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#Portichiusi: the human costs of migrant deterrence in the Mediterranean

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#Portichiusi: the human costs of migrant deterrence in the Mediterranean*

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Abstract

Using daily data on forced migration from the IOM, I compare trends in flows and mortality across three major migration routes in the Mediterranean, analysing the effects of the introduction of rescue-deterrence policies in Italy. Controlling for exogenous shocks which affect push and pull factors in mobility, along with sea state conditions and route-day fixed effects, I find that the reduction in refugee migration flows in the Central Mediterranean has been modest, at best. At the same time, these policies have generated a permanent increase in daily mortality rates in the Central Mediterranean, having grown by more than 4 deaths per day. Finally, I investigate whether variations in mortality are sufficient to offset migration flows. Increases in mortality rates, however, are only accompanied by a short-term negative displacement effect, as migration attempts are delayed by increases in absolute mortality, rather than being prevented.

Keywords: *costs of migration, forced migration, EU refugee crisis, deterrence policies*

JEL codes: F22, J15, J61, J68

1 Introduction

Forced migration flows to EU member states through the Mediterranean Sea reached their peak in 2015 and have continued to persist in the last several years. Turmoil in the Middle East and Africa has generated an unprecedented displacement of individuals toward the EU, many of whom have attempted to reach the shores of Europe by crossing the Mediterranean sea.

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This migration route is far from safe, and the death tool has been steadily increasing over the course of time. Indeed, the evolution of the refugee crisis into a humanitarian disaster has dominated political discourse and created friction between EU member states. In response to the crisis, patrol operations in the Central Mediterranean (such as operations *Mare Nostrum*, *Triton* and *Themis*) have intensified, but the effort has been far from concerted, with these operations relying, mostly, on voluntary contributions from EU member states, and the focus of these operations gradually shifting from search and rescue (S&R, onwards) to border patrol. Furthermore, uncertainties in the implementation and interpretation of the Common European Asylum System (Dustmann et al., 2017a), including major weaknesses in the asylum procedures envisioned under the Dublin regulation, where the duty of examination of an asylum application falls to the country of first arrival, have only led to further discord and discontent.

In response to these developments, some private initiatives have arisen and NGOs, such as Open Arms, Sea-Watch, Mediterranea, Mèdecins Sans Frontières and Save the Children, amongst many others, have been conducting S&R operations in the Central (and in rarer instances, Eastern) Mediterranean area.[1] These activities have not gone unnoticed.

While some regulation efforts have been made by national authorities, their presence has been, more or less, tolerated. In Italy, the first of these attempts, the so-called "Minniti Code" was enacted during the former Gentiloni government in July 2017, and required NGOs conducting S&R operations in the Central Mediterranean to comply to a code of conduct. The adoption of said code was not met without opposition from NGOs.[2] However, the code still allowed NGOs to perform their operations, even if within specified boundaries.

This code was not the only measure enacted during the Gentiloni government, as this initiative was accompanied by a much larger change in migrant policy consisting of strengthening the role of the Libyan coast guard in border patrol operations and in concluding agreements with Libyan tribal chiefs to break their links with migrant smugglers.[3] Critics of this "desert diplomacy" approach argued that these measures only led to the further exploitation of refugees and severe violations of human rights.[4]

In the midst of this debate, non-withstanding the policies of the Gentiloni government, populist voices have campaigned in favour of curbing all rescue operations in the Mediterranean,

[1] European Union Agency for Fundamental Rights (2019); 2019 update - NGO ships involved in search and rescue in the Mediterranean and criminal investigations; available at: https://fra.europa.eu/en/publication/2019/2019-update-ngos-sar-activities; last accessed: August 27th, 2019.

[2] La Repubblica (2017); Migranti, codice Ong: Msf non firma. Minniti: "Chi non sottoscrive regolamento è fuori"; available at: https://www.repubblica.it/cronaca/2017/07/31/news/migranti_msf_non_firma_codice_ong-172058967/; last accessed: August 27th, 2019.

[3] The Guardian (2017); Italian minister defends methods that led to 87% drop in migrants from Libya; https://www.theguardian.com/world/2017/sep/07/italian-minister-migrants-libya-marco-minniti; last accessed: August 28th, 2019

[4] Politico.eu (2019); Italy's 'minister of fear'; https://www.politico.eu/article/marco-minniti-italy-minister-of-fear/; last accessed: August 28th, 2019.

arguing that the presence of S&R vessels, even if regulated, encourages migration attempts, implying that the interruption of these activities would deter migrants from crossing the sea.[5] As the hostility of natives towards refugees grew, some of those voices provided an electoral platform for their sentiments.[6] In Italy, the electoral success of the Lega Nord under the new guise of a "national-populist" party platform, and the nomination of its leader Matteo Salvini as the Minister of Interior of the M5S-Lega coalition government, has marked the beginning of a new era in migrant policy for Italy, an era that is in fulfillment of this narrative. The Twitter hashtag "#Portichiusi" embodied this new stance, which championed, quite literally, the closure of ports to all vessels carrying rescued migrants.

Indeed, since the appointment of the M5S-Lega government in June 2018, led by prime minister Giuseppe Conte, the Italian migration policy has been consistently characterised by a rescue-deterrence stance: S&R activities of NGO vessels operating in the Central Mediterranean have been actively hindered, while the Italian coast guard has also been prevented from rescuing shipwreck victims outside Italian territorial waters (IOM, 2018). In multiple occasions, the Ministry of Interior prevented vessels carrying rescued migrants from reaching Italian shores: these actions went as far as minister Salvini risking his own prosecution for kidnapping after ordering the Italian Coast Guard ship U. Diciotti not to let rescued refugees disembark. His prosecution was only deterred by the Parliament voting in favour of his immunity from prosecution.[7] These deterrence efforts also culminated in two decree laws (known as *Decreto Sicurezza* and *Decreto Sicurezza bis*), enacted in October 4th, 2018 and June 15th, 2019, respectively, which toughened immigration laws, deprived asylum applicants of many legal guarantees and *defacto* criminalised migrant rescue operations.

It is still unclear whether the rescue-deterrence policies promoted by the government have been successful in their aims. Does signalling an abdication of responsibility to rescue stranded people at sea, increasing the perceived cost of crossing, actually reduces migration flows? And what is the actual cost of such a policy in terms of human lives being lost? In this paper, I aim to answer these questions, estimating the impact of deterrence policies such as the one

[5] As remarked, amongst the others, by declarations of Matteo Salvini – La Repubblica, January 19th, 2019; Centinata annegati senza aiuto, ma per Salvini è colpa delle ong – Luigi Di Maio – Il Fatto Quotidiano, April 23th, 2017; Ong 'taxi del Mediterraneo'? Di Maio fa insinuazioni senza dare soluzioni; available at: https://www.ilfattoquotidiano.it/2017/04/23/ong-taxi-del-mediterraneo-di-maio-fa-insinuazioni-senza-dare-soluzioni/3538861/; last accessed: August 27th, 2019 – and, over the continent, Nigel Farage – The Telegraph, September 1st, 2015; Nigel Farage: EU has opened doors to migration exodus of biblical proportions; available at: https://www.telegraph.co.uk/news/politics/nigel-farage/11836131/Nigel-Farage-EU-has-opened-doors-to-migration-exodus-of-biblical-proportions.html; last accessed: August 27th, 2019.

[6] While reverse causation between anti-migrant sentiment and the success of these parties cannot be excluded, evidence from Hangartner et al. (2019) suggests that inflows of refugees can change natives' attitudes and policy preferences, exploiting a natural experiment conditioning inflows of refugees to Greek islands. Whether these changes are further fuelled by preexisting institutional weaknesses leading poor integration of migrants in local communities and labour markets, is, however, still unclear.

[7] Reuters (2019); Italian parliament saves Salvini from migrant kidnapping probe; available at: https://www.reuters.com/article/us-italy-politics-salvini/italian-parliament-saves-salvini-from-migrant-kidnapping-probe-idUSKCN1R11Y4; last accessed: August 28th, 2019.

promoted in Italy in terms of variations in migration flows and their human costs.

At the same time, the question whether increases in mortality rates alone affect decisions to migrate remains unanswered, as the introduction of the policy is not sufficient to determine whether changes in flows can be directly attributed by variations in mortality, or rather by other factors. There are specific economic assumptions concerning risk-adversity and learning processes in refugee migration decisions which underlie rescue-deterrence policies. My aim is to test whether permanent and short-term changes in 'environmental' risk factors can affect (or change) migration decisions in these context.

The paper is organised as follows: Section 2 discusses the literature on the refugees crisis and migration decisions under risk; section 3 describes the data sources used in this paper, while section 4 elaborates and discusses the econometric models used to produce the final estimates. Then, the following three sections present the main results; showing the impact of rescue-deterrence on migration flows (section 5) and their effect on mortality rates (section 6), while estimates for the impact of variations in mortality on migration attempts are contained in section 7. Finally, section 8 presents the conclusion.

2 Overview of the literature

An influential work from Dustmann et al. (2017a) first focused on the European refugee crisis from both a policy and labour integration perspective. The authors found that coordination across the EU has been lacking, and that member states have interpreted their responsibility within the Geneva Convention for Refugees with much liberty, which also underlines how asylum applications have been far from equally distributed across countries. Notably, the study also finds that integration into labour markets has been more difficult for refugees than for economic migrants. Weaknesses in asylum policies across EU member states, along with their limited effectiveness in controlling migration flows, were already underlined in Hatton et al. (2004), who called for more coordination across the EU, and in Facchini et al. (2006), who argued that these inefficiencies are the systemic product of strategic delegation in this policy field.

All these studies place emphasis on the distinction between forced migrants (or refugees) and economic migrants which is, indeed, very important. Economic migrants have long been studied in the literature and their migration decisions have long been framed within economic theory.[8] Risk can, indeed, act both as a pull and push factor both for economic and forced migrants.

Forced migration, however, responds to different causes, such as violent conflicts, as studied in Schmeidl (1997), Vogler and Rotte (2000), Neumayer (2005), and Melander and Öberg

[8]See Lee (1966), and Borjas (1989)

(2007), amongst others. Direct changes in exposure to risk factors in the origin country[9] can then affect decisions to leave. However, 'pull' factors in forced migration, influencing the decision on which country to migrate to, including how to reach this destination, are much less unambiguous. Forced migrants are assumed to account for all these risk factors when considering their expected utility for staying or leaving.

Recent forced migration flows to Europe and their determinants were studied in Brück et al. (2018), who focused on 'push' and 'pull' factors influencing refugee migration decisions. In regards to the flows following from the Arab Spring, violence in the origin country and unemployment in the host country appear as significant predictor of arrivals.

Some attempts have been made to quantify the impact of rescue-deterrence policies in Italy and their influence as (negative) pull factors. In this regard, the work from Villa[10] is certainly worth mentioning. This work similarly focuses on the effect of "desert diplomacy" and "#Portichiusi" policies on migration flows, estimating a monthly reduction of 12,119 (SE: 2,417; ≈408 daily) and 6,539 (SE: 2,717; ≈220 daily) arrivals by the Sea, respectively.[11] Most notably, no significant effect from the presence of NGOs S&R vessels is found. Descriptive evidence in the relationship between official search and rescue operations and mortality was also provided in Deschenes and Moretti (2009).

I expand on this work by providing a more robust analysis of mortality and migration flows, using high frequency data and controlling for exogenous time-dependent migration shocks by adopting a comparative approach with other migration routes. In any case, the value of the present work resides beyond the analysis of flow-deterrence as this is, to the best of the author's knowledge, the first attempt to provide a comprehensive analysis of the impact of these policies on mortality rates, and on the impact of mortality on short-term decisions to migrate, with a focus on reverse causality issues.

It is straightforward that rescue-deterrence policies comply to an underlying economic rationale: individual costs of migration are increased as agents update their information on the perceived riskiness of a migration attempt. For a deterrence policy to be successful, this perception can be modified either directly, through factual increases in mortality (an "extensive" margin), or indirectly, through updates in expectations generated by the announcement of the policy itself (the "intensive" margin).

Previously cited literature focused precisely on this mechanism, where variations in migration flows are attributed to environmental changes in risk. The perception of risk among migrants and refugees, however, might diverge significantly from the general population. The literature on migration choice is not unfamiliar to risk attitudes, and can instruct the design

[9]See also Rodriguez and Villa (2012) for how displacement responds to changes in kidnapping risk, and Deschenes and Moretti (2009) for changes in mortality.

[10]Il Post (2019); Chi porta davvero i migranti in Italia; available at: https://www.ilpost.it/2019/07/08/ong-sbarchi-italia-libia/; last accessed: August 28th, 2019.

[11]Source: https://twitter.com/emmevilla/status/1158779941691019264/photo/1

of this study.

The relatively lower risk-aversion of migrants is documented by a number of studies. Looking at economic migrants, Jaeger et al. (2010) first found that lower risk-aversity makes individuals more likely to migrate. These findings were later reconfirmed, in a different context, by Dustmann et al. (2017b).

Risk attitudes were first studied in the context of the EU refugee crisis in Bocquého et al. (2018), which studied the risk preferences of refugees in an experimental setting, and framed the results within cumulative prospect theory. The authors conclude that forced migrants are characterised by low loss aversion and a preference for gains, implying that deterrence measures might be less effective on this population.

This literature is valuable to us, but does not provide much insight into the possibility of changes in risk aversion. Under this line of thought, flows might change due to increases in mortality, in accordance with individual risk aversions, which would remain the same. Another strand of literature, instead, investigated whether external events might affect individual preferences for risk. In the context of our research question, these studies might suggest that increases in the mortality rates of the Mediterranean could also generate permanent changes in migration behaviours.

A paper from Callen et al. (2014) focused on direct exposure to violence and changes in risk attitudes, arguing that traumatic experiences lead to individuals developing a preference for certainty. However, these results were reassessed and criticized by Vieider (2018), while Akgüç et al. (2016) also provided evidence that individual risk attitudes are unaffected by substantial changes in the environment.

3 Data

I use data from the International Organization for Migration (IOM) and Frontex, integrating these sources with data from Eurostat, the Italian Air Force (ITAF – *Aeronautica Militare*, in Italian), the Armed Conflict Location and Event Data Project (ACLED) and information on NGOs S&R vessels activity from a number of news sources.

The IOM reports and disseminates data on both migration flows[12] and missing migrants[13] in the Mediterranean Sea.

IOM data on registered arrivals is collected 'through consultations with the ministry of the interior, coast guards, police forces and other relevant national authorities IOM (2018). This data includes arrivals both by land and by sea, and is reported for all major countries of first arrival in Europe.

Information on missing migrants, instead, is reported for each of the three main migration

[12]Available at: https://migration.iom.int/europe?type=arrivals
[13]Available at: https://missingmigrants.iom.int/downloads

routes in the Mediterranean: namely, Western (possible destination: Spain), Central (Italy or Malta) and Eastern (Greece and, more rarely, Cyprus). This data is collected from multiple sources, which are detailed in the data-set: these could be, for example, government authorities, the press, alarm phones or search and rescue vessels. The estimated date of the accident is also based on these sources, which are classified by their quality: therefore, I drop all observations on incidents based on information from only one media source (level 1), so as to minimise measurement error.[14]

Both figures on arrivals and missing migrants are generally reported daily, with a few relevant exceptions. While for Italy, Malta, Greece and Cyprus daily flows by sea have been available since 2014, Spanish authorities have only began to do so recently, as accesses have reported monthly up until the end of 2017. Daily arrivals to Spain for 2017 are then imputed by dividing total monthly flows across each day in a month.

Frontex also supplies monthly information on the origin of migrants crossing the sea.[15] I have used these figures to reconstruct the nationality of migrants attempting to cross the Mediterranean. Monthly unemployment figures from Eurostat for Spain, Italy and Greece were also collected, so that they can be used as 'pull' factor controls in our econometric model, following from the findings of Brück et al. (2018).

The Italian Air Force releases its *Meteomar* bulletin every six hours, announcing forecasts and present conditions for the sea state in the Mediterranean. The bulletin offers notices and forecasts for 22 areas in the Mediterranean. Comparing information on migration routes from the IOM and the coordinates from these areas, I match three "seas" where most migration attempts occur: the Libyan sea for the Central Mediterranean Route, the Alboran sea for the Western Route, and the Aegean sea for the Eastern Route. Running a simple text mining technique, I then reconstruct daily sea state conditions for each of the three routes, generating indicators for occurrences (and their forecasts) of seastorms (meaning a >= 7 score on the Douglas scale) and thunderstorms.

Information on political instability at exit points is obtained through Raleigh et al. (2010). I proxy political instability through the daily number of fatal accidents linked to violent political unrest registered in the largest exit point countries (Libya and Tunisia for the Central Mediterranean route, Morocco and Algeria for the Western Mediterranean, Turkey for the Eastern Mediterranean). Instability in origin countries is, instead, not relevant to this analysis, as I study variations in flows comparatively across routes, meaning that these shocks are absorbed by design once controlling for shocks affecting a single route.

An overview of non-governmental S&R operations is provided by the European Union Agency for Fundamental Rights.[16] Using this information, I reconstruct the time-frame of

[14]More information on the methodology of the Missing Migrants project from the IOM is available at: https://missingmigrants.iom.int/methodology.

[15]Available at: https://frontex.europa.eu/along-eu-borders/migratory-map/

[16]Ibidem, 1

activities for each NGO vessel, and create an indicator for the number of active private S&R vessels on each day for every given route.

Finally, I harmonise and aggregate this information to construct a final dataset, which includes daily information from January 2017 to March 2019. As, starting from July 2017, the introduction of the "desert diplomacy" policy in the Central Mediterranean route significantly affected the number of accesses, the empirical model will also allow for the introduction of multiple policies.

All flows to the five Mediterranean states are aggregated into the three main routes, for 911 days. This simplification is motivated by two distinct necessities: firstly, this is the only way to reduce all data sources to a common number of dimensions and, secondly, the final destination of missing migrants can never be fully ascertained. Nevertheless, the absence of significant unilateral changes in migration policies in Malta (meaning that flows to Malta will be as well affected by policy changes in Italy), along with the negligible volume of migrants who eventually land on this island, allows the aggregation of all flows into the three distinct routes without compromising the estimates.

4 Empirical Model

As a model for migration flows, I propose the following specification, using a group-level difference in difference estimator:

$$\begin{aligned} Attempts_{rt} = \beta_0 + Policy^{'}\beta_1 + Vessels_{rt}\beta_2 + Deaths^{'}\beta_3 + Seastate^{'}\beta_4 + \\ Unrest^{'}\beta_5 + PullShocks^{'}\beta_6 + PushShocks^{'}\beta_8 + \gamma_r + \delta_t + \epsilon_{rt} \quad (1) \end{aligned}$$

where β_0 is a constant and $Policy$ is a vector of migration policies ($Policy_{1rt}, Policy_{2rt}, ...,$ $Policy_{Prt}$) at time t in each migration route r, which can either be western, central, or eastern Mediterranean. The outcome variable $Attempts_{rt}$ indicates the number of daily migration attempts – that is, the sum of deaths and successful arrivals by sea. As it takes less than a day to reach Italy from Libya,[17] I assume that missing or dead individuals would have reached their destination on the same day of their disappearance, if they survived. $Vessels_{rt}$, instead, captures the number of active search and rescue vessels operated by NGOs, while $Deaths$ is a vector of lags and moving averages for reported dead or missing migrants.

Route specific variation in sea conditions is captured by the $Seastate$ vector, including lagged values for sea state conditions in each route, while γ_r and δ_t are, respectively, fixed effect specific to the migration route, week and month. This specification essentially establishes

[17] The Economist (2015); Everything you want to know about migration across the Mediterranean; available at: https://www.economist.com/the-economist-explains/2015/04/21/everything-you-want-to-know-about-migration-across-the-mediterranean; last accessed: September 2nd, 2019

a group-level difference-in-differences setting, where daily fixed effects are captured by the δ_t term, while γ_r covers the baseline effect of each migration route. As the $Policy$ vector already captures the interaction between time and the 'treated' route, the coefficients contained in β_1 will yield the impact of each policy on the dependent variable.

Finally, $Unrest$ specifies lags and moving averages for political unrest in the exit regions, while $PushShocks$ and $PullShocks$ are vectors of push and pull factors affecting the relative supply of migrants in a given route, in a given day. These factors should include those economic, cultural and geographic determinants which might affect the number of attempts in a given route and which are not already captured by route and time fixed affects.

$PullShocks$ includes lagged values for the monthly level of unemployment in the main destination of each of the three routes – so either Spain, Italy or Greece.

Given that modelling socio-economic shocks from each country of origin would generate an excessive loss of degrees of freedom, possibly leading to over-specification bias, $PushShocks$ controls for exogenous shocks specific to populations which only cross a single route. This term is obtained by first identifying, for each route, the monthly share of the nationalities which, during the full study window, have attempted crossing on this specific route.

This monthly ratio is then multiplied by the daily attempts, and then de-trended, to obtain an approximation of the daily variation in migrants whose preference for a single route is infinitely elastic with regards to the pull-factors conditioning access through the other routes. In other words, this term controls for variations in route-specific push-factors, which might pose as a source of bias for total amount of accesses which cannot already be controlled by the fixed effects terms in the model. While I could still assume route-specific migration shocks to be random and uncorrelated with the policy adoption, the very small number of groups in my analysis (n = 3) still requires shocks to be shared across the three routes for them not to affect the results.

The model proposed in equation (1) is then re-adapted to study daily mortality in each route, as in equation (2):

$$\begin{aligned} Deaths_{rt} = \beta_0 + Policy^{'}\beta_1 + Vessels_{rt}\beta_2 + Attempts_{rt}\beta_3 + Seastate^{'}\beta_4 + \\ Unrest^{'}\beta_5 + PullShocks^{'}\beta_6 + PushShocks^{'}\beta_8 + \gamma_r + \delta_t + \epsilon_{rt} \quad (2) \end{aligned}$$

where $Deaths_{rt}$ indicates the daily number of dead or missing migrants per route, while the fourth term in the right side of the equation refers to migration attempts in the same day. Compared to equation (1), this term is not a vector of lags and moving averages, but refers to the number of migration attempts on the same day.

Indeed, I assume that daily attempts might be affected by previous variations in mortality because of changes in the perceived risk of migration, but daily fatal accidents on the sea would be solely dependent on the number of attempts on the same day, as I assume the mortality rate $Deaths_{rt}/Attempts_{rt}$ to be exogenous to the number of attempts.[18]

Models (1) and (2) are more than sufficient for testing the impact of rescue-deterrence policies in terms of flow reduction and mortality. In these cases, potential reverse causality issues between flows and mortality are tempered by the assumption that these policies generate a permanent and exogenous change in perceived mortality rates.

I am, however, also interested in whether mortality itself affects flows as a deterrent, independently from policy actions. However, estimating the effect of variations of perceived mortality in the sea over migration attempts is a much more complicated issue.

First of all, how actors update their information on mortality should be discussed. A perfectly informed and rational actor would update his/her information on migration risk using the expectation $E[Deaths_{rt}/Attempts_{rt}]$ for the mortality coefficient. These expectation could be based on previous values for this coefficient, such as $Deaths_{rt-1}/Attempts_{rt-1}$ or a ratio of moving averages.

But do individuals really account for the denominator in this coefficient? Increases in absolute mortality in the sea might be caused by increases in flows, with relative mortality remaining fixed; but it seems difficult to believe that individuals would prioritize relative over absolute information on mortality.

The behavioural literature has presented evidence in support of this assumption. Availability heuristics (as first studied in Tversky and Kahneman, 1974) have been shown to influence individual expectations on the likelihood of an event based on 'the ease with which instances or occurrences can be brought to mind.' These heuristics can lead to biases where other relevant information is not as easily available. Large tragedies in the Mediterranean sea usually receive large media coverage and, due to their salience, tragic events might also be easier to recall. In contrast, information on flows might not be as easily available, or flows could be mistakenly held as fixed. This could lead to biases in decision making, where individuals would value absolute over relative mortality.

Also, even if the denominator were known, it is unlikely that individuals are immediately exposed to the mortality ratio, rather than having to compute that for themselves from absolute figures. Indeed, studies in affect heuristics (see Slovic et al., 2000) have shown how perceived risk is greater when information is updated through frequency-based scales rather than communicated through probabilities.

It follows that, in order to measure the effect of increases in mortality and its effects on the perceived risk of migration, absolute increases in mortality should be used as explanatory variables, rather than changes in relative mortality.

As discussed, the mortality rate is exogenous to attempts but perceived mortality – if informed by the aforementioned processes – is not, as total deaths are a function of attempts.

[18] Also, on a slightly more technical note, as the IOM already adjusts the date of fatal accidents to the most plausible day, there is no need to lag the co-variate group to account for delays in the reporting of deaths.

If individuals do not take into account the total number of attempts, and if perceived mortality is only affected by deaths, then perceived mortality is not exogenous, and the effects of reported deaths on attempts will be upwardly biased.

Removing this bias is then paramount. Further, lagging deaths is not a sufficient solution to the problem. As discussed in Bellemare et al. (2017), the use of lagged explanatory variables cannot appease endogeneity concerns when there are reasons to believe lagged values are still suffering from endogeneity. In this case, a different empirical strategy is needed.

For increases in absolute mortality to be really exogenous, these increases should be assigned independently from migration flows. The solution to this problem will come from an instrumental variable approach and, more precisely, by exploiting the random variation generated by relative mortality itself.

Indeed, as discussed earlier, and as will later be demonstrated, relative mortality is exogenous to the number of migration attempts, while still retaining relevant predictive power on absolute mortality. This means that instrumenting absolute mortality through its relative component will yield an unbiased estimate for the effect of each additional death in the Mediterranean on migration attempts. Filtered by this instrument, reported deaths become as good as random, as increases in absolute mortality are randomised through increases in relative mortality, controlling, in this way, for the stocks of flows already affecting the total number of dead or missing.

This being considered, the resulting first stage regressions will be:

$$\begin{aligned} Deaths^{'} = \beta_0 + Policy^{'}\beta_1 + Vessels_{rt}\beta_2 + Mortality^{'}\beta_3 + Seastate^{'}\beta_4 + \\ Unrest^{'}\beta_5 + PullShocks^{'}\beta_6 + PushShocks^{'}\beta_8 + \gamma_r + \delta_t + \epsilon_{rt} \end{aligned} \quad (3)$$

where $Deaths$ and $Mortality$ are vectors of lags and moving averages for absolute and relative mortality. Model (3), indeed, implies as many first stages as the number of lags in the model. For clarity purposes, I will use a one-day lag and a varying moving average for the past days, but more combinations are certainly possible.

Finally, these values from model (3) are plugged in the second stage equation (4):

$$\begin{aligned} Attempts_{rt} = \beta_0 + Policy^{'}\beta_1 + Vessels_{rt}\beta_2 + \widehat{Deaths}^{'}\beta_3 + Seastate^{'}\beta_4 + \\ Unrest^{'}\beta_5 + PullShocks^{'}\beta_6 + PushShocks^{'}\beta_8 + \gamma_r + \delta_t + \epsilon_{rt} \end{aligned} \quad (4)$$

where $\widehat{Deaths}$ is a vector of predicted values from the first stages in equation (3).

Finally, the nature of the model and data used requires a few words to be spent on the correct calculation of standard errors.

In panel difference-in-difference designs, it is often suggested that standard errors should be clustered by group and time. However, in instances, such as ours, when data is already

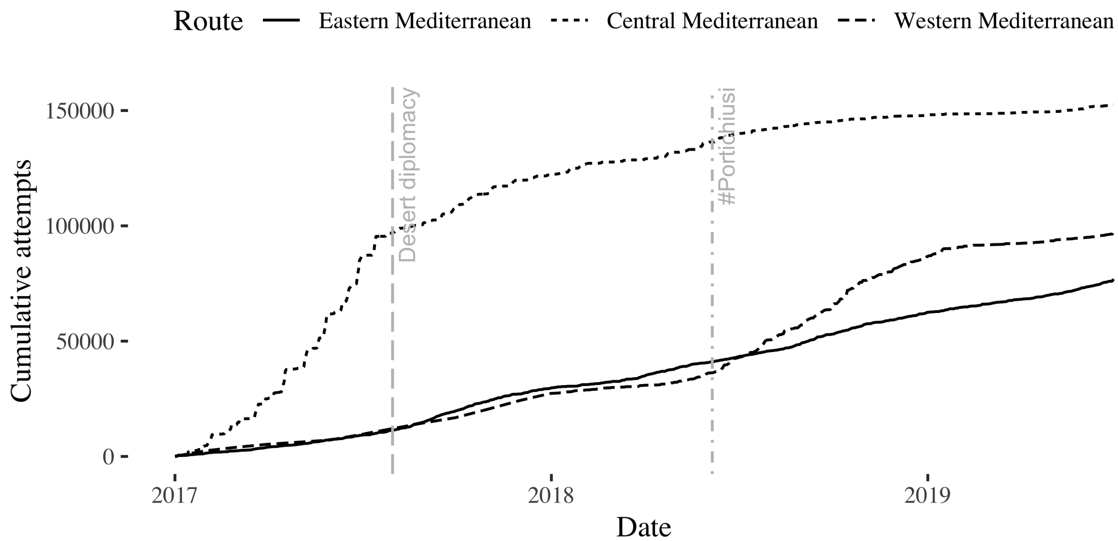

Figure 1: Cumulative migration attempts in the Mediterranean

aggregated at the group level, clustering standard errors by group and time is not any different from not clustering at all (Cameron and Miller, 2015). In these cases, it is suggested to simply cluster by group, and leave the time dimension unclustered (Cameron and Miller, 2015; Bertrand et al., 2004).

Collapsing individual data on the group level of aggregation in order to obtain more consistent standard errors is, after all, already a standard practice in the applied literature (see Bertrand et al., 2004).

However, in panels with small n and large t, we also need to account for serial correlation and time-wise heteroscedasticity. In these instances, an asymptotically efficient Panel Corrected Standard Errors (PCSE) estimator, as proposed by Beck and Katz (1995), is often considered appropriate. The estimator assumes disturbances to be serially correlated and heteroskedastic, and will then be used to produce robust standard errors for the remainder of the paper.

5 Deterrence and migration flows

Cumulative migration flows across the three routes, starting from January 2017, are plotted in figure 1.

While, naturally, the figure only focuses on the time-driven variation in flows, omitting the influence of other important predictors, preliminary visual evidence already suggests that the most significant impact on migration flows is linked with the introduction of the "desert diplomacy" approach under the Gentiloni government. Comparing trends in the Central Medi-

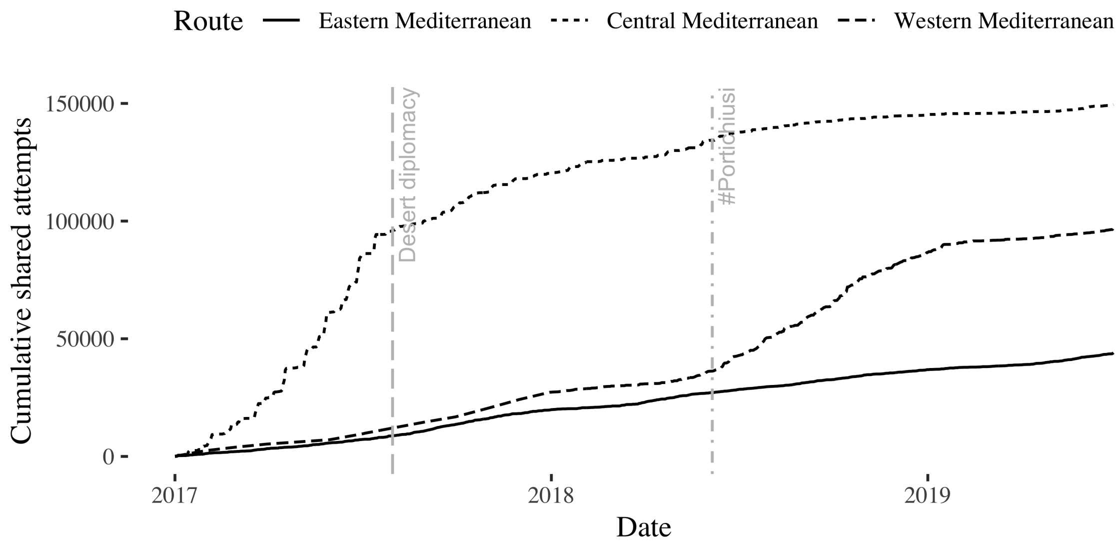

FIGURE 2: CUMULATIVE MIGRATION ATTEMPTS IN THE MEDITERRANEAN ($A \cap B \cap C$ SET)

terranean with the other routes, parallel trends in growth between the three routes have been disrupted by the introduction of the policy, after which the slope of the Central Mediterranean route has changed.

Rescue-deterrence policies (#Portichiusi) enacted during the Conte government, instead, do not seem to have had a great impact on flow reduction: indeed, since the introduction of Minniti's policies ("desert diplomacy"), cumulative attempts in the Central Mediterranean have grown linearly, suggesting that no significant change in trends has occurred. However, while trends in growth between the Central and Eastern Mediterranean have remained parallel, the Western route has witnessed a peculiar increase in accesses, suggesting that a relocation effect might have taken place.

Results from figure 1 might, however, be misleading: shocks unique to a specific route might lead to a bias in our estimates, especially if we suspect the presence of route-specific and time-dependent migration shocks from specific countries. In these cases, the only solution is to suppress the 'unique' components from flows, filtering out all entries from countries of origin where migrants do not have access to all three routes.

More formally, suppose that there are three sets of nationalities A, B and C. Nationalities in A have had at least one migrant attempting to cross, say, the Western Mediterranean route across the estimation window, and the same goes for the other sets and routes. Focusing on the $A \cap B \cap C$ subset enables us to focus only on those migrants who had the option to choose between the three routes, controlling for route-specific shocks.

I do so in figure 2, by obtaining the monthly proportion of shared flows from Frontex data s_{rt}, and applying this ratio to the daily number of arrivals. This method is valid as long as we assume that the daily nationality composition to reflect monthly figures, a decently reasonable simplification.

After adjusting flow figures for this component, previous trends appear to persist, including the relocation effect, which even experiences a higher relative increase.

Regression results are plotted in table 1. Column (1) estimates the baseline effect of the two policies, omitting all controls except for day and route fixed effects. I find a statistically significant reduction of 392 migrants per day after the introduction of Minniti's policies, and a statistically significant -122 reduction for Salvini's policies. Other regressors are then reintroduced in the next specification, until the full model is presented in column (5).

Column (2) introduces controls for absolute mortality – including a one-day lag and a moving average for the previous two weeks – and for the number of S&R vessels operating in the sea. Relative mortality controls are, instead, shown in the appendix. The policy coefficients are not particularly affected, and, as the next specification will confirm, it is worth considering that the presence of vessels does not appear to be connected to increases in migration activity, in contrast with the accusations that their presence has acted as a positive pull factor to refugee migration. The interpretation of the mortality coefficients is, instead, less straightforward, as these estimates for mortality are not robust to reverse causality: hence the positive coefficient for both regressors.[19]

Columns (3) and (4) introduce controls for sea state conditions, political instability at exit points and unemployment in the first arrival country. Weather conditions appear as a significant deterrent for migration behaviour, increasing the precision of the model.

Column (5) completes the model, adding controls for route-specific migration shocks. These controls reduce the effect of both the #Portichiusi (moving to -131.227, SE: 59.785) and desert diplomacy policy (-369.846, SE: 6.887). Other regressors retrieve their signs and magnitudes, with a few exceptions; notably, the 14 days moving average for political instability at exit point now becomes a statistically significant predictor of migration attempts. Column (7) retrieves the same specification, but changes the dependent variable so that only the $A \cap B \cap C$ subset is represented, as done for figure 2. The policy coefficients maintain a comparable magnitude.

Finally, as I suspect relocation effects to the Spanish route, in column (6) I add dummies for policy spill-over effects in the other routes, using the Eastern Mediterranean route as a baseline, to the specification from column (5). I repeat the same exercise in column (8), using the model from column (7).

These results suggest that, undoubtedly, a dislocation effect has been generated. However, given the limitations of the data at hand, it is not currently possible to find which of the two policies ultimately caused the dislocation effect in 2018. At best, the rescue-deterrence policies have generated a ≈157 individuals reduction in daily flows, at worse, this reduction is of only ≈46 refugees per day – and barely significant from a statistical standpoint as well.

[19] In any case, as will be discussed later, vessel present is also not immune to this issue.

Table 1: Effect of deterrence policies on daily migration attempts

	Daily migration attempts							
	Total Attempts						Shared Attempts	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
#Portichiusi	−122.033***	−126.731*	−159.237***	−158.160***	−131.227**	−56.944**	−156.669**	−45.571*
	(40.755)	(73.842)	(54.424)	(54.542)	(59.785)	(22.726)	(66.928)	(27.044)
#Portichiusi (W. Route)						92.375***		102.841***
						(10.110)		(9.030)
Desert diplomacy	−391.969***	−360.457***	−383.621***	−383.135***	−369.846***	−361.071***	−372.303***	−332.384***
	(10.434)	(20.443)	(16.688)	(12.924)	(6.887)	(23.310)	(18.346)	(25.097)
Desert diplomacy (W. Route)						−16.479		11.747
						(10.813)		(9.207)
No of S&R Vessels		−2.389	−9.770*	−9.711*	−7.024	−0.312	−11.164	0.752
		(7.998)	(5.521)	(5.157)	(4.969)	(4.876)	(7.035)	(5.564)
Reported Deaths (lag 1)		2.940***	2.925***	2.925***	2.923***	2.927***	2.899***	2.898***
		(0.223)	(0.203)	(0.203)	(0.215)	(0.217)	(0.195)	(0.214)
Reported Deaths (MA14)		5.283***	5.059***	5.058***	4.159***	3.506***	5.113***	3.256***
		(0.376)	(0.456)	(0.450)	(1.106)	(1.027)	(0.594)	(0.862)
Wind Storm 00h00			−38.981***	−39.020***	−38.629***	−36.130***	−35.823***	−32.322***
			(4.090)	(3.823)	(6.377)	(6.659)	(5.108)	(8.051)
Wind Storm (lag 1)			−24.090*	−24.138*	−22.038	−20.433	−26.196**	−20.573
			(14.272)	(13.915)	(13.590)	(14.076)	(12.519)	(13.474)
Thunder Storm 00h00			−16.953	−16.829	−19.011	−18.882	−17.983	−19.255
			(21.405)	(20.960)	(20.108)	(20.074)	(20.210)	(19.255)
Thunder Storm (lag 1)			−17.581**	−17.490**	−19.423**	−18.636**	−17.261*	−17.477*
			(8.662)	(8.871)	(8.895)	(9.177)	(8.849)	(9.353)
Instability at exit point (lag 1)			−9.609	−9.618	−8.498	−8.269	−9.057	−7.596
			(8.454)	(8.447)	(9.208)	(9.269)	(8.226)	(9.052)
Instability at exit point (MA14)			−13.289	−12.584	−13.916***	−28.127***	−10.747	−33.531***
			(12.834)	(7.752)	(4.717)	(3.796)	(7.985)	(5.206)
Youth unemp. in host country (log, lag 5 months)				−36.009	−90.520	219.977	−135.419	312.283
				(278.925)	(253.148)	(329.335)	(285.290)	(302.867)
Country of origin controls	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*No*	*No*
Route fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Time fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.43	0.45	0.455	0.455	0.475	0.478	0.459	0.482
Adjusted R^2	0.143	0.172	0.177	0.176	0.206	0.208	0.182	0.216
Observations	2,733	2,691	2,691	2,691	2,691	2,691	2,691	2,691

Note: *p<0.1; **p<0.05; ***p<0.01

Beck and Katz (1995) Panel Corrected Standard Errors, clustered by route.

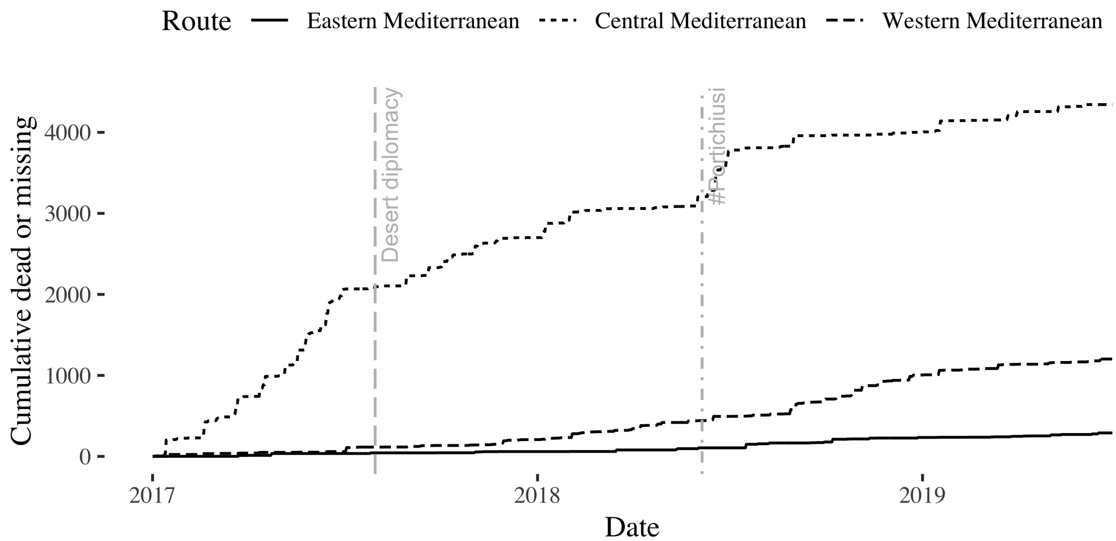

Figure 3: Cumulative reported dead-or-missing in the Mediterranean

Until further evidence is available, discerning whether rescue-deterrence policies in the Central Mediterranean have had an immediate (as exemplified in figures 1 and 2) effect on migration flows towards Spain, or whether the relocation effect has been generated by previous "desert diplomacy" attempts, disrupting migration routes to the coast from within Libya, is left to the judgement of the reader.

In any case, it is evident – both from visual evidence and from coefficient analysis – that total flows in the Mediterranean have not changed much since the introduction of the policy, even if countries like Italy or Malta were comparatively less affected. Holding the Eastern Mediterranean route as the baseline, differences in the rescue-deterrence coefficients from column (6) point at an increase in 35.431 migrants per day across the Western and Central routes, with a 24.873 standard error: after the introduction of rescue deterrence policies, total refugee migration flows have barely changed at all.

6 Deterrence and human costs

Trends in absolute mortality in the Mediterranean are reported in figure 3 where, again, cumulative sums for each of the three routes are plotted, starting from January 2017. As mentioned earlier, I also filter by source using the quality criteria set by the IOM, so that only reported deaths than can be fully attributed to migration attempts are estimated. The true mortality rate could then, be, understated.

On the one hand, the figure suggests that trends in mortality have followed a linear path over the entire estimation window in both the Eastern and Western Mediterranean routes.

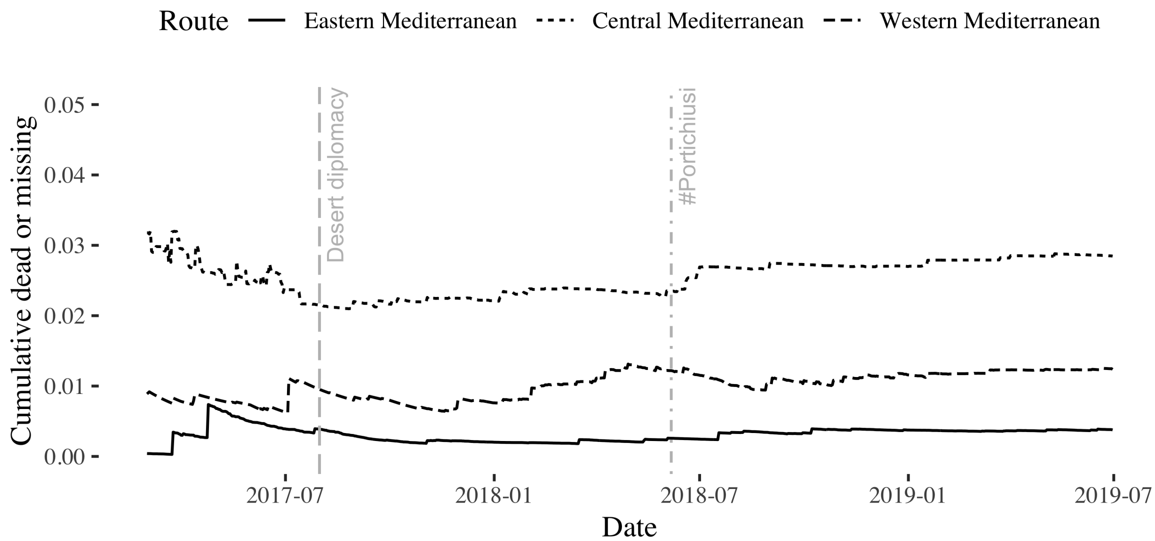

FIGURE 4: CUMULATIVE DEAD-OR-MISSING OVER CUMULATIVE ARRIVALS IN THE MEDITERRANEAN

On the other hand, the Central Mediterranean route has experienced two discontinuities in regard to the occasion of the introduction of the two policies. Indeed, since the introduction of "desert diplomacy", mortality in the sea has seen a significant reduction,[20] while "#Portichiusi" rescue-deterrence policies seems to have generated an opposite effect, increasing mortality by a significant margin.

What is disconcerting, at least from this initial visual evidence, is that, after the introduction of rescue-deterrence policies, trends in absolute mortality in the Eastern and Western routes have been proportional to the flows in migration while, in the Central route, mortality has increased, even if migration flows, as seen earlier, have diminished.

Figure 4 provides some further checks to these findings, showing changes in the ratio between cumulative dead-or-missing accidents and cumulative migration attempts in the Mediterranean.[21] As the ratio in the Central route increases after the introduction of rescue-deterrence policies, the previous interpretation remains fundamentally unchanged.

Table 2 presents regression output for the effect of deterrence policy on absolute mortality. As migration attempts, being included among the covariates, are already controlled for in the model, there is no reason to worry about the relocation effect which affected previous estimates.

Column (1) introduces a basic specification including the policy vector and migration attempts as controls. These first results might falsely suggest that rescue-deterrence policies have had no effect on mortality rates. Further controls are introduced until the full model is

[20] Increases in mortality on land are not to be excluded, but their study goes beyond the aims of this research.
[21] The first months are censored so that the ratio can stabilise.

Table 2: Effect of deterrence policies on daily mortality

	Daily reported dead or missing						
	Total dead or missing					Minus S&R	Mortality Rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
#Portichiusi	0.154	4.426***	4.333***	4.424***	4.444***	3.938***	0.075***
	(0.113)	(0.623)	(0.701)	(0.563)	(0.639)	(0.609)	(0.026)
Desert diplomacy	−2.942***	0.069	−0.043	0.444	0.434	−0.648	−0.055***
	(0.374)	(0.552)	(0.539)	(0.624)	(0.660)	(0.631)	(0.017)
Migration Attempts	0.011***	0.011***	0.011***	0.010***	0.010***	0.010***	−0.0001***
	(0.0005)	(0.0005)	(0.0004)	(0.0005)	(0.0004)	(0.0003)	(0.00001)
No of S&R Vessels		0.865***	0.842***	0.891***	0.881***	0.745***	0.015**
		(0.138)	(0.155)	(0.139)	(0.149)	(0.143)	(0.007)
Wind Storm 00h00			0.116	0.111	0.120	0.188	0.011***
			(0.277)	(0.201)	(0.215)	(0.235)	(0.004)
Wind Storm (lag 1)			−0.338	−0.086	−0.101	−0.041	−0.010
			(0.281)	(0.458)	(0.439)	(0.458)	(0.010)
Thunder Storm 00h00			−0.435	−0.465	−0.473	−0.631	0.003
			(0.584)	(0.581)	(0.597)	(0.626)	(0.013)
Thunder Storm (lag 1)			−0.155*	−0.213***	−0.219***	−0.276	−0.009
			(0.089)	(0.080)	(0.084)	(0.250)	(0.009)
Instability at exit point (lag 1)				0.801*	0.799*	0.844*	0.007
				(0.425)	(0.427)	(0.447)	(0.004)
Instability at exit point (MA14)				−0.823	−0.835	−0.993	0.023
				(0.837)	(0.861)	(0.913)	(0.016)
Youth unemp. in host country (log, lag 5 months)				3.501	2.796	2.787	−0.269**
				(3.688)	(3.693)	(3.135)	(0.107)
Country of origin controls	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*
Route fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Time fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.087	0.1	0.101	0.4	0.4	0.4	0.382
Adjusted R^2	0.086	0.099	0.099	0.094	0.092	0.092	0.065
Observations	2,733	2,733	2,733	2,691	2,691	2,691	2,691

Note: *p<0.1; **p<0.05; ***p<0.01
Beck and Katz (1995) Panel Corrected Standard Errors, clustered by route.

achieved in column (5). Column (2) introduces the number of active NGO S&R vessels as a control, overturning previous results, and suggesting that reverse correlation affected estimates from column (1): this time, the effect of "desert diplomacy" appears not statistically different from zero, while an increase in 4.426 deaths per day is revealed after the appointment of Giuseppe Conte's government. It is important to note that the presence of S&R vessels is not exogenous to the number of deaths, as these vessels are already operated in response to increases in total mortality in the Mediterranean: the estimate for the vessels coefficient is, then, not robust to reverse causality.

Column (3) adds controls for the sea state, while column (4) adds further push and pull factor controls. Column (5) controls for migration shock. In conformity with the estimates from table 1, sea state controls suggest a negative effect of adverse conditions (one day earlier) on mortality, given the reduction of migration attempts. The other controls add more noise to the model, as expected, with the adjusted r-squared being reduced from their inclusion. The coefficient for the policy vector confirm a 4.444 increase in absolute mortality caused by the introduction of rescue-deterrence policies, while the previous policy attempt still does not reach the 5% significance level.

As discussed earlier, data on missing migrants in the Mediterranean is collected from multiple sources. Since some of these sources are, indeed, rescue vessels, the reduction of search and rescue activities in the Mediterranean route caused by the deterrence policy itself might stand as a potential source of bias. Indeed, it is straightforward that, for each additional NGO ship involved in search and rescue ceasing operations, the probability of deaths in the sea being reported by one of these vessel lowers considerably.

This could pose as a significant source of downward bias, as the number of S&R vessels is correlated with the introduction of the policy, meaning that our estimates will underestimate the effect of the deterrence policy in terms of mortality rates.

These hurdles, however, can be easily overcome. Indeed, I discussed how IOM missing migrants data details the original source of information for each record. In this way, I were able to filter out all casualties reported by S&R vessels, producing an alternate variable $Deaths^*_{tr}$ where the post-policy variation in deaths is not caused by the reduction of operational S&R vessels. While total mortality will still be lower, differential rates in mortality before and after the introduction of the policy should not be biased by the introduction of the policy.

Figures for the effect of the effect of deterrence policies on $Deaths^*_{tr}$ are presented in column (6). Interestingly, the difference in the policy coefficients between columns (5) and (6) is positive, suggesting that S&R vessels still play an important role in reporting dead or missing individuals, and that most bias concerns can be disregarded.

Finally, a new specification is presented in column (7), this time using relative mortality ($Deaths_{tr}/Attempts_{tr}$) as the dependent variable. Estimates reveal a change in the relative mortality of 0.075% and -0.055% for the policies of Salvini and Minniti, respectively. Also, the magnitude of the attempts coefficients is so small it can effectively be argued that the mortality rate is independent from attempts, as I discussed earlier. Reverse causality concerns for the effect of vessels presence on mortality rates persist.

7 Deterrence of mortality

I now turn to the final question addressed in this paper. Previous results did not provide any evidence on the channel through which rescue-deterrence can affect migratory patterns. Given that rescue-deterrence implies an increase in the risk of crossing the sea as a deterrent to migration, it should be questioned how changes in mortality can affect decisions to interrupt ongoing migration attempts.

This question is addressed in table 3, where instrumental variable estimates for the effect of absolute mortality on migration attempts are shown. As discussed in section 4, daily reported deaths – the endogenous variable – are instrumented through relative mortality, referring to ratio between deaths and migration. Reduced form estimates showing the direct effect of relative mortality on migration attempts are shown in table 4 in the appendix.

The models from table 3 retain the same co-variates from table 1, column (6), with only the endogenous variable vector *Deaths* being replaced. Column (1) contains a single one-day lag in said vector. Columns (2) to (4) switch the endogenous variables vector between pairings of one-day lags and varying moving averages for the days preceding t – moving from 3, to 7 and finally 14 days before each attempt. In all cases, all first stage specifications successfully pass the F-tests for excluded instruments, suggesting that relative mortality is indeed a relevant predictor for absolute mortality.

Looking at the main estimates for the effect of mortality, results are now overturned, evidencing that endogeneity concerns for absolute mortality were, indeed, valid. The effect of increases in mortality one day before the migration attempt is turned negative, ranging between a 1.450 and 2.141 reduction in migrants attempting crossing per day. Most importantly, analysis of the moving averages coefficients reveals this to reduction to be explained as temporary near-term displacement. Indeed, no effect is detected within the 3 days window, and the reduction of migration attempts is completely re-absorbed after 7 days, suggesting that refugees do not reverse their migration decision as a consequence of increases in the risk of crossing, but only postpone their departure by a few days.

While these results are only valid for the first 14 days, and are supposed to affect migration decisions already taken (and not initial migration decisions), the fact that the "#Portichiusi" policy coefficient loses all its statistical significance indicates that its remaining components, including, as found earlier, the permanent increase in mortality, are also ineffective in reducing migration flows.

The insignificance of the policy coefficient in Italy indicates that the remaining variation

Table 3: Effect of mortality on migration attempts

	Daily migration attempts			
	Total Attempts			
	(1)	(2)	(3)	(4)
#Portichiusi	−20.367	−19.416	−37.940	−42.662
	(23.313)	(22.361)	(32.151)	(28.823)
#Portichiusi (W. Route)	107.224***	107.698***	101.186***	98.499***
	(11.356)	(11.335)	(12.131)	(11.107)
Desert diplomacy	−390.612***	−392.273***	−376.570***	−373.058***
	(16.579)	(18.669)	(13.576)	(15.993)
Desert diplomacy (W. Route)	−2.954	−2.528	−8.196	−11.520
	(10.381)	(10.387)	(11.227)	(10.364)
No of S&R Vessels	7.422	7.655	3.871	3.095
	(5.336)	(5.197)	(6.764)	(6.065)
Reported Deaths (lag 1)	−1.450***	−1.268***	−2.141***	−2.032***
	(0.371)	(0.300)	(0.515)	(0.410)
Reported Deaths (MA3)		−0.522		
		(1.135)		
Reported Deaths (MA7)			4.244**	
			(1.837)	
Reported Deaths (MA14)				5.042***
				(0.774)
Wind Storm 00h00	−33.256***	−33.133***	−34.315***	−34.234***
	(7.442)	(7.445)	(7.301)	(7.080)
Wind Storm (lag 1)	−21.415	−21.264	−22.844	−22.567
	(15.491)	(15.530)	(15.252)	(15.337)
Thunder Storm 00h00	−22.452	−22.743	−19.647	−20.208
	(19.455)	(19.637)	(18.852)	(18.235)
Thunder Storm (lag 1)	−22.961*	−23.069*	−19.947*	−20.536*
	(12.870)	(12.810)	(11.714)	(11.441)
Instability at exit point (lag 1)	−8.814	−8.919	−8.309	−9.111
	(8.610)	(8.676)	(8.010)	(8.523)
Instability at exit point (MA14)	−36.499***	−36.655***	−33.719***	−30.299***
	(4.905)	(5.158)	(2.893)	(3.712)
Youth unemp. in host country (log, lag 5 months)	333.480	336.601	298.914	268.669
	(363.611)	(365.567)	(350.728)	(329.016)
Country of origin controls	*Yes*	*Yes*	*Yes*	*Yes*
Route fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Time fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Adjusted R^2	0.172	0.169	0.168	0.169
First Stage (1): Adj. R^2	0.141	0.142	0.144	0.152
First Stage (1): F Test	81.385	86.595	90.746	1925.109
First Stage (2): Adj. R^2		0.205	0.338	0.581
First Stage (2): F Test		203.446	287.186	260.202
Observations	2,691	2,691	2,691	2,691

Note: *p<0.1; **p<0.05; ***p<0.01

Beck and Katz (1995) Panel Corrected SEs, clustered by route.

(1) First stage for endogenous variable: Reported Deaths (lag 1)

(2) First stage for endogenous variable: Reported Deaths (MA3-14)

in flows linked with the policy introduction is mostly driven by random shocks, and that the only significant reduction in flows is to be attributed to relocation effects, which might have been, in turn, generated by the previous "desert diplomacy" approach.

Overall, these results reinforce the view that forced migration is qualitatively different from economic migration, supporting of previous findings in the literature suggesting that forced migrants are characterised by extremely low levels of risk-aversion.

8 Conclusions

It is widely considered that coordination in refugee migration policies and asylum procedures in the EU has been lacking, leaving the EU destination countries to deal with the crisis by themselves. Persistence of flows, dissatisfaction with the EU framework and political opportunism from national-populist forces have led to an unprecedented strengthening of anti-migrant sentiment in the countries involved. In Italy, the appointment of a new government in June 2018 heralded the beginning of a novel rescue-deterrence stance in migration, which set to reduce migration flows by effectively making the crossing of the Mediterranean riskier.

Based on high-frequency data on migration flows and migrant disappearances in the Mediterranean across three major migration routes, I provide empirical evidence on the effect of rescue-deterrence policies on both flows and mortality rates, and investigate the effect of increases in absolute mortality on decisions to continue ongoing migration attempts.

I find that both absolute and relative mortality in the route towards Italy and Malta have increased by at least 4 deaths per day since the introduction of the policy, and that this increase in mortality has been accompanied by a very modest reduction in flows. Finally, this work shows that forced migration flows do respond to short-term changes in mortality, but that this effect is only temporary, as migration attempts are delayed and reabsorbed within few weeks. Notably, there is also evidence to suggest that permanent increases in mortality are also ineffective. These findings suggest that risk aversion among refugees might be particularly low.

In the view of the author, the evidence uncovered by this paper provides a strong point in support of the repeal – or a large revision – of rescue-deterrence practices in migration policy. Signalling the abdication of a responsibility to rescue refugees in distress, while hindering the humanitarian initiatives engaged in search and rescue operation, is not only relatively ineffective as a strategy for flow disruption, but most importantly carries an unacceptable cost in terms of human lives.

References

Akgüç, M., Liu, X., Tani, M., and Zimmermann, K. F. (2016). Risk attitudes and migration. *China Economic Review*, 37:166–176.

Beck, N. and Katz, J. N. (1995). What to do (and not to do) with Time-Series Cross-Section Data. *The American Political Science Review*, 89(3):634–647.

Bellemare, M. F., Masaki, T., and Pepinsky, T. B. (2017). Lagged Explanatory Variables and the Estimation of Causal Effect. *The Journal of Politics*, 79(3):949–963.

Bertrand, M., Duflo, E., and Mullainathan, S. (2004). How Much Should We Trust Differences-In-Differences Estimates? *The Quarterly Journal of Economics*, 119(1):249–275.

Bocquého, G., Deschamps, M., Helstroffer, J., and Joxhe, M. (2018). Risk and Refugee Migration. CREA Discussion Paper Series 18-08, Center for Research in Economic Analysis, University of Luxembourg.

Borjas, G. J. (1989). Economic Theory and International Migration. *International Migration Review*, 23(3):457–485. PMID: 12282789.

Brück, T., Dunker, K., Ferguson, N., Meysonnat, A., and Nillesen, E. E. (2018). Determinants and Dynamics of Forced Migration to Europe: Evidence from a 3-D Model of Flows and Stocks. IZA Discussion paper series No. 11834, IZA - Institute of Labor Economics.

Callen, M., Isaqzadeh, M., Long, J. D., and Sprenger, C. (2014). Violence and Risk Preference: Experimental Evidence from Afghanistan. *American Economic Review*, 104(1):123–148.

Cameron, A. C. and Miller, D. L. (2015). A Practitioner's Guide to Cluster-Robust Inference. *Journal of Human Resources*, 50(2):317–372.

Deschenes, O. and Moretti, E. (2009). Extreme weather events, mortality, and migration. *The Review of Economics and Statistics*, 91(4):659–681.

Dustmann, C., Fasani, F., Frattini, T., Minale, L., and Schönberg, U. (2017a). On the economics and politics of refugee migration. *Economic Policy*, 32(91):497–550.

Dustmann, C., Fasani, F., Meng, X., and Minale, L. (2017b). Risk Attitudes and Household Migration Decisions. IZA Discussion paper series No. 10603, IZA - Institute of Labor Economics.

Facchini, G., Lorz, O., and Willmann, G. (2006). Asylum seekers in europe: the warm glow of a hot potato. *Journal of Population Economics*, 19(2):411–430.

Hangartner, D., Dinas, E., Marbach, M., Matakos, K., and Xefteris, D. (2019). Does Exposure to the Refugee Crisis Make Natives More Hostile? *American Political Science Review*, 113(2):442–455.

Hatton, T. J., Richter, W. F., and Faini, R. (2004). Seeking asylum in europe. *Economic Policy*, 19(38):5–62.

IOM (2018). Mixed migration flows in the Mediterranean, Compilation of Available Data and Information, June 2018. Report, International Organization for Migration.

Jaeger, D. A., Dohmen, T., Falk, A., Huffman, D., Sunde, U., and Bonin, H. (2010). Direct Evidence on Risk Attitudes and Migration. *The Review of Economics and Statistics*, 92(3):684–689.

Lee, E. S. (1966). A Theory of Migration. *Demography*, 3(1):47–57.

Melander, E. and Öberg, M. (2007). The Threat of Violence and Forced Migration: Geographical Scope Trumps Intensity of Fighting. *Civil Wars*, 9(2):156–173.

Neumayer, E. (2005). Bogus Refugees? The Determinants of Asylum Migration to Western Europe. *International Studies Quarterly*, 49(3):389–409.

Raleigh, C., Linke, A., Hegre, H., and Karlsen, J. (2010). Introducing ACLED: An Armed Conflict Location and Event Dataset. *Journal of Peace Research*, 47(5):651–660.

Rodriguez, C. and Villa, E. (2012). Kidnap risks and migration: evidence from colombia. *Journal of Population Economics*, 25(3):1139–1164.

Schmeidl, S. (1997). Exploring the Causes of Forced Migration: A Pooled Time-Series Analysis, 1971-1990. *Social Science Quarterly*, 78(2):284–308.

Slovic, P., Monahan, J., and MacGregor, D. G. (2000). Violence risk assessment and risk communication: The effects of using actual cases, providing instruction, and employing probability versus frequency formats. *Law and Human Behavior*, 24(3):271–296.

Tversky, A. and Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157):1124–1131.

Vieider, F. M. (2018). Violence and Risk Preference: Experimental Evidence from Afghanistan: Comment. *American Economic Review*, 108(8):2366–2382.

Vogler, M. and Rotte, R. (2000). The effects of development on migration: Theoretical issues and new empirical evidence. *Journal of Population Economics*, 13(3):485–508.

A Appendix

Table 4: Reduced form effect of relative mortality on migration attempts

	Daily migration attempts			
	Total Attempts			
	(1)	(2)	(3)	(4)
#Portichiusi	−23.522	−23.238	−25.124	−31.007
	(22.498)	(22.275)	(23.631)	(25.142)
#Portichiusi (W. Route)	105.398***	105.406***	105.627***	105.844***
	(11.137)	(11.089)	(11.181)	(11.364)
Desert diplomacy	−385.188***	−385.144***	−385.853***	−386.332***
	(16.802)	(16.727)	(17.297)	(17.899)
Desert diplomacy (W. Route)	−3.731	−3.553	−4.323	−5.444
	(10.651)	(10.627)	(10.602)	(10.860)
No of S&R Vessels	6.556	6.566	6.549	6.260
	(5.122)	(5.104)	(5.181)	(5.405)
Relative Mortality (lag 1)	−30.667***	−27.508***	−33.265***	−35.643***
	(5.872)	(5.034)	(5.654)	(5.724)
Relative Mortality (MA3)		−9.401		
		(9.331)		
Relative Mortality (MA7)			30.886*	
			(17.516)	
Relative Mortality (MA14)				117.955***
				(25.021)
Wind Storm 00h00	−34.068***	−33.955***	−34.100***	−34.148***
	(7.341)	(7.232)	(7.304)	(7.138)
Wind Storm (lag 1)	−20.498	−20.452	−20.816	−20.559
	(14.965)	(14.913)	(15.101)	(14.796)
Thunder Storm 00h00	−20.730	−20.557	−20.680	−20.929
	(20.270)	(20.265)	(20.162)	(20.108)
Thunder Storm (lag 1)	−22.297*	−22.104*	−22.864*	−22.951*
	(12.017)	(11.990)	(12.249)	(12.048)
Instability at exit point (lag 1)	−8.578	−8.558	−8.668	−8.692
	(8.792)	(8.783)	(8.871)	(8.823)
Instability at exit point (MA14)	−34.886***	−34.703***	−35.380***	−35.390***
	(4.021)	(4.020)	(4.352)	(4.377)
Youth unemp. in host country (log, lag 5 months)	313.451	313.874	310.137	310.875
	(358.085)	(357.342)	(359.457)	(360.388)
Country of origin controls	*Yes*	*Yes*	*Yes*	*Yes*
Route fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Time fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
R^2	0.466	0.466	0.466	0.466
Adjusted R^2	0.191	0.191	0.191	0.191
Observations	2,691	2,691	2,691	2,691

Note: *p<0.1; **p<0.05; ***p<0.01
Beck and Katz (1995) Panel Corrected SEs, clustered by route.