Determinants of Migration Choices: The Role of Beliefs about Career and Non-Career Outcomes

Alaitz Ayarza*
University of the Basque Country (UPV/EHU)

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Abstract

Using original survey data on subjective expectations, I examine how expected career and non-career returns shape migration choices among highly educated young adults from lagging regions in advanced economies. I document strong trade-offs between professional and personal life returns across three counterfactual migration scenarios. A life-cycle utility model shows that non-career factors drive migration choices and welfare, explaining why short-term migration is preferred over long-term migration. Removing short-term migration benefits shifts more short-term migrants to staying than to long-term migration, with responses varying by ability. Policy simulations show promoting short-term migration is three times more cost-effective for high-ability stayers than long-term migrants. A follow-up survey confirms that initial expectations strongly predict realized migration choices and outcomes.

Keywords: Migration choices; return migration; subjective expectations.

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1 INTRODUCTION

Since the late 1980s, regional disparities in advanced countries have widened, undoing some of the marked decline of the previous three decades (IMF, 2019). Today, one in six European Union residents lives in a lagging region (EC, 2017). Economists debate two strategies to support these populations: people-based policies that encourage migration to opportunity-rich areas and place-based policies that focus on developing lagging regions (for a discussion see e.g., Kline and Moretti, 2014; Bartik, 2020; Gaubert et al., 2021). A key issue in this debate is the cost of incentivizing migration. How responsive are individuals' migration decisions to expected labor market gains? How responsive are they to expected impacts on personal lives? Estimating these elasticities requires identifying potential migrants' preferences at the point of deciding whether to migrate or remain in their region of birth.

A well known aspect of realized migration choices is that many—if not most—are temporary (Dustmann and Görlach, 2016a). This makes it challenging to identify preferences at the time of deciding whether to migrate or stay using data on realized choices: First, the selective nature of both migrating and returning makes it difficult to infer counterfactual outcomes under the different migration alternatives (Dustmann and Görlach, 2016b). Second, even if the realized effects of temporary and long-term migration were causally estimated, they may not reflect the outcomes that potential migrants anticipated at the time of their decision. Third, not all realized temporary migrations are part of optimal life-cycle strategies; some result from unexpected shocks that occur after migrating. As a result, identifying potential migrants' preferences at the time of decision-making requires data on expected choices and outcomes collected at that moment.

In this paper, for each potential migrant, I collect data on (i) subjective choice probabilities of counterfactual migration alternatives and (ii) expected outcomes conditional on each alternative. The population of interest consists of tertiary-educated young adults from lagging regions, with migration defined as moving out of one's region of birth, either to another region within the same country or abroad. Since potential migrants are assumed to be forward-looking, the complete choice set includes three migration alternatives: no-migration, return migration, and long-term migration. By combining data on expected choices with expected outcomes, I estimate a discrete life-cycle utility model that identifies preferences at the time of choosing whether to migrate or stay at birthplace. Then, I use the estimated preferences to conduct counterfactual analyses.

I focus on the role of expected career versus non-career returns in migration decision-making. Career outcomes include employment status, wage conditional on employment, and the quality of the match between job and academic degree. Non-career outcomes

include enjoying being close to family, partner, and friends, and the quality of social life. Collecting this data allows me to empirically demonstrate the existence of psychic costs related to migration. This contrasts with the standard approach in the literature, where psychic costs (e.g., birthplace premium) are estimated as the residual of the model to rationalize why many people choose either to never migrate or to return (e.g., Kennan and Walker, 2011; Ransom, 2022).

The data come from a survey of 609 final-year bachelor's degree students conducted in 2020 in Andalusia, Spain's most populous region and a low-growth lagging region in the EU (EC, 2017). I argue that surveying the most mobile group of people—young and highly educated—in regions with poor career prospects makes it plausible to assume that all survey participants have been actively thinking about migration decisions and have therefore well-formed expectations. Section 3 shows evidence supporting this assumption. The setting is relevant beyond Andalusia or Spain, as regional inequalities and migration patterns in the country are comparable to those of other advanced economies.

I complement this dataset with data from a follow-up survey conducted 4 years later, which collected information on individuals' current realized migration trajectories and outcomes. 36% of respondents are migrants by this time. Combining data from 2020 and 2024, I show that there is a strong individual-level relationship between respondents' expected and realized migration choices as well as between expected and actual career and non-career outcomes. These relationships confirm the validity of the employed survey methodology and provide further evidence on the quality of the collected data.

The first part of the paper examines beliefs: How do young people perceive the impacts of short- and long-term migration on their life cycle's career prospects and personal lives compared to never migrating? Results show that the average potential migrant anticipates significant trade-offs between career and non-career outcomes within alternatives, with the trade-off being lowest under short-term migration. First, for career outcomes, respondents expect lower gains from temporary migration compared to long-term migration while at the destination, consistent with the literature showing that outcomes at the destination depend on the expected migration duration (e.g., Dustmann, 1993, 1999; Adda et al., 2022). In the longer term, they anticipate higher career gains after returning compared to never migrating, in line with the literature that motivates return migration as a pathway to accumulating valuable skills at birthplace faster abroad (e.g., Dustmann and Glitz, 2011; Mayr and Peri, 2009). Nevertheless, they also believe returning home means missing important career opportunities available with long-term migration. Thus, long-term migration is viewed as the career maximizing alternative. Second, respondents expect significant and persistently lower non-career outcomes at the destination, making long-term migration the alternative with most negative expected life-cycle effects on

personal life factors.

To provide context on the magnitude of the perceived effects, I compare ex-ante returns with ex-post observed outcome differences between respondents who are actual migrants and stayers in the follow-up survey. I find that average ex-ante returns consistently align with ex-post returns, though ex-ante returns are generally more pessimistic. Finally, results also reveal that the described average ex-ante returns mask significant heterogeneity across individuals, and that consistent with the Roy model of self-selection, respondents sort into migration alternatives based on ex-ante returns.

Next, I take advantage of the richness of the data to understand where the differences in ex-ante returns between migrants and non-migrants stem from. Gelbach decompositions show that differences in networks play a crucial role in explaining gaps in full-time employment, match quality, and all non-career outcomes, and that differences in study and work destination choices between migrants and stayers are key in explaining their differences in expected career gains. Despite accounting for a rich set of covariates, the analysis highlights the significant role of unobserved characteristics in shaping beliefs. In particular, observed characteristics explain a larger share of the higher career outcomes than of the higher non-career outcomes expected by migrants relative to stayers (42%-84% versus 24%-37%). These results underscore the challenge of inferring outcomes for the non-chosen migration alternatives using realized choice data.

The second part of the paper presents the preference estimates of the life-cycle model. Eliciting ex-ante returns to include them directly into the choice model has a key advantage: unlike in the standard approach—which uses realized choice data—my preference estimates do not rely on maintained assumptions regarding belief formation. This is crucial, since observed migration choices can be consistent with several combinations of expectations and preferences (Manski et al., 1993; Manski, 2004). My estimates of ex-ante returns are heterogeneous, can be biased and I remain agnostic about potential migrants' information sets (see Porcher et al. (2024) for evidence on how accounting for heterogeneity in information sets affects estimated migration elasticities to expected wages and migration costs).

Model results show that all career and non-career outcomes are positive and statistically significant determinants of migration choices. The elasticity of migration choice with respect to full-time earnings is about 0.80%. This number is in the range of the elasticity to changes in earnings estimated by Dahl and Sorenson (2010) for Danish engineers (0.5-1%), and is somewhat lower than that in other studies (e.g., Ransom (2022), 0.92-1%, for moves within the US; Bertoli et al. (2013), 0.95%, for migrations from Ecuador to Spain;

or Porcher et al. (2024), 1.5%, for moves within Brazil).[1] Additionally, the elasticity for full-time employment (0.68%) is much higher than for part-time (0.11%), indicating that high-skilled young adults' early career decisions are mainly driven by full-time opportunities. The sizable elasticity for job match quality (0.62%) shows that the chance to work in a field related to their studies is an important factor in migration choice, independent of earnings. On the other hand, young adults are willing to give-up 34% of expected annual earnings over their life-cycle for a one standard deviation increase in the quality of social life and 15% for an equivalent increase in proximity to family, partner, and friends. The latter is equivalent to a willingness-to-pay equal to 38% of annual earnings to raise the outcome from its expected value under long-term migration to that under no migration. This number is in line with the 30% willingness-to-pay to live close to family and friends estimated by Koşar et al. (2021) for respondents self-identified as "mobile" in the US (56% for the "rooted").

Next, I demonstrate that while career prospects influence migration decisions, personal life considerations have a larger impact on choices and welfare, consistent with respondents' preference for temporary over long-term migration. I illustrate this by conducting two counterfactual exercises using the previously estimated parameters. The first removes anticipated career effects from short- and long-term migration, leading 36% of individuals to change their preferred alternative and resulting in a 5% decrease in average utility. The second counterfactual, which removes anticipated non-career effects, results in larger effects, causing 45% of individuals to switch choices and increasing average utility by 10%.

I conclude the paper by focusing on short-term migration. First, I show that tertiary-educated young adults planning short-term migration are positively selected on ability, as measured by GPA. I then quantify the role of three key expected benefits of short-term migration—(i) temporarily higher career outcomes at the destination relative to the birthplace, (ii) faster skill accumulation at the destination relative to the birthplace (which improves career outcomes after return), and (iii) the birthplace premium—in shaping baseline migration choices. Among these, expecting temporarily higher career outcomes has the greatest impact, closely followed by the birthplace premium. In contrast, only the highest-ability individuals anticipate sufficiently increased earnings after return for this benefit to be pivotal in their decision to migrate short-term. Counterfactuals further reveal that potential migrants view short-term migration as a distinct choice rather than

[1] Note that the estimated elasticity is much higher than that found in other types of decisions using the same methodology that I employed. For example, using data on subjective expectations under counterfactual scenarios, Delavande and Zafar (2019) and Wiswall and Zafar (2015) estimate elasticities of school choice and college major choice with respect to earnings at approximately 0.12% and 0.15%, respectively.

a pathway to permanent migration: when any of the three benefits are removed, a larger fraction consistently switches to no-migration rather than to long-term migration. Crucially, those switching to long-term migration have consistently higher ability than those opting for no-migration, with the largest ability gap emerging for the human capital accumulation channel. Taken together, these results underscore the need for effective labor market integration programs to ensure the return of high ability migrants and highlight the vulnerability of lagging regions to the permanent loss of talent.

Second, I quantify the cash transfers needed to attract individuals into short-term migration based on ability rank and baseline migration preference. Among the highest-ability quartile, incentivizing short-term migration is nearly three times more cost-effective for those planning to stay than for those planning to migrate long-term. This reveals the challenges lagging regions face in preventing permanent talent loss. At the same time, it suggests that attracting high-ability stayers to short-term migration could serve as a strategic investment to retain talent while fostering skill acquisition during early career years, a stage of particularly poor career prospects in lagging regions.

This is the first study that uses subjective expectations data to understand migration decisions under uncertainty. Previous migration studies have used subjective expectations data to asses the accuracy of individuals' expectations about actual realizations in the population, because systematic biases in beliefs can call for policy (information) interventions. These papers focus on migration from developing countries either using regular (e.g., McKenzie et al., 2013; Baseler, 2023; Frohnweiler et al., 2024) or irregular pathways (e.g., Bah and Batista, 2020), where information is scarce and particularly valuable.[2] This paper instead uses subjective expectations data to shed light on the determinants of migration choices, which has been traditionally answered with realized choice data.

The paper contributes to and builds on several strands of the literature. First, the analysis of ex-ante returns offers empirical underpinnings for the literature on migration and on temporary migration (e.g., Kerr et al., 2016; Dustmann and Görlach, 2016a; Jia et al., 2023), as it provides, for the first time, direct evidence on career and non-career life-cycle returns to short-term and long-term migration anticipated by young adults at the time of decision-making. I show that perceived returns are very heterogeneous across individuals, and that there is ex-ante sorting consistent with the Roy model as applied by Borjas (1987). I also provide insights into the belief formation process by investigating the determinants of the migrant-stayer gap in expected returns.

Second, it complements the literature estimating the drivers of migration decision-making. On the one hand, it belongs to the long tradition of work seeking to understand

[2]Other migration studies in developing countries that use expectations data include (Gibson and McKenzie, 2011).

whether expected labor market outcomes drive migration choices. This research has used realized choice data and has mostly restricted to studying the role of earnings (e.g., Tunali, 2000; Dahl, 2002; Kennan and Walker, 2011; Grogger and Hanson, 2011; Gibson and McKenzie, 2011; Bertoli et al., 2013). My survey design allows me to overcome the endogeneity problem by which career outcomes are only observed for those who are working, and to analyze the role of a broader set of career outcomes—other than earnings—in driving migration choices. On the other hand, the paper builds on the more recent literature that unpacks the black box of migration costs by measuring the role of nonpecuniary factors on migration choices. Some of these studies use realized choice data (e.g., Dahl and Sorenson, 2010; Huttunen et al., 2018; Büchel et al., 2020), while others use stated preference approaches (e.g., Koşar et al., 2021; Gong et al., (forthcoming). I contribute to the literature by estimating preferences for both career and non-career outcomes within the same framework using data on subjective expectations. In contrast to studies using realized choice data, my preference estimates do not rely on assumptions regarding belief formation.

Finally, this paper adds to the growing literature that uses subjective expectations data to understand decision-making under uncertainty. As stressed in a series of recent papers, in the presence of heterogeneity and uncertainty it is the ex-ante differential gains—as opposed to ex-post ones—that are relevant for agents' decision-making (e.g., Cunha and Heckman, 2007; Cunha et al., 2005). The methodology that I employ has mostly been used to study educational choices (Wiswall and Zafar, 2015; Boneva et al., 2022; Wiswall and Zafar, 2021) or occupational choices (Arcidiacono et al., 2020)[3]. I complement this literature by studying a new and relevant decision context: highly educated young adults' early career migration choices from lagging regions. The results from the follow-up survey indicate that the expectations data are, in fact, meaningful and predictive of future choices and outcomes, validating the use of the methodology to studying migration decisions.

The rest of the paper is organized as follows. Section 2 presents the conceptual framework. Section 3 introduces the data and Section 4 shows that collected expectations are predictive of later outcomes. Section 5 describes the ex-ante returns. Section 6 includes ex-ante returns into the life-cycle utility model and estimates the model parameters. Section 7 sheds light into short-term migration. Section 8 concludes.

[3]Other studies on educational choices (Arcidiacono et al., 2012; Zafar, 2013; Attanasio and Kaufmann, 2014; Kaufmann, 2014; Stinebrickner and Stinebrickner, 2014; Attanasio and Kaufmann, 2017; Delavande and Zafar, 2019) and health choices (Delavande, 2008) also elicit beliefs in counterfactual scenarios, but elicit only the alternative that individuals are most likely to choose or a ranking of them. This approach cannot capture individuals' uncertainty at the time of the survey (Blass et al., 2010).

2 CONCEPTUAL FRAMEWORK

This section develops a simple model of migration choice at the beginning of individuals' labor market careers. The model is based on the survey design and collected data.

A. The Choice of Migration Alternatives

At time of labor market entry after completing her studies, t_0, individual i thinks about the different migration alternatives that she could follow from t_0 to T. The complete migration choice set is summarized in the following three alternatives:

> ***No-migration,*** *$m = 1$: Always work in the region of birth.*
> ***Short-term migration,*** *$m = 2$: Work outside for some time but return to the region of birth to work by period T.*
> ***Long-term migration,*** *$m = 3$: Work outside for some time and not return to the region of birth to work before period T.*

After comparing how each migration alternative is expected to affect several relevant career and non-career factors from t_0 to T, at time t_0 individual i intends to follow the migration alternative that maximizes her expected utility.

B. The Choice of Migration Destination

Individual i compares the trade-offs between the three alternatives by considering her most likely migration destination i.e., *"the destination where she thinks she would migrate if she were to migrate"*. This destination can be anywhere outside her region of birth i.e., another region within her country of birth or another country.

This framework makes two assumptions. First, it assumes that when individuals are choosing whether to migrate or stay they have one preferred migration destination—within their feasible choice set—in mind and therefore, the migration decision boils down to choosing whether to stay in their region of birth or migrate—short-term or long-term—to that other migration destination. Second, that individuals do not *anticipate* onward migration i.e., moving for work from one migration destination to a new one, different from their region of birth, within the specified time span (from t_0 to T).[4] The reason for limiting the choice to a single location was twofold. First, to reduce the risk of experimenter demand, as asking for more than one potential destination could make survey participants think about destinations they had never thought about before. Second, to reduce the cognitive load required to elicit expected outcomes in different locations.

[4]Note that they can anticipate different destinations for pursuing further studies and working.

Based on separate questions regarding the migration decision-making process, Table A1 in the Appendix shows that the decision-making process of the majority of young adults complies with these assumptions.

C. Timing of Belief Elicitation

Beliefs are elicited at time τ, where $\tau < t_0$, when individual i is a last year bachelor's degree student in her region of birth.

There are several factors that need to be considered when choosing the timing for eliciting beliefs. First, in order to minimize the risk of cognitive dissonance or ex-post rationalization (Festinger, 1957), beliefs should be elicited *before* choice-specific investments are made. In our setting, this requires surveying individuals when they are still living in their region of birth. Second, even if our migration alternatives are defined over labor market trajectories, one needs to take into account that migrating to work and migrating to undertake education are often interrelated (Dustmann and Glitz, 2011). As a result, the timing of belief elicitation entails a trade-off between measurement error and sample selection bias. On the one hand, surveying future college-educated individuals at the time when they are finishing high-school in their region of birth would minimize sample selection bias, as individuals do not typically sort into high-school based on their propensity to migrate. At this stage, however, most students may have little idea of what migration alternative they want to pursue in their professional careers, and most importantly, may not have well formed expectations about outcomes conditional on migration alternatives (measurement error). On the other hand, surveying individuals when they are finishing the very last stage of their education (e.g., master's degrees, PhD) in their region of birth would minimize measurement error at the risk of incurring in sample selection bias by missing the early movers with highest propensity and motivation to migrate.

In my setting, surveying final-year bachelor's students in their region of birth minimizes the mentioned biases, because only 8% of students pursue their bachelor's degree outside their region of birth (a proportion that triples for master's studies).[5]

[5]All respondents are born in Andalusia, the most populous region of Spain (the institutional setting is detailed in section 3.A.). The fraction of students enrolled in a bachelor's degree in a region other than their region of birth is very low in Spain (14% on average, in the academic year 2016/17) and due to its large population size, and consequently, large degree supply, it is particularly low in Andalusia (8% in 2016/17). The mobility to study a master's degree, however, triples. The percent of students pursuing their master's degree in another Spanish region is 23.4% for those born Andalusia and 26.7% on average in Spain (Fundación BBVA-Ivie, 2018).

D. *Resolvable Uncertainty*

For each individual, the survey collected data on the subjective probability of choosing each migration alternative between t_0 and T, where T corresponded to 10 years after finishing the bachelor's degree. Because the three migration alternatives are mutually exclusive and complete the choice set, the choice-specific reported probabilities must sum up to 1. Eliciting the probability of following each alternative (instead of stating the most likely alternative) allows me to capture the fact that some uncertainty will be resolved on the value of the alternatives between the time in which beliefs are elicited at time τ and agents choose their migration alternative at time t_0.

The subjective expected utilities of migration alternative m at times τ and t_0 are linked through the following relationship:

$$\mathbb{E}[U_{im}|\mathcal{I}_{it_0}] = \mathbb{E}[U_{im}|\mathcal{I}_{i\tau}] + \xi_{im\tau} \tag{1}$$

where $\mathbb{E}[.|]$ is the subjective expectation operator, U_{im} is individual i's utility from migration alternative m and $\mathcal{I}_{i\tau}$ and $\mathcal{I}_{it_0}$ are individual i's information sets at time τ and t_0 respectively. We denote as $\xi_{im\tau}$ the uncertainty to be resolved for migration alternative m when beliefs are captured at time τ (which Blass et al., 2010, refer to as "resolvable uncertainty"). The $\xi_{im\tau}$ term represents a preference shock that is assumed to be realized after students report their likelihood of choosing each migration alternative and before they actually make the migration choice. It reflects any unanticipated change in the utility of a migration alternative that occurs between τ and t_0 (e.g., finding a partner at birthplace).

Note that $\mathbb{E}[U_{im}|\mathcal{I}_{i\tau}]$ accounts for *anticipated* utility changes resulting from actions that students plan to undertake between τ and t_0. The most obvious of these actions is further study plans after finishing their bachelor's degree. Survey participants were first asked about their future study plans and then instructed to take these reported plans into account when reporting their expected career and non-career outcomes (section 5.C. discusses these results).[6] Thus, in our framework, $\mathbb{E}[U_{im}|\mathcal{I}_{i\tau}]$ incorporates how students expect study choices prior to labor market entry to affect the utility of each migration alternative. Because future study and migration choices are sequential in time, each student evaluates the trade-offs from the three counterfactual migration alternatives under the same study plan.

[6]The survey collected data on students' expected highest level of education [bachelor's degree/other type of further studies/master's degree/Ph.D.] and the specific location within [region of birth/other region within country of birth/other country] where they planned to pursue such studies.

E. *Expected Utility by Migration Alternative*

At time τ, student i possesses a distribution of beliefs $G_{i,\tau}(x|m,t)$ about the probability of the vector of future career and non-career outcomes $x \in X$ occurring in all future periods $t \geq t_{i0}$ *if* she were to choose migration alternative m. In the short-term and long-term migration alternatives, the distribution of beliefs of individual i are elicited at her most likely migration destination, as described in Section 2.E..[7] We allow the start period of the migration path t_0 to vary across individuals with their expected maximum level of education. Student i's subjective expected utility from migration alternative m at time τ is given by

$$\mathbb{E}[U_{im}|\mathcal{I}_{i\tau}] = \sum_{t=t_{i0}}^{T} \beta^t \int_{x\in X} u(x)\, dG_{i\tau}(x|m,t) \tag{2}$$

where $t_{i0} \in \{0,1,2,3\}$. We set $t_{i0} = 0$ if student i does not plan to pursue further studies after finishing the bachelor's degree and $t_{i0} = 1$, $t_{i0} = 2$, $t_{i0} = 3$ if they plan to pursue other type of studies, a master's degree and a PhD respectively. This specification reflects that the migration alternative of students who plan to pursue further studies is shorter in length and starts farther in time relative to students who plan to enter the labor market right after finishing their bachelor's degree. $\beta \in (0,1)$ is the discount rate. $u(x)$ is the migration alternative's utility function that provides the mapping from the finite vector of outcomes x to utility. A key feature of the model is that when choosing the intended migration alternative m at time t_0, decision-makers face uncertainty about each alternative's career and non-career outcomes over the life-cycle.

3 DATA

A. *Institutional Setting*

All potential migrants are born in Andalusia, a low-growth lagging region in the EU (EC, 2017). Andalusia, with over 8 million inhabitants, is the most populous of the 19 large regions (NUTS2) that comprise Spain. In 2019, the region's per capita disposable income was 12,900 euros in PPS, significantly lower than that of the richest region of the country, the Basque Country, with 21,000 euros in PPS (Eurostat, 2023). To put these figures in perspective, the difference between Andalusia and the Basque Country

[7] After asking about the subjective probability of choosing each migration alternative, the survey asked every individual—including those who planned to not migrate—the destination where they thought they would migrate if they were to migrate. First, they could choose between moving to another region within their country of birth or to another country. Then, the survey asked to specify the location. Specific locations were elicited to instruct participants to imagine living in their reported locations, to better envision the migration experience (as in Boneva et al., 2022).

is similar to the difference between the per capita disposable income of Germany (21,400 euros in PPS in 2019) and Greece (12,100 euros in PPS 2019). Spain, on the other hand, is poorer than surrounding countries where Spaniards are free to move without any legal restriction (e.g., Germany). The setting implies that high-educated young adults born in Andalusia (as many others born in lagging regions of relatively poor high-income countries e.g., Portugal, Italy, Greece) face incentives to migrate both internally as well as internationally.

Similar to global migration patterns, many migrations out of Andalusia are temporary (see Dustmann and Görlach (2016a) for a review on migration temporariness). For example, 52% of internal migrants with university education born in the region—and 72% with lower education—return within the next 10 years since labor market entry (Continuous Work History Sample, MCVL). For comparison, in Italy, about 68% of internal migrants from the poorer south to the more prosperous north return during their entire working trajectories (Bartolucci et al., 2018). Across countries, on average, close to 50 percent of international cohorts arriving in Europe have left the destination country ten years after arrival (OECD, 2008). While these numbers refer to realized returns—including both anticipated and unplanned temporary migrations—, the high prevalence of short-term migration suggests that at least some of them were likely anticipated, justifying the inclusion of this option in our choice model.

Consistent with the well known fact that individuals are most likely to move when they are young (Constant and Zimmermann, 2013), both out-migration and return migration in Andalusia happen early in individuals' careers and then level out. Looking at careers over 10 years since labor market entry, for example, about 44% of internal migrants with tertiary education born in the region start their career directly in another region of Spain, and over 80% of them have already migrated within the first 5 years following labor market entry. The median age at migration is 26 years old. As for returns, about 60% of return migrants come back within the first 5 years of arrival and 70% have returned by year 10 (Continuous Work History Sample, MCVL). These patterns motivate our choice of focusing on early career migration decisions.

B. Population of Interest

An implicit assumption of the employed survey methodology is that survey participants have well-formed expectations (Wiswall and Zafar, 2021). This does not mean that their beliefs need to be correct, but that decision-makers are assumed to have been actively thinking about their potential choices. I argue that focusing on the most mobile group of people—young adults with tertiary education—in a region with few career opportunities makes it plausible to assume that all survey participants—including those who will choose

to stay—have been actively thinking about migration decision-making. To further ensure that this assumption holds, I restricted the target population to students pursuing degrees with career prospects in the private sector (degrees Social Sciences, Engineering, and Natural Sciences), as geographic mobility in the public sector is limited to within the country and depends on grades in regional or national competitive exams.[8]

The results from a set of questions that participants answered at the end of the survey are consistent with individuals having well-formed expectations: 35% of participants answered that it had been easy to imagine the hypothetical migration scenarios either because it was a daily topic in their lives (86%) or because they had been getting informed about it (14%) and 63% responded that, while it required effort to imagine them, these scenarios involved questions that they had been thinking about beforehand. Only 2% of participants answered that the hypothetical scenarios were very difficult to answer because the setting was foreign to them. Reassuringly, in open-ended questions, 90% of the later group answered that this was so because they planned to study for competitive exams to become public servants (in their case firefighters). I take these results as evidence that the counterfactual scenarios presented to respondents are realistic and relevant for them.

C. Survey Administration

The first dataset was collected in June 2020 through two surveys designed with Qualtrics Survey software, distributed via email two days apart. The surveys were administered at the schools of Social Science, Engineering, and Natural Science at two large public universities that according to the QS World University Ranking rank highest among Andalusian universities: the University of Seville (US) and the University of Granada (UGR).[9] Map B1 in the Appendix shows the location of the two universities. The target population were last year bachelor's degree students, which included 5,296 individuals across the schools.

Students received the email with the link to the first survey directly from the schools, through their official communication address. The survey link was closed 12 hours later, once the number of participants that my budget permitted to monetarily compensate was reached. This corresponded to a response rate of 18%.[10] This survey, which took on average 7 minutes to complete and included a luck game with probabilistic payoffs

[8]Therefore, I excluded the degrees in Arts and Humanities, and Health Sciences, which are much more likely to provide employment in the public sector.

[9]Table A2 in the Appendix shows the list of degrees that participated in the survey within each school.

[10]This response rate is broadly comparable to that of other surveys conducted on similar populations. For instance, the response rate for Cortés et al. (2022)'s survey of Boston University's Questrom School of Business was 20%.

that encouraged participation, collected students' individual and family characteristics, as well as their contact information (phone number and email address). Only students who reported being born in Andalusia were invited to participate in the second survey (688 students). This restriction minimizes the risk of ex-post rationalization, as explained in section 2.C..

The second survey took on average 25 minutes to complete, and students were compensated with 6€ for successfully completing it. This survey collected data on study plans, expected migration choices, and beliefs under the counterfactual migration alternatives. 90% of the invited students completed the follow-up survey successfully. Individuals who responded have very similar characteristics to those who were invited but did not respond (p-value of the joint F-test is 0.22).[11] The final sample consists of 609 individuals.

Payments for both surveys were made using Bizum, a highly popular, instant, and commission-free phone-to-phone payment system in Spain.[12] Transfers require only the recipient's phone number, which encouraged participants to share theirs. These numbers were later used to contact them via WhatsApp for the follow-up survey.

D. Follow-up Survey Administration

In the spring of 2024 I conducted a follow-up survey on the sample of 609 individuals who participated in the 2020 survey. The goal of this survey was to assess whether beliefs are predictive of realized outcomes years later. Thus, the follow-up survey collected data on sample member's past and current location choices, as well as their actual current career and non-career outcomes. Respondents were also asked to update their expectations about their migration choice probabilities up until 10 years after finishing the bachelor's degree. The survey was distributed via email and the WhatsApp messaging platform. All individuals who completed the survey participated in a lottery with a 700€ prize, and as in the other cases, the money was transferred via Bizum. A total of 299 individuals—about 50% of the initial sample—completed the survey.[13] I fail to reject the joint hypothesis that a rich set of covariates available in 2020 for all respondents (included in Table I) are unrelated to responding to the follow-up survey at standard statistical levels (p-value of the joint F-test is 0.37). This suggests that the nonresponse in the follow-up survey is largely ignorable.

[11] I fail to reject the joint hypothesis that university, field of study, gender, age and socioeconomic status are unrelated to responding to the second survey at standard statistical levels.

[12] Bizum, launched by Spanish banks in 2016, was offered by more than 96% of all Spanish banks in 2020. It is widely used for small, instant payments among friends, colleagues, or family members. For instance, when a group dines out, it is common for one person to pay the bill and receive Bizum transfers from the others.

[13] This response rate is similar to the response rate of follow-up surveys in studies employing similar methodologies e.g., Wiswall and Zafar (2021) had a 56% response rate.

E. Sample Characteristics

Table I presents descriptive statistics. Column (1) summarizes the characteristics of the 2020 sample. The higher proportion of respondents from the University of Seville reflects the timing of the survey distribution, which began with these students. The average age of respondents is 23, and their average grade is 6.82 in a 0-10 scale. 46% of the sample are females and 50% of them are from as high socioeconomic status, defined as having at least one parent who attended university. Column (2) shows the characteristics of the follow-up sample. Individuals who responded to the follow-up survey have very similar characteristics to those in the main sample, although women are slightly over-represented. Crucially for us, the subjective probabilities of choosing each migration alternative do not differ between the two samples. Additionally, the proportions of respondents selecting an internal and an international destination in the event of migration are virtually the same across the two samples. Finally, column (3) reports characteristics about the population of bachelor's degree students enrolled in the three reported fields of the two universities using statistics from administrative data sources. While students in natural sciences are slightly under-represented and those in engineering slightly over-represented compared to administrative records, the distribution of respondents across fields of study is comparable to the distribution in my samples, and individual characteristics are similar too. Overall, the results show that the sample is largely representative of the population of interest.

F. Measures of Career and Noncareer Outcomes

The 2020 survey elicited information about expected future career and non-career outcomes at two future points in time: 3 and 10 years after finishing the bachelor's degree. The survey instructed students to assume that by $t = 3$, they had finished all their studies and were already living at their chosen migration destination (in the short-term and long-term migration alternatives). By definition of migration alternatives (see section 2.A.), by $t = 10$ individuals have returned to their region of birth in the short-term migration alternative and are still living at their chosen migration destination in the long-term migration alternative. The choice of these timings corresponds to patterns described in Section 3.A..

To elicit beliefs regarding career outcomes students were told to think about jobs that they thought they would be offered and that they would accept (as in e.g., Jensen (2010); Wiswall and Zafar (2015)). Beliefs about these outcomes were elicited for $t = 3$ and $t = 10$ by migration alternative (no-migration, $m = 1$; short-term migration, $m = 2$; and long-term migration, $m = 3$). This means that expected outcomes at a given time and location depend on the entire sequence of locations defining that migration alternative.

For example, even though the location sequence is identical up to $t = 3$ for short- and long-term migration, respondents may report different outcomes at $t = 3$ if they believe that future location sequences—which differ between the two alternatives—will affect their current outcomes. Similarly, outcomes at $t = 10$ for short-term migration and no-migration may differ, even though individuals reside in their region of birth at this time in both cases, if they believe that past location sequences—which differ between the two alternatives—impact their future outcomes. Table A3 in the Appendix illustrates the belief elicitation tables. Career outcomes are defined as follows:

(1) *Expected employment status:* Expected probability of working full-time, working part-time, being unemployed and being out of the labor market at $t = 3$ and $t = 10$ if they were to follow migration alternative $m = 1$, $m = 2$ and $m = 3$.

(2) *Expected minimum and maximum wages if working full-time:* Expected monthly minimum and maximum gross wages if working full-time at $t = 3$ and $t = 10$ if they were to follow migration alternative $m = 1$, $m = 2$ and $m = 3$. Students were asked about monthly—rather than annual—earnings because individuals, especially those who do not have a work contract yet, are used to referring to wages on a monthly basis in Spain. When I refer to annual wages, these are monthly wages multiplied by 14, the common number of payments in the country.

(3) *Expected mean wages if working full-time:* Based on the minimum and maximum wages reported by each individual, the survey also elicited individual-level wage distributions for $m = 1$ and $m = 2$ at $t = 3$. More specifically, students were shown 5 adjacent intervals characterized with 4 thresholds determined by a branching algorithm (see Section C.1. in the Appendix for details). Using sliding bars, respondents had to state the expected percent chance that their full-time wages would fall in each of the shown intervals.[14] Then, following Engelberg et al. (2009) I estimate the mean and variance for each individual under each migration alternative, fitting a uniform, triangular or a lognormal distribution, based on the number of intervals filled by the individual. These estimated expected means are compared to realized average wages of full-time working migrants and stayers in the follow-up survey.

(4) *Expected minimum and maximum wages:* Collecting expected wages conditional on employment status on the one hand and employment status probabilities on the other allows us to circumvent the standard endogenous selection into employment issue where job characteristics are only observed for individuals who work. Using information collected in questions (1) and (2), I construct the expected minimum (maximum) monthly

[14]Instead of eliciting the information in the form of a cumulative distribution (cdf), as in Dominitz and Manski (1997), I used a probability density (pdf). Experimental evidence suggests that individuals find assessing the probabilities that the outcome lies in each interval less demanding than assessing the probabilities that the outcome does not exceed the sequence of thresholds (Bover, 2015).

gross earnings, which is a weighted average of the expected minimum (maximum) earnings if working full-time with the employment status probabilities. Because I do not collect data on expected wages if working part-time, I assume that this is expected to be half of the expected wage if working full-time (as in Wiswall and Zafar, 2015). I also assume that young adults who are unemployed and out of the labor market do not receive any monetary compensation.[15] For each individual, I calculate expected minimum and maximum wages at $t = 3$ and $t = 10$ if they were to follow migration alternative $m = 1$, $m = 2$ and $m = 3$.

(5) *Expected match quality:* Expected probability of working in a job which is directly related to their bachelor's degree studies in $t = 3$ and $t = 10$ if they were to follow migration alternative $m = 1$, $m = 2$ and $m = 3$.

The survey also collected information about three outcomes that relate to personal and family life, which I refer to as non-career outcomes. In order to decrease the burden of questions and minimize fatigue, students were asked about these outcomes by location [at region of birth/ at chosen migration destination outside the region of birth] as opposed to migration alternative.

(1) *Expected quality of social life*: Expected probability of enjoying the quality of social life in $t = 3$ and $t = 10$ conditional on living [at region of birth/outside region of birth].

(2) *Expected enjoyment from being close to loved ones*: Expected probability of enjoying being close to family, partner and friends in $t = 3$ conditional on living [at region of birth/outside region of birth].

(3) *Expected distress from being far from loved ones*: Expected probability of suffering from being far from family, partner and friends in $t = 3$ conditional on living [at region of birth/outside region of birth].

Finally, measures of realized career and non-career outcomes, collected in the follow-up survey, were obtained as follows: First, individuals were asked whether they were [studying/studying and working/working/unemployed/none of the above]. If they were working, they were further asked whether they were working full-time or part-time, about their earnings and about the extent to which their job was related to their field of study in the bachelor's degree in a 0-100 scale.[16] Additionally, respondents were asked to rate the extent to which they enjoyed their quality of social life, enjoyed being close to family, partner and friends and suffered from being far from family, partner and friends in a

[15] Given that the right to receive unemployment benefits depends on accumulated work experience, the duration of these benefits is short early in individuals' careers.

[16] Respondents could report their earnings on an annual or monthly basis. International migrants were shown the default local currency of their country of residence, with the option of changing it.

0-100 scale.

The timing of the follow-up survey, approximately three years after completing the bachelor's degree, allows us to analyze whether individual expectations in 2020 about outcomes at $t = 3$ predict their equivalent realizations in 2024. Importantly, I emphasize that respondents were not reminded of their answers from four years earlier, and they were not given any incentives to provide answers that would match their prior beliefs.

4 PREDICTIVE VALIDITY

The primary purpose of the follow-up survey is to evaluate the quality of the elicited expectations and validate the survey methodology. If the expectations data were purely noise, no systematic relationships with future realizations would be expected. As shown below, I find a strong systematic relationship between the beliefs elicited when respondents were final-year bachelor's degree students and their actual outcomes four years later.

A. Expected and Realized Career and Non-Career Outcomes

Each panel in Table II reports a regression of the realized outcome in 2024 on the expectation for that outcome as reported in 2020. The expectations reported in this table are those weighted by the individual-specific probability of choosing each of the migration alternatives. This individual-level relationships allow us to test how closely individuals can predict their own future career and non-career outcomes. Results show a systematic positive and strong relationship between expectations and future realizations. For example, students who expected higher future earnings do, in fact, report earning more. The estimated elasticity of earnings if working-full time (0.43) is sizable and statistically significant at the 1% level. Other outcomes, such as the expected and realized match quality, enjoyment from being close to loved ones and suffering from being far from loved ones are also positive and strongly related at the 10%, 5% and 1% levels respectively. Note, in any case, that while these results demonstrate a close connection between beliefs and outcomes, providing evidence of the quality of the data, expectations alone explain a small part of the realized outcomes years later. This reinforces the idea that it is the beliefs at the time of choice, not the realized outcomes in later periods, that are fundamental to understanding choices.

B. Expected and Realized Migration Choices

Table III shows the estimates of a linear probability model of choosing to migrate. Results show that a 10 percentage point higher expected percent chance of migrating in 2020

(sum of expected choice probability of migrating short-term and migrating long-term) is associated with a 5.8 percentage point higher probability of being a migrant i.e., being living outside their region of birth in 2024 (statistically significant at the 1% level). Interestingly, potential migrants are not only able to predict their migrant status, but actual migrants also ended up moving to their anticipated destinations (70% were living in the destination they had reported 4 years earlier).[17]

Despite the strong positive correlation between expected and realized choices, a larger share of our sample has ended up staying than they predicted during their undergraduate studies: the average expected probability of staying in 2020 was 0.36, while the observed frequency of actual stayers in 2024 is 0.63.

First, it is important to note that respondents assessed migration choice probabilities within a 10-year period following graduation (see Section 2.A.). This implies that some individuals who have not yet migrated by 2024 may still do so in later periods. To analyze this, I compare the average expected choice probabilities reported in 2020 with their updated counterparts in 2024 among those who are still living in Andalusia at the time of the follow-up.[18] Results show that, while uncertainty regarding expected migration choices has significantly decreased between 2020 and 2024 (the average expected probability of staying rose from 0.41 in 2020 to 0.70 in 2024 among stayers), the fact that this probability is not 1 suggests that some may still migrate between the follow-up and the next 10 years after finishing their bachelor's degree.

Second, these differences do not rule out rational expectations, as they may result from intervening aggregate shocks to the labor market.[19] This is particularly relevant to our analysis, as our beliefs were elicited in June 2020, only a few months after the outbreak of the COVID-19 pandemic.[20] At the time, it is likely that the negative effects of the pandemic on the labor market were overestimated. To investigate this, the 2020 survey included questions about the expected impact of COVID-19 on the Andalusian labor market and the corresponding changes to participants' migration plans (results are summarized in Figure B2 in the Appendix). According to survey responses, over 80% of respondents anticipated that the COVID-19 shock would have a more negative effect in Andalusia than in other Spanish regions. Furthermore, 36% reported that their

[17] Among those who had changed destinations, 23% had expected to move to another country but were instead living in another region, while for 7%, the reverse was true.

[18] The follow-up survey asked respondents to update their expectations about their migration choice probabilities up until 10 years after finishing the bachelor's degree.

[19] For a detailed discussion on the importance of considering unanticipated aggregate shocks when assessing deviations from rational expectations, see d'Haultfoeuille et al. (2021).

[20] This is also the case in Arcidiacono et al. (2020), which elicited beliefs in 2009, two years after the Great Recession began, to study occupational choices using stated probabilities and ex-ante returns. They found that more graduates entered business than expected, while fewer entered government or law, attributing this to unanticipated post-recession shocks.

probability of working in Andalusia versus elsewhere had decreased due to the shock (38% indicated that it did not change and 19% that it had increased). Among those who noted a decrease, 66% said the likelihood of working in another country versus another Spanish region had increased (21% that it had not change and 7% that it had decreased). Despite these pessimistic views, GDP growth in Spain during 2023 was among the strongest in the euro area (Fernández-Cerezo et al., 2023). My findings align with students anticipating a severe negative impact of COVID-19 on the Andalusian labor market, which raised their expected likelihood of migrating after graduation, but finally some of them choosing to stay, as the impact turned out to be less severe than expected.

The strong positive relationships between expected and realized career and non-career outcomes indicate that respondents' expectations under different scenarios are informative. Additionally, the strong alignment between expected and realized migration choices confirms that stated choices in hypothetical scenarios reflect actual behavior, validating the survey methodology.[21]

5 EX-ANTE RETURNS

How do young adults expect short- and long-term migration to impact career and non-career outcomes over their life-cycle compared to never migrating? The potential outcome framework allows me to compute individual-specific, fully heterogeneous ex-ante returns. The returns can be biased, and I remain agnostic about agents' information sets.

In this section, I relate these anticipated effects to the commonly cited motives for different types of migration in theoretical models. To put the magnitudes into context, I also compare ex-ante returns to realized ex-post differences between actual migrants and stayers in the follow-up survey. Note, in any case, that while their comparison provides valuable context, ex-ante and ex-post returns are not directly comparable—the later need not reflect a causal difference in ex-post potential outcomes and need not reflect the beliefs anticipated by students at the time of data collection. The section concludes by examining the determinants of belief formation based on individual characteristics.

Given the collected data, I calculate individual-level ex-ante returns to short-term ($m = 2$) and long-term ($m = 3$) migration in the short-term ($t = 3$ years after completing the bachelor's degree) and in the long-term ($t = 10$ years after). Ex-ante returns for continuous variables (full-time minimum, maximum, and mean earnings) are calculated as percent changes as follows:

[21] There is growing evidence, in the context of migration choices, showing that respondents' stated migration probabilities are highly predictive of their future migration decisions (e.g., Koşar et al., 2021; Gong et al., (forthcoming).

$$\delta^{w^F}_{i,m,t} = \frac{\mathbb{E}(w_i^F|m,t) - \mathbb{E}(w_i^F|m' = \text{no-migration}, t)}{\mathbb{E}(w_i^F|m' = \text{no-migration}, t)} * 100 \quad (3)$$

where $\delta^{w^F}_{i,m,t}$ is the percent difference in full-time earnings expected by individual i at time t if she were to choose migration alternative $m = 2$ or $m = 3$ relative to choosing the no-migration alternative. $\mathbb{E}(w_i^F|m,t)$ and $\mathbb{E}(w_i^F|m',t)$ are directly reported by individual i in the survey (see Section 3.F.).

Ex-ante returns for binary outcomes—all remaining outcomes—are calculated following the same approach but are expressed as percentage point differences.

A. Average Ex-Ante Returns at Two Future Points in Time

Ex-ante returns, averaged across respondents, are presented in the first row of each panel. Results for career outcomes are summarized in Table IV, while those of non-career outcomes are detailed in Table V.

A.1. Career Outcomes

- *In the short-term ($t = 3$)*: Three years after completing their bachelor's degree, respondents expect their minimum (maximum) full-time earnings to be 29% (24%) higher with short-term migration, and 32% (28%) higher with long-term migration, compared to not migrating (Panel A of Table IV). The statistically significant (1% level) difference in expected earnings between short-term and long-term migration—despite the identical location sequences in both alternatives up to this point—suggests that potential migrants anticipate making different skill investments or sorting into different types of jobs based on their expected length of stay. This finding aligns with the literature linking human capital investments at the migration destination to the expected migration duration (Dustmann, 1993, 1999; Adda et al., 2022). For example, Adda et al. (2022) show that migrants planning longer stays tend to invest more in skills, leading to steeper realized career paths at the migration destination. My results suggest that potential migrants *anticipate* a similar dynamic. In general, regardless of the length of stay, earnings at migration destinations are expected to exceed those at home—and they do. The expected premia in the mean wage for full-time work (estimated fitting individual-level earnings distributions, as explained in section 3.F.) is equal to 26%, which is slightly lower than the actual 32% higher earnings observed among full-time working migrants relative to stayers in 2024. As mentioned, the difference between ex-ante and ex-post returns could be attributed to both biased returns and selection into migration.

Regarding other career outcomes three years after graduation, respondents anticipate

a 10 percentage point higher probability of being employed full-time if they migrate, either short-term or long-term, compared to not migrating (Panel B). These expected gains are lower than the actual difference observed in the proportion of migrants and stayers working full-time in 2024, which is 15 percentage points. Similarly, respondents anticipate a 9 and 10 percentage point higher probability of working in jobs related to their bachelor's degree for short-term and long-term migration, respectively, compared to never migrating (Panel C). These expected gains exceed the actual difference in 2024, which is only 2 percentage points.

- *In the long-term ($t = 10$)*: The migration literature has proposed several theoretical models to explain why migrants return to their birthplace even when wages are persistently higher at the destination (see Dustmann and Görlach (2016a) for a survey of this literature). One such argument is related to the accumulation of human capital. Take, for example, settings where skills can be more easily accumulated in the workplace of the migration destination than at home, such as through the higher skill level of coworkers or the presence of learning hubs (Dustmann et al., 2011; De la Roca and Puga, 2017). In this case, given that the sole purpose of migrating is the accumulation of human capital, between the options of choosing to not migrate and a permanent migration, individuals would choose the former. Yet, if individuals anticipate that the experience accumulated abroad will boost their earnings at return, they may find it optimal to migrate temporarily. Many theoretical frameworks formalize the idea that the working experience and skills that returning migrants have accumulated abroad boosts the productivity of regions of origin (e.g., Santos and Postel-Vinay, 2003; Dustmann et al., 2011; Mayr and Peri, 2009). The empirical evidence on such realized returns is, on the other hand, mixed, with earnings differences between returnees and nonmigrants ranging from negative to positive.[22] Do young adults even anticipate these after-return career gains when deciding whether to migrate or stay in their birthplace? My results show that they do.

Ten years after completing their bachelor's degree, the average respondent anticipates her minimum (maximum) full-time earnings at birthplace to be 13% (12%) higher after returning from temporary migration compared to never having migrated (statistically significant at the 1% level) (Panel A). While no difference is expected in full-time employment probabilities upon return, respondents also anticipate modest gains of 2 percentage points (statistically significant at the 1% level) in securing a job directly related to their

[22]Some studies find positive effects (e.g., Co et al., 2000; Reinhold and Thom, 2013; De Vreyer et al., 2010), others negative (e.g, Ramos, 1992; Enchautegui, 1993), others find positive effects but attribute those to the positive selection of emigrants from the origin country rather than an accumulation of human capital (e.g., Lacuesta, 2010). Note that in my setting, by construction of the survey design, I do not have selection problems.

field of study (Panels B and C). These results demonstrate that the average high-skilled young adult views temporary migration as a human capital strategy in which skills can be accumulated more quickly at the migration destination than at home.[23]

At the same time, respondents anticipate a 31% (32%) higher minimum (maximum) full-time earnings at $t = 10$ if they migrate long-term compared to never migrating (Panel A). Additionally, they anticipate a 5 percentage point higher probability in both being employed full-time and securing a quality job match (Panels B and C). The fact that the earnings premia to long-term migration are twice as high as the returns to short-term migration show that despite the anticipated human capital transferability, the average respondent would expect to forgo significant career opportunities by returning to their birthplace instead of staying longer at their migration destination.

Taken together, these results indicate that, on average, high-skilled young adults expect long-term migration to provide better career opportunities than short-term migration, which in turn is preferred over no migration. As a result, if the average individual only cared about career outcomes, she would choose to migrate long-term.[24]

A.2. Non-Career Outcomes

Since Sjaastad (1962), psychic costs have been used to explain why migration does not take place even in the face of obvious wage differentials and relatively small monetary moving costs.[25] Additionally, many studies (e.g., Hill, 1987; Djajić and Milbourne, 1988) explain return migration in terms of location-specific preferences. In this case, migrants face a trade-off between the higher lifetime income (and higher consumption) at the destination and a preference for consumption at origin, where the marginal utility of consumption is higher than abroad. Despite the wide use of psychic costs (home ties or preference for birthplace) as an integral component of migration models, most studies do not empirically show the existence of these costs; they simply limit to estimating them as a residual i.e. the portion of mobility which the chosen model (with its particular set of assumptions) cannot explain. By eliciting expected non-career outcomes outside their region of birth and in it, I can demonstrate the existence of psychic costs—negative returns to non-career outcomes. Results are presented in Table V.

[23] The fact that 93% of respondents who would migrate internally would choose Madrid, the capital city of Spain and a hub of high-skilled young adults in the country (González-Leonardo et al., 2022), is consistent with this motive (see De la Roca and Puga, 2017).

[24] Note that for an easy exposition of the results, the estimated earnings effects do not account for price differences across migration destinations. Expected earnings were elicited in euros for all destinations. Actual earnings were elicited at local currencies, and earnings at migration destinations with other currencies were converted into euros using the 2024 exchange rate.

[25] "Since people are often genuinely reluctant to leave familiar surroundings, family, and friends, migration involves a "psychic" cost." (Sjaastad, 1962, page 85).

In the short-term, three years after completing their bachelor's degree, young adults expect a 20 percentage points lower probability of enjoying the quality of social life at their chosen migration destination compared to their birthplace. Additionally, they anticipate a 51 percentage points lower probability of enjoying being close to family, partner and friends, and a 48 percentage points higher probability of suffering from being away. These anticipated effects are larger in magnitude but share the same direction as the difference between the actual values reported by migrants and stayers in 2024. For example, in a 0-100 scale, migrants reported to have a quality of social life 9 percentage points lower than stayers. Migrants also reported to be enjoying being close to loved ones by 32 percentage points less than stayers and to be suffering for being far from loved ones 30 percentage points more than stayers.

In the long-term, ten years after completing their bachelor's degree, young adults expect their quality of social life to be 16 percentage points lower if they live outside their region of birth compared to living within it. Although results indicate that young adults anticipate some adaptation to their migration destinations over time, the negative expected effects remain persistent.

The results indicate that potential migrants anticipate trade-offs between career and non-career outcomes over the life cycle within migration alternatives. Given these ex-ante returns, their choices depend on preferences for career versus non-career outcomes, which are estimated in Section 6. The remainder of this section provides further insights into the ex-ante returns.

B. Heterogeneity in Ex-Ante Returns and Sorting based on Ex-Ante Returns

While the average returns indicate an important general pattern, they can mask substantial heterogeneity across potential migrants. To explore this, I calculate the proportion of individuals anticipating negative, null, and positive ex-ante returns for each outcome (results are reported in rows 2–4 of each panel, career outcomes in Table IV and non-career outcomes in Table V). The findings underscore that expected returns are very heterogeneous, and that they vary by outcome and proximity in time ($t = 3$ or $t = 10$).

For career outcomes, beliefs about the effects of migration on full-time employment and job quality are more heterogeneous than those on full-time earnings. For instance, nearly 80% of respondents believe that long-term migration will have a positive long-term effect on earnings, while only about 60% and 50% expect positive effects on full-time employment and job quality, respectively. For non-career outcomes, views on the effect of migration on the quality of social life are more heterogeneous than views regarding the effects of being close to loved ones or the discomfort of being far from them. For example, while 72% of respondents expect a negative effect of migration on the quality of social life

three years after graduation, a significant portion—20%—anticipates no effects, and 8% expect positive effects. This contrasts with a much larger 90% of respondents agreeing that migration will impact negatively the enjoyment of being close to loved ones.

Additionally, ex-ante returns in the long-term (t=10) are more heterogeneous than those in the short-term (t=3), particularly for short-term migration. For example, slightly over 50% of respondents expect positive effects from short-term migration on full-time earnings after returning, 40% expect no effect, and nearly 10% anticipate negative effects. Thus, while the *average* respondent does anticipate that temporary migration will allow her to enjoy higher earnings after returning to birthplace relative to never having migrated, the views on these effects are very heterogeneous—not only on size but on sign—despite all respondents having a bachelor's degree, being of a similar age, and being from the same region of birth. In contrast, expectations for long-term migration are more uniform, with 78% of respondents predicting positive effects, 18% expecting no effect, and only 4% anticipating negative effects.

The reported heterogeneity suggests that respondents sort into migration alternatives based on significantly different returns. Our data allow us to test whether, consistent with the Roy model (and the standard model of migration decision-making à la Roy as applied by Borjas, 1987), students choose alternatives in which they perceive comparatively higher ex-ante gains. Specifically, I investigate whether respondents who sort into long-term (or short-term) migration perceive higher relative returns on various outcomes for migrating long-term (short-term) versus not migrating, compared to their counterparts who do not plan to migrate long-term (short-term).[26] Consistent with the Roy model, I find clear evidence of positive sorting into alternatives on the basis of ex-ante returns (results are shown in the last three rows of each panel by outcome, in Table IV for career and Table V for non-career outcomes). For example, long-term migrants expect significantly higher career returns from long-term migration compared to short-term migrants and stayers (e.g., the average expected increase in full-time earnings 10 years after graduation is 42% for long-term migrants, 34% for short-term migrants, and 21% for stayers). Similarly, long-term migrants expect the least negative effects of migration across all non-career outcomes. For instance, they anticipate their quality of social life to be 13 percentage points lower if they live outside their region of birth compared to living in it three years after graduation—substantially smaller than the differences expected by short-term migrants (-19 percentage points) and stayers (-26 percentage points).

The next section analyzes the determinants of these reported migrant-stayer gaps in ex-ante returns over the life-cycle.

[26]Each respondent is classified into a migrant type based on the migration alternative for which they reported the highest probability of choice; for instance, stayers are those who assigned the highest probability to the no-migration alternative.

C. *Determinants of the Migrant-Stayer Gap on Life-Cycle Ex-ante Returns*

Economic studies on migration decision-making with realized choice data must assume the conditioning variables on which potential migrants base their beliefs.[27] The collected data allow me to directly examine which individual characteristics are associated with migrants expecting higher life-cycle returns than non-migrants.

To set the stage for analysis, I first show that several individual characteristics (like having higher GPA or being older) have a strong and positive relationship with the expected returns to several outcomes over the life-cycle (see Table A4 in the Appendix). The remaining results are presented in Table VI. For each given outcome, Column (1) shows the raw migrant-stayer gap, revealing, as documented earlier, that migrants expect significantly higher gains in all outcomes relative to stayers (statistically significant at the 1% level).[28] Column (2) adds a set of covariates to the regression, showing that the different distributions of these characteristics within migrants and stayers explain part of the higher returns expected by the former relative to the later, but not all.[29] Column (3) shows that the covariates explain the largest portion of the migrant-stayer gap for ex-ante earnings, explaining 84%. Additionally, covariates explain a larger share of the migrant-stayer gap in the remaining career outcomes than in the non-career outcomes. For example, they explain 42% and 50% of the gap in expected gains in full-time employment and match quality, while they explain between 24% and 37% of the gap in non-career outcomes (distress from being far from loved ones, enjoyment from proximity, and social-life quality). Overall, the results show that even a rich set of characteristics—typically not available in datasets—cannot fully explain the differences in ex-ante returns between migrants and stayers, and underscore the need of taking unobserved heterogeneity into account when making assumptions about expectations for counterfactual migration alternatives.[30]

Finally, using Gelbach decompositions (Gelbach, 2016), I analyze which observable characteristics contribute the most to explaining the migrant-stayer gap. The results

[27] As shown by Manski et al. (1993), different assumptions regarding conditioning variables can lead to different parameter estimates.

[28] Migrants are those who assign a higher probability of choice to migrating (short-term plus long-term) than to no-migrating.

[29] This list includes age, gender, socioeconomic status, GPA, field of study in the bachelor's degree, network differences between home and abroad, a dummy for whether individual's chosen migration destination in the event of migrating is internal or international and a dummy for whether the individual's expected location for further studies is in their region of birth or outside of it.

[30] These findings align with the extensive literature on self-selection into migration, which emphasizes that migrants and stayers differ not only in observed characteristics but also in unobserved ones (e.g., Bütikofer and Peri, 2021). These unobserved differences, in turn, account for much of the variation in observed outcomes (typically earnings) between migrants and stayers (e.g., McKenzie et al., 2010; Fernández-Huertas Moraga, 2011; Borjas et al., 2019).

(Column (3) of Table VI) show that differences in study and work destinations together account for much of the higher expected career gains expected by migrants relative to stayers. Their contributions to non-career outcomes, however, largely offset each other.[31] Differences in the distribution of individual characteristics—age, gender, socioeconomic status, GPA, and field of study—between migrants and stayers help explain why migrants expect higher non-career gains and higher gains in full-time earnings, but not in full-time employment and match quality (in fact, adding these covariates exacerbates the gap in the latter two outcomes). Finally, network differences at migration destinations and home regions between migrants and non-migrants are crucial in explaining the migrant-stayer gap in full-time employment, match quality, and all non-career outcomes.[32] Several studies have demonstrated the important role of networks in residential mobility choices (e.g., Costa et al., 2018; Büchel et al., 2020). My results (Table A4) show that young adults view networks—including broader connections like friends of friends—as crucial for anticipating higher returns from migration on both career and non-career outcomes. Gelbach decompositions (Table VI) reveal that migrants' stronger networks, compared to non-migrants', largely explain their higher expected returns, which drive migration decisions.

6 MODEL RESULTS

This section combines the individual-specific ex-ante returns on career and non-career outcomes described in the previous section with elicited subjective choice probabilities to estimate a discrete choice life-cycle utility model. Then, I use the estimated preference parameters to perform counterfactual exercises, which are shown at the end of this section. Section 7 applies additional counterfactuals to shed light into the reasons for planning short-term migration, a relevant question for policy-making in lagging regions.

A. Model Specification

For tractability, I assume that the utility function is additively separable in career and non-career attributes as follows

[31] This is because, on the one hand, migrants are more likely to plan to pursue studies outside their region of birth, which is associated with both higher expected career and non-career returns to migration (see Figure B3 in the Appendix, which shows that migration decisions for studies and work are interconnected; where the former, by providing a natural environment to build networks, is seen as a strategy to support the later). On the other hand, migrants are also more likely to plan international over internal destinations in the event of migration, which are associated with higher career gains, but also with more negative non-career returns.

[32] This variable is constructed by subtracting respondents' perceived likelihood of having a network that will help them find a job in their region of birth from their perceived likelihood of having such a network at their chosen migration destination 3 years after finishing the bachelor's degree.

$$\begin{aligned}\mathbb{E}[U_{im}|\mathcal{J}_\tau] = \sum_{t=t_{i0}}^{T} \beta^{t+g_i}\Big[\phi_1 \sum_{l=FT,PT} P_{imt}(L=l) * \mathbb{E}(w_{q,imt}|L=l) \\ + \phi_2 P_{imt}(\text{Study-Job Match}) * \mathbb{1}[P(L=FT)+P(L=PT)>0] \\ + \phi_3 P_{imt}(\text{Enjoy social life}) + \phi_4 P_{imt}(\text{Enjoy being close})\Big] + \gamma_m\end{aligned} \tag{4}$$

where $\sum_{l=FT,PT} P_{imt}(L=l) * \mathbb{E}(w_{q,imt}|L=l)$ are expected earnings, that is, expected earnings conditional on employment status averaged by expected employment status probabilities. $P_{imt}(L=l)$, where $l = \{FT, PT\}$, is student i's expected probability of working full-time and part-time in migration alternative m at time t and $\mathbb{E}(w_{q,imt}|L=l)$ is students i's expected minimum (maximum) yearly gross earnings in migration alternative m at time t conditional on employment status l, where $q \in \{min, max\}$. We therefore assume that individuals' utility from earnings can operate both through the employment and wage margins. I specify two different utility functions, one which is a function of expected minimum earnings, w_{min}, and another one which is a function of expected maximum earnings, w_{max}. P_{imt}(Study-Job Match) is student i's expected probability of having a job that is directly related to her bachelor's degree at time t in migration alternative m, conditional on being employed. P_{imt}(Enjoy social life) and P_{imt}(Enjoy being close) are student i's expected probabilities of enjoying the quality of their social life and enjoying being close to family members, partner and friends at time t under migration alternative m. Absent direct measures on respondents' beliefs about noncareer outcomes, researchers typically introduce a "home-bias" in the utility specification, understood as a utility cost of living away from one's birthplace, and estimated as a residual.[33] By directly eliciting information on the different noncareer outcomes, I can identify the preference parameter for the different outcomes separately. ϕ_1 and ϕ_2, and ϕ_3 and ϕ_4, are the utility values from the discounted expected lifetime value of the career and non-career factors, respectively. γ_m captures choice-specific unobservable factors that affect lifetime utility. Our goal is to estimate the parameter vector $\Theta = \{\{\phi_j\}_{j=1}^4, \gamma_m\}$ up to scale.

B. Estimation of the preference paramaters

To estimate the model I assume that the evolution of outcomes follows the functional forms described in Section C.2. in the Appendix. I then follow the standard procedure in the literature that uses this methodology (e.g., Wiswall and Zafar, 2021). First, I assume that the preference shocks described in equation (1) are perceived to be independent and

[33] See for example, Kennan and Walker (2011); Ransom (2022).

identically distributed across individuals and migration alternatives following a standard type I extreme-value distribution. Then, student i's subjective probability at time τ of following migration alternative m is given by

$$\begin{aligned} p_{im\tau} &= P_i(\mathcal{E}[U_{im}|\mathcal{I}_\tau] + \xi_{im\tau} > \mathcal{E}[U_{in}|\mathcal{I}_\tau] + \xi_{in\tau}, (m,n) \in M_i, m \neq n) \\ &= \frac{exp(\mathcal{E}[U_{im}|\mathcal{I}_\tau])}{\sum_{n \in M_i} exp(\mathcal{E}[U_{in}|\mathcal{I}_\tau])} \end{aligned} \tag{5}$$

After taking the no-migration alternative, $m = 1$, as the reference alternative, we can re-write the log relative probability of choosing migration alternative m relative to migration alternative $m = 1$ as

$$ln\left(\frac{\tilde{p}_{im\tau}}{\tilde{p}_{i1\tau}}\right) = \Delta \mathbb{E}[U_{im}|\mathcal{I}_\tau] + \omega_{im} \tag{6}$$

where Δ denotes the differencing operator taken with respect to the baseline migration alternative, and where we normalize γ_m equal to zero for the no-migration alternative. ω_{im} represents a measurement error, which reflects that the reports of migration alternative probabilities in my data, $\tilde{p}_{im}$, measure the "true" probabilities, p_{im}, with some error. We now have a linear relationship between the known quantities in the data. I estimate the linear regression using ordinary least squares (OLS) and least absolute deviation (LAD) estimators. For estimation using OLS, I recode all reported extreme probabilities of 0 and 1 to 0.001 and 0.999, respectively.[34] Note that while the OLS estimator is sensitive to these roundings, the quantile estimator is not, and therefore, it is preferred (Blass et al., 2010). Since we have two observations per respondent, standard errors are clustered at the individual level.

C. Model Estimates

Table VII presents the LAD and OLS estimates of the utility specification in equation (6). All results assume that $\beta = 0.95$. Columns 1 and 3 show the results for the utility specification which is a function of expected minimum earnings, while columns 2 and 4 provide the counterpart results using maximum earnings.

The coefficients for all career and non-career outcomes are positive and statistically

[34]Note that in this context, the reports of extreme values, probabilities of exactly zero or one, reflect rounding, not censoring or truncation. In this context, there is little substantive difference between expressing a very low probability of following a migration alternative as 0.01 or zero. In any case there are very few extreme cases in my data: only 2% of individuals assign a probability of 1 and 11% assign a probability of 0 to any of the three migration alternatives.

significant at the 1% level across all four specifications, indicating that the migration choices of highly educated young adults are influenced by both career and non-career factors. To interpret the magnitudes and compare my findings with the existing literature, I convert the parameter estimates for career outcomes into choice elasticities and those for non-career outcomes into willingness-to-pay estimates. These results, shown below, are based on the LAD estimates reported in Column (1) of Table VII.

C.1. Choice Elasticities

I begin by examining what the model estimates imply about the responsiveness of expected migration choices to changes in career outcomes. For example, in response to an increase in beliefs about minimum earnings in migration alternative m, how likely would an individual be to choose that migration alternative? For each student i, I compute the percent change in the likelihood of choosing migration alternative m when beliefs about a given career outcome increase by 1% in each year of migration alternative m and are held constant in the other two alternatives. These choice elasticities are heterogeneous across students, as they depend on individual specific beliefs about outcomes for each alternative.

The mean elasticity for minimum earnings (averaged across individuals and across the three migration alternatives) is 0.80%. This number is in the range of elasticity of the choice to changes in earnings estimated by Dahl and Sorenson (2010) for Danish engineers (whose estimates are between 0.5-1%), and is somewhat lower than that estimated by Ransom (2022) (between 0.92 and 1% for moves within the US) and Bertoli et al. (2013) (equal to 0.95% for migrations from Ecuador to Spain) and Porcher et al. (2024) (for moves within Brazil 1.5%). The elasticity of choice that I estimate for the probability of working full-time is equal to 0.68% and for part-time equal to 0.11%, which is consistent with young adults at the start of their professional careers seeking to work full-time. Finally, the mean elasticity of the study-job match is equal to 0.62%, showing that young adults' expected migration choices respond to good study-job match prospects, after controlling for earnings.

C.2. Willingness to Pay

Coefficients of non-career factors are easiest to interpret in terms of willingness-to-pay (WTP) estimates. For example, how much of their expected earnings are students willing to forgo to increase the probability of enjoying the quality of their social life by Δ percentage points, other things being equal? Based on the utility specification in equation (6), the per-period willingness-to-pay to experience an increase equal to Δ percentage

points in non-career outcome x_j in a each period is computed as $WTP_j = (\phi_j/\phi_1) \cdot \Delta$, where $j = \{3, 4\}$.

Table VIII reports the results. On average, young adults are willing to give-up 5,614€ per year (equivalent to 34% of their annual earnings) to increase the quality of their social life by 1 standard deviation over the life-cycle. Additionally, they would be willing to give-up 2,492€ annually, (equivalent to 15% of their annual earnings) for an equivalent increase in the enjoyment derived from being close to family, partner and friends. These results show that expected differences in quality of social life across the migration alternatives play a larger role in migration-decision making than expected differences in enjoyment from being close to loved ones.

To compare the results to those of other studies, I calculate the amount of earnings that they are willing to give-up to increase each non-career outcome from its expected level in the long-term migration alternative to its expected level in the no-migration alternative. I find that young adults would be willing to give-up 38% or their annual earnings (6,249€ per year) to increase the enjoyment from being close to loved ones by this amount. This number lies in the range of the WTP in order to live close to family estimated by Koşar et al. (2021) for US residents. Using an stated-preference methodology, they estimate a WTP equal to 30% of annual earnings for individuals who self-identify as "mobile" and 56% for the "rooted". On average, we would expect highly educated young adults to fall into the former group. Taking both non-career factors together, young adults are willing to give up 75% of their lifetime earnings (12,185€ annually) to increase both factors from their expected levels in the long-term migration alternative to their expected levels in the no-migration alternative.

D. Counterfactual Exercises

In addition to comparing the magnitudes of preference estimates over different outcomes, our survey methodology allows us to evaluate how anticipating different migration effects on one's career trajectory and personal life influences choices and welfare. These exercises help quantify the relative importance of career and non-career considerations in migration decision-making.

Table IX presents the results of three counterfactual exercises, each based on a different assumption about ex-ante returns. The first column presents the average predicted probability of choosing each of the three migration alternatives at baseline, while the remaining columns display the results of the counterfactual exercises. To compute the welfare effects of each counterfactual, I compare the expected lifetime utility of the migration alternative chosen under the counterfactual scenario, c, ($m_i^{*c} = \arg\max_{m \in M} \mathbb{E}(U_{im})$) to that of the alternative chosen at baseline, b, ($m_i^{*b} = \arg\max_{m \in M} \mathbb{E}(U_{im})$). Panel B

reports the fraction of individuals experiencing a utility gain or loss, along with the percentage change in mean utility across the sample under different counterfactuals. Panel C presents the proportion of individuals who switch migration alternatives and the direction of these switches under the hypothetical scenarios. All results are estimated using the preference parameters from Column (1) of Table VII.

D.1. The Impact of Career Ex-Ante Returns on Choices and Welfare

To quantify the impact of expected career effects on migration choices and welfare, the first counterfactual assumes that respondents expect the same career outcomes as in the no-migration alternative in the other two migration alternatives too.

Column (2) of Table IX presents the results. The likelihood of choosing short- and long-term migration decreases by 3 and 6 percentage points, respectively, when expected career gains from migration are set to zero. This highlights that improving future labor market prospects is a reason why high-educated young adults choose to migrate. Indeed, so much so that without this motive, nearly all long-term migrants at baseline would reconsider their plans, with 30% opting not to migrate and 67% switching to short-term migration. Similarly, nearly half of those planning short-term migration at baseline would decide not to migrate under the new scenario. A much smaller flow occurs in the opposite direction, with 8% of those initially choosing not to migrate switching to short-term migration. This reflects the heterogeneity in ex-ante returns regarding career outcomes across respondents, with some expecting negative effects from migration.

Overall, if individuals expected no impact on future career outcomes from migration, 36% would change their preferred migration alternative, resulting in nearly 58% experiencing a utility loss, with a 5% decrease in average utility across the sample. These welfare effects demonstrate that high-educated young adults in lagging regions use geographic mobility as a path to increase utility through better career prospects.

D.2. The Impact of Non-Career Ex-Ante Returns on Choices and Welfare

To quantify the impact of non-career ex-ante returns on choices and welfare, the next counterfactual assumes that respondents expect the same non-career outcomes as in the no-migration alternative in the other two migration alternatives too.

Results are presented in Column (3) of Table IX. This counterfactual leads to larger changes in average migration probabilities compared to the previous one: the average probability of choosing short-term migration increases by 4 percentage points, while that of long-term migration increases by 11 percentage points. The substantial increase in the likelihood of choosing to migrate—both short- and long-term—when individuals expect migration to have no effect on non-career outcomes indicates that psychic costs are a key

reason that restricts migration. Indeed, if individuals anticipated no such costs, almost all of the young adults choosing to not migrate at baseline would switch into migrating, with 77% planning to migrate short-term and 20% long-term. Additionally, as the relative advantage of short-term migration over long-term migration in non-career outcomes disappears, 13% of individuals planning to migrate short-term at baseline would now switch into planning long-term migration. This result shows that the preference to enjoy higher non-career outcomes is an important reason for choosing short-term migration over long-term migration. As with career outcomes, young adults' belief heterogeneity is reflected in some migration flows taking the opposite direction. In particular, about 9% of young adults, who anticipate a positive effect of migration on at least one career outcome (anticipate "psychic benefits"), would switch from long-term migration to short-term migration if they anticipated migration to have no effect on career outcomes.

This counterfactual results in about 25% more switches than the counterfactual assuming no effects on career outcomes (36% versus 45%). Additionally, the proportion of individuals experiencing a utility loss is very small (6%), while the proportion experiencing a gain is very large (91%). Overall, utility increases by about 10% in the sample, almost doubling the utility change induced by the previous counterfactual. These findings highlight that expected psychic costs on life-cycle utility through separation from family and friends, and disruptions to quality of social life are key determinants of migration choices. Eliminating these migration costs leads to significant welfare gains, as most potential migrants no longer perceive a trade-off between increasing utility through career and non-career outcomes and can simply choose the migration alternative that maximizes their career prospects.

7 SHORT-TERM MIGRATION

Understanding who considers temporary migration an optimal life-cycle strategy—and why—is crucial for policy-making in lagging regions. Advocates of place-based policies argue that out-migration from distressed areas does not help those left behind (e.g., Bartik, 2020). For instance, Anelli et al. (2023), show that, in Italy, the emigration of highly educated young individuals reduced firm creation in the country. In contrast, return migration can benefit local productivity if returning migrants are able to bring networks and skills back to origin (Santos and Postel-Vinay, 2003; Dustmann et al., 2011; Mayr and Peri, 2009). Following this argument, many governments encourage migration

of high-educated young adults conditional on return.[35] The target population of these policies are individuals still in their region of birth—such as our survey respondents.

In this section I analyze two questions: First, who, in terms of ability, considers short-term migration an optimal life-cycle strategy at baseline—and why. Second, I calculate the cash transfer that is required, by ability level, to encourage short-term migration among those planning to not migrate and to migrate long-term at baseline.

A. Selection into Planned Short-Term Migration by Ability

Figure I shows that young, highly educated adults' ability—measured by their standardized average GPA at the end of their bachelor's degree—is positively related to their expected probability of migrating, with a stronger association for temporary than for long-term migration.[36]

Thus, young adults who plan short-term migration are positively selected on ability: the average ability among those whose preferred migration alternative—the option with the highest subjective expected utility—is short-term migration is 0.09 standard deviations (s.d.), which is significantly higher (at the 1% level) than the ability of those who prefer not to migrate (-0.12 s.d.) and higher than the one of those who prefer long-term migration (-0.03 s.d.).

B. Determinants of Planned Short-Term Migration

What are the reasons behind their plan to migrate short-term? Based on the anticipated effects on career and non-career outcomes described in Section 5, I consider three benefits linked to short-term migration and quantify to what extent they are pivotal in making it an optimal life-cycle strategy: (i) temporarily higher career outcomes at destination, (ii) faster accumulation of skills at destination, and (iii) birthplace premium. They are defined as follows.

i. Temporarily higher career outcomes at destination: Difference in expected career outcomes between no-migration and short-term migration *during the periods at the migration destination.*

ii. Faster accumulation of skills at destination: Difference in expected career outcomes between no-migration and short-term migration *during the periods after return.*

[35] One such program is *Programa Talentia*, in Andalusia. The program offers various incentives, including cash transfers, to encourage migration conditional on return. Program participants must return and reside back in Andalusia for at least 4 of the 8 years following program completion; otherwise, they are required to repay the monetary benefits received. Another example is the Overseas Employment Program in the Philippines.

[36] GPA is their self-reported average GPA (0-10 scale) regarding the previous academic year. Given that degrees across schools and universities may vary in difficulty, I standardize the GPA by university and school.

iii. Birthplace Premium: Difference in expected noncareer outcomes in short- and long-term migration *during the periods after return.*

I evaluate how each benefit influences the choice of short-term migration by calculating the share of respondents who would no longer prefer this option if the expected benefit was removed. For the first two channels, this means setting career outcomes in short-term migration equal to those in no-migration. For the birthplace premium, noncareer outcomes in short-term migration are set equal to those in long-term migration. The results, based on preference estimates from Column (1) of Table VII, are shown in Table X. For each counterfactual, Panel A shows total switches and the average ability of switchers, Panel B the proportions switching to no-migration and long-term migration, and Panel C the ability gap between these two groups.

Results are summarized as follows. First, temporarily higher career outcomes at destination has the largest impact on short-term migration plans, as its removal results in the highest proportion of switches out of this option (54%), compared to birthplace premium (46%) and faster accumulation of skills at destination (19%). Notably, only 19% of individuals anticipate sufficiently boosted earnings after return for this benefit to be pivotal in choosing short-term migration. Interestingly, these individuals have significantly higher average ability compared to the other two groups: their average ability is 0.24 s.d., while it is 0.07 s.d. for those influenced by temporarily higher career outcomes, and 0.04 s.d. for those driven by the birthplace premium.

Second, I analyze whether those who switch out from short-term migration when each benefit is removed are switching into no-migration or into long-term migration. The fraction switching to one and other alternative allows to assess the role of each expected benefit in preventing brain drain—by avoiding long-term migration—versus in encouraging the acquisition of experience elsewhere—by avoiding no-migration. Results show that there is a consistently higher proportion of individuals switching to no-migration than to long-term migration across all three channels. This fact reveals that long-term migration is not always a corner solution of an individual's choice of optimal migration duration, but a conceptually different form of migration compared to short-term migration. Importantly, the difference in the fraction of individuals switching to one and other option is different across channels. On the one hand, birthplace premium can be seen as an asset that promotes migration among those who would otherwise not migrate, as 79% of individuals for whom birthplace premium is pivotal would opt for never migrating if this benefit were absent. On the other hand, temporarily higher career outcomes at the destination is important for preventing long-term migration, as 44% of individuals for whom this channel is pivotal would opt for long-term migration if this benefit were absent. Furthermore, among those for whom the faster accumulation of skills at destination

is pivotal, 63% would switch to no-migration and 37% to long-term migration.

Finally, the ability gap between those who would switch to long-term migration and no-migration is always positive, showing that those with higher ability are always more prone to choosing to migrate long-term than to not migrate absent specific benefits linked to short-term migration. The ability gap is highest for the faster accumulation of skills at destination channel, 0.31, showing that for high-ability individuals, expecting competitive career outcomes after return is critical to choosing short-term migration. This highlights the need for effective labor market integration programs upon return to avoid a permanent loss of talent in lagging regions.

Overall, these results underscore that the motivations for planning short-term migration vary significantly by ability level: high-ability individuals are more responsive to factors that enhance career outcomes or skill acquisition, while lower-ability individuals are more influenced by the birthplace premium. These findings reveal that targeting specific benefits linked to short-term migration can influence not only the overall take-up of this option, but also the type of individuals it attracts, with broader implications for labor market outcomes at regions of origin.

C. Ability Gradient and the Cost of Promoting Short-Term Migration Non-Migrants and Long-Term Migrants

I this section, I examine how the ability gradient influences the cost of promoting short-term migration among individuals who do not consider this option an optimal choice at baseline. To explore this, I calculate the cash transfer—measured in present discounted value—required to make the average individual in three ability percentiles (25th, 50th, 75th) indifferent between their baseline choice and short-term migration. Figure II presents these results separately for individuals whose baseline preference is no-migration and long-term migration.

A clear pattern emerges: the cost of promoting short-term migration decreases with ability for stayers but rises for long-term migrants. For instance, a 20,000€ incentive suffices to attract an average individual in the 75th ability percentile who initially plans to stay. In contrast, persuading someone in the same ability group who plans long-term migration requires a much higher transfer—about 57,000€—nearly three times as much. These findings suggest that financial incentives are less effective in discouraging high-ability individuals from long-term migration, as they anticipate greater net gains from their initial choice. However, attracting high-ability stayers to short-term migration is significantly less costly. This strategy could serve as a targeted investment in retaining talent while fostering skill acquisition during early career years—a period of limited opportunities in lagging regions and crucial for human capital accumulation (Arellano-

Bover, 2022).

It is essential to note that the migration experience itself likely influences both preferences and expectations over time. This is why policies encouraging migration conditional on return often include measures to address initial commitment break-up. Estimating these measures requires data on actual migrants' expectations when deciding whether to continue abroad or return home. My survey participants are too young for this choice. Thus, the simulations in this section simply illustrate the ability gradient in the take-up of policies that encourage short-term migration at the initial decision-making stage.

8 CONCLUSION

Understanding the migration choices of highly educated young adults from lagging regions is essential for designing policies that address regional disparities. These choices are difficult to model due to the selective nature of migration, limited knowledge of how potential migrants gather and process information, the dynamic nature of decisions (including unplanned returns), and the broad impacts of migration on life outcomes beyond earnings. This paper investigates the determinants of migration choices by incorporating rich data on subjective expectations into a life-cycle utility model. This approach allows me to identify potential migrants' preferences over a set of career and non-career outcomes at the time of decision-making, without relying on assumptions about selection into migration or the belief formation process. It builds on recent literature that uses subjective expectations data to analyze decision-making under uncertainty in other contexts (e.g., Arcidiacono et al., 2020; Wiswall and Zafar, 2021).

Regarding beliefs, potential migrants anticipate significant trade-offs between career and non-career outcomes across migration alternatives. Ex-ante returns vary widely, and consistent with the Roy model, individuals sort into migration based on expected gains. Higher expected net gains among migrants, compared to stayers, largely stem from differences in destination choices and networks. Regarding preferences, model estimates show that both career and non-career factors significantly shape migration decisions. Nevertheless, counterfactual analyses reveal that while career prospects matter, personal life considerations play a larger role in shaping choices and welfare, explaining the preference for short-term over long-term migration.

I then use the model to gain further insights into the determinants of planning to return. Short-term migrants are positively selected on ability, and overall, temporary career gains are the primary driver of their choice, followed closely by the birthplace premium. Nevertheless, the fact that expecting improved career outcomes upon return is a key determinant for the highest-ability individuals highlights the need for quality labor

market integration programs to retain talent. Counterfactuals also show that potential migrants perceive short- and long-term migration as distinct options: without short-term migration, more individuals would opt for no migration rather than migrate long-term. Again, ability plays a key role on this choice: higher-ability individuals are consistently more prone to switch to long-term migration, underscoring the vulnerability of lagging regions to the permanent loss of talent. Finally, promoting short-term migration among high-ability stayers is nearly three times more cost-effective than among those already planning to migrate long-term. This suggests that short-term migration policies could serve as a strategic investment to promote early career skill acquisition in places with poor employment prospects.

The follow-up survey conducted 4 years later confirms a strong link between the initial beliefs and later choices and outcomes, validating the employed survey methodology. My results suggest several possible avenues for future work. First, the current framework does not incorporate savings and borrowing, which are likely important in other migration contexts, especially for migrations from developing countries where financial constraints and remittances play a key role. Second, the model could be extended to include the migration destination as a choice variable, which is key in explaining the higher returns expected by migrants relative to stayers. This approach would allow the researcher to further understand the reasons for choosing one destination over another. Note, however, that this imposes the stricter assumption that all potential migrants—including those choosing to stay—have well formed expectations about different potential migration destinations.

9 REFERENCES

Adda, Jérôme, Christian Dustmann, and Joseph-Simon Görlach, "The dynamics of return migration, human capital accumulation, and wage assimilation," *The Review of Economic Studies*, 2022, *89* (6), 2841–2871.

Alesina, Alberto, Armando Miano, and Stefanie Stantcheva, "Immigration and redistribution," *The Review of Economic Studies*, 2023, *90* (1), 1–39.

Anelli, Massimo, Gaetano Basso, Giuseppe Ippedico, and Giovanni Peri, "Emigration and entrepreneurial drain," *American Economic Journal: Applied Economics*, 2023, *15* (2), 218–252.

Arcidiacono, Peter, V. Joseph Hotz, and Songman Kang, "Modeling College Major Choices Using Elicited Measures of Expectations and Counterfactuals," *Journal of Econometrics*, January 2012, *166* (1), 3–16.

_ , _ , Arnaud Maurel, and Teresa Romano, "Ex Ante Returns and Occupational Choice," *Journal of Political Economy*, June 2020, *128* (12), 4475–4522.

Arellano-Bover, Jaime, "The effect of labor market conditions at entry on workers' long-term skills," *Review of Economics and Statistics*, 2022, *104* (5), 1028–1045.

Attanasio, Orazio P. and Katja M. Kaufmann, "Education Choices and Returns to Schooling: Mothers' and Youths' Subjective Expectations and Their Role by Gender," *Journal of Development Economics*, July 2014, *109*, 203–216.

_ and _ , "Education Choices and Returns on the Labor and Marriage Markets: Evidence from Data on Subjective Expectations," *Journal of Economic Behavior & Organization*, August 2017, *140*, 35–55.

Bah, Tijan L and Catia Batista, "Why Do People Migrate Irregularly? Evidence from a Lab-in-the-Field Experiment in West Africa," *Kellogg Working Paper*, 2020, *435*, 45.

Bartik, Timothy J, "Using place-based jobs policies to help distressed communities," *Journal of Economic Perspectives*, 2020, *34* (3), 99–127.

Bartolucci, Cristian, Claudia Villosio, and Mathis Wagner, "Who migrates and why? Evidence from Italian administrative data," *Journal of Labor Economics*, 2018, *36* (2), 551–588.

Baseler, Travis, "Hidden income and the perceived returns to migration," *American Economic Journal: Applied Economics*, 2023, *15* (4), 321–352.

Bertoli, S., J. Fernández-Huertas Moraga, and F. Ortega, "Crossing the Border: Self-selection, Earnings and Individual Migration Decisions," *Journal of Development Economics*, March 2013, *101*, 75–91.

Blass, Asher A., Saul Lach, and Charles F. Manski, "Using Elicited Choice Probabilities to Estimate Random Utility Models: Preferences for Electricity Reliability," *International Economic Review*, May 2010, *51* (2), 421–440.

Boneva, Teodora, Marta Golin, and Christopher Rauh, "Can perceived returns explain enrollment gaps in postgraduate education?," *Labour Economics*, 2022, *77*, 101998.

Borjas, George J, "Self-Selection and the Earnings of Immigrants," *American Economic Review*, 1987, *77* (4), 24.

_ , Ilpo Kauppinen, and Panu Poutvaara, "Self-Selection of Emigrants: Theory and Evidence on Stochastic Dominance in Observable and Unobservable Characteristics," *The Economic Journal*, January 2019, *129* (617), 143–171.

Bover, Olympia, "Measuring Expectations from Household Surveys: New Results on Subjective Probabilities of Future House Prices," *SERIEs*, November 2015, *6* (4), 361–405.

Büchel, Konstantin, Maximilian V. Ehrlich, Diego Puga, and Elisabet Viladecans-Marsal, "Calling from the Outside: The Role of Networks in Residential Mobility," *Journal of Urban Economics*, September 2020, *119*, 103277.

Bütikofer, Aline and Giovanni Peri, "How cognitive ability and personality traits affect geographic mobility," *Journal of Labor Economics*, 2021, *39* (2), 559–595.

Co, Catherine Y, Ira N Gang, and Myeong-Su Yun, "Returns to returning," *Journal of Population Economics*, 2000, *13*, 57–79.

Constant, Amelie F and Klaus F Zimmermann, *International handbook on the economics of migration*, Edward Elgar Publishing, 2013.

Cortés, Patricia, Jessica Pan, Ernesto Reuben, Laura Pilossoph, and Basit Zafar, "Gender Differences in Job Search and the Earnings Gap: Evidence from the Field and Lab," *The Quarterly Journal of Economics*, 2022.

Costa, Dora L, Matthew E Kahn, Christopher Roudiez, and Sven Wilson, "Persistent social networks: Civil war veterans who fought together co-locate in later life," *Regional science and urban economics*, 2018, *70*, 289–299.

Cunha, Flavio and James J Heckman, "Identifying and estimating the distributions of ex post and ex ante returns to schooling," *Labour Economics*, 2007, *14* (6), 870–893.

_ **, James Heckman, and Salvador Navarro**, "Separating uncertainty from heterogeneity in life cycle earnings," *oxford Economic papers*, 2005, *57* (2), 191–261.

Dahl, Gordon B., "Mobility and the Return to Education: Testing a Roy Model with Multiple Markets," *Econometrica*, 2002, *70* (6), 2367–2420.

Dahl, Michael S and Olav Sorenson, "The Migration of Technical Workers," *Journal of Urban Economics*, 2010, p. 13.

De la Roca, Jorge De La and Diego Puga, "Learning by Working in Big Cities," *The Review of Economic Studies*, January 2017, *84* (1), 106–142.

Delavande, Adeline, "Pill, Pathch, or Shot? Subjective Expectations and Birth Control choicePILL,," *International Economic Review*, August 2008, *49* (3), 999–1042.

_ **and Basit Zafar**, "University Choice: The Role of Expected Earnings, Nonpecuniary Outcomes, and Financial Constraints," *journal of political economy*, 2019, *127* (5), 51.

d'Haultfoeuille, Xavier, Christophe Gaillac, and Arnaud Maurel, "Rationalizing rational expectations: Characterizations and tests," *Quantitative Economics*, 2021, *12* (3), 817–842.

Djajić, Slobodan and Ross Milbourne, "A general equilibrium model of guest-worker migration: The source-country perspective," *Journal of international economics*, 1988, *25* (3-4), 335–351.

Dominitz, Jeff and Charles F. Manski, "Using Expectations Data to Study Subjective Income Expectations," *Journal of the American Statistical Association*, September 1997, *92* (439), 855–867.

Dustmann, Christian, "Earnings adjustment of temporary migrants," *Journal of Population Economics*, 1993, *6*, 153–168.

_ , "Temporary migration, human capital, and language fluency of migrants," *scandinavian Journal of Economics*, 1999, *101* (2), 297–314.

_ **and Albrecht Glitz**, "Migration and education," in "Handbook of the Economics of Education," Vol. 4, Elsevier, 2011, pp. 327–439.

_ **and Joseph-Simon Görlach**, "The Economics of Temporary Migrations," *Journal of Economic Literature*, March 2016, *54* (1), 98–136.

_ **and** _ , "Estimating immigrant earnings profiles when migrations are temporary," *Labour Economics*, 2016, *41*, 1–8.

_ **, Itzhak Fadlon, and Yoram Weiss**, "Return Migration, Human Capital Accumulation and the Brain Drain," *Journal of Development Economics*, May 2011, *95* (1), 58–67.

EC, *Competitiveness in low-income and low-growth regions: The lagging regions report*, Commission Staff Working Document, European Commission, 2017.

Enchautegui, Maria E, "The value of US labor market experience in the home country: The case of Puerto Rican return migrants," *Economic Development and Cultural Change*, 1993, *42* (1), 169–191.

Engelberg, Joseph, Charles F Manski, and Jared Williams, "Comparing the point predictions and subjective probability distributions of professional forecasters," *Journal of Business & Economic Statistics*, 2009, *27* (1), 30–41.

Fernández-Huertas Moraga, Jesús, "New Evidence on Emigrant Selection," *Review of Economics and Statistics*, February 2011, *93* (1), 72–96.

Fernández-Cerezo, Alejandro, Iván Kataryniuk, and Francisco José Rodríguez, "The Spanish economy's greater resilience vis-à-vis the euro area in 2023: the role of sectoral composition," *Economic Bulletin - Banco de España*, 2023, *2023/Q4, 03.*

Festinger, Leon, *A Theory of Cognitive Dissonance*, Vol. 2 of Stanford University Press. 1957.

Frohnweiler, Sarah, Bernd Beber, and Cara Ebert, "Information frictions, belief updating and internal migration: Evidence from Ghana and Uganda," *Journal of Development Economics*, 2024, p. 103311.

Fundación BBVA-Ivie, "Movilidad Universitaria," ESENCIALES Fundación BBVA-Ivie Nº31/2018 2018.

Gaubert, Cecile, Patrick M Kline, and Danny Yagan, "Place-based redistribution," Technical Report, National Bureau of Economic Research 2021.

Gelbach, Jonah B, "When do covariates matter? And which ones, and how much?," *Journal of Labor Economics*, 2016, *34* (2), 509–543.

Gibson, John and David McKenzie, "The Microeconomic Determinants of Emigration and Return Migration of the Best and Brightest: Evidence from the Pacific," *Journal of Development Economics*, May 2011, *95* (1), 18–29.

Gong, Yifan, Todd Stinebrickner, Ralph Stinebrickner, and Yuxi Yao, "The Role of Non-Pecuniary Considerations: Location Decisions of College Graduates from Low Income Backgrounds," *International Economic Review*, (forthcoming).

González-Leonardo, Miguel, Antonio López-Gay, and Albert Esteve, "Interregional migration of human capital in Spain," *Regional Studies, Regional Science*, 2022, *9* (1), 324–342.

Grogger, Jeffrey and Gordon H. Hanson, "Income Maximization and the Selection and Sorting of International Migrants," *Journal of Development Economics*, May 2011, *95* (1), 42–57.

Hill, John K, "Immigrant decisions concerning duration of stay and migratory frequency," *Journal of development economics*, 1987, *25* (1), 221–234.

Huttunen, Kristiina, Jarle Møen, and Kjell G Salvanes, "Job Loss and Regional Mobility," *Journal of Labor Economics*, 2018, *36* (2), 31.

IMF, *Chapter 2: Closer Together or Further Apart? Subnational Regional Disparities and Adjustment in Advanced Economies*, World Economic Outlook, International Monetary Fund, 2019.

Jensen, Robert, "The (Perceived) Returns to Education and the Demand for Schooling*," *The Quarterly Journal of Economics*, May 2010, *125* (2), 515–548.

Jia, Ning, Raven Molloy, Christopher Smith, and Abigail Wozniak, "The economics of internal migration: Advances and policy questions," *Journal of economic literature*, 2023, *61* (1), 144–180.

Kaufmann, Katja Maria, "Understanding the Income Gradient in College Attendance in Mexico: The Role of Heterogeneity in Expected Returns," *Quantitative Economics*, 2014, *5* (3), 583–630.

Kennan, John and James R. Walker, "The Effect of Expected Income on Individual Migration Decisions," *Econometrica*, 2011, *79* (1), 211–251.

Kerr, Sari Pekkala, William Kerr, Çağlar Özden, and Christopher Parsons, "Global talent flows," *Journal of Economic Perspectives*, 2016, *30* (4), 83–106.

Kline, Patrick and Enrico Moretti, "People, places, and public policy: Some simple welfare economics of local economic development programs," *Annu. Rev. Econ.*, 2014, *6* (1), 629–662.

Koşar, Gizem, Tyler Ransom, and Wilbert van der Klaauw, "Understanding Migration Aversion Using Elicited Counterfactual Choice Probabilities," *Journal of Econometrics*, 2021.

Lacuesta, Aitor, "A revision of the self-selection of migrants using returning migrant's earnings," *Annals of Economics and Statistics/Annales d'Économie et de Statistique*, 2010, pp. 235–259.

Manski, Charles F., "Measuring Expectations," *Econometrica*, 2004, *72* (5), 1329–1376.

Manski, Charles F et al., "Adolescent econometricians: How do youth infer the returns to schooling," *Studies of supply and demand in higher education*, 1993, *43*, 60.

Mayr, Karin and Giovanni Peri, "Brain drain and brain return: theory and application to Eastern-Western Europe," *The BE Journal of Economic Analysis & Policy*, 2009, *9* (1).

McKenzie, David, John Gibson, and Steven Stillman, "A Land of Milk and Honey with Streets Paved with Gold: Do Emigrants Have over-Optimistic Expectations about Incomes Abroad?," *Journal of Development Economics*, May 2013, *102*, 116–127.

_ , Steven Stillman, and John Gibson, "How Important Is Selection? Experimental vs. Non-Experimental Measures of the Incomes Gains from Migration," *Journal of the European Economic Association*, 2010, *8* (4).

OECD, "International Migration Outlook 2008," *Washington, DC and Paris: Organisation for Economic Co-operation and Development*, 2008.

Porcher, Charly, Eduardo Morales, and Thomas Fujiwara, "Measuring Information Frictions in Migration Decisions: A Revealed-Preference Approach," Technical Report, National Bureau of Economic Research 2024.

Ramos, Fernando, "Out-migration and return migration of Puerto Ricans," in "Immigration and the work force: Economic consequences for the United States and source areas," University of Chicago Press, 1992, pp. 49–66.

Ransom, Tyler, "Labor market frictions and moving costs of the employed and unemployed," *Journal of Human Resources*, 2022, *57* (S), S137–S166.

Reinhold, Steffen and Kevin Thom, "Migration experience and earnings in the Mexican labor market," *Journal of Human Resources*, 2013, *48* (3), 768–820.

Santos, Manon Domingues Dos and Fabien Postel-Vinay, "Migration as a source of growth: the perspective of a developing country," *Journal of Population Economics*, 2003, *16* (1), 161–175.

Sjaastad, Larry A, "The costs and returns of human migration," *Journal of political Economy*, 1962, *70* (5, Part 2), 80–93.

Stinebrickner, R. and T. R. Stinebrickner, "A Major in Science? Initial Beliefs and Final Outcomes for College Major and Dropout," *The Review of Economic Studies*, January 2014, *81* (1), 426–472.

Tunali, Insan, "Rationality of Migration," *International Economic Review*, 2000, *41* (4), 893–920.

Vreyer, Philippe De, Flore Gubert, and Anne-Sophie Robilliard, "Are there returns to migration experience? An empirical analysis using data on return migrants and non-migrants in West Africa," *Annals of Economics and Statistics/Annales d'économie et de statistique*, 2010, pp. 307–328.

Wiswall, M. and B. Zafar, "Determinants of College Major Choice: Identification Using an Information Experiment," *The Review of Economic Studies*, April 2015, *82* (2), 791–824.

Wiswall, Matthew and Basit Zafar, "Human Capital Investments and Expectations about Career and Family," *journal of political economy*, March 2021, *129* (5), 64.

Zafar, Basit, "College Major Choice and the Gender Gap," *Journal of Human Resources*, 2013, *48* (3), 52.

10 TABLES

Table I. Sample Characteristics

	Baseline	Follow-up	Admin data
University of Seville (%)	64.70	61.54	47.63
Field of study (%)			
- Natural Science	7.39	8.70	14.58
- Social Science	63.05	61.20	61.44
- Engineering	29.56	30.10	23.98
Female(%)	45.65	49.83**	48.31
Age at Phase 1 Survey	23.09	23.15	[a]
	(2.23)	(2.34)	
GPA, 0-10 scale	6.82	6.85	6.90
	(0.84)	(0.83)	
High SES (%)	49.58	46.46	45.80
Network Differences (p.p.)	-11.84	-14.01	
	(35.74)	(36.47)	
Planned Further Studies (%)			
- Andalusia	66.83	65.55	
- Outside Andalusia	33.17	34.45	
Expected migration probs. (%)			
- Stay	36.58	37.02	
	(27.03)	(27.57)	
- Migrate Short-Term	36.67	36.95	
	(20.06)	(20.68)	
- Migrate Long-Term	26.76	26.03	
	(21.23)	(21.13)	
Chosen Migration Destination (%)			
- Other region	67.98	67.22	
- Other country	32.02	32.78	
Observations	609	299	

Sources: Administrative data comes from publicly available statistics for the US and UGR universities from the Spanish Ministry of Universities for all variables but socioeconomic status (SES). The SES in the admin data is calculated using the Spanish Labor Force Survey, 2019, restricting the sample to households living in Andalusia, with a son or daughter born and attending university in Andalusia.
Notes: Mean (standard deviation) reported for the continuous outcomes.
- High socioeconomic status (SES) is equal to one if at least one of the respondents' parents has a college degree. In the admin data, it is the proportion of households with at least one parent with university degree.
Δ Networks (p.p.) is the individual-level difference between the following two questions: "How likely do you think it is that you will have a network that will help you find a job in [chosen migration destination]? And in your home region?"
- [a] 74% are under 25 years old at graduation, 21% are 25–30, and the rest are older.
** The difference in proportion of females between the main sample and follow-up sample is significant at the 5% level.

Table II. Individual-Level Relationship Between Expected Outcomes (Weighted by Individual-Specific Choice Probabilities) and Actual Outcomes

	All	Currently *not* studying
	Dependent Variable: Log(current Earnings)	
Log(Expected FT Earnings)	0.399***	0.431***
	(0.0628)	(0.0636)
Observations	195	167
R-squared	0.156	0.188
Mean of the dependent variable	7.595	7.612
	Dependent Variable: Employed Full-time	
Expected prob. of FT employment	0.174*	0.115
	(0.0915)	(0.0759)
Observations	270	206
R-squared	0.0126	0.0114
Mean of the dependent variable	0.804	0.913
	Dependent Variable: Study-Job Match	
Expected probability of study-job match	0.241***	0.168*
	(0.0833)	(0.0946)
Observations	233	192
R-squared	0.0366	0.0174
Mean of the dependent variable	0.707	0.707
	Dependent Variable: Enjoy Social Life Q.	
Expected probability of enjoying social life	0.0192	-0.00821
	(0.0759)	(0.0925)
Observations	270	206
R-squared	0.000234	0.0000411
Mean of the dependent variable	0.763	0.779
	Dependent Variable: Enjoy Close	
Expected probability of enjoying being close	0.173**	0.196**
	(0.0750)	(0.0870)
Observations	270	206
R-squared	0.0161	0.0196
Mean of the dependent variable	0.715	0.714
	Dependent Variable: Suffer Far	
Expected probability of suffering from being far	0.262***	0.301***
	(0.0744)	(0.0883)
Observations	270	206
R-squared	0.0414	0.0508
Mean of the dependent variable	0.286	0.303

Notes: The first column restricts the sample to all individuals who have finished the bachelor's degree in the follow-up sample. The second column is restricted to individuals who are not studying in the follow-up sample. Each cell in the table presents estimates from an OLS regression of the dependent variable on the 2020 expectation and a constant. Standard errors are reported in parentheses. *, **, *** Significant at the 10%, 5% and 1% level respectively.

Table III. Linear Probability Model of Expected Percent Chance of Migrating at Baseline and Actual Migration Choice in Follow-Up Survey

	Current choice: Migrant	
	All	Currently not studying
Expected percent chance of migrating	0.00475***	0.00580***
	(0.000975)	(0.00113)
Observations	270	206
R-squared	0.0726	0.0996
Mean of the dependent variable	0.333	0.364

Notes: The first column restricts the sample to all individuals who have finished the bachelor's degree in the follow-up sample. The second column is restricted to individuals who are not studying in the follow-up sample.

Expected percent chance of migrating (0-100 scale)

*** Significant at the 1% level.

Table IV. Expected and Realized Returns to Career Outcomes

	Expected Returns				Actual Returns
	Short-term Migration		Long-term Migration		
	3.y.a.	10.y.a.	3.y.a.	10.y.a.	3.y.a.
	(1)	(2)	(3)	(4)	(5)
	Panel A: % gains in expected and realized full-time min., max. and mean earnings				
Average [min - max] [a]	0.29*** - 0.24*** (0.41 - 0.48)	0.13*** - 0.12*** (0.23 - 0.50)	0.32$^{***}_{+++}$ - 0.28$^{***}_{+++}$ (0.42 - 0.40)	0.31$^{***}_{+++}$ - 0.32$^{***}_{+++}$ (0.40 - 0.46)	0.10 - 0.31
Average mean [b]	0.26*** 0.32				0.32
Negative (%) [c]	4.23 - 8.47	7.76 - 8.82	4.59 - 7.23	3.70 - 4.06	
Zero (%) [d]	22.40 - 20.99	40.21 - 42.15	16.23 - 13.23	17.81 - 14.46	
Positive (%) [e]	73.37 - 70.55	52.03 - 49.03	79.19 - 79.54	78.48 - 81.48	
Stayer [f]	0.24*** - 0.19*** (0.32 - 0.56)	0.10*** - 0.09*** (0.23 - 0.22)	0.26*** - 0.19*** (0.30 - 0.27)	0.21*** - 0.22*** (0.27 - 0.34)	
Return Migrants [g]	0.32*** - 0.24*** (0.45 - 0.41)	0.14*** - 0.16*** (0.24 - 0.75)	0.35*** - 0.30*** (0.44 - 0.41)	0.34*** - 0.33*** (0.40 - 0.36)	
LT migrant [h]	0.33*** - 0.31*** (0.47 - 0.43)	0.14*** - 0.11*** (0.24 - 0.23)	0.39*** - 0.40*** (0.53 - 0.51)	0.42*** - 0.47*** (0.53 - 0.68)	

	Panel B: p.p. gains in expected and realized full-time employment				
Average	0.10^{***}	0.01	0.10^{***}	0.05^{***+++}	0.15
	(0.20)	(0.17)	(0.21)	(0.17)	
Negative (%)	18.87	39.51	20.99	27.69	
Zero (%)	21.87	13.58	19.58	13.76	
Positive (%)	59.26	46.91	59.44	58.55	
Stayer	0.07^{***}	-0.01	0.06^{***}	0.02^{**}	
	(0.18)	(0.17)	(0.20)	(0.16)	
Return Migrants	0.11^{***}	0.03^{***}	0.11^{***}	0.06^{***}	
	(0.19)	(0.16)	(0.19)	(0.17)	
LT migrant	0.13^{***}	-0.01	0.15^{***}	0.07^{***}	
	(0.23)	(0.19)	(0.24)	(0.18)	
	Panel C: p.p. gains in expected and realized study-job match				
Average	0.09^{***}	0.02^{***}	0.10^{***+}	0.05^{***+++}	0.02
	(0.21)	(0.14)	(0.21)	(0.19)	
Negative (%)	18.87	20.11	19.75	17.81	
Zero(%)	20.11	43.39	17.46	32.45	
Positive (%)	61.02	36.51	62.79	49.74	
Stayer	0.06^{***}	0.00	0.06^{***}	0.01	
	(0.20)	(0.16)	(0.21)	(0.20)	
Return Migrants	0.09^{***}	0.02^{***}	0.09^{***}	0.05^{***}	
	(0.20)	(0.12)	(0.20)	(0.16)	
LT migrant	0.15^{***}	0.03^{***}	0.17^{***}	0.13^{***}	
	(0.21)	(0.15)	(0.23)	(0.21)	

Sources: Main sample for Columns (1)-(4) (year 2020) and follow-up sample column (5) (year 2024). *Notes:* Standard deviations in parenthesis. ***, **, * Means statistically different from zero at the 1%, 5% and 10% level. $^{+++}$, $^{++}$, $^{+}$ Mean of long-term migration at time t larger than the mean of short-term migration at time t at the 1%, 5% and 10% level. Columns (1)-(4) report individual-level expected returns for each outcome. See Section 5 for definitions of expected returns by outcome. Column (5) reports the difference between the average migrant and stayer in the follow-up sample. See Section 3.F. for definitions of expected and actual outcomes. ^{a} Actual minimum and maximum earnings are earnings at the 10th and 90th percentile of the earnings distribution in the follow-up sample, respectively. ^{b} Average mean expected full-time earnings returns is the estimated mean from the fitted distributions (see Section 3.F.) and average mean actual full-time earnings returns is the difference between the average full-time earnings among actual migrants and actual stayers in the follow-up sample. ^{c}, ^{d}, ^{e} Fraction of respondents in the sample that expect negative, zero and positive expected returns respectively. ^{f}, ^{g} ^{h} Average expected returns among individuals that assign the highest choice probability to no-migration, short-term migration and long-term migration respectively ^{i}.

Table V. Expected and Realized Returns to Noncareer Outcomes

	3 years after			10 years after
	Enjoy social life (1)	Enjoy being close (2)	Suffer being far (3)	Enjoy social life (4)
	Panel A. Expected Returns [a]			
Average [b]	-0.20***	-0.51***	0.48***	-0.16***
	(0.25)	(0.31)	(0.35)	(0.20)
Negative(%) [c]	71.78	92.24	3.88	66.84
Zero(%)	20.46	4.76	7.76	25.40
Positive(%)	7.76	3.00	88.36	7.76
Stayer [d]	-0.26***	-0.59***	0.55***	-0.18***
	(0.26)	(0.27)	(0.34)	(0.23)
Return Migrants	-0.19***	-0.50***	0.49***	-0.16***
	(0.21)	(0.30)	(0.34)	(0.17)
LT migrant	-0.13***	-0.41***	0.35***	-0.11***
	(0.26)	(0.35)	(0.35)	(0.20)
	Panel B. Realized Returns (3 y.a.) [e]			
Average	-0.09	-0.32	0.30	

Sources: Main sample for Panel A (year 2020) and follow-up sample for Panel B (year 2024).

Notes: Standard deviations in parenthesis. *** Means statistically different from zero at the 1% level. [a] Individual-level percentage point difference between the expected outcome at the chosen migration destination relative to birthplace. [b] Average difference across the sample. [c], [d], [e] Fraction of respondents in the sample that expect negative, zero and positive expected returns respectively. [f], [g] [h], Average expected returns among individuals that assign the highest choice probability to no-migration, short-term migration and long-term migration respectively [i] Difference between the reported actual outcomes by migrants relative to stayers 4 years later. See Section 3.F. for outcome definitions.

Table VI. Gelbach Decomposition of Migrant-Stayer Gap in Ex-Ante Returns into a Set of Covariates

	FT Earnings			FT Employment.			Match Qual.			Suffer Far			Enjoy Close			Social Life Qual.		
	Base	Full	Expl.	Base	Full	Expl.	Base	Full	Expl.	Base	Full	Expl.	Base	Full	Expl.	Base	Full	Expl.
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Migrant-Stayer Gap	10,279.62***	1,634.39	84.10	0.28***	0.17	41.53	0.27***	0.14	49.74	-0.69***	-0.51***	26.05	0.58***	0.37**	37.37	0.43***	0.33***	23.52
	(2513.50)	(2286.73)		(0.10)	(0.10)		(0.10)	(0.10)		(0.18)	(0.18)		(0.16)	(0.16)		(0.12)	(0.12)	
Covariates																		
- Age			0.37			-18.68**			-28.30			28.44			9.06			18.32
- Gender			2.54			-6.52			-0.57			19.28			11.20			0.38
- SES			0.55			-29.76			-10.79			-22.09*			20.80			-5.00
- GPA			4.27			-7.73			-2.31			19.72			17.76			23.08
- Study Field			9.69*			-6.42			-0.82			7.69			-1.66			-3.99
- Networks			-0.95			43.70**			32.86**			36.81**			42.47**			39.49*
- Destination			68.58***			101.83***			89.88***			-95.30***			-67.00***			2.69
- Studies Out			14.95*			23.58			20.04			105.44***			67.38***			25.02

Notes: The dependent variables are the ex-ante returns over the life cycle for each given outcome, measured as the difference in the expected stream of outcomes between short-term migration and no-migration, and between long-term migration and no-migration. Section C.2. in the Appendix details the assumptions about the evolution of outcomes over time under each migration alternative. Since each respondent has two observations, standard errors are clustered at the individual level. All regressions control for a short-term migration dummy. *Base:* OLS regression including a dummy for whether the individual expects to be a migrant (i.e., reports a higher choice probability for migration—short-term plus long-term—than for no-migration). *Full:* Includes the base controls plus the additional listed covariates. *Explained:* Results from the Gelbach decomposition. The Migrant-Stayer Gap in this column is the ratio of the estimate in the full specification to that in the base specification, multiplied by 100. The remaining rows show the contribution of each covariate, expressed as a percentage, to the explained portion of the Migrant-Stayer Gap. These contributions sum to 100%. Covariate definitions: Age at completion of bachelor's degree: (<25, 25–29, >25). SES: High SES (at least one parent attended university) vs. Low SES. GPA: Standardized at the school level. Study Field: Bachelor's degree in Social Sciences, Engineering, or Natural Sciences. Networks: Constructed as the individual-level difference in respondents' perceived likelihood of having a job-search network at chosen migration destination vs. in their region of birth 3 years after completing their bachelor's degree. Destination: Internal versus international migration destination. Studies Out: Dummy variable (1 = plans to pursue further studies outside Andalusia, 0 = otherwise, including not pursuing further studies).

Table VII. Estimates of Model Parameters

	(1) LAD	(2) LAD	(3) OLS	(4) OLS
ϕ_1: Minimum unconditional earnings	0.124***		0.132***	
	(0.0247)		(0.0268)	
ϕ_1: Maximum unconditional earnings		0.0697***		0.0590***
		(0.0150)		(0.0124)
ϕ_2: Prob. of good study-job match	0.204***	0.204***	0.311***	0.322***
	(0.0783)	(0.0765)	(0.0901)	(0.0889)
ϕ_3: Prob. of ejoying social life	0.352***	0.348***	0.386***	0.371***
	(0.0636)	(0.0634)	(0.0890)	(0.0890)
ϕ_4: Prob. of enjoying being close	0.135***	0.130***	0.157***	0.160***
	(0.0436)	(0.0459)	(0.0570)	(0.0565)
γ_{ST}	0.371***	0.401***	0.347***	0.336***
	(0.114)	(0.138)	(0.0937)	(0.0930)
Constant	0.0421	0.0442	0.132	0.220
	(0.214)	(0.238)	(0.198)	(0.193)
N	1134	1134	1134	1134
adj. R^2			0.157	0.159
pseudo R^2	0.081	0.081		

Notes: Parenthesis in OLS columns report robust standard errors clustered at the individual level. Parenthesis in LAD columns report bootstrapped standard errors with 1000 replications clustered at the individual level. Minimum and maximum earnings are earnings conditional on employment status averaged by employment status probabilities.

Table VIII. Willingness-to-Pay to Increase Given Attribute by Δ

	Δ	
	From m_3 to m_1 [a]	1 s.d. [b]
	(1)	(2)
	A. *Enjoy social life*	
WTP (€, year)	5,909.59***	5,614.36***
	(1,646.05)	(1,563.82)
WTP (as % of avg. annual earnings [c])	36%	34%
	B. *Enjoy being close*	
WTP (€, year)	6,249.21***	2,492.22***
	(2,336.79)	(931.93)
WTP (as % of avg. annual earnings)	38%	15%

Note: WTP estimates are based on estimates reported in column (1) of Table VII. Standard errors are in parentheses and calculated using the delta method. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. [a] The difference in the present discounted value of the expected outcome between the no-migration and long-term migration alternatives across the sample. [b] A one standard deviation increase in the discounted present value of the expected outcome. The expected outcome is computed at the individual-level (as a weighted average across alternatives using individual choice probabilities), then averaged across individuals. One standard deviation corresponds to a 0.20 percentage point increase in social life quality and a 0.23 percentage point increase in proximity to loved ones. [c] Average annual earnings refer to the minimum annual earnings computed at the individual level (computed as a weighted average across alternatives using individual choice probabilities) and averaged across respondents, which equals 16,541€. Annual values are discounted present values over the entire migration paths divided by the number of years in the path.

Table IX. Choices and Utility Changes under Different Expected Career and Noncareer Returns

	Baseline	Homogeneous Career Outcomes	Homogeneous Noncareer Outcomes
	(1)	(2)	(3)
	Panel A. Mean Probability (%) of Choosing Each Migration Alternative		
No-migration (NM)	36.11	45.08	21.34
Short-term migration (ST)	39.23	35.96	42.93
Long-term migration (LT)	24.67	18.95	35.73
	Panel B. Utility Changes (%)		
Proportion with utility loss [a]		57.85	5.64
Proportion with utility gain [b]		6.53	91.36
Utility change [c]		-5.15	10.33
	Panel C. Switches of Chosen Alternative (%)		
Total proportion switch [d]		35.98	44.80
Proportion switch			
- ST among NM at base [e]		8.37	76.74
- LT among NM at base [f]		0.00	20.47
- NM among ST at base [g]		48.28	0.00
- LT among ST at base [h]		0.00	13.17
- NM among LT at base [i]		30.30	0.00
- ST among LT at base [j]		66.67	9.09

Notes: Column (2) assumes that expected career outcomes in the utility function (see eq. 4) are the same across all alternatives and equal to those under no-migration. Column (3) makes the same assumption for expected non-career outcomes. Panel A presents the model-based predicted probabilities of choosing each migration alternative, averaged across respondents. Statistics in Panels B and C are computed by assigning each respondent to the migration alternative that yields the highest subjective expected utility. [a] and [b] indicate the proportion of respondents who experience a utility loss or gain, respectively, under each counterfactual relative to the baseline. [c] represents the average individual-level percentage change in utility between the counterfactual and baseline. Panel C reports the proportion of respondents who change their preferred migration alternative under each counterfactual. [d] is the fraction of respondents whose chosen alternative differs between the baseline and counterfactual, relative to the total sample. [e] is the fraction of respondents who switch from no-migration at baseline to short-term migration under the counterfactual, relative to the total number choosing no-migration at baseline. [f] is the fraction of respondents who switch from no-migration at baseline to long-term migration under the counterfactual, relative to the total number choosing no-migration at baseline. [g], [h], [i], and [j] follow the same logic for other migration transitions.

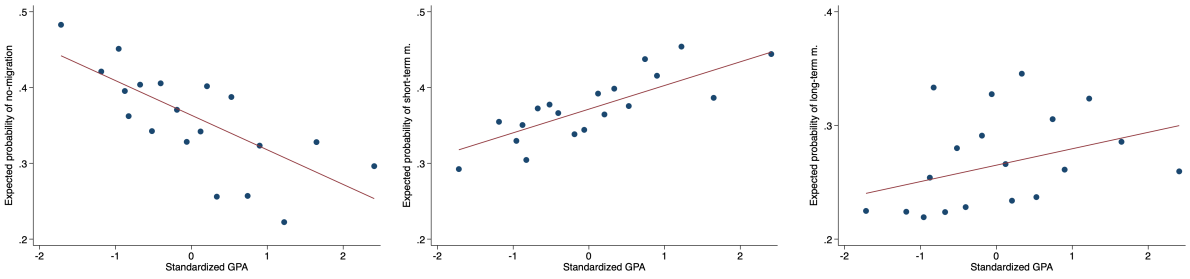
Table X. Proportion Switching From Short-Term Migration to Either No-Migration or Long-Term Migration When Each Channel Is Removed

	Temporarily higher career outcomes at destination	Faster accumulation of valuable skills at destination	Birthplace premium
	(1)	(2)	(3)
	Panel A. Total Proportion Switching		
-Fraction (%)	54	19	46
-Average Ability (s.d.)	0.07	0.24	0.04
	Panel B. Proportion Switching to NM and LT		
-No-migration, NM (%)	56	63	79
-Long-Term m, LT (%)	44	37	21
	Panel C. Average Ability Gap between Switchers to LT and NM		
-S.D. (LT-NM)	0.26	0.31	0.15

Notes: Notes: See Section 7.B. for definitions of channels. Panel A reports the fraction of individuals who initially prefer short-term migration but switch when each channel is removed, relative to the total number of individuals who preferred short-term migration at baseline. The standardized average ability refers to the mean ability of switchers. Panel B shows the fraction of switchers moving to no-migration versus long-term migration, relative to the total number of switchers. Panel C reports the ability gap between those switching to long-term migration and no-migration. The chosen alternatives are the options with the highest subjective expected utilities.

11 FIGURES

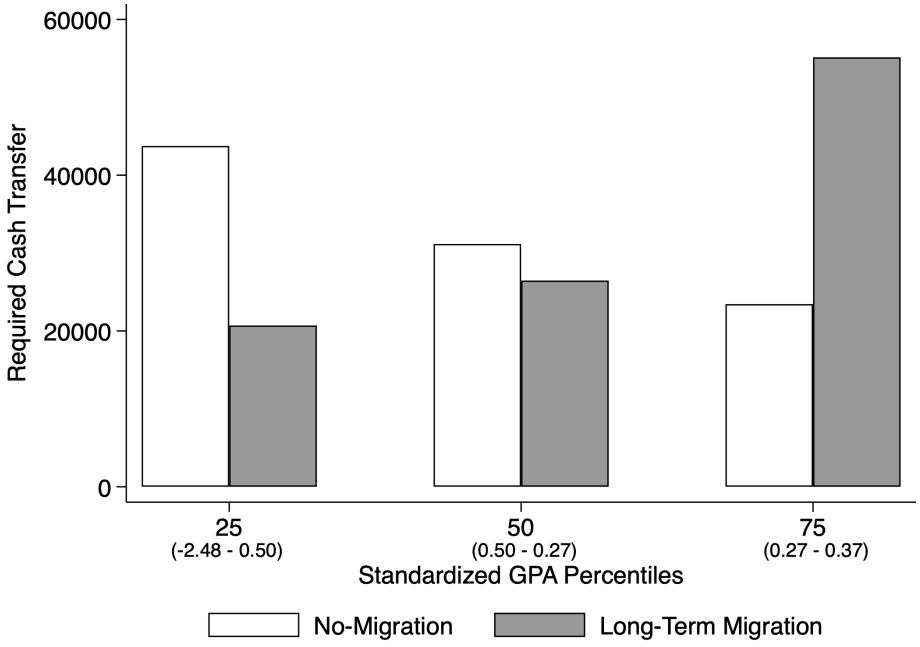
Figure I. Individual-Level Relationship Between GPA and Expected Probability of No-Migration, Short-Term Migration, and Long-Term Migration



(a) No-Migration (b) Short-Term (c) Long-Term

Notes: Each graph shows binned scatter plots with the correlation between the subjective expected choice probability reported by each individual in the sample and the individuals' reported GPA in the bachelor's degree, standardized at the school level.

Figure II. Cash Transfer Required at t_0 to Make the Average Individual in Each Ability Quartile Indifferent Between Short-Term Migration and the Preferred Alternative at Baseline (No-Migration or Long-Term Migration)



Notes: The graph shows the cash transfer required to make the average individual in each ability quartile indifferent between short-term migration and their preferred alternative at baseline. Ability quartiles are based on standardized GPA within the full sample. Parentheses indicate the standardized GPA range for each quartile. White bars represent individuals who prefer no-migration at baseline, while gray bars represent those who prefer long-term migration. The preferred alternative is the option with the highest subjective expected utility at baseline.

A APPENDIX TABLES

Table A1. Migration Decision-Making Framework

	Bachelor's degree students	Everyone, currently stayer	Everyone, currently migrant
Fraction of people choosing (%)			
- Same destination in ST and LT m.[a]	59	61	65
- Only one destination in ST m.[b]	62	57	39
- Only one destination in LT m.[c]	55	50	38
Certainty of destination (%)			
- Internal vs International m.[d]	80	81	80
- Specific location[e]	58	55	63
Observations	29	206	93

Source: Follow-up survey sample.

Notes: Think about your career path within the next 10 years and think about your short-term and long-term migration plans: [a] "Would you choose the same specific migration destination if you were to migrate short-term and long-term?" [b] If you were to migrate short-term, would you migrate to only one specific migration destination before returning to birthplace? [c] If you were to migrate long-term, would you migrate to only one migration destination within the 10 years following graduation? [d] "If you were to migrate, tell us the probability of choosing an internal versus an international migration." Certainty of internal vs international destination is the highest of the two reported probabilities by each respondent averaged across respondents. [e] If respondents gave a positive probability to internal (international) migration, they were asked about up to two provinces (NUTS3 level) (countries) and their probabilities. Certainty of specific location is the maximum of up to four products of internal (international) probabilities and specific province (country) probabilities per individual, averaged across respondents. The table's results can be summarized as follows: (i) the majority of respondents would choose the same destinations under short-term and long-term migration, (ii) at the time of decision-making, when they are living in their region of birth, the majority of respondents do not anticipate onward migration (moving from one migration destination to another), (iii) respondents are pretty certain regarding whether they would be internal or international migrants, (iv) respondents have a clear specific candidate location where they would move to (whether Spanish province at NUTS3 level or country).

Table A2. Categorization of Degrees

Degrees in the Department of Business and Economics (Social Sciences)
Double Degree in Business Administration and Management and Law
Double Degree in Business Administration and Management and Building
Double Degree in Law and Economics
Degree in Business Administration and Management
Degree in Economics
Degreen in Tourism
Degree in Marketing and Market Research
Degree in Finance and Accounting
Degrees in the Department of Engineering
Degree in Aerospace Engineering
Degree in Civil Engineering
Degree in Electronic, Robotics and Mechatronics Engineering
Degree in Industrial Organization Engineering
Degree in Energy Engineering
Degree in Industrial Technologies Engineering
Degree in Telecommunication Technologies Engineering
Degrees in the Department of Natural Sciences
Double Degree in Computer Engineering and Mathematics
Degree in Industrial Electronic Engineering
Degree in Chemical Engineering
Degree in Biology
Degree in Biochemistry
Degree in Biotechnology
Degree in Statistics
Degree in Physics
Degree in Geology
Degree in Mathematics
Degree in Chemistry
Degree in Optics and Optometry

Table A3. Illustration of Belief Elicitation for Career Outcomes

	Short-term $t = 3$	Long-term $t = 10$
No-migration ($m = 1$)**:** Region of birth - Region of birth	—	—
Short-term m. ($m = 2$)**:** [Migration destination] - Region of birth	—	—
Long-term m. ($m = 3$)**:** [Migration destination] - [Migration destination]	—	—

Notes: This representation allows respondents to easily compare expected outcomes across alternatives at a given point in time taking complete location sequences into account.

Table A4. Determinants of Life-Cycle Ex-Ante Returns

	(1) FT Earnings	(2) FT Employment	(3) Match	(4) Suffer Far	(5) Enjoy Close	(6) Enjoy S. Life
Age:25-29	1233.2	0.275**	0.208*	0.613***	-0.185	-0.278***
	(2630.8)	(0.110)	(0.118)	(0.194)	(0.176)	(0.107)
Age:≥ 25	-8266.6	0.585**	0.0381	0.366	-0.513*	-0.0322
	(5066.5)	(0.236)	(0.262)	(0.569)	(0.275)	(0.346)
Male	3984.0**	-0.00736	-0.128*	-0.642***	0.452***	0.0222
	(1841.3)	(0.0729)	(0.0730)	(0.125)	(0.115)	(0.0746)
High SES	367.3	-0.0759	-0.190**	0.198	0.281**	-0.00978
	(1871.8)	(0.0748)	(0.0788)	(0.129)	(0.120)	(0.0795)
Std. GPA	1578.9*	-0.00972	-0.0338	-0.161***	0.171***	0.106***
	(863.0)	(0.0343)	(0.0347)	(0.0598)	(0.0561)	(0.0354)
Engineering	5516.3**	0.0209	-0.0359	-0.158	0.0151	0.0332
	(2143.8)	(0.0759)	(0.0839)	(0.152)	(0.128)	(0.0864)
Natural Science	-4261.2	0.214	-0.117	-0.0677	-0.110	0.361***
	(4277.4)	(0.145)	(0.138)	(0.196)	(0.188)	(0.123)
Δ Networks	-689.4	0.495***	0.569***	-0.771***	1.038***	0.471***
	(3097.2)	(0.115)	(0.130)	(0.188)	(0.177)	(0.129)
Migration dest.	yes	yes	yes	yes	yes	yes
Further study dest.	yes	yes	yes	yes	yes	yes
Observations	854	854	854	854	854	854
R-squared	0.219	0.0981	0.100	0.205	0.238	0.0954
Mean of the dep. var.	25648.3	0.413	0.470	2.551	-2.665	-0.959

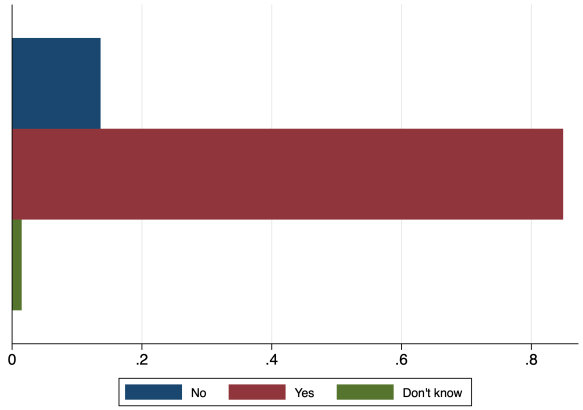
Notes: Each column presents results from an OLS regression on a given dependent variable. The dependent is the ex-ante returns over the life-cycle for each given outcome. That is, the difference in the expected stream of outcomes over the life-cycle between short-term migration and no-migration and between long-term migration and no-migration (Section C.2. in the Appendix details the assumptions about the evolution of outcomes over time under each migration alternative). All regressions include a short-term migration dummy. Since we have two observations per respondent, standard errors are clustered at the individual level. The base categories are: age < 25, female, low SES, Social Sciences. High SES is defined as having at least on parent who attended university. Age refers to age at completion of bachelor's degree. Migration destination is a dummy that takes value equal to 1 for internal and 0 for international and further study destination is a dummy that takes value equal to 1 for their region of birth (Andalusia) and 0 otherwise. ΔNetworks is constructed by subtracting respondents' perceived likelihood of having a network that will help them find a job in their region of birth from their perceived likelihood of having such a network at their chosen migration destination 3 years after finishing the bachelor's degree.

B APPENDIX FIGURES

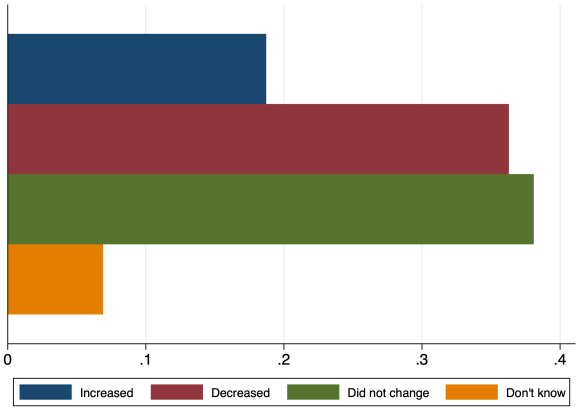
Figure B1. Location of Universities in the Sample

Notes: The university marked in red is the University of Seville (US) and the one marked in blue is the University of Granada (UGR). The UGR is located in Granada -the capital city of the province of Granada- and the US in Seville -both the capital city of the province of Seville and of Andalusia-. The blue line marks the borders of the region of Andalusia.

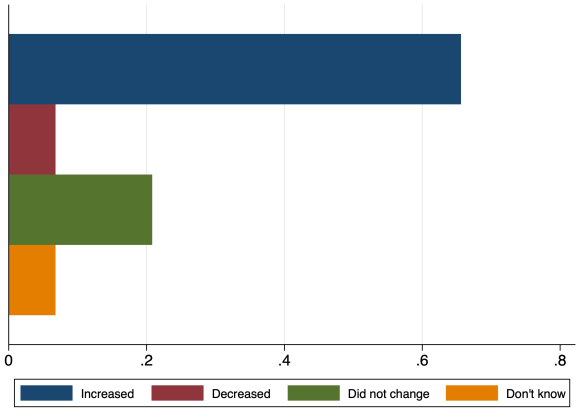
Figure B2. Expected Effect of Covid-19 on the Aggregate Economy and on their Migration Plans



(a) The Andalusian Economy



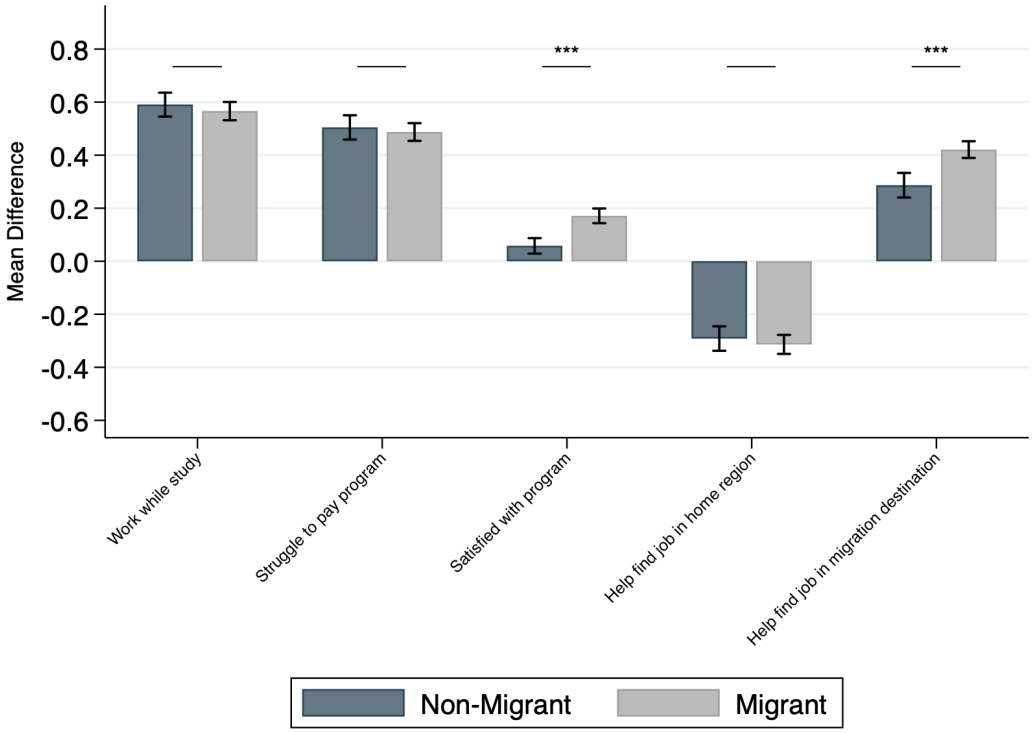
(b) Stay in Andalusia vs Migrate



(c) Migrate Internally vs Internationally

Notes: B2a: "Do you think Andalusia will be one of the Spanish regions most affected by the economic recession induced by Covid-19?". B2b: "How has the probability of you working in Andalusia, rather than in another Spanish region or another country, changed?". This question was asked to all respondents (N = 609). B2c: "How has the probability of you working in another country, rather than in another region of Spain, changed or how do you think it will change in the future?". This question was asked to individuals who, in question B2b, reported that their probability of working in Andalusia had decreased (N = 221).

Figure B3. Individual-Level Expected Differences in Outcomes Between Studying Outside and Within the Region of Birth, by Migrant Type



Notes: Individual-level mean differences for each outcome are calculated by subtracting each respondent's expected likelihood of the outcome if they were to pursue further studies at their chosen migration destination from the likelihood if they were to pursue such studies in their region of birth. An expected migrant is defined as a respondent who assigns a higher likelihood to migrating (short-term or long-term) than to staying. The sample is restricted to respondents planning to pursue further studies after completing their bachelor's degree.
*** Mean differences between expected migrants and non-migrants statistically different from zero at the 1% level.

C EMPIRICAL APPENDIX

C.1. Fitting Elicited Earnings Distributions: Sequence of Showed Thresholds

Based on the minimum and maximum wages reported by each individual, I elicited individual-level wage distributions for $m = 1$ and $m = 2$ at $t = 3$. Then, each student was shown 5 adjacent earnings intervals characterized with 4 thresholds. The thresholds that individuals were shown were determined as follows: First, using a question branching algorithm in the survey, each individual was assigned 1 out of 10 possible branches. The branch that each individual was assigned to depended on the midpoint of their reported range. In particular, this midpoint could fall into one of the following 10 intervals: (1) ≤ 1400€; (2) (1400,1600]; ... ; (9) (2800,3000]; (10) > 3000€. Each interval corre-

sponded to a branch which had 4 predetermined thresholds. For example, assume that a student reported to expect to earn a minimum of 900€ and a maximum of 1500€ if working full-time in her region of birth. The midpoint of this range belongs to interval (1). Then, this student was asked about the percent chance that her wage would fall in each of the following 5 intervals: (1) ≤ 1000€; (2) (1000€,1200€]; (3) (1200€ ,1400€]; (4) (1400€ ,1600€]; (5) > 1600€. Students reported the percent chance of each interval using a sliding bar, which was set at zero. Using sliding bars has been suggested as a method to avoid bunching (Alesina et al., 2023). Instead of eliciting the information in the form of a cumulative distribution (cdf), as in Dominitz and Manski (1997), I used a probability density (pdf). Experimental evidence suggests that individuals find assessing the probabilities that the outcome lies in each interval less demanding than assessing the probabilities that the outcome does not exceed the sequence of thresholds (Bover, 2015).

C.2. Parametric Assumptions Regarding the Evolution of Outcomes over Time Under Each Migration Alternative

For each individual, the survey elicited beliefs about career outcomes by migration alternative at two future points in time: 3 and 10 years after finishing the bachelor's degree. Using these two points per individual i and migration alternative m, I assume that outcomes have a linear growth throughout the migration alternative. This resembles the growth in career related outcomes typically observed over the very beginning of individuals' labor market trajectory, which is the period in which our migration alternatives are defined. On average, students are 26 at $t = 3$, and are 33 at the end of the alternative, at $T = 10$. Specifically, we approximate each alternative as follows.

By definition of the alternatives, in the no-migration alternative respondents are living in Andalusia in every period $t \in [3, 10]$, and the long-term migration alternative respondents are living in their chosen migration destination in every period $t \in [3, 10]$. For these two alternatives, I assume that these outcomes grow linearly throughout the alternative, from t_{i0} to T, and denote the growth rates as g_{i,x,m_1} and g_{i,x,m_3}, where the subscripts i and x denote that growth rates are individual and outcome specific, and m_1 and m_3 refer to the no-migration and long-term migration alternatives respectively.

$$\begin{aligned} g_{i,x,m_1} &= \frac{Pr(x|i, m = 1, t = 3) - Pr(x|i, m = 1, t = 10)}{10 - 3} \\ g_{i,x,m_3} &= \frac{Pr(x|i, m = 3, t = 3) - Pr(x|i, m = 3, t = 10)}{10 - 3} \end{aligned} \tag{1}$$

where x is equal to minimum and maximum earnings if working full-time, study-job match, working full-time and working part-time. Then, the probability of outcome x in

period t in migration alternatives m_1 and m_3 for student i are defined as:

$$\begin{aligned} Pr(x|i, m = 1, t) &= Pr(x|i, m = 1, t = 3) + g_{i,x,m_1} * (t - 3), \quad \text{for} \quad t \in [t_{i0}, 10] \\ Pr(x|i, m = 3, t) &= Pr(x|i, m = 3, t = 3) + g_{i,x,m_3} * (t - 3), \quad \text{for} \quad t \in [t_{i0}, 10] \end{aligned} \tag{2}$$

where the value of t_{i0} depends on the expected maximum level of education of student i, with t_{i0} being equal to 0,1, 2 and 3 for students whose maximum expected level of education is a bachelor's degree, other type of studies, a master's degree and a PhD respectively.

Given that the 2020 survey did not ask students about the period in which they would return back to their region of birth to work conditional on choosing the short-term migration trajectory, I assume that all students return back at period $t = 7$, which corresponds to living at the chosen destination for 4 years. This is in line with migration patterns described in Section 3.A. using administrative data. Thus, in the short-term migration alternative, $m = 2$, students are assumed to be living at their chosen destination $\forall t, t < 7$, and back at their region of birth at $\forall t, t \geq 7$. For this alternative, I assume that students believe each outcome's growth rate is location specific (g_{i,x,m_3} while living at the chosen migration destination and g_{i,x,m_1} while living in the region of birth). The probability of outcome x in period t for student i in the short-term migration alternative, $m = 2$, is defined as:

$$Pr(x|i, m = 2, t) = \begin{cases} Pr(x|i, m = 2, t = 3) + g_{i,x,m_3} * (t - 3), & \text{for} \quad t_{i0} \leq t \leq 6 \\ Pr(x|i, m = 2, t = 10) + g_{i,x,m_1} * (t - 10), & \text{for} \quad 7 < t \leq 10 \end{cases} \tag{3}$$

where the value of t_{i0} is defined as above.

For each individual, the survey elicited beliefs about non-career outcomes by location at two future points in time: 3 and 10 years after completing their bachelor's degree. I assume that while individuals are at their migration destination, expected outcomes are the same for both short-term and long-term migration. Similarly, while in their region of birth, expected outcomes are the same for short-term and no-migration alternatives. Additionally, I assume that growth rates are location-specific. To estimate values under the no-migration alternative, we compute the linear growth rate of outcomes between $t = 3$ and $t = 10$ in the region of birth. For the long-term migration alternative, we compute the linear growth rate over the same period at the chosen migration destination. Once these two growth paths are constructed, outcomes under short-term migration align with those of the migration alternative that shares the same destination. Finally, respondents

were asked about the probability of enjoying proximity to family, a partner, and friends at $t = 3$ only. We assume that this probability remains constant over time within each location.