Why Do People Migrate Irregularly?
Evidence from a Lab-in-the-Field Experiment in West Africa*

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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 drivers of irregular migration decisions using an incentivized lab-in-the-field experiment in rural Gambia, the African country with the highest per-capita rate of irregular migration to Europe. Potential migrants substantially overestimate the probability of dying *en route*, reporting an average belief of 51 percent compared with a best available estimate of about 20 percent. In the experiment, reducing the probability of dying *en route* from 50 to 20 percent raises willingness to migrate irregularly by 3.0 percentage points, while reducing the probability of obtaining legal residence from 50 to 30 percent lowers it by 2.1 points. Our results highlight the importance of potential migrants' prior beliefs in shaping responses to information and suggest that information policies that fail to account for these beliefs may backfire.

Keywords: International migration; Irregular migration; Migration intentions; Information campaigns; Prior updating; Migration policy; Lab-in-the-field experiment; West Africa.

JEL Codes: C93, D83, F22, J17, O15.

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1. Introduction

International migration has increased steadily in recent decades, reaching 281 million in 2020, or about 3.6 percent of the world population.[1] While most migration occurs through legal channels, there are large and increasing numbers of irregular migrants.[2] The number of irregular migrants detected crossing European borders reached nearly 2.3 million between 2016 and 2024.[3] A substantial share of these flows took place along the Central Mediterranean route from West Africa to Italy, locally known as the "*backway*". Despite high mortality and severe risks, including starvation and dehydration in the Sahara, trafficking and forced labor in Libya, and drownings in the Mediterranean Sea, this route remains the main entry point for irregular African migrants to Europe.[4]

In this context of extremely risky migration, it is important to understand the decision-making process leading individuals to migrate. Specifically, this paper focuses on establishing whether potential irregular migrants are adequately informed about the risks of irregular migration from West Africa to Europe, and experimentally measuring how their migration decisions respond to changes in the probability of dying *en route* to destination and of obtaining legal residence status in Europe upon arrival.

We examine the determinants of irregular migration decisions from West Africa to Europe in a high-incidence setting. For this purpose, we implemented an incentivized lab-in-the-field experiment among potential migrants in rural Gambia, the country with the highest prevalence of irregular migration in the region. Most Gambian "*backway*" migrants come precisely from the rural areas where our project took place, making this context particularly relevant for studying the role of information in migration decisions.

In our experiment, young men aged 15-25 played an incentivized migration game designed to elicit their willingness to migrate depending on varying chances of dying *en route* to destination and of obtaining legal residence status in Europe upon arrival. The associated earnings varied across rounds depending on the migration circumstances faced. In each round, respondents made binary decisions about whether to migrate to Italy or stay in The Gambia. In addition,

[1] United Nations (2020). "World Migration Report 2020: Highlights" (ST/ESA/SER.A/452).
[2] Throughout the paper we refer to irregular migrants as those whose migratory movements take place outside the regulatory norms of sending, transit, or receiving countries, following the definition of the International Organization for Migration. https://home-affairs.ec.europa.eu/networks/european-migration-network-emn/emn-asylum-and-migration-glossary/glossary/irregular-migration_en
[3] FRONTEX (2025) "Detections of illegal border crossing statistics" https://www.frontex.europa.eu/assets/Copy_of_Monthly_detections_of_IBC_PRESS_v13_20250505.xlsx
[4] *Missing Migrants Project* (2025) https://missingmigrants.iom.int

respondents stated their willingness to pay to migrate and also reported the payment they would accept to forgo migration.

We find that potential migrants substantially overestimate the risks of irregular migration and yet nearly half of them are willing to take these risks. On average, respondents believed that 51 percent of migrants died *en route*, more than twice the best available estimates. Despite these priors, intentions to migrate remained very high, with nearly half of respondents reporting willingness to take the "*backway*". This pattern shows that even exaggerated beliefs about mortality do not deter irregular migration aspirations.

Our results show that migration choices in the lab responded systematically to changes in mortality risk and legal-status prospects. In the experiment, reducing the probability of dying *en route* from 50 to 20 percent raises willingness to migrate irregularly by 3.0 percentage points, while reducing the probability of obtaining legal residence from 50 to 30 percent lowers it by 2.1 points. To assess the external validity of the incentivized migration choices, we collected follow-up data one year after the experiment. Lab migration decisions predict subsequent intentions to migrate irregularly, the follow-up outcome that most closely corresponds to the experimental choices.

The findings of our study challenge the premise of many information campaigns aimed at discouraging irregular migration. Such interventions assume that potential migrants underestimate dangers, and that information campaigns can therefore deter irregular migration. Our results show the opposite: because migrants may overestimate dangers, information that lowers perceived mortality risk may actually encourage migration. Effective policy design must therefore account for prior beliefs, as narrowly framed messages risk unintended effects.

Our paper contributes to a broad literature on the determinants of migration decisions (Sjaastad 1962; Harris and Todaro 1970; Borjas 1987; Rosenzweig and Stark 1989; Chiquiar and Hanson 2005; Bazzi 2017). Because these determinants rarely vary in isolation outside the laboratory, recent literature identifies them in incentivized lab-in-the-field experiments (Barnett-Howell 2018; Lagakos et al. 2018; Batista and McKenzie 2023; Batista et al. 2025), extending designs first applied to remittance behavior (De Arcangelis et al. 2015; Batista et al. 2015). Ours is, to the best of our knowledge, the first incentivized lab-in-the-field experiment on irregular migration.

Another strand of related literature concerns information and irregular migration. Information frictions persist even within transnational households (McKenzie et al. 2013; Ashraf et al.

2015; Batista and Narciso 2018), and randomized field experiments have examined how information affects migration decisions (Bryan et al. 2014; Beam 2016; Beam et al. 2016; Shrestha 2020; Baseler 2023; Frohnweiler et al. 2024). Within the literature on irregular migration from Africa to Europe (Arcand and Mbaye 2013; Mbaye 2014; Dunsch and Tjaden 2021; Mesple-Somps and Nilsson 2021; Beber and Scacco 2022; Tjaden and Gninafon 2022; Beber et al. 2026; Friebel et al. 2024; Di Iasio and Wahba 2024), the closest experiment to ours is Bah et al. (2023). In rural Gambia, it randomized a video information treatment (combining migrant testimonials with facts about journey risks and legal status prospects) on its own and alongside other treatments providing alternatives to irregular migration. The information intervention reduced backway intentions, but left beliefs about the riskiness of the journey unchanged and produced no change in actual departures. Battiston et al. (2024) provides a complementary experiment in Guinean schools that separately randomized risk information, destination-outcome information, and their combination. Only risk information reduced subsequent migration outside Guinea, particularly migration without a visa. Irregular migration is rare in both settings, making treatment effects difficult to detect, unlike in lab-in-the-field experiments like ours. In addition, because each intervention conveys several journey and destination dimensions jointly, these studies identify the effect of an information package rather than the separate effects of legal-status prospects and mortality risk on their own. The message is also fixed in both, so each identifies a response at a single information point relative to its population's priors. We instead independently vary mortality risk and legal-status prospects within subjects across the experimental grid and map responses onto elicited priors. This decomposition explains how bundling can neutralize a campaign: where priors overstate mortality but also overstate the chances of legal status, the two corrections push migration in opposite directions, as in the combined arm of Battiston et al. (2024). Our results therefore connect to information effects depending on the gap between message and prior (Cruces et al. 2013; Haaland et al. 2023) and asymmetric responses to good and bad news (Sharot et al. 2012; Frohnweiler et al. 2024).

2. Country Context

The Gambia is the smallest country on mainland Africa, bordered by Senegal and the Atlantic Ocean. According to the 2024 Census, its population is 2.4 million.[5] At the time of our 2017 fieldwork, The Gambia was among the poorest countries in the world, with GDP per capita of $2,156 after a decade of essentially no per-capita growth.[6]

Migration plays a central role in The Gambia, where emigration is a key economic driver. Remittances from abroad accounted for nearly 22 percent of the country's GDP in 2023.[7] Europe is the main destination for Gambian emigrants, most of whom migrate irregularly through the "*backway*", as this option is locally known.[8] The main route is the Central Mediterranean route through Senegal, Mali, Niger and Libya. There are no visa requirements for Gambians to enter these transit countries. Illegal smuggling typically starts in Niger to reach Libya. Since the 2011 civil war, Libya has shifted from a destination country to a transit magnet for migrants. This route is extremely risky for African migrants, who face documented risks of maltreatment in Libya such as physical abuse, kidnapping, and forced labor.[9]

Despite substantial risks, the Central Mediterranean route remains the main entry route for irregular African migrants to Europe. In 2017, FRONTEX recorded 101,448 arrivals of African nationals to Italy via this route, including 5,808 Gambians (Appendix Figure A2). This flow represented 0.28 percent of The Gambia's population, the highest per capita incidence among African countries that year. Between 2009 and 2024, 62,127 Gambian irregular migrants were recorded entering Europe, about 2.3 percent of the resident population.[10] Although flows declined during COVID-19, *backway* migration intentions remained high, and departures quickly rebounded (Bah et al. 2024).

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[5] Gambia Bureau of Statistics, 2024. *Preliminary Report of the 2024 Census in The Gambia*. https://gambia.unfpa.org/en/publications/preliminary-report-2024-census-gambia

[6] World Bank Development Indicators, 2025. https://databank.worldbank.org/source/world-development-indicators

[7] *Ibidem*.

[8] The Gambia Labour Force Survey (2018) shows that 63 percent of international emigrants from The Gambia migrated irregularly.

[9] North Africa Mixed Migration Hub (2017). "Survey Snapshot, Italy".

[10] FRONTEX (2025) "Detections of illegal border crossing statistics" https://www.frontex.europa.eu/assets/Copy_of_Monthly_detections_of_IBC_PRESS_v13_20250505.xlsx

3. Methodology

3.1 Survey and Sampling Framework

The survey data used in our work were collected from a representative sample of 595 households living in rural villages in the Upper River Region (URR) of The Gambia, from which the 407 experimental subjects are drawn. According to the Gambia Labor Force Survey (2018), this region represented 12 percent of the country's population and had the highest share of irregular migrants relative to working population in the country at the time - more than 5 percent.

The 60 Enumeration Areas (EAs) in our sample were randomly selected from a population of 526 EAs using population size proportional sampling based on the Gambia 2013 census. Within each EA, 10 eligible households were sampled by random walk. Enumerators surveyed every n^{th} household, with *n* determined by the size of the EA. Upon reaching a selected household, enumerators confirmed eligibility, which required the household to have at least one man aged 15-25.[11] Where several were eligible, one was randomly selected. The household head and the selected youth were then surveyed.

Following this sampling procedure, 595 eligible households were surveyed. The selected youth was successfully interviewed in 584 of these households, of whom 407 agreed to participate in the experiment.

3.2 Lab-in-the-field experimental design

Our experimental design uses an incentivized lab-in-the-field experiment. Participants played a sequence of decision-making games explicitly framed as choices between remaining in The Gambia and migrating irregularly to Europe through the "backway" and living there for ten years. Each experimental subject was endowed with an hypothetical amount of 100,000 Gambian Dalasis (GMD),[12] which translated into actual monetary payoffs as detailed in the

[11] Young men only were included in our sample because 99 percent of irregular Gambian emigrants are male according to the Gambia Labor Force Survey (2018).
[12] Equivalent to about 2,000 Euros, using the 1 EUR ~ GMD 50 OANDA exchange rate from May 2017. This exchange rate is used for conversions throughout the remainder of the paper.

explanations that follow. The precise instructions detailing the experimental framing of the experiment to players are provided in Appendix A1.

The experimental subjects played 16 rounds (ordered randomly) of an incentivized game in which they made migration-related decisions based on different combinations of two factors: the probability of dying *en route* to the migration destination and the probability of obtaining legal residence status upon arrival, each with four possible scenarios. The four scenarios corresponded, respectively, to 0, 10, 20, and 50 percent probability of dying *en route*, and 0, 30, 50, and 100 percent probability of obtaining a legal residence permit or asylum status at destination. These thresholds were selected before fieldwork so that the scenario grid would span the range between potential migrants' prior beliefs and the best available estimates for the study period. Pilot survey work conducted in the same region ahead of the experiment indicated that potential migrants expected, on average, a 50 percent probability of dying *en route* and a 50 percent probability of obtaining legal residence at destination. We therefore included a 50 percent value in both dimensions, so that the design contains a scenario corresponding to the prior beliefs prevailing in this population. The remaining values span the best available estimates of the two probabilities, approximately 20 percent and 33 percent for the study period, the latter implemented as 3 in 10 because all probabilities were communicated to subjects as frequencies out of ten (Appendix A2), together with the certainty endpoints. To ease comprehension, enumerators explained outcomes and payments verbally in the local language, following a script (Appendix A1). In each round, respondents were given showcards visually illustrating the probabilities of dying *en route* and of obtaining legal residence upon arrival in Europe, presented as frequencies out of ten (Appendix Figure A1).

Note that all rounds were framed as hypothetical scenarios and respondents were not informed that any round corresponded to our estimates of the actual risk of dying *en route* and of the chances of obtaining a residence/asylum permit. No real-world information treatment was randomly assigned across participants during or after the experiment.

Participants were informed of the fixed wages attached to each legal status upon successful migration to Europe: €1000 with legal residence status and €500 without a permit.[13] Expected

[13] These values were based on an additional small survey we conducted in Italy among Gambian irregular migrants residing in the Siracusa and Catania regions. These values are 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 that about one quarter of these differences in consumption was due to undocumented migrants earning less than documented migrants. Appendix A2 details the choice of experimental parameters.

payoffs, by contrast, varied across rounds with mortality risk and legal-status prospects, so that legal status is the channel through which expected earnings vary in our design. We vary this probability rather than the wage because the wage premium is the return to legal status, and because it is the probability of legal status, not the wage, that destination policy sets. Participants received the endowment, the two wages and the event probabilities, but no pre-calculated expected payoff for each round, which would have collapsed the two experimentally varied dimensions into a single researcher-computed statistic and shifted attention to that monetary summary (Appendix A4).

In each game round, after the corresponding scenario had been described verbally and displayed on a showcard, participants were asked to make three decisions: (1) whether they were willing to migrate irregularly; (2) how much of their GMD 100,000 endowment they were willing to pay for the cost of migrating; and (3) how much they were willing to accept per month to stop migrating and live in The Gambia. The exact wording of these questions is reproduced in Appendix A1. Participants' actual earnings from the game were determined post-experiment via a randomized incentive system. One round was randomly selected for payment, and the outcome within that round was realized according to its specified probabilities. The average realized payment was GMD 100, equivalent to approximately two days' wages based on our survey data. This financial stake, combined with the framing detailed in Appendix A1, aimed to ensure participants engaged seriously with the experimental decisions.

3.3. Descriptive statistics

Table 1 summarizes descriptive statistics for the 407 experimental subjects who participated in our lab-in-the-field incentivized experiment. All participants were male, averaged 20 years of age and earned an average monthly income of GMD 1175 (~EUR 23). Only 36 percent of the sample had any formal education – and only 14 percent of respondents had completed primary schooling. Risk preferences were elicited using a hypothetical lottery. Participants reported an average 36% fraction of a hypothetical GMD 1000 endowment they would invest in a lottery yielding a 50% gain or loss. Time preferences were assessed via maximum willingness to pay (WTP) for immediate versus one-year receipt of a hypothetical GMD 100,000 prize, implying a mean annual discount factor (1 - WTP fraction) of 0.89. The precise framing used for these elicitations is detailed in Appendix A3.

In terms of individual migration history and network, 39 percent of the respondents reported having previously migrated outside their village for at least 6 months. The duration of past migration spells averaged 24 months. Seventy-seven percent of the sample knew at least one person (be it a relative or a friend) who had migrated outside their village, a proxy for their migration network. On average the size of the migration network was 2 individuals per respondent. Respondents were also asked how many migrants they knew that had successfully reached Europe via the "*backway*", and how many had died attempting the journey. On average, they knew 9 successful migrants and 4 migrants who died *en route*.

We document high migration intentions among respondents in our sample. 81 percent expressed a willingness to migrate internally, and 92 percent intended to migrate abroad. 47 percent of the sample reported their willingness to migrate irregularly via the "*backway*" route. Preferred destinations of "backway migration" were Italy (32%), Germany (27%), Spain (17%), the U.S. (6%), and the U.K. (5%), consistent with recorded migration patterns.

Respondents reported an average expected "*backway*" migration cost of GMD 84,893 (~EUR 1,698) and an expected monthly wage abroad of EUR 1,452. On average, they were willing to forgo migration in exchange for GMD 26,797 (~ EUR 540) per month. These reports suggest substantial perceived gains from migration relative to local earnings, presumably offset by the perceived riskiness of the "backway" journey, as well as any local amenities.

We elicited the expected probability of dying *en route* and the expected probability of obtaining asylum or a residence permit. On average, respondents assigned a 51% probability to dying *en route* and a 38% probability to obtaining legal status. These elicited beliefs confirm the priors documented in our pilot work for the probability of dying *en route*, but indicate lower expectations about obtaining legal residence than the pilot had indicated.

Beliefs about the risks and outcomes of "*backway*" migration reveal systematic biases. Our best available benchmarks for the study period are approximately 20 percent for the probability of dying *en route* and 33 percent for the probability of obtaining legal status (described in Appendix A2). Relative to these benchmarks, experimental subjects substantially overestimated mortality risk and held somewhat more optimistic beliefs about the likelihood of obtaining legal status.

These expectation biases should be interpreted cautiously. First, mortality benchmarks may suffer from measurement error and aggregation bias, while respondents may incorporate

individual-specific information not reflected in population averages.[14] Second, limited access to reliable information likely contributes to these misperceptions. Potential migrants often receive inaccurate information from their networks, and this problem is likely to be especially serious in the context of "*backway*" migration from Africa to Europe, where immigration policy changes rapidly and information access is limited in isolated rural origin regions.

4. Identification strategy and main empirical results

4.1. Identification strategy

Using the variation from individual migration decisions made in the laboratory experiment, we estimate the following model using a Linear Probability Model (LPM):

$$M_{ir} = \alpha + \beta_1 . PD_{ir} + \beta_2 . PP_{ir} + \delta_i + \theta_r + \varepsilon_{ir} \quad (1)$$

where M_{ir} denotes individual i's migration decision in round r; PD_{ir} is the probability of dying *en route* faced by individual i in round r; and PP_{ir} is the probability of obtaining a legal residence permit faced by individual i in round r. δ_i denotes individual fixed effects and θ_r stands for round order fixed effects. Standard errors are clustered at the individual level.

Our estimates of interest β_1 and β_2 provide us respectively with the effects of the probabilities of dying *en route* and of obtaining a legal residence permit on the probability that experimental subjects choose to engage in irregular migration in the experiment. The advantage of our design is that due to the availability of variation both within and across individuals, we can include individual fixed effects in our specification, which allow us to control for potentially relevant omitted individual variables. Our specification includes round order fixed effects to absorb any systematic within-game trends, such as learning or fatigue, and improve precision, although the order of the sixteen rounds was randomized across subjects, and is, hence, orthogonal to both experimental probabilities by construction.

[14] As further discussed in Appendix A2, available estimates, particularly those on the death risk of irregular migration, are subject to substantial measurement error. For example, the probability of dying is calculated using body counts and witness reports of deaths *en route*. Respondents' network counts do not provide an alternative benchmark. Using the sample means reported in Table 1, known deaths account for 29.3 percent of known deaths and arrivals combined. This is, however, not a mortality rate. Its denominator counts only migrants who reached Europe, and therefore omits unsuccessful but non-fatal migration attempts. Networks also overlap across respondents. This 29.3 percent rate would anyway lie well below the 51 percent mean elicited prior belief on mortality, still leaving a large expectation gap. The probability of obtaining legal status upon arrival is less prone to error as it only covers those that actually reached Europe and applied for asylum status.

To allow the migration response to vary more flexibly across the hypothetical scenarios presented in the lab experiment, we also estimate the following Linear Probability Model:

$$M_{ir} = \alpha + \sum_{d \in \{0,10,20\}} \beta_d * 1[PD_{ir} = d] + \sum_{p \in \{0,30,100\}} \beta_p * 1[PP_{ir} = p] + \delta_i + \theta_r + \varepsilon_{ir} \quad (2)$$

where $1[\cdot]$ is an indicator function and the omitted category in this regression is the 50 percent scenario in both dimensions. The set of coefficients β_d give the change in the probability of choosing to migrate irregularly when the mortality scenario moves from 50 to d percent, holding the legal status scenario fixed, and β_p is defined analogously. As in Equation (1), δ_i and θ_r denote individual and round-order fixed effects, and standard errors are clustered at the individual level.

4.2. Empirical results

Table 2 presents the main estimation results from model (1). Consistent with theoretical predictions, individuals are more willing to migrate irregularly when perceived risks are lower and expected returns are higher. Column (1) indicates that a one percentage point (pp) increase in the probability of dying *en route* reduces migration willingness by 0.123pp, statistically significant at the 1% level. Conversely, a one pp increase in the probability of obtaining a residence permit in Europe raises the likelihood to migrate irregularly by 0.125pp. Column (2) adds individual and round-order fixed effects, keeping the magnitude of the estimated coefficients at -0.124pp and 0.128, respectively, still statistically significant at the 1% level. These LPM estimates are robust to alternative specifications, including probit and logit models.

Columns (3) and (4) of Table 2 restrict the estimation sample to experimental subjects whose migration choices vary across rounds (i.e. those who do not choose to always migrate or never to migrate independently of the lab round). In this selected sample, the estimates are more than three times larger in absolute value. A one-percentage-point increase in the probability of dying *en route* lowers willingness to migrate irregularly by between 0.45 and 0.46pp, while the probability of obtaining legal status raises it by about 0.47pp.[15]

[15] The contrast between the two pairs of columns also shows why we identify our parameters from the within-subject variation. The 296 subjects excluded from columns (3) and (4) do not respond to the experimental

The subjects whose migration choices do not vary across rounds are not a random subset, and their laboratory behavior is informative about the decision they were asked to make. Those who never choose migration in the experiment are far less likely to report intending to migrate irregularly at baseline than those who always do, 10 against 84 percent. The contrast is specific to irregular migration: the two groups are statistically indistinguishable in their intention to migrate abroad in general, in their intention to migrate internally, and in their previous migration experience. Their prior beliefs also differ in the direction implied by the decision problem: those who never choose migration expect a higher probability of dying *en route* and a lower probability of obtaining legal residence. They also report a lower willingness to take risks. Laboratory behavior among these subjects is therefore closely related to their attitudes and beliefs about irregular migration specifically, rather than to a general propensity to migrate. This pattern is consistent with their lack of responsiveness reflecting a relatively fixed position on irregular migration rather than a failure to understand or respond to the experimental probabilities.

We complement the results shown in Table 2 with the estimation of equation (2), which replaces the continuous mortality-risk and legal-status probabilities with indicators for their specific parameter values in each round. The 50 percent scenario is the omitted category for both dimensions. It was chosen at the design stage to match the prior beliefs of potential migrants, as established in our pilot fieldwork.

We show the estimation results in Figure 1 and in Appendix Table A1. Each point in Figure 1 gives the estimated change in the probability of choosing irregular migration under the faced scenario relative to the omitted 50 percent scenario, holding the other experimental dimension constant. The probabilities shown on the vertical axes are the values assigned to parameters in the experimental rounds. The horizontal bars report 95 percent confidence intervals based on standard errors clustered at the individual level.

Figure 1 shows that experimental subjects respond systematically to changes in the scenarios faced. A 20 percent probability of dying *en route* relative to the 50 percent reference scenario (closely matching the 51 percent mean prior baseline belief) significantly increases migration willingness by 3.0pp, while a 10 percent probability increases it by 3.8pp, and zero mortality risk by 6.7pp. The magnitude of the response therefore increases as the mortality risk declines.

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parameters over the range we offer, and in any single round that heterogeneity is left in the error term, which the individual fixed effects absorb.

Subjects also respond systematically to changes in the probability of obtaining a legal permit, although here the 50 percent reference scenario lies above the beliefs our subjects report, at 38 percent on average, so that these estimates are better read as responses to a change in the scenario faced than as the correction of a mean prior belief. Moving from the 50 percent reference scenario to a 30 percent probability of obtaining a residence permit reduces the willingness to migrate irregularly by 2.1pp, while reducing it to zero lowers it by 9.9pp. Conversely, raising the probability to 100 percent increases the willingness to migrate irregularly by 3.7pp.

Table 3 examines how individual beliefs and characteristics predict willingness to migrate irregularly across experimental rounds. The regressors are selected to capture factors directly related to the experimental decision. Prior beliefs about the likelihood of dying *en route* and of obtaining a residence permit, as well as the presence of irregular migrants in one's network, are the strongest predictors of migration decisions. In the fully specified model in column (3), a one-standard-deviation (SD) increase in the expected probability of dying *en route* is associated with a 4.3pp reduction in the willingness to migrate, an effect statistically significant at the 5% level. A one-SD increase in the expected probability of obtaining a residence permit is associated with a 10.6pp increase in the willingness to migrate, statistically significant at the 1% level. Migrant-network experiences display a similar asymmetry. The number of known deceased migrants has no statistically significant association with migration choices, whereas a one-SD increase in the number of known successful "*backway*" migrants predicts an 8.1pp increase in willingness to migrate, significant at the 1% level. These results are consistent with subjects placing greater weight on favorable migration prospects than on adverse migration outcomes.

In terms of individual characteristics, risk preferences are the key determinant of "*backway*" migration decisions in the lab. A one-SD increase in risk preferences is associated with a 6.7pp increase in the willingness to migrate, an effect statistically significant at the 1% level. Individual time preferences, age, formal education and individual income display no significant effects.[16]

[16] We also tested adding household characteristics (namely, household size, presence of internal migrants, presence of international migrants, and receipt of remittances) to this regression. It left the main coefficients unchanged, and these variables were jointly insignificant.

These associations are also informative about how participants approached the experimental task. Conditional on the experimental scenario, prior beliefs about the probability of dying *en route* and the probability of obtaining legal status, as well as exposure to successful backway migrants, which has no counterpart within the experiment at all, predict laboratory migration choices. These patterns are consistent with participants bringing migration-related beliefs, preferences and decision rules, or heuristics, formed outside the experiment into the experimental task, rather than evaluating the scenarios solely on the basis of their monetary payoffs.

A single expected monetary payoff would be a sufficient statistic for the lab migration choices only under restrictive assumptions about preferences. Choices differ across rounds when expected monetary payoffs are identical in a way that excludes expected utility maximization over monetary payoffs under risk neutrality or risk aversion. Two scenarios yield the same expected migration payoff: one with no mortality risk and no possibility of a legal permit, and one with 50 percent mortality with a legal permit certain on arrival (Appendix A1). Among the 398 subjects facing both scenarios, 35.7 percent chose migration in the first and 43.7 percent in the second, a paired difference of 8.0pp ($p<0.01$), which is inconsistent with risk aversion over the monetary payoffs of the game. Across all sixteen scenarios, the two probabilities remain jointly significant once the expected payoff of each round is controlled for, while the coefficient on the expected payoff is close to zero (Appendix Table A2). Subjects therefore respond to the composition of the migration prospect rather than to its expected monetary value alone, consistent with the migration framing leading participants to value outcomes beyond the experimental payments - such as visiting family in Africa, which the lab instructions explicitly linked to legal status. Appendix A4 provides further discussion.

Because the experimental migration choices are cognitively demanding and only 36 percent of the subjects have any formal schooling, we assess whether the estimated responses reflect comprehension of the scenarios rather than noise. Three patterns indicate that they do. First, as Figure 1 shows, choices track both parameters monotonically across all four assigned levels rather than merely in sign, and the same ordering is present in the unconditional cell means. Second, responsiveness to neither parameter varies with education, whether measured by an indicator for any formal schooling or by years of schooling, and the two interactions are jointly insignificant in every specification (Appendix Table A3). Third, the response to the assigned mortality risk is already present in the first round played (Appendix Table A4). Since the order of scenarios was randomized, this is a between-subject comparison with a single observation

per respondent, and it therefore cannot reflect learning across rounds, anchoring on a previously seen showcard, or consistency with a subject's own earlier answers. We did not administer a formal comprehension test, so this evidence is behavioral rather than direct. Nevertheless, systematic responses that are monotonic across scenarios, unrelated to schooling, and present from the first decision, provide reassurance that subjects understood the central trade-offs represented by the showcards.

Our findings have potentially important implications for information interventions aimed at deterring irregular migration. They suggest that correcting migrants' overestimation of *backway* mortality risks may increase, rather than reduce, the willingness to migrate irregularly, contrary to the intended effect of information campaigns aimed at deterring such migration by emphasizing migration risks. However, our results also suggest that information that lowers migrants' beliefs about the probability of obtaining asylum could reduce willingness to migrate irregularly, since subjects also tend to overestimate their chances of receiving legal residence upon arrival in Europe. The effectiveness of information provision may therefore depend critically on both the direction of prior belief biases and the particular migration outcome about which information is provided.

5. Do Lab Migration Decisions Predict Subsequent Migration Outcomes?

Migration choices elicited in a laboratory setting may, in principle, differ from actual behavior. To examine this possibility, we conducted a follow-up phone survey one year after the experiment.

We successfully re-interviewed 261 of the original 407 participants. International migration was rare: only 3.4 percent of respondents had migrated internationally, mostly to Senegal rather than Europe. Migration intentions remained relatively high: 77 percent intended to migrate at some point in the future, 33 percent within the following year, and 33 percent intended to emigrate irregularly.

Table 4 reports LPM regressions of each follow-up outcome on the share of laboratory rounds in which the respondent chose to migrate irregularly. Because each outcome is observed once per respondent, estimation is at the respondent level. The estimates are positive for all four outcomes and largest for the intention to migrate irregularly, which most closely matches the

experimental choice that subjects made repeatedly in the laboratory. Respondents who chose to migrate in every laboratory round are 12.9pp more likely to report an intention to migrate irregularly one year later than those who never chose to migrate, an effect equivalent to 39 percent of the 33 percent follow-up mean, significant at the 10 percent level. The other associations are positive but less precisely estimated.

Two features limit the precision of our estimates. First, the follow-up sample is small: minimum detectable effects at conventional power are 7.1, 16.9, 19.1 and 19.4 percentage points across the four outcomes, against point estimates of 2.2, 5.2, 9.5 and 12.9 percentage points, implying low power to detect effects of the estimated magnitudes. Second, the follow-up year was unusually unfavorable for observing the migration our experiment elicits. The Central Mediterranean route, which accounted for 92 percent of Gambian irregular arrivals in 2016, contracted sharply: Gambian detections fell from 11,878 in the twelve months before the experiment to 3,127 in the twelve months after it, and from 1,161 in May 2017, the month of the experiment, to 60 by August. Intentions also fell, from 44.7 to 33.3 percent among respondents observed at both dates. Attrition further reduced power but does not appear selective: follow-up status is unrelated to laboratory migration choices ($p = 0.89$) or baseline intentions to migrate irregularly ($p = 0.30$). Consistent with this difficulty to detect relationships with realized migration when migration itself is rare, Batista and McKenzie (2023) find that analogous lab decisions strongly predict migration-search behavior but not realized migration.

Additional support for the relevance of our experimental measure comes from the well-established finding that migration intentions predict subsequent migration outcomes, both at the macro (e.g., Tjaden et al., 2019; Docquier et al., 2014; Bertoli and Ruyssen, 2018) and the micro level (e.g., Chort, 2014; Creighton, 2013; Van Dalen and Henkens, 2013). Tjaden et al. (2019) show that a 1 percent increase in Gallup World Poll migration intentions corresponds to a 0.8 percent increase in bilateral migration flows. Chort (2014) finds that intentions reported in the 2002 wave of the Mexican Family Life Survey significantly predict migration in the 2005–06 follow-up. Our follow-up cannot precisely test this relationship because realized international migration is too rare in our sample.

Overall, the follow-up evidence and prior literature support interpreting our experimental measure as informative about individuals' underlying propensity to migrate irregularly. This interpretation remains supportive rather than conclusive: it requires the migration framing to activate decision processes relevant outside the experiment, while a stronger quantitative

interpretation would additionally require their sensitivity to mortality risk and legal-status probability to be similar inside and outside the experimental environment, an assumption our design cannot test.

What the experiment does deliver, and where its contribution lies, is randomized variation in the probabilities of dying *en route* and of obtaining legal status, holding all else fixed. This type of variation is not available in observational data, where migration risks, returns and policy regimes move together and are correlated with the characteristics of those who face them.

6. Concluding Remarks

This paper studies the drivers of irregular migration from West Africa to Europe using an incentivized lab-in-the-field experiment with rural households in The Gambia, the country with the highest per-capita rate of irregular migration to Europe at the time of data collection. Participants made incentivized migration choices across scenarios that independently varied the probability of dying *en route* and of obtaining legal status at destination. This design allows us to identify the separate effect of each probability on the irregular migration lab decision while holding the other dimension constant.

Our findings show that both dimensions matter for irregular migration decisions. Reducing the probability of dying *en route* from 50 to 20 percent raises willingness to migrate irregularly by 3.0pp, while reducing the probability of obtaining legal residence from 50 to 30 percent lowers it by 2.1pp. These responses are particularly relevant given the gaps between participants' prior beliefs and our benchmark estimates for the study period. When participants overestimate both probabilities, correcting these beliefs can generate offsetting responses. Our separate identification of the two effects may therefore help explaining why information campaigns that bundle multiple dimensions produce small or null average effects, even when each component matters.

A striking implication of our findings is that information campaigns aimed at deterring irregular migration may have unintended consequences. Their effectiveness depends critically on the alignment between the information provided and potential migrants' prior beliefs: information about risks may backfire when those risks are overestimated, while responses may also differ across positive and negative outcomes, with migrants appearing to place greater weight on

uncertain positive outcomes. These results highlight the importance of accounting for prior beliefs and how different types of information are processed when designing migration policies, and point to an important avenue for future research.

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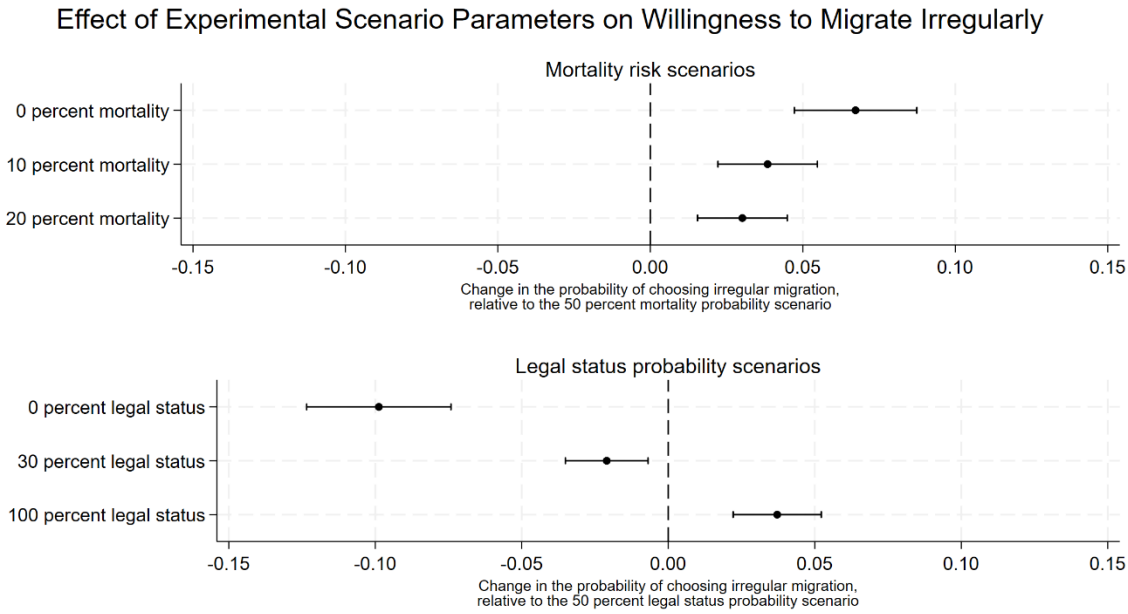
Figures

Figure 1. Experimental Impact on Willingness to Migrate Irregularly



Notes: Each point shown is the coefficient on an indicator for the experimental scenario parameters shown on the vertical axis, estimated jointly in a single linear probability model with individual and round order fixed effects. The omitted category is the 50 percent scenario for both parameters. Bars are 95 percent confidence intervals from standard errors clustered at the individual level.

Tables

Table 1. Summary Statistics of Participants in the Experiment

Variable	Mean	SD	N
Individual characteristics			
Age	20.25	3.24	407
Formal education [Yes=1, No=0]	0.36	0.48	407
Years of formal education	2.87	4.30	407
Monthly income (GMD)	1,174.62	2,970.85	407
Risk preferences (0-1 scale, where 1 is maximum risk taking)	0.36	0.30	394
Time preferences (0-1 scale, where 1 is maximum patience)	0.89	0.18	380
Has migrated before [Yes=1, No=0]	0.39	0.49	391
Duration of migration (if any) in months	24.04	25.65	142
Has relatives or friends abroad (migration network) [Yes=1, No=0]	0.77	0.42	389
Number of relatives or friends abroad	2.01	2.04	401
Number of known successful *"backway"* migrants	9.47	11.62	403
Number of known dead migrants en route	3.93	4.63	400
Intentions to migrate and prior beliefs			
Has intention of migrating within the country [Yes=1, No=0]	0.81	0.39	404
Has intention of migrating outside the country [Yes=1, No=0]	0.92	0.28	406
Has intention of migrating irregularly [Yes=1, No=0]	0.47	0.50	406
Top preferred destination (if intending to migrate irregularly)			
Italy [Yes=1, No=0]	0.32	0.47	179
Germany [Yes=1, No=0]	0.27	0.44	179
Spain [Yes=1, No=0]	0.17	0.37	179
United States [Yes=1, No=0]	0.06	0.24	179
United Kingdom [Yes=1, No=0]	0.05	0.22	179
Expected cost of migrating (GMD)	84,893.49	104,786.86	169
Expected monthly wage in destination (EUR)	1,451.57	1,724.13	185
Monthly value required to forgo migrating (GMD)	26,796.55	39,169.57	174
Expected probability of dying en route	0.51	0.26	396
Expected probability of obtaining permit	0.38	0.29	398
Household characteristics			
Household size	10.35	6.49	407
Has internal migrants [Yes=1, No=0]	0.58	0.49	382
Has international migrants [Yes=1, No=0]	0.65	0.48	405
Received remittances [Yes=1, No=0]	0.36	0.48	397

Notes: Sample of 407 experimental participants, one observation per respondent. The number of observations varies across rows because of item nonresponse.

Table 2. Willingness to Migrate Irregularly - Results from the Lab Experiment

	(1)	(2)	(3)	(4)
Probability of dying en route	-0.123***	-0.124***	-0.451***	-0.458***
	(0.019)	(0.019)	(0.060)	(0.061)
Probability of obtaining a permit	0.125***	0.128***	0.472***	0.474***
	(0.015)	(0.014)	(0.037)	(0.036)
Constant	0.379***	0.377***	0.431***	0.431***
	(0.022)	(0.007)	(0.032)	(0.022)
Individual fixed effects	No	Yes	No	Yes
Round order fixed effects	No	Yes	No	Yes
N	6426	6425	1761	1761
n	407	406	111	111
R^2	0.011	0.815	0.148	0.448

Notes: Regressions estimated using a Linear Probability Model. The dependent variable is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. Probability of dying en route is the hypothetical probability of dying *en route* to Italy. Probability of obtaining a permit is the hypothetical probability of obtaining a residence permit (or asylum status) in Italy. *N* is the total number of observations and *n* is the total number of respondents. Each individual has a maximum of 16 observations. In columns (3) and (4), estimation is conducted by dropping those who are willing to migrate in all rounds (106) and those that are not willing to migrate in any round (190). Standard errors in the parentheses, clustered at the individual level. *Significant at 10%; **significant at 5%; ***significant at 1%.

Table 3. Predictors of Lab Willingness to Migrate Irregularly

	(1)	(2)	(3)
Expected probability of dying *en route*	-0.203**	-0.175**	-0.167**
	(0.081)	(0.082)	(0.083)
Expected probability of obtaining a residence permit	0.441***	0.396***	0.365***
	(0.072)	(0.073)	(0.077)
Number of known dead migrants		-0.003	-0.002
		(0.005)	(0.005)
Number of known successful irregular migrants		0.006***	0.007***
		(0.002)	(0.002)
Age (in years)			-0.012
			(0.007)
Has formal education (binary)			0.016
			(0.046)
Monthly income (thousands of GMD)			-0.002
			(0.007)
Risk preferences			0.224***
			(0.075)
Patience			-0.168
			(0.121)
Constant	0.354***	0.313***	0.606***
	(0.065)	(0.068)	(0.199)
N	6158	6111	5633
n	390	387	357
R^2	0.104	0.12	0.144

Notes: Regressions estimated using a Linear Probability Model, including round and round order fixed effects. The dependent variable is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. "Expected probability of obtaining a residence permit" and "Expected probability of dying en route" are both elicited in the baseline survey prior to the experiment taking place. Risk preferences are measured using an hypothetical lottery on a 0-1 scale, where 1 is maximum risk taking. Patience is measured on a 0-1 scale, where 1 is maximum patience. *N* is the total number of observations and *n* is the total number of respondents. Each individual has a maximum of 16 observations. Standard errors in the parentheses, clustered at the individual level. *Significant at 10%; **significant at 5%; ***significant at 1%.

Table 4. Lab Willingness to Migrate Irregularly and Follow-up Migration Outcomes 1 Year After

	(1) Migrated internationally	(2) Intention to migrate	(3) Intention to migrate next year	(4) Intention to migrate irregularly
Average migration rate across lab rounds	0.022	0.052	0.095	0.129*
	(0.026)	(0.060)	(0.068)	(0.069)
Constant	0.025*	0.747***	0.290***	0.280***
	(0.013)	(0.038)	(0.040)	(0.040)
Mean of dependent variable	0.034	0.768	0.329	0.333
MDE	0.071	0.169	0.191	0.194
N	261	246	246	246
R^2	0.003	0.003	0.008	0.015

Notes: Regressions estimated using a Linear Probability Model. Average migration rate across lab rounds is the fraction of rounds in which the respondent chose to migrate. MDE is the minimum detectable effect, which is computed at 80 percent statistical power and 5 percent significance. N is the total number of respondents. Robust standard errors in the parentheses. *Significant at 10 percent; **significant at 5 percent; ***significant at 1 percent.

Online Appendices

Appendix A1: Lab-In-The-Field-Experiment Framing

Given the specificities of the local context, with low literacy levels and prevalence of local languages, the experimental subjects were verbally given the following game instructions, in their local language by enumerators of local origin – but not from the same village, to ensure there were no personal acquaintances or connections.

Enumerators were instructed to explain the game in detail and to ask respondents questions before proceeding in order to ensure that the rules and setup of the game were clear. Probabilities were presented as frequencies out of ten migrants and illustrated using the showcards reproduced in Appendix Figure A1.

Suppose that you are given 100,000 Gambian Dalasis. You can decide what to do with the money. You can either keep it or use it to migrate to Europe through the "Backway" and stay living there for 10 years. 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 20000 Euros (D1,000,000) you win, we will pay you 1-real euro (D50). You have the opportunity to win a minimum of D0 up to a maximum of D300.

For example, people who choose not to migrate can keep the gift of D100,000 which is equivalent to a payoff of D5. While those who choose to migrate can either win D0 if they die along the way, D150 if they reach Europe, but do not obtain a permit/asylum. And finally those who migrate and obtain a permit wins D300.

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 Europe or you will die along the way. This depends on the chances we will be providing. From those who successfully reach 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.

After the scenario for each round was explained verbally and presented using the corresponding showcard, respondents were asked the following questions:

(1) Migration decision:

"Are you willing to migrate through the 'backway'/illegally?" [No/Yes]

(2) Willingness to pay:

"Out of D100,000 gift, how much are you willing to pay for cost of migrating?"

(3) Willingness to accept:

"How much are you willing to accept per month in order to stop migrating and live in Gambia?"

Note: Respondents who answered "No" to the migration question (1) proceeded to the next round without answering questions (2) and (3).

Appendix A2: Lab-In-The-Field-Experiment Choice of Parameters

The lab-in-the-field experiment consisted of 16 incentivized rounds in which experimental subjects made migration-related decisions based on different combinations of two factors: the probability of dying *en route* to the migration destination and the probability of obtaining legal residence status upon arrival.

There were four scenarios for each factor: 0, 10, 20, and 50 percent probability of dying in the migration route, and 0, 30, 50, and 100 percent probability of obtaining a legal residence permit or asylum status at destination. These thresholds were selected based on their relevance, as indicated by our pilot survey data and other sources, which we now turn to describe.

According to IOM data, 181,436 migrants arrived in Italy by sea in 2016 via the Central Mediterranean route, while 4,579 migrants were recorded dead or missing on this route, implying a recorded mortality rate for attempted sea crossings of 2.46 percent.[1] These figures are not specific to Gambian migrants because nationality is unavailable for most recorded deaths. For the segments of the route before reaching the Mediterranean, for which comparable administrative data are unavailable, we use the January 2017 North Africa Mixed Migration Hub survey of 381 migrants who reached Italy.[2] According to this survey, 65% of respondents reported witnessing one or more migrant deaths during their journey. Of these, 44% were reported in Libya, 38% in the Sahara Desert, 15% in the Mediterranean Sea, and 3% in transit countries such as Niger. The Gambia accounted for 10.8 percent of respondents. The survey is not statistically representative and, because it interviews survivors and does not record the number of fellow travelers, these witness shares cannot themselves be interpreted as mortality rates.

To approximate a full backway mortality rate, we use the sea segment as a benchmark for the full route and assume that the relative incidence of witnessed deaths across segments is proportional to relative mortality. Scaling the 2.46 percent recorded sea mortality rate by the

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[1] International Organization for Migration (2017). Mixed Migration Flows in the Mediterranean and Beyond: Compilation of Available Data and Information - Reporting Period 2016. International Organization for Migration. https://reliefweb.int/sites/reliefweb.int/files/resources/2016_Flows_to_Europe_Overview.pdf [Last accessed on August 22, 2026]

[2] North Africa Mixed Migration Hub (2017). "Survey Snapshot, Italy, January 2017." Mixed Migration Hub. https://reliefweb.int/attachments/0d8fb046-bcf6-32e7-ab66-08a95d49624e/Italy-MHub-Survey-Snapshot-Jan-2017.pdf [Last accessed on August 22, 2026]

corresponding witness shares yields 6.24 percent for the Sahara, 7.22 percent for Libya, and 0.49 percent for other transit countries, which together with the sea component sum to an overall 16.41 percent mortality rate.

This calculation is necessarily imprecise and is likely to understate route-wide mortality. The recorded sea mortality rate is itself a lower bound because many bodies are never recovered. In addition, deaths at sea are particularly likely to generate multiple witness reports among survivors interviewed in Italy, whereas deaths in Libya and the Sahara are less observable and can only be reported by migrants who survive the remainder of the journey. Using the sea witness share as the scaling benchmark therefore tends to understate mortality on the overland segments. For these reasons, we treated 16.4 percent as a conservative benchmark and selected the nearby 20 percent scenario, rather than interpreting either value as a true or official mortality rate.

Table 1 reports that the average respondent knows 9.47 migrants who reached Europe through the *backway* and 3.93 who died attempting the journey, so that known deaths account for 29.3 percent of known deaths and arrivals combined. This is not a mortality rate because the denominator counts only migrants known to have reached Europe. It therefore omits unsuccessful, but non-fatal migration attempts: migrants who returned or were returned, were intercepted or detained, remained stranded in transit, or were still *en route* at the time of the survey. Moreover, these counts cannot straightforwardly be aggregated to recover a population quantity as they are not independent draws from the population of *backway* migrants. Respondents living in the same village draw on overlapping networks, so a single death or arrival can enter the counts of several respondents. Averaging or pooling across respondents therefore does not recover a population quantity, as it would if each respondent contributed with an independent sample of migration journeys. Nevertheless, the implied figure of 29.3 percent still lies far below the 51 percent mean elicited mortality prior belief reported in Table 1.

The 50 percent threshold for the probability of dying matches prior beliefs from the pilot survey. Our pilot survey elicited the expected probability of dying *en route* from 20 young males of ages 15 to 25 years from the region of the study. On average, the respondents expected that 5 out of 10 Gambians would die along the "backway", corresponding to a 50 percent probability of dying.

We analyzed official data on residence permits granted in Italy from the Asylum Information Database (AIDA, 2016).[3] This database contains detailed numbers of individuals who arrive in Italy by nationality and by destination and who apply for asylum. It also includes information on the final decision on the asylum applications. Italy was the main entry country in Europe for Gambian migrants at the time of our fieldwork, as described in Section 2. In 2016, 8,930 migrants originating from The Gambia applied for asylum status in Italy. The rejection rate of asylum requests for these migrants was 67.5 percent. This rejection rate implies an estimated 32.5 percent probability of obtaining asylum status or a residence permit. Because the showcards presented all probabilities as frequencies out of ten migrants, we implemented the nearest available value, 30 percent. This is substantially lower than the 50 percent expectation measured in our pilot survey.

We combined these two thresholds (the first based on existing data and the second based on the prior beliefs 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 set the parameters for the different game rounds.

The showcards shown in Appendix Figure A1 visually illustrate the probabilities of dying en route and of obtaining residence status upon successful arrival in Europe. These showcards were shown to experimental subjects to facilitate visualization of the risks presented in each lab round of the experiment.

[3] 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 [Last accessed on August 22, 2026]

Appendix A3: Measures of risk and time preferences

Risk Preferences

Imagine you won a gift of 1,000 Dalasis 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 (1,500 Dalasis if you invest 1,000 Dalasis) within a year. If you lose, you get half (500 Dalasis if you invest 1,000 Dalasis) within a year too. You can choose to invest in the whole game (1,000 Dalasis), only part or nothing. *How much would you like to play in this risky but potentially lucrative investment?*

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

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*?

Appendix A4:

Do Experimental Subjects Respond Only to Expected Monetary Payoffs?

In the implementation of the lab experiment, participants were informed of the hypothetical endowment, the payoffs associated with each outcome, and the probabilities of each round, but not of an overall pre-calculated expected payoff. Providing participants with a researcher-calculated expected payoff would have amounted to a different experimental environment. It would have reduced the need for participants to process separately the probability of dying *en route* and the probability of obtaining legal status on arrival, which are the two dimensions that the experiment is designed to vary independently. It would therefore have changed the decision problem and the interpretation of the resulting responses, particularly because scenarios with very different mortality risks and legal-status prospects can have the same expected payoff.

In every round, a subject who stays in The Gambia received GMD 5. A subject who migrates received GMD 0 if he dies *en route*, GMD 150 if he reaches Europe without obtaining a permit, and GMD 300 if he reaches Europe and obtains a permit, as described in Appendix A1. With a probability of dying *en route* d and a probability of obtaining legal status conditional on arrival p, the expected monetary payoff from migrating is therefore $EV = (1 - d)\,[300p + 150(1 - p)] = 150\,(1 - d)\,(1 + p)$. Across the sixteen scenarios, EV ranges from GMD 75 to GMD 300 and takes fifteen distinct values, because one pair of scenarios yields exactly the same expected payoff.

A single expected monetary payoff would be a sufficient statistic for the decision only under restrictive assumptions about preferences, namely risk neutrality over the monetary payoffs of the game and no value attached to the consequences of each outcome beyond its payoff. The data do not support an interpretation in which subjects are simply solving the expected-monetary-value problem implied by the experimental payoffs.

A particularly informative comparison comes from the two scenarios with identical expected monetary payoffs from migration. In the scenario with no mortality risk and no possibility of obtaining legal status, migration yields GMD 150 with certainty. In the scenario with a 50 percent probability of dying *en route* and certainty of obtaining legal status conditional on arrival, migration yields GMD 300 with probability one half and zero otherwise. Both therefore imply an expected monetary payoff of GMD 150, and staying yields GMD 5 in both. If subjects were responding only to the expected monetary value of the experimental payoffs, these two scenarios would be equivalent. Yet, among the 398 subjects with a recorded decision in both scenarios, 35.7 percent choose migration in the first and 43.7 percent in the second, a paired difference of 8.0 percentage points (s.e. 1.8, $p<0.01$). The direction of this difference is inconsistent with risk aversion over the monetary payoffs of the game, since subjects are more likely to migrate under the prospect involving a 50 percent probability of receiving nothing. Because the comparison holds the expected payoff fixed, it requires no assumption about how the probability of choosing migration varies with the expected payoff.

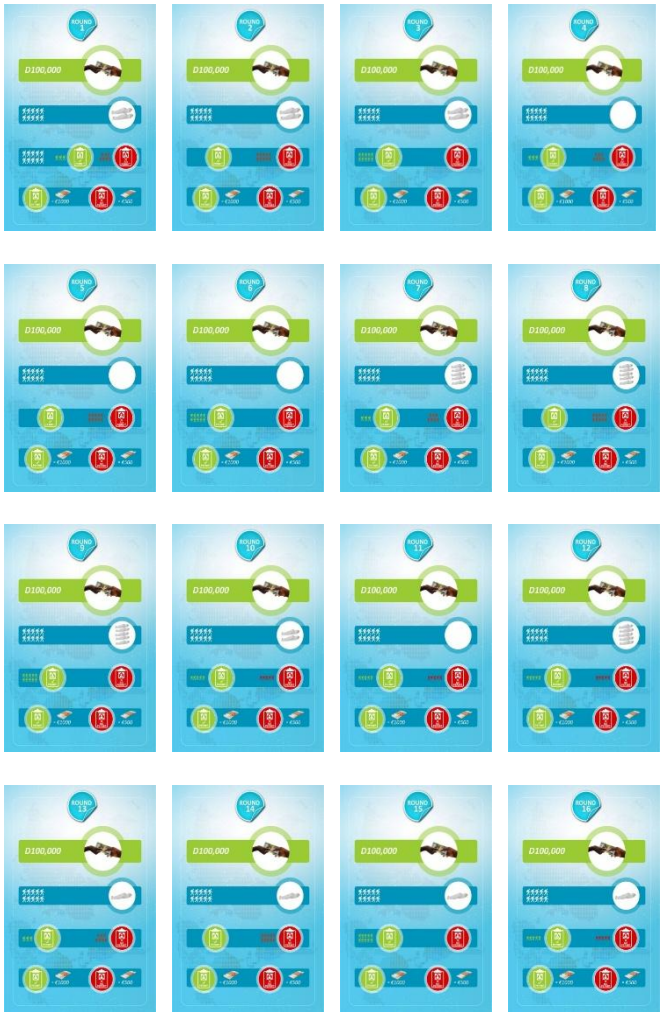
Appendix Table A2 shows that the same pattern holds across the full experimental design. Column (1) replaces the two probabilities in equation (1) with the expected payoff of the round, measured in hundreds of GMD: the willingness to migrate irregularly rises by 8.1 pp for each GMD 100 of expected payoff. Column (2) includes the expected payoff together with the probability of dying *en route* and the probability of obtaining legal status. The coefficient on the expected payoff is then close to zero (-0.008, s.e. 0.023), while the two experimentally varied probabilities remain jointly significant ($p < 0.001$). If subjects were responding only to the expected monetary value of the experimental payoffs, the two probabilities would carry no information once the expected payoff is controlled for, but the F test rejects this restriction.

We can conclude that subjects respond to the composition of the migration prospect rather than simply to its expected monetary value. This is consistent with the migration framing leading participants to attach distinct value to mortality risk and legal status, including dimensions of legal status that were explicitly described in the lab instructions, but are not captured by the associated wage alone, such as the opportunity to visit family in Africa, as described in Appendix A1.

We therefore presented participants with the underlying probabilities and associated outcomes rather than with a pre-calculated expected payoff. The design also took several steps to limit the computational burden without collapsing the two dimensions: probabilities were shown in natural frequencies, as a number out of ten migrants, on the visual showcards reproduced in Appendix Figure A1; the possible outcomes of a round and their monetary consequences were enumerated in a worked example (Appendix A1); and all instructions were delivered verbally in the local language by enumerators of local origin. The resulting responses may nevertheless reflect both participants' valuation of the migration outcomes and the way in which they process these probabilities.

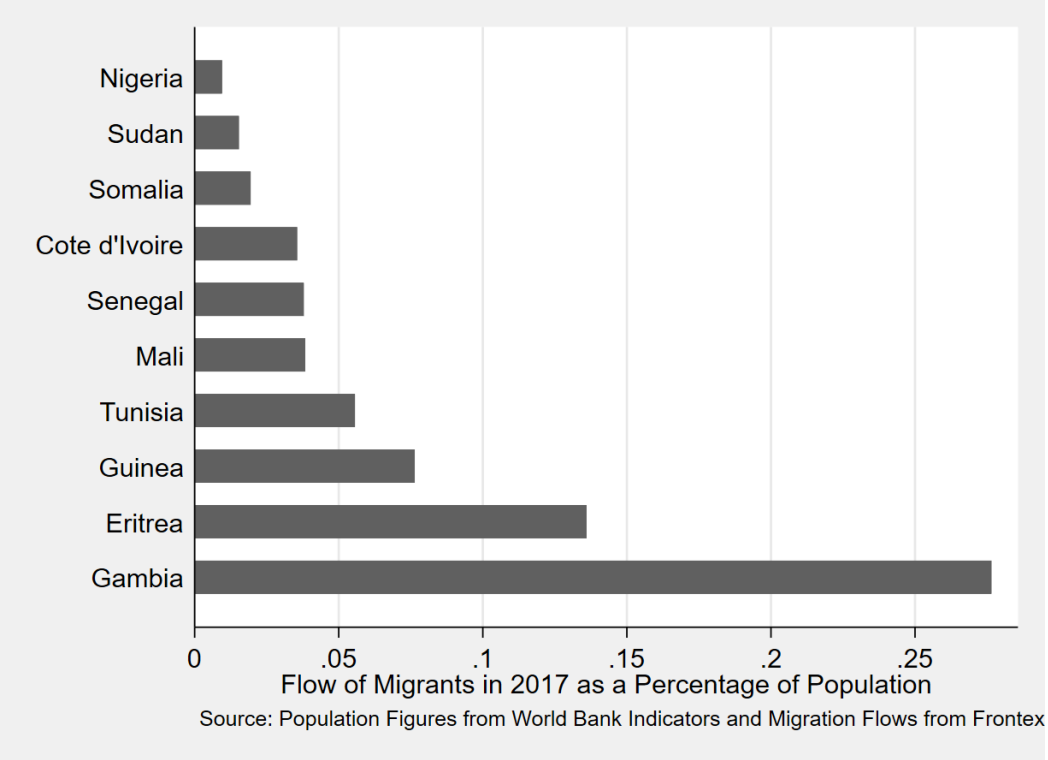
Appendix Figures

Appendix Figure A1: Show Cards corresponding to 16 Game Rounds



Notes: The figure reproduces the 16 showcards used in the experiment, corresponding to all combinations of four probabilities of dying *en route* (0, 10, 20, and 50 percent) and four probabilities of obtaining legal residence upon arrival in Europe (0, 30, 50, and 100 percent). The order in which the 16 scenarios and corresponding showcards were presented was randomized across subjects. Probabilities were presented as frequencies out of ten to facilitate comprehension. Each card displays, from top to bottom: the round number; the hypothetical endowment of GMD 100,000; the number of migrants out of ten who survive the journey and the number who die en route under that round's scenario; the number of the surviving migrants who obtain a legal residence permit and the number who do not; and the monthly wage attached to each status upon arrival in Italy, namely EUR 1,000 with a residence permit and EUR 500 without. The visual coding distinguishes these outcomes: deaths en route are represented by gray body symbols, while among surviving migrants, green figures denote those obtaining a residence permit and red figures those not obtaining one, matching the green "Permit" and red "No permit" symbols on the cards. Cards were shown alongside the verbal explanation of the scenario given by the enumerator; the corresponding instructions are reproduced in Appendix A1.

Appendix Figure A2: Total Flow of Migrants as a Percentage of Origin Population Crossing the Central Mediterranean Route in 2017 by Top 10 countries of origin



Notes: The figure reports irregular migrant arrivals in Italy via the Central Mediterranean route in 2017 as a share of the origin country's population, for the ten origin countries with the highest ratio. Arrival counts are FRONTEX detections of illegal border crossings; population figures are from the World Bank World Development Indicators.

Appendix Tables

Table A1. Lab Willingness to Migrate Irregularly

	(1)
Probability of dying en route 0%	0.067***
	(0.010)
Probability of dying en route 10%	0.038***
	(0.008)
Probability of dying en route 20%	0.030***
	(0.007)
Probability of obtaining a legal permit 0%	-0.099***
	(0.013)
Probability of obtaining a legal permit 30%	-0.021***
	(0.007)
Probability of obtaining a legal permit 100%	0.037***
	(0.008)
Constant	0.397***
	(0.007)
N	6425
n	406
R^2	0.816

Notes: Regressions estimated using a Linear Probability Model including individual and round order fixed effects. The dependent variable is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. The explanatory variables are indicators taking value 1 if the probability scenario takes indicated value in respective observation round. The omitted category is the 50 percent scenario for both parameters. *N* is the total number of observations and *n* is the total number of respondents. Each individual has a maximum of 16 observations. Standard errors in the parentheses, clustered at the individual level. *Significant at 10%; **significant at 5%; ***significant at 1%.

Table A2. Willingness to Migrate Irregularly - Expected Monetary Payoff

	(1)	(2)
Expected payoff of migrating (GMD 100)	0.081***	-0.008
	(0.008)	(0.023)
Probability of dying en route		-0.142**
		(0.056)
Probability of obtaining a permit		0.138***
		(0.031)
Individual fixed effects	Yes	Yes
Round order fixed effects	Yes	Yes
F test, both probabilities		13.98
p-value, both probabilities		0.000
N	6425	6425
n	406	406
R^2	0.813	0.815

Notes: Regressions estimated using a Linear Probability Model including individual and round order fixed effects. The dependent variable is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. Expected payoff of migrating is (1 - d)[300p + 150(1 - p)], in units of GMD 100, where d is the probability of dying en route, p is the probability of obtaining a permit, and GMD 150 and GMD 300 are the game payoffs on arrival without and with a permit (Appendix A1). Probability of dying en route is the hypothetical probability of dying en route to Italy. Probability of obtaining a permit is the hypothetical probability of obtaining a residence permit (or asylum status) in Italy. The F test refers to the joint null that the coefficients on both probabilities are zero. N is the total number of observations and n is the total number of respondents. Each individual has a maximum of 16 observations. Standard errors in the parentheses, clustered at the individual level. *Significant at 10%; **significant at 5%; ***significant at 1%.

Table A3. Willingness to Migrate Irregularly - Heterogeneous Effects of Education

	(1)	(2)	(3)	(4)
Probability of dying en route	-0.126***	-0.121***	-0.116***	-0.111***
	(0.023)	(0.023)	(0.022)	(0.022)
Probability of obtaining a permit	0.135***	0.139***	0.128***	0.131***
	(0.019)	(0.019)	(0.018)	(0.018)
Has formal education (binary)	0.038			
	(0.047)			
Has formal education (binary) # Probability of dying en route	0.007	-0.008		
	(0.042)	(0.041)		
Has formal education (binary) # Probability of obtaining a permit	-0.028	-0.031		
	(0.029)	(0.029)		
Years of formal education			0.006	
			(0.005)	
Probability of dying en route # Years of formal education			-0.003	-0.005
			(0.005)	(0.005)
Probability of obtaining a permit # Years of formal education			-0.001	-0.001
			(0.003)	(0.003)
Individual fixed effects	No	Yes	No	Yes
Round order fixed effects	No	Yes	No	Yes
F test, both interactions	0.467	0.704	0.311	0.705
p-value, both interactions	0.627	0.495	0.733	0.495
N	6426	6425	6426	6425
n	407	406	407	406
R^2	0.012	0.815	0.013	0.815

Notes: Regressions estimated using a Linear Probability Model. The dependent variable is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. Probability of dying en route is the hypothetical probability of dying en route to Italy. Probability of obtaining a permit is the hypothetical probability of obtaining a residence permit (or asylum status) in Italy. The F test refers to the joint null that both interactions with education are zero. N is the total number of observations and n is the total number of respondents. Each individual has a maximum of 16 observations. Standard errors in the parentheses, clustered at the individual level. *Significant at 10%; **significant at 5%; ***significant at 1%.

Table A4. Willingness to Migrate Irregularly - Results from the Lab Experiment (First Round Played Only)

	(1)	(2)
Probability of dying en route	-0.320**	-0.857***
	(0.131)	(0.245)
Probability of obtaining a permit	0.08	0.462***
	(0.064)	(0.113)
Constant	0.432***	0.495***
	(0.044)	(0.082)
N	407	111
R^2	0.016	0.207

Notes: Regressions estimated using a Linear Probability Model. The dependent variable is a binary variable taking value 1 if the respondent is willing to migrate irregularly and 0 otherwise. Probability of dying en route is the hypothetical probability of dying en route to Italy. Probability of obtaining a permit is the hypothetical probability of obtaining a residence permit (or asylum status) in Italy. N is the total number of observations. In column (2), estimation is conducted by dropping those who are willing to migrate in all rounds (106) and those that are not willing to migrate in any round (190). Robust standard errors in the parentheses. *Significant at 10%; **significant at 5%; ***significant at 1%.