

# Understanding Willingness to Migrate Illegally: Evidence from a Lab in the Field Experiment

**Tijan L. Bah**

Nova School of Business and Economics (Universidade Nova de Lisboa), NOVAFRICA, University of Paris Panthéon-Sorbonne, and DIAL

**Catia Batista**

Nova School of Business and Economics (Universidade Nova de Lisboa), CReAM, IZA, and NOVAFRICA

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**WHY DO PEOPLE MIGRATE IRREGULARLY?  
EVIDENCE FROM A LAB-IN-THE-FIELD EXPERIMENT IN WEST AFRICA\***

**Tijan L Bah and Catia Batista**

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**ABSTRACT**

Irregular migration to Europe by sea, though risky, remains one of the most popular migration options for many sub-Saharan Africans. This study examines the determinants of irregular migration from West Africa to Europe. We implemented an incentivized lab-in-the-field experiment in rural Gambia, the country with the region's highest rate of irregular migration to Europe. Male youths aged 15 to 25 were given hypothetical scenarios regarding the probability of dying *en route* to Europe and of gaining legal residence status after successful arrival. According to the data we collected, potential migrants overestimate both the risk of dying *en route* to Europe and the probability of obtaining legal residency status. In this context, our experimental results show that providing potential migrants with official numbers on the probability of getting a legal residence permit decreases their likelihood of migration by 2.88 percentage points (pp), while information on the death risk of migrating increases their likelihood of migration by 2.29 pp—although the official numbers should be regarded as a lower bound to actual mortality. Follow-up data collected one year after the experiment show that the migration decisions reported in the lab experiment correlate well with actual migration decisions and intentions. Overall, our study indicates that the migration decisions of potential migrants are likely to respond to relevant information.

**Keywords:** International migration; Information; Expectations; Irregular migration; Willingness to migrate; Lab-in-the-Field Experiment; The Gambia.

**JEL Codes:** F22, D84, J17, J61, O15

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## 1. INTRODUCTION

The number of international migrants in the world has been rising, reaching 244 million (3.3 percent of the world population) in 2015.<sup>1</sup> While most people migrate legally, there are large and increasing numbers of irregular migrants. Estimates on the total number of irregular migrants in the European Union in 2008 range between 1.8 and 8 million.<sup>2</sup> These numbers increased significantly in recent years with the European Border Agency (FRONTEX) recording almost 3 million irregular migrants crossing European borders since 2015.

Irregular migration is a particularly risky endeavor. Irregular migrants traveling from West Africa to Europe typically cross the Sahara Desert to reach Libya, from where they cross the Mediterranean to reach Italy—this route is officially called the Central Mediterranean route, and it is locally known as the “backway.” In addition to the widely reported deaths in the Mediterranean Sea, this journey entails a variety of other serious and more common challenges, including death from starvation in the desert, and abductions for ransom, slavery, torture and other ill treatment, especially in Libya.<sup>3</sup> Between 2000 and 2014, more than 22,400 migrants were recorded as having lost their lives trying to reach Europe.<sup>4</sup> The number of such deaths has been increasing, with 17,390 migrants dying in the Mediterranean between 2014 and 2018.<sup>5</sup> Notwithstanding the risks, the Central Mediterranean route to Europe continues to be the main entry point for irregular migrants from Africa. In 2017 alone, 101,448 African migrants were recorded as reaching Italy by sea.

Our work aims at understanding the motives driving individuals to migrate irregularly from Western Africa to Europe. For this purpose, we implemented a lab-in-the-field experiment among potential migrants in rural Gambia. The irregular emigration rate from The Gambia in 2009–2017 was 2 percent, making it the West African country with the highest incidence of

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<sup>1</sup> United Nations (2016). “International Migration Report 2015: Highlights” (ST/ESA/SER.A/375). United Nations, Department of Economic and Social Affairs, Population Division.

<sup>2</sup> These estimates are notoriously imprecise given the challenges in defining and tracking irregular migrants, as discussed by the International Organization for Migration’s *World Migration Report 2018*.

<sup>3</sup> CNN (2017). “People for Sale: Exposing migrant slave auction sales in Libya.” Last accessed on November 15, 2018, at <https://edition.cnn.com/specials/africa/libya-slave-auctions>; Amnesty International (2015). “Libya is Full of Cruelty: Stories of Abduction, Sexual Violence and Abuse from Migrants and Refugees.” Last accessed on November 15, 2018, at: [http://www.amnesty.eu/content/assets/Reports\\_and\\_Briefings\\_2015/Libya\\_is\\_full\\_of\\_cruelty.pdf](http://www.amnesty.eu/content/assets/Reports_and_Briefings_2015/Libya_is_full_of_cruelty.pdf).

<sup>4</sup> Brian, Tara, and Frank Lazcko, 2014. *Fatal journeys: Tracking lives lost during migration*. International Organization for Migration. <https://www.iom.int/files/live/sites/iom/files/pbn/docs/Fatal-Journeys-Tracking-Lives-Lost-during-Migration-2014.pdf>

<sup>5</sup> Missing Migrants Project (2018). <https://missingmigrants.iom.int>. Last accessed on November 15, 2018.

irregular migration relative to its total population.<sup>6</sup> Most of these irregular migrants come from the rural areas where our project took place.

In our experiment, sampled males aged 15 to 25 played an incentivized migration game designed to elicit willingness to migrate depending on varying chances of dying *en route* to their destination and of obtaining legal residency status. The experiment included sixteen rounds, where each round provided a different combination of hypothetical probabilities of dying *en route* and of obtaining legal residency status in Europe upon arrival, with corresponding hypothetical wages in Europe fixed depending on the migration circumstances faced. In each round, respondents made binary decisions about whether to migrate to Italy or stay in Gambia. They also reported their willingness to pay for the migration cost (out of their game endowment) and decided on how large a payment they were willing to accept in order to forgo migrating. While one of the rounds provided factual information on the risk of dying *en route* and the chances of obtaining residence status, this was unknown to respondents.

Our data show that potential migrants overestimate both the chances of dying *en route* and of obtaining a legal residence permit: their expected probability of dying *en route* is 30 pp higher than the official numbers, while the expected chances of obtaining a residence permit are 7 pp higher than the actual probability. Our experimental counterfactual results predict that providing potential migrants with accurate information on the probability of obtaining a legal residence permit would decrease their likelihood of migration by 2.88 pp, while receiving official numbers on the death risk of irregular migration would increase their likelihood of migration by 2.29 pp, although the official numbers we provided should be regarded as lower bounds to actual death risks. Overall, our study suggests that in making migration decisions, potential migrants may actively respond to information about relevant facts regarding the costs and benefits of migration.

In order to evaluate the credibility of the (incentivized) migration decisions made in the context of our lab-in-the-field experiment, we collected follow-up data one year after the experiment. Our analysis of these data showed that decisions in the lab correlated well with actual international migration decisions and intentions one year after the experiment. In

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<sup>6</sup> FRONTEX (2018). "Detections of illegal border crossing statistics." Last accessed on November 15, 2018, at [https://frontex.europa.eu/assets/Migratory\\_routes/Detections\\_of\\_IBC\\_2018\\_09\\_05.xlsx](https://frontex.europa.eu/assets/Migratory_routes/Detections_of_IBC_2018_09_05.xlsx).

addition, we find that lab decisions are positively correlated with the expected net benefit of migration computed for each round.

This paper contributes to the limited existing academic economics literature on irregular migration. While we are not the first to use experimental techniques to study the willingness to migrate, our work is, to the best of our knowledge, the first to implement a lab-in-the-field experiment aimed at examining the determinants of *irregular* migration.

Our methodological contribution is related to a small number of recent studies on international migration utilizing lab experiments. Batista and McKenzie (2018) conduct an incentivized laboratory experiment to test various theories of migration departing from the neoclassical migration model of net expected income maximization, considering also additional and more realistic factors such as migrant-skill self-selection, credit constraints, incomplete information, and multiple destination choices. Using a sample of potential migrants (graduating university students in Kenya and Portugal), the results suggest that adding these realistic features, especially uncertainty and imperfect information, to the neoclassical model brings migration decisions to levels much more consistent with reality than the ones implied by simpler income maximization considerations. In a recent complementary piece of work, Barnett-Howell (2018) used a migration video game in a lab experiment to examine how individuals in the United States and Ethiopia make migration choices. He also found an important role for imperfect information in explaining lack of movement. Relatedly, Lagakos et al. (2018) conducted a discrete choice experiment in Bangladesh to understand the relative weights people place on migration-related factors such as the quality of living, relative to wages or family separation, in making internal migration decisions. Their setup allows respondents to hypothetically choose between staying put or migrating under two different scenarios. The options vary in terms of wages, unemployment rates, and amenities at destination (namely, availability of a latrine facility and regularity of family contacts). This study shows that unemployment risk and housing conditions are important determinants of (internal) migration decisions, while family separation seems to act as less of a deterrent to rural-urban migration. In our work, we follow this line of research in that we use an incentivized lab-in-the-field experiment to test for relevant determinants of the willingness to migrate, although our focus is more specifically on irregular migrants from West Africa and the extreme risks they face in

their migration journey. Nevertheless, our results are consistent with these prior studies in that lower expected benefits decrease the willingness to migrate.

Our work is also closely related to the role of information in determining international migration. The contributions of Shrestha (2019, 2020) highlight the importance of access to information for potential migrants' expectations and their subsequent migration decisions. Shrestha (2019) offers evidence on how the deaths of migrants in a district affect subsequent migration decisions for up to twelve months. He argues that migrants are not fully informed on migration risks and thus update their beliefs after the occurrence of deaths of migrants from their district. Furthermore, Shrestha (2020) conducted a randomized field experiment providing information on mortality rates during the migration journey and documented how this information affected subsequent migration decisions in Nepal. More specifically, and consistent with our own findings, these experimental findings show that providing information on migration-related mortality rates and on wages at destination is effective in changing expectations, especially for less experienced migrants. Relatedly, Dunsch et al. (2019) and Bah et al. (2019) conducted two randomized controlled experiments providing information to potential irregular migrants. Dunsch et al. (2019) randomly invited potential migrants to the screening in Dakar, Senegal, of a video documentary about migrant returnees. The research showed that potential migrants who participated in the screening were more likely to be informed about the risks and returns of irregular migration and less likely than those in the placebo group to express an intention to migrate. Similarly, Bah et al. (2019) use a sample of 4,000 potential migrants in rural Gambia to document that those who viewed a video documentary about migration to Europe and Senegal are more knowledgeable about the risks of irregular migration.

Although the phenomenon of irregular migration from Africa to Europe has attracted much media attention lately, most economics literature has focused on irregular migration from Mexico to the United States and particularly on the consequences of immigration policies on these irregular migration flows. Orrenius and Zavodny (2003) show no long-term impact for amnesty programs on the flow of undocumented migrants. Gathmann (2008) shows that stricter border control increased the price of border smugglers ('coyotes') by 17 percent, while the demand for smugglers remained unchanged. The strongest effect of tighter enforcement was the shift of irregular migrants to more remote crossing places.

Amuedo-Dorantes et al. (2013) showed that tougher immigration measures such as E-Verify (a mandate obliging employers to check the work authorization of employees) impacted deportation fears and interstate mobility and reduced deportees' intentions to return to the US. Similarly, Amuedo-Dorantes and Lozano (2014) showed that Arizona's SB1070 law, which made it a crime for an alien not to carry proper documentation, had little effect on the share of undocumented immigrants. While rather specific to the context of Mexico-US irregular migration flows, the findings provided by this literature are consistent with our results in that they highlight the role of policy constraints shaping the riskiness of irregular migration as important determinants of migration decisions.

There are only a few studies that examine the willingness to migrate irregularly from West Africa. In their research, Arcand and Mbaye (2013) and Mbaye (2014) use data from a survey of about 400 individuals in Dakar to offer important contributions to the understanding of irregular migration from Senegal. Mbaye (2014) shows that potential migrants are willing to accept a high risk of dying *en route* and that they are mostly young, single, and poorly educated. Moreover, she argues that the cost of irregular migration, migrant networks, high expectations, and tight immigration policies significantly explain the willingness to migrate irregularly. Arcand and Mbaye (2013) study how individual risk-aversion and time preferences affect the willingness to migrate irregularly and to pay for smuggling services. They find that the willingness to pay for a smuggler is an increasing function of an individual's intertemporal discount rate and a decreasing function of risk-aversion. More recently, Friebel et al. (2018) study the impact of distance on individual intentions to migrate from Africa to Europe. Using the demise of the Gaddafi regime in 2011 as an exogenous source of variation that affects the distance from Africa to Europe due to an increase in the usage of the central Mediterranean route (Libya to Italy), they found negative effects of distance on intentions to migrate. The effect is especially larger for educated youth with a migration network. Our paper builds on these contributions by offering additional evidence on the importance of the probability of dying *en route* and of gaining legal status in shaping the willingness to migrate irregularly. Moreover, our incentivized lab-in-the-field experiment provides us with additional variation (relative to cross-section survey analysis) to power our empirical analysis. In addition, our experimental setup, while hypothetical, allows



us to use within-individual variation to compare what would have happened to the willingness to migrate irregularly from one specific scenario to another.

Understanding the determinants of the willingness to migrate may have important consequences on economic development. Batista et al. (2012), for example, show that the probability of own future migration has important positive effects on educational attainment in Cape Verde—even on those individuals that end up not actually emigrating. The evidence suggests that a 10-pp increase in the probability of own future migration increases the probability of completing intermediate secondary education by 4-pp for individuals who do not migrate. Additionally, Docquier et al. (2014) show a strong correlation between the intention to migrate and subsequent actual migration. Consistent with their findings, the data from the follow-up survey we conducted one year after the experiment also point to both actual migration decisions and intentions correlating well with the lab migration decisions taken one year earlier.

The rest of the paper is organized as follows. Section 2 presents the country context in which we conduct our analysis. Section 3 discusses the survey and sampling framework, the lab-in-the-field experiment, and descriptive statistics. Section 4 presents the econometric approach and main empirical results. Section 5 presents some robustness checks using follow up data on actual migration decisions and intentions measured one year after the lab experiment. Section 5 offers concluding remarks.

## 2. COUNTRY TEXT

Sandwiched by Senegal, The Gambia is the smallest country in mainland Africa with a population of 2 million people. In 2017, the country had an estimated GDP per capita of \$1700, ranking 176 out of 190 countries, one of the poorest in the world. Over the last decade, the country recorded an average growth rate of 2.8 percent per year.<sup>7</sup>

Politically, since independence from the United Kingdom in 1965, the country has had three presidents: Dawda Jawara (1965–1994), Yaya Jammeh (1994–2016), and Adama Barrow (2016–present). Jammeh ousted Jawara in a bloodless coup, but in December 2016, Jammeh's 22-year rule ended with Barrow's electoral victory, making it the country's first democratic transition.

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<sup>7</sup> World Bank Development Indicators, 2017.

Migration is an important phenomenon in The Gambia. Emigration is a cornerstone of the Gambian economy, with remittances amounting to almost 20 percent of GDP, which is equivalent to the whole contribution of the tourism sector to GDP.<sup>8</sup> The country also attracts many regional immigrants, mostly from Senegal. According to the 2013 census, international immigrants correspond to 6 percent of the population, while rural to urban migrants account for 7 percent.

Europe is the main international migration destination for many Gambians, who mostly emigrate irregularly—through the “backway.”<sup>9</sup> The most popular “backway” migration route from Gambia is currently the Libya route, also known as the Central Mediterranean route. This route entails travelling from Gambia through Senegal, Mali, and Niger, and from there to Libya, as illustrated in Figure 1. There are no visa requirements for Gambians to enter these transit countries. Illegal smuggling typically starts in Niger to reach Libya. Before the fall of the Gaddafi regime, many African migrants opted for Libya as a destination country with many job opportunities. However, the 2011 Libyan civil war destabilized the region, subsequently turning Libya into a transit magnet for many economic migrants and refugees. Presently, this route is the riskiest option for many African migrants, who in Libya face risks of maltreatment such as physical abuse, kidnapping, and slavery.<sup>10</sup>

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<sup>8</sup> World Bank *Migration and Remittances Factbook 2016*. Last accessed on November 15, 2018, at: <https://openknowledge.worldbank.org/handle/10986/23743>.

<sup>9</sup> The Gambia Labour Force Survey (2018) shows that 63 percent of international emigrants from The Gambia migrated irregularly. The representative survey covers 6260 households from 313 enumeration areas nationwide.

<sup>10</sup> North Africa Mixed Migration Hub (2017). “Survey Snapshot, Italy.”

FIGURE 1

## IRREGULAR MIGRATION ROUTES FROM THE GAMBIA TO ITALY



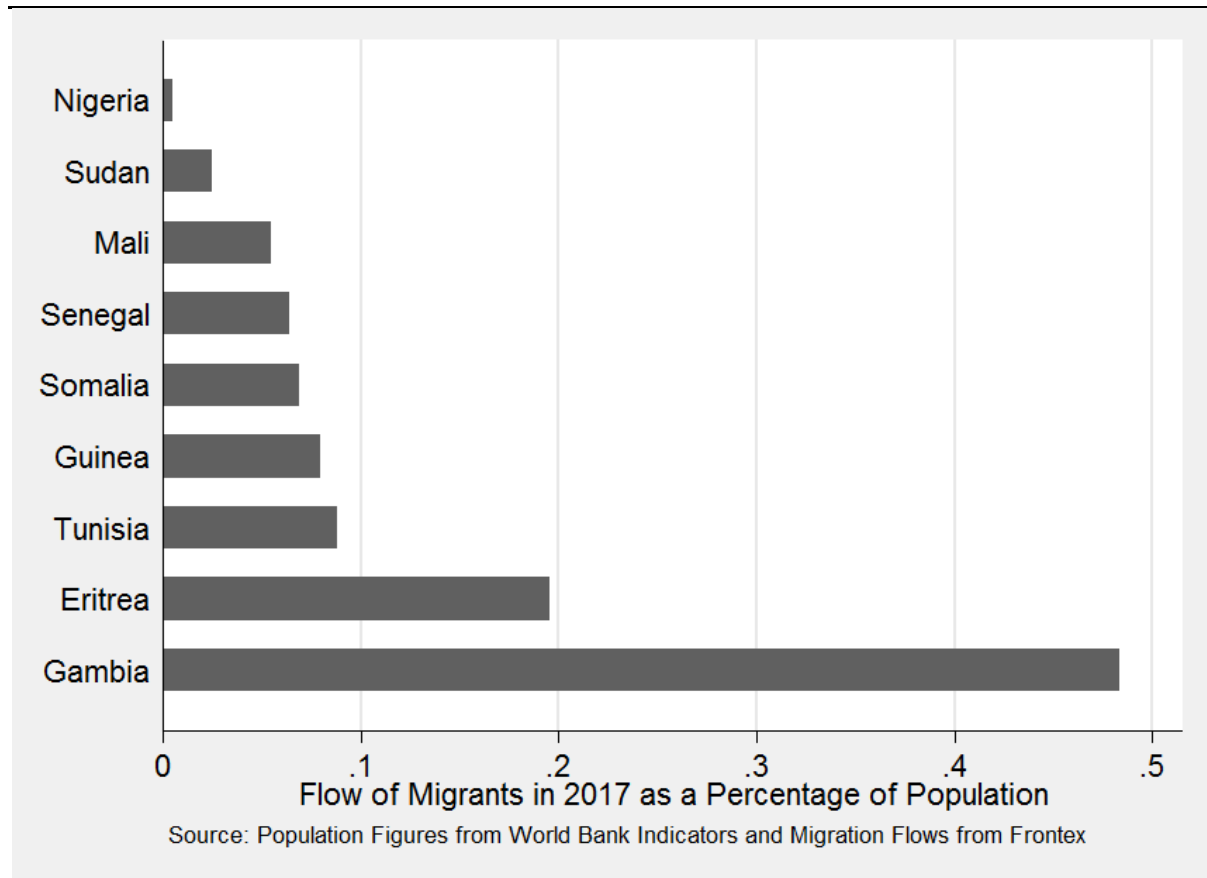
Source: Gene Thorp, The Washington Post  
<https://www.washingtonpost.com/sf/world/2015/06/14/tiny-gambia-has-a-big-export-migrants-desperate-to-reach-europe/> [Last accessed on Jun 3, 2020.]

Notwithstanding the risks, the Central Mediterranean route to Europe continues to be the main entry point of irregular migrants from Africa. According to 2018 figures from FRONTEX, 101,448 African migrants were recorded as reaching Italy by sea in 2017 alone. As shown in Figure 2, about 8,500 Gambians were detected arriving in Europe by sea in 2017, which represents about 0.4 percent of the country's total population and makes The Gambia the sender

country with the largest incidence of irregular migrants to Europe. Note that from 2009 to 2017 the number of Gambian irregular migrants entering Europe was recorded as 43,400, representing 2 percent of the country's resident population.

**FIGURE 2**

**TOTAL FLOW OF MIGRANTS TAKING THE CENTRAL MEDITERRANEAN ROUTE IN 2017 AS A PERCENTAGE OF POPULATION OF TOP 10 COUNTRIES OF ORIGIN**



### 3. METHODOLOGY

#### 3.1 Survey and Sampling Framework

The survey data used in our work were collected using a representative sample of 406 households living in rural villages in the Upper River Region (URR) of The Gambia. According to the 2018 Gambia Labour Force Survey, this region represents 12 percent of the

country's population and has the highest share of irregular migrants relative to working population in the country—more than 5 percent.

The 60 sampled enumeration areas (EAs) were randomly chosen from a population of 526 EAs using population size proportional sampling based on The Gambia's 2013 census. In each enumeration area, a random sample of ten eligible households was drawn. Eligibility was determined by asking whether a young man aged 15–25 belonged to the household.<sup>11</sup> If the household had more than one youth within the eligible age range, one would be randomly selected. In each of these households, after surveying the household head, the sampled young males were also surveyed.

The households were sampled using a simple random walk within each EA. Enumerators surveyed every  $n^{\text{th}}$  household, where the  $n^{\text{th}}$  household depended on the size of the EA. Once they sampled the  $n^{\text{th}}$  household, the participation criterion of the household was ascertained by asking whether the household had at least one young man aged 15–25 years. Households that did not satisfy this criterion were replaced by the geographically closest household to the right. Following this sampling procedure, 595 households were finally surveyed. Out of these households, a sample of 584 male youths were also surveyed, of which 406 participated in the experiment. Initially, enumerators were instructed to pick every second household to participate in the experiment. However, this strategy was subsequently discarded to allow one sampled youth to participate in each household. The fieldwork took place in May 2017.

### **3.2 Lab-in-the-Field Experiment**

The experiment was implemented as a simple lab-in-the-field game in which participants were hypothetically endowed with 100,000 Gambian Dalasis (GMD).<sup>12</sup> We frame the participants' decisions as migration decisions with a 10-year time horizon. The precise framing of the experiment to players is provided in Appendix A1.

The experimental subjects must play 16 different rounds of an incentivized game in which migration-related decisions must be made, depending on different combinations of four

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<sup>11</sup> Young men only were included in our sample because 99 percent of irregular Gambian emigrants are male according to the 2018 Gambia Labor Force Survey.

<sup>12</sup> Equivalent to 2,000 Euros (1 euro = GMD 50 exchange rate).

different scenarios for the probability of dying *en route* to the migration destination and for the probability of obtaining legal residence status at the destination.

The four scenarios in the games were 0, 10, 20, and 50 percent probability of dying on the migration route, and 0, 33, 50, and 100 percent probability of obtaining a legal residence permit or asylum status at destination.

These numbers were determined based on data from our pilot survey, and other official databases described as follows. According to the International Organization for Migration, from January to December 2016, 181,436 migrants arrived in Italy by sea, while 4,581 migrants lost their lives.<sup>13</sup> These figures provide a lower bound for the mortality rate at sea, estimated at 2.46 percent deaths of all attempted migration journeys by sea. In addition, we obtained the probability of dying *en route* by adding the probability of dying *en route* before reaching the sea. The 2017 North Africa Mixed Migration Hub survey reports the incidence of cases where migrants report dead bodies along the way (including the Sahara Desert, Libya, and Mediterranean Sea).<sup>14</sup> According to the data from the January 2017 survey, 44 percent of respondents reported witnessing one or more dead in Libya, 38 percent in the Sahara, 15 percent at sea, and 3 percent in transit countries such as Niger. Combining the probability of dying at sea of 2.5 percent and the incidences of witnessing migrant deaths *en route* of 15 percent, we estimated the overall probability of dying *en route* as 17.5 percent. In the experiment, we use 20 percent as a proxy that approximates the actual death rate over the migration route given the likely undercount of fatalities. The game's 50 percent threshold for the probability of dying matches expectation data from our pilot survey. The pilot survey we conducted previously to the experiment elicited the expected probability of dying for 20 young males aged 15 to 25 from the region of the study. On average, the respondents expect that 5 out of 10 Gambians die along the "backway," corresponding to a 50 percent probability of dying.

The official data on residence permits is obtained from the Asylum Information Database (AIDA, 2016).<sup>15</sup> This database contains detailed information on numbers of migrants

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<sup>13</sup> International Organization for Migration (2017). "Mixed Migration of Flows in the Mediterranean and Beyond: Compilation of Available Data and Information - Reporting Period 2016." [http://migration.iom.int/docs/2016\\_Flows\\_to\\_Europe\\_Overview.pdf](http://migration.iom.int/docs/2016_Flows_to_Europe_Overview.pdf).

<sup>14</sup> North Africa Mixed Migration Hub (2017). "Survey Snapshot, Italy."

<sup>15</sup> Asylum Information Database (AIDA) 2016. "Country Report: Italy." European Council on Refugees and Exiles (ECRE). [https://www.asylumineurope.org/sites/default/files/report-download/aida\\_it\\_2016update.pdf](https://www.asylumineurope.org/sites/default/files/report-download/aida_it_2016update.pdf). Last accessed on December 10, 2019.

who arrive in Italy by nationality and by destination, who applied for asylum, and the final decision on the applications. We chose Italy because it is the main entry country in Europe for Gambian migrants, as described in Section 2. In 2016, 8,930 migrants originating from The Gambia applied for asylum status in Italy. The rejection rate for these migrants was 67.5 percent. Using this rate, we estimate the probability of obtaining asylum status or a residence permit at 33 percent.

We therefore combined these two estimates (the first based on existing data and the second based on expectations from the pilot data) and two other extreme but interesting cases (0 and 10 percent chance of dying and 0 and 100 percent chance of obtaining residence or asylum status) to obtain the rounds for the game. For each round in the game, respondents were given showcards (shown in Figure A1 in the appendices) visually illustrating probabilities of dying *en route* and of obtaining residence status. Note that all rounds were framed as hypothetical scenarios and respondents were not informed that one of the rounds included the actual risk of dying and chance of obtaining a residence/asylum permit.

In addition, information on the corresponding migrant wages was provided as part of the experiment. Based on a small pilot survey conducted in Italy among Gambian irregular migrants residing in the Siracusa and Catania regions, we consider that, once migrants successfully reach Europe, they face two possible wages: EUR 1000 for those with legal residence status, and EUR 500 for those without permits. This setting is consistent with the findings of Dustmann et al. (2017), who show that undocumented migrants consumed about 40 percent less than documented migrants in Italy, and about one quarter of these differences in consumption is due to undocumented migrants earning less than documented migrants.

In each round, given the respective information provided verbally by the interviewer and visually by the showcard given to the experimental subject, participants had to make three decisions: (1) willingness to migrate, (2) willingness to pay for the cost of migration using the endowment provided, and (3) willingness to be paid in order to forgo migrating. The order of the 16 rounds was randomized.

Once the experimental subjects finished playing the game, their payoffs within the game were determined by randomly selecting one of the rounds played. In the selected round, the payout was made using the corresponding probabilities. Using our survey data, we found the average payoff payment was GMD 100, equivalent to the pay for two days' work. This relevant

monetary pay and the framing script were included in our design to incentivize experimental subjects to seriously consider the decisions made in the game. Note that while the hypothetical wages are fixed across rounds, the expected payoffs vary across rounds. For example, the expected payoff in terms of wages in a round with 0 percent probability of dying and 0 percent probability of obtaining residence/asylum permit corresponds to EUR 250. Similarly, the round with 0 percent probability of dying and a 100 percent probability of obtaining residence/asylum permit corresponds to an expected monthly wage of EUR 1000. The expected wage was not specifically indicated in each round; only hypothetical endowment, wages, and the number of deaths and asylum permits granted per 10 migrants were shown.

### 3.3 Descriptive Statistics

Table 1 shows the descriptive statistics of the data on the 406 sampled young males who participated in the experiment. On average, the interviewed youth is 20 years old with a monthly income of GMD 2,061. In terms of formal education, 32 percent of the young men have some formal education with an average of eight years of education, and 38 percent of the respondents reported they had already migrated outside their village for more than six months. The duration of the migration spell averages 23 months. Almost all of the sampled young (82 percent) know at least one person (be it a relative, a family member, or a friend) who has migrated outside the country (migration network). On average, the size of the migration network is 2.8 per respondent. We also elicited data on the number of migrants known by the respondent who successfully travelled to Europe through the “backway” and also the number of people who died along the way. The data indicates that on average respondents know 11 persons who successfully reached Europe through the “backway,” and an average of 3.7 persons who lost their lives *en route* to Europe.



TABLE 1

## SUMMARY STATISTICS OF SAMPLED PARTICIPANTS IN THE EXPERIMENT

Variable	Mean	SD	No of Obs.
<b>Individual characteristics</b>			
Age	20.12	3.26	406
Formal education [Yes=1, No=0]	0.42	0.36	406
Years of formal education (if any)	8.17	2.35	172
Monthly income (GMD)	1639	3369	258
Has migrated before [Yes=1, No=0]	0.39	0.48	406
Duration of migration (if any) in months	21.75	24.14	159
Has relatives or friends abroad (migration network) [Yes=1, No=0]	0.76	0.42	406
No. of relatives or friends (youth with migration network)	2.79	2.24	309
No. of known successful migrants	9.88	11.74	406
No. of known dead migrants <i>en route</i>	3.75	4.45	406
Has intention of migrating within the country	0.81	0.39	406
Has intention of migrating outside the country [Yes=1, No=0]	0.92	0.26	406
Has intention of migrating irregularly [Yes=1, No=0]	0.46	0.50	406
<i>Top preferred destination (if intending to migrate irregularly)</i>			
Italy	0.29	0.45	208
Germany	0.27	0.40	208
Spain	0.16	0.37	208
United States	0.06	0.25	208
United Kingdom	0.04	0.19	208
Monthly value required to forgo migrating (EUR)	525	715	208
Expected cost of migration (GMD)	79274	9741	208
Expected monthly wage in destination (EUR)	1338	1598	406
Expected probability of dying <i>en route</i>	0.48	0.25	406
Expected probability of obtaining of permit	0.38	0.28	406
Time preference	0.89	0.16	406
Risk preference	0.37	0.30	406
<b>Household characteristics</b>			
Household head age	50.03	15.39	406
Household size	10.52	7.29	406
Has internal migrants [Yes=1, No=0]	0.52	0.40	406
Has international migrants [Yes=1, No=0]	0.64	0.48	406
Has at least one irregular migrants [Yes=1, No=0]	0.43	0.49	260
Received remittances	0.36	0.48	406

Data on willingness or intention to migrate both internally and externally were elicited. To measure willingness to migrate, we asked the following question: *Ideally, if you have the opportunity, are you willing to migrate elsewhere inside The Gambia?* This question corresponds to intention or willingness to migrate internally. For those who answered in the affirmative, a follow-up question of their preferred destination was asked. The intention to

migrate outside The Gambia was elicited in a similar way. The results from the data indicate an overwhelming majority of 82 percent willing to migrate within The Gambia while 91 percent of the respondents expressed a willingness to migrate outside The Gambia. The magnitude of these statistics highlights the fact that most young males aged 15 to 25 years desire to migrate and live elsewhere, outside their current settlements. Similarly, to elicit willingness to migrate irregularly, we ask the following question: *Ideally, if you have the opportunity, are you willing to migrate through the “backway”/irregular way?* We used the term “backway” as the irregular migration route is commonly known as such in the Gambia. Almost half of the sampled young (47 percent) responded in the affirmative. The top five intended destinations are Italy (29 percent), Germany (27 percent), Spain (16 percent), the United States (6 percent), and the United Kingdom (4 percent). These statistics are consistent with the current top destination countries of migrants from The Gambia. In addition to their intended destination, we collected information on expected cost of migrating, expected monthly wages in their destination country, and how much they were willing to accept per month in order to forgo migrating. The average expected cost of migration amounts to GMD 85,394 (more than EUR 1500). In order to forgo migrating, respondents on average are willing to accept GMD 28,370 (about EUR 525) per month. This indicates that young males are willing to accept a substantial risk of dying *en route* instead of receiving a substantial amount compared to their current monthly earnings. This is in line with their average expected wage of EUR 1,478 per month in Europe, which corresponds to more than GMD 70,000.

We also elicited further expectations from our sample. Specifically, in addition to the expected cost of migrating, expected wage at destination, and willingness to forgo migrating irregularly, we elicited the expected probability of dying *en route* and the expected probability of obtaining a residence or asylum permit. Expected probabilities were collected using the following simple questions: *Out of every ten Gambian migrants, how many people do you think die on the way migrating to Europe through the “backway”/irregular way? Out of every ten Gambian migrants, how many people do you think obtain residence or refugee status in Europe?* The answers to these questions represent the expected probabilities of dying *en route* and obtaining residence or asylum status. On average, respondents estimate at respectively 49 percent and 40 percent the probabilities of dying *en route* and of obtaining a permit. According to our best estimates, as described in the previous section, the probability of dying is 20 percent

while the probability of obtaining a permit is 33 percent, indicating that our experimental subjects substantially overestimate, on average, the risk of dying *en route*, while also overestimating the probability of obtaining residence status. These expectation biases should be taken with some caution, as the official estimates are not only prone to measurement error,<sup>16</sup> but they are also averages over individuals, whereas our respondents may have relevant individual information that makes their expectations less biased than an average comparison may suggest.

Furthermore, we elicited time and risk preferences. Respondents were asked how much they are willing to invest in a lottery with a 50 percent chance of doubling their investment and a 50 percent chance of losing half out of a GMD 1,000 hypothetical endowment. The percentage of the endowment they were willing to invest in the lottery is our proxy for risk preference. On average, respondents were willing to invest 38 percent of the GMD 1,000 endowment. Similarly, to elicit time preferences, we asked respondents to suppose they had won GMD 100,000 in a lottery, and that they could choose either to wait for one year to be paid the full amount, or pay to receive the amount immediately at the cost of a fraction of the lottery value. Using this information, the discount factor can be calculated as one minus the fraction they are willing to pay to receive the money immediately. The average discount factor is 0.90. See Appendix A2 for the exact framing of the risk and time preference elicitation questions.

Who are those young men willing to migrate irregularly and who are those not willing to migrate? Table 2 provides brief summary statistics on these groups of people. Out of the 406 sampled young males, 370 (91 percent) express willingness to migrate outside the country, while the remaining 63 have no intention to migrate. However, out of the more than 90 percent wishing to migrate, only a lesser fraction (46 percent) are willing to migrate irregularly. This raw statistic is consistent with Mbaye (2014). Aspiring irregular migrants are relatively younger, with an average age of 19.92 years compared to 20.28 years for those not willing to migrate irregularly. Those who are willing to migrate irregularly have 8.46 years of education compared to 8.56 for those not willing to migrate irregularly. In addition, the former earn an average monthly income of GMD 1,517 compared to an average of GMD 2,130.21 for the latter. While the share of individuals with past migration experience is the same in both groups

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<sup>16</sup> As discussed before, these estimates, particularly those on the death risk of irregular migration, are likely to suffer from measurement error. For example, the expected probability of dying is calculated based on body counts and reports from witnesses of deaths *en route*. The probability of obtaining legal migration status upon arrival is less prone to error as it only covers those who actually reached Europe and applied for asylum status.

(38 percent), potential irregular migrants have more migration experience in terms of number of months than those unwilling to migrate irregularly (24.8 versus 21.6 months). In addition, both groups share the same fraction (82 percent) of having a migration network; however, those willing to migrate irregularly have a larger average network of 3.01 persons versus 2.76 for those not willing to migrate irregularly. Furthermore, potential irregular migrants know on average more people who successfully migrated irregularly (11.6) compared to those not willing to migrate irregularly (8.3). Looking at the number of people known by the two groups who lost their lives *en route*, we observe those who are not willing to migrate irregularly know more people who lost their lives *en route* to Europe compared to potential irregular migrants (3.83 versus 3.67). The expected probability of dying *en route* for those willing to migrate irregularly averages 45 percent compared to 53 percent for those unwilling to do so. This implies that while both groups expect a higher probability of dying compared to the actual estimated probability (20 percent), those willing to migrate irregularly expect a lower risk of dying. Finally, potential irregular migrants expect a higher chance of obtaining residence status (47 percent versus 33 percent for those unwilling to migrate irregularly), and they are on average willing to invest 44 percent of their hypothetical endowment (versus 32 percent for those not willing to migrate irregularly), implying that they are less risk averse.

TABLE 2

## SUMMARY STATISTICS: TEST OF STATISTICAL DIFFERENCES

Variable	Willing to migrate irregularly		Not willing to migrate irregularly		Test of differences
	N=189		N=226		N=406
	Mean	SD	Mean	SD	P-value
<b>Individual characteristics</b>					
Age	18.86	3.23	20.40	3.27	0.0875
Years of formal education (if any)	8.18	2.33	8.18	2.37	0.9929
Monthly income (GMD)	1516	3118	2130	3448	0.0827
Has migrated before [Yes=1, No=0]	0.38	0.48	0.38	0.48	0.9951
Duration of migration (if any) in months	24.77	29.89	21.56	17.56	0.3365
Has relatives or friends abroad (migration network) [Yes=1, No=0]	0.77	0.41	0.75	0.43	0.5658
No. of relatives or friends (youth with migration network)	2.17	1.44	2.00	1.13	0.3164
No. of known successful migrants					
No. of known migrants dead <i>en route</i>	11.69	12.94	8.52	11.64	0.0086
Has intention of migrating within the country	3.77	4.91	4.55	3.57	0.1482
Has intention of migrating outside the country [Yes=1, No=0]	0.87	0.33	0.74	0.43	0.1010
Expected probability of dying <i>en route</i>	0.96	0.17	0.87	0.32	0.0004
Expected probability of obtaining permit	0.43	0.24	0.53	0.25	0.0002
Time preference	0.46	0.29	0.29	0.25	0.0000
Risk preference	0.89	0.17	0.89	0.18	0.2723
<b>Household characteristics</b>	0.44	0.29	0.30	0.29	0.0000
Household head age					
Household size	52.81	15.73	50.31	14.78	0.1323
Has internal migrants [Yes=1, No=0]	10.15	6.40	9.94	6.90	0.7518
Has international migrants [Yes=1, No=0]	0.60	0.48	0.59	0.46	0.7307
Received remittances [Yes=1, No=0]	0.70	4.45	0.60	0.49	0.2013
	0.36	0.48	0.31	0.46	0.3014

## 4. ECONOMETRIC APPROACH AND MAIN EMPIRICAL RESULTS

## 4.1. Estimation Strategy

In order to analyze how the probability of successfully reaching Italy and the probability of obtaining a legal residence permit affect migration-related outcomes such as the willingness to migrate, the willingness to pay for migration, and the willingness to be paid to forgo migrating, we can estimate the following model:

$$O_{ir} = \phi + \beta_1 PD_{ir} + \beta_2 PP_{ir} + \theta_r + \delta_i + \varepsilon_{ir} \quad (1)$$

where  $O$  denotes our three outcomes of interest: willingness to migrate, to pay, and to forgo migrating.  $PD$  is the probability of dying *en route* and  $PP$  is the probability of obtaining a permit.  $\delta_i$  represents individual fixed effects and  $\theta_r$  is round order fixed effects. Our estimates of interest are  $\beta_1$  and  $\beta_2$ :  $\beta_1$  gives us the effect of probability of success on the three outcomes, while  $\beta_2$  gives us the effect of the probability of obtaining a residence permit on our outcomes of interest. The advantage of our design is that due to the two sources of variation—both within individuals and across individuals—we can include individual fixed effects that will allow us to control for potential individual time-invariant omitted variables.

## 4.2. Empirical Results

### *a. Main results: Willingness to migrate irregularly*

Table 3 below shows the regression results from the lab-in-the-field experiment.

Respondents were given different hypothetical information about the probability of dying *en route* and the probability of obtaining a residence permit and wages in the destination country. Given this hypothetical information, they made hypothetical decisions to migrate irregularly or not. Thus, the dependent variable is whether individuals are willing to migrate irregularly or not. We are interested in understanding how different factors affect decisions to migrate irregularly or not, with special interest in the probabilities of dying *en route* and of obtaining an asylum or residence permit.

We present results from a linear probability model with various specifications. Irrespective of the specifications, we observe that increasing the probability of dying *en route* reduces the probability of individuals' willingness to migrate. The coefficient is statistically significant at the 1 percent level. On the other hand, the chance of obtaining a residence or asylum permit is positively correlated with the odds of migrating. This implies that potential migrants care about the likelihood of obtaining asylum status once they reach Europe. Columns (1) and (3) provide parsimonious correlations, while columns (2) and (4) estimate the model by including individual and round order fixed effects.

TABLE 3

WILLINGNESS TO MIGRATE IRREGULARLY: RESULTS FROM THE EXPERIMENT				
	(1)	(2)	(3)	(4)
	Migrate Irregularly	Migrate Irregularly	Migrate Irregularly	Migrate Irregularly
Prob. of permit	0.1894*** (0.0240)	0.1301*** (0.0148)	0.4936*** (0.0445)	0.4181*** (0.0384)
Prob. of dying	-0.1561*** (0.0193)	-0.1175*** (0.0253)	-0.3545*** (0.0582)	-0.3789*** (0.0393)
Constant	0.3609*** (0.0244)	0.3491*** (0.0072)	0.4638*** (0.0427)	0.3951*** (0.0211)
Individual fixed effects	No	Yes	No	Yes
Round order fixed effects	No	Yes	No	Yes
<i>N</i>	6478	6478	1815	1815
<i>n</i>	406	406	115	115
<i>R</i> -squared	0.0236	0.8200	0.1667	0.5462

Notes: Regressions estimated using a Linear Probability Model. *Migrate irregularly* is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. *Prob. of permit* is the hypothetical probability of obtaining a residence permit (or asylum status) in Italy. *Prob. of dying* is the hypothetical probability of dying en route to Italy. *N* represents the total number of observations and *n* is the total number of respondents. Each individual has a maximum of 16 observations (rounds). In columns (3) and (4), estimation is conducted by dropping experimental subjects who are willing to migrate in all rounds (102) and those that are not willing to migrate in any round (189). Standard errors in parentheses, clustered at the individual level. \*Significant at 10 percent; \*\*significant at 5 percent; \*\*\*significant at 1 percent.

In column (1) of Table 3, the results show that a 1 percent increase in the probability of obtaining a residence permit increases the willingness to migrate by 0.19 pp, highlighting that potential migrants care about the likelihood of obtaining residence permit once they reach Europe. Similarly, increasing the hypothetical mortality rate by 1 percent reduces the willingness to migrate irregularly by 0.16 pp. Once we control for both individual and round order fixed effects in column 2, the magnitude of effect reduces to 0.13 percent for the residence permit effect and 0.12 percent for the mortality effect. Note that this magnitude is very similar to the 0.15 pp mortality effect estimated by Shrestha (2020) in Nepal.

In columns (3) and (4) of Table 3, we restrict the sample by dropping respondents who never choose to migrate and those who always migrate irrespective of the round. The resulting estimates double in magnitude. The coefficient on the legal permit increases to 0.42 pp, while the mortality effect also increases to 0.38 pp.

The experimental setup allows us to evaluate changes in the willingness to migrate if potential migrants had accurate information about the chances of dying *en route* and obtaining residence permits. Table 4 presents results comparing the willingness to migrate of experimental subjects when moving from their current expectations about migration risks to different probabilities of dying *en route* and of obtaining legal residence status. Column (1) of table 4 shows that the expected 50 percent probability of dying *en route* and the 50 percent probability of obtaining a residence permit corresponds to 37 percent of all experimental subjects being willing to migrate, and 47 percent when including only the experimental subjects in the responsive sub-sample.

As is reported in column (1) of Table 4, we find that reducing the probability of dying to 0 percent increases the likelihood of migrating by 6.5 pp and increasing the probability of obtaining a permit to 100 percent increases migration by 3.7 pp.

Recall that (based on the official numbers described above) the actual probability of dying *en route* is 20 percent and the probability of obtaining a legal residence permit is 30 percent. Our results suggest that knowing the probability of dying *en route* is 20 percent instead of the average 50 percent expectation increases migration by 2.3 pp. Similarly, adjusting the probability of obtaining a residence permit from 50 percent to 30 percent reduces migration by 2.9 pp. The difference between these coefficients is statistically significant at the 1 percent level.

Column (2) in Table 4 shows that the willingness to migrate of responsive experimental subjects is reduced by 9.4 pp when moving from the 50 percent expected probability to the actual 30 percent probability of obtaining a permit. In the same way, we observe that the willingness to migrate increases by 7 pp when the probability of dying *en route* changes from the expected probability of 50 percent to the 20 percent actual probability of dying *en route*. The difference between these coefficients is also statistically significant.



TABLE 4

## WILLINGNESS TO MIGRATE IRREGULARLY: RESULTS FROM THE EXPERIMENT

	(1) Migrate Irregularly	(2) Migrate Irregularly
0% prob. of permit	-0.0985*** (0.0139)	-0.3154*** (0.0370)
30% prob. of permit	-0.0288*** (0.0092)	-0.0935*** (0.0292)
100% prob. of permit	0.0370*** (0.0093)	0.1196*** (0.0276)
0% prob. of dying	0.0648*** (0.0114)	0.2097*** (0.0368)
10% prob. of dying	0.0353*** (0.0102)	0.1101*** (0.0322)
20% prob. of dying	0.0229*** (0.0115)	0.0709*** (0.0300)
Constant	0.3745*** (0.0154)	0.4742*** (0.0496)
Individual fixed effects	Yes	Yes
Round order fixed effects	Yes	Yes
<i>N</i>	6478	1835
<i>n</i>	406	115
<i>R</i> <sup>2</sup>	0.8219	0.8157

Notes: Regressions estimated using a Linear Probability Model. *Migrate irregularly* is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. *Prob. of permit* is the hypothetical probability of obtaining a residence permit (or asylum status) in Italy. *Prob. of dying* is the hypothetical probability of dying *en route* to Italy. *N* represents the total number of observations and *n* is the total number of respondents. Each individual has a maximum of 16 observations (rounds). The omitted category corresponds to the average expected probabilities of dying *en route* (50 percent) and of obtaining a permit (50 percent). In column (2), estimation is conducted by dropping those who are willing to migrate in all rounds (102) and those that are not willing to migrate in any round (189). Standard errors in parentheses, clustered at the individual level. \*Significant at 10 percent; \*\*significant at 5 percent; \*\*\*significant at 1 percent.

Table 5 describes predictors of the experimental subjects' responsiveness (in terms of migration decisions) to the information provided in the various rounds of the lab experiment. Column (1) in Table 5 describes how individuals who choose to never migrate in any of the experimental rounds are less likely to know current emigrants and more likely to know past

migrants who died *en route* to Europe. They tend to have relatively low expectations regarding the probability of obtaining a residence permit and expect that the probability of dying *en route* is relatively high. They are substantially more risk averse than individuals who migrate in at least some of the experimental rounds. Column (2) shows a different story for experimental subjects who responded to the varying information provided across the different experimental rounds: these responsive subjects know few past migrants who died in route to Europe, and had relatively high expectations regarding the probability of obtaining a legal residence permit. Finally, column (3) of Table 5 showed that subjects who do not respond to the information provided in the different experimental rounds because they always chose to migrate tend to have relatively low expectations about the probability of dying *en route*.

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**TABLE 5**

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**PREDICTORS OF EXPERIMENTAL SUBJECTS' RESPONSIVENESS TO INFORMATION PROVIDED IN THE LAB EXPERIMENT**

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	(1) Never Migrate	(3) Migrate Always	(2) Migrate Sometimes
No. of known migrants	-0.0064*** (0.0016)	0.0034 (0.0023)	0.0030 (0.0024)
No. of known dead migrants	0.0107* (0.0054)	0.0073 (0.0057)	-0.0179*** (0.0039)
Expected permit	-0.0490*** (0.0079)	-0.0005 (0.0081)	0.0495*** (0.0088)
Expected dead	0.0252** (0.0095)	-0.0187* (0.0083)	-0.0065 (0.0092)
Risk preference	-0.2848*** (0.0816)	0.1067 (0.0737)	0.1781* (0.0813)
Constant	0.5120*** (0.1449)	0.4325** (0.1447)	0.0555 (0.1356)
N	359	359	359

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Notes: Regressions estimated using a Linear Probability Model. *Never migrate* is binary variable taking value 1 if respondent is not willing to migrate in all rounds and 0 otherwise. *Migrate sometimes* is binary variable taking value 1 if respondent expressed willingness to migrate in some rounds and 0 otherwise. *Migrate always* is binary variable taking value 1 if respondent is willing to migrate in all rounds and 0 otherwise. *No. of known migrants* is the number of known migrants who migrated, *No. of known dead migrants* is the number of known “backway” migrants who died *en route* to Italy. *Expected permit* is the expected probability of obtaining a residence/asylum permit. *Expected dead* is the expected probability of dying *en route* to Italy. *Risk preference* is measured as willingness to take a gamble (see Appendix A1 for the precise question phrasing). Robust standard errors in the parentheses. \*Significant at 10 percent; \*\*significant at 5 percent; \*\*\*significant at 1 percent.

***b. Heterogeneous Effects: Expectations***

One alternative interpretation of the migration choices made by potential migrants in our lab experiment is that they do not necessarily reflect migration decisions, and they can instead simply translate the experimental subjects' preferences for risky behavior. The implication is that lab decisions would perhaps be similar if framed in a different context, such as tobacco use or gambling. In this section, we examine the robustness of our main empirical findings by presenting how experimental migration decisions vary with expectations about the probability of dying during the irregular migration journey, as well as expectations about the probability of acquiring legal status after successful arrival in Europe. These results show how these migration-related expectations are significantly linked to the migration decisions made in the experiment.

Results in Tables 6A and 6B illustrate how, in addition to the expected effects of the probabilities of dying *en route* and of obtaining a legal residence permit, over-estimation of both probabilities also gives rise to the expected effects: overestimating the probability of obtaining a legal permit after arrival in Europe has a positive significant effect on the probability of migration, whereas overestimating the probability of dying *en route* to Europe has a significant negative effect on the decisions to migrate.

Table 6A further shows that for those who overestimate the probability of obtaining a legal permit, the impact of additional increases in the probability of a permit will have a positive significant effect, but lower than the impact on those who underestimate this probability. In this same instance where subjects overestimate the probability of a permit, an increase in the probability of dying *en route* seems to have a negative effect, but this cannot be statistically distinguished from the effect of this probability on those who underestimate the probability of obtaining a permit.

Similarly, in Table 6B, we observe that for those overestimating the probability of dying *en route*, the marginal effects of increased probabilities of obtaining a permit and of dying *en route* have the expected signs but cannot be distinguished from the effect of those probabilities on the subjects who underestimate the probability of dying.

TABLE 6A

## HETEROGENEOUS EFFECTS BASED ON EXPECTED PERMIT

	(1) Migrate irregularly	(2) Migrate irregularly
Prob. of permit	0.1094*** (0.0236)	0.0806*** (0.0171)
Prob. of dying	-0.1007*** (0.0373)	-0.0759*** (0.0230)
Overestimate prob. of permit	0.1448*** (0.0452)	
Overestimate prob. of permit * Prob. of permit	0.0858** (0.0359)	0.0959*** (0.0299)
Overestimate prob. of permit * Prob. of dying	-0.0806 (0.0579)	-0.0919** (0.0417)
Constant	0.2993*** (0.0306)	0.3761*** (0.0067)
Individual fixed effects	No	Yes
Round order fixed effects	No	Yes
Observations	6478	6478

Note: Regressions estimated using a Linear Probability Model. *Migrate irregularly* is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. *Prob. of permit* is the hypothetical probability of obtaining a residence permit (or asylum status) in Italy. *Prob. of dying* is the hypothetical probability of dying *en route* to Italy. *Overestimate probability of permit* corresponds to subjects with an expectation above the actual probability of obtaining a legal residence permit (30 percent). Standard errors in parentheses, clustered at the individual level. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

TABLE 6B

	(1)	(2)
	Migrate irregularly	Migrate irregularly
Prob. of permit	0.1199** (0.0354)	0.0916*** (0.0257)
Prob. of dying	-0.1341** (0.0571)	-0.1436*** (0.0533)
Overestimate prob. of dying	-0.1368** (0.0592)	
Overestimate prob. of dying * Prob. of permit	0.0421 (0.0409)	0.0437 (0.0311)
Overestimate prob. of dying * Prob. of dying	-0.0056 (0.0658)	0.0295 (0.0578)
Constant	0.4785*** (0.0537)	0.3763*** (0.0066)
Individual fixed effects	No	Yes
Round order fixed effects	No	Yes
Observations	6478	6478

Note: Regressions estimated using a Linear Probability Model. *Migrate irregularly* is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. *Prob. of permit* is the hypothetical probability of obtaining a residence permit (or asylum status) in Italy. *Prob. of dying* is the hypothetical probability of dying *en route* to Italy. *Overestimate probability of dying* corresponds to subjects with an expectation above the actual probability of dying *en route* (20 percent). Standard errors in parentheses, clustered at the individual level. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

***c. Are experimental subjects behaving rationally?***

A final check on the robustness of our findings is to evaluate whether experimental decisions to migrate are rational in the sense of net income maximizing.

According to the neoclassical theory of migration initially put forward by Sjaastad (1962), the decision to migrate is governed by utility maximization based on expected net income flows. Individuals migrate if their expected net income from migration is positive. Using our experimental setup, we can compute the expected net income of migrating irregularly. Our experimental set up assumes that individuals face two types of wages: a monthly wage of EUR 1000 for those who have a legal residence permit, and EUR 500 for those without a permit. To compute the expected benefit of migrating for each round, we employ the respective probabilities of dying and chances of obtaining permit applied in each round. Similarly, we compute the expected benefit of staying in Gambia. We assume that individuals who choose to stay in the country are faced with the existing labor market outcomes and earn their reported salary or the average national monthly salary of people in rural Gambia. Although negligible compared to the risk of dying *en route*, 25-year old males who live in rural areas of the country are also faced with a non-trivial 0.35 percent risk of dying according to the 2013 census.<sup>17</sup> We used this fatality rate to compute the benefit of staying put instead of migrating. Additionally, for computational purposes, we assume the cost of migration to be EUR 2000; the gain from dying *en route* or dying in the country to have a zero payoff; and the migration period to last for ten years. Finally, for discounting purposes, we utilized the average lending rate of 22.63 percent published by the central bank at the time of the survey (May 2017).

The computation exercise yields an average net present gain from migration of EUR 29,311 if we assume the reported individual monthly salary of our respondents; EUR 29,185 assuming the average monthly salary of GMD 2000; and EUR 28,027 when we utilize the national monthly average of GMD 3000.

How does this affect experimental subjects' decisions to migrate irregularly? In other words, are respondents behaving rationally, i.e., are respondents choosing to migrate when the net gain of migrating is positive? The descriptive results suggest that the respondents are indeed behaving rationally, in that in all the 38 cases with a negative net gain of

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<sup>17</sup> This fatality rate compares to 17.1 percent in the USA and 8 percent in Canada for men aged 25-29.

migration, only one was willing to migrate irregularly (2 percent). When we analyze the cases in which the expected net gain of irregular migration was positive, we observe that 41 percent are willing to migrate irregularly. Table 7 below shows the impact of the net gain of migration on the willingness to migrate. Depending on which assumptions are made when computing the benefit of staying in the country, we observe an increase in the willingness to migrate of about 11 percent for every 1 percent increase in the expected net gain of migration. It is worth highlighting that our assumption of zero payoff for the death outcome renders our estimated net gain of migration as an upper bound.

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**TABLE 7**

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**WILLINGNESS TO MIGRATE IRREGULARLY AND EXPECTED NET GAIN OF MIGRATION**

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	(1) Migrate irregularly	(2) Migrate irregularly	(3) Migrate irregularly
ln(NPV1)	0.1082*** (0.0155)		
ln(NPV2)		0.1109*** (0.0123)	
ln(NPV3)			0.1050*** (0.0117)
Constant	-0.7034*** (0.1609)	-0.7281*** (0.1267)	-0.6621*** (0.1195)
<i>N</i>	4421	6478	6478
<i>n</i>	248	406	406

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Notes: Regressions estimated using a Linear Probability Model. *Migrate irregularly* is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. *NPV1* is estimated using the individual reported monthly wage, *NPV2* is done with the average monthly wage of GMD 2000, and *NPV3* uses the national average monthly wage rate of GMD 3000. Standard errors in parentheses, clustered at the individual level. \*Significant at 10 percent; \*\*significant at 5 percent; \*\*\*significant at 1 percent.

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***d. Willingness to pay to migrate and willingness to forgo migration if paid***

As a final robustness check, we examine how the probabilities of dying *en route* and of obtaining a legal permit to stay in Europe affect the willingness to pay for irregular migration (though smugglers) and the willingness to receive a payment to forgo migrating irregularly. Recall that in the experiment, subjects were hypothetically endowed with GMD 100,000, and they can choose how much they are willing to pay out of this amount in order to finance

migration costs. The measures we use are obtained through this hypothetical, non-incentivized, experiment.

Column (1) of Table 8 describes how the risk of dying *en route* and the chances of obtaining a residence permit affect the amount potential migrants are willing to pay for irregular migration costs and the value of the opportunity cost of migrating. These results show that the hypothetical probabilities of dying *en route* have negative but insignificant effects on the amount potential migrants are willing to pay for migration costs. However, the probability of obtaining a residence permit has a positive and significant effect on this amount: a one-percent increase in the chance of obtaining a permit increases the willingness to pay for migration by 5.6 percent. Furthermore, in column (2) of Table 8, we observe that both the risk of dying and the chances of obtaining a residence permit affect the opportunity cost of migrating. The estimated elasticities suggest that for every one-percent increase in the risk of dying, the amount potential migrants need to be paid to forgo migration is reduced by 9 percent. Similarly, respondents need to be paid up to 6 percent more for every one-percent increase in the chances of obtaining a residence permit.

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**TABLE 8**

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**RESULTS FROM THE EXPERIMENT: AMOUNT WILLING TO PAY TO MIGRATE AND AMOUNT WILLING TO BE PAID TO FORGO MIGRATION**

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	(1)	(2)
	log (Value Willing to Pay for Migration)	log (Compensation to Forgo Migration)
Prob. of permit	0.0566** (0.0388)	0.0627* (0.0277)
Prob. of dying	-0.0001 (0.0559)	-0.0903* (0.0517)
Constant	10.765*** (0.0148)	9.5633*** (0.0350)
Individual fixed effects	Yes	Yes
Round order fixed effects	Yes	Yes
<i>N</i>	2733	2731
<i>n</i>	205	205
<i>R</i> -squared	0.7352	0.9330

Notes: Regressions estimated using OLS. *Value Willing to Pay for Migration* is the hypothetical

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## **5. DO LAB MIGRATION DECISIONS REFLECT ACTUAL MIGRATION DECISIONS?**

An alternative interpretation of the migration choices made by experimental subjects in our lab experiment is that they may not translate into actual migration decisions. To check the robustness of our findings relative to this concern, we collected follow-up data via telephone calls. As is described in Table 9, the research team managed to re-contact 263 out of the initial 406 experimental subjects who participated in the lab experiment. This large attrition rate may mask the occurrence of more international migration than we could measure in the follow-up survey, as it is particularly difficult to track irregular migrants to Europe, even though the research team members tried to contact these experimental subjects via social media, in addition to telephone contacts.

Of those we could re-interview, 22 percent had actually migrated, although only 3 percent had migrated internationally—and mostly to Senegal. In terms of intentions to migrate, 77 percent of re-interviewed experimental subjects still intended to migrate in the future, although only 33 percent in the following year; also, 33 percent expressed an intention to emigrate irregularly.

The actual decisions and intentions to migrate correlate very significantly with the experimental migration decisions, although the magnitude of this correlation is small. As displayed in Table 10, reporting experimentally to migrate is associated with an increase by 1.75 pp in the probability of actual migration, and with an increase of 10.8 pp in the intention to migrate irregularly.

TABLE 9

## DESCRIPTIVE STATISTICS FROM FOLLOW-UP SURVEY

	N	Mean	SD	Min	Max
Migrated	263	.2243346	.4179387	0	1
Migrated internally	263	.1901141	.3931391	0	1
Migrated internationally	263	.0342205	.1821418	0	1
Migrated to Senegal	263	.0304183	.1720626	0	1
Intends to migrate	248	.766129	.4241471	0	1
Intends to migrate next year	248	.3266129	.4699227	0	1
Intends to migrate irregularly	248	.3306452	.4713968	0	1

Notes: Migrated is a binary variable taking value 1 if the respondent migrated and 0 otherwise. Migrated internally takes value 1 if respondent migrated within the country and 0 otherwise. Migrated internationally takes value 1 if the respondent migrated outside the country and 0 otherwise. Intent to migrate takes value 1 if the respondent is willing to migrate.

TABLE 10

LAB WILLINGNESS TO MIGRATE IRREGULARLY AND FOLLOW-UP ACTUAL  
MIGRATION DECISIONS AND INTENTIONS

	(1) Migrated internationally	(2) Intent to migrate	(3) Intent to migrate next year	(4) Intent to migrate irregularly
Lab willingness to migrate	0.0175*** (0.0059)	0.0394*** (0.0136)	0.0700*** (0.0154)	0.1077*** (0.0155)
Constant	0.0269** (0.0114)	0.7515*** (0.0276)	0.2994*** (0.0306)	0.2874*** (0.0306)
Round order fixed effects	Yes	Yes	Yes	Yes
<i>N</i>	4151	3912	3912	3912
<i>n</i>	263	248	248	248
<i>R</i> <sup>2</sup>	0.002	0.002	0.005	0.013

Notes: Regressions estimated using a Linear Probability Model. Lab willingness to migrate is binary variable taking value 1 if respondent is willing to migrate irregularly in the lab-in-the-field experiment, and 0 otherwise. *N* represents total number of observations and *n* is the total number of respondents. Each individual has maximum of 16 observations. Standard errors in the parentheses, clustered at the individual level. \*Significant at 10 percent; \*\*significant at 5 percent; \*\*\*significant at 1 percent.

## 6. CONCLUDING REMARKS

This study aims at improving our understanding of the determinants of the willingness to migrate irregularly from West Africa to Europe. To this end, we implemented an

incentivized lab-in-the-field experiment using a sample of 406 households in rural Gambia, the country with the largest incidence (as percent of population) of irregular migration to Europe. In the incentivized experiment, subjects faced scenarios with differing probabilities of successfully reaching Europe, and of obtaining asylum or other residence status that would allow them to travel and work legally upon arrival. In each scenario, respondents made choices about whether to migrate irregularly, about their willingness to pay for migration, and about the amount they were willing to accept in order to forgo migrating.

Our results suggest that potential migrants overestimate both the risk of dying *en route* to Europe and the probability of obtaining legal residency status. Moreover, on average, we found evidence of youth willing to reject a substantial amount of money per month to forgo migrating irregularly. Our findings suggest that willingness to migrate irregularly is not only affected by the risk of dying *en route*, but also by the chances of obtaining asylum or a legal residence permit. Additional evidence also shows that prior expectations may act as important determinants of willingness to migrate irregularly. Overall, our study suggests that the migration decisions of potential migrants actively respond to information about relevant facts regarding the costs and benefits of migration.

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## APPENDICES

### *A1: Lab-In-The-Field-Experiment Framing*

Imagine that you have/given 100,000 Gambian Dalasis (GMD). You can decide what to do with the money. You can either keep it or use it migrate to Europe through the “Backway”. Now I will give you 16 different scenarios, and for each scenario, you will decide whether you will migrate or not, how much you are willing to pay for migration cost, and how much you are willing to accept in order to stop migrating. In this game, depending on what you choose to do, you stand the chance to win real money at the end of the game.

For every EUR 20000 (GMD 1,000,000) you win, we will pay you 1-real euro (GMD 50). You have the opportunity to win a minimum of GMD 5 up to a maximum of GMD 300. For example, people who choose not to migrate can keep the gift of GMD 100,000 which is equivalent to a payoff of GMD 5. While those who choose to migrate can either win GMD 0 if they die along the way, GMD 150 if they reach but do not obtain a permit/asylum. And finally those who migrate and obtain a permit win GMD 300.

Before playing the game, as you may know, migration to Europe while profitable can also be risky. The rules of the game are as follows: If you choose to migrate, you can either successfully reach to Europe or you will die along the way. This depends on the chances we will be providing. All those who successfully reach in Europe, some will have residence permit/asylum papers, while others will not. Those who obtain the permit have the opportunity to earn more money compared to those who do not. Moreover, the people who obtain the permit will also have the opportunity to come visit their family back in Africa.

At the end of the game, we will randomly choose one scenario from the sixteen scenarios to pay you. The case that we choose will determine how much you will earn; therefore we advise that you take each decision equally seriously. We will play the chances of dying en route and the chances of obtaining a residence permit for that chosen round.

## A2: Preferences

### Risk Preferences

Imagine you won a gift of GMD 1,000 without any indication of how you should spend this amount. You are now given the possibility to use that money in a game. In this game you can win or lose. Usually, in every 10 people who play this game, 5 win and 5 lose. If you win, you get 150 percent of the amount invested in the game (GMD 1,500 if you invest GMD 1,000) within a year. If you lose, you get half (GMD 500 if you invest GMD 1,000) within a year too. You can choose to invest in the whole game (GMD 1,000), only part or nothing.

**How much would you like to play in this risky but potentially lucrative investment?**

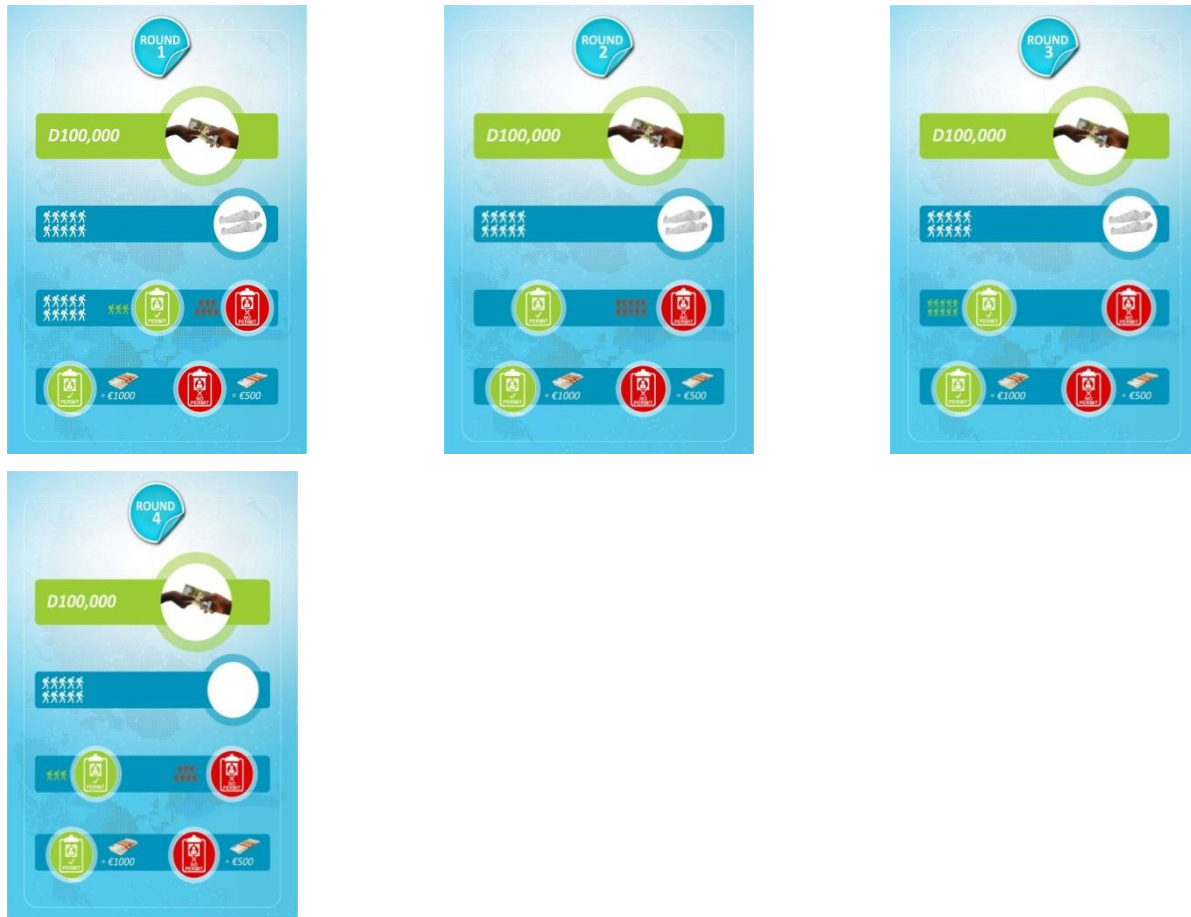
<i>Nothing, I will decline playing</i>	<i>0</i>
<i>100 Dalasis (GMD)</i>	<i>1</i>
<i>200 Dalasis (GMD)</i>	<i>2</i>
<i>300 Dalasis (GMD)</i>	<i>3</i>
<i>400 Dalasis (GMD)</i>	<i>4</i>
<i>500 Dalasis (GMD)</i>	<i>5</i>
<i>600 Dalasis (GMD)</i>	<i>6</i>
<i>700 Dalasis (GMD)</i>	<i>7</i>
<i>800 Dalasis (GMD)</i>	<i>8</i>
<i>900 Dalasis (GMD)</i>	<i>9</i>
<i>1000 Dalasis (GMD)</i>	<i>10</i>
<i>Don't know [Interviewer: Do not read.]</i>	<i>99</i>

### Time Preferences

Suppose you have won GMD 100,000 in a lottery. However, the lottery will not pay out the prize to you until exactly one year from now. How much are you willing to pay to receive the GMD 100,000 immediately rather than one year from now?

GMD

APPENDIX FIGURE A1: SHOW CARDS





ROUND 5

D100,000

XXXXX  
XXXXX

XXXXX XXXXX

+ €1000 + €500

ROUND 6

D100,000

XXXXX  
XXXXX

XXXXX XXXXX

+ €1000 + €500

ROUND 7

D100,000

XXXXX  
XXXXX

XXXXX XXXXX

+ €1000 + €500

ROUND 8

D100,000

XXXXX  
XXXXX

XXXXX XXXXX

+ €1000 + €500



ROUND 13

D100,000

★★★★★

★★★★★

★★★★★

★★★★★

+ €1,000

+ €500

ROUND 14

D100,000

★★★★★

★★★★★

★★★★★

★★★★★

+ €1,000

+ €500

ROUND 15

D100,000

★★★★★

★★★★★

★★★★★

★★★★★

+ €1,000

+ €500

ROUND 16

D100,000

★★★★★

★★★★★

★★★★★

★★★★★

+ €1,000

+ €500