Border Enforcement and Rescue Policy in the Central Mediterranean: Drivers and Consequences

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1 Research area and contribution to the literature

During the last few years, the Central Mediterranean migration route to Europe has witnessed a record increase in flows and migration-related deaths. Arrivals have raised from 42925 in 2013 to 181436 in 2016 (EPSC, 2017). Migrants deaths at sea have increased from 644 in 2013 to 4579 in 2016. From January 2014 to to July 2017, conservative estimates suggest that 14500 people lost their lives trying to cross the Mediterranean on the route (IOM, 2017a). At the same time, search and rescue (SAR) operations have changed in nature. Originally they where conducted almost exclusively by Italian navy, coastal guard, and commercial vessel. Now, institutionalized European and NGO-based operations have a big role. Also, operations changed in reach, through up-and-downs. The launch of Mare Nostrum in 2013, the shift to Triton at the end of 2014, and then to extended Triton mandate in 2015 have resulted in a zigzagging reach of SAR activities, increasing, decreasing, and then re-increasing. The last tendency was amplified by the enactment of EU Navfor Med by European Union (EU) in 2015, and by NGO starting to engage in SAR between 2015 and 2016. Looking at yearly figures, arrivals seem to correlate positively with reach of operations, and deaths at sea seem to follow. However, a sound econometric analysis on frequent data is needed in order to say something precise about the issue. This research wants to assess the impact SAR reach, or distance of rescue operations from the Libyan coast, on migrants deaths and arrivals. Further, major changes in operations' reach where brought about important shipwrecks in the Mediterranean or large events. For this reason, I also want to assess the impact of public attention and media coverage on SAR reach. This might shed light on how policy responds to non-voting outcomes, in general.

The Central Mediterranean Route to Europe is a maritime route of migration. Migrants undertaking it leave Central Northern Africa shores to reach Italy or Malta, contracting with smugglers journeys on possibly unseaworthy boats. This is an overwhelmingly Libyan market: 89% of migrants rescued during Operation Triton left for Europe from Libyan shores. This is due to two factors. First, Libyan civil war, starting in 2014, has provided a fertile ground for the thriving of human smuggling and trafficking. This situation does not seem to have changed recently. To this date, Libya remains a fragile political environment, with two main conflicting authorities on a state levels, and several other informal local authorities. Second, Libyan Coast

is not far from the Italian island of Lampedusa (300 km), from Sicily (440 km), or from Malta (340 km). Tunisia is closer, but there border enforcement is backed by more stable institutional environment.

International conventions such as 1982 United Nations Convention on the Law of the Sea (UNCLOS) and 1974 International Convention for the Safety of Life at Sea (SOLAS) require an able shipmaster to provide assistance to persons in distress. The same set of conventions require State Parties to organize 'distress communication and coordination in their areas of responsibility' and to provide 'for rescue of persons in distress around their coast' (UNHCR, 2017b). Libyan situation has also meant a total lack of cooperation in SAR activities, with migrants saved in Libyan SAR area effectively being disembarked in Italy (Frontex, 2015). This has set the basis for the current debate over the moral hazard problem of SAR efforts, with some policy-makers arguing that SAR advances smugglers' operations.

As I briefly sketched above, the Central Mediterranean route has also witnessed many changed in border policy and SAR operations. Before October 2013, Italian custom police and coastal guards, together with merchant ships were managing most of the SAR operations on the Central Mediterranean route. On that month, in the wake of a shipwreck causing 366 migrants to die near Lampedusa, Italian government launched SAR Operation Mare Nostrum as a way to tackle increased migration flows. Mare Nostrum brought extended rescue operations operations to the Maltese and Libyan rescue areas. The operation was discontinued on October 2014 due to the the uneven sharing of the burden of funding in Europe, and replaced by the cheaper Operation Triton, by Frontex, deploying assets of Italian and other European Navies and operating nearer to the Italian coast with a view of ensuring border enforcement. This meant a reduction in reach of rescue activities, to 30 nautical miles from the Italian coast. Two shipwrecks with 1200 deaths in April 2015 prompted increased funding for Triton in the same month, and the start of EU-NavFOR Med by EU in June, commonly referred to as Operation Sophia (EPSC, 2017). Operation Sophia also conducts smugglers' boat diversion from October 2015. So, the twin shipwrecks of April 2015 have also resulted in a larger reach for SAR operations, in two ways. First, the mandate for Triton increased to 138 miles away of the Italian coast. Second, Operation Sophia conducts SAR operations inside the Libyan SAR zone, 200 miles away from Italy. At the same time, NGOs have started conducting a larger fraction of operations. These facts have contributed to move rescue activities increasingly near to Libyan coasts (UNHCR, 2017a).

These policy changes likely had an effect on illegal migration and related deaths. Frontex claims that reducing rescue distance from the Libyan coast increased deaths at sea in two ways. First, by acting as a pull factor and increasing departures. Second, by leading smugglers to switch to unsafe boats that have no opportunity of reaching Europe. As for the first, basing such statements on correlations is problematic. It is true, for example, that arrivals on the route went from 42925 in 2013 to 170100 in 2014, after the enactment of Operation Mare Nostrum. However, the lack of a clear counterfactual is particularly haunting in this context. The end of 2014 civil war in Libya, and the complex political situation in its aftermath had likely an effect in the establishment of a well-functioning smuggling market. For one thing, smugglers' networks across North Africa might have taken time to organize, before operating at full capacity. In fact, other institutions, such as IOM, do not agree with Frontex in viewing rescue as a determinant

of the increase in departures. They state, for example, that when Operation Mare Nostrum was ended an increase in flows was registered IOM (2017b). Also, they claim that decreasing rescue distance from the Libyan coast simply reduces the risk for migrants by increasing the chance they make it safely to rescue. As for the second way, namely the switch in boat technology, we know for a fact that the switch happened and that today 70 % of boats on the route are dinghies (EPSC, 2017). However, this might also have been caused by the diversion of smugglers' boats under Operation Sophia, effectively leading to higher prices for safer vessels (HoL, 2017). Further, it is not clear if the change in boats composition justified an increase in risk, given lower distances of rescues. As a matter of fact, apart from major changes in policy, there is considerable variation in rescue distances in high-frequency data (monthly or daily), to be exploited in addressing such questions. This variation is apparent in Frontex georeferenced data on interceptions that I describe below. I plan to use this data in this research, in order to assess Frontex conjectures. To the best of my knowledge, this will be the first attempt to exploit such data for these purposes. The most related work is now been undertaken by Frattini and Fasani. So far, a working paper is not available, but preliminary work was presented at Bocconi University in October 2017. Their research aims to assess the effectiveness of European border enforcement policy and routes take-up. This is related, inasmuch as it touches the Central Mediterranean Route, but they focus on border enforcement more than SAR and look at other variables, like expenditure, days covered by operations, and assets deployed. Then, research about SAR activities, touching the key issue of rescue distances, is needed in order to inform policy and scrutinize it. In the case of death risk, research should determine whether decreasing distances simply makes rescue easier, or if it changes smugglers' technology enough to make the route riskier. In the same way, the 'pull-factor' effect should be evaluated. These effects could be non-linear, and should probably estimated non parametrically and validated locally using quasi-exogenous variation in policy.

The very fact that there is variation in rescue distances, even in high-frequency data, deserves attention. Some of this variation is due to the fact that interceptions follow a random processes, and that rescue operations do not happen on a precise line. However, previous discussion has also highlighted that big events command big shifts in policy. A natural question is how much of this is due to policy-makers revising their expectations about the consequences of their choices and how much is due to larger public attention and shifting public attitudes over the issue. On the demand side, one could ask how public opinion, attention and media coverage of migration in different European countries impact policy. On the supply side, one could wonder whether different actors in policy (e.g. Frontex, NGOs, national coastal guards) react to public attention and media coverage, and public opinion differently. Public attention may be proxied in a simple econometric specification by the volume of Google searches in a country relating to migration, illegal migration, or illegal migration from Libya. Attitudes can be obtained from the Eurobarometer survey, as I explain below. In all cases, one should always take into account the effect of the main outcome variables (arrivals and deaths at sea), which could provide spurious correlation between media attention and policy.

The issue of how policy responds to public opinion is attracting interest in economics literature. Snyder Jr and Strömberg (2010) show that lower media coverage in US districts causes lower knowledge about the actions of representatives by citizens. Also, they find that congressmen

with facing lower local press coverage align their actions with local interests less. Snyder Jr and Strömberg (2010) focus on newspapers and use 'congruence' between the local media market and a congressional district to measure local coverage of politician actions. Congruence is the mean of market share of each newspaper in a district weighted by the share of its readers living in the same district. The idea is that a newspaper should allocate media coverage to congressmen based on where its readers live. Also, controlling for observable district demographics and economic characteristics, congruence should be orthogonal to other determinants of officials' responsiveness to constituents' preferences. Another recent study exploits 'congruence'. Facchini et al. (2016) investigate individual representatives' roll call votes behavior on trade and migration issues. They assess if officials' voting behavior responds to public opinion differentially based on the level media coverage of their activities in the respective constituencies. This would be consistent with agency models of electoral accountability (Facchini, 2016). Authors find that public opinion impacts voting behavior more strongly in constituencies where congruence is higher. The result holds for migration, but not for trade. They explain this result with the higher salience of the migration for voters. Finally, Campante, Ferraz, Souza, and Tepedino, in work in progress, find that social media and cell phones improve the responsiveness of politicians to their constituencies[1]. So, studying public attention by looking at Google searches would place this work in the last literature relating to social networks and internet. This is more and more relevant as sources of information move online. Also, studying public attention, public opinion, and media coverage would allow this research to make statements about the bargaining power of different countries in the process. This is particularly interesting in a setting where a European agency sets policy for an aggregate of states. Policy might respond differentially to the preferences of citizens of different countries, based on funding, the nationality of the president of the council, the population weight of each country, and so on. Indeed, policy faces a true bargaining process between countries with possibly different preferences over outcomes. Exploiting variation in public attention one might understand how this bargaining is solved. Similarly, by using political alignment of newspapers, we might understand which political groups are better able to influence policy.

This research will analyze determinants and consequences of border enforcement and SAR policy in the Central Mediterranean. Preliminary analysis show that rescue distance has a negative impact on death risk, and not much of an impact on arrivals. Also, policy seems to respond to public attention by bringing SAR nearer to the Libyan coast. I plan to bring everything together into a model of policy choice.

This study aims to understand the reasons of policy choices in the Central Mediterranean Route, and their consequences in terms of death risk and arrivals. In doing so, it will help scrutinize European border enforcement and SAR policy and understand the incentives it faces.

[1]For a brief description of the research, refer to Felipe Campante's website at https://sites.google.com/site/fcampanteresearch/home/work-in-progress.

2 Data to be collected and/or used

Data to be used include Frontex georeferenced data on rescue operations, Missing Migrants data on dead and missing migrants in the Central Mediterranean route, coastline data available in Python's Matplotlib Basemap, Google Trends data on public attention, Eurobarometer survey question on migration attitudes, media coverage data from Factiva. In what follows, I describe such data and what I already have of it.

2.1 Frontex data

Frontex data for rescue operations from 2014 onwards was already collected by the author, under the Right to Access Information, granted by EU Regulation 1049/2001. A data point is a rescue operation, and variables collected are date, locations of detection and interception in coordinates, type of detection and interception, type of boat used by migrants, and number of migrants. Frontex does not want to disclose data for operations conducted inside their operational area. However, this does not affect the anlysis, as only 1-2% of boats leaving from Libya where rescued inside the operational area. I plan on obtaining the same data from the period before operation Triton started.

2.2 Missing Migrants

Mssing Migrants dataset is a dataset constructed by IOM and accessible online. It is the most comprehensive dataset of migration incidents around the world causing one or more migrants to die or go missing. Information is obtained from several sources, such as media, institutions, and NGOs. It records number of deaths and number of missing per incidents, the location of the incident, type of incident, and source information.

2.3 Matplotlib Basemap

This open source free toolkit is a Python library for plotting 2D maps. Using such software, one can construct a code to obtain the distance of rescue operations and incidents from the Libyan coast. I have already implemented a code that associates to each rescue operation in Frontex data and for each incident in Missing Migrants data its distance from the Libyan coast.

2.4 Google Trends

Google trends data contains volume of searches by word, or list of words, in a given country, over time. This data can be used as a proxy for public attention to the issue. Weekly data or daily data for less than 3 months can be downloaded from Google Trends webpage. Downloading longer series of daily data requires a bit more work with a Google Pseudo-API in Python. I have implemented a code that does so, and gathered data for Italy, for a number of keywords related to migration. I plan on using the same code to gather data about Germany and France as they are the most relevant contributors to EU budget together with Italy in 2016 (EC, 2017). In order to better inform keywords, I will rely on the media analysis (see below).

2.5 Eurobarometer Survey Question about migration attitudes

Eurobarometer is a survey of public opinion conducted regularly by European Commission every year since 1973. A sample of 1000 citizens of each country in Europe are surveyed on a number of issues. Since 2014, the Eurobarometer has featured a question about attitudes toward international migration. Then, answers across countries is available twice a year for the following question:

'Please tell me whether each of the following statements evokes a positive or negative feeling for you. Immigration of people from outside the EU'.

Answers can be *'Very Positive'*, *'Fairly Positive'*, *'Fairly Negative'*, *'Very Negative'*, *'Don't know'*.

This data can be downloaded for free. It will be a proxy of political opinion about migration in the empirical analysis.

2.6 Media coverage data

Data about media coverage can be accessed by a number of online archives. Among others Factiva, is particularly advantageous, as it is available for free to students of my institution (Bocconi), and it contains a wide range of Italian articles. Data collection will consist in counting daily newspaper articles about migration, illegal migration, and illegal migration from Libya, in Italy, Germany and France. It will also register occurrences in newspapers with different political lines. This data collection would also be relevant to provide a criterion of selection of keywords in Google Trends data.

3 Data use

Data analysis will be articulated in three phases.

Such exercise will start from basic analysis of how death risk and arrivals vary with rescue distances. The analysis will exploit non-parametric estimation. To see why we need non-parametric estimation, consider the following model of the smugglers' market.

Demand is composed by a measure M_m of migrants, with endowment k, linear in consumption, with marginal utility $\alpha_E > 1$ in Europe and 1 elsewhere (set utility of death to 0). Supply is made of a measure $M_s < M_m$ of smugglers, indexed by i; i can offer a journey to a migrant, using effort x to provide security (probability of making it safely to rescue) $y(x)$. Smugglers cost is a function of a (rescue distance from the coast) and a specific component ε, known to smugglers and distributed according to F, $c(x, a, \varepsilon)$. We have c and y twice continuously differentiable, and:

$$0 \leq y(x) \leq 1, \qquad c_a, c_\varepsilon, c_{ax}, y_x > 0, \qquad y_{xx} < 0, \qquad lim_{x\to\infty} y_x = 0.$$

Almost all are standard conditions. The only ones that deserve attention are the assumptions about the increasingness of c in ε, meaning that a higher shock is detrimental to smugglers' profit, and the positive cross-derivative of a and x, meaning that higher distance implies a higher cost

is required to set the same level of safety. Policy maker sets a. In equilibrium, smugglers will appropriate the surplus. For $\alpha_E y(x) > 1$, price for smuggler i is given by:

$$p(x^*(a,\varepsilon)) = \frac{[\alpha_E y(x^*(a,\varepsilon)) - 1]}{\alpha_E y(x^*(a,\varepsilon))} k.$$

Where x^* is the optimal level of effort for a smuggler facing distance cost shock ε if distance is a. We turn to characterize x^*. Suppose that payment is obtained only if migrants make it to Europe[2]. We notice that price is heterogeneous across smugglers, given different random components in their cost functions. This is sustained in equilibrium by compensation in probability. Hence, smugglers' problem is to decide if to stay in the market and conditional on staying setting the optimal probability of survival for a migrant. In mathish, their problem is $\max\{V(a), 0\}$, where $V(a)$ is:

$$\begin{aligned} V(a,\varepsilon) = &\max_x p(x)y(x) - c(a,\varepsilon,x), \\ &\text{s.t. } \alpha_E y(x) > 1. \end{aligned}$$

Let us see how death probability changes with distance. To do it, let us impose a functional form for the probability of survival. Let y be given by:

$$y(x) = 1 - \gamma^x, \text{ with } 0 < \gamma < 1,$$

And the cost function be

$$c(a,x,\varepsilon) = a^\beta x\varepsilon, \text{ with } \beta > 0;$$

The constraint for the maximization problem is:

$$x \geq \frac{\ln(\alpha_E - 1) - \ln \alpha_E}{\ln \gamma} =: \bar{x}.$$

The support of ε is $(0, +\infty)$. FOC for an interior solution gives the following expression for the probability of migrant's death.

$$\gamma^x = \frac{a^\beta \varepsilon}{-k \ln \gamma}$$

This is what will be provided by smugglers in the market, $\mathcal{M}(a)$ namely the measure of smugglers such that such that

$$\frac{\alpha_E - 1}{\alpha_E} \geq \frac{a^\beta \varepsilon}{k \ln \gamma} \left[\ln \left(\frac{a^\beta \varepsilon}{-k \ln \gamma} \right) - 1 \right].$$

In passing, we notice that to the estimate the pull-factor effect we need to retrieve $\mathcal{M}(a)$. This can be almost any type of inverse cumulative distribution function. Then, we it is advisable to estimate non-parametrically.

[2]There is some evidence that this is the case, for one thing because the relationship of migrants with migration smuggling networks continues when migrants get to Southern Italy and they move to other destinations in Europe. Finally, a mechanism of this kind has likely to be in place for the market not to break.

Following with the theory, there is no need to check constraint of maximization problem, as for this smugglers this is satisfied. Also, there exists $\bar{\varepsilon}(a) > 0$ such that for all $\varepsilon < \bar{\varepsilon}(a)$ the optimal solution is the interior one, and for $\varepsilon \geq \bar{\varepsilon}(a)$ the optimal solution is staying out of the market. Importantly, $\bar{\varepsilon}(a)$ decreases in a. We are now ready to write the death risk as a function of a. Call $s(a)$ the fraction of departed migrants not making it to rescue. Integrating FOC over the measure of smugglers in the market, $\mathcal{M}(a)$, and taking logs, we get:

$$\ln s(a) = \beta \ln a - \ln(-k \ln \gamma) + \ln \int_0^{\bar{\varepsilon}(a)} \varepsilon dF(\varepsilon),$$

Then,

$$\frac{d \ln s(a)}{d \ln a} = \beta + \left[\int_0^{\bar{\varepsilon}(a)} \varepsilon dF(\varepsilon) \right]^{-1} f[\bar{\varepsilon}(a)] \bar{\varepsilon}'(a) a, \tag{1}$$

The second addend is negative since $\bar{\varepsilon}'(a)$ is negative.

$$\frac{d \ln \mathcal{M}(a)}{d \ln a} = \left[\int_0^{\bar{\varepsilon}(a)} dF(\varepsilon) \right]^{-1} f[\bar{\varepsilon}(a)] \bar{\varepsilon}'(a) a. \tag{2}$$

Again, given the behavior of $\bar{\varepsilon}(a)$ gives us that the last expression is decreasing in a. Equation 1 and 2 have very simple interpretations. Equation 1 means that the impact of the rescue distance on death probability is *a priori* indeterminate even in sign. This is because advancing rescue lines make rescue easier (first addend), but at the same time it makes worse boats enter the business (second addend). Equation 2 simply tells us that the measure of smugglers is decreasing in a. Increasing a shifts their costs up across the board and makes some of them get out the market. This formulation can take into account other cost-shifters (which could multiply the cost function or enter as additive variable costs), like climate conditions, oil prices, and boat prices. This could be used to assess the impact of EU-Nav For. Even before adding this extensions, these equations tell us a simple thing: plain OLS is not enough. We need to go for non-parametric methods like kernel regression or spline estimation. That is what I plan to do. After that, results for arrivals will be checked locally using quasi-exogenous variation in the extension of SAR operations, occurred in the aftermath of two shipwrecks in 2015. Also, results on the effect of distance on deaths and arrivals will be checked by instrumenting distance with lagged volume of Google searches (possibly interacted with measures of population attitudes toward migration), controlling for past arrivals and deaths. Controlling for past arrivals and deaths should grant exogeneity. As for relevance, it will be deal with in the next paragraph, explaining the next empirical stage.

I will move to determine basic determinants of rescue for different actors policy, among public opinion, attention, and media coverage. First, I will do so using google data on searches regarding migration different European countries. Second, I will move to media data, to better grasp the political alignment of the coverage.

In the next stage, I plan to estimate a model of policy (distance) selection. A planner will choose rescue distance for the coast taking into account the public attention, the endogenous response of the smugglers' market and the feedback on attention.

So, first I will conduct analyses about pull-factor, death risk, and the influence of public attention, public opinion and media coverage on policy. In this stage I will also use exogenous variation to validate results locally. Then I will pass to structural econometrics to make relevant policy counterfactuals.

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