Human Smuggling under Risk: Evidence from the Mediterranean*

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Abstract

Since 2007, the number of refugees fleeing conflict and violence has doubled to about 25 million. Although mass migration has destabilized the European Union, lead to broad changes in national immigration policies, and triggered the resurgence of far right, xenophobic political parties, human smuggling has attracted little attention in political science. We address this gap by theorizing key features of the political economy of smuggling. We emphasize the importance of reputational dynamics within smuggling networks which create long-term economic incentives to avoid risks, particularly in the Mediterranean sea. We leverage granular data on migrant flows across the Mediterranean, coupled with information about sea routes, riots at port cities, and wave conditions, to test our theoretical argument. We find strong evidence consistent with our argument that smugglers strategically minimize the probability of potential harm to migrants, especially while at sea. This finding may represent an opportunity for targeted policy interventions.

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There are more than 240 million international migrants in the world. Refugees, who flee conflict and violence, and irregular migrants[1] are a growing proportion of international migrants. Since 2007 the number of refugees has doubled to about 25 million (UNHCR 2018b). Since 2014, more than 1.8 million migrants have crossed the Mediterranean. Some of these migrants are refugees, and nearly all have used a smuggler. Annually, human smuggling to the European Union (EU) is a 5 to 6 billion dollar industry, and it is growing (Europol 2016). Crossing the Mediterranean Sea is also risky; more than 15,000 people have died crossing to Europe since 2014 (UNHCR 2018a). Because migrants often face the possibility of death in their home countries and the countries they transit through, deadly sea conditions are presumed to not deter migrants.

Scholars are focusing greater attention to migration and smuggling, particularly in sociology and public policy (Triandafyllidou 2018; Campana 2018; Cusumano 2017; Kassar and Dourgnon 2014). Yet human smuggling have gone largely unexplored in political science. We begin to fill this gap by describing key features of the political economy of smuggling across the Mediterranean. Political unrest drives some migrants to cross the Mediterranean, but the reputational dynamics of the clandestine smuggling market moderate these flows, particularly under dangerous sea conditions. Our evidence suggests that human smugglers respond to long-term economic incentives. This finding may yield actionable insights for crafting policy interventions.

More generally, our study of migration addresses a topic of enormous political importance. The dramatic increase in migration across the Mediterranean and into Europe has destabilized the EU, lead to broad changes in national immigration policies, and triggered the resurgence of far right, xenophobic political parties. Exploring what factors influence the timing and intensity of human smuggling may create opportunities for governments and non-governmental organizations to address the often dangerous conditions under which migrants arrive.

1. These include people who avoid formal ports of entry, persons who are smuggled and persons who stay in a country without formal status.

With detailed data about crossings from North Africa to Italy, we establish that migrants respond to political unrest in North Africa by fleeing across the Mediterranean to Europe. The response is moderated by smugglers' reluctance to send migrants in sea conditions that are too risky. We demonstrate that migrants respond to riots along the coast of Libya and Tunisia by fleeing across the Mediterranean. A 10 percent increase in riots near ports where migrants congregate corresponds to a 4.89 percent increase in migrants arriving in Italy. As the sea conditions worsen, measured using granular wave height data, substantially fewer migrants arrive in Italy. A 10 percent increase in wave height corresponds to a 27 percent decrease in arrivals in Italy. These findings are robust to a number of alternative model and outcome specifications.

Human smuggling is more responsive to dangerous sea conditions than local political unrest. We argue that this calibrated response to wave height is consistent with long-run economic considerations. Human smuggling is this context relies on two actors: the land smuggler, who takes migrants along their passage to port, and the sea smuggler, who ferries migrants to sea. To ensure a steady flow of fee-paying migrants, each actor must maintain their reputation for safe passage. We observe a binding constraint on the sea smuggler at the final step of the journey: crossing the Mediterranean. Sea conditions are strongly correlated with death and disappearance. Smugglers aware of their long-term economic incentives should and, as we document, do strategically avoid setting migrants adrift under risky conditions.

Migrants, Smugglers, and Reputation

Migrants traveling across the Mediterranean typically employ two types of smugglers. One or more from their country of origin to the Mediterranean coast (land smuggler) and another to ferry them out to sea (sea smuggler). Once migrants arrive at a smuggling port along the coastline, it may take days or weeks before they are taken to sea. Once they depart it will take another week on average before their arrive and are processed in Italy. Smugglers instruct migrants to drive in their boats towards Italy for six to eight hours and then to

call for help. Boats may drift for several days before rescue (UNHCR 2017). Once rescued, often by a NGO or coast guard vessel, migrants begin a sequence of processing that starts on the rescue ship, continues in the nearest harbor, and ends at a "hotspot," where formal identification and registration occur (Papadopoulou et al. 2016).

The human smuggling market is quite competitive, especially in coastal port cities. Sea smugglers who stay in the market must ensure a steady flow of new migrants. To do this, sea smugglers develop a pipeline of migrants with a network of land smugglers. Since the market is competitive, how does the sea smuggler distinguish themselves? They build a reputation for the final leg of the journey: safe passage at sea.

Reputational dynamics facilitate illicit markets and transactions in them. Because the markets are illegal, the exchanges cannot be enforced by formal contracts. Instead people rely on repeated interactions and a reputation to facilitate "relational contracts" or cooperation in the shadow of the future. Recent work has established how reputation works in drug markets (Przepiorka, Norbutas, and Corten 2017). The logic to the Mediterranean human smuggling reputation is similar; it is built on repeated interactions. The information environment for smuggling is different from other illicit markets. Since most of the migrants are not from North Africa, but further south, their family and friends do not have information about which sea smuggler they used. Instead, the sea smuggler preserves his reputation among other smugglers by sending migrants into the Mediterranean only when they are likely to arrive in Europe and report back to their family that all was well. The reputational mechanism at work in smuggling across the Mediterranean is much like original work on relational contracts in supply chains and the theory of the firm (Grossman and Hart 1986; Baker, Gibbons, and Murphy 2002).

A stylized story demonstrates how the mechanism works in human smuggling across the Mediterranean. There are two smugglers, a land smuggler and a sea smuggler. The sea smuggler puts migrants into the Mediterranean, so that they can be rescued and brought to Europe. The land smuggler operates in a large city in sub-Saharan Africa and recruits

African migrants and takes them to the sea smuggler. Family and friends of the migrant know the land smuggler, but not the sea smuggler. When their migrant friend or family member arrives in Europe, they learn about the quality of the smuggler. Thus, if the sea smuggler and the land smuggler both do a good job, the land smuggler can recruit migrants in the next period. If the sea smuggler fails, people will not want to travel with the land smuggler. Since the sea smuggling market is competitive, the land smuggler may be able to find a new sea smuggler. If not, the land *and* sea smugglers will soon be out of business.

An intercepted exchange between a land smuggler in Sudan and a sea smuggler following the deaths of hundreds of migrants in the Mediterranean demonstrates our stylized account captures real dynamics.

> [A Sudanese people smuggler asked] a fellow people smuggler in Libya how many people on the boat were "his"... Exactly 109, came the answer—of which 58 did not survive... The Sudanese smuggler reproached his Libyan counterpart for his role in overcrowding the boat—and in the end, the Libyan smuggler took it upon himself to personally notify the families of the victims whose safe passage he had failed to deliver. He also shelled out $5,000 in compensation (Da Silva 2017).

Data and Design

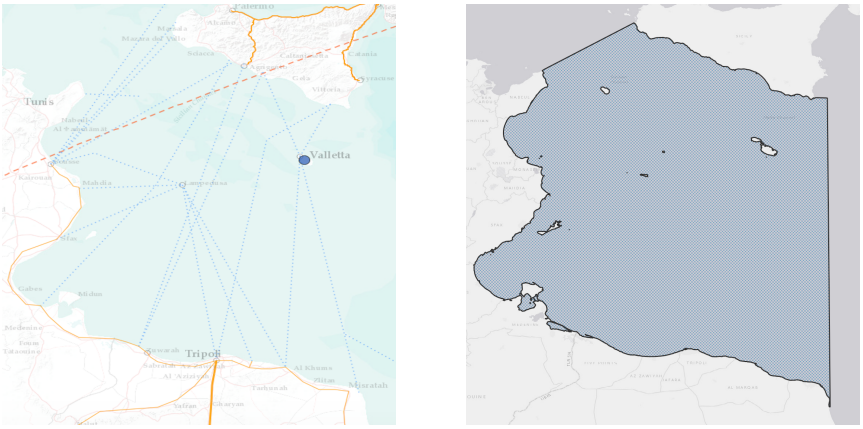
We study migrant movement into Italy from January 2016 to April 2018. Our data tracks the arrival of 307,056 individuals and was provided by the United Nations High Commissioner for Refugees, through the Operational Portal—Mediterranean. The arrivals were predominantly processed at the Lampedusa Intake Facility, located in the Italian Pelagie Islands. Remaining counts were compiled at smaller facilities along the Italian coast. These records do not distinguish origins, effectively yielding a daily time series of migration. From this port of entry, we trace the nine primary sea routes back to their origins in Libya and Tunisia (see Figure 1). These routes, based on extensive qualitative research, were compiled by the International Organization for Migration (IOM).

To capture variation in political unrest near areas where migrants depart, we construct 25-kilometer buffers around these nine port locations. We identify all riots within these buffers captured in the Armed Conflict Location & Event Data Project (ACLED). During

our sample period, nearly all events recorded within our buffers were georeferenced to the town (spatial precision level 1), giving us more confidence in the assignment of riot events to ports. Because sea travel takes up to roughly one week from departure to arrival, we calculate the sum of riot events in the prior week.

Migration patterns might also be influenced by sea conditions. To account for this, we gather daily sea wave height data from the EU's Copernicus marine environment monitoring service. Wave heights were recorded at 0500 local time (approximately sunrise). We calculate wave conditions within a geographic zone derived from the IOM sea route data, enabling us to capture sea heights along and around these passageways (see Figure 1). Similar to our unrest data, we construct an average of wave heights from the prior week to account for the lag between departure conditions and arrivals in Italy.

Figure 1: Region of Study: migration passages and smuggling hubs (a) and area used for calculating sea conditions (b).



(a) IOM Migration Routes (b) Sea Condition Area

Notes: Data on smuggling routes and hubs drawn from the IOM tracking system. Sea condition zone is authors' projection. Data on sea conditions is drawn from the Copernicus marine environment monitoring service. The coordinate projections differ between (a) and (b).

We supplement these records with data from IOM's Missing Migrants Project. Missing migrant records are clustered by event, and include estimates of the number of migrants killed or missing associated with an event, such as a boat capsizing. We collapse these records into a daily time series and, as a robustness check, combine our information on arrivals with this

data to calculate a daily total flow (of those that did and did not arrive in Italy). To confirm our qualitative evidence about the risks associated with poor sea conditions, we calculate a daily death rate. We discuss this further below.

Our main specification incorporates political unrest (riots) and sea conditions. We begin by estimating Equation 1:

$$arrivals_i = \alpha + \beta_1 riots_i + \beta_2 wave\_height_i + \gamma month_i + \lambda day_i + \epsilon \quad (1)$$

Where $arrivals_i$ is the daily total of arrivals, $riots_i$ indicates the intensity of riots in the prior week, and $wave\_height_i$ captures average sea conditions in the prior week. To ease interpretation as elasticities (percentages), we evaluate the log of these three measures.[2] Supplemental models incorporate $month_i$ and day_i. $month_i$ indicates month of year fixed effects and day_i represents day of week fixed effects. We leverage $month_i$ to capture any seasonal trends in flight, violence, or sea conditions. day_i helps us account for any systematic variation in arrivals that might be driven by intake operation calendars (e.g., the facility may staff fewer officers on Sundays). In our main specification, we produce heteroskedasticity robust standard errors. To account for the possibility that flows are serially correlated over time, we also produce Driscoll-Kraay temporal autocorrelation robust standard errors.

Results

Table 1 reports the results from our main specifications in equation 1. In Column 1, we present the baseline correlation between arrivals and the intensity of political unrest in the prior week. We find evidence consistent with our expectations of a strong positive relationship. A 10 percent increase in riot intensity corresponds to a 4.89 percent increase in arrivals. In Column 2, we introduce our measure of sea travel risk. If our argument is correct, we would expect a negative correlation between wave height and arrival intensity. Here, the evidence is even sharper. A 10 percent increase in wave heights leads to an approximately 27 percent decrease in arrivals. We have no reason to expect that sea conditions would be

2. We add one to $arrivals_i$ and $riots_i$ before calculating the log.

linked to riot activity, but jointly estimating these effects in Column 3 allows us to partial out any residual pair-wise correlation. Our estimates are stable. In Column 4, we introduce $month_i$ fixed effects to the model, which helps to account for seasonal variation in migration, violence, and sea conditions. Our estimate of the impact of sea risks is marginally attenuated, but remains more than five times larger in magnitude than political unrest. It is possible that staffing schedules or intake regulations lead to higher levels of registered arrivals on certain days of the week. To account for this, we add day_i fixed effects to Column 5. Our results are unaffected. It is also possible that the intensity of arrivals, and other conditions, may be strongly correlated over time. If so, our baseline approach to standard errors would overstate the precision of our estimates. Thus, we calculate Driscoll-Kraay temporal autocorrelation robust standard errors in Column 6 using a 14 day window, which we believe is conservative. The precision of our estimates decreases slightly, but two parameters of interest, riot intensity and sea risks, remain strongly correlated with migration patterns.

Table 1: Impact of riots and sea conditions on refugee flows into Europe

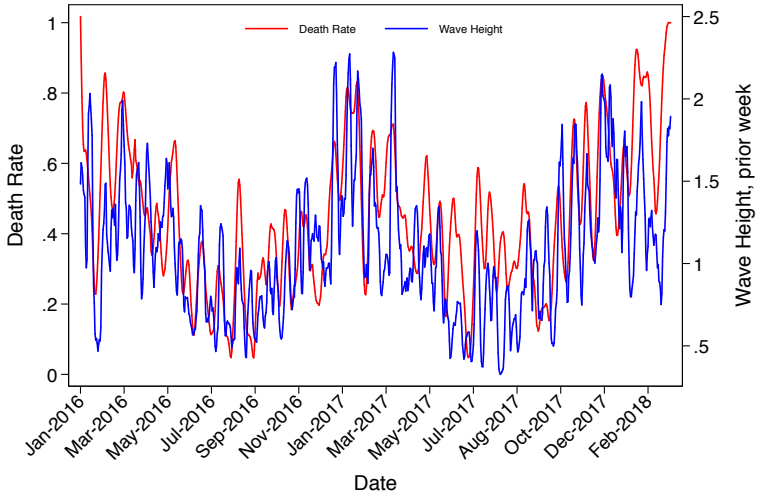
	1	2	3	4	5	6	7	8
Riots	0.489***		0.478***	0.503***	0.503***	0.503**	0.389**	
	(0.174)		(0.162)	(0.163)	(0.164)	(0.200)	(0.164)	
Wave Height		-2.715***	-2.711***	-2.542***	-2.542***	-2.542***	-1.863***	0.366***
		(0.233)	(0.231)	(0.333)	(0.332)	(0.364)	(0.269)	(0.0581)
Model Spec.								
Outcome	Arrivals	Arrivals	Arrivals	Arrivals	Arrivals	Arrivals	Total	DR
Month of year FE				Yes	Yes	Yes	Yes	Yes
Day of week FE					Yes	Yes	Yes	Yes
Driscoll-Kraay SE						Yes	Yes	Yes
Observations	812	812	812	812	812	812	812	788
R^2	0.00914	0.130	0.139	0.171	0.174	0.174	0.174	0.153

Notes: Outcome of interest is the daily total of migrants arriving in Italy (ln) (Columns 1-6). In Column 7, the outcome is the daily total flow of migrants (the sum of arrivals and reported deaths and disappearances). In Column 8, the outcome is the daily death rate (as a percentage of total flow of migrants). Total number of riots in the prior week (ln) and average sea conditions (wave height) during the prior week (ln) are the regressors of interest. Unit of analysis is the day. Heteroskedasticity robust standard errors are reported in Columns 1-5; Driscoll-Kraay temporal autocorrelation robust standard errors (clustered by 14 day windows) are reported in Column 6-8. Stars indicate *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

It is possible that the patterns we observe are driven by survivorship bias: during poor sea conditions, fewer migrants survive and are able to make land fall. The strong negative

correlation between risky sea conditions and arrivals, therefore, may be biased in the direction of our argument. This would overstate the elasticity in magnitude. If, instead of arrivals, we were able to identify the total flow of migrants, this could address this concern. That would involve combining arrivals with information on the flow of migrants that die or disappear on their sea passage. Thus, we rely on the IOM's data on missing migrants. The IOM platform is the most comprehensive presently available and is widely used by governmental and non-governmental actors in the region for tracking casualties. We collapse this data into a comparable daily time series and sum arrivals and deaths from this source into a total migrant flow. We replicate our most conservative model specification in Column 7 with this new outcome. Notice that our sea condition coefficient decreases in magnitude, from roughly 2.54 to 1.86. The elasticity of riots also declines, which is consistent in relative scale.

Figure 2: Trends in Death Rates and Sea Conditions during Sample Period



Notes: Daily death rates are calculated using IOM data on migrant deaths and disappearances in the Mediterranean and UNHCR intake data for the Italian coast. Wave heights are drawn from the Copernicus platform.

Our data on migrant casualties allow us to verify the mechanism of our argument, that poor sea conditions increase the risk of death. To evaluate this claim, we calculate a daily death rate. Because this rate is unobserved if migrants neither arrive nor die on a given day, our design is now an interrupted daily time series. We begin by visualizing this relation-

ship in Figure 2. The two trends, death rates and wave heights, covary closely. As waves reach dangerous levels (greater than 1.5 meters for most rubber craft), death rates increase substantially. We next present statistical evidence of the correlation between the death rate and sea conditions in Column 8 of Table 1, following the main specification in Column 6. The estimates confirm that there is a strong positive relationship between sea risk and the percentage of migrants who die or are lost at sea.

Discussion

Migrants crossing the Mediterranean is among the most pressing issues facing the EU. Understanding what drives and limits migrants crossing the Mediterranean is a critical first step in designing an effective policy response. Our work establishes two key empirical relationships. First, migrants, who are already precariously situated in Libya, respond to violence and political unrest by crossing the Mediterranean. While migrants may be drawn to the EU for economic reasons, one proximate cause of their choice to travel is the instability along the North African coast.

Second, these political forces are moderated by economic ones. At roughly 5 times the elasticity magnitude, risky sea conditions forestall people from crossing the Mediterranean. It is unlikely, if not impossible, that migrants are judging the seas. Rather, the calibrated response to fluctuations in sea conditions come from experience at the sea. Sea smugglers send migrants across the Mediterranean only when it is sufficiently safe. Doing so preserves their reputation for safe passage and ensures they will have a future stream of income—new migrants to smuggle.

Smugglers appear responsive to long-term economic incentives. These finding are consistent with a recent explanation for recent decline in migration. Human smugglers, because of government subsidies on oil, have begun transporting and smuggling petrol instead. We anticipate policy interventions that enhance alternative economic opportunities to smugglers may lower the intensity of Mediterranean human smuggling.

References

Baker, George, Robert Gibbons, and Kevin J. Murphy. 2002. "Relational Contracts and the Theory of the Firm." *The Quarterly Journal of Economics* 117 (1): 39–84.

Campana, Paolo. 2018. "Out of Africa: The organization of migrant smuggling across the Mediterranean." *European Journal of Criminology* 15 (4): 481–502.

Copernicus Marine Environment Monitoring Service. 2018. *Mediterranean Sea Waves Analysis and Forecast.* Accessed June 28, 2018.

Cusumano, Eugenio. 2017. "Emptying the sea with a spoon? Non-governmental providers of migrants search and rescue in the Mediterranean." *Marine Policy* 75:91–98.

Da Silva, Chantal. 2017. "Inside the 'free market' of people smuggling." *Independent* (October 14). Accessed July 17, 2018.

Grossman, Sanford, and Oliver Hart. 1986. "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy* 94 (4): 691–719.

International Organization for Migration. 2018. *Migration Flows - Europe.* Accessed July 18, 2018. http://migration.iom.int/europe/.

Kassar, Hasséne, and Paul Dourgnon. 2014. "The big crossing: illegal boat migrants in the Mediterranean." *European Journal of Public Health* 24 Suppl 1:11–5.

Law Enforcement Cooperation, European Union Agency for, and International Criminal Police Organization. 2016. *Migrant Smuggling Networks.* May.

Papadopoulou, Aspasia, Elisa Maimone, Vicky Tsipoura, and Katerina Drakopoulou. 2016. *The Implementation of the hotspots in Italy and Greece.* Brussels: ECRE, May.

Przepiorka, Wojtek, Lukas Norbutas, and Rense Corten. 2017. "Order without Law: Reputation Promotes Cooperation in a Cryptomarket for Illegal Drugs." *European Sociological Review* 33 (6): 752–764.

Raleigh, Clionadh, Andrew Linke, Håvard Hegre, and Joakim Karlsen. 2010. "Introducing ACLED: An Armed Conflict Location and Event Dataset." *Journal of Peace Research* 47, no. 5 (September): 651–660.

Triandafyllidou, Anna. 2018. "Migrant Smuggling: Novel Insights and Implications for Migration Control Policies." *The ANNALS of the American Academy of Political and Social Science* 676 (1): 212–221.

UNHCR. 2017. *Mixed Migration Trends in Libya: Changing Dynamics and Protection Challenges.* http://www.unhcr.org/en-us/publications/operations/595a02b44/.

———. 2018a. *Mediterranean Situation, Operational Portal: Refugee Situations.* Accessed July 8, 2018. https://data2.unhcr.org/en/situations/mediterranean.

———. 2018b. *Statistical Online Population Database.* Accessed July 18, 2018. http://www.unhcr.org/statistics/populationdatabase.