Human Smuggling and Intentions to Migrate to Europe[*]

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FIRST DRAFT - NOT FOR CITATION OR CIRCULATION

Abstract

This paper investigates the role of the human smuggling industry in shaping individual intentions to migrate between origin and destination countries. We employ an indirect approach to measure 'unobserved' variables and combine cross-country survey data on individual intentions to migrate from Africa and the Middle-East to European countries with bilateral distances measured along geolocalized migration routes. The latter are land and sea routes typically used by human smugglers for South-North irregular border crossing. Hence, we exploit the 2011 Libyan civil war as an exogenous shock to bilateral distances to identify the impact on individual migration intentions. Time variation in migration routes allows us to control for country pair fixed effects, along with country-time fixed effects. We find a strong negative effect of distance along smuggling routes on individual migration intentions. Shorter distance increases the willingness to migrate especially for youth, and significantly more for male and educated individuals than for females and illiterates respectively.

JEL codes: K23, K42
Keywords: International Migration, Human Smuggling, Illegal Migration, Libyan Civil War

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1 Introduction

Worldwide migration pressure is expected to rise with growing demographic and economic differences between developed and developing countries. One of the most controversial aspect of global migration flows - which generates an enduring public policy debate in several destination countries - is undocumented or illegal migration. In general, there is no indication that there has been a decrease in the willingness of people to move across international borders despite high legal barriers to migrations (Docquier et al. 2014). The latter, though, increase migration costs and creates the business for intermediaries in the form of human smuggling and trafficking (Friebel and Guriev, 2006). This paper contributes to the literature on the determinants of international migration by assessing the impact of distance along irregular migration routes – those typically used by the smuggling industry – on the individuals' intention to migrate.

Human smuggling and the facilitation of illegal entry to states for profit is the third largest transnational crime (following drug and arms trafficking), which has been dramatically growing across the Mediterranean area over the last few years. It has been argued that immigration enforcement activities may increase the economic returns to the smuggling business and divert migration routes for irregular migrants. Human smuggling services involve increasingly sophisticated networks between origin and destination countries and there is now relatively abundant anecdotal evidence on how this business works in facilitating (with high monetary and non-monetary costs) the transit of workers, refugees and their families across international borders.

In this paper we build novel geocoded data of irregular migration routes from Africa and the Middle-East toward Europe to investigate the role of the human smuggling infrastructure in shaping, all else equal, individual migration intentions between countries. We do so by employing an indirect approach and using exogenous variation in the migration routes coming from the 2011 civil war in Libya, in particular the end of the Gaddafi regime. The latter resulted, as a side effect, in the opening up of the Central Mediterranean Route (CMR), which is a major (and most risky) route typically used by smugglers of migrants for illegal border crossing

A sizeable amount of research has been conducted on the determinants of international migration, which is the equilibrium outcome of demand and supply factors. On the supply side, flows have been shown to be a function of migrants' decision to move according to economic incentives (e.g. Borjas, 1987; Chiswick, 1999 and Mayda, 2010) while, on the demand side, flows are shaped by destination countries' migration policies (Ortega and Peri 2013) and, most importantly, labor market conditions (Hanson 2009). Yet, international migration increasingly depends on the perceived opportunity to actually move across countries and the legal possibility to migrate does not remove the incentive for illegal migration – especially when economic incentives are high (Hanson and Spilimbergo, 1999). On the one hand host countries' restrictive policies, such as border controls, may increase the costs of moving. On the other hand, access to intermediaries or smuggling services – i.e., the support needed to enter the country of destination, to overcome legal barriers, find work etc. – are likely to ease migration barriers and cross-country relocation.

While there is evidence on the (strong) impact of socio-economic incentives and (weak impact of) legal barriers on the migration choice, little evidence exists on the role of human smuggling in shaping the size, composition and direction of (irregular) migrant flows. This paper makes an attempt to better understand the role of the smuggling industry by using a natural experiment that, indirectly, generates a shock to the supply of smuggling services. However, since illegal migration is not without (high) costs and risk, the marginal impact of its supply industry is likely to be different across individuals. Our empirical data and framework accommodate this heterogeneity across sub-groups of the population and helps shedding light on different channels at play.

For the sake of our analysis, two aspects of the South-North smuggling industry are key, namely that it is an illegal business (i.e. it offers services to irregular migrants) and makes use of major (typically land and sea) migration routes. For African migrants without European travel visas, the most viable way to move northward is that of travelling through the trans-Saharan and maritime ruotes.[1] Migration routes are typically shaped on old ones used

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[1]According to Europol-INTERPOL 2016, more than 90% of the migrants coming to the EU are facilitated, mostly by members of a criminal network. Not all migrants are actually able to go beyond North Africa, putting their journey to an end in one of the Mediterranean coastal countries (especially in Libya and in Maghreb, where nowadays almost 2 millions of irregular migrants live). Yet, an increasing share of the migration stream uses Mediterranean sea routes.

by caravans and during transumanza through the desert, while new routes have been slowly developing based on smuggling competition and human exploitation (see Imap). Geographical distance, migration routes and human smuggling services have been shaping migrants' origins across Africa but still not reducing the migratory pressure from Libya, which still remains the major hub of people migrating towards Italy and the main spot of departure for the European dream. Yet, Libyan borders have been 'closed' during the 2008 Friendship Treaty with Italy, which allocated significant fundings to fight illegal migration, in particular via sea. Border controls and migrants' retention collapsed unilaterally in 2011, due to the Libyan civil war that ended with the killing of Colonel Gaddafi.[2] Hence, if we depict Africa-to-Europe migration routes as a network (with hotspost as nodes), it follows that the opening up of Libyan borders and central Mediterranean routes right after 2011 makes many nodes in the network closer than before, potentially easing the prospective migrants' chances to move northward. According to official statistics, the number of people crossing the central Mediterranean route was 4500 in 2010, while in 2011 it increased by a factor of almost 15, reaching 64300.[3]

In the empirical analysis we use a large, repeated cross-country survey dataset from 2010 and 2012 on individual migration intentions between origin and destination countries in Africa, the Middle East and Europe respectively. In particular, we exploit the exogenous variation in sea distance across different smuggling routes driven by the availability of the central Mediterranean route. The changes in the routes came about with the Arab Springs and the opening of Libya channel. We use this change to identify the impact of the aggregate supply of smuggling services on individual intentions to migrate. While we work with intentions instead of actual migration, for our purpose it has an important advantage, namely that it includes not only regular but also irregular potential migrants. Several authors have shown that there is a high correlation between aspirations or intentions and the actual migration ???.

The empirical model estimates individual bilateral migration intentions as a function of this newly-geocoded time-varying length of migration routes, while controlling for individual

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[2]On February 26, 2011, the Friendship Treaty signed between Italy and Libya on August 31, 2008 was suspended by the Italian government.

[3]http://frontex.europa.eu/trends-and-routes/centralmediterranean-route/

level characteristics, time-varying country-specific and country-pair fixed effects. The latter absorb all economic incentives and policy related determinants of (legal) migration such that identication comes from the change in migration distance along irregular migration routes. In particular, pair fixed effects allow us to control fo all long-run (between 2010-2012) static differences – including geographical distance, bilateral agreements, economic, language and cultural proximity– between countries, so that the impact of the change in distance estimated in our analysis directly captures the impact of human smuggling supply on the individual plans to migrate. Moreover, we investigate heterogeneous effects by interacting our measure of availability of human smuggling services (proxied by the time-varying migration distance) with individual-level characteristics. Indeed, irregular migration entails high (monetary and non-monetary) costs such that, by differenting the impact across the individual's age, gender, number of dependends and literacy, we characterise the likelihood to respond to the incentive for irregular migration.

All else equal, results point to a strong negative effect of the distance connecting country pairs along illegal routes on the willingness to migrate. The distance effect is significant only for youth and much stronger for males, and educated individuals (more than primary education) than for females and low-skilled respectively. This is consistent with a model where individual migration decisions depend on economic incentive factors along with migration costs and the actual opportunity to (legally o illegally) cross international borders.

The rest of the paper is organized as follows. Section 2 describes the background and analytical framework. Data are presented in Section 3 while Section 4 describes the empirical strategy. Results are reported in Section 6. Section 7 concludes.

2   South-North irregular migration

During the Gaddafi regime until 2010, the CMR was essentially a closed route for irregular migration, since Libyan borders were heavily patrolled by local and international police. In 2008 in fact, Italy signed the Friendship Treaty with Libya with the aim of investing even more in border control and fighting irregular migration, especially via sea. Article 19 of the Treaty, signed by Gaddafi and Berlusconi, called for two things in particular. On the one
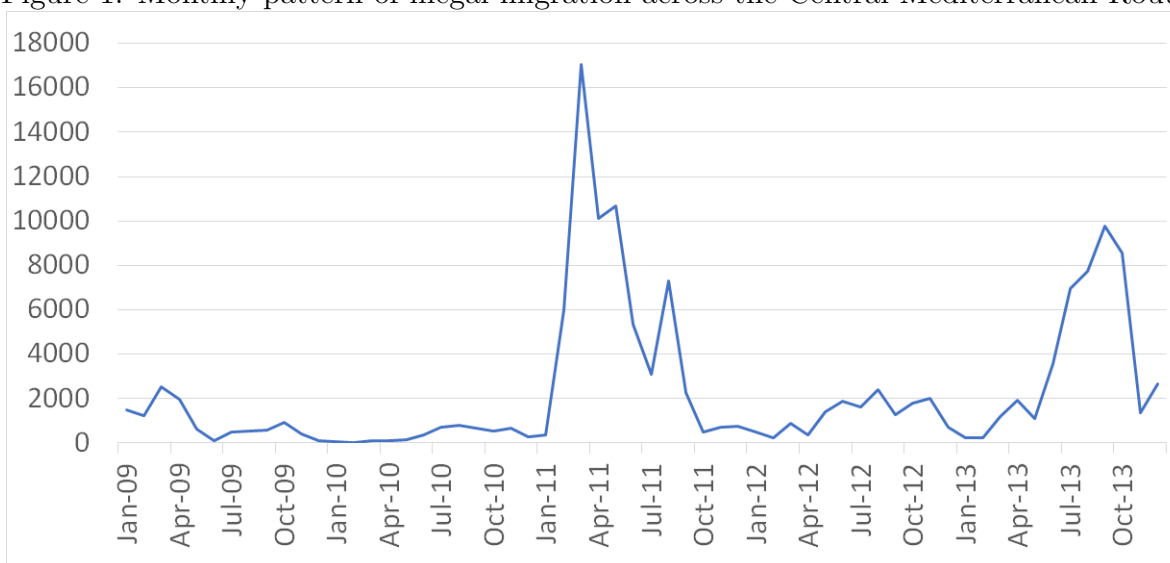
hand, the approximately 2000 km of Libyan coast are to be patrolled by mixed crews on patrol boats provided by Italy. Six patrol boats were supposed to enter into operation in May 2009. On the other hand, Libyan land borders are to be controlled by a satellite detection system jointly financed by Italy and the European Union. Yet, in 2011, a wave of sudden riots and revolts, known as the Arab Spring, shaken up the socio-politic environment of many African Mediterranean countries. Popular revolts started in Tunisia in mid December 2010 and in 14 months rulers in Tunisia, Egypt, Libya and Yemen had been forced from power. In particular, in 2011 a lot of Tunisian people left the country through the CMR, while as from late 2011 the Gaddafi autocratic regime collapsed and Libyan borders suddenly become available to undocumented migration.

By using Frontex data sources, Figure 1 shows a flat and close to zero pattern in illegal migration across the CMR until the end of year 2010, a large spike in 2011 and a lower average level in 2012, which however is still around 3 times larger than that in 2010. In particular, the spike in 2011 comes from many people from sub-Saharan Africa who originally left their country of origin to work in Libya and have fled from the country to Europe as soon as the regime collapsed and sea routes were no more controlled, so that smugglers took control of the human traffic in the CMR. Figure 2 instead informs on the variability over time and space of the country of origin of people crossing the CMR before and after the collapse of Libyan regime. For many countries in the sample we see large and increasing absolute numbers and, most important, some of these countries are not so close to Libya (see for example Somalia, Eritrea, Syria and Nigeria), suggesting that Libya, since 2011, became the main human smuggling hub connecting African countries to European ones. Yet, as shown in Figure 3, CMR is also the most risky route for irregular migrants, and indeed the number of fatalities increased dramatically in the Central route with respect to the other routes after the 2010.

3   Data

We use information on potential migrants from two waves of the Gallup's World Poll (GWP) which is a repeated cross-section, nationally representative individual-level dataset covering

Figure 1: Monthly pattern of illegal migration across the Central Mediterranean Route

Notes: The figure shows the monthly number of detected illegal migrants (i.e. detected border crossing) arriving in European territory across the Central Mediterranean Route. Source: Frontex)
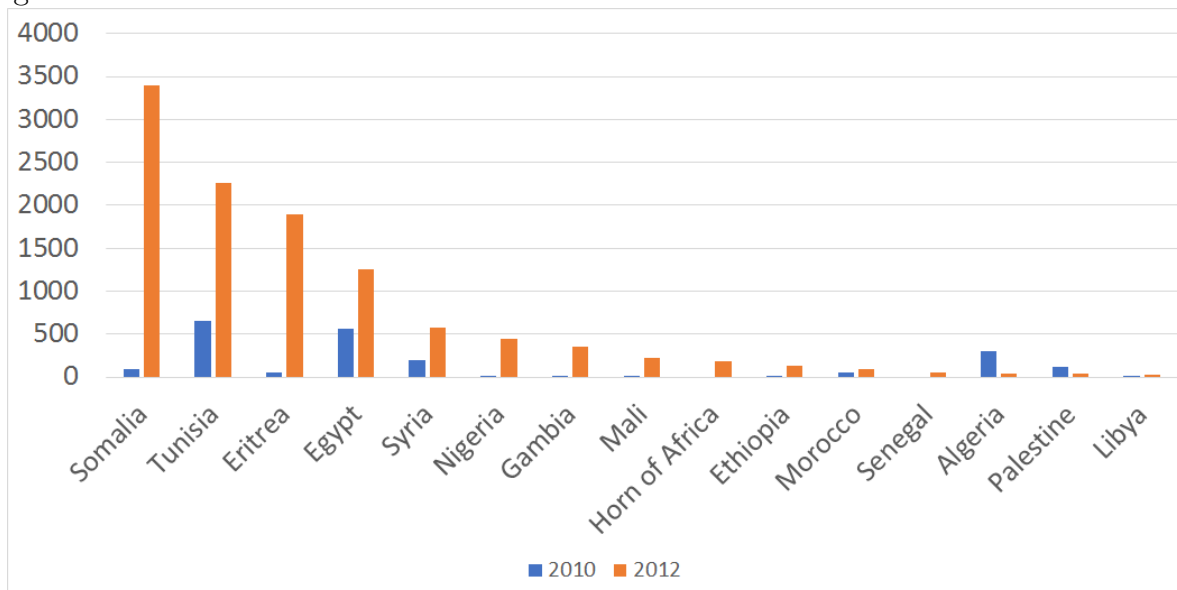
more than 150 countries over several years. The survey covers each country comprehensively, including rural areas.[4] GWP builds on yearly surveys of residents older than 15 year of age in more than 150 countries and represents more than 98 per cent of the world's adult population (e.g. see (**?**) or (**?**) for papers using the same dataset).[5] While the GWP contains data from 2005 onwards, we limit our sample to years 2010 and 2012, excluding year 2011 because of the Arab Spring and the associated spike in migration across the Mediterranean sea. The reason for not using earlier years from the survey is that we are able to distinguish international from local migration intentions from 2010. We limit our sample to South-North migration to Europe so that we end up having 30 migrant-origin countries in Africa and the Middle-East, and 29 European destination countries for two time periods, in a pre-post fashion. Figures A1 through A4 in Appendix A show origin and destination countries and average migration (intention) shares in our sample.

By its clandestine nature, irregular migration is not observable and it is empirically

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[4]See further details on the dataset and a full list of available variables in (**??**).

[5]The information is collected from randomly selected, nationally-representative samples of about one thousand individuals per country. In some countries, larger samples are collected in major cities or areas of special interest. Additionally, in some large countries, such as China and Russia, sample sizes increase to at least two thousand respondents. The survey covers each country comprehensively, including rural areas, with the country samples being probability based (i.e. the weights applied in the survey are used in the empirical analysis of this paper).

Figure 2: Detected illegal migrants across the Central Mediterranean Route by country of origin
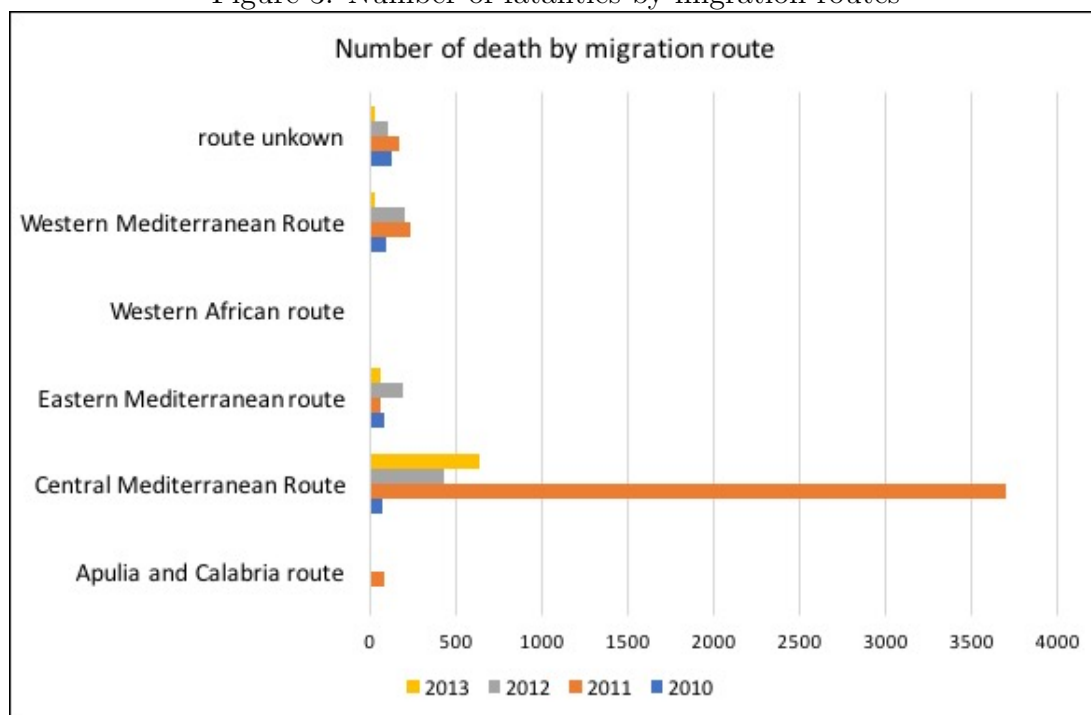

Notes: The figure shows the number of detected illegal migrants (i.e. detected border crossing) arriving in European territory across the Central Mediterranean Route from selected origin countries in years 2010 and 2012. Source: Frontex)

difficult to account for its size and composition. An advantage of using intentions to migrate instead of actual migration is that intentions are likely to be a primary determinant of the supply side of international migration flows. Indeed, intentions provide a measure of migration propensities also including potential illegal migrants, which are omitted from most migration statistics. On the other hand, a common concern when using intentions is whether intensions are "mere words or true plans" (**?**). Other studies have been conducted using migration intentions from GWP show that there is a high correlation of cross-country data on intentions with actual migration flows (see for example (**?**)). In this paper, we use a rather exclusive definition of migration intentions by considering positive answers to the three GWP questions altogether, i.e. whether respondents would like to move abroad and whether they are likely or they plan to do so in the following year.[6]

Key to our study, after answering the individual intention to migrate, GWP survey asks respondents to indicate a preferred country of destination, which allows us to investigate

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[6]Migration intention is measured by using the answer to the following questions: (i) "Ideally, if you had the opportunity, would you like to move permanently or temporarily to another country, or would you prefer to continue living in this country?"; (ii) In the next 12 months, are you likely or unlikely to move away from the city or area where you live?"; (iii) Are you planning to move permanently to another country in the next 12 months, or not?"; (iv) "To which country would you like to move?.

Figure 3: Number of fatalities by migration routes

Number of death by migration route

migration intentions by origin–destination pairs and merge them with both origin and destination country-specific data. We focus on the area across the Mediterranean sea (i.e. Africa, Middle East and Europe) so that our final dataset consist of micro-level information from individuals living in about 30 developing countries, reporting 29 European countries as preferred destination, in the years 2010 and 2012.

In order to check to what extent our variable on international migration intention can be a proxy for actual migration, we merged our data with two different datasets containing actual migration. Since these datasets are at aggregate level (country-level instead of individual-level), we aggregated our data using actual population data and survey weights. First, we used bilateral migration flows from OECD (these contain some missing country-pairs), second, we used bilateral migration stock from (**?**), . The migration stock data provide the number of migrants in the destination country originating from a given country based on census data for the years 1980–2010 for every five years. From this we calculated the yearly average net bilateral flows (just taking the difference between the stocks) and match this to our data. The correlation between our data on international migration intentions and the

actual migration flows obtained from both datasets for 2010 is about 0.72.

Table 1 reports average emigration rates based on migration intentions for our sample. In our sample, on average, 0.65 percent of the population intended to migrate internationally in 2010, and 0.8 percent in 2012. The increase in intentions was mainly driven by an increase in young, male individuals' intentions to migrate internationally.

Table 1: Emigration rates, based on intentions (GWP, 2010-2012)

	2010	2012
Emigration rate	0.65	0.80
Male emigration rate	0.39	0.54
Youth emigration rate (<30)	0.41	0.54
Low-skilled emigration rate	0.63	0.74
High-skilled emigration rate	0.02	0.05

Note. Emigration rate is the population weighted average across our sample of country-level emigration rates (which are defined as the share of population with migration intentions). Low-skilled is defined as primary and/or secondary education, high-skilled defined as tertiary education.

Table 2 reports migration intentions for the ten countries with highest emigration rates (based on intentions) with all these countries above the sample average. Table 3 provides further details on where people from the five highest emigration countries would like to migrate, listing the two most important destinations for each country. The preferred destinations by country are only a few, with most respondents hoping to go to a few selected destination countries in Europe.

3.1 Bilateral Distances

We construct a matrix of bilateral distances from each country of origin (o) to each destination (d) by mapping migration routes between Africa, Middle East and Europe. Unlike air distance, migration routes changes over time, hence we construct the matrix D_{odt} where t is year 2010 and 2012.[7] The assembling process follows several steps. First, the patterns of international migration routes from less developed countries to developed (European) countries have been geolocalized from the 2010 map provided by the iMap website (http://www.imap-

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[7]We constructed a full matrix for each African and European country pair but the coverage in the GWP defines the number of country pairs used in the regression analysis.

Table 2: Migration shares- Top ten origin countries (GWP, 2010-2012)

Rank	2010		2012	
	Origin country	Emigration rate	Origin country	Emigration rate
1	Senegal	6.58	Comoros	4.17
2	Djibouti	3.78	Sengal	3.49
3	Comoros	2.81	Sudan	2.33
4	Somoalia	2.12	Ghana	2.07
5	Mali	1.98	Guinea	1.72
6	Mauritania	1.45	Algeria	1.68
7	Tunisia	1.42	Mauritania	1.61
8	Morocco	1.28	Congo Rep.	1.29
9	Sudan	1.05	Morocco	1.29
10	Ghana	1.02	Nigeria	1.18

migration.org/). This website has been developed by ICMPD, Europol and Frontex. Each country is represented by the coordinates of its capital city, as the migration routes usually go through it and because the location of the capital city is a good proxy for the center of mass of each country in terms of population. The structure of migration routes represent the network connecting all of the countries in our sample [8] In Figure 4 the network of migration routes in 2010 is represented by the red segments connecting the (capitals of) African and European countries. The blue segments represent the sea routes that after the Arab Spring, and in particular after the end of the Colonel Gaddafi's regime, became available again since the end of 2011. Hence, the Central Mediterranean Route has been added to the 2010 network to obtain the new structure as of 2012 and the minimal distances between countries has been recomputed.

The distance associated with each origin-destination pair is the minimal geodesic distance calculated by means of a Djkstra algorithm along the segments of the network.[9] In order to avoid too much arbitrariness, we do not impose differential transit costs depending on altitude, ruggedness or other geomorphological characteristics, so the cost of moving between nodes matches maps one to one with the distance[10]. The resulting matrix can be represented

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[8]Those off the migration routes have been connected to their closest neighbouring country using the shortest straight link.

[9]The implicit assumption here is that the cost of connecting two nodes off the migration routes is infinite.

[10]We do an exception for sea routes for which we use a 0.2 factor to rescale the marginal cost of travelling (i.e. the effective length of segments along the sea is 5 times shorter than the measured geodesic distance).

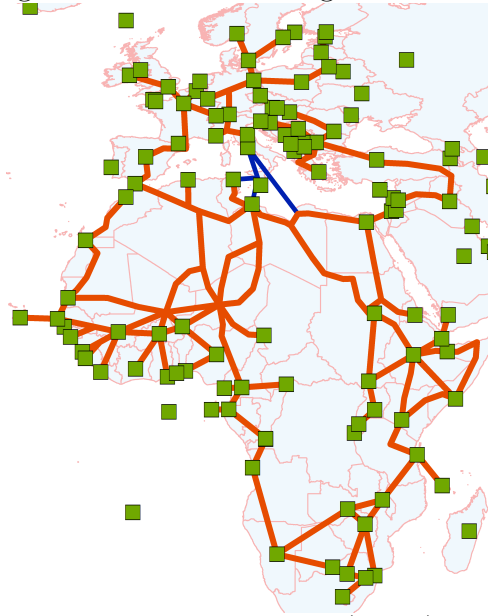Table 3: Bilateral migration shares- Top-five origin countries with top-two destinations (GWP, 2010-2012)

Rank	2010			2012		
	Origin	Top-2 destination	Emigration rate	Origin	Top-2 destination	Emigration rate
1	Senegal	Spain	2.36	Comoros	France	3.99
		Italy	1.86		Germany	0.177
2	Djibouti	France	2.39	Senegal	France	1.44
		UK	0.48		Spain	1.30
3	Comoros	France	2.48	Sudan	UK	1.25
		UK	0.14		France	0.58
4	Somalia	UK	1.42	Ghana	UK	1.20
		Sweden	0.25		Spain	0.60
5	Mali	France	0.82	Guinea	France	0.76
		Spain	0.60		UK	0.43

in Figure 5, where each dot is an origin-destination country pair and the axes report the distance in 2010 and 2012. It is worth noting that, by construction, the addition of links in the network (the central Mediterranean route opened in 2011) made the minimal distance between country pairs either unchanged or shorter, particularly for those country pairs close to the new links.

In order to describe the relationship between our main variables of interest, migration intentions and our proxy for smuggling services, in Figure 6 we plot the country-level correlation between these variables. More specifically, we plot the change in the weighted sample average share of potential migrants (those with a positive migration intention) from each country of origin between 2010 and 2012 against the average change (i.e. decrease) in distance for each country-pair. The graph clearly shows a negative correlation between distance (which can only shrink in our setting) and migration intentions.

This assumption has however minor impact on the results of the empirical analysis. First, because the length of the average route connecting a country pair is in the order of magnitude of thousands of kilometers and the maximum sea distance (between Libya and Italy) is of less then 300 kilometers. Second, because the important change between distances across the two periods is the emergence of CMR, with its length playing a minor role in the overall change.

Figure 4: Network of migration routes

Notes: The figure shows the location of the capital cities of countries (squares) and the migration routes connecting them (lines). Countries not connected are excluded from the sample. Red migration routes relative to year 2010 are obtained from iMap website, while blue ones are those added to constuct the network in 2012.
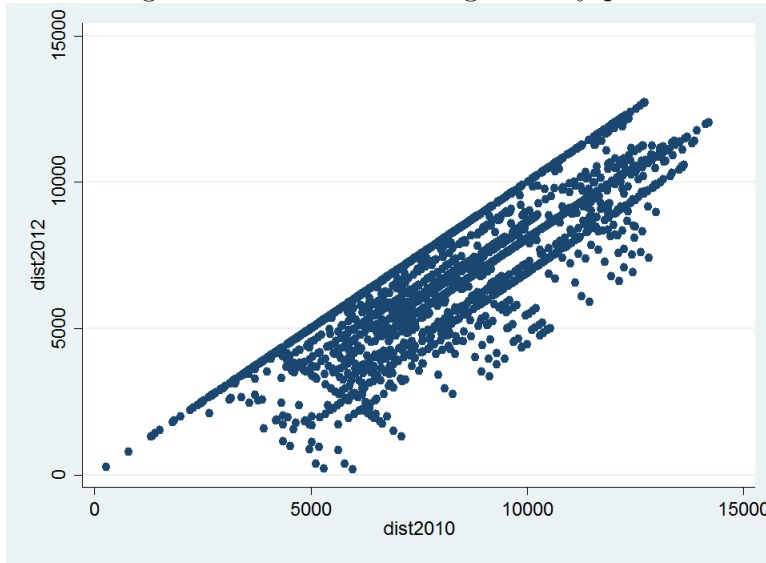
4   Empirical strategy

In our empirical specification we use a gravity model specification. The gravity model has been extensively used to empirically model trade flows since **?**, and the theoretical foundations have been linked to different trade models (see an overview in **?**). The gravity model has been also applied to other type of flows between countries, including migration flows. **?** provide a good overview of the gravity model's application to international migration flows laying out also the theoretical basis for the gravity model's application to migration flows. We employ the gravity framework and exploit an exogenous shock to distance in migration routes to estimate the impact of the latter on individual-level migration intentions. Hence, the bilateral estimation equation is as follows:

$$M_{iodt} = \beta_0 + \beta_1 X_{iot} + \beta_2 \mathbf{ln D}_{odt} + v_{ot} + w_{dt} + u_{od} + e_{iodt} \tag{1}$$

where the outcome variable M_{iodt} is a binary indicator of migration intention of individual i to move from country of origin o to country of destination d at time t. The regressor of interest, lnD_{odt} is the time-varying (log of) distance, measuring the distance between the
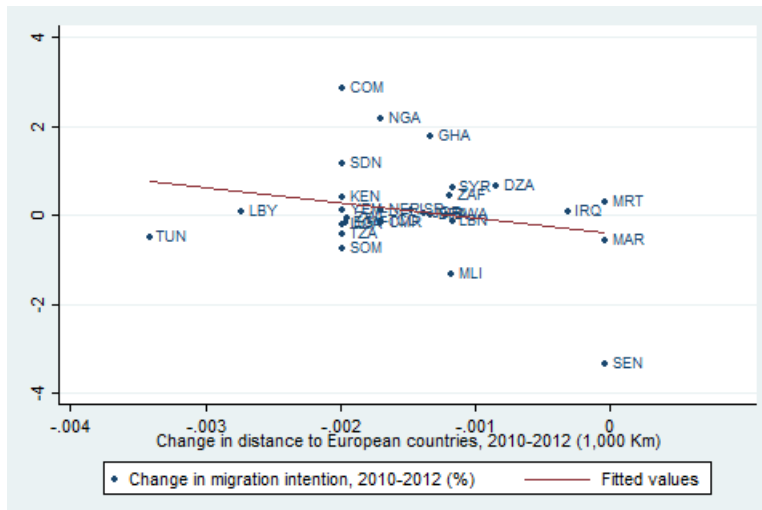
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Figure 5: Distances among country pairs

Notes: The figure shows the distances, in Kilometres, between country pairs in 2010 and 2010.

origin and destination country in terms of migration routes. In addition, we control for a vector of individual covariates (including age, gender, education, employment, number of children in the household, wealth, urban city residence, satisfaction with amenities), X_{iot} (note that this is not a proper panel, and the same individual is not appearing in different years). Finally, we also include a full set of origin-year (v_{ot}) and destination-year (w_{dt}) fixed effects together with country pair fixed effects (u_{od}). The latter control for all static and dynamic socio-economic pull and push drivers of migration, including economic incentives at origin and migration policy at destination. The inclusion of pair dummies controls for all long-run determinants of country-pair location choices such as geographical and economic proximity, common language, shared tastes and bilateral migration policy. Given that our time-frame is short, very little change (if any) would have taken place over the period in terms of bilateral migration policies. Hence, the identification comes from short-run changes – in particular a reduction – in the length of illegal migration routes, which translate in changes in smuggling services supply to (mostly) irregular migrants.

By estimating equation (1) we are able to uncover the average causal effect in having access to shorter illegal migration routes on the individual-level intention to migrate. In addition we also investigate heterogeneous effects of the human smuggling shock by interacting our measure of availability of human smuggling services (proxied by the time-varying migra-

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Figure 6: Change in the share of positive migration intentions and change in distance between country pairs, 2010-2012

Notes: The figure plots the relation between the change in the average distance between origin and destination countries (in thousands Kilometers) and the variation in the share of individuals reporting a positive intention to move to one of the destination countries.

tion distance) with individual-level characteristics. This allows us to uncover the features of individuals who respond more (or less) to the incentive for irregular border crossings. In particular, since irregular migration is a high risky and costly process (even more along the CMR), we interact our distance measure with individual level characterstics whigh proxy for risk preferences such as gender, age, number of dependents and literacy. Thus, we expect the effect of distance on migration to be heterogeneous across sub-groups of the population and typically stronger for less risk-averse individuals. The latter strategy helps confirming identification since any potential aggregate omitted variables would have to behave differently across sub-groups in order to exhibit the sorts of heterogenous effects we find.

5   Results

We start by estimating the impact of changes in migration route distance on individual migration intentions, as specified in equation (1), controlling for individual-level charateristics and country-pair fixed effects. The within pair estimator sweeps out all bilateral heterogeneity, including time-invariant (between 2010-2012) geographical distance, common (visa) agreements, countries' proximity in terms of language, culture or living standards. Moreover, pair fixed effects account for any unobservable static bilateral country-level common factors

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simultaneously affecting the smuggling supply and migration intentions. The first column of Table 4 reports estimates with a linear probability model of bilateral migration intentions as a function of individual charateristics and migration route distance, while controlling for time and pair fixed effects. Individual charaterstics include a vector of controls typically shaping the migration decision including age, gender, marital status, family size (number of children), employment status, a wealth index (pricipal component), a dummy for having a family member/friend abroad (migration network), a dummy for urban (city) area, and satisfaction for amenities. In column (2) we present a more demanding speicification by adding other aggregate controls, namely origin- and destination-country by time fixed effects. The latter control for static and dynamic push and pull factors of international migration at the country-level such as (origin and destination) GDP, wages, conflicts, climate shocks and migration policy. (see...REF)

Results show a significant negative effect of the change in distance along illegal migration routes between country pairs on the individual intention to migrate. This result is robust to the inclusion of individual controls as well as a large set of aggregate fixed effects. Results on the individual level determinants of international migration intetions show the expected sign. In particular, female, young, married individuals with a job are less likely to be willing to migrate, whereas being low-skilled (i.e. having no more than primary education) does not play a significant role in the migration decision. On the other hand, ceteris paribus, being better off in terms of wealth (and worse off in terms of expected living standards), living in a big city, having a network abroad (i.e. a friend or relative already migrated abroad) significantly increase migration intentions.

5.1 Heterogenous effects

Here we investigate interacted effects in different sub-groups of the population, while controlling for unobserved heterogeneity through pair and country-time fixed effects. Results are presented in Table 5 where we report estimates of the main regressors and interacted effects. Results are consistent in showing that a shorter distance in migration routes decreases the individual intention to migrate. Yet, the effect is heterogenous across sub-groups of the population. In particular, the effect is strong and significant only for individuals less than

30 years of age (col 1). Moreover, those who responds more to the incentive for irregular migration (the decrease in distance along migration routes) are males, those with a higher share of dependents and relatively more educated people, i.e. those with more than primary education. This is consistent with the argument that the Libya 'shock' decreases monetary costs of human smuggling for border crossing but increases costs in terms of risks to die or be severely hurt.

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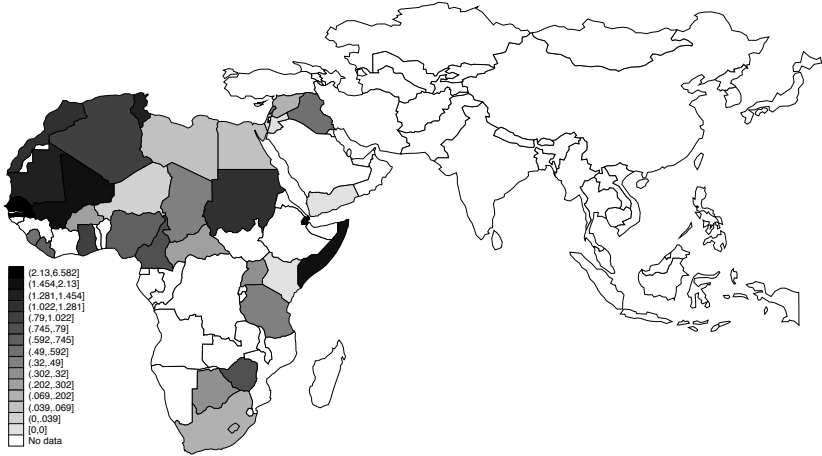
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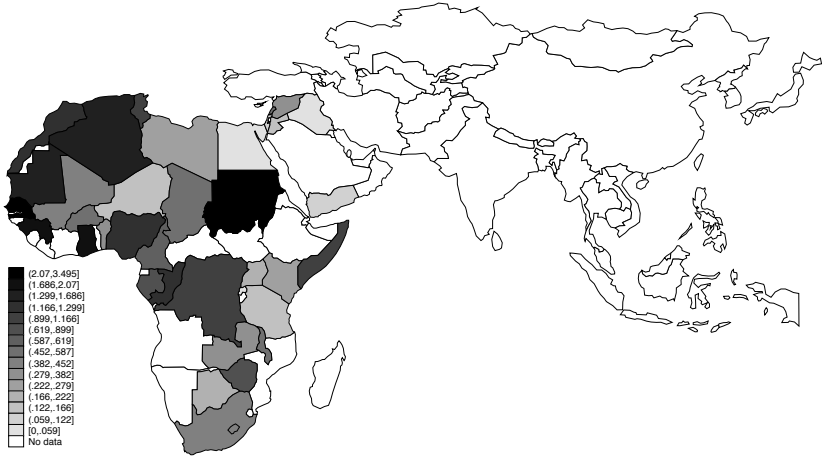
A Appendix

Figure A1: Emigration intention rates (our sample 2010)

Notes: The figure shows emigration rates calculated from individual intentions to migrate from our sample origin countries to our sample of destination countries.

Figure A2: Emigration intention rates (our sample 2012)

Notes: The figure shows emigration rates calculated from individual intentions to migrate from our sample origin countries to our sample of destination countries.

Figure A3: Immigration intention rates (our sample 2010)

(16.465,20.481]
(6.822,16.465]
(1.633,6.822]
(1.551,1.633]
(1.215,1.551]
(.558,1.215]
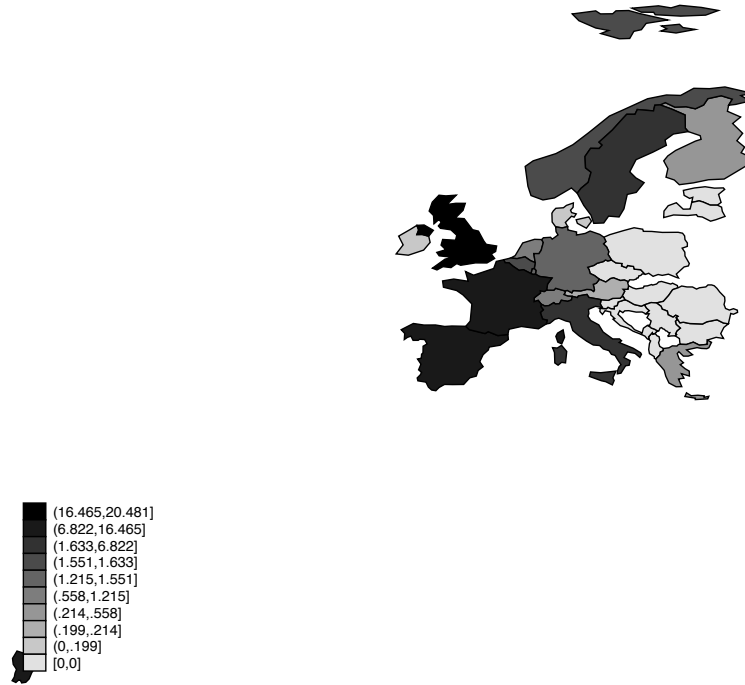(.214,.558]
(.199,.214]
(0,.199]
[0,0]

Notes: The figure shows immigration rates calculated from individual intentions to migrate from our sample origin countries to our sample of destination countries.

Figure A4: Immigration intention rates (our sample 2012)

(19.897,41.873]
(5.399,19.897]
(1.784,5.399]
(1.366,1.784]
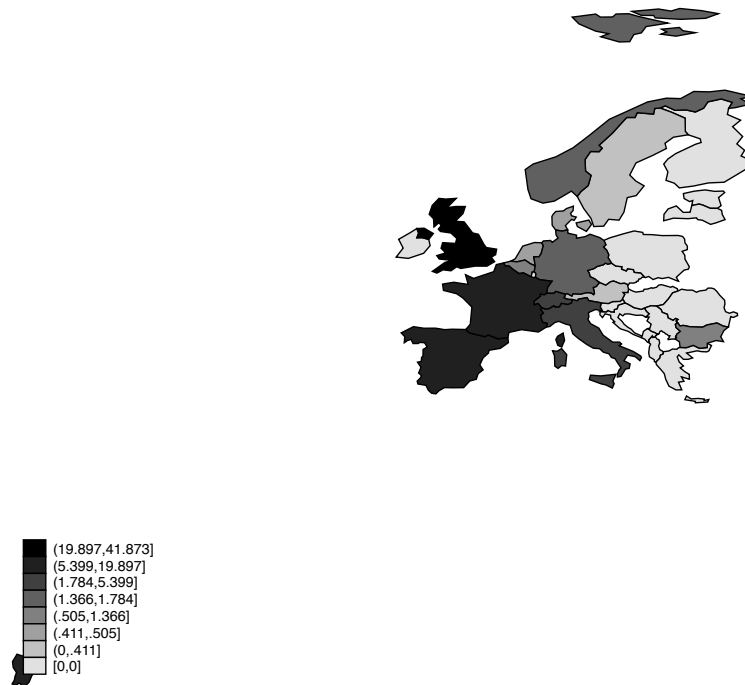(.505,1.366]
(.411,.505]
(0,.411]
[0,0]

Notes: The figure shows immigration rates calculated from individual intentions to migrate from our sample origin countries to our sample of destination countries.

Table 4: The impact of distance on bilateral migration intentions

VARIABLES	(1) Migration intention	(2) Migration intention
Distance by smuggling routes	-0.0005**	-0.0012*
	[0.0002]	[0.0007]
Female	-0.0001***	-0.0001***
	[0.0000]	[0.0000]
Age	-0.0000***	-0.0000***
	[0.0000]	[0.0000]
Married	-0.0001**	-0.0001**
	[0.0000]	[0.0000]
Primary Education	-0.0000	0.0000
	[0.0000]	[0.0000]
Employment	-0.0001**	-0.0001**
	[0.0000]	[0.0000]
# of children	-0.0000	-0.0000
	[0.0000]	[0.0000]
Close networks abroad	0.0003***	0.0004***
	[0.0001]	[0.0001]
Wealth	0.0003***	0.0002**
	[0.0001]	[0.0001]
Standard of living	-0.0005***	-0.0005***
	[0.0001]	[0.0001]
Large city	0.0002***	0.0002***
	[0.0001]	[0.0001]
Satisfaction with the city/area	-0.0003***	-0.0002***
	[0.0000]	[0.0000]
Constant	0.0052***	0.0116**
	[0.0020]	[0.0058]
Observations	1,267,416	1,267,416
Year 2012 dummy	YES	YES
Origin FE	NO	YES
Destination FE	NO	YES
OriginX2012 FE	NO	YES
DestinationX2012 FE	NO	YES
Pair FE	YES	YES

Notes: The dependent variable is a binary indicator for positive bilater migration intention. Results are estimated with a linear probability model. Robust standard errors are reported in brackets. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5: The impact of distance on bilateral migration intentions- Heterogenous effects

VARIABLES	(1) Mig.intention	(2) Mig.intention	(3) Mig.intention	(4) Mig.intention
Distance by smuggling routes	-0.0015**	-0.0010	-0.0013*	-0.0014**
	[0.0007]	[0.0007]	[0.0007]	[0.0007]
Female	-0.0059***			
	[0.0015]			
Distance by smuggling routes*female	0.0006***			
	[0.0002]			
Age dummy (<30)		0.0054***		
		[0.0016]		
Distance by smuggling routes*age dummy (<30)		-0.0006***		
		[0.0002]		
Share of dependents in the hh (>0.6)			-0.0045***	
			[0.0010]	
Distance by smuggling routes*share dep.(>0.6)			0.0005***	
			[0.0001]	
Primary Education				-0.0032**
				[0.0013]
Distance by smuggling routes*primary edu				0.0004**
				[0.0001]
Constant	0.0147**	0.0091	0.0121**	0.0135**
	[0.0059]	[0.0058]	[0.0058]	[0.0058]
Observations	1,267,416	1,267,416	1,268,721	1,267,416
Origin FE	YES	YES	YES	YES
Destination FE	YES	YES	YES	YES
OriginX2012 FE	YES	YES	YES	YES
DestinationX2012 FE	YES	YES	YES	YES
Pair FE	YES	YES	YES	YES

Notes: The dependent variable is a binary indicator for positive bilater migration intention. Results are estimated with a linear probability model. All regressions include a set of country-pair and country-year fixed effects. Robust standard errors are reported in brackets. *** $p<0.01$, ** $p<0.05$, * $p<0.1$