the origin country has a strong positive coefficient, meaning that a one percentage point increase in unemployment rate increases human costs by 18.1 percent.

For the Western Balkan route, civil liberties give a strong positive coefficient, and processing policy gives a strong negative coefficient, meaning that a one-point increase in civil liberties increases migrant deaths by 41.2 percent, and a one-point increase in processing policy decreases migrant deaths by

65.6 percent. Welfare policy gives a positive coefficient and is marginally significant. As welfare policy toughens by one-point, migrant deaths increase by 35.4 percent. The unemployment rate at the destination country has a strong negative coefficient. A one percentage point increase in unemployment rate decreases migrant deaths by 19.7 percent. For the Western Mediterranean route, the coefficient on the unemployment rate at the origin country is negative and marginally significant. A one percentage point increase in unemployment rate decreases migrant deaths by 556.9 percent. The coefficient on log of network is negative and marginally significant as well. A ten percent increase in network decreases migrant deaths by 40.45 percent. Finally, log of total migrant population gives a strong positive coefficient, meaning that a ten percent increase in total migrant population increases migrant deaths by 8.81 percent.

When comparing to Graph 2, the Central Mediterranean route has similar results in terms of policy's effect. However, for the Western Balkan route, the regression shows that stricter welfare policy increases human costs while the graph shows the opposite. These results suggest that policy may be a strong contributing factor to the number of border deaths, particularly for the routes going through the Central Mediterranean and the Western Balkan. In regards to the heterogeneous effect, the results of Table 5 show that policies have opposite effects on certain routes.

VIII. Conclusion

These findings help to illuminate the contributing factors to the human costs of migration and add value to what the small existing group of studies have found regarding this topic. Learning more in depth about this topic is important, especially among the destination countries where most border deaths occur. This paper strongly emphasizes the relevance of human costs to current debates about migration policies. Human costs are strongly affected by policies enforced by host countries, and it is important to consider which parts of the policies are helping to reduce migrant deaths and those which do not. Border control policies should fight against the smuggling of migrants in boats that are not capable of safely transporting men, women and children, and the asylum application process should be more accommodating to those who desperately need to find refuge. Essentially, destination countries should be held accountable for the increasing number of human costs surrounding their borders.

Additionally, this paper brings more awareness to an ongoing issue of recording and identifying the missing and dead migrants. As Spijkerboer argues, "In order to support a debate on border control in which human costs play a role, it is crucial that more, and more reliable information becomes available."⁴⁵

With greater advancement on how information on border deaths is collected, future research can receive better representative results, and pinpoint more accurately which explanatory variables are significantly affecting the human costs of migration. Doing more research on this topic is the first step toward saving migrant lives at risk.

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X. Appendix

Table 1: List of countries and their numerical codes

Destination Country	Dcode	Origin Country	Ocode
Australia	1	Afghanistan	1
Austria	2	Bangladesh	7
Czech Rep.	5	China	10
Denmark	6	Cote d'Ivoire	13
Germany	8	Fiji	19
Hungary	9	Guinea	22
Italy	11	Indonesia	25
Norway	13	Iran (Islamic Rep. of)	26
Poland	14	Iraq	27
Spain	15	Malaysia	30
Sweden	16	Nigeria	37
		Pakistan	38
		Russian Federation	40
		Sri Lanka	43
		Syrian Arab Rep.	45
		Ukraine	47
		Viet Nam	48

Table 2: Summary statistics

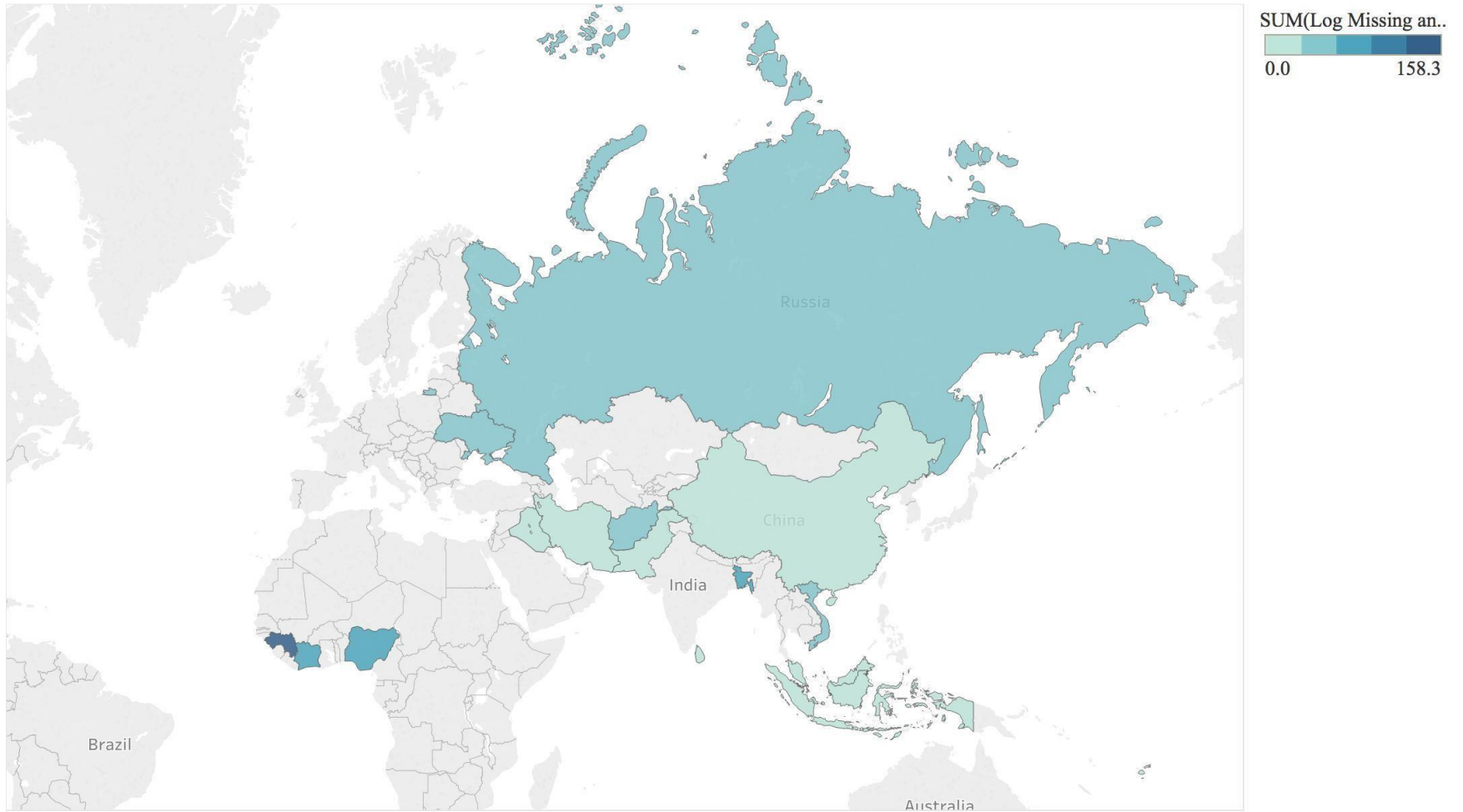
Variable	Obs	Mean	Std. Dev.	Min	Max
Year	2,431	2006	3.742427	2000	2012
DestinationCountry	0				
Dcode	2,431	9.090909	4.945335	1	16
OriginCountry	0				
Ocode	2,431	28.11765	14.25645	1	48
Route	0				
Rcode	2,431	1198.043	708.8569	1	2406
UNHCRMigrants	2,136	2412.167	7778.418	1	76884
MissingandDead	2,431	19.58906	169.8147	0	3787
LogMissingandDead	2,431	0.278804	1.091225	0	8.239594
TotalMigrantPopulation	2,431	2139.041	7331.823	0	76884
LogTotalMigrantPopulation	2,431	4.523678	2.806632	0	11.25007
ShareofMigrantDeath	2,138	2.736028	14.3648	0	100
LogShareofMigrantDeath	2,138	0.2097004	0.8291178	0	4.61512
PoliticalTerror	2,354	3.602804	0.8735674	1.5	5
CivilLiberties	2,354	4.897196	1.139471	2	7
PoliticalRights	2,354	5.317757	1.385113	2	7
BattleDeathsBest	2,354	656.3645	1794.619	0	15055
CivilWarBattleDeaths	2,354	0.6563645	1.794619	0	15.055
OriginUnemp	2,431	7.603389	3.892408	0.492	28.1
LogOriginGDP	2,354	8.015251	0.8575841	6.00751	9.70269
DestUnemp	2,431	7.691608	4.037437	2.5	25.1
LogDestGDP	2,431	10.27809	0.3708943	9.266815	11.09873
LogApplications	1,757	4.985646	1.735731	0.6931472	9.828764
LogNetwork	1,787	6.773606	3.503521	0	12.63953
LogDistance	1,787	1.528169	0.6317521	-0.3739665	2.724645
TotalPolicy	2,431	1.618881	2.677641	-4	8
AccessPolicy	2,431	0.6958042	0.7592156	-1	2.25
WelfarePolicy	2,431	0.3059441	1.397218	-2.75	4
ProcessingPolicy	2,431	0.6171329	1.363767	-3	3
TotalPolicy_H	2,431	2.346154	3.27965	-4	10
TotalPolicy_0	2,431	0.7272727	1.194239	-2	2
AccessPolicy_H	2,431	1.036713	0.8232191	-1	3
AccessPolicy_0	2,431	0.3409091	0.4166835	0	1
WelfarePolicy_H	2,431	0.6241259	1.87095	-3	6
WelfarePolicy_0	2,431	0.3181818	1.02319	-2.25	2
ProcessingPolicy_H	2,431	0.6853147	1.554052	-3	4
ProcessingPolicy_0	2,431	0.0681818	0.5446188	-1	1

Table 3: Total missing and dead and total UNHCR migrants for each country pair

Origin Country	Destination Country											Grand Total
	Australia	Austria	Czech Rep.	Denmark	Germany	Hungary	Italy	Norway	Poland	Spain	Sweden	
Afghanistan	938	22	0	0	0	22	0	0	0	0	0	982
	84,995	77,337	3,636	70,720	452,285	24,672	22,578	59,718	1,427	1,231	64,984	863,583
Bangladesh	0	0	0	0	0	0	10,473	0	0	0	0	10,473
	4,161	2,683	30	312	9,869	674	4,447	645	96	157	5,838	28,912
China	2	0	0	0	0	0	0	0	0	0	0	2
	24,482	6,844	929	1,661	56,935	913	422	3,906	176	217	3,525	100,010
Cote d'Ivoire	0	0	0	0	0	0	0	0	0	7,013	0	7,013
	445	503	132	65	7,348	130	19,678	408	22	2,084	900	31,715
Fiji	1	0	0	0	0	0	0	0	0	0	0	1
	2,842				26			8			3	2,879
Guinea	0	0	0	0	0	0	10,473	0	0	7,013	0	17,486
	678	1,095	130	92	10,396	81	2,989	476	48	473	794	17,252
Indonesia	500	0	0	0	0	0	0	0	0	0	0	500
	13,229	39	6	906	1,951			932			127	17,190
Iran (Islamic Rep. of)	54	0	0	0	0	0	0	0	0	0	0	54
	31,590	28,251	527	21,159	330,509	1,823	8,433	36,926	202	1,310	67,831	528,561
Iraq	10	22	0	0	0	22	0	0	0	0	0	54
	110,367	28,564	2,072	116,263	668,192	13,357	20,014	108,933	1,182	3,603	400,860	1,473,407
Malaysia	1	0	0	0	0	0	0	0	0	0	0	1
	1,215			10	670			45			124	2,064
Nigeria	0	0	0	0	0	0	10,473	0	0	0	0	10,473
	1,325	14,217	697	318	34,325	1,344	15,655	2,265	215	1,046	3,343	74,750
Pakistan	38	22	0	0	0	22	0	0	0	0	0	82
	11,375	5,236	365	887	94,929	798	9,848	3,647	467	804	3,410	131,766
Russian Federation	1	0	27	27	27	0	0	27	27	0	27	163
	3,123	150,180	9,011	7,448	459,977	1,428	2,927	38,398	118,591	5,142	27,422	823,647
Sri Lanka	9	0	0	0	0	0	0	0	0	0	0	9
	26,539	571	338	5,765	134,474	161	7,803	12,623	854	324	1,614	191,066
Syrian Arab Rep.	1	0	0	0	0	0	0	0	0	0	0	1
	1,555	7,795	520	7,191	154,589	581	2,105	3,638	268	655	29,614	208,511
Ukraine	0	0	27	27	27	0	0	27	27	0	27	162
	1,150	4,724	9,722	721	362,335	515	578	822	325	655	4,266	385,813
Viet Nam	3	0	27	27	27	0	0	27	27	0	27	165
	5,021	1,605	3,577	3,486	249,386	1,191	139	1,813	191	269	4,584	271,262
Grand Total	1,558	66	81	81	81	66	31,419	81	81	14,026	81	47,621
	324,092	329,644	31,692	237,004	3,028,196	47,668	117,616	275,203	124,064	17,970	619,239	5,152,388

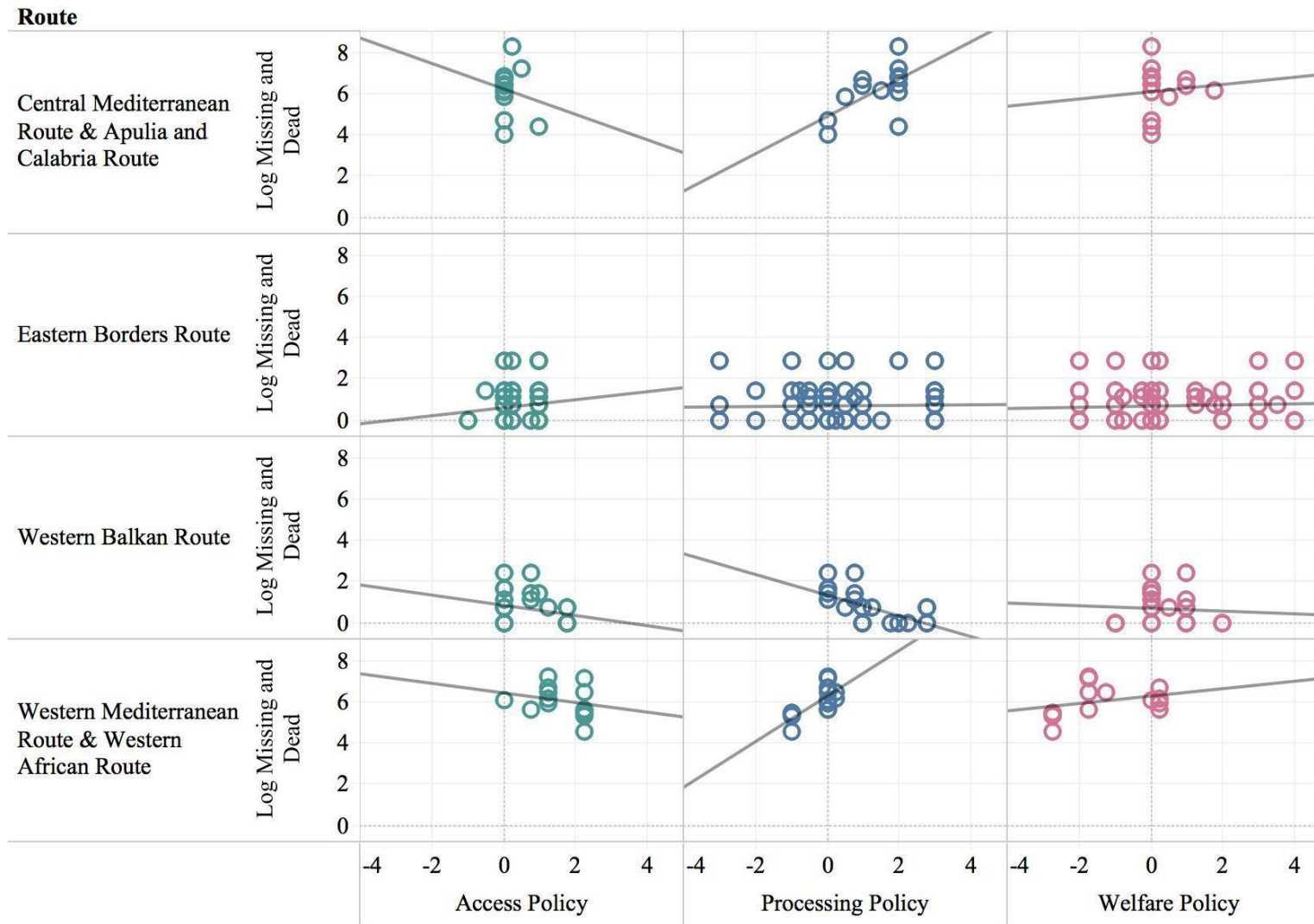
Source: From author's calculations.

Graph 1: Map of origin countries and total number of fleeing people recorded as missing or dead



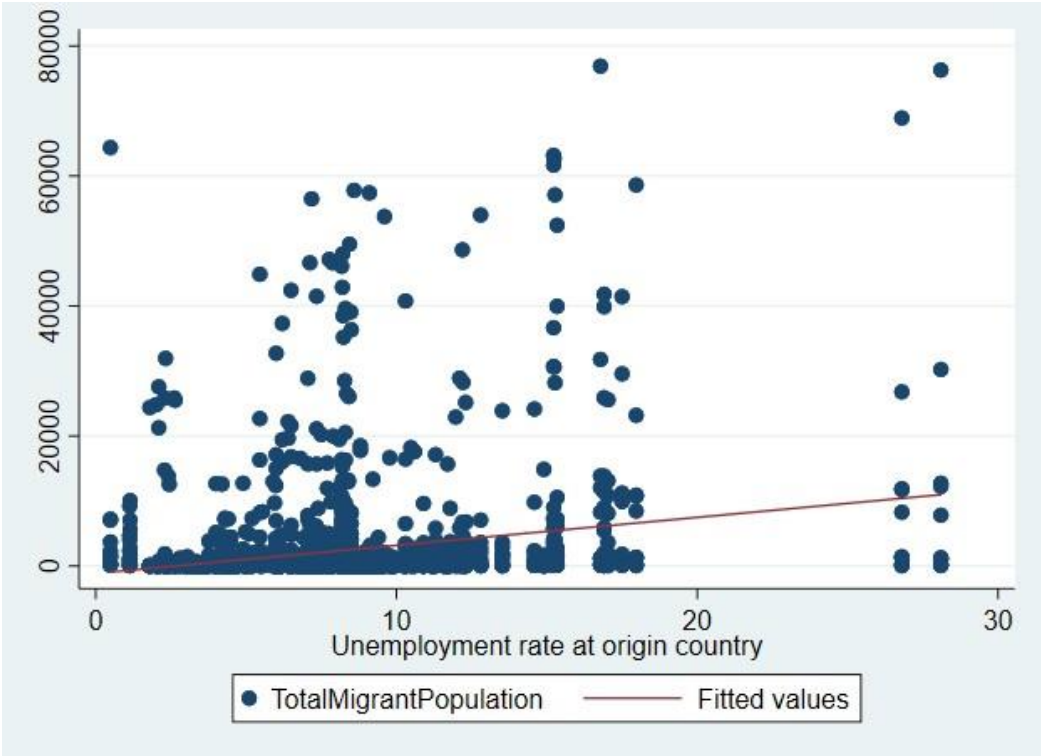
Source: From author's calculations.

Graph 2: Relationship between human costs and policy for each route



Source: From author's calculations.

Graph 3: Total migrant population and unemployment rate at origin country



Graph 4: Total migrant population and log GDP per capita at destination country

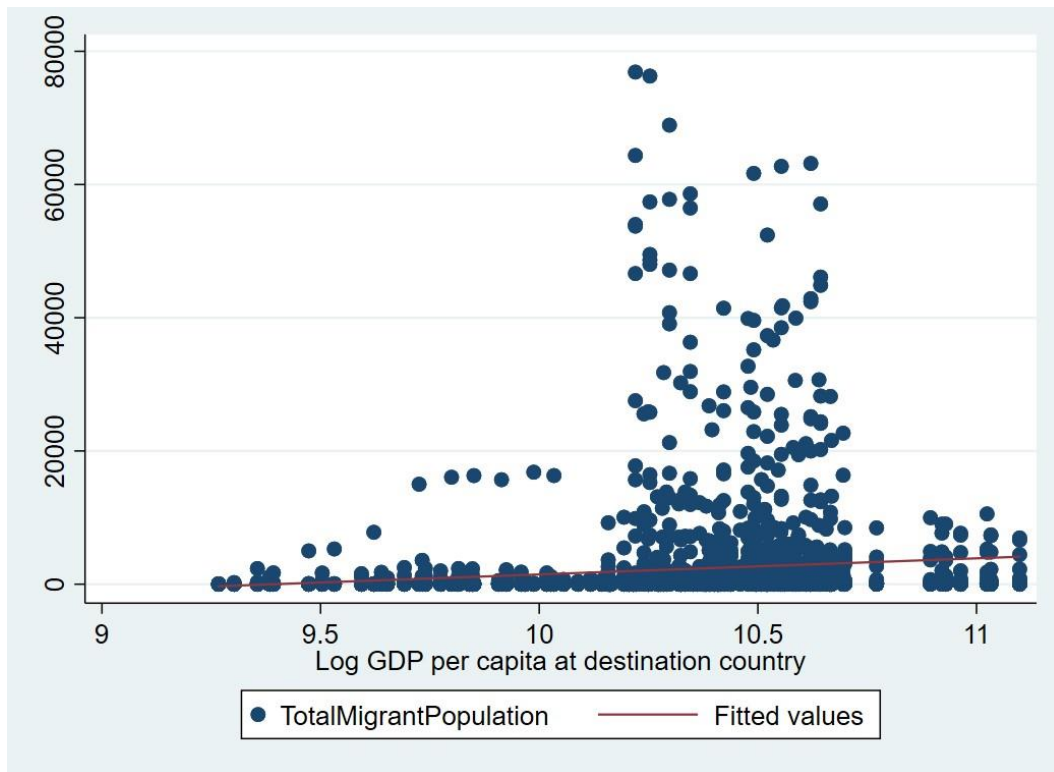


Table 4: Regressions with fixed effects

	(LogTotalMigrantPopulation)	(LogMissingandDead)	(LogShareofMigrantDeath)
PoliticalTerror	0.008 (0.080)	-0.052 (0.066)	-0.033 (0.050)
CivilLiberties	0.178 (0.082)**	-0.065 (0.068)	-0.047 (0.052)
PoliticalRights	-0.011 (0.056)	0.087 (0.046)*	0.043 (0.035)
CivilWarBattleDeaths	0.014 (0.020)	-0.004 (0.017)	0.006 (0.013)
AccessPolicy	0.063 (0.084)	-0.054 (0.069)	-0.009 (0.053)
ProcessingPolicy	0.242 (0.041)***	-0.125 (0.035)***	-0.053 (0.026)**
WelfarePolicy	-0.265 (0.041)***	0.107 (0.034)***	0.053 (0.026)**
OriginUnemp	0.025 (0.018)	-0.012 (0.015)	-0.001 (0.011)
DestUnemp	-0.031 (0.015)**	-0.020 (0.012)*	-0.007 (0.009)
LogOriginGDP	-0.690 (0.265)***	0.196 (0.219)	0.085 (0.167)
LogDestGDP	-1.133 (0.705)	-0.767 (0.582)	-0.553 (0.446)
LogNetwork	0.268 (0.016)***	0.031 (0.014)**	0.098 (0.010)***
LogDistance	-0.993 (0.112)***	-0.299 (0.095)***	-0.310 (0.070)***
LogTotalMigrant Population		0.303 (0.020)***	
R^2	0.72	0.39	0.33
N	1,787	1,787	1,769

Notes: Table 4 presents regressions with origin country (Ocode), destination country (Dcode) and time (Year) fixed effects. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 5: Relationship between human costs and explanatory variables for each route

	(Central Mediterranean)	(Eastern Borders)	(Western Balkan)	(Western Mediterranean)
PoliticalTerror	0.195 (0.195)	-0.079 (0.257)	-0.108 (0.141)	0.140 (0.122)
CivilLiberties	-0.184 (0.321)	-0.586 (0.163)***	0.412 (0.130)***	-0.145 (0.172)
PoliticalRights	-0.245 (0.194)	0.641 (0.158)***	-0.139 (0.100)	-0.180 (0.138)
CivilWarBattleDeaths	-0.256 (0.620)	0.101 (0.142)	0.034 (0.036)	0.099 (0.538)
AccessPolicy	-1.641 (0.322)***	0.219 (0.152)	0.186 (0.192)	-0.458 (0.368)
ProcessingPolicy	-0.608 (0.407)	-0.030 (0.067)	-0.656 (0.185)***	0.534 (0.465)
WelfarePolicy	-0.023 (0.221)	0.040 (0.061)	0.354 (0.152)**	0.241 (0.245)
OriginUnemp	0.047 (0.114)	0.181 (0.048)***	-0.009 (0.022)	-5.569 (1.898)**
DestUnemp	-0.262 (0.109)**	0.038 (0.022)*	-0.197 (0.052)***	-0.002 (0.036)
LogOriginGDP	-1.425 (0.997)	-0.212 (0.222)	0.074 (0.192)	2.337 (2.538)
LogDestGDP	-1.874 (3.258)	-0.005 (0.257)	0.216 (0.328)	5.047 (2.866)
LogNetwork	-0.154 (0.228)	-0.048 (0.039)	0.010 (0.027)	-4.045 (1.483)**
LogTotalMigrant Population	1.394 (0.162)***	0.038 (0.034)	-0.060 (0.073)	0.881 (0.198)***
R^2	0.89	0.12	0.72	0.93
N	39	234	78	26

Notes: Table 5 presents a heterogeneous effect of policy on different routes without any fixed effects on Ocode, Dcode and Year. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

XI. Notes

¹ These terms all relate to human costs: migrant deaths, border deaths, missing and/or dead.

² “Counting the dead,” *The Migrants’ Files*, last modified March 31, 2014, <http://www.themigrantsfiles.com>.

³ “The Central Mediterranean route: Migrant Fatalities,” *Missing Migrants Project*, last modified August 2017, <https://missingmigrants.iom.int/central-mediterranean-route-migrant-fatalities-january-2014-july-2017>.

⁴ Ibid.

⁵ Thomas Spijkerboer, “The human costs of border control,” *European Journal of Migration and Law* 9, no. 1 (2007): 127.

⁶ Wayne A Cornelius, “Death at the Border: Efficacy and Unintended Consequences of US Immigration Control Policy,” *Population And Development Review* 27, no. 4 (December 2001): 661-685, http://www.jstor.org/stable/2695182?seq=1#page_scan_tab_contents.

⁷ Ibid., 680.

⁸ Ibid.

⁹ Thomas Spijkerboer, “The human costs of border control,” *European Journal of Migration and Law* 9, no. 1 (2007): 127.

¹⁰ Ibid., 137.

¹¹ Timothy J Hatton, “60 Million Refugees Refugees, Asylum Seekers, and Policy in OECD Countries,” *The American Economic Review* 106, no. 5 (2016): 441-445.

¹² Ibid.

¹³ Ibid., 444.

¹⁴ Ibid.

¹⁵ Migrants are leaving their origin countries to find better economic opportunities rather than because they are fleeing civil wars.

¹⁶ Timothy J Hatton, “60 Million Refugees Refugees, Asylum Seekers, and Policy in OECD Countries,” *The American Economic Review* 106, no. 5 (2016): 441-445, 444.

¹⁷ List of countries and their numerical codes can be found in the Appendix under Table 1.

¹⁸ “Counting the dead,” *The Migrants’ Files*, last modified March 31, 2014, <http://www.themigrantsfiles.com>.

¹⁹ "Australian Border Deaths Database," *The Border Crossing Observatory*, accessed November 21, 2017. <http://artsonline.monash.edu.au/thebordercrossingobservatory/publications/australian-border-deaths-database/>.

²⁰ "Population Statistics," *UNHCR: The UN Refugee Agency*, accessed November 21, 2017. http://popstats.unhcr.org/en/overview#_ga=2.23781754.1501886433.1511147157-908265576.1511147157.

²¹ Timothy J Hatton, "60 Million Refugees Refugees, Asylum Seekers, and Policy in OECD Countries," *The American Economic Review* 106, no. 5 (2016): 441-445.

²² This study does not include the years 1997-1999 because these years do not have any recorded migrant deaths for them since The Migrants' Files and the Australian Border Deaths Database began collecting their data in 2000.

²³ "Data," *The Political Terror Scale*, accessed November 21, 2017. <http://www.politicalterrorscale.org>.

²⁴ "About Freedom in the World: An annual study of political rights and civil liberties," *Freedom House*, accessed November 21, 2017. <https://freedomhouse.org/report-types/freedom-world#.UyXqYYVJtMI>.

²⁵ "UCDP Downloads," *The Uppsala Conflict Data Program*, accessed November 21, 2017. <http://ucdp.uu.se/#/exploratory>.

²⁶ Timothy J Hatton, "60 Million Refugees Refugees, Asylum Seekers, and Policy in OECD Countries," *The American Economic Review* 106, no. 5 (2016): 441-445.

²⁷ Ibid.

²⁸ Timothy J Hatton, "The rise and fall of asylum: What happened and why?," *The Economic Journal* 119, no. 535 (2009).

²⁹ Ibid., 33.

³⁰ "Welcome to OECD.Stat," *OECD.Stat*, accessed November 21, 2017. <http://stats.oecd.org>.

³¹ "PWT 7.1," *Groningen Growth and Development Centre*, last modified September 12, 2016, <https://www.rug.nl/ggdc/productivity/pwt/pwt-releases/pwt-7.1>.

³² "Indicators," *The World Bank*, accessed November 21, 2017. <https://data.worldbank.org/indicator>.

³³ "Welcome to OECD.Stat," *OECD.Stat*, accessed November 21, 2017. <http://stats.oecd.org>.

³⁴ "International migration data sets," *Welcome to Frederic Docquier's homepage*, last modified April 2013, <https://perso.uclouvain.be/frederic.docquier/oxlight.htm>.

³⁵ "Population Statistics," *UNHCR: The UN Refugee Agency*, accessed November 21, 2017. http://popstats.unhcr.org/en/overview#_ga=2.23781754.1501886433.1511147157-908265576.1511147157.

³⁶ “Distance Between Capital Cities,” *Kristian Skrede Gleditsch*, accessed November 21, 2017. <http://privatewww.essex.ac.uk/~ksg/data-5.html>.

³⁷ “Unemployment, total (% of total labor force) (modeled ILO estimate),” *The World Bank*, last modified March 2017, <https://data.worldbank.org/indicator/SL.UEM.TOTL.ZS?view=chart>.

³⁸ “Migratory Routes Map,” *Frontex: European Border and Coast Guard Agency*, last modified November 2017, <http://frontex.europa.eu/trends-and-routes/migratory-routes-map/>.

³⁹ Most country pairs do not have routes that fall under these classifications.

⁴⁰ Timothy J Hatton, “60 Million Refugees Refugees, Asylum Seekers, and Policy in OECD Countries,” *The American Economic Review* 106, no. 5 (2016): 441-445.

⁴¹ *Ibid.*

⁴² Kaivan Munshi, “Networks in the modern economy: Mexican migrants in the US labor market,” *The Quarterly Journal of Economics* 118, no. 2 (2003): 549-599.

⁴³ Timothy J Hatton, “60 Million Refugees Refugees, Asylum Seekers, and Policy in OECD Countries,” *The American Economic Review* 106, no. 5 (2016): 441-445.

⁴⁴ Thomas Spijkerboer, “The human costs of border control,” *European Journal of Migration and Law* 9, no. 1 (2007): 127, 139.

⁴⁵ *Ibid.*, 139.