Subjective expectations and individual decisions of future graduate students

Andrea Catalina Blanco Moreno

A thesis submitted for the degree of Doctor of Philosophy in Economics

Institute for Social and Economic Research

University of Essex

June, 2018

A Papá y a María del Pilar: el reino de los Inmortales.
A Mamá, Ximena y Andrés: la vida misma.

Contents

List of tables

List of Figures

Declarations

No part of this thesis has been submitted for another degree.

Chapter 1 is a joint work between my supervisor Professor Adeline Delavande at The University of Essex and Professor Basit Zafar at The University of Arizona.

The other Chapters in this thesis are exclusively mine.

Acknowledgements

I would like to thank the precious academic, professional and personal guidance of my supervisors Professor Adeline Delavande and Dr Renee Luthra. In the four years working with you I not only acquired many tools to understand my research questions, in fields of research that I feel passionate about such as subjective expectations and decision theory, but also in my daily life you provided leading examples of academic brilliance, kindness, empathy and strength. You may not have noticed, but both of you have leave an important imprint in the woman, economist and academic that I would like to become. During my third year of the PhD, Dr Birgitta Rabe kindly agreed to supervise me while Professor Delavande was on her maternity leave. I am also very grateful to her for supporting me during the very first transformation of my fieldwork from paper work into research papers, and thank her for her patience and guidance.

This thesis would not have been possible without the generous funding of the "Departamento Administrativo de Ciencia Tecnología e Innovación de Ciencia, Tecnología e Innovación COLCIENCIAS", the administrative department of Science Technology and Innovation within the Colombian Government, who granted me the Francisco Jose de Caldas Scholarship.

Being at ISER has been such a privilege. It has been a wonderful place to work and learn. I would like to thank the past and present occupiers of 5N.A.07 for providing the value of authenticity. I would especially like to mention Yamil, Federico, Claudia, Ipek, Franco Victor and Caroline for their love of coffee and for their friendship that is so like those South American friendships that come from the gut and nothing less. Special thanks to Claudia for her smile and friendship and for being the best "godinez officemate", and to Federico for being the conscience of the office.

I would like to express my gratitude to my mom to whom I owe two of the most precious gifts that I have: my life and my sister. Thanks for being a leading example as a mother and as an entrepreneur, and for daring to study engineering in a time when "women should stay at home". Thank you for your unbreakable will and smile. Thank you for raising me in the way you did.

Dad, you are now, as you would prefer to say, an example of the first law of thermodynamics. I would not be here without you, without your example as a father, as a scientist, as a professor.

To my beloved sister Ximena, I express my thanks for just being herself, for her continuous support, for never stopping believing in me, for being my earth pole. I've never known anyone stronger than you, yet so tender and caring.

To Andres: thanks for being you, thanks for bringing out the best version of me. Thanks for dreaming with me and being by my side when needed. Thank you for joining me in this adventure. Thank you for being the love of my life. Thanks for all the laughs, for making me smile every time I come home. I am grateful for the family we are.

I am grateful for all the strong women in my life, starting with my mom, my aunts, my cousins, and my friends. Thanks to all my family, all so different and yet determining and shaping the woman that I am.

During these years I have witnessed so many acts of selfless generosity and many of these came from our friend Andrea del Pilar: she is the glue of our lovely Colchester family. Paloma, Tati, Claire, Yadi, Carlos and Niky, Tati Gelves David and Esme: thank you all for being our family here.

I am grateful to all my friends in Colombia, but in this particular journey I would like to thank Dr Juan Tomas Sayago, Dr Ana Maria Blanco and our next doctor, Dr Jennifer Taborda. Thank you for being the support that I need when I need it. You always encouraged me to pursue this dream that we have talked about since we were undergraduates in our beloved Alma Mater. I keep you in my heart always. Also, thanks go to Jose Manuel Salinas who taught me that life is like Boxing.

Special thanks go to Professor Sergio Monsalve from my Alma Mater Universidad Nacional de Colombia. He taught me that intuition and common sense are two of the most powerful tools for an economist, and he has encouraged me to keep trying, keep researching, and keep learning.

Maria you are now cosmic dust and you Luis H are an example of the first law of thermodynamics. I am grateful and honoured to have had you both in my life. According to your current dimensions, I like to think that you are present in the pink clouds, in the beautiful sunsets that I see from my ISER window, and in the gusts of wind every time I think of you. I love you.

Last but not least I thank God for all the blessings**.**

Summary

The gains derived from human capital can be affected by life –changing decisions. In my thesis I explore three of these decisions: the decision to migrate abroad (Chapter 1), the decision to migrate inside your own country (Chapter 2) and the decision to become an entrepreneur (Chapter 3). The three decisions involve a great deal of uncertainty that individuals express through expectations. I study these decisions by analyzing subjective expectations of future college graduate students. In chapter one I use the survey and data collection of Delavande and Zafar and for the second and third chapter I designed one survey and did the data collection in Bogotá, Colombia. Beyond the study of the determinants of individual migration and entrepreneurial expectations as strategies to allocate human capital, I contribute to the literature on subjective expectations.

Chapter 1 investigates the role of subjective expectations and beliefs in the decision of migration of Pakistani college students to USA, Saudi Arabia and China. Findings suggest that students from different socioeconomic backgrounds and exposure to Western ideas react differently to the same potential migration destinations, not only in their preference for earnings but also in their individual preference for risks and amenities. Chapter 2 investigates what should be the incentives that a government must provide to promote the migration of future graduates from a developed urban centre to less developed ones in Colombia, as a strategy for regional development. The expected earnings, expectations about provision of schools, access to health and roads are the most important determinants to promote this specific type of migration in Colombia. Chapter 3 examines the role of earning expectations and personal characteristics on the subjective probability of becoming an entrepreneur of future graduates from Bogotá, Colombia. The expected earnings as an entrepreneur together with the preference for independence and having a previous entrepreneurial experience in the family affects positively the subjective probability of becoming an entrepreneur. These results are similar to other studies giving evidence that it is feasible to use subjective expectations as a measure of entrepreneurial intentions.

Introduction

Human capital is one of the main drivers of development. Consequently, attraction, retention and allocation of human capital together with the creation of quality and sustainable jobs are important concerns for developing countries. Migration and Entrepreneurship are two forms to allocate human capital and create quality jobs.

One special source of human capital in developing countries are the college graduates, since they are a small proportion of the total population and tend to concentrate in the developed urban areas. Human capital strongly improves and fosters development through entrepreneurial education and externalities. Moreover, Human capital of workers (that could be migrants) enters as input in the production function, while entrepreneur´s human capital influences firm´s wide productivity, affecting not only the entrepreneur but the whole economic sector (Lucas 1978, Gennaioli 2013).

Accordingly, this thesis studies two types of determinants of migration expectations, the expectations to migrate abroad and to migrate inside your own country (Chapters 1 and 2), and the determinants of the expectations about becoming an entrepreneur (Chapter 3), of college graduates of Pakistan and Colombia. I focus on this particular population by surveying and analyzing subjective expectations in both countries. I want to study how expectations could help to understand potential decisions of migration and entrepreneurship?

I want to investigate what are the determinants that influence the expectations about these three events. The first chapter is based on the survey and data collection of Delavande and Zafar in 2010. for the second and third chapter I design my own survey and did the

data collection in Bogotá Colombia in 2015. I use separate sections of the same survey for each chapter.

In 2015 were estimated 244 million international migrants, it is the 3.3 % of the world population, while 740 million people have migrated within their own country of birth. There are several motivations for migration, while the vast majority migrate for work, family or study, other part are forced to migrate for reasons such as natural disasters, (Mbaye 2017, Laczko 2009); civil, armed, ethnic conflicts or persecution (Ibañez and Velez 2008, Naudé 2010), Yet the proportion of forced displaced migrants out of the total is a relatively small (IOM 2018, Mbaye 2017).

In the first and second chapters I deal with a potential individual decision of migration due to economic reasons. It is individuals who evaluate the expected earnings, amenities and personal cost of remaining home versus going abroad (Chapter 1) and of moving inside their own country (Chapter 2). In the assessment of the decision individuals include their individual characteristics, skills and preferences such as religiosity, education, language and amenities. In most of the cases, with the exception of forced migration and necessity entrepreneurship, migrants and entrepreneurs are self-selected, it is both are rational individuals that make optimizing decisions about which markets they will enter: job, location, education etc. The individuals compare their earnings at the home country (city) and the destination, like in the first and second chapter, or compare a paid employment versus a self employment option like in the third chapter. Roy (1951) and Borjas (1987) work into the concept of self-selection and occupation. The Roy model discusses optimizing choices between two occupations, and in the extension by Borjas (1987) the choice is made between two countries (cities) as the decision I present in the three chapters. The choice of occupation or destination is affected by (i) the distribution

of earnings and skills, (ii) the correlation among the two skills, (iii) the technologies for applying these skills, (iv) consumer tastes that impact the demand for different types of outputs. The main conclusions are (i) that if there is a positive association between the performances in both activities (locations) it will not be possible to have the best performers at both activities, (ii) If the skills required in different jobs are rewarded in the same way, individuals will move to a different occupation or country (Autor, 2003). Empirical applications of a Roy economy of two occupations show that the self selection of the individuals into different occupations lead to reduce inequality in earnings if compared with individuals that are randomly assigned into other jobs (Heckman and Honore, 1990). Studying the expectations about three decisions that allocate human capital gives light of some strategies of skill distribution and to how to reduce income inequality.

In the first chapter we study *what are the main determinants of migration expectations of Pakistani college students to the USA, China and Saudi Arabia?* Pakistan is the third country in south Asia and the sixth in the world for human capital mobility (World Bank, 2016). In 2010 Pakistan was one of the top 20 counties in the stock of tertiary educated migrants (Migration and Remmitances Factbook 2016). The effects of the mobility of high skilled have been perceived as brain gain, because of the remmitances, since educated migrants remit more (Farooq and Ahmad 2017, Bollard et al 2011) Moreover Beine et al. (2008) find that Pakistan experiences a human capital formation through the migration of the highly skilled, since returns to education are higher abroad, the prospect of migration could raise the expected return of human capital inducing people to invest in education at home. The variety of Pakistani migration work force makes imperative to explore all opportunities abroad (ILO 2016), thus understanding the role of expectations

and individual preferences in the individual decision of migration will help to design better incentives and policies.

Using a unique dataset we investigate the determinants of migration expectations of Pakistani university students to the USA, China and Saudi Arabia using hypothetical migration scenarios. The survey was designed by Delavande and Zafar, the data collection was made in Islamabad/ Rawalpindi metropolitan area and Lahore during May and October of 2010. The survey was handed out in large classrooms of 50-100 students and last on average 90 minutes. The focus on these two cities is for practical reasons of the data collection. The sample size for this chapter was 2232 male students and the response rate in the sections relevant for this chapter exceed 94%. Delavande and Zafar use data drawing from this survey (2014, 2015)

Saudi Arabia is the first destination choice of Pakistani emigrants and USA is the third (OECD, 2015). Saudi Arabia is similar in culture to Pakistan, while China with a very different language and culture is a new potential migration destination not only by the geographical proximity but also as a growing economy that provide cheaper school costs than the USA. We elicit probabilistic expectations of migration conditional on being offered a job with a given wage. We found that students' expected earnings differential is a strong predictor of migration expectations and students also value the same earnings differently according to the destination. Individuals from different socioeconomic backgrounds have different reactions to different countries. We use the opinion of the destination country as a measure of the preference for amenities. We found that having a positive opinion of the destination country increases the subjective probability of moving, yet the effect of the opinions vary across destinations.

In the second and third chapter I try to find possible incentives to mitigate two major development neck bottles in Colombia. First one is how to allocate human capital in regions that need it and the second one is the creation of options of first employment for college graduates as a way to reduce the unequal returns to higher education. Only 22.5% of the college graduates in Colombia find their first job between zero and six months (Colombian Ministry of Education (MEN), 2016) and 20% of the Colombians who obtain a tertiary degree does not find a job (Observatory for the labour market and social security OMMTS 2017). The proposed strategy is motivate the migration of those graduates as a first job option (Chapter 2) but also understand what are the drivers of those who want to create their own business, in order to promote entrepreneurship as an alternative job option (Chapter 3).

The latest data about actual migrants in Colombia comes from the 2005 census. The graduate survey of the Colombian ministry of education asks about earnings and employment one, three and five years after graduation. There is not data on graduates' expectations before obtaining their degree and the data on expectation is collected using Likert scales. Collecting data at this stage when graduates don't have experience at the job market allow to recover true preferences without any bias derived from previous job market experience, although in Colombia is common that students are also full time workers. These reasons motivate my data Collection for the second and third chapter. I design my own survey and did the data collection in Bogotá Colombia during July and August of 2015 using one paper based survey for both chapters. The survey last on average 30 minutes and were handed out in the classroom where each student answer individually. The sample were 747 students from 7 universities and 2 university institutions, it is institutions who offers few number of 4 years programmes if compared

with a university. The selection of the institutions and classes surveyed were due to practical reasons. The sections 2.5.1 and 3.5 expand the reasons behind the selection of universities and majors. The response rate of the unit survey was 99%.

In the second chapter I study "*What should be the incentives that a government could offer to college graduates in Bogotá Colombia in order to motivate migration to less developed regions that despite having importance sources of income lack economic and social development?* For example, La Guajira a Colombian region which main economic activity is coal mining, have had a public income flow as a result of the subsoil exploitation (royalties) of 120 million USD in 2015-2016 by the end of 2016 the region have only used 54% of these moneys (SGR , DNP 2016) yet 62.8% of the region are considered poor (Dane 2015). Regions lack institutional capacity that will help to present better investment projects (Bonet and Orrego 2014, Bird 2012). Evidence of this lack of institutional capacity is the percentage of royalties' resources that has been used. There are two main reasons for these low rates of resource use: first one is an important percentage of the projects presented by the regions have been not approved by the central level, and second is that the resources have not been included in the list of government expenses (Hernandez and Hererra 2016).

Meanwhile, 20% of the Colombians who obtain a university degree does not find a job (Observatory for the labour market and social security 2017 (OMMTS for its acronym in Spanish) and Colombian Ministry of Education, 2015) also the proportion of overeducated workers has increased from 14.9 in 2009 to 20.1 % in 2016. These 20% of graduates could be a relevant source of human capital that support regional institutions and provide better input for the royalties' allocation. Acemoglou and Robinson (2010) have stated the importance of the institutions as drivers of economic development and

growth yet they said (pp.136) “We will also argue that in our state of knowledge does not yet enable us to make specific statements of how institutions can be improved”. Despite the limitations of the sample size and the theoretical restrictions of assuming a very simple model of migration I want to contribute to the understanding of how institutions could be improved through the migration of the highly skilled. In my study, in a hypothetical scenario of a job offer placed in the region of la Guajira if the wage increases by 25% the percent chance of accepting this offer is on average 51%. The results show that the perception of the availability of public goods, together with the expected incomes increases the subjective probability of migration from Bogotá to la Guajira, Arauca and Chocó.

In the third chapter I study *“How the expectations about earnings and personal characteristics affect the subjective probability of becoming an entrepreneur of college graduates in Bogotá Colombia?*

The problems of Colombian new firms are similar to those in the rest of the world, low survival rates, firms do not create enough new jobs, insufficient or barriers to access sources of funding (GEM 2016- 2017). Yet another issue arise and is the lack of data on entrepreneurial expectations at different stages of higher education.

I investigate the determinants of the self-reported probability of becoming an entrepreneur using different modules of the survey of chapter 2. I elicit expectations about different aspects of the entrepreneurial activity, including the self-reported probability of becoming an entrepreneur in different scenarios; the expected earnings and the cost of starting a firm; and the self-reported perception of non-cognitive traits associated with entrepreneurial attitudes. I found that the expected earnings as an

entrepreneur, together with being a student from a less selective university, is associated with an increase of the probability of becoming an entrepreneur; while coming from an affluent background and having a higher Grade Point Average (GPA) decreases this probability. There are some non-cognitive traits that increase this probability such as, the willingness to take risks, the importance given to creativity at work, the desire for independence and having a member of a family that is an entrepreneur, while effort tolerance and firm cost expectations appears not to be significant in the decision. The results that I found using subjective expectations are in line with the results of the literature (Zhang et al. 2015, Kacperczyk 2013, Stephens et al.2006,). These results show that collecting data of subjective expectations about entrepreneurial behaviours is worthwhile to understand how uncertainty affects these behaviours and how the intention of becoming an entrepreneur is formed.

Why Subjective Expectations?

The Gallup Survey on Migration Intentions which is the largest survey on migration intentions worldwide shows the differences between aspirations, intentions and actual migration behaviours. Latest data show that 710 million adults which are 14% of world population will migrate to another country if they have the chance to do so. But, when the question raised is what kind of plans have you made for migration? The number of potential migrants reduces to 66 million and reduces even more when the question asks about actual preparations 23 millions (IOM 2018).

In the entrepreneurial activities in 2016, 53% of the surveyed population of the GEM survey in Colombia declare an intention to create a firm; however of those 53%, only 16% actually create their own firm.

Does it mean that is not valuable to study migration or entrepreneurial expectations? No, it means that studying migration and entrepreneurial expectations do not have as a goal to predict migration or entrepreneurial behaviours but to understand the decision process of both activities. The decision process provides valuable inputs for policy making. For example if a country is experiencing a researchers brain drain, a possible solution is offering better wages but if the expectations are more driven to have better technological and research assets (i.e labs), or a research oriented rather than teach oriented work load that other destinations could offer, the policy will be misguided. One example is given by Gibson and McKenzie (2009) who study the determinants of a return migration of the bright and brightest in Tonga, New Zealand and Papua New Guinea, by using subjective expectations finding that individual preferences for risk and patience matters more than income gains of migration. In another study McKenzie et al. (2013) have documented how potential male migrants from Tonga tend to underestimate their expected wage in the arrival country (New Zealand). A potential source is the flow of information that the potential migrants receives from their familiar network that already migrate which tend to report a lower income to release the pressure to remit more to Tonga. In Bangladesh where arsenic contaminated water is a public health issue, data on expectations show that the long term health effects are of less concern than the short term ones (Tarozzi et al. (2009). In the specific case of Colombia, Attanasio et al. (2005) find that households that had experienced greater volatility in their income during the previous three years report a wider range of expected income and that more educated individuals expect a higher

income in the next month. These two results have implications in two main economic activities: saving and invest.

Literature in economics and subjective expectations gives evidence that expectations are informative of future events (See Delavande 2011, 2014) but their importance relies more in the input that provide to the understanding of the decision process, rather than their predictive capacity. Moreover in psychology and health exist a debate about how much of the intentions or expectations translate into actions. Three concepts are exposed, the behavioural intention which relates to Ajzen´s theory of planned behaviour (TPB) which is one of the main theoretical frameworks used to understand entrepreneurial intentions and discussed in the third chapter , the behavioural expectation (Warshaw and Davis 1985) and the behavioural willingness (Gibbons and Gerrard, 1997) which includes the description of risky scenarios. While behavioural intentions are a plan, behavioural expectations and behavioural willingness are treated as predictions, yet the behavioural expectations are able to explain 10% of adolescent behaviour (Gibbons 2008). The predictive capacity of the intentions is related to some characteristic about the predicted behaviour. The first one is when the behaviours are rare or hard to observe and the second is when predicted behaviours involve unpredictable time lags (Krueger et al., 2010).

Asking about choices in the form of probabilities makes possible to include data about expectations in the economic modelling process. The methodological advantages of collecting data on expectations are (i) to calculate every statistical concept of interest, (ii) Avoiding the anchoring bias, meaning that the answers are not influenced or restricted to the option presented, (iii) to have interpersonal comparable responses, (iv) allows individual to express uncertainty about future outcomes (Delavande, 2014).

Eliciting individual beliefs in large scale surveys is not common in developing countries, but recently an increasing number of studies are gathering data on expectations events. Delavande et al.(2011) and Delavande (2014). Main results give evidence that individuals show heterogeneity in their beliefs; therefore making assumption instead of measuring expectations is omitting one part of the analysis. The expectations vary with observable characteristics in the same ways as actual outcomes. For example, the upper and lower bound of the subjective and actual of the onset of the monsoon season are remarkably similar (Gine et al.,2009) In Uganda a lower price of a coffee crop is negatively associated with the subjective expectation of having a negative return to the coffee production (Hill 2009, 2010). See Delavande (2014) for a review of the most recent studies in subjective expectations.

As discussed in the previous section, subjective expectations are a valuable source of information to study gains of human capital and capital allocation. In the three chapters I found evidence that suggest the importance of analyzing individual preferences and collecting data on subjective expectations. The main conclusion is that income expectations matters in the decision process but individual preferences and beliefs about the contexts matters more. The conclusions of the thesis are summarized in the conclusion section where areas of future work and policy implications are given.

Chapter 1. Subjective Migration Expectations

1.1 Introduction

The decision to migrate abroad is one of the most important choices that individuals can make in order to change their life. Understanding the individual decision to migrate is difficult, as people who have already migrated are likely to be different from the general population in terms of both observable and unobservable variables, such as motivation, risk preferences or liquidity constraints. Moreover, while one can observe the outcomes, such as employment and earnings, once an individual has migrated, one typically does not observe what their expectations about those outcomes were at the time of the migration decision, and it is these expectations which are likely to be the key drivers of migration. Recent studies suggest that potential migrants are misinformed about the economic opportunities abroad (e.g. McKenzie et al., 2013). In this chapter, we investigate the role of income and other non-pecuniary amenities in the decision to migrate. We circumvent the problems highlighted above by eliciting migration probabilistic expectations conditional on being provided a job with a certain level of earnings. We focus on the migration intentions of college degree educated Pakistanis.

Pakistan is an interesting choice for study because it is the second highest country among South Asian nations to send migrant workers abroad. Between 2011 and 2015 more than 3 million Pakistanis left the country for foreign-based jobs (ILO, 2016). The main destinations include Saudi Arabia, United Kingdom and the United States (OECD, 2015). While a large proportion of the migration comes from unskilled workers, 1.8% of the Pakistani emigrants are highly educated. Moreover, 26% of Pakistanis with tertiary education would migrate if they had the chance to do so (OECD, 2015).

We asked the students what would be the *percent chance* for them to migrate to (i) Saudi Arabia, (ii) China and (iii) the USA if they were offered employment at age 30 with a certain wage. We specified 3 jobs for all 3 countries, each with a different wage, all substantially higher than what the students would expect to earn if they were to stay in Pakistan. We therefore observed 9 scenarios reported as subjective probabilities of migration for each respondent. While hypothetical, these scenarios are advantageous as they allow us to recover true preference parameters compared to a situation where one purely observes migrants or potential migrants (Delavande and Zafar, 2017; Wiswall and Zafar, 2018). By providing a notional wage in the destination country, the scenarios remove (i) information asymmetries, where the potential migrants may only have imperfect information about economic opportunities abroad and (ii) liquidity constraints, which might prevent potential migrants from moving when there is uncertainty about how long it would take to find a job in the destination countries.

The destinations choice want to capture the uncertainty about three different potential destinations, one that is familiar in culture and it is one of the main destinations for work migration like Saudi Arabia. The second China differs in culture and language but is closer in distance. Finally the US is a distant destination that differs in language and culture but is also one of the main destinations of job migration. A further discussion about the choice of the destination is given in the section 1.2.

We focus on the individual decision to migrate from students enrolled in various types of tertiary education institutions. One of the types surveyed are Madrassas. These are schools that teach religious sciences, like jurisprudence, the Qu'ran and its commentaries, together with rational sciences like Arabic grammar, literature, logic and rhetoric. They tend to be free and have no admission requirements. The second types of universities are

the Islamic universities, which combines traditional Islamic teaching with a liberal arts curriculum. They tend to cater to middle-class students. Finally, we include Western-style universities, which are similar in their curriculum style to the US colleges and charge expensive tuition.

Using the new data, we investigate the role of students' expected earnings differential and their opinion of Pakistan and the destination countries, along with other observable characteristics, in the expectation to migrate. We find that on average the probability of migration increases when the earning gain increases and when the opinion of the destination country increases. Yet there are differences in the willingness to migrate to different country according to the current institution the respondents are currently enrolled into.

The individual migration decision of highly skilled individuals could be motivated by a number of reasons. Since the work of Todaro (1969), one determinant of migration widely studied in the literature is the income differential between the country of origin and the host (arrival) destination. The income differential could be represented by a relative income differential, as studied by Portes (1976), Borjas (1991) and Kennan and Walker (2012), by the scale of the differential income (Rosenweig, 2007) or by the nominal difference in wages, as proved by Grogger and Hanson (2011). Kennan and Walker (2012) also show that some of the migration decisions are generated because of the unfavourable realization of the wage in a previous migration or in the current location. This literature has implicitly assumed that potential migrants have perfect information about the wages available abroad, but McKenzie et al. (2013) have documented how potential male migrants from Tonga tend to underestimate their wage in the arrival

country (New Zealand). The source of the underestimation might derive from inaccurate flows of information from the extended family and older cohorts.

Non-pecuniary determinants, such as the prestige or the social status of living and working abroad, political stability, political freedom and social peace, have been pointed out as determinants of migrations of the highly skilled (Oteiza 1967, Portes 1976). Studies have also documented individual determinants of migration, such as individual preferences and risk aversion. For example, Gibson and Mackenzie (2011) find that brain drain is strongly related to preferences rather than liquidity constraints or gains in wages abroad. In our analysis, we focus on one synthetic and individual-specific measure of the non-pecuniary amenities a country has to offer: an individual's opinion of the country (on a scale from 1 to 10). The opinion of the country could proxy to some extent the attachment to the source country and to the destination. A higher level of attachment to the host country is associated with a longer stay and attachment to the country of origin is associated to a shorter stay (Barbiano di Belgiojoso 2016)

We also investigate the role of risk preferences, trust and religiosity. Individuals that have been identified to be more willing to take risks are more likely to migrate (Jaeger et al.2010). Religiosity is a less explored determinant of migration, with the exception of Guveli (2015), Neudörfer and Dresdner (2014), Myers (2000) most of the research focuses in how religiosity changes after migration (see Guveli 2015 for a Review).

In the extension of the Roy model (1951), Borjas (1987) identifies three cases of selection: Positive, negative and refugee sorting. In the first one the upper tail of the home distribution (the best and brightest) will migrate because the return to the skills is higher in the arrival country. In the second case, the lower tail of the distribution will migrate as

the result of a highly unequal distribution of the earnings in the source country. The third case, the refugee sorting belongs to the case when migrants came from the lower tail of the distribution in their home country and arrive to the upper tail of the distribution in the host country. This is because his decision is forced by a conflict, persecution, prejudice (i.e European Jews) or because the skills were rewarded very differently in their home country (i.e intellectuals from the former communist block) (Autor 2003). In this chapter we will deal with the first and second case. Since we assume that individuals maximize their utility and income, we will not deal in this chapter with those who migrate from the upper tail of the source country income and arrive to the lower tail of the host country.

Because of the self-selection of migrants, a large part of the migration literature focuses, as we do, on the intention to migrate of the general population (e.g. Burda et al., 1998; Uebelmesser, 2006; Drinkwater and Ingram, 2009). One of the most complete studies on migration intentions, including a comparison between 129 countries, was undertaken by Dustmann and Okatenko (2014). They study the relationship between intentions of migration and individual wealth in three different geographical regions: Sub-Saharan Africa, Asia and Latin America. For the richest region, that is Latin America, the probability of migration decreases when wealth increases, while for Asia and Africa the opposite is the case. They also find that local amenities, such as public services and securities, explain an important part of the intention of migration.

Violence in the form of xenophobic attacks at the destination country has been proved to decrease the migration intention (Friebel et al. 2013). Other non pecuniary assets like a family network and the culture of migration are determinants in shaping the migration intentions. Two main branches of the theory of international migration study this asset. First one is the social capital theory (Hugo 1981, Massey et al.1987, Palloni, et al.2001)

and the theory of cumulative causation (Myrdall 1957, Massey 1990). In the social capital theory, contact with the family network in the destination country reduces the cost and risks for potential new migrants, it is the network improves the information set of the potential migrant. In the theory of cumulative causation, previous migrants create a culture of migration in their source country, it is migration is accepted as way to achieve economic and social mobility a certain lifestyle that is not possible to achieve with the local resources, as a result labour migration become part of the structure of values and expectations of the families (Heering et al. 2004). In our study we ask for expectations of migration to Saudi Arabia, which is one of the main destinations of Pakistani migration. Then, presumably the students should have better information about the Saudi job market. As a second destination we include China which is becoming a new attractive destination because of the geographical proximity and cheaper cost of education if compared to the last destination: the US.

The role of the family is considered in the international migration literature (Mincer 1978, Borjas 1991, Davanzo 1976). Families with children tend to be less mobile than individuals since the net benefit from migration is diminished by the cost of having children, also children not only influence the decision of migration but later will influence the potential destinations, since the decision will take into account school availability and costs (Mincer 1978). Our study ask about the expectations about having children at age 40, this expectation differs with each socioeconomic backgrounds while Madrassa students expect to have 5 children on average the students of the Islamic universities expect 3.

Because of its importance, intention to migrate has been included in general social surveys in the last thirty years. For example, the Gallup World Poll surveys people in

more than 160 countries and asks: “In the next 12 months, are you likely or unlikely to move away from the city or area where you live?” The possible answers are “likely to move,” “unlikely to move,” “don't know,” and “refused to answer” (Gallup, 2013).Most surveys use a similar Likert scale. The problem of eliciting expectations using Likert scales is that such types of scale, in which events are described using words such as “very likely” and “fairly likely”, provide only an ordinal measure and do not allow for interpersonal comparisons because each respondent may have a different interpretation of the scales.

An alternative approach is to measure expectations or intentions as probabilities. Such quantities are helpful to assess whether individuals have accurate expectations about the future, and can be used in economic models which require quantitative measures of probabilities and uncertainty (see Manski, 2004 and Hurd, 2009, for a review of the literature on the elicitation of expectations in developed countries, and Attanasio, 2009 and Delavande, 2014 for a review in developing countries). Important findings using this alternative method include the fact that people are willing and able to provide their expectations in probabilistic format, there is substantial heterogeneity in beliefs, and expectations tend to vary with observable characteristics in the same way as actual outcomes.

The remainder of this chapter is set out as follows: section 1.2 provides a background to the migration of educated Pakistanis; section 1.3outlines a theoretical model of migration; section1.4 presents the study design and sample characteristics; section 1.5 presents the empirical results and section 1.6 provides a summary and conclusions.

1.2 Migration in Pakistan

With a population of 207 million (Pakistan Bureau of Statistics, 2017), Pakistan is a country of migrants. Between 1971 and 2015, 8.1 million Pakistanis officially went abroad for employment, based on official work migration application data from the government. More than 50% of the migrants during this period came from the Punjab province, and this is where the institutions surveyed for this study are located. This figure of 50% also represents the share of the total population of Pakistan who live in this province. In 2010, 14% of Pakistani emigrants to OECD destinations were between 15 and 24 years old, 79.7% were between 25 and 64 years old and 6.6% were over 65 years old (OECD, 2015). More generally, highly educated migration is on the rise. Pakistani migrating labour force have changed from illiterate and semi- skilled to skilled, educated professionals (ILO 2015). Between 2000 and 2011, the rate of highly educated emigrants has increased by 122.1% (OECD, 2015). In 2015, 1.8% of Pakistani migrants were highly qualified, 0.8% highly skilled, 40.8% skilled, 16.2% semi-skilled and 40.4% unskilled (BEOE, 2015). However this data does not reflect completely the number of highly educated migrants since highly qualified and highly skilled migrants do not always register with a government agency. Pakistan has benefit from this migration not only through remittances but also from the return of newly skilled migrants.

The destination choices of Pakistani emigrants are Saudi Arabia, the United Kingdom, the United States, Canada, Spain and Italy (OECD, 2015). Although, United Kingdom is one of the main destinations of highly skilled Pakistani migrants, we did not include it as a destination in the survey because of the potential bias in the expectations that colonial ties could create. The colonial ties create a network based on the common set of cultural, linguistic, institutional affiliations that make a country a preferred destination (Vezzoli and Flahaux 2017, Beine, Docquier and Özden 2009). While migration drivers to other English speaking countries like the USA has been less explored. The migration to the

USA is associated with work migration but also with academic purposes. In 2010-11, 52.4% of the migrants who arrived in the USA were highly educated (OECD, 2015). USA is a geographically distant destination with strong language and cultural differences with Pakistan.

Saudi Arabia have similarities in culture and religion and is the main migration destination. The migration of Pakistanis to Saudi Arabia was traditionally classified as low skilled migration (Gazdar, 2003); however, since 1970 this composition has been changing (Ari, 2009).

China is also different in language and culture, but is closer as geographical distance. In addition is becoming a new destination choice for middle-class Pakistanis. According to Pakistani news, China has a growing job market and also offers cheaper school costs than the USA. During recent years, many Pakistanis have been enrolling into Chinese courses and considering applying to Chinese universities (Dawn, 2012).

1.3 A model of migration

We present a simple static model of migration that motivates our data collection. Consider an individual at age 30 who graduated from a university in Pakistan and is offered a job abroad. The individual will only migrate if the value of the expected utility of migration is higher than the value of the expected utility of staying in Pakistan. We assume no borrowing or lending for simplicity, so the individual consumes his wage.

The expected utility of staying in Pakistan is given by:

$$E\ U_{i\ stay} = \gamma\ ln(C_{is}) + \alpha_s\ (O_{i\ pkg}) + \beta_s x_i + \varepsilon_{is},$$

whereC_{is} is *i*'s expected wage received in Pakistan, conditional on graduating from the institution in which the student is currently enrolled, $O_{i\ pkg}$ is the self-reported opinion of Pakistan, x_i is a set of other variables relevant to the decision to migrate (i.e. field of study, parent´s income, type of university, etc.) and ε_{is} is a random term know by the individual but unknown to the researcher.

The expected utility of migration is given by:

$$EU_{i\ mig} = \gamma ln(C_{im}) + \alpha_m\ (O_{im}) + \beta_m x_i + \varepsilon_{im}$$

Where C_{im} is i's expected wage in the arrival country, and O_{im} is the self-reported opinion of the arrival country, and ε_{im} is a random term know by the individual but unknown to the researcher.

The student will migrate if and only if his expected utility of migrating is larger than his expected utility of staying in Pakistan, i.e. if$EU_{imig} > EU_{istay}$. The probability of migration is defined as:$P\ (U_{imig} > U_{istay})$

$$P\ (U_{imig} > U_{istay})=$$

$$P\ [(\varepsilon_{is} - \varepsilon_{im}) < \gamma[ln(C_{im}) - ln(C_{is})] + \alpha_m\ (O_{im}) - \alpha_s\ (O_{i\,pkg})\ + (\beta_{im} - \beta_{is})x_i]\ (1)$$

To better understand the determinants of migration, we collected unique data on the individual-specific probability of migration, P(migration). The objective is to make an inference regarding the values ofγ , η and β.

1.4 Study design

1.4.1 Sample

The study was conducted between May and October 2010. Two Western-style Selective Universities (SU and VSU) participated in the study, one Islamic University (IU), and four Madrassas (M). All were located in the Islamabad/Rawalpindi metropolitan area and Lahore. Islamabad is Pakistan's capital and the metropolitan area of Islamabad, Rawalpindi, is the third largest area in the country with a population of about 4.5 million. Lahore is the second largest city of Pakistan with a population of 10 million inhabitants (Delavande and Zafar, 2015). The focus on these two cities is for practical reasons of the data collection.

The survey was carried out by the Survey Centre associated with the Islamic University. After consent was granted by the institution, they were informed that their students would participate in a survey on decision making and opinions, and were notified that the study was being performed on behalf of an international organization. The survey was handed out in a large classroom in groups of 50-100 students, where each student received an anonymous questionnaire. The study was completed in Urdu, with the exception of the VSU where the students are more used to reading and writing in English.

The questionnaire was designed by Delavande and Zafar and had four sections: the first section collected data on determinants of schooling choices, the second consisted of experimental games, the third section collected demographical details and the fourth section asked about personal attitudes and political issues. For this chapter we used sections one, three and four.

1.4.2 The educational institutions

The three types of institutions selected cover different parts of the higher education spectrum in Pakistan. One end of the spectrum is the Madrassas (M), also known as religious schools. They base their studies on texts dating to before the fourteenth century and teach classes in Urdu (Fair, 2006; Rahman, 2008). Madrassa students must memorise sections of the Quran, and their education covers religious science, Arabic grammar and literature, logic and rhetoric (Rahman, 2008). Advanced study within the Madrassas produces an Alim (Islamic scholar and/or teacher). Most students who graduate from a Madrassa go on to work in the religious sector. According to the Pakistani Ministry of Education, the advanced stages of a Madrassa education are equivalent to a university bachelor degree.

In the middle of the higher education spectrum are the Islamic Universities (IU), the second type of university included in the study. IUs provide a liberal arts curriculum, combined with Islamic teachings and courses. Their curriculums include training in basic and applied sciences, engineering, management, social sciences, languages and Islamic studies. Islamic universities have segregated campuses for males and females, and classes are taught in Arabic or Urdu. Their admission requirements include the previous grades obtained in education and there are different admission tests according to the selected faculty. The length of the programme is typically 4 years and the obtaining of the degree requires passing the Hifz test, which requires memorising the Q'uran. Islamic universities tend to be public and, therefore, are accessible to low and middle income groups. Moreover a relatively large proportion of students at such universities have typically studied for some time at Madrassas before enrolling.

The other end of the spectrum is the Western-style Universities. These types of universities are similar to American colleges. They provide a liberal arts curriculum, teach classes in English, and have campuses that mix female and male students. Tuition at such institutions tends to be expensive so they cater to wealthy students. We divide the Western-style universities into two types: the Selective University (SU) and Very Selective University (VSU). Although both types have a Western style, they differ in terms of reputation, cost and selection of the students.

1.4.3 Sample Characteristics

Tables 1.1 and 1.2 present the socioeconomic characteristics and the wage expectations of the students at the four institution groups. We focus on male respondents because in a context like Pakistan female migration may be done at the household level. Moreover, only 0.1% of the total migrants of Pakistan are women (ILO, 2015).

Table 1.1 Socio demographic characteristics

	All	M	IU	SU	VSU	F test	Response rate
Number of respondents	**2232**	**1060**	**428**	**507**	**230**		
Age	21.87 (2.87)	22.2 (2.97)	21.9 (2.55)	21.6 (2.28)	20.7 (3.74)	0.00	98.4%
% of fathers with no education	15.9	21.9	4.7	19.5	0.4	0.00	99.7%
% of parents with income between 2000 and 18000 rps.[1]	42.3%	72.2%	27.1%	9.7%	3.5%	0.00	99.5%
% of parents with income between 18000 and 100.000 rps.[2]	46%	25.5%	66%	66.8%	55%	0.00	99.5%
% of parents with income higher than 100.000 rps.	11%	1.5%	6.1%	23.1%	40.4%	0.00	99.5%
% of respondents that own a hon	56	62.4	45.1	60.9	41.3	0.00	98.4%
% of parents of respondent that own							
Home	84.2	82.5	84.2	93.0	92	0.00	99..5%
Tv	57.7	29.7	79.9	83.4	90	0.00	99.6%
Cellphone	78.2	74.1	80.4	80.1	90.9	0.00	99.7%
Computer	48.1	25.6	60.5	70.0	82.2	0.00	99.6%
Internet	29.7	6.8	40.0	49.1	74.8	0.00	99.5%
Car	36.3	10.0	40.9	67.3	82.2	0.00	99.6%
motorcycle	40.5	39.7	36.4	45.4	43.0	0.00	99.6%
bike	44.4	32.9	49.1	64.1	47.0	0.00	99.6%

1. Approx 174.8 USD.
2. Approx (987 USD)

The average age of the students is between 20 and 22 years. The p-values of an F-test (reported in the sixth column) indicate substantial sorting in terms of observables in these institutions, with students at the more Western universities being substantially better off. Parents income is presented as a percentage of the sample that declares whether the parents receive a monthly income between three different intervals

showing low-middle, middle-high and high income. The majority of Madrassa students (72%) and a significant portion of IU students (27.1%) belong to the low-middle income category. The majority of IU, SU and VSU students belong to the middle income category. Other economic indicators, such as the owning of some durable goods and services, also show a difference, especially on items related to access to technology: TVs, computers and access to the internet.

1.4.4 Expected earnings

Table 1.2 presents three different expected monthly income. We asked for income expectations conditional on graduating from their own institutions and all the other institutions in our sample using the following question:

"Consider the hypothetical situation where you graduate from each of the institutions listed below. Look ahead to when you will be 30 years old and suppose that you are working then. Think about the kinds of jobs that will be available to you. How much do you think you could earn per MONTH on AVERAGE at the age of 30 at these jobs?"

For the purpose of our study, there are two important expected wages that we collected.

Expected monthly earning conditional on graduating from current university. The self-reported expected monthly wage at age 30, assuming that the student graduates from the institution in which he is currently enrolled, is relevant from the perspective of migration decision, since it can be considered as the expected earnings if the student stayed in Pakistan. Table 1.2 show some descriptive statistics.

Table 1.2 Expectations at Age 30

	All	M	IU	SU	VSU	F Test [1]
Number of respondents	**2232**	**1060**	**428**	**507**	**230**	
Expected wage at age 30 conditional on graduating from the institution in which the student is enrolled. (Rs)	31.9 (41.1)	13.8 (26.3)	45.2 (29.1)	47.3 (48.6)	58.1 (57.1)	0.00
Highest Expected wage at age 30 as a University graduate	55.1 (53.4)	38.6 (49.7)	71.4 (45.8)	75.8 (59.6)	57.4 (41.8)	0.00
Log difference between the highest expected earnings overall and earnings as a graduate of the current	0.7 (1.1)	1.1 (1.2)	0.5 (0.8)	0.4 (1.1)	0.03 (0.7)	0.00

1.P-value of an F-test for equality of the means of the variables in the rows across the four institutions(columns 3 to 5)

2 The response rate for these questions were 99.7 and 99.2 respectively

VSU students expect the higher earnings on average, while a Madrassa student expects on average a wage four times lower than a VSU student. Notice that the differences between the expected wage of IU and SU students are relatively small. There is an important amount of heterogeneity in the beliefs, as can be seen in the values of standard deviation. For example, for SU students the tenth percentile is Rs 24,000 for their expected wage and at 90th percentile the expected wage is Rs 75,000. Since the universities do not collect data on the actual wages of their graduates, it is not possible to test the accuracy of the expectations reported (Delavande and Zafar, 2014).

Highest expected monthly earning: The second important expectation is the highest expected wage regardless of the institution in which they are currently enrolled, and is the highest answer collected from the question mentioned above. This expected wage is important because it is used in each of the nine scenarios of migration (see section 1.4.5). Regardless of the institution in which they are enrolled, the highest expected earnings for the whole sample tend to be those reported when the student hypothetically graduated from VSU.

On average the highest expected monthly wage was about Rs 55,000. The values of the standard deviation show an important amount of heterogeneity in beliefs, as was also shown in the figures for the first expected earnings.

Table 1.2 also shows the logarithmic difference between the highest expected earnings regardless of the institution of enrolment and the expected earnings when the student graduates from the institution in which he is currently enrolled.

1.4.5 Eliciting migration expectations

We asked questions regarding hypothetical migration scenarios to the USA, China and Saudi Arabia. This migration is conditioned to a job offer with three different wage scenarios: first when a job offers twice the highest expected wage in Pakistan, second when a job offers five times and finally when the job offers ten times the highest expected wage in Pakistan.

The elicited probability question was phrased as follows:

"What is the percent chance that you would move to the USA and take up this job offer if the job pays you two[/five/ten] times the highest income that you report during the last section on a monthly basis?"

The same questions were asked for China and Saudi Arabia. In total, therefore, each student report nine probabilities of migration, three per country and three for each wage offered. Table 1.3 shows the mean and standard deviation of these probabilities according to student's current institutions.

Table 1.3 Subjective probabilities of migration for nine different scenarios

Institution	USA			China			Saudi Arabia		
	Wage offered			Wage offered			Wage offered		
	Twice than PK	Five times than PK	Ten times than PK	Twice than PK	Five times than PK	Ten times than PK	Twice than PK	Five times than PK	Ten times than PK
M	0.26 (0.28)	0.35 (0.32)	0.46 (0.38)	0.37 (0.30)	0.49 (0.32)	0.64 (0.36)	0.65 (0.30)	0.74 (0.28)	0.85 (0.27)
IU	0.44 (0.31)	0.61 (0.31)	0.74 (0.32)	0.53 (0.30)	0.71 (0.26)	0.84 (0.26)	0.64 (0.30)	0.79 (0.242	0.90 (0.20)
SU	0.41 (0.32)	0.57 (0.34)	0.70 (0.36)	0.525 (0.31)	0.71 (0.28)	0.84 (0.272)	0.63 (0.31)	0.80 (0.23)	0.90 (0.19)
VSU	0.48 (0.31)	0.63 (0.303)	0.70 (0.32)	0.43 (0.30)	0.56 (0.29)	0.69 (0.337)	0.47 (0.30)	0.58 (0.30)	0.70 (0.32)
Total	0.35 (0.31)	0.48 (0.34)	0.59 (0.38)	0.44 (0.31)	0.59 (0.31)	0.73 (0.339)	0.62 (0.31)	0.74 (0.27)	0.85 (0.25)

There are three important facts to note from table 1.3. First, within a migration country, students report a higher probability of migration when the expected wage rises. For example, on average overall universities for the lowest wage offered the probability of migration to the USA is 0.35 and for the highest it is 0.59.

Second, there is difference in the expectation to migrate based on the destination country. Regardless of the wage offered, on average the students are more prone to expect to migrate to Saudi Arabia rather than the USA or China, possibly because of the familiarity of the region or the cultural similarities between the two countries. For the highest offered wage the average probability of the migration to Saudi Arabia is 0.85, while for the USA it is 0.59 and for China it is 0.73.

The third important difference is across institutions. Madrassa´s students declare the lowest probabilities of migration to the USA, possibly because they have been less exposed to Western culture. The Figures 1.1, 1.2 and 1.3 presents the histograms of the probability of migration to China, Saudi Arabia and the USA.

Figure 1.1 Probability of migration to China

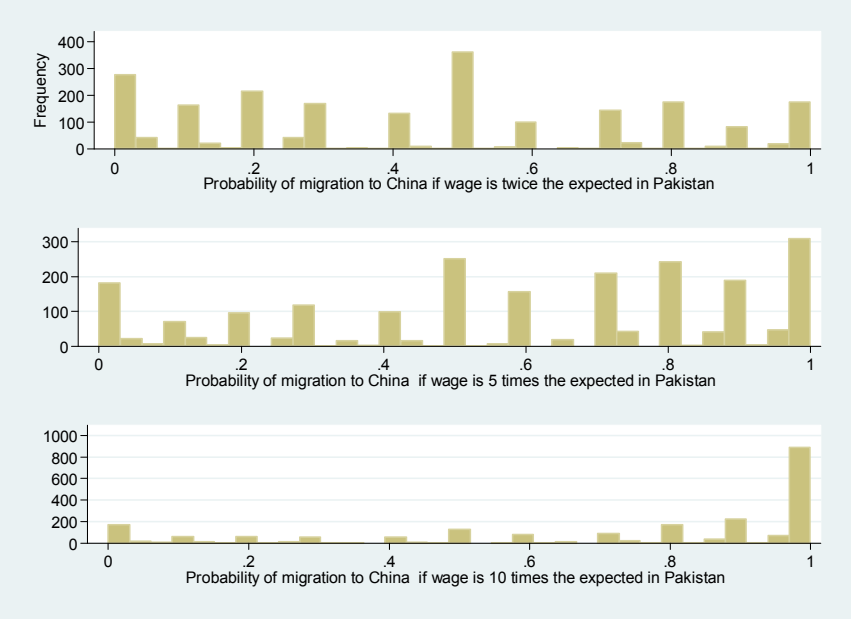


Figure 1.2 Probability of migration to Saudi Arabia

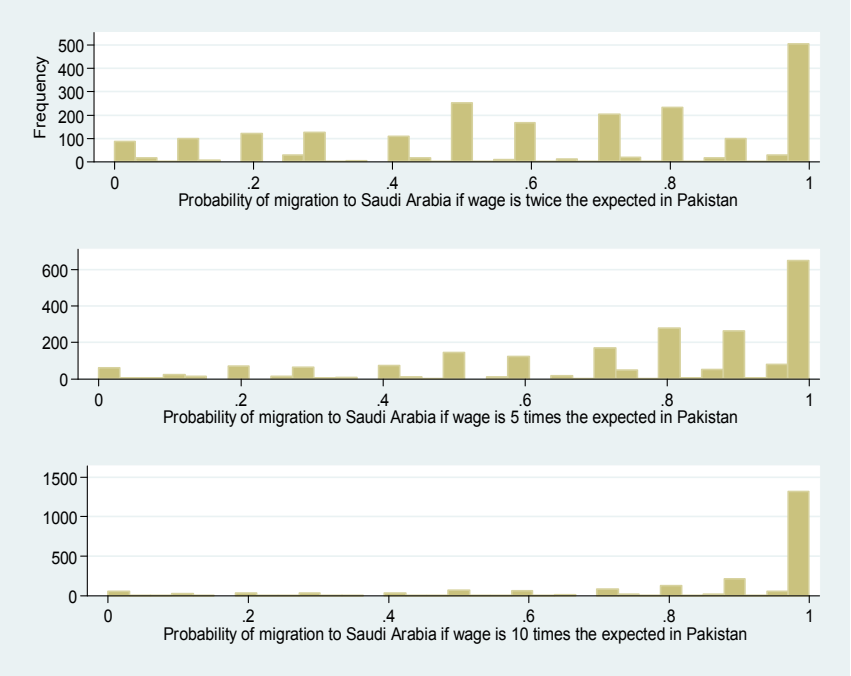


Figure 1.3 Probability of migration to the USA

The histograms combine the three expected wages by country. The subjective probabilities of migration show as discussed in section 1.2, the differences between the three destinations. Students will prefer to go to Saudi Arabia rather than China and certainly rather than the US where regardless if the expected wage is twice, five or ten times the expected in Pakistan , the students definitely will not move. At the higher expected income Saudi Arabia as a destination shows a distribution with a heavy tail (many observations with probability equal to 1). The probability of migration to China show more variation in the answers, students reports less probabilities of 0 and more answers between 0 and 1 which means that thinking on moving to this destination generate more uncertainty since both of them are less familiar to the students compared to Saudi Arabia. The US is the destination that presents more probabilities of 0 for the three wages. For the highest wages shows two high frequencies at 0 and 1 respectively.

1.4 Other determinants of migration.

Individual migration decisions not only consider wage differentials and socioeconomic characteristics, but also non-cognitive traits related to an individual's personality and their long term and life changing plans, like the decision to have a family, and cognitive traits like languages. Having language skills enhances access to other cultures but also gives you confidence as a migrant since it increases the chances to succeed and adapt in the destination country (Dustmann 1994, Espenshade and Fu, 1997).

In our study we have information on some of these potentially relevant traits, such as willingness to take risks, trust in others, religiosity and the expected number of children at age 40. As location specific capital we collected measures about the opinion of the country, and the language skills in English and Arabic. Those characteristics are presented in Table 1.4.

Table 1.4 Other determinants of migration

	All	M	IU	SU	VSU	F Test [1]	Response Rate
Expected number of children at age 40	4.1	5.1	3.3	3.2	2.9	0.00	98.1%
Risk General (0-10)[3]	6.1 (3.2)	5.3 (3.9)	6.5 (2.4)	6.9 (2.4)	6.7 (1.9)	0.00	88%
Trust people (0-10)[4]	4.8 (2.9)	5.1 (3.3)	4.7 (2.6)	4.8 (2.6)	4.3 (1.9)	0.00	93.5%
Religiosity (0-10)[2]	7.4 (2.3)	9.2 (1.6)	6.2 (1.7)	5.92 (1.8)	5.3 (1.6)	0.00	89%
Opinion of Pakistan (0-10)[5]	4.3 (3.3)	5.3 (3.7)	3.8 (2.7)	3.2 (2.8)	4.2 (2.9)	0.00	85.8%
Opinion of USA (0-10)	2.3 (2.9)	1.5 (2.5)	2.4 (2.8)	2.6 (2.9)	4.1 (3.0)	0.00	85.8%
Opinion of China (0-10)	6.4 (2.42)	5.8 (2.58)	6.6 (2.12)	7.0 (2.14)	7.0 (2.46)	0.00	86%
Opinion of Saudi Arabia (0-10)	8.0 (2.6)	8.3 (2.7)	7.7 (2.5)	8.3 (2.2)	6.4 (2.7)	0.00	86%
% of respondents with good level of spoken English	32	11	38	51	40	0.00	95.2%
% of respondents with good level of spoken Arabic	21	48	32	29	7	0.00	96.6%

1.P-value of an F-test for equality of the means of the variables in the rows across the four institutions(columns 3 to 5).

2.Self-reported religiosity on a scale of zero (not religious at all) to 10 (very religious).

3.Self-reported risk preference on a scale of zero (totally unwilling to take risk) to 10 (fully prepared to take risks).

4.Self-reported level of trust on a scale of zero (people cannot be trusted) to 10 (people can be completely trusted).

5 Self-reported opinion on Pakistan,USA,China and Saudi Arabia in a scale from 0 (very unfavourable) to 10 (very favourable).

6.How proficient are you in the Arabic/ English language (speaking)? 1=Very good 2=good 3=mediocre 4=weak 5= don't know the language.We report the percentage of students who answer 1 or 2

Regarding family plans, student expects to have four children on average by age 40, though a student from VSU on average expects to have two children less than a Madrassa student.

We measure the willingness to take risks using the following question *"How would you rate your willingness to take risks in general? Using a scale from 0 meaning "totally unwilling to take risks" to 10 "fully prepared to take risks".* Within institution there exist variations relating to this self-perception: for example at SU the average is 6.9 but the standard deviation is 2.4. In general, students declare they feel they are prepared in some way to take risks (6.1).

The level of trust in others was elicited using the following question: "*Would you say people can be trusted?"* The scale was from zero to ten, where zero means "people

cannot be trusted" and ten means "people can be completely trusted". The average level of trust was 4.84. Notice that these traits do not vary much across the institutions.

Not surprisingly, there is heterogeneity in the level of religiosity across institution, with Madrassa´s students reporting the highest level. The question was: *"How religious do you consider yourself on a scale from zero to ten, where zero means not religious at all and ten means very religious?"*

The opinion of Pakistan and the three possible destination countries (USA, China and Saudi Arabia) was self-reported by the students on a scale from zero to ten, where zero means very unfavourable. On average students have a middle-range opinion of their own country (4.27); in contrast, they have a better opinion of Saudi Arabia (7.95) and of China (6.42). The lowest opinion is associated with the USA (2.26). There are differences in the self-reported opinions of destination countries: for example, when we move across the universities spectrum, the opinion of the USA becomes more favourable.

Finally, the language skills were measured using the following question "How proficient are you in the Arabic/ English language (speaking)? The answers were: 1=Very good, 2=good 3=mediocre, 4=weak, 5= don't know the language. We report the percentage of students who answer 1 or 2. Half of the students of SU (51%) and 40% of the VSU students declare that they have a good level of spoken English, in comparison to the average figure of 32%.

1.5 Empirical Results

1.5.1 GLM estimates

We will now estimate equation (1). Because the probability of migration is reported in values from 0 to 100 and then rescaled to 0 to 1, we will use an extension of the Generalized Linear Model (GLM) by Papke and Wooldridge (1996) for fractional response data. The functional form of the GLM is the following

$$G\{E(y)\} = \mathbf{x}\beta, \qquad y \sim F$$

Where G is the link function and F the distributional family, F will define the member of the linear exponential family (LEF) that will be used. The central element in the GLM is the function G(·), it is a monotonic and differentiable link function which is the inverse of the conditional mean function. The link function also expresses the transformation to be applied to the dependent variable (Baum 2013, Kaiser 2015). The GLM estimators are a maximum likelihood estimators based on a density in the LEF and an extension of the non linear least squares.

The dependent variable in our GLM model is a student self-reported probability of migration at age 30 to the USA, China and Saudi Arabia conditioned to a job offer when the wage is two times, five times or ten times the highest expected wage in Pakistan. Papke and Wooldridge suggest that a GLM with a binomial distribution and a logit link function which is consistent with individual marginal effects. In this case in the dependent variable we have real zeros and real ones therefore other estimator like those derived from the Tobit model will be inaccurate.

The first independent variable is the expected migration earnings gain, measured as the difference between the log earnings associated with the relevant job offer and the log of the expected earnings at age 30 for the institution in which the student is currently enrolled.

As demographic controls, we include a wealth index that is a sum of a group of binary variables. For each of the main items that the parents own we create a dichotomic variable: 1 if the parents have the item and 0 if they don't have it; then the index sums up all responses with 1 as a value (see Table 1.1 for the description of the items). Another variable included was the income of the parents of each student. As presented in Table 1.1, we divide the categorical value into three income categories. We also control for institutions in which the baseline is Madrassa. The English language variable is a dummy variable that groups the students according to whether they consider that they have a good or very good level of spoken English. Another variable with the same procedure for Arabic was included in the model.

We also include as independent variables the opinion held of Pakistan and the destination countries (USA, China and Saudi Arabia).Since the opinion variables have near to 14% missing values, we include a dummy variable for missing values for each opinion variable.

Individual characteristics such as the religiosity level, willingness to take risks, the level of trust in others and the expected number of children by the age of 40 are also included in the analysis.

Table 1.5 reports the average marginal effects of three different estimations of the determinants of the subjective probability of migration to the USA, China and Saudi Arabia, when the wage offer is five times the highest expected wage in Pakistan. The

estimates for the other wage offers - twice and ten times the expected wage in Pakistan - can be found in Appendix 1.1 and 1.2.

Table 1.5 Determinants of the subjective probability of migration to the USA, China and Saudi Arabia, when the wage is five times the highest expected wage in Pakistan. Average marginal effects of a GLM model.

	USA	China	Saudi Arabia
	b/se	b/se	b/se
Expected migration earnings gain	0.021**	0.022***	0.013**
	[0.008]	[0.006]	[0.005]
Father with no education	-0.024	-0.036*	-0.022
	[0.020]	[0.019]	[0.016]
Age	-0.005**	-0.005**	0.001
	[0.003]	[0.002]	[0.002]
Islamic University	0.169***	0.151***	0.041
	[0.040]	[0.038]	[0.035]
Selective University	0.142**	0.150***	0.029
	[0.045]	[0.043]	[0.038]
Very Selective	0.172***	-0.015	-0.126***
	[0.047]	[0.044]	[0.038]
Student of social sciences	0.052	0.047	0.05
	[0.043]	[0.039]	[0.036]
Students of Engineering	0.047	0.012	0.067*
	[0.044]	[0.041]	[0.038]
Students of Business	0.025	0.001	0.016
	[0.035]	[0.032]	[0.030]
Proficiency in spoken English	0.042**	0.025	-0.006
	[0.017]	[0.016]	[0.014]
Proficiency in spoken Arabic	0.003	-0.017	-0.013
	[0.019]	[0.017]	[0.016]
Religiosity level (0-10)	0.005	0.000	0.002
	[0.004]	[0.004]	[0.003]
Expected number of children at age 40	-0.009**	-0.004	0.001
	[0.003]	[0.003]	[0.003]
Risk general	0.004	0.004*	-0.001
	[0.002]	[0.002]	[0.002]
Trust People (0-10)	-0.004	0.000	-0.004**
	[0.003]	[0.002]	[0.002]
Opinion of Pakistan (0-10)	0.003	-0.001	0.000
	[0.002]	[0.002]	[0.002]
Opinion of the arrival country (0-10)	0.020***	0.007**	0.013***
	[0.003]	[0.003]	[0.002]
N	2110	2110	2110

The expected earnings gain from migration is associated with an increase of the probability of migration to the USA, China and Saudi Arabia. The marginal effects are precisely estimated (significant at 10%) and of similar magnitude across the country, though slightly smaller for the case of Saudi Arabia. This could suggest that a smaller

wage premium is required to move to this country. To test this hypothesis, in Table 1.6 we estimate a GLM model with interactions between the expected gain of migration and the country. In terms of magnitude, a change in the expected earnings gain from migration of 10% changes the probability to migrate to the USA by 0.002, to China by 0.0021 and to Saudi Arabia by 0.001. The effect of the expected gain of migration is statistically significant regardless the destination but small in magnitude.

Despite the fact that the respondents are all at university and of similar age, we find that older individuals are less prone to expect to migrate to the USA and China. There is no age effect regarding Saudi Arabia.

There are differences between the migration determinants among the different universities for each scenario. Students from different institutions react differently to different countries. For example, being a student from IU or SU has a similar effect on the probability of migration to the USA and China: they are much more willing to migrate than Madrassa students (increase in the probability of migration of 0.15). When compared with the students of M, being a VSU student decreases the probability of migration to Saudi Arabia by 0.12. The students from VSU are more prone to migrate to the USA (marginal effect of 0.17) rather than to Saudi Arabia (marginal effect of -0.12). A possible explanation is that VSU students come from affluent backgrounds and are more exposed to foreign cultures, have better proficiency in English and their education is based on a Western model (see Table 1.1, 1.2). Also the migration to Saudi Arabia has been associated with low skill migration: for individuals from an affluent background this could be a deterrence factor.

The expected number of children at age 40 is associated with a decrease in the subjective probability of migration only for the case of the USA. Having a family could turn the individual decision of migration into a household decision. The preparation and the costs of migration are higher for a family than they are for an individual. Having a family may not affect a migration decision to a less distant country like China or Saudi Arabia, but could be a deterrence factor for a distant country like the USA.

The presence of language skills, in terms of the proficiency to speak English, is associated with an increase in the subjective probability of migration to the USA. The ability to communicate could explain a sense of confidence in the person's ability to adapt in the USA, therefore an increase in the willingness to move to this country. The confidence given by the language skills, whether in English or Arabic, is not associated with changes in the probabilities of migration to China and Saudi Arabia.

Non-cognitive traits like religiosity and trust are not generally associated with a change in the subjective probability of migration, with the exception of trust which is associated with a decrease in the probability of migration to Saudi Arabia. Students who are more willing to take risks are also slightly more likely willing to migrate to China (marginal effect of 0.004, which is marginally statistically significant).

The opinion of Pakistan is not associated with a change in the probability of migration, but the opinion of the arrival country is associated with an increase of the probability of migration to the three countries, and the size of the estimate is bigger for the USA in comparison to China and Saudi Arabia.

In Table 1.6 we present the estimates of the GLM model including interactions for the country of destination. In practice, we append all the probabilities of migration that

belong to a wage offer that is five times the wage expected in Pakistan. We present a selected set of controls and their interactions. The full list of estimates can be found in Appendix 1.3. We cluster standard errors at the individual level.

Table 1.6 Interactions between countries and some determinants of migration. Dependent variable: probability of migration when wage offered is five times the highest expected in Pakistan.

	b/se
China	0.207
	[0.300]
USA	0.088
	[0.337]
Expected migration earnings gain	0.136***
	[0.029]
China*Expected migration earnings	-0.046
	[0.028]
USA*Expected migration earnings	-0.099**
	[0.034]
China*Age	-0.037**
	[0.012]
USA*Age	-0.045**
	[0.014]
Self reported level of religiosity	0.052**
	[0.016]
China*Self-reported level of religiosity	-0.052***
	[0.010]
USA*Self-reported level of religiosity	-0.055***
	[0.012]
Risk	-0.019*
	[0.010]
China*Risk	0.040***
	[0.009]
USA*Risk	0.040***
	[0.011]
Country opinion	0.032***
	[0.009]
China*Country opinion	0.012
	[0.012]
USA*Country opinion	0.076***
	[0.015]
Opinion of Pakistan	-0.019*
	[0.010]
China*Opinion of Pakistan	0.013
	[0.010]
USA*Opinion of Pakistan	0.032**
	[0.012]
N	6330

Table 1.6 shows that the expected migration gains interacted with the USA is negative suggesting that a given increase in expected earnings lead to a smaller increase in the decision to migrate to the USA compared to Saudi Arabia. If compared to Saudi Arabia, a higher willingness to take risks has a greater effect on the probability of migration to China and the USA, as was already suggested in table 1.4. The opinion of the US matters more in the probability of migration, when compared to the opinion of Saudi Arabia. The self-reported level of religiosity has less effect on the decision to migrate to China and the USA.

1.5.2 Individual fixed effect estimations

The intention data presents some issues. First as researchers we are not able to follow up on whether the respondents migrate or not. Second, most of the time, in the migration intention surveys there is only one point of data. However, in our study we have nine different probabilities of migration for each individual. If there is unobserved heterogeneity that could influence some of these variables and the probability of migration, we can control for that in our analysis. In Table 1.7 we present the estimates of three models: GLM with and without controls and fixed effects. In this case we treat each probability of migration as a different observation and cluster standard errors at the individual level.

Table 1.7 GLM and Fixed effect model.

	GLM without controls	GLM with controls	Fixed Effects
	b/se	b/se	b/se
Expected migration earnings gain	0.155***	0.040***	0.059***
	[0.008]	[0.002]	[0.001]
Opinion of the arrival country	0.081***	0.013***	0.013***
	[0.003]	[0.001]	[0.001]
China	-0.834***	-0.182***	-0.194***
	[0.025]	[0.005]	[0.004]
USA	-0.917***	-0.214***	-0.221***
	[0.028]	[0.007]	[0.005]
Constant	0.301***	0.271**	0.536***
	[0.033]	[0.114]	[0.006]
N	21794	21094	21794

The effects of the expected earnings gain from migration on the expected to migrate slightly higher in the fixed effect models compared to the model without fixed effects. Because the wage offered is fixed, the unobserved heterogeneity that biases downward the coefficient may come from the expected wage in Pakistan conditional on graduating from the currently enrolled institution (which enters negatively in the expected earnings game). Maybe students who are more self-confident report higher expected earnings and higher probability to migrate. Adding individual fixed effect has essentially no impact on the marginal effects associated with opinion or the country dummies.

Table 1.8 Fixed effect estimations with country interactions. Country base line: Saudi Arabia.

	b/se
China	-0.110***
	[0.011]
USA	-0.289***
	[0.010]
Expected migration earnings gain	0.108***
	[0.002]
China* [Expected migration earnings gain]	-0.059***
	[0.002]
USA* [Expected migration earnings gain)]	-0.019***
	[0.003]
Country Opinion	0.001
	[0.001]
China* Country Opinion	0.009***
	[0.001]
USA*Country Opinion	0.032***
	[0.001]
Constant	0.497***
	[0.009]
N	21794

In Table 1.8 we present the fixed effect estimations with interactions in order to expand our analysis on the country differences. As in table 1.6, we see that the interactions between the expected migration gain and USA is negative and precisely estimated, but now we also see a negative and precise effect for China. Again, this suggests that a given increase in expected earnings lead to a smaller increase in the decision to migrate to the China and the USA compared to Saudi Arabia. A possible explanation is that the information set that students have about the cost of living in Saudi Arabia is more complete than the one they have about USA or China. Probably, students know better how much they could afford in Saudi Arabia with a twice, five or ten times their expected wages in Pakistan, if compared to what they could possibly afford in the US or China. As a consequence, an increase in the expected earnings have more impact in the probability of going to Saudi Arabia if compared to the USA which rejects our hypothesis that a smaller premium wage is required to move to Saudi Arabia.

The effect that the opinion of the arrival country has on the probability of migration is different for each destination, with larger marginal effects for USA followed by China. Then the opinion of the destinations that are less familiar to the students affects more their migration expectations to these countries that when the destination country is to some extent known like Saudi Arabia.

1.6 Conclusion

The decision to migrate is a life changing decision for every individual, regardless of whether it is a long or short term migration. Migrants decide between multiple alternatives which carry their own level of uncertainty. Moreover, each individual has a different set of beliefs and expectations for each alternative. Yet, migration intention data usually only offers one point of data, analysing responses to one destination, and does not include quantitative measures of expectations. Amenities are studied and included in migration decision models; however the analysis is made using realized choices or using ordinal measures of preference. We add to the literature on migration intentions by including quantitative measures of the migration intention and subjective earning expectations, and by using the opinions as a measure of the amenities in the decision modelling.

Using a unique data set with multiple choices of migration and quantitative measures of expectations we investigate the determinants of migration of Pakistani students to the USA, China and Saudi Arabia. The literature of highly educated migration highlights the importance of non-cognitive traits and individual preferences in addition to the expected earnings as determinants of migration. However there is less research about the influence and effect of the expectations on those determinants. Since highly educated migrants are self-selected, the differences within this specific group have been less explored. Our

dataset allows us to study the expectations of highly educated individuals from very different socioeconomic backgrounds. We found that individuals place a different value on the same earnings in different destinations. We test the opinion of Pakistan and the arrival country as a measure of the amenities expectations. Opinion is a determinant of migration that affects more those far and less known destinations like the USA if compared with the most familiar one that is Saudi Arabia.

Migration decision is a set of observable and unobservable choices. Our findings suggest that without data on individual expectations and beliefs about the income and amenities at source and arrival destinations, the study of migration intention is not complete. Asking about expectations is valuable and feasible; further, the advantage of interpersonal comparable responses helps us to understand how the tertiary educated decide to migrate in different cultures. From a policy perspective, the information set that university graduates have could be influenced by their socioeconomic background. Therefore policy interventions that aim to improve the information to all migrants regardless their socioeconomic position or type of university about the expected earnings and job opportunities at potential destinations could help to expand the potential migration destinations and turn this opportunities into a brain gain.

Chapter 2: Inter-regional graduate migration from Bogotá Colombia: An approach using subjective expectations

2.1 Introduction

University graduates are an important source of human capital, critical for regional development. The regions that retain human capital improve their economic performance, become more competitive and start innovation and economic growth processes, while the regions that lose human capital trail behind. Moreover, there is double-way causality between the migration flow of human capital and the innovation performance of a region (Faggian and McCann, 2009).

The importance of human capital in regional development has been studied and evidenced through decades (Gennaioli et al. 2013; Faggian and McCann 2009; Glaeser and Gottlieb 2009; Florida et.al 2008; Mathur 1999). Main findings are is that human capital may have externalities (Lucas 1988, 2008) and workers and entrepreneurs move across regions (Glaeser and Gottlieb 2009), the geography matters, and human capital fosters development via entrepreneurial education and externalities (Gennaioli et al.2013).

However there is much less research on the determinants of that migration of university graduates to less developed regions. Some important dynamics could lead to regional development policies arise from this opposite flow. For example, how could the rural areas attract and retain human capital?

In Colombia, due to the 'natural resource curse', some regions remain behind in social and economic development, despite acquiring important resources as a result of their subsoil exploitation (royalties) during the last 30 years. Regions still invest their royalties

in infrastructure projects without a clear impact on their development (Bonet and Urrego,2014). Yet, one of the causes of the unequal regional development in Colombia could be the weakness of the Colombian regional institutions (Cortes and Vargas, 2012). A possible cause of this institutional weakness is the lack of human capital to support regional institutions and vigilate the investment of the royalties in less developed regions. For example during the period 2015-2016, Arauca a Colombian region in which main economic activity is oil exploitation receives royalties of 72 million USD but have only used 66% of their resources while 36 % of their population are considered poor. In this chapter I want to find, what should be the incentives that a government could offer to college graduates in Bogotá Colombia in order to motivate migration to less developed regions that despite having importance sources of income lack economic and social development? I want to find these incentives by studying the determinants of university students' expectations to migrate to less developed regions that receive royalties. I choose three cities in Colombia: Arauca (Arauca) and Riohacha (La Guajira) because they have been traditionally royalties receptors and Quibdó (Chocó) because since 2012 it is a new receptor of royalties. Despite the flow of income a third of Arauca´s population and half of La Guajira and Chocó are considered poor. In addition, the three of them have experienced public order offenses due to the presence of the armed conflict and illegal activities.

The three regions are expelling their human capital instead of retaining it. Only 42% of the college graduates of La Guajira stay in la Guajira while only 28.3% of the graduates of Chocó stay in Chocó and 40% of Araucan´s graduates stay in their region. The three regions have a low number of graduates while during 2001 until 2014 nearly one million graduates from Bogotá only 2240 graduate in Arauca, 17621 college students study in

Chocó and 13513 in La Guajira. As a short or medium term strategy attracting new graduates to work with regional institution in the design and implementation that are funded by royalties could work as a way to boost these regions economic and social development.

The studies about skilled internal migration in Colombia are scarce. Some of them are based on the success of immigrants of other regions in the capital city (Romero, 2010) and other analyses the return migration of university graduates to their origin regions on the completion of their postgraduate studies abroad (Cepeda, 2012).To the best of my knowledge there is only one study about the internal migration behaviour of actual national university graduates (Gomez Caceres, 2015). This study shows where the university graduates migrate after graduation, and identifies those types of graduates who choose to migrate. Still, what the less developed regions must do to motivate university graduate migration is a question that remains unanswered.

Understanding the motivation for migration requires understanding expectations in origin and in arrival destinations (Corcoran et.al, 2010; Dustmann and Okatenko, 2014; Rabe and Taylor, 2012). Last data on actual migrants in Colombia came from 2005 census and data about migration expectation is inexistent. As a result, I did my own survey to collect the subjective expectations of 747 university students in Bogotá, the capital city of Colombia. The students reported their probabilistic expectations of migration for hypothetical job offers in three different cities: Arauca, Quibdó and Riohacha, which all receive royalties. Then I asked them for their expected wage in Bogotá one year after graduation and the probabilistic expectation of finding a job. I elicited beliefs about the provision of public goods and services, such as access to health, roads, and schools and their perception of the security conditions.

In my analysis, I estimate whether the individual probability of migration to Arauca, Quibdó and Riohacha is affected by the difference in wages, family characteristics, individual characteristics and the perception of amenities and provision of public goods in the origin and arrival destinations, using an extension of the Generalized Linear Model (GLM) for fractional response data (Papke and Wooldridge, 1996). In order to check the weight of unobservable individual characteristics, I include an individual fixed effect model. I found that the difference in wages and the perception of amenities and security are determinants of the subjective probability of migration.

I make three contributions to the literature of graduate inter-regional migration: (i) Studying the opposite flow of migration from developed urban areas to less developed urban areas; (ii) Using subjective expectations of migration and job opportunities in source and arrival destinations, instead of estimated probabilities; and (iii) Including perception of amenities not only in the source but also in the arrival destination.

This chapter is organized as follows: the second section reviews the literature of inter-regional migration of graduates, surveys about migration intentions, and subjective expectations in developing countries; the third section is an overview of Colombia focusing on the regions, migration patterns and the Colombian higher education system. The fourth section describes the theoretical model of migration that motivates the data collection. The fifth section is the study design, data description, and the elicitation of probabilities of migration. The sixth section shows the empirical results and the conclusion are provided in the seventh section.

2.2. Literature Review

2.2.1 Inter-regional migration of university graduates

The regional science perspective states that a region will be more competitive if it has a good stock of human capital (Glaesser, 1994). Hence, differences in educational attainment are determinants of regional development, and explain a large share of regional income differences in a country (Gennaioli et al.,2013 ; Faggian, 2004,2009,2015). These arguments prompt the question: what must regions do to attract human capital? This point could be answered by understanding how the decision of migration is made by educated individuals and finding the determinants of inter-regional migration for this group.

The migration of university graduates has been studied to some extent for developed countries such as the United Kingdom (Faggian et al., 2007, 2009); United States (Whisler et al., 2008); Netherlands (Venhorst et al.,2010); Finland (Happanen and Tervo,2012) and Italy (Ciriaci, 2011). However this phenomenon is not yet fully studied in developing regions, Maldonado (2017) study internal graduate migration in Mexico, and Gomez Caceres in Colombia (2015). Usually the common explored path is migration to other urban centres. One possible cause for this focus is that the job offers for the high skilled population are concentrated in the dominant urban centres and their surroundings, while for the non-skilled workers the offers are evenly distributed geographically (Faggian et al., 2013).

One exception can be found in the study of Corcoran et al. (2010) who study university graduates' migration to rural areas in Australia. Using microdata of college graduates six months after the graduation, they identify the rural areas that are facing more challenges

in attracting and retaining human capital. Then they identify those who return or move to these areas. The results show that the field of study, in particular education and health, and ethnicity groups are determinant characteristics in choosing a non-urban centre as a job destination.

2.2.2 Does distance matter?

Human capital and job search migration theories predict that the probability of migration is positively related with human capital levels but also that expected migration distances increases with a higher level of human capital. However with modern agglomeration economies, when the level of skill increases as well with the wage level of the occupation, the potential employment locations decrease (Faggian and McCann, 2013). Distance plays a role in the graduate migration, Faggian et al. (2007) describe the utility function of migration as a function of moving from an individual original location (A) to a potential job location (B). The utility function is a function of personal and human capital characteristics, a vector of characteristics of location B, and the distance A and point B distance from one place to other. Distance was included so that the utility can vary with monetary and personal cost associated to the migration move. Location-specific variables are given. With this function they study the likelihood of UK graduates to become one out of five different migrants: repeated migrants who migrate to attend the university and then migrate again for job reasons; university stayers who migrate to acquire education and then stay in the region in which they have studied ; late migrants who decide to migrate several years after finishing their studies, return migrants who come back to their original region after finishing college; and non- migrants those who study in their region of birth and stay there. The results suggest that higher human capital increases the likelihood of the experience of a late or a repeated migration, except for the

most qualified students who, according to the results, are less mobile. Increasing human capital is also associated with a decreasing likelihood of being a return migrant or a university stayer.

Faggian and McCann (2007) study the sequential migration choice for Scotland and Wales. They find that for both countries, the higher the distance that a graduate travels to obtain higher education, the lower the probability that they will return to their origin cities. In the case of the Netherlands, distance also plays an important role in the evaluation of job offers, since graduates value employment options nearby greater than similar options located further away (Venhorst et al.,2010).

2.2.3 Who are those who migrate?

The results show that for developed countries like Netherlands and the UK, women are more mobile than men. According to Corcoran et al (2007) female graduates in UK tend to experience more repeated and late migration in comparison to males, as female migration looks for better job opportunities and to compensate for gender differences. In Colombia female graduates appear to be less mobile than men (Gomez Caceres 2015). Gender show mixed results according to the studied countries, a possible explanation could be the female participation in higher education but also strong cultural differences.

Age also plays a role; older UK graduates are more likely to migrate years after graduation or to return to their original location while Dutch graduates are more likely to move to the centre of the country. The results differs from a developing country setting like Colombia in which older graduates are more likely to become repeated migrants it is to migrate to obtain higher education and then migrate again to find a job (Gomez Caceres 2015).

The best academic performers are more likely to stay in the region in which they study or to migrate some years after graduation. (Venhorst 2010, Corcoran et al.2007). This is an effect of the job queuing the best performers have the job offers first, therefore they do not need to migrate in order to obtain an offer. The field of study also influences the willingness to migrate, being health and teaching moving inside the country and other fields like economics who are more prone to move abroad (Venhorst et.al 2010). Engineers and business graduates that study in a peripheral area, are more prone to move from their origin region since those jobs appear to be unrepresented (Coniglio and Prota.,2008).

2.2.4 When and why graduates migrate?

Migration is a process that could start when the university chosen is far away from home. After graduation an individual could seek a job in the current location or migrate, or could return to their original city. All these decisions could happen right after graduation or could be postponed after gaining some working experience. This time interval varies across countries and depends on how mobile are the graduates. Happanen and Tervo (2012) find that migration hazard rates increase and afterwards decrease find that two years before and after graduation, in the case of Finland. Moreover, graduates are not very mobile and migration cases occur after ten years of graduation. In the case of Italy the process starts when an individual decides to study away from his original region.

The job opportunities are also a relevant determinant for graduate migration. Liu and Shen (2014) find that Chinese college graduates are more responsive to wage levels and less sensitive to the risk of unemployment. This result is also in line with Venhorst et al 2010 that show graduates value more a higher wage than better amenities. Faggian et al,

2007 show that interregional variations in wages are a strong motivator of migration, as is stated in labour market theory. If compared with other determinants job opportunities have a higher impact as motivators of migration (Liu and Shen (2014, Venhorst, 2013).

The amenities also are a determinant of graduate migration. Whisler et al. (2008) study the migration behavior of graduates in the US, discriminating by age groups and focusing on the relevance of the amenities in making the migration decision. An abundance of cultural and recreational amenities lowers the out-migration rates and the metropolitan areas with growing human capital are also associated with lower out-migration rates. The higher cost of living encourages the migration of the youngest and the oldest graduates, while factors such as security and climate are determinants for those graduates near to retirement. The study also controls for the marital status of the migrants, finding it relevant for the migration behavior.

2.2.5 Graduate migration in Colombia

In the specific case of Colombia, migration studies tend to focus on forced migration, and those examples related to voluntary migration rely on data from before 2000 (Gomez Caceres, 2015; Romero, 2010). The studies focus on analyzing the rural-urban flow of migration and their impact on the job market (Silva et al., 2007; Silva and Roman, 2009; Romero 2010). Romero (2010) includes educational attainment as part of the analysis of how successful the migrants are in terms of income, when the migration flow is from other cities to Bogotá, and controlling when regions are formed only by city of birth or by city of residence. Results suggest that migrants in Colombia are the most educated members of the population or the ones that are pursuing some kind of education. Then, when the investment in migration is made, individuals are better off in Bogotá than in their place of birth. This result shows how urban centres in Colombia capture the most skilled labour forces and the costs are assumed by the less-developed regions from which these migrants came. Another study which stresses the loss of human capital by the regions has been completed by Cepeda (2012).She studies the probability of return to Bogotá and the probability of returning to Colombia after undertaking postgraduate study abroad. Being born in a different city and having lived in Bogotá before are both determinants in the decision to come back to Bogotá, after finishing postgraduate studies abroad. The real decision for migration is made before graduation, when the student decides to acquire his university degree in a main city.

The studies of inter-regional migration of university graduates in Colombia are even scarcer. As far as I know, the only study that analyses this migration pattern is Gomez Caceres (2015). She analyses the case of repeat and returning migrants, and in this case it

is those individuals who have migrated to attend university and migrate again after graduation and those who return to their original cities after graduation. She uses specific data for graduates in Colombia at two moments of migration, at the beginning of university enrollment and after university graduation. She studies separately each case of migration and then combines both. The findings show different results from repeat and return migrants. Her results show that female graduates are less mobile and that graduates from universities of a higher quality will migrate to another destination for work, but they do not return to their home city. In contrast, a higher level of income within the family will increase the probability that the graduate returns home. A result that differs from the literature, in this study, is that older graduates will be more likely to become repeat migrants. Gomez Caceres explains that the rigidity of the labour market and migration are assumed to be a costly process for graduates, meaning that graduates postpone a decision of migration for later when they have accumulated more years of experience.

2.2.6 Eliciting probabilities of migration and Measuring Expectations

Few migration surveys include data on subjective expectations. In migration intention studies, migration intention questions are asked using different versions of a Likert scale. For example, the Gallup World Poll uses the statements: "likely to move", "unlikely to move", "don't know" and "refuse to answer" (see Dustman and Okatenko, 2014).Other surveys, like the British Social Attitudes survey and the International Social Survey Programme, use a more informative scenario, i.e. giving the reasons for migration. However, the answers still use a Likert scale coded from one to five (see Drinkwater and Ingram, 2009). In the case of the German Socio-Economic Panel (GSOEP), the question of migration intentions uses different words such as: "enthusiastic", "yes but depends", "rather not" or "absolutely not" (see Burda et al., 1998). These answers, although informative, cannot be compared across individuals. The word "likely" could have different meanings for two different individuals. Another drawback is that the information needed to do economic analysis about expectations is not extractable from qualitative expectation data. One exception is McKenzie et al. (2013) and the first chapter of this thesis. McKenzie et al. (2013) ask potential migrants of the island of Tonga in the Pacific about their probabilistic expectations of employment and income abroad. They found that Tongans underestimate their income abroad, but those who expect a higher income were more prone to apply for a job abroad. The income underestimation seem to be driven by inaccurate flows of information from the extended family, or by basing own expectations on the information provided by older cohorts, but also by the existing gender wage gap between the origin and source destination. In the first chapter we ask to Pakistani university students probabilistic expectations of migration to the USA, Saudi Arabia and China, using nine hypothetical scenarios of migration. Each scenario is a job

offer in one of the three countries, the offer rises up to two five and ten times the highest expected wage in Pakistan, finding that the difference in wages together with the opinion of the arrival country, the type of university attended and the expectations of having children at age 40 matters in the decision of migration to each of these countries.

The probabilistic scale has desirable properties, like the advantage of allowing testing internal consistency of a respondent's elicited expectations about the occurrence of certain events. Moreover, the researchers can compare the elicited expectations with actual events and give conclusions about subjective expectations and realities. Asking for elicited probabilities also helps to overcome the anchoring problem that arises when the survey has fixed values or intervals given by the interviewer (Dominitz and Manski,1997, McKenzie et al.,2013). The correlation of the expectations goes in the same direction of actual outcomes, showing that expectations are good predictors of actual behaviours. Moreover, Delavande et al. (2011), show that subjective expectations are more accurate when the time horizon is shorter.

In developing countries, it had been argued that these types of questions may be prohibitive in terms of time and that illiterate persons may not answer them, because they are not familiar with the concept of probability. Delavande et al. (2011) and Delavande (2014) refute all of these concerns, reviewing the results of some of the innovative surveys that have elicited probabilistic subjective expectations in developing countries such as Colombia (Attanasio et al., 2005), Mexico (Attanasio and Kaufmann, 2009) Malawi (Delavande and Kohler, 2009), Tonga, New Zealand and Papua New Guinea (Gibson and McKenzie, 2011) Tonga (McKenzie et al., 2013) and India (Gine and Klonner, 2007). For the specific case of Colombia, Attanasio et al. (2005) elicit income expectations, asking two groups about their minimum and maximum expected household

income in the next month. They ask the first set of respondents the probability that the expected income will fall between the minimum and the midpoint located between the minimum and the maximum, while another group was asked about the probability that the income would fall between the midpoint and the maximum. They test if the sum of the average of the probabilities answered by groups A and B equals 1, and cannot reject the hypothesis, proving that the respondents answer according to the basic law of probabilities. Attanasio et al. (2005) also show a correlation between past outcomes and expectations about the future, finding that the expected income ranges reported is wider when the households that have experienced greater income volatility in the previous three years.

Recently the inclusion of subjective expectations in the estimation of economic models has become more common, for example in the case of potential migrants (McKenzie et al.,2013) and returns to schooling, (Atannasio and Kaufman (2005) ; Delavande and Zafar, 2013, 2014) among other studies.

One contribution of this chapter is to include expectations not only of migration, but about the perception of the availability of the amenities in both source and arrival destination. Amenities are included in this chapter as the provision of four public goods: Security and access to roads, schools and hospitals. In a developing setting like Colombia this type of amenities are of particular importance. Dustmann and Okatenko (2014) find that for migration intentions, the level of contentment with security and public goods are a key determinant. The World Bank point out the inseparable link between security and migration (Koser 2014) yet there is less quantitative measurements of expectations about security. Data on expectations of migration and destinations is relevant not only for the

research on inter-regional migration of university graduates, but also for regional migration in general.

2.3 Overview of Colombia

2.3.1 Regions of Colombia

Colombia is located in the north-west region of South America, sharing its borders with the Caribbean Sea and the Pacific Ocean, Brazil, Ecuador, Panama, Peru and Venezuela. With a population of 48 million inhabitants (DANE, 2015), the gross domestic product composition is 6.1% agriculture, 36.9% industry and 52.7% services. In the political administrative division of Colombian territory, the next geographical unit is the "*departamento*". Colombia has 32 "*departamentos*" and 1096 municipalities. The capital city is Bogotá and this represents the biggest contribution to the GDP with 25%. Only six *"departamentos"* produce 65.5% of the GDP. The main cities of Colombia are located in these six *"departamentos"* (Dane, 2014).

Colombia has very strong differences across its regions, not only because of the geographical differences but also on the level of economic development. There are six regions: Pacific, Caribbean (also called Atlantic region), Insular, Andean, Orinoquia (Valleys and Plain regions of Colombia) and Amazonic (near to the Amazon River). According to the Colombian National Department of Statistics (or DANE, its acronym in Spanish), in 2014 the percentage of the population living in multidimensional poverty was 24.6% in the Atlantic region, 34.6% in the Pacific region, 28.1 % in the Insular or central region and 18% in the Orinoquia or oriental region. In contrast, in the capital

Bogotá, the number of people living in multidimensional poverty was 5.4% (DANE, 2014, 2015, 2016).

Royalties are the compensation paid by a firm to the Colombian government for the exploitation of national subsoil and they are one of the most important sources of income for municipalities. For example, royalties' income is twice the income derived from two of the most important taxes: housing and industry. During the decade 2002-2012, Colombia doubled its oil and coal production (Bonet and Orrego, 2014). While royalties in 2002 were 0.6% of the GDP, in 2012 they had risen to 1.66%.The royalties must be allocated between the "departamentos" that produce or have been affected by the transportation of the products exploited. As a result, 70% of the royalties were concentrated in seven "departamentos" (Arauca, Casanare, Cesar, La Guajira, Huila, Meta and Santander) As a constitution rule these royalties are used for funding regional development projects. However, there is evidence that the Colombian regions have not expended these resources wisely (see Bonet and Orrego, 2014, for a survey). In 2012, the royalties' income was 5 billion USD. In 2012 the Colombian government introduced a royalties' system reform to improve the allocation of income from royalties between all departments, cities and municipalities, using poverty levels and socioeconomic development as an allocation criteria.

I want to investigate the determinants of the migration decision of university graduates from Bogotá to three different cities that receive royalties in Colombia: Arauca, the capital city of the department of Arauca; Quibdó, the capital city of Chocó; and Riohacha, the capital city of La Guajira. The three departments in which these cities are located have witnessed internal armed conflict. Chocó is located in the Pacific region, Arauca is located in the Orinoquia and La Guajira is located in the Caribbean region. Arauca and

Chocó have had a decrease in their GDP in comparison to previous years (2014), at -7.0% and -6.2%respectively, while La Guajira had a growth rate below the national average (DANE,2014). The paradox is that even if these regions had received an important flow of income in the form of royalties, more than 50% of their population lives in poverty and perform poorly in Latin-American indexes such as the NBI.[1]In particular in 2015 in Chocó and La Guajira, 62.8% and 53.3% of the population respectively were classified as poor , using monetary poverty as an index(DANE, 2015). In the case of Arauca,35.9% of their population were in poverty in 2014 using the NBI index (ANH, 201).[2]Figure 2.1 shows the location of the origin destination (Bogotá) and the arrival destinations: Arauca, Quibdó, and Riohacha.

1 The NBI index, or unsatisfied basic needs index, is an index developed by the UNECLAC (United Nations Economic Commission for Latin America and the Caribbean) in the 1980s. Most NBI indices include indicators such as access to clean water, quality of housing, crowding, education level of household head, school attendance, nutrition, and others.Based on census data, it is calculated using two different measures: one is weights of the indicator and the other is thresholds or cut-offs. In general an NBI index is a good proxy for poverty (See Hicks, 1996).

[2]In the case of Chocó and La Guajira, the monetary poverty index was updated in2015, but in the case of Arauca the information was only available using the NBI index.

Figure 2.1 Political Administrative Divisions of Colombia.

Source: Colombian Geographic Institute Agustin Codazzi.

The National Department of Statistics (DANE,2015) has only estimated flows of migration for the period after 2005.In Table 2.1 the estimates of net migration flow are shown for the population aged between 20-29 years old, for the period 2015-2020.The data is divided into two age groups, which I have included because it covers the minimum

(21 years old) and median (25)ages of the graduates' distribution, according to Gomez Caceres (2015).

Table 2.1 Estimated numbers of migrants during 2015-2020 for population age 20-29 in Bogotá, Arauca, Quibdó and Riohacha. Thousands of persons.

"Departamento"	Estimated number of new migrants Age 20-24	Estimated number of new migrants Age 25-29
Bogotá	11	6.82
Arauca	-0.99	-0.99
Chocó	-1.96	-1.94
La Guajira	3.83	3.26

Source DANE (2015)

Arauca and Chocó have an estimated negative net flow of migration for both age groups. Despite being one of the poorest departments in Colombia, La Guajira has a positive net flow of migration (DANE, 2015). This positive net flow of migration is explained by the coal mining activity, because in the last 30 years the coal mining industry has experienced a boom. Therefore many Colombians have migrated to La Guajira because of the job opportunities.

The latest data on migration in Colombia are from the 2005 census. According to the census data, Colombians are not a very mobile population. Only 7.6% of the population has been living in a different municipality within the last five years. The difficulty of finding a job is the motivation for migration for 15.6% of the migrants (DANE 2010), while only 4.4% claim the pursuit of education as a reason to migrate.

University graduates show a different behaviour: during 2007-2011, 46.9% of university graduates had migrated at least once. The first migration is made to acquire a university

degree. After obtaining their degree, only 4.3% migrate to a different city to work, while7.7% return to their original location (Gomez Caceres, 2015). The flows of future university students from intermediate cities to big urban centres are caused mainly because the universities are located in the big urban centres and it is not only the universities that are concentrated in these centres but also the job market.

According to the Colombian Ministry of Education (or MEN, its acronym in Spanish), in 2014, 69.1 % of the graduates who studied in Bogotá go on to work in Bogotá and 81.5% of the graduates working in Bogotá are originally from Bogotá. In the case of Arauca, 40% of the graduates from a university in Arauca subsequently work in Arauca and 28.9% of the graduates working in Arauca were born in Arauca. In 2014 in Chocó, 28.3% of the university graduates of Chocó stay on to work there, while 62.3% of the total number of graduates working in Chocó originally came from Chocó (MEN,2015). In La Guajira 42.3% of the university graduates from a university in La Guajira continue after their studies to work in La Guajira, while 39.7% of the graduates working in La Guajira are originally from La Guajira. Regional disparities are also shown in the opportunities that future graduates have to obtain their first job. A graduate from Bogotá has a 64% probability of finding a job, while the probability of finding graduate employment from regions such as Caribe and Pacífico is 43% and 40% respectively (Baron, 2012).

2.3.2 Colombian Higher Education System

The Colombian higher education system provides two types of degrees vocational (2 years) and academic (4-5 years). Vocational degrees are supplied by technical and technological institutes and Universities supplies most of the academic programs (Bonilla et al.2016). Between the universities and Technical/Technological institutions are placed the university institutions who supply a limited number of academic programs. The three types of institutions cover the spectrum of Higher Education institutions (HEI) in Colombia.

Colombian HEI´s are located in the main cities of the country. The students that can afford the cost of moving migrate to Bogotá and the other main cities in Colombia, and start attending mainly the universities in those cities. During the period of 2001 until 2014, nearly 3 million students graduated from Colombian HEI, of which 1,110,726 studied in Bogotá, while only 17,621 studied in Quibdó, 2,240 studied in Arauca and 13,513 studied in the department of La Guajira(MEN, 2015).

The HEI in Colombia are a mixture of both public and private, and differ in their level of selectiveness and tuition fees. The selection of the participant HEI in the survey seeks to cover the spectrum of higher education in Bogotá. Therefore, I include one public and eight private HEI classified according to the Colombian Ministry of Education classification (MIDE).[3]This ranking system evaluates different aspects of the HEI and classifies them in a ranking from 1 to 186. Since I want to study expectations after

3The universities were classified using the MIDE indicator developed by the Colombian Ministry of Education. The MIDE indicator was based on the proposal of the Carnegie Foundation for the Advancement of Teaching to evaluate students using two components: current students and alumni. Then the indicator evaluates professors, taking measures of their skills and academic level, and evaluates research by measuring the number of different types of publications. Finally the MIDE indicator evaluates the environment, measuring impact and internationalization. The indicator in total measures six dimensions.

graduation, the respondents were students currently in the third to fifth year of their studies.

2.4 Theoretical model

The utility function of migration must account for wages and amenities available in the arrival and origin destination, the personal characteristics that could affect this utility and the cost of migrating to the arrival destination. In this model I assume that the student can afford the cost of moving, and that the cost of migration is related to the opportunity cost of moving instead of remaining in Bogotá.

A graduate will migrate to city *m* if the expected utility associated with migrating to the city *m* is higher than the expected utility of staying in Bogotá.

The expected utility of migration of student *i* to city *m* can be represented by the following equation:

$$EU_{\ migration\ i,m} = \gamma \ln(w_{i,m}) + \delta x_{imig} + \lambda(z_{i,m}) + \varepsilon_{im}$$

$w_m =$ *Wages offered in city m. Since in each scenario of migration the job offer is placed, the probability of being employed and receive this wage is equal to1.*

$x_i =$ *Personal attributes that influence the decision of migration i.e having relatives that have already migrated, the closeness of family ties, the self-reported willingness to take risks and a measure for time preference.*

$z_{im} =$ *Individual self-perceptions of the amenities available in city m (security, roads, schools, access to good hospitals, chance of commuting).*

$\varepsilon_{im} =$ *Random term known by the student but not by the researcher*

The expected utility of staying in Bogotá is defined as:

$$EU_{iBog} = \gamma[P_{i,jobB}(\ln w_{i,Bog}) + (1 - P_{i,jobB})(\ln 1)] + \delta_{i,bog}(x_i) + \lambda(z_{i,Bog}) + \varepsilon_{i,Bog}$$

(2)

P_{jobB}= *Probability of finding a job in Bogotá*

$wi_{,Bog}$ =*Expected wage of student i in Bogotá.*

x_i = *Personal attributes of student i.*

Z_{iBog}= *Individual self perceptions of the amenities available in Bogotá.*

ε_{iBog}= *Random term known by the student but not by the researcher.*

$(ln\ 1)$ =*Since there is not unemployment insurance in Colombia the expected income of not being employed is 0.*

A future graduate will migrate if and only if:

$$EU_{migration(i,m)} > EU_{i,Bog} \quad (3)$$

Student *i*'s individual subjective probability of migration is defined as:

$$P_{i\ migration\ (m)} = \mathrm{P}\left[EU_{i,migration(\ m)} > EU_{i,Bog}\right] =$$

$$P\ [\varepsilon_{im} - \varepsilon_{iBog}] < \gamma[ln\ (w_{im}) - P_{jobB} * ln\ (w_{i,Bog}\ )\ ] + (\delta_{imig} - \delta_{Bog})x_i + \lambda(z_{im} - z_{ibog}\ )$$

We observe the probability of migration P(migration)and the objective is to estimateγ,δ and λ.

2.5 Study Design

Bogotá has 115 HEI, of those 30 are universities and 20 are quality certified, it is an independent institution on behalf of the Colombian Ministry of Education evaluates and after evaluation certifies or not their quality as academic institutions. Of those 20, 15 are universities (MEN, 2016) during the months of November 2014 and January 2015 I contacted 35 HEI in Bogotá via e mail. The 35 HEI are universities and university institutions, it is they only offer academic programs of four and five years of duration. The difference between universities and university institutions consist in that the universities offer a bigger number of academic programs. The other HEI are the technical and technological institutions that offer programs of two years of duration.

They are all members of the Colombian Association of Universities. This association has a long tradition of networks and associates very different types of HEI. In the email I presented my research programme and asked for an interview to discuss the university's participation in the survey, scheduled to be held during the first week of the second academic period of the year, at the end of July and early August. I exclude 2 institutions of the set of the 35 initial HEI: the first one because it only had postgraduate programmes and the second because they only have one or two academic undergraduate programmes devoted to public management. I contacted all the HEI again from July 10th to July 23th. Nine HEI participate in the survey. The selection of the HEI, classes and students surveyed responds to a convenience sample.

The nine participant HEI cover different features of Colombian institutions that offer academic degrees: one is public and the other eight are private. Seven are universities. Six of them were quality certified at the period of the data collection. The HEI in

Colombia and specifically universities vary across their size, selectiveness, academic level and tuition fees. The purpose of the selection of these HEI was to cover these features. The focus of the HEI selection was also the academic level, since the question is not only what makes students consider migration, but what makes the best students consider migrating to less developed areas.

I surveyed 747 students from four different bachelor schemes: economics, engineering, law and political science, business and accounting. I selected the field of studies, considering what kind of human capital is required by the mayoralties and governorates, who are the authors of the majority of the royalties' investment projects. It has been argued that the lack of technical capacity in the project formulation is one of the reasons for the regions to not use all their royalties' income (Rojas 2015). Royalties investment projects requires infrastructure designs (engineers), budget and project management (economists, business and accountants), and finally royalties projects requires an important legal knowledge due to the nature of the funding (lawyers).

The overall response rate in the sections of the surveyed covered by this chapter is about 97%, with the exception of the probabilities of finding amenities in the Arauca, Quibdó and Riohacha which in some cases have a response rate of 89%. In table 2.2, I present the main features of the surveyed HEI.

Table 2.2 Features of the surveyed HEI

Type	Status	Position in the Ranking	Number of Students (2015)	Number of academic Undergraduate Programmes	Number of Programmes surveyed
University 1	Public	2	24,667	49	6
University 2	Private	7	18995	37	3
University 3	Private	15	6750	17	2
University 4	Private	17	10,882	22	1
University 5	Private	24	9467	27	1
University 6	Private	31	14802	18	1
University 7	Private	50	11,103	18	6
HEI 1	Private	40	8975	29	3
HEI 2	Private	91	10840	17	3

2016 Sources MEN (2016) HEI own websites

Within the universities, I try to include as much of the engineering programs in the Public university since is one of the top universities and also have a higher number of students, In the private universities, In the other universities I try to surveyed as much fields of studies as I could but the final decision about which faculties and programs I could survey among those four fields of study was taken by the dean of each department. Some universities do not offer academic programmes in the fields I surveyed like University 3. The two HEI reported are university institutions it is they offer 4 year programs but have a restricted number of programs.

The survey was conducted in Bogotá, Colombia, from the 23th July until the 3rd September 2015.This period is the beginning of the second term of the academic year. In Colombia undergraduate studies last between four and five years, and each academic year has two terms of 16 weeks of lectures and exams, called semesters. Since I want to study expectations after graduation, the respondents were third, fourth and five year students.

The survey begins with a couple of examples to familiarize the respondents with the percent chance questions and the concepts of probability. One example was the description of the percent chance scale as a way to describe the probability of occurrence

of an event using descriptions like: “numbers like 2% or 5% describe an event that has very low chances of happening, while 80% means an event with a pretty even chance of happening”. The second example was a picture of a rule with a scale from 0 to 100 and below numbers such as 2% the word “won’t happen” and below the interval 70% to 90% the words “possible to happen.” , Finally I ask the students to answer two training questions about the probability of eating pizza in one and two weeks. These examples have been used by different surveys on subjective expectations (Delavande and Zafar,2014;Attanasio and Kaufman 2014). I designed the survey following Delavande and Zafar (2014). The survey asks about three probabilistic expectations: expectations of internal migration, expectations of finding a job in different cities and with different wages, and expectations to become an entrepreneur under certain scenarios.

The survey has five extensive sections that begin with the informed consent followed by two training questions. The first section is dedicated to the socioeconomic identification of the students. The second section is dedicated to current working experience and to the elicitation of probabilistic expectations of wages and job finding after graduation in Bogotá, Arauca, Quibdó and Riohacha. The third section asks about the student opinion of the importance of characteristics such as independence, creativity and networks. The fourth section is dedicated to their expectations and knowledge about their own college debt, if any. The final section is dedicated to after college migration and entrepreneurial scenarios.

2.5.1 Data

The sample is composed of 747 students. 51.7% of them are men and 48.3% are women. The average age is 22.3 years with a standard deviation of 3.34 years. The reason for this

difference in age is twofold; first, because of where the students are, in terms of the stage of their degree. For the purpose of my research, students must be preferably in the second half of their studies (third year onwards) or in the concluding semesters (8^{th} to 10th). Second, some of the students are full-time workers, who tend to be older than students who attend during the day. In Table 2.3 I show the descriptive statistics of the sample.

Table 2.3 Descriptive Statistics

	%/ mean (sd)
Female	48.26
Male	51.74
Age	22.35
	(3.34)
Married	6.06
Work	19.89
Born in Bogotá	72.84
Living with Parents	76.64
Fathers with college degree	35.75
Mothers with college degree	36.81
Previous experience of migration inside the family	31.64
Previous experience of unemployment inside the family	45.99
Monthly Family income[2]	
1 monthly mimimum wage or less	2.29
Bewteen 1 and 3 monthly minimum wages	31.27
Bewteen 4 and 6 monthly minimum wages	33.29
More than 6 monthly minimum wages	33.15
socioeconomic strata (1-6) [3]	
1 (poor)	1.07
2	16.22
3	49.73
4	22.52
5	6.43
6 (Affluent)	4.02
Individual Characteristics	
Self-reported individual level of family attachment [4] (0-10)	4.8
	(3.02)
Willingness to take risk in general[5] (0-10)	7.011
	(1.61)
Level of trust in others[6] (0-10)	5.6
	(2.03)
Importance of networks to find a job[7] (0-10)	8.12
	(1.63)
% of the sample that declare being impatient [8]	66.71
N	747

1. The average rate of response to these questions was of 99% with the exception of father education that has a rate of response of 97%

2. Monthly minimum wage in Colombia for 2015 was 225.77 USD using exchange rate of the month in which the data were collected.

3.The socioeconomic stratification in Colombia is used to clasify the properties that require access to public services. The properties are ranked from 1 to 6 where 1 is the lowest category, made using the location of the residence.This stratification is a common soicioeconomic indicator in Colombia.

4. Self reported level from 0 ("I am completely independent") to 10 (" I cannot live in a different city from my family")

5. Self reported level from 0 ("I am not prepared to take risks at all") to 10 ("I am fully prepared to take risks")

6. Self reported level from 0 ("I do not trust others") to 10 ("Others can be fully trusted")

7.Self reported level from 0 ("Networks are irrelevant") to 10 ("Networks are the most important factor")

8. The question was a lottery question about cashing a price of 100 now, or 105 in a month, 120 in six months, or 150 in a year.

The majority of the students are born in Bogotá, are single and live with their parents. The third part of the parents has at least a university degree, 35.7% of their fathers and 36.8% of their mothers. If the World Bank definition of tertiary education is adopted, which includes all types of formal education received after obtaining a high school degree, 58% of the mothers and 51% of the fathers of the students have tertiary education. One third of the sample has a relative who has migrated to another department of Colombia (31.64%), while 45.9% of the sample has had a family experience of unemployment. In the sample 19.89% are students who work. Within this group there are different types of working experiences; some of them are tutors for some of the subjects of their bachelor's degree, while others, in particular students from the universities ranked from positions 30-50, are students who are full-time workers. This is a feature of this type of university: usually they offer lectures during the evening and therefore the majority of their students are full-time workers who choose the lectures scheduled in the evening.

The students came from different universities and backgrounds as reflected in their families' income. As shown in Table 2.3, one third of the sample declares to be in each one of the income categories, with 33.56% in the lower bound of the income categories (less than 1 and 1 to 3 monthly minimum wages), 33.29%in the middle categories (between 4 to 6 minimum wages) and 33.15% in the upper category (4 to 6 monthly minimum wages). For 2015 the monthly minimum wage in Colombia was 225.77 USD. In Colombia a socioeconomic stratification exists according to the location of the residence; this stratification is used to calculate the prices of public services such as water and electricity. The method is very common and is used in many aspects by the Colombian population. The majority of the students declare they are located in the socioeconomic strata number 3,meaning they reside in the middle category.

The students consider themselves independent from their family (4.80) and prepared to take risks in general (7.01), while they trust others (5.9), and give high importance to networks in order to obtain a job (8.12). These non-cognitive traits are measured using scales from 0 to 10. Many of the students are impatient, 66.71% of the sample will cash a 100 dollar prize now instead of a prize of 150 dollars in one year's time. I use this measure of time preference as a measure of patience as in Gibson and McKenzie (2009).

The students within the sample are from different fields of study and different types of HEI. Table 2.4 shows the principal characteristics associated with their education, such as the grade point average (GPA), semester (equivalent to the academic term), ranking position of their universities according to the Colombian Ministry of Education, and the expected wages of the students one year and five years after graduation, if they work in the city of Bogotá.

Table 2.4. Educational Characteristics of the students

	% mean (SD)
Average GPA (0-5)	3.84
	(0.28)
Semester (1-10)	
below 5th	1.74
5th	5.49
6th	17.67
7th	17.27
8th	26.77
9th	20.75
10th	9.37
Field of Study	
Engineering	32.84
Political Sciences and Law	11.31
Economics	49.13
Business	6.73
Ranking of the University according to Colombian Ministry of Education	
(1-10)	44.04
(11-25)	14.86
(26-50)	36.95
(51-100)	4.02
Public University	32.80
Private University	67.20
Probability of finding a Job in Bogotá one year after graduation	73
	(17)
Probability of finding a Job in Bogotá five years after graduation	80
	(20)
Expected salary in Bogotá one year after graduation (USD)	737.60
	(303.5)
Expected salary in Bogotá five years after graduation (USD)	1647.90
	(888.9)
Quality Certified [2]	82.60
N	747.00

1 The response rate of these questions were aproximately of 99% with the exception of the GPA (95%) and expected salary five years after graduation (97.5), probabilities of finding a job in Bogota one and five years after graduation (97.3)

2 Quality certification is given to the universities the national council of accreditation ,a public academic organization and evaluate the quality of the universities in Colombia and certifies their academic quality (research, number and academic level of teachers, publications) and other aspects as their campus facilities, the alumni performance in the job market etc.

The grade point average (GPA) in Colombia is measured from a scale to 0 to 5, with 3 being the approbatory level. In the sample the average GPA is 3.8. The threshold to obtain a scholarship is 4.0. Almost half of the sample is comprised of students from the field of economics (49.1%) and a third of the sample are students from engineering (32.8%), 11% of the sample were students from political sciences (11%) and finally 6.73% study business. More than half of the sample are students currently in their8th to 10th semester (56.8%), while the other 40.4% are students that are in the middle of their degree (5th semester)or in the 6th and 7th semesters. A small minority of 1.74% of the

students are in an earlier stage, before the 5th semester, and 0.94% of the students do not report the semester in which they are currently studying.

To classify the universities according to their academic level and selectiveness, I use the MIDE indicator of the Colombian Ministry of Education. 44.04% of the sample is represented by students within the top 10 universities in Colombia, 14.86 % came from institutions positioned at11-25, while 36.9% came from universities located in positions 26-50.Finally, 4.02% came from one university located in position 90-100 in the rankings. Therefore, the majority of the students came from universities with a good position in the rankings; in some cases the university has a reputation just for a programme or a specific group of programmes rather than having a broader reputation as an educational institution. This is particularly the case with the institutions located in the range 31-50 in the ranking.

The students are confident about finding a job in the city in which they are studying (Bogotá). After one year of their graduation, the average self-reported probability of finding a job is 73%. This probability increases over time, for when the students were asked about the probability of finding a job in Bogotá five years after their graduation, the average increased to 80% with a standard deviation of 20%.

The expected monthly wage after one year of graduation declared by the students is 737 USD. The wages were asked in the survey using pesos which is the Colombian currency. The exchange rate was calculated using the official rate for July 2015, 2854 COP =1USD, since in Colombia exchange rate is highly volatile.

There is an important amount of heterogeneity is observed within the wages, with the standard deviation being almost 40% of the average expected wage reported (303USD).

After five years from their graduation, they expect on average 1688 USD monthly, but with a standard deviation of 888.9 USD. One previous hypothesis was that this differential came from the different type of universities in which students are enrolled. However the average wages classified by type of university are not that different. Therefore the difference between expected wages could only be explained by each student's expectations and their field of study, as I will show in the next tables.

2.5.2 Eliciting migration expectations and self-perceptions of the cities

The expectations of wages and job opportunities are the aspects that show higher standard deviation, showing that each individual elaborates different personal beliefs. This section will deal with how the probabilities of migration are elicited from the students, when given a certain wage**.**

The elicitation of subjective probabilities in my survey starts with questions about expectations after graduation, like the percent chance of starting postgraduate studies, or the percent chance of finding a job related to their current field of study. Then I ask about the probabilities of having four different wages in four different cities. Later I ask questions using more complete scenarios.

The expectation reported by a student will be more accurate if the scenario is fully defined (Manski, 1999). In a fully defined scenario, the questions ask for a probabilistic prediction of the occurrence of an event, given a set of relevant information for that scenario. In the survey the specified scenario includes a hypothetical situation: in this situation, the student has graduated and has been on a job search for about a month. Then he is assumed to receive job offers in Arauca, Quibdó and Riohacha. The job description includes the length and type of the contract, the number of monthly wages that will be

received during the length of the contract, the distance of the cities from Bogotá by plane and finally the monthly wage. All the questions in the survey ask for quantities to be reported in Colombian pesos. As a reminder during the survey, I use the following sentence: "Remember that in Colombia the monthly minimum wage for 2015 was 644.350 COP". This figure equates to 225.7USD at the exchange rate of July of 2015. In Colombia monthly minimum wage is a reference figure or indicator to quantify income and expenses.

The question used to elicit probabilities of migration was the following:

"Imagine that you have recently graduated and have been on a job search for about a month. Then you receive three job offers to work in three different cities: Arauca (Arauca), Quibdó (Chocó) and Riohacha (La Guajira).All of them are one hour away from Bogotá by plane. The type of contract specifies that your employer will pay your health insurance and your pension fund; you will receive 14 wages yearly and it is a one-year contract. Now consider: What is the percent chance that you will accept the offer in each of these cities if the wages is 1 million COP?"

The second question is formulated in the same way, but the wage rises to 1.6 million COP; the third question asks for the percent chance to accept the offer if the wage is 2 million COP and the final question asks for the percentage chance of accepting the offer if the wage is 2.5 million COP.

The selection of the timeframe "you have been on a job search for a month" is related to how much time after graduation, a graduate find a job. According to the Colombian Ministry of labour on average a graduate find a job 10 months after graduation.

The wage categories were made according to the data available on current first wages of graduates collected by the Colombian Ministry of Education (MEN), and with the data reported by El empleo, a well-known job website in Latin America. According to the MEN, the starting average wage in 2014 for graduates of social sciences and engineering is 1.8 million COP and 1.6 for economics, accounting and business. I include data from the job portal elempleo.com in order to include not only data on self-reported wages but also of the job offers placed in the market, 44 % of the offers placed in the job portal are between 1.000.000 and 3.000.000 COP. From the demand side 51% of the job applicants search offers with wages in between this bandwidth. Also, the job website shows that job offers for the recently graduated start with a wage of 800,000 COP (i.e. business management),and can be as high as2.5 million COP (i.e. for a graduate of medicine).The four fixed wages that I use are in between the ones presented by the job portal and the ones presented by the Ministry of Education. The selected wages were 1 million COP, which is equivalent to 1.6 of the minimum monthly wage in 2015; 1.6 Million COP, which is equivalent to 2.5 times the minimum monthly wage; 2 Million COP, equivalent to 3.1 minimum monthly wages and 2.5 Million COP, which is equivalent to 3.9 minimum monthly wages.[4]

In Figure 2.2, 2.3 and 2.4, I show the frequency of responses about the probabilities of migration.

[4]However for some students job offers with the higher wages of 2 million and 2.5 million COP were a surprise; some of them commented to me during the survey, "Do you think that the market for those kinds of wages exists for recent graduates?"

Figure 2.2 Probability of migration to Arauca (Arauca) given four different job offers.

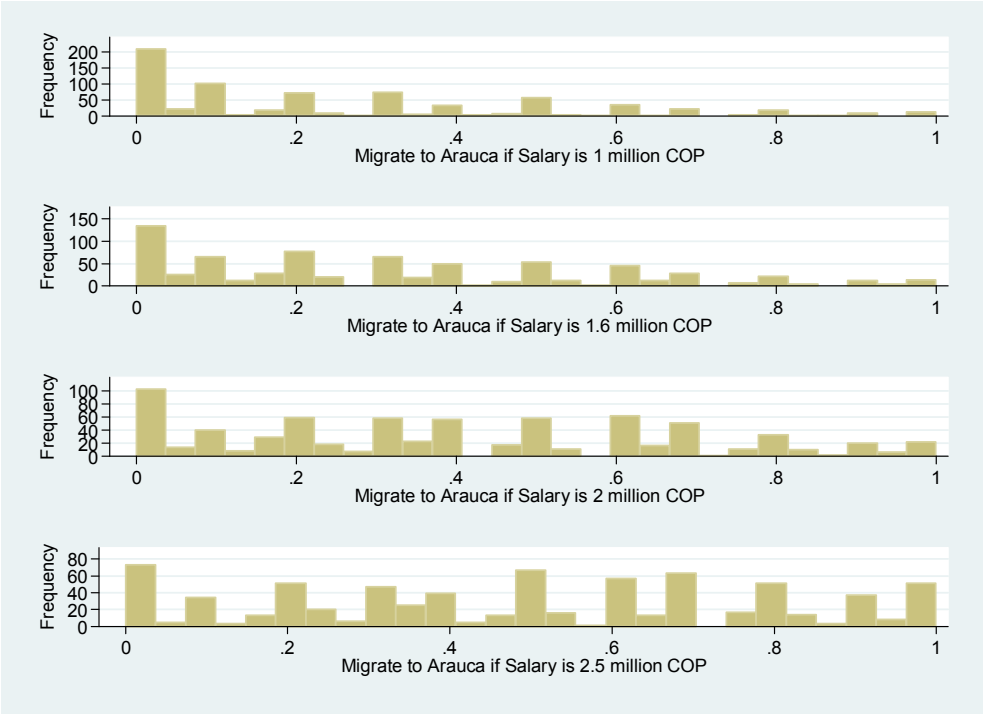


Figure 2.3: Probability of migration to Quibdó (Chocó) given four different job offers.

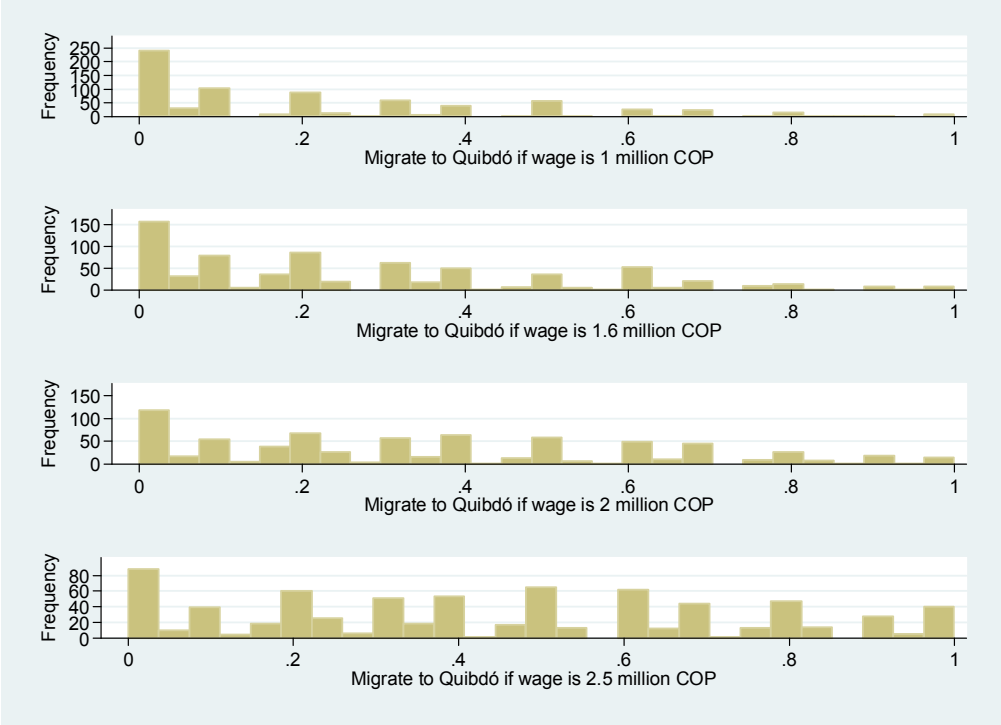
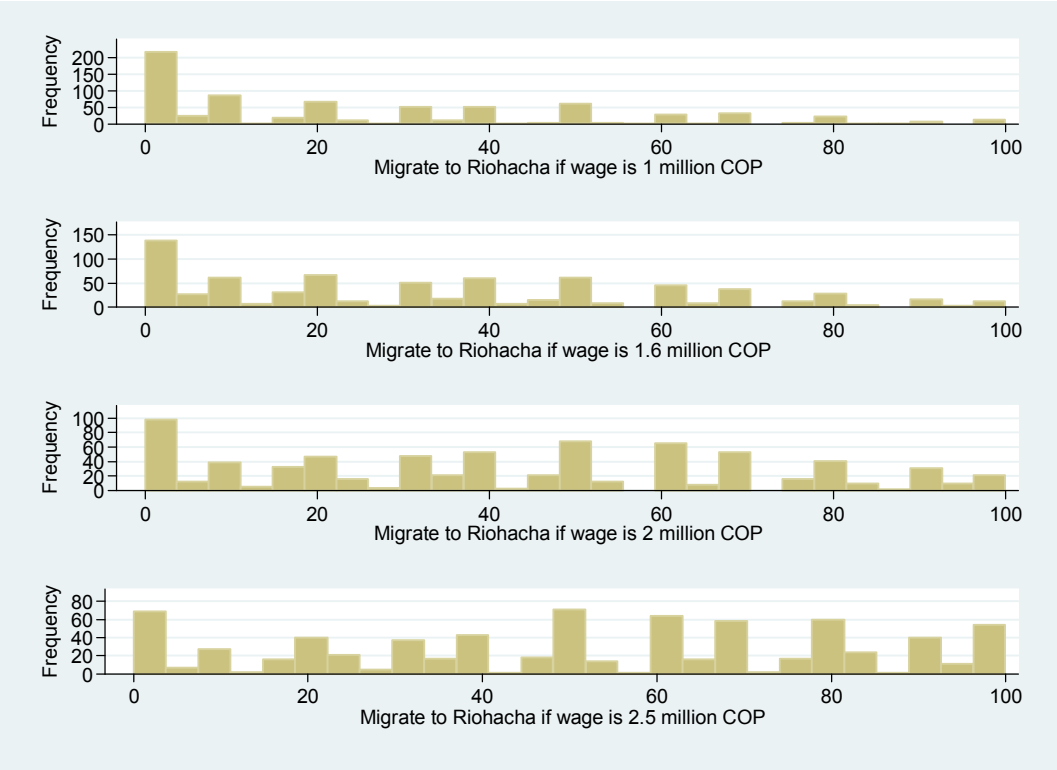


Figure 2.4 Probability of migration to Riohacha (La Guajira) given four different job offers



As can be seen in Figure 2.2, 2.3 and 2.4 the students declare all kinds of probabilities, not only lower and upper. The students declare lower probabilities to migrate to Quibdó (Chocó) when the wage offered is 1 million COP. There are a considerable number of students who reports probabilities of migration of 0 regardless how high are the wages offered. When the wage offered increases to the highest offer (2.5 million COP) more students report a probability of one. Note that when the wage offer increases from the first offer 1 million COP to the next ones 1.6, 2 and 2.5 million COP students start to report different numbers, see in figure 2.4 the differences. Table 5 also shows that on average the probabilities of migration increase when the wages offered increased as well.

Table 2.5 presents the probabilities of migration to Quibdó, Arauca and Riohacha given the 4 different wage offers.

Table 2.5 Probabilities of migration to Quibdó, Arauca and Riohacha given four job offers, expressed in Colombian monthly minimum wage (mw) of 2015 and in USD.

	1 Mllion COP	1.6 Million COP	2 Million COP	2.5 Million COP
	1.6 mw	2.5mw	3.1mw	3.9 mw
	$350.38	$ 560.61	$700.77	$875.96
	mean/sd	mean/sd	mean/sd	mean/sd
Quibdó	0.22	0.27	0.35	0.44
	(0.24)	(0.25)	(0.27)	(0.29)
Arauca	0.252	0.31	0.4	0.48
	(0.26)	(0.26)	(0.28)	(0.30)
Riohacha	0.26	0.33	0.42	0.51
	(0.26)	(0.27)	(0.29)	(0.30)
N	730	731	731	730

1. Colombian monthly minimum wage for 2015 was 225.77 USD or 644,350 COP. The exchange rate used was the average for July 2015.

2. The average response rate was 98%

The least attractive destination is Quibdó. The probabilities of migration increases when the wages increase, proving that on average the monotonicity property is not violated. Yet, for all the cities there are at least two decimal points of standard deviation showing the differences among the respondents.

Arauca and Riohacha are known because of the job opportunities within the oil and coal extraction sector, while Quibdó sadly is usually in the news because of public order offences. The three cities are also known for having socioeconomic and security issues. Therefore it is important to measure how strong the perception is about these issues in order to investigate the individual decision of migration.

In the theoretical models of migration decision, amenities play a crucial role. To measure perceptions about the destinations, I include questions about the probability of finding

amenities such as good schools, access to good hospitals and good roads in Bogotá, Arauca, Quibdó and Riohacha. I choose this set of amenities because all of them are supposed to be provided, at least to some extent, by the government, and they are a proxy measure of how strong the institutions and the government presence are inside a region. Other amenities surveyed were the perceived level of security in Bogotá and the three cities, with the perception of security being measured using a Juster (1964) scale from 0 to 10.The question was: "*How safe do you feel in Bogotá, Arauca, Quibdó, Riohacha. On a scale from 0 to 10, being 0 "Totally unsafe / I fear for my life" and 10 "I feel completely safe*". Other specific items relating to security, like the probabilities of being robbed or being the victim of a violent event, are also measured. Security is a public good usually studied in the migration literature as a push factor. However, the increase of the level of security as a pull factor for internal migration has not yet been fully explored. In Table 2.6 I present the probabilities of finding these amenities.

Table 2.6 Probabilities of finding amenities in Bogotá Quibdó Arauca and Riohacha.

	Bogotá	Quibdó	Arauca	Riohacha	Ftest*
			mean/[sd]		
Level of Security (0-10) [1]	6.52	4.70	4.92	5.29	0.000
	[2.10]	[2.16]	[4.20]	[2.03]	
Probability of being robbed	0.69	0.57	0.54	0.51	0.000
	[0.25]	[0.24]	[0.24]	[0.24]	
Probability of being victim of a violent act	0.54	0.597	0.608	0.529	0.000
	[0.27]	[0.24]	[0.24]	[0.24]	
Probability of commuting to Bogotá during the weekends	NA	0.47	0.48	0.45	0.000
		[0.31]	[0.30]	[0.30]	
Probability of finding good schools	0.90	0.33	0.42	0.41	0.000
	[0.15]	[0.20]	[0.20]	[0.20]	
Probability of finding good roads	0.63	0.28	0.38	0.35	0.000
	[0.22]	[0.17]	[0.19]	[0.19]	
Probability of having access to a good hospital	0.82	0.33	0.38	0.36	0.000
	[0.20]	[0.19]	[0.19]	[0.19]	
N	719	663	688	684	
Response rate	96%	89%	92%	92%	

1. The question was: "How safe do you feel in Bogotá, Arauca, Quibdó, Riohacha; in a scale from 0 to 10, being 0 "Totally unsafe / I fear for my life" and 10 "I feel completely safe?"

* P value of an F test of the equality of the means of the row variable across the four cities

The students consider Bogotá almost two points safer than other destinations (6.52).Surprisingly, given the security and public order conditions of both cities, the perception of security in Quibdó is not distant from Arauca, yet there is an important standard deviation for this city in particular (4.2). Riohacha, which has experienced security issues, is considered by the students the second safest destination (5.29). However, the students consider Bogotá an unsafe city in terms of specific security issues, such as robbery. On other security issues, like being a victim of a violent act, the students perceive all cities in a similar way. This is interesting because Arauca, Quibdó and Riohacha have experienced guerrilla and paramilitary violence as well as criminal gang activity, which are widely reported by the media.

One common practice of workers in the mining extraction industries is to do a long commute; specialized workers go to the cities to work for a fixed amount of time and then

come back to the main cities in which they are established with their families. Therefore I ask about the probability of commuting and returning to Bogotá during the weekends if working in one of the three cities. For the students, commuting is a choice that has on average an almost equal chance in terms of whether it will happen or not.

The question about the schools was formulated using the word "school", denoting primary and high schools and not including universities. This question wants to capture schools as public amenities as well as providing a different time horizon for the migration, as many migrants work in these cities but their families and their life are in the main cities. Students consider that it is possible to find good schools in Bogotá and express some degree of uncertainty for the three cities, with there being lower expectations for Quibdó.

The lack of a sufficiently developed road infrastructure in Colombia is related to the expectations reported about roads in the four destinations including Bogotá. The question about hospitals is about access instead of the existence of good hospitals. This is because Colombia has several health insurance systems, not only public and private, but also special systems for armed forces; public school teachers; and a subsidised system for the poorest population or the population identified in a situation of socioeconomic vulnerability. As expected, access to hospitals is one of the amenities that show bigger differences between the perceptions for the capital city (Bogotá) and the other three cities.

2.6. Modelling Migration intentions to Arauca, Quibdó and Riohacha

The dependent variable of this model is the self-reported probability of migration from Bogotá to Arauca, Quibdó, or Riohacha given four different wages. Each student reports 12 different probabilities of migration, one for each one of the four wages offered, and for

each one of the three cities. I treat each probability of migration as a different observation, then I have now 8964 observations, because each of the 747 students report twelve different probabilities without those who did not report probabilities of migration, the final number of observations begin with 7341 and then after the list wise deletion of the item non response of other dependent variables, the numbers 7061, 7021 and for the last model who include all sets of controls 6887. I create one variable for each difference in the perception of the amenities. The variable is the self-reported probability of the availability of each amenity in city *m* minus the self-reported probability of finding this amenity in Bogotá. I also include a city *m* effect. Usually when the dependent variable is a proportion, as it is in this case, the best approach is to use a GLM model for fractional response data (Papke and Wooldridge, 1996). The same model used in chapter 1.A comparison between OLS and GLM estimates is in Appendix 2.1.

Table 2.7 presents five different models of migration. The first column only includes the logarithmic expected difference in wages and city effect. The second column also includes the socioeconomic characteristics. The third column adds the university and educational characteristics. The fourth column adds the non-cognitive traits, for example a self-reported measure of time preference and trust in others are included, among other characteristics. Finally, the fifth column includes columns one to four plus city different perceptions about availability of the amenities. A full list of estimates is in Appendix 2.2.

The logarithmic difference in wages correspond to the following expression: $ln\ (w_{im}) - P_{jobB} * ln\ (w_{i,Bog})$. The first part is the logarithm of the real wages offered in the destination. It is one of the four different wages that I include in the questions that elicit the probability of migration to Arauca, Quibdó and Riohacha. Then, each one of those wages is converted to real wages using the monetary poverty basket of each

"departamento" which serve as a price index. Since the job offer is already placed, the probability of having each wage is equal to one. Both wages are expressed in USD.

Table 2.7 Average marginal effects for a GLM model of the probability to migrate to city m given a job offer. City baseline Quibdó part A.

	(1)	((2)	(3)	(4)	(5)
	Main	socio economic	University	Non Cognitive traits	City Perception
	b/se	b/se	b/se	b/se	b/se
Expected wage differential between destination and Bogotá	0.019***	0.017***	0.011***	0.016***	0.017***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
Arauca in comparison to Quibdo	0.080***	0.081***	0.081***	0.083***	0.073***
	[0.009]	[0.009]	[0.009]	[0.009]	[0.009]
Riohacha in comparison to Quibdo	0.064***	0.064***	0.063***	0.064***	0.051***
	[0.008]	[0.007]	[0.007]	[0.007]	[0.007]
Gender (male)		-0.031***	-0.025***	-0.024***	-0.020**
		[0.007]	[0.007]	[0.007]	[0.007]
Age		-0.005***	-0.005***	-0.007***	-0.004**
		[0.001]	[0.001]	[0.002]	[0.002]
Married		-0.090***	-0.087***	-0.085***	-0.089***
		[0.018]	[0.018]	[0.018]	[0.018]
High income of the parents		-0.066***	-0.065***	-0.072***	-0.064***
		[0.009]	[0.009]	[0.009]	[0.009]
Strata_1 (Low)		0.132***	0.149***	0.156***	0.149***
		[0.027]	[0.027]	[0.026]	[0.028]
Strata_4		-0.009	-0.019**	0.002	0.003
		[0.009]	[0.009]	[0.010]	[0.009]
Strata_5 (High)		-0.045**	-0.067***	-0.033**	-0.022
		[0.015]	[0.016]	[0.016]	[0.016]
Strata_6 (High)		-0.242***	-0.284***	-0.270***	-0.237***
		[0.025]	[0.026]	[0.026]	[0.026]
Born in Bogotá		-0.020**	-0.021**	-0.028**	-0.020**
		[0.008]	[0.008]	[0.009]	[0.008]
Students who work		-0.084***	-0.096***	-0.092***	-0.095***
		[0.010]	[0.010]	[0.010]	[0.010]
Living with parents		-0.048***	-0.037***	-0.045***	-0.039***
		[0.009]	[0.010]	[0.010]	[0.009]
Top_10			-0.348***	-0.352***	-0.300***
			[0.038]	[0.039]	[0.039]
Top_25			-0.026**	-0.041***	-0.014
			[0.012]	[0.012]	[0.012]
Top_100			-0.01	-0.012	0.005
			[0.017]	[0.017]	[0.017]
Study in a public University			0.280***	0.289***	0.251***
			[0.037]	[0.038]	[0.038]
Having a High GPA > 4			-0.033***	-0.036***	-0.034***
			[0.008]	[0.008]	[0.008]

The probability of migration from Bogotá to Arauca, Quibdó or Riohacha could be explained by the difference between the wages offered in the destination and the expected wages in Bogotá. Across all five columns the wage difference between arrival destination and Bogotá are statistically significant. If the difference in wages is evaluated at the mean,[5] an increase by 20% of the difference in the expected wages increases the probability of migration to Arauca, Quibdó and Riohacha by 0.03 percentage points.

[5]My original variable is the log of the expected wage in destination minus the expected wage in Bogotá one year after graduation. For practical purposes, I found the value of logarithm of the difference between the two wages $ln\ (w_{im}) - P_{jobB} * ln\ (w_{i,Bog})$. LN(736.9)-LN(581.34): this will be X1.Then I create a variable that is the log of the mean value of the average offered wage in the destination

The destinations also affect the intention of migration. According to column five, the probability of migration to Arauca increases by 0.07 when compared to Quibdó. In the case of Riohacha the probability increases by 0.051.

The estimates in column two to five show that having parents with a high level of income, in comparison with parents of a middle income, will reduce the probability of migration to Quibdó, Arauca and Riohacha. This is also confirmed by the inclusion of the socioeconomic strata of the students. The strata classification gives 1 to the lower bound and 6 to the highest; the base line used is strata 3, the most common category among the sample. Being a strata 6 student decreases the probability of migration by 0.2 across the five columns. As a contrast, if the student declares that he is from a less affluent background, strata 1, the probability of migration increases by 0.13, when all controls are included (Column 5).

Older students are less interested in migrating to one of the three destinations. Those who are married and those who live with their parents are also less interested in moving to less developed areas. Moreover, being a student who works will decrease the probability of migration, and this could be explained not only by the student's additional knowledge of the job market but also because those who work are on average older students. Being born in Bogotá also decreases the probability of migration.

The model of column three includes all university characteristics, and among the educational characteristics, being a student of a public university increases the probability of migration by 0.28, while being a student of a top 10 ranked university decreases the

---

increased by 1.2 minus the logarithm of the expected wage in Bogotá: $P_{jobB} * ln\ (w_{i,Bog})$. I use the mean of both variables: P_{jobB} and the logarithm of the mean of $w_{i,Bog}$ .This will be X2. LN (736.9*1.2)- LN(581.34)hen x1-x2 = 0.1823. This will be the value that I will multiply the coefficient of the original difference in salaries: this will be my result. An increase by 20% in the difference in wages increases the probability of migration by 0.03 percentage points.

probability by 0.3. This result holds when individual controls and perceptions of the city are included, across columns 4 to 5. In part B of table 2.7 I continue the discussion of the results.

Table 2.7b Average marginal effects for a GLM model of the probability to migrate to city m given a job offer. City baseline Quibdó part B.

	(1)	((2)	(3)	(4)	(5)
Business			0.090***	0.085***	0.059***
			[0.013]	[0.013]	[0.012]
Law & Political Science			0.412***	0.414***	0.368***
			[0.035]	[0.036]	[0.036]
Engineering			0.070***	0.061***	0.052***
			[0.008]	[0.008]	[0.008]
Self reported willingness to take Risk (0-10)				0.009***	0.009***
				[0.002]	[0.002]
Self reported level of trust in others (0-10)				0.016***	0.015***
				[0.002]	[0.002]
Patience (0-4)				-0.016***	-0.019***
				[0.003]	[0.003]
Self-reported importance of Persistence in live (1-10)				0.003***	0.003***
				[0.001]	[0.001]
Mom who attended College				-0.019**	-0.023**
				[0.008]	[0.008]
Previous experience of family unemployment				-0.018**	-0.016**
				[0.007]	[0.007]
Difference in reported security level in city m and Bogotá (0-10)					0.006***
					[0.001]
Difference in reported probability of being robbed in city m and Bogota (0-10)					-0.009
					[0.016]
Difference in reported probability of being victim of a violent act in city m and Bogota (0-10)					-0.037**
					[0.015]
Probability of commuting to Bogotá during the weekends					-0.013
					[0.011]
Difference in probability of finding good schools in City m and in Bogotá					0.249***
					[0.018]
Difference in probability of finding good roads in City m and in Bogotá					0.058***
					[0.016]
Difference in probability of finding good hospitals in City m and in Bogota					-0.038*
					[0.020]
N	7341	7061	7021	6887	6887

The field of study is also a significant determinant for the decision of migration. For example, being a student of law and political science increases the probability of migration by 0.36 (Column 5) if compared to the students of economics. This result must be handled with caution since only 11% of the sample is composed by future lawyers. In the case of engineering and business if compared with the students of economics, being a student of those two fields will increase the probability of migration by 0.05.

The self-reported level of willingness to take risks and the importance given to persistence are statistically significant and affect positively the probability of migration.

Other characteristics, like the level of trust in others, increase the probabilities of migration by 0.016. Being impatient decreases the probability of migration by 0.017.The results on risk and patience are in line with those obtain by Gibson and McKenzie (2009), in a study that use subjective expectations to measure determinants of migration of the bright and brightest in Papua New Guinea, Tonga and New Zealand.

The city amenities controls affect the subjective probability of migration. An increase in the difference of security in city *m* versus Bogotá will increase the probability of migration by 0.07. While the probability of finding good schools increase the intention of migration to Arauca, Quibdó and Riohacha by 0.26. This is one of the largest effects I found, together with the effect of the type of university and having political science and law as a field of study.

Each student report 12 probabilities of migration, in order to check if the unobserved heterogeneity influence some of these variables and the probability of migration, I include an individual fixed effect model in table 2.8.

Table 2.8 Determinants of migration intention to Arauca, Quibdó and Riohacha Individual Fixed Effect estimates. Dependent variable: Probability of migration.

	FE b/se
Expected wage differential between destination and Bogotá	0.268***
	[0.005]
Arauca	0.043***
	[0.005]
Riohacha	0.044***
	[0.004]
Self-reported security level in arrival destination (0-10)	0.007***
	[0.001]
Self-reported probability of being robbed in arrival destination	0.003
	[0.022]
Self-reported probability of being victim of a violent act in destination	-0.069***
	[0.020]
Probability of commuting to Bogotá during the weekends	-0.077***
	[0.019]
Probability of finding good schools in arrival destination	0.115***
	[0.024]
Probability of finding good roads in arrival destination	0.140***
	[0.023]
Probability of having access to a good hospital in Arrival destination	0.131***
	[0.028]
	[0.026]
Constant	0.048**
	[0.018]
N	7341

In the individual fixed effect estimates, the effect of the difference in wages is larger. An increase in the difference in wages by 20% increases the probability of migration by 5 percentage points. When controlling for those covariates that variate at city level, the difference in the expected wages effect on the probability of migration is bigger. There is important heterogeneity among the individual preferences and perceptions about the cities. Traditionally in migration intention there is only one wage associated or there is uncertainty about the wage in the destination, here I have three destinations and four different salaries that are already offer. The results highlight the importance that the

difference in the perceptions about amenities has in the decision, without controlling at individual level; some of these effects were not visible in the GLM estimates.

Two possible concerns arise with the results obtained and the measurement of the probabilities. The first one is about students that report higher probabilities of migration will migrate regardless the destination. To test this concern I estimate a quantile regression, to check the migration determinants at different quantiles of the probability distribution, the first and the fourth. I show the results of the quantile regressions in table 2.9. The results in table 2.9 show difference between in what affects the probability of migration for those who report lower and higher probabilities of migration. The negative effect of being affluent of being a student who works is higher for those who are at the tail of the distribution (75^{th} quantile). The effect of the risk is positive in both parts of the distribution but is higher at the 25^{th} quantile. The university effect is relevant at the 25^{th} quantile but not at the 75^{th}. The security and the schools matter considerable more for those at 75^{th} quantile. This results also support the argument of how heterogeneous are the beliefs of the students, and therefore how important is to include them in the analysis.

The second concern is that since the surveys are long and respondents got tired, the students will report the same probability of migration to the three cities. 21% of the sample reports the same probability of migration for the three cities. In the appendix 2.3 I present the average marginal effects of the GLM model and the fixed effect estimates excluding those who answer the same probability for the three destinations and for the four wage offers. The GLM estimates of the subsample are similar to the full sample estimates.

Table 2.9 Determinants of migration intention to Arauca, Quibdó and Riohacha. Quantile regressions at p25 and p75. Dependent variable: Probability of migration

	P25 b/se	P75 b/se
ln (Wage offered in arrival destination)- [P(job Bog) *ln (expected wage)]	0.017*** [0.002]	0.023*** [0.002]
Arauca in comparison to Quibdo	0.050*** [0.006]	0.098*** [0.009]
Riohacha in comparison to Quibdo	0.028*** [0.005]	0.073*** [0.008]
Gender (male)	-0.010** [0.005]	-0.037*** [0.007]
Age	-0.009*** [0.001]	0.002 [0.001]
Semester	-0.003** [0.002]	0.005** [0.003]
Married	-0.026** [0.011]	-0.142*** [0.017]
Having at least one child (dummy)	0.035*** [0.010]	-0.024* [0.014]
Low income of the parents	0.026*** [0.006]	0.006 [0.009]
High income of the parents	-0.038*** [0.006]	-0.077*** [0.009]
Strata_1 (Low)	0.255*** [0.021]	0.185*** [0.031]
Strata_2	0.034*** [0.007]	0.020** [0.010]
Strata_4	0.021** [0.007]	0.024** [0.010]
Strata_5 (High)	0.009 [0.011]	-0.044** [0.016]
Strata_6 (High)	-0.142*** [0.015]	-0.234*** [0.022]
Born in Bogotá	-0.011* [0.006]	-0.022** [0.009]
Students who work	-0.061*** [0.007]	-0.110*** [0.010]
Living with parents	-0.021** [0.006]	-0.071*** [0.010]
Top_10	-0.491*** [0.060]	-0.166* [0.090]
Top_25	-0.046*** [0.008]	-0.01 [0.012]
Top_100	0.038** [0.012]	-0.026 [0.019]
Study in a public University	0.448*** [0.060]	0.105 [0.089]
Having a High GPA > 4	-0.031*** [0.005]	-0.011 [0.008]
Missing correction for having a high GPA	0.106*** [0.011]	0.005 [0.017]
Business	0.093*** [0.010]	0.043** [0.015]
Law & Political Science	0.551*** [0.059]	0.235** [0.088]
Engineering	0.027*** [0.006]	0.083*** [0.009]
Self reported willingness to take Risk (0-10)	0 [0.001]	0.023*** [0.002]
Self reported level of trust in others (0-10)	0.009*** [0.001]	0.021*** [0.002]
Preference for present returns (0-4)	-0.024*** [0.002]	-0.012*** [0.003]
Self-reported importance of Persistence in live (1-10)	0.004*** [0.000]	0.002** [0.001]
Self-reported Importance of networks to access to labor market (1-10)	0.000 [0.001]	0.003 [0.002]
Self-reported level of attachment to fhe Family	0.001* [0.001]	-0.003** [0.001]
Mom who attended College	-0.014** [0.006]	-0.047*** [0.008]
Previous experience of migration in the Family	0.012** [0.005]	-0.033*** [0.008]
Previous experience of family unemployment	-0.005 [0.005]	-0.028*** [0.007]
Difference in reported security level in city m and Bogotá (0-10)	0.004*** [0.001]	0.009*** [0.001]
Difference in reported probability of being robbed in city m and Bogota (0-10)	-0.007 [0.010]	0.021 [0.016]
Difference in reported probability of being victim of a violent act in city m and Bogota(0-10)	-0.031** [0.010]	-0.069*** [0.015]
Probability of commuting to Bogotá during the weekends	-0.024** [0.007]	-0.018* [0.011]
Difference in probability of finding good schools in City m and in Bogotá	0.157*** [0.013]	0.311*** [0.019]
Difference in probability of finding good roads in City m and in Bogotá	0.040*** [0.010]	0.048** [0.015]
Difference in probability of finding good hospitals in City m and in Bogota	-0.022* [0.013]	-0.014 [0.020]
N	6887	6887

2.7. Conclusions

I have surveyed a specific population of potential migrants: university students in Bogotá, Colombia, that are near to their graduation. I try to understand the motivations behind a migration decision from Bogotá to less developed regions like La Guajira, Arauca and Chocó. Despite the limitations of the sample size, the expectations and perceptions that the students have about these regions are likely to be of interest to policy makers and academics. In a tight job market such as Colombia, a first employment initiative that could mobilize recent graduates to work in the regional institutions of less developed regions, could help to improve the resource allocation and generate regional development.

I found that an increase by 20% in the expected wages difference between Arauca, Riohacha and Quibdó and Bogotá, increases the probability of migration to these cities by 5 percentage points. Venhorst (2013) point out that graduate migration in the case of the Netherlands is driven by "region familiarity". It is how similar is the arrival region to familiar home regions. It is clear that Arauca, Quibdó and Riohacha are substantially different from Bogotá. Therefore other factors like the job opportunities, and in this study particular setting, the first job as a graduate experience, the difference in wages must be exploited as part of the incentives inside the regional policy design.

The expectations about the provision of public goods, such as schools, access to hospitals and good road infrastructure increases the probability of migration to these cities. I found the results concerning schools were particularly interesting. The students believe in education as a development tool, therefore if the regional institutions focus their efforts in their own schools not only will they increase their own human capital but they will also attract more. Arauca (Arauca), Quibdó (Chocó) and Riohacha (La Guajira) are not three

popular destinations; they have problems with poverty and public order issues. Therefore I expected a larger effect of the security perception in the probability of migration; however, other public goods such as schools and hospitals matter more in the decision.

The universities in Colombia educate different types of graduates. Those who are part of the top 10 universities will be less interested in migrating to Arauca, Quibdó and Riohacha. These students are probably expecting bigger opportunities from the job market in Bogotá. However being a student from a public university is one of the largest effects that I found, together with being a student from political science and law: this bachelor's degree has not previously been associated with labour migration in Colombia, at least not as strongly as engineering, for example. These results are encouraging, since the public university that I include is also a top 10 university. It means that some of the brightest graduates and also those from different degree disciplines are also considering migrating. These results give some light in terms of what kind of graduates want to migrate and therefore how to design a tailored graduate migration programme in Colombia.

The results of the individual fixed effect suggest that commuting will decrease the probability of migration of the graduates to these areas. Traditionally the migrant population of Arauca and Riohacha are commuters, who have their life and home in another Colombian city. the results show that the intention of the university graduates is to repeat this type of behaviour, then the challenge of the national government and the governments of Arauca, Quibdó and Riohacha is how to make these regions attractive enough that future migrants might consider living there instead of commuting.

The non-cognitive trait related to the student environment, like a previous migration experience and how attached an individual is to his family, do not seem to be relevant in explaining the probability of migration. Yet, a previous unemployment experience inside the family is associated with a decrease of the probability of migration. This experience could negatively influence the preference for risk and since to migrate is a risky decision, also negatively affect this probability. As a contrast a higher preference for risk is associated with an increase in the probability of migration. A migration decision is always a risky decision, but also a decision that requires patience to adapt to the new destination. Other traits are also important, such as placing trust in others.

As a regional development strategy, regions must focus on offering higher entrance wages to university graduates and improve the supply of public goods such as security, schools, access to hospital and roads. Future research must be focused on exploring how other factors, such as exposure to violence and contentment in Bogotá, affects the migration decision. Dynamic models will provide further enlightenment on how long these graduates are likely to establish themselves in Arauca, Quibdó and Riohacha.

Chapter 3 Subjective expectations and personal traits: Entrepreneurial intentions of university graduates in Bogotá, Colombia.

3.1 Introduction

The creation of quality and sustainable jobs is one of the main goals of economic development. One form of job creation is through sustainable and long lasting entrepreneurial activities. Developing countries are commonly pointed out as a fertile environment for entrepreneurship, since the job market is tighter in these countries, the economy drives the individuals into starting new businesses (Iakovleva et al., 2011). However, in developed societies with a higher amount of job positions, risk adverse individuals will be less likely to start an entrepreneurial activity (Iyigun and Owen, 1998). In this study I will use as a definition of entrepreneur, the simplest one: it is anyone who starts and runs a new business (Stull, 2014). This definition includes Baumol's classifications of creative and replicative entrepreneurs and keeps the focus on the decision to start a new business, rather than on other discussions that are outside of the scope of this chapter.

Using two sections of my own survey of university students, the same survey used in chapter 2. I study the determinants of the decision to become an entrepreneur of university students in Bogotá, Colombia. In particular I want to investigate: what is the role of earning expectations at paid and self employment in the subjective probability of becoming an entrepreneur? I elicit the self-reported probability of becoming an entrepreneur and the probability of finding a job in Bogotá five years after graduation; the expected earnings as an entrepreneur and the expected earnings as an employee in Bogotá. Since entrepreneurial attitudes are significant in explaining career choices (Fitzsimmons and Douglas, 2005), I ask for the self-reported measures of those attitudes,

like willingness to take risks, a preference for income but also other work perquisites and non-pecuniary factors, such as the desire for independence and effort aversion. The results show an important amount of heterogeneity in the student's beliefs about (i) expected earnings as entrepreneurs and as employees (ii) their own preference for becoming entrepreneurs, (iii) higher expected income as an entrepreneur is associated with a higher probability of becoming one and (iv) the non-cognitive traits associated with entrepreneurial attitudes increases this probability. In the survey, on average five years after graduation a student expects monthly earnings as an entrepreneur of $2040 USD and the average probability of working in their own firm is on average 0.58, then the expected earnings accounting for the risk of becoming an entrepreneur are $1183 USD; while the expected wage as an employee, considering the average reported probability of finding a job is 0.8 five years after graduation, are $1308 USD. Then, the earnings of potential entrepreneurs are lower than the expected wage as an employee.

Colombia a country of 49 million inhabitants had in 2016 1,379,284 firms, of which 370,318 were registered as societies or corporations and 1,008,996 were registered as single proprietorships. The survival rate of the firms, in the first five years after their creation, is 29.7% and on average the life of a firm in Colombia is 12 years (Confecamaras 2016). According to the Global Entrepreneurial Monitor (GEM) survey[6], in 2016, 53% of the surveyed population in Colombia (2069 individuals) declare an intention to create a firm; however of those 53%, only 16% actually create their own firm. Those in the age group from 25 to 34 years old declare the higher intentions to become an entrepreneur. Colombian start ups it is those firms that are at their first five years in the

[6] The survey asks a stratified random sample of 2,069 individuals. According to GEM policies, the minimum number of respondents should be 2,000.

market but are characterized by being able to replicate and upgrade their scale of production have created 7933 direct employments. Moreover 84.4% of the entrepreneurs of the start-ups have at least a university degree. The main field of study associated with the start-ups are those related to economics and by second place those fields related to informatics and engineering (Innpulsa 2017). I include these two fields of study in my survey. Beside the common statement about the importance of entrepreneurship for developing countries, exist also the possibility to use entrepreneurship as a form to mitigate the unequal returns to higher education by creating alternative job sources in a tighter job market as Bogotá Colombia where 20% of the Colombians with a tertiary degree does not find a job (OMMTS 2017) and between 2009 to 2016 the number of overeducated workers has increased from 14.9% to 20.1%.

University graduates are a special group of entrepreneurs in developing countries. As a result of their education they have a set of skills that could be used to create ventures or firms with more value added to the economy. Also formal education has been associated with the creation of human capital and consequently human capital has been proved to be an important attribute for nascent entrepreneurs (Davidsson and Benson, 2003). The entrepreneurs with higher education are associated with bigger firm sizes, therefore become sources of employment for others (Burke et al., 2002). In developing countries, an entrepreneurial activity developed by university graduates could improve not only their own quality of employment but the quality of employment of others, since having a firm will warrant that they are creating formal employment opportunities.

The main theoretical frameworks used to study entrepreneurial behaviours are linked directly to the concept of intention. Bandura (1993) introduces the concept of self-efficacy, defined as the confidence that each individual has in their own ability to fulfil a

task. Ajzen's (1991) theory of planned behaviour (TPB) describes how a decision is a result of attitude toward behaviour, subjective norms (peer perception) and perception of control (perception of own skills). Shapero and Shokol's (1982) Entrepreneurial Event Model considers how a person's attempt to launch a new venture can be explained by desirability, perceived feasibility and propensity to act. Despite the links between the theoretical frameworks in relation to expectations and preferences, to the best of my knowledge surveys on entrepreneurial behaviours do not measure uncertainty or beliefs in a quantitative form[7]. I propose in this chapter the subjective probability of becoming an entrepreneur as a self-assessment of the future graduates own capabilities, skills, preferences and beliefs.

I make two contributions to the literature on entrepreneurial intentions: (i) Using a measuring subjective expectations as a synthetic measure of the intention of becoming an entrepreneur (ii) Analyzing the role of the expected earnings as an employee and as an entrepreneur. This chapter is organized as follows: the second section is the literature review, the third section provides the institutional context, the fourth section presents a simple theoretical model of entrepreneurial decision, and the fifth section presents the data. The sixth section presents the empirical results and a conclusion is given in the seventh section.

3.2 Literature review

The decision to become an entrepreneur has been investigated by different research disciplines seeking to identify the economic and psychological motivations of individuals choosing to pursue a self-employment career. The studies mainly focus on how the

[7] See appendix 3.1 to review other form of questions about entrepreneurial intentions.

intentions to become an entrepreneur are formed, by actual and potential entrepreneurs, and how many of these intentions lead to actual behaviours. Most of the studies conclude that the decision is a combination of pecuniary and non-pecuniary factors (Stull, 2014) and that the entrepreneurial intentions are good predictors of subsequent entrepreneurial behaviours. The economic theory models the decision of becoming an entrepreneur as a choice between a risky (self-owned firm) and a safer option (wage paid employment), using utility maximization criteria (Lucas, 1978; Kihlstrom and Laffont, 1979; Douglas and Shepherd, 1999, 2002; Parker, 2004; Lazear, 2005; Stull, 2014; Morgan and Sizak, 2016). While in management and psychology, the main frameworks used are the Theory of Planned Behaviour (TPB) (Ajzen, 1991), the entrepreneurial event model (EEM) (Shapero, 1975; Shapero and Shokol, 1982) and the concept of self-efficacy (Bandura, 1977, 1983).

In this literature review, I first present the theoretical approaches of the economic theory to the decision of becoming an entrepreneur. Then I present relevant empirical studies, making a distinction between potential and actual entrepreneurs, followed by the main concepts of the theoretical framework used by management and psychology. To conclude I present the studies that have been undertaken of the entrepreneurial intentions of university students in Colombia.

3.2.1The decision to become an entrepreneur according to the economic theory.

The theoretical microeconomic models of the entrepreneurial decision describe the decision between starting a firm and accepting a paid employment, using utility maximization criteria. In the industrial organization literature, the characteristics of the entrepreneur have been part of the models explored but have been studied for different

purposes, for example to understand the equilibrium of the market or the optimal size of the firms. For Khilstrom and Laffont (1979) the most salient factors that influence the choice of becoming an entrepreneur are the level of entrepreneurial abilities, labour skills and the initial access to the capital required to create a firm and the level of risk aversion. Focusing on the last item, they found that less risk adverse individuals will become entrepreneurs and the most risk averse will become labourers. However the economic factors were not included in the utility function of the entrepreneur. In this respect, Campbell (1992) developed a model to determine the economic factors of the decision of becoming an entrepreneur, finding that if the expected net benefits of the entrepreneurship are positive and higher than the expected gains from wage labour, the individual will start a new venture. The expected benefits in both activities are a function of average wages of self-employment and wage employment, and the probability of finding a job is a function of the general state of the economy. An increase in the level of success as an entrepreneur and the differential in both expected incomes will depend on the level of risk aversion, since the decision of the risk preferrer will be less affected by the probability of success.

Personal traits such as work effort and desire for independence were also included in the utility maximization criteria. Douglas and Shepherd (2000) present a theoretical model of entrepreneurial decision, in which the utility function of an entrepreneur is a function of the perceived income of a self-employee, the work effort required, the level of risk that the activity of being self-employed carries, the anticipated level of independence obtained in the self-employed job, and other working perquisites. The results shows that the greater the tolerance to risk bearing, and the higher the preference for independence or decision making control, the greater the incentive will be to be self-employed. Authors also

conclude that even if individuals with a higher level of effort and greater tolerance for work and risk, and a preference for independence, will be more prone to become self-employed, these attitudes are neither sufficient nor necessary conditions to become self-employed.

The role of initial wealth and observable conditions of the labour market were also included in the utility function of the entrepreneur. Eisenhauer (1995) investigated the decision of becoming an entrepreneur in the self-employment population of the US. Using time series data of the ratio of non-agricultural self-employed workers to the civilian labour force as a proxy of self-employment, Eisenhauer (1995) finds that the probability of self-employment is positively related to the initial wealth, and to the number of hours worked in a wage employment, but negatively related to real hourly wages in the employment sector, and unemployment insurance. Blanchflower and Oswald (1998), using the National Child Development Study (NCDS), a longitudinal study in Great Britain, investigate how the probability that an individual might declare herself as self-employed is affected by psychological variables and inheritances and gifts received. They also consider how inheritances and gifts, as a proxy of the absence of financial constraints, affect individual past movements in and out of self-employment. The results are that those who receive an inheritance or gifts are more likely to become self-employed and psychological variables including hostility and acceptance anxiety are not determinants of self-employment. Another study of actual entrepreneurs is made by Lazear (2005), who defines the entrepreneur as an individual who has a wider set of skills rather than an expert or specialist in one field. The choice problem becomes a decision between acquiring a wider set of skills instead of becoming a specialist. Using a dataset of Stanford alumni, Lazear (2005) finds that those alumni who become entrepreneurs

have a balanced set of skills, come from different academic backgrounds and have a wider range of previous occupations.

Focusing on potential, rather than actual entrepreneurs, Douglas and Shepherd (2002) and Stephens et al. (2006) investigate determinants of entrepreneurial intention in business graduates and MBA students. Douglas and Shepherd (2002), using their own survey and conjoint analysis,[8] propose different entrepreneurial scenarios in which they combined low or high level of income, independence, risk bearing and work effort. The graduates must rank the different scenarios using an 11 point scale from "very low utility" to "very high utility". The results show a positive relation between the individual attitudes toward risk and independence with the entrepreneurial intentions. Stephens et al. (2006), using discrete choice models, study the prediction of entrepreneurial intentions from the attitudes and perceived abilities of MBA students. The findings show that a higher perception of income and independence within the self-employment option compared to wage employment will increase the individual entrepreneurial intentions. Also an individual who has lower self-expectations of their abilities as an entrepreneur (lower self-efficacy) will expect a higher income as an employee; conversely an individual that has a higher self-efficacy will expect a higher income derived from a self- employment activity.

3.2.2 The entrepreneurial decision according to management and psychology theory.

Intentions have been proved to be to some extent good predictor of behaviours, according to psychology literature. In particular, intentions are good predictors of behaviours when

[8] A revealed preference method where the consumer preference is estimated based on the overall evaluation of the set of alternatives that have pre-specified attributes, in order to evaluate the utility derived from the entrepreneurial offers.

the behaviours are rare or hard to observe or involve unpredictable time lags (Krueger et al., 2010 p.11). Following this line of argument, the decision of becoming an entrepreneur has been studied by understanding the intention to become an entrepreneur. This has been the approach used mainly by psychology and management researchers, among other disciplines; they have created a field of research called entrepreneurial studies. The studies of entrepreneurial intention of university students consider efficacy, entrepreneurial attitude, motivation and subjective specifications as the main study determinants (Valencia et al., 2016). The Theory of Planned Behaviour by Ajzen (1991) and the Entrepreneurial Event Model (EEM) by Shapero and Sokol (1982) have been the two theoretical approaches mainly used to study entrepreneurial intentions (Karali, 2013).

In 1991, Ajzen developed the Theory of Planned Behaviour (TPB); this theory establishes three determinants of intention behaviour. The first one is attitude toward behaviour, and according to this determinant a suggested behaviour is evaluated on how favourable or unfavourable it is and this valuation is subject to the reflex of an individual's own personal beliefs. The second is the subjective norm, which represents the social or peer pressure that will induce certain behaviour, for example, the expectations that family and friends may have about the individual. The third determinant is the perception of control, relating to the perception that the individual has of their own skills. TPB is the main theoretical framework used to study entrepreneurial intentions among university students (Valencia et al., 2016). Another concept widely used is the self-efficacy theory (Bandura 1977, 1993), defined as the confidence that an individual has in their own ability to accomplish a task. The higher the self-perceived capability, the higher will be the size of the goal and the commitment to achieve it. According to Bandura, self-efficacy processes are governed by how individuals feel, think and motivate themselves. In the EEM

(Shapero and Sokol, 1982) a person attempting to launch a new venture is defined according to three key factors: the perceived desirability of the goal, the perceived feasibility and the propensity to act.

The studies of entrepreneurial intentions of university graduates usually incorporate a self-designed survey which collects data of the components of the theory of planned behaviour (TPB) or measurements of self-efficacy. Depending on the scope of the study, the surveys are carried out in one or several universities in single or multiple countries; including students from different fields of study; or students that are taking specific programmes of entrepreneurial education. Some of the studies describe the survey findings, while others use cross-sectional statistical modelling techniques such as factor analysis, path analysis and regression. One upfront caveat of the studies is the lack of standardization or a unique metric to test entrepreneurial intentions (Liñan and Chen, 2009). The representativeness is also usually difficult to achieve, since studies are not representative of all universities.

The main findings are that students from developing countries have higher entrepreneurial intention in comparison with the developed countries (Iakovleva et al., 2011; Kuttim et al., 2014). Culture also plays a role, since students from different cultures rank differently in terms of entrepreneurial attitudes (Pruett et al., 2009; Fitzsimmons and Douglas, 2005). Having a family member who is an entrepreneur positively affects your intention to become an entrepreneur (Espiritu-Olmos and Sastre-Castillo, 2015; Zellweger et al., 2011; Pruett et al., 2009). Relevant personal traits include kindness, the need for achievement (Majumdar and Varadarajan, 2013; Fitzsimmons and Douglas 2005), tolerance of ambiguity, neuroticism, extroversion, inner control and the tendency to risk taking (Espiritu-Olmos and Sastre-Castillo, 2015; Khuong and Huu Ann, 2016).

The preference or the tendency to risk taking is one of the most salient determinants of the entrepreneurial intention (Ozaralli and Rivenburgh, 2016; Zhang et al., 2015). In contrast, the fear of failure is studied as a factor that negatively affects the intention of becoming an entrepreneur, as reviewed by Morgan and Sizak (2016). The difference between expectations about the job market and the individual's own expectations has also been studied. A self-valuation of individual capabilities and self-expectations about the job market affect the decision process: some individuals consider the job market does not value their skills, therefore they expect less non-entrepreneurial job opportunities, and they end up accepting an uncertain entrepreneurial job opportunity because they feel their satisfaction will be greater (Lee and Venkataraman, 2006).

The decision of becoming an entrepreneur is also influenced by the individual's environment. The impact of the environment begins with having an entrepreneur as a role model in the nearest level of interaction: families, neighbours and peers (Kacperczyk, 2013). But the effect of the environment does not end there: entrepreneurial education at high school (Osorio and Londoño, 2015) and during undergraduate studies (Oosterbeek et al., 2010) is also another level of environmental influence. The results concerning the effect of the entrepreneurial education on the entrepreneurial intention of the students show mixed results; some of the studies find that an entrepreneurial education has little or no effect on the entrepreneurial intentions (Premand et al., 2016: Oosterbeek et al., 2010), while others found a positive effect on entrepreneurial intention (Maresch et al., 2016; Fayolle and Gailly, 2015; Hattab, 2014; Karimi et. al., 2013; Souitaris et al., 2007; Wilson et al., 2007; Turker and sönmez selçuk, 2009).

Another possible effect of education is the field of study chosen by the student. Many surveys about entrepreneurial behaviours focus on students of business and management,

yet there is evidence that entrepreneurs could come from different fields of study (Lazear, 2005). On a wider level, the effect of the environment is studied by contrasting the behaviours of individuals of different cultures. Culture is defined as a shared set of values, beliefs and expected behaviours (Hofstede, 1980). Fitzsimmons and Douglas (2005) investigate to which degree the entrepreneurial attitudes and abilities affect the entrepreneurial intentions and whether these effects vary across different cultures. The results show that the effects of entrepreneurial attitudes on the decision to become an entrepreneur do vary across cultures, and also that each culture values each entrepreneurial attitude differently. Economic factors such as per capita income could partially explain the difference in the entrepreneurial behaviours for some but not all of the countries surveyed.

3.2.3 Entrepreneurial decision studies in Colombia

The literature of the entrepreneurial intentions of the students in Colombia is scarce. The studies follow Ajzen's TPB, developing their own surveys in different stages of education including high school level (Osorio and Londoño, 2015) and undergraduate studies (Soria et al., 2016; Varela et al., 2011). Furthermore, some of them are cross-country studies (Soria et al., 2016; Rodríguez and Prieto Pinto, 2009; Gasse and Tremblay, 2011). In the case of Colombia, the social legitimacy that is gained from being an entrepreneur is relevant in increasing entrepreneurial intentions (Soria et al., 2016). Positive attitudes toward entrepreneurship, together with the exposure to entrepreneurial activities, are determinants of the intentions (Osorio and Londoño, 2015). The perception of how difficult it is to become an entrepreneur and the perception of the individual's own skills level (self-efficacy) have a less relevant effect in the case of high school students.

Subjective norms show no statistical significance to explain entrepreneurial intentions of high school and university students (Soria et al., 2016).

Varela, Martinez and Peña (2011) study the effect of a tailor-made entrepreneurial education programme on students of economics, business and engineering by surveying the students' entrepreneurial attitudes and demographic aspects. The results show that women show less entrepreneurial intentions than men. While financial constraints are perceived as the main barrier to creating a firm. The student motivations to become entrepreneurs are ranked as follows: the primary motivation is their self-fulfilment, the second is the desire to be their own boss, the third motivation is making money and the final impetus is facing a challenge.

Soria et al. (2016) study the entrepreneurial intentions of business students in Chile and Colombia using TPB. While for Chilean students the TPB is able to explain the entrepreneurial intentions, for Colombian students it fails and only two variables have explanatory power: attitude toward entrepreneurship and perceived behavioural control. The social legitimacy of entrepreneurship is a factor that influences the individual entrepreneurial intentions in both countries. Rodríguez and Prieto Pinto (2009), using Ajzen's TPB, study the entrepreneurial intentions of university students in France, Tunisia and Colombia. They found there were higher entrepreneurial intentions among Colombian women than compared to France, and also that Colombian students perceive they could achieve economic stability by developing their own entrepreneurial activity. Finally, Colombian students value highly the possibility that being an entrepreneur brings the opportunity to take risks and to be creative at their work.

This chapter seeks to contribute to the study of entrepreneurial intentions in Colombia by including the probability of becoming an entrepreneur as a comparable measure of the

entrepreneurial intention, and by including self-reported measures of earnings in self-employment and wage employment. Stephens et al. (2006) stress the importance of having data on the perceived knowledge of the potential entrepreneurs about the income, risk and work effort of the two work choices: being self-employed or being an employee. However this data is rarely collected or used in the entrepreneurial intentions research. By asking students about their expected income in self-employment and wage employment, their willingness to take risks and ascertaining their levels of work effort, I try to overcome this lack of data. Some of the studies restrict their samples to students of one or two fields of study and surveyed only one university. With the aim to cover the spectrum of university education in Bogotá, Colombia I surveyed students from 9 different universities and 4 different fields of study.

3.3 The institutional context

The Republic of Colombia has 49 million inhabitants and is an efficiency-driven economy. An efficiency-driven economy is an economy that has become more competitive with further development and is accompanied by industrialization processes, relying more on economies of scale, with a larger capital intensive organization. 94.7 % of Colombian registered firms are micro firms with less than 10 workers and 4.9% are small firms which have between 11 to 50 employees and medium firms with between 50 to 200 employees[9].

3.3.1 Firms in Colombia

[9]The firm classification in Colombia includes two characteristics: size and assets. A micro firm hires up to 10 workers or has assets of less than 500 monthly minimum wages (122,745 USD). A small firm hires between 11 and 50 workers and has assets between 501 and 5000 monthly minimum wages (between 122,745 and 1.2 million USD). A medium firm hires between 51 workers and 200 workers and has assets between 5001 and 30,000 monthly minimum wages (1.2 million and 7.3 million USD) (Mincit.gov.co).

In 2016 Colombia had 1,379,284 firms, of which 370,318 were registered as societies or corporations and 1,008,996 were registered as single proprietorships. The number of new firms increased by 17%, in comparison with the figures published in 2015. The survival rate of the firms, in the first five years after their creation, is 29.7% and on average the life of a firm in Colombia is 12 years. The main sectors for new firms are commerce, followed by tourism, manufacturing industries and professional activities (Confecamaras, 2016). According to the Global Entrepreneurial Monitor (GEM) survey,[10]. In 2016, 53% of the surveyed population (2069 individuals) declare an intention to create a firm; however of those 53%, only 16% actually create their own firm. Those in the age group from 25 to 34 years old declare higher intentions to become an entrepreneur and 32% of people who hold a university degree are engaged in a nascent or new entrepreneurial activity, compared to 25% who only hold a high school degree.

3.3.2 Higher Education in Colombia

The Colombian higher education system has three types of undergraduate degrees: Technical and technological, that last 2 years, and academic degrees that last between 4 and 5years ,depending on the field of study. Between 2001 and 2014, approximately 3.2 million students graduated in Colombia, including those who have completed undergraduate and graduate degrees (MEN, 2016). Of those students, 1,355,919 graduated during the period between 2011 and 2014. Traditionally there are more graduates with University degrees: of those the 1,355,919 graduates, 45.3% obtain a University degree; 26.8% obtain a technological degree and 5.7% a technical degree, while the other 22.2% graduates have completed postgraduate studies. Higher education is highly concentrated in the most developed cities, which are the capital cities of the

[10] The survey asks a stratified random sample of 2,069 individuals. According to GEM policies, the minimum number of respondents should be 2,000.

"departamentos" of Colombia. The "departamentos" are the equivalent to a region in other countries. 34% of the graduates in the period 2001-2014 have studied in Bogotá, the capital city of Colombia. Only five "departamentos" are responsible for producing 65.5 % of the graduates.

According to the Colombian Ministry of Education (MEN) in 2015, 49% of the population aged 17-21 years old were pursuing higher education, and were enrolled in all forms of higher education in Colombia. The national unemployment rate for the youth population in 2015 was 15.3%, while in the capital city of Bogotá the unemployment rate was 13.2% (Mintrabajo, 2016). However for every five of those who are working, only two are formally employed, in other words having a contract that covers social security and health. It is important to stress the fact that the youth population for the employment rate was calculated including people from age 18 to age 28. Colombia has experienced an increase in higher education enrolment and a change in the labour force, with the rate of workers with tertiary education increasing from 17.4% in 2009 to 21.7% in 2016 (OMTSS, 2017). In the same period, the number of overeducated workers has increased from 14.9% to 20.1%.; a worker is overeducated when he has a higher educational degree than the one required for his job. Despite the important effort to increase the rate of university enrolment, this effort is not necessarily linked to an improvement in the employment rate of graduates. In 2016, the rate of unemployment of university graduates in Colombia was 9.5% for men and 10.5% for women (OMTSS, 2017). In 2015, a report by the Inter-American Development Bank provided evidence that the returns of higher education in Colombia could be negative for some of the graduates, depending on the type of university and the field of study (Gonzalez-Veloza et al., 2015). In the following section I expand this overview with a focus on the specific characteristics that I surveyed.

The HEI in Colombia differ in terms of their quality. An external organization evaluates the institutions, covering all aspects of academic quality, and at the end of the process, if the evaluation is positive the institutions are awarded with a higher quality certification. Colombia has 327 HEI that includes institutions who offer only technical and technological degrees, and the different campuses of the main public and private universities. 132 HEI are located in the Bogotá and suburbs, of these 132 HEI, 40 are Universities, 23 are public, and 6 are ranked top-10 in the country (Ham et al. 2016). Since 2015, as an informative parameter of quality, the Colombian Ministry of Education (MEN) has developed their own higher education institution ranking: the model of indicators of academic performance, or MIDE (with the acronym derived from the Spanish term for the model). The ranking combines the institutions' performance in higher education state exams, the first salaries achieved as a university graduate, and the research status, including number of researchers, patents, publications, citations and internationalization and research networks. I use this ranking to classify the universities that participated in my survey.

Colombian HEI also differ in terms of their nature, with 48% of the graduates between 2011 and 2014 obtaining their degree from public HEI and 52% from private institutions. The universities are further differentiated by their selectiveness and tuition fees. The main public university has their own admission exam, while other public universities and private institutions rely on the state exam which is equivalent in nature to the SAT in the US. The elite universities combine state exam thresholds and their own interviews as the model for their selection criteria. The tuition fees could vary from 26.6 USD to 4,694 USD per academic year in a public university, in which the tuition fees are charged according to the socioeconomic characteristics of the students; while in the private

institutions the tuition fees varies from 2,000 USD to almost 13,000 USD for an academic year.

3.4 Theoretical Model

I present a simple model for the decision to become an entrepreneur that motivates the data collection. In the model, five years after graduation, student *i* will become an entrepreneur if the expected utility of being an entrepreneur is higher than the expected utility of not being an entrepreneur, it is being an employee in Bogotá. Modifying Campbell (1992) in terms of the expected benefits in both activities, I replace the function of average wages as an employee and average income derived of self-employment with the individual elicited expected wages as an employee and expected earnings as an entrepreneur. The probability of finding a job, instead of being a function of the general state of the economy, is the individual elicited subjective probability of finding a job. Also following Douglas and Shepherd (2000, 2002) I include a measure of work effort and independence.

The expected utility of being an entrepreneur of student i, is:

$$EU_{i,entrepreneur} = P_{i,success}(\ln W_{ent,i}) + (1 - P_{i,success})(\ln 1) + \alpha_{ent}(x_i) + \beta(h_{ent,i}) - \gamma \ln C_i + \varepsilon_{ientrepreneur}(1)$$

Where

$P_{i,success}$

$= Probability\ of\ success\ as\ an\ entrepreneur\ five\ years\ after\ graduation$

$W_{entrepreneur,i} = Expected\ monthly\ earnings\ as\ an\ entrepreneur\ of\ student\ i$

$x_i = Individual\ characteristics\ associated\ with\ entrepreneurial\ attitudes$

$h_{entrepreneur} = Weekly\ hours\ that\ student\ i\ wants\ to\ work\ in\ his\ own\ firm$

$C_i = The\ cost\ of\ establishing\ his\ own\ firm\ for\ student\ i$

$\varepsilon_{ientrepreneur} = Random\ term\ known\ by\ the\ student\ but\ not\ by\ the\ researcher$

The expected utility of not being an entrepreneur for student i, is defined as:

$$EU_{i,non\ ent} = P_{i,job\ bog}(\ln W_{i,emp}) + (1 - P_{i,job\ bog})(\ln 1) + \alpha_{emp}(x_i) + \beta(h_{emp}) + \varepsilon_{i,emp}\ (2)$$

Where

$P_{i,job\ bog} = Self - reported\ probability\ of\ finding\ a\ job\ by\ student\ i$

$W_{i,emp}$

$= Expected\ wage\ of\ student\ i\ \ as\ an\ employee\ in\ Bogotá\ 5\ years\ aftergraduation$

$(ln\ 1)$

$= Since\ there\ is\ not\ unemployment\ benefit\ in\ Colombia\ the\ expected\ income\ of$

$not\ being\ employment\ is\ 0.$

$x_{\ i} = Individual\ characteristics$

$h_{emp} = Weekly\ hours\ that\ student\ i\ is\ willing\ \ to\ work\ in\ a\ job\ that\ he\ likes$

$\varepsilon_{i,emp} = Random\ term\ known\ by\ the\ student\ but\ not\ by\ the\ researcher$

A future graduate will become an entrepreneur if and only if

$$EU_{entrepreneur,i} > EU_{i,non\ entrepreneur} \quad (3)$$

So, the probability of becoming an entrepreneur is given by

$$P\left[EU_{entrepreneur,i} > EU_{i,non\ entrepreneur}\right] \quad (4)$$

Working with the equations (3) and (4)

$$P\left[\varepsilon_{ientrepreneur} - \varepsilon_{i,employee}\right] < \lambda\left(P_{i,success} * \ln w_{\ ent,i} - P_{i,job\ bog} * \ln w_{i,emp}\right) + \beta\left(h_{ent} - h_{emp}\right) + \left(\alpha_{ent} - \alpha_{emp}\right)x_i - \gamma \ln C_i$$

I observe the probability of becoming an entrepreneur (4) and the goal is to estimate λ, β, b, α, γ.

3.5 Data

3.5.1 Sample

Bogotá has 84 Higher Education Institutions (HEI) that offers academic programs, and of those institutions, 30 are universities. I contacted via email 35 HEI, who are all members of the Colombian Association of Universities in Bogotá; this association has a long tradition of networks and associates different types of higher education institutions. Nine HEI agreed to participate in the survey. The participant institutions cover different features of Colombian higher education institutions, one is public and the other eight are private. All of them offer academic programs. Seven are universities. Six out of 9 of the HEI were quality certified at the period of the data collection. Two of them are considered to be elite universities, because of their position in the ranking of the Ministry of Education, their selectiveness, and their tuition fees. The sample is composed of 747 students and is the same sample of chapter 2. I design one survey for both chapters data were collected the same day, the survey was paper based and the sample is a convenience sample. In Table 3.1, I show the principal socioeconomic characteristics of the sample, such as gender, family income, socioeconomic strata, and individual characteristics of the students, such as the semester (the academic term used in Colombia) in which the students are studying, the field of study and the quality of the university that they have chosen. I include four different fields of study, economics, business and accounting, different academic programmes of engineering and finally political sciences and law. In Colombia, the entrepreneurial intentions of university students of business related programmes are higher than other areas according to other surveys on entrepreneurial

intentions of university students like the GUESS project (2016)[11]. Moreover, according to the Colombian graduate survey, of all those who report being an entrepreneur as their main occupation five years after graduation 21% comes from engineering and 24 % comes from a business background , while 4 and 2% respectively are lawyers or economists. My motivation was to include fields associated with potential and actual entrepreneurs as well with other fields in which this career choice is less common. Within the HEI, in the public university that I surveyed I try to include as much as fields of study possible since is one of the biggest universities in terms of academic programs and number of students. In some of the HEI was not possible to survey students from all the fields of study.

[11]The GUESSS project studies entrepreneurial intentions of university students around the world. The determinants of entrepreneurial intentions in the GUESSS project studies are: the university context, the family context, the role of personal motives, and social and cultural context

Table 3.1 Descriptive statistics.

	%/ mean (sd)	Response rate
Female	48.3	99.9
Male	51.7	99.9
Age	22.3 (3.3)	99.3
Married	6.1	99.5
Born in Bogotá	72.8	100
Living with Parents	76.6	100
Fathers with college degree	35.8	97.7
Mothers with college degree	36.8	100
Previous experience of migration inside the family	31.6	98.1
Previous experience of unemployment inside the family	46.0	100
Has a business owner in his family	52.0	97.5
Monthly Family income[1]		99.3
1 monthly mimimum wage or less	2.3	
Bewteen 1 and 3 monthly minimum wages	31.3	
Bewteen 4 and 6 monthly minimum wages	33.3	
More than 6 monthly minimum wages	33.2	
socioeconomic strata (1-6)[2]		99.9
1 (poor)	1.1	
2	16.2	
3	49.7	
4	22.5	
5	6.4	
6 (Affluent)	4	
Students who work	19.9	100
Average GPA (0-5)	3.8 (0.3)	94.4
Semester (1-10)		99.1
below 5th	1.7	
5th	5.5	
6th	17.7	
7th	17.3	
8th	26.8	
9th	20.8	
10th	9.4	
Field of Study		99.5
Engineering	32.8	
Political Sciences and Law	11.3	
Economics	49.1	
Business	6.7	
Ranking of the University according to Colombian Ministry of Education[3]		100
(1-10)	44	
(11-25)	14.9	
(26-50)	37	
(51-100)	4	
Public University	32.8	100
Private University	67.2	100
Quality Certified [3]	82.6	100
N	747	

1 .Monthly minimum wage in Colombia for 2015 was 225.77 USD using exchange rate of the month in which the data were collected (July -September 2015).

2.The socioeconomic stratification in Colombia is used to clasify the properties that require access to public services. The properties are ranked from 1 to 6 where 1 is the lowest category, made using the location of the residence. This stratification is a common socioeconomic indicator in Colombia.

3. Quality certification is a certification given by a public academic organization linked to the Colombian Council of Higher Education which evaluates the quality of the universities in Colombia and certifies their quality in different aspects.

In the sample 51.7% of the students are men with an average age of 22 years. The majority of the students are born in Bogotá, (72.8%), are single and live with their parents. One third of the students' parents have at least a college degree: representing 35.8% of the students' fathers and 36.8% of mothers.[12] The students came from different backgrounds, as reflected in their family income. As shown in Table 3.1, one third of the sample declares to be in each one of the income categories: 33.5 % in the lower band of the income categories (less than 1 and 1 to 3 monthly minimum wages), 33.29 in the middle categories (between 4 to 6 minimum wages) and 33.1 in the upper category (more than 6 monthly minimum wages). For 2015, the monthly minimum wage in Colombia was 225.77 USD. Almost have of the sample (46%) have experienced unemployment in their family and 52% have a family member that is a business owner.

The socioeconomic stratification in Colombia is a ranking from one to six stratums, in which one is the lower category and six the highest. The social stratums classify the properties in urban and rural areas. The properties are ranked according to their location, characteristics and their surrounding areas. The lowest category is one and the highest is six. This stratification is used to calculate the prices of public services, such as water and electricity. It is a common socioeconomic indicator in Colombian society. In the sample, the majority of the students declare they are located in the socioeconomic strata 3, which is the middle category. 19.9% of the sample is composed of students who work, and

[12]In my case I use university degree as a classification of tertiary education criteria. However, the World Bank definition of tertiary education includes all types of formal education received after obtaining a High School degree. If the World Bank classification is used, then 58% of the mothers have tertiary education, and 51% of the fathers of the students have tertiary education.

they have different types of working experiences: some are teaching assistants for the subjects of their academic program, while others, in particular students from the universities ranked from positions 30-50, are students who are also full-time workers.

The grade point average (GPA) in Colombia is measured from a scale of 0 to 5, with 3 being the subject approval threshold and 4.0 the minimum qualification needed to obtain a scholarship. In the sample the average GPA is 3.8. The students are enrolled in four different bachelor schemes: engineering, political sciences and law, economics and business. Almost half of the sample is represented by students from economics (49.1%), followed by engineering (32.8%), political sciences (11.3%) and business (6.7%). The majority of the students are in the final years of their degree, with 56.8 % of the sample being students in their 8^{th} to 10^{th} semester (i.e. their fourth and fifth year). The other 40.4% are students that are in the middle of their degree, in either their third year (5^{th} and 6^{th} semesters) or at the beginning of their fourth year (7^{th} semester). The universities are classified according to their academic level and selectiveness using the MIDE indicator of the Colombian Ministry of Education. The Ministry ranks all Colombian universities from 1 to 186. 44.04% of the sample is composed of students at the top 10 universities in Colombia, 14.86 % came from positions 11-25, while 36.9% came from universities located in positions 26-50 and finally 4.02% came from one university located in position 90-100 in the rankings.

3.5.2 Preferences and non-cognitive traits related to becoming an entrepreneur

The decision to become an entrepreneur is a decision that includes some economic aspects, such as a preference for income and the lack of financial constraints. However it is also shaped by individual characteristics such as risk aversion, desire for independence and creativity, among others. In Table 3.2, I report the students' beliefs and perceptions of these characteristics.

Table 3.2 Individual Characteristics

Willingness to take risk in general (0-10)[1]	7.0 (1.6)	7.0	99.5
Self-reported level of trust in others [2]	5.6 (2.0)	6.0	99.73
% of the sample that declares being impatient [3]	66.7		99.33
Self-reported importance given to persistence in daily life (0-10)[4]	9.5 (1.0)	10	99.87
Self-reported importance given to being his/her own boss (0-10)[5]	8.7 (1.8)	10	99.6
Self-reported individual level of family attachment (0-10)[6]	4.8 (3.0)	5	99.46
Self-reported importance given to creativity at work (0-10)[7]	8.9 (1.5)	9	99.33
Self-reported importance given to networks as a job finding channel (0-10)[8]	8.1 (1.6)	8	
Number of weekly hours that the student will work in a job that he/she likes	45.7 (9.7)	48	98.53
Number of weekly hours that the student will work in his/ her own firm	51 (15.4)	51	94.24
N		747	

1.The question was: Between 0 ("I am not prepared to take risks at all) and10 (" I am fully prepared to take risks") How prone do you consider yourself to taking risks?

2. The question was: Between 0 ("I do not trust others") and 10 (" Others can be fully trusted") How much do you trust others?

3.The question was a lottery question about cashing a prize of 100 now,105 in a month, 120 in six months, 150 in a year.

4. The question was: Between 0 ("is it not relevant") and 10 ("is indispensable") How important is persistence in live?

5The question was: Between 0 (it is not relevant) and 10 (it is very important) How much do you value being your own boss?

6.The question was: between 0 ("I am completely independent) and 10 ("I cannot live in a different city from my family") How attached do you consider yourself to be to your family ?

7.The question was: Between 0 ("is it not relevant") and 10 ("is indispensable") How much does creativity matter at work?

8. The question was: Between 0 ("Networks are irrelevant") and 10 ("are the most important factor") How much does networks matters in the job fiding process?

I elicit the readiness to take risks using the following question: "With 0 being I am not prepared to take risks and 10 being I am fully prepared to take risks, how prone do you consider yourself to taking risks?" On average the students consider themselves prone to take risks (7 on a scale of 1-10). To elicit trust, I use a scale in which 0 means "I do not trust others" and 10 means "Others can be fully trusted". On average the level of trust was 5.6, yet there was a standard deviation of 2 scale points.

Approximately two-thirds are impatient, declaring a strong preference for present returns. I elicit a self-perception of patience using the following question: "Would you prefer a prize of $100, now or 105 in a month, 120 in six months or 150 in a year?" 66.7% of the students answered that they would prefer $100 now. I measure patience as in Gibson and McKenzie (2009).

On average the students report that persistence is important in life (9.5 out of 10). They declare being their own boss is important (8.9), and give importance to creativity at work (8.7). The last non-cognitive trait that I measured is effort tolerance. I specifically related the effort tolerance to the number of hours that an individual decided to work in two scenarios: first, how many hours in a week a student wants to work in a job that that she likes. The second scenario is how many weekly hours a student wants to work if she works in her own business. The specific questions were:

How many weekly hours will you work if you work in a job that you like?

How many weekly hours will you consider working if you have your own firm?

On average the students would be willing to work 5.3 hours more each week if they were working in their own firm.

3.5.3 Eliciting job market expectations

In this section, I present the elicitation of the student expectations about the job market. I focus on the expectations of job finding and starting entrepreneurial activities in two scenarios: one and five years after graduation. Table 3.3 presents the job market expectations of the students. The results are presented by the type of university. The first results that are shown are the self-reported probabilities of finding a job in Bogotá one and five years after graduation.[13] The second part presents different measures of entrepreneurial intentions.

The first measure presents the percentage of students who will start their own business five years after graduation, based on their responses to a yes/no question. The question was as follows: *"Imagine yourself five years after your graduation; you don't have any school debt. Will you start your own business?"*

The second measure is the probability to start a new firm, and this information was elicited in the following way: "*Imagine yourself five years after graduation you don't have any school debt. What is the probability that you will start your own business?"* In Colombia 22% of the enrolled students use government scheme loans (Bonilla et al., 2016). Therefore asking a "no schooling debt" scenario is relevant in order to restrict the answer to the individual preference for being an entrepreneur.

[13]The question was: "What is the percent chance that you will find a job in Bogotá one and five years after graduation?"

Finally I present a measure that elicits the probability of working in their own business five years after graduation: *"Imagine yourself five years after graduation. What is the chance that you will be working in your own business, a business related to your field of study?"*

Table 3.3 Job market expectations of the students

		Ranking of the University						
	All	(1-10)	(11-25)	(26-50)	(51-100)	Median	Response Rate	F test
Probability of finding a Job in Bogotá one year after graduation	**0.73**	0.73	0.72	0.72	0.72	0.70	97.9	0.000
	(0.17)	(0.15)	(0.18)	(0.19)	(0.19)			
Probability of finding a Job in Bogotá five years after graduation	**0.80**	0.82	0.82	0.78	0.75	0.85	97	0.000
	(0.19)	(0.19)	(0.17)	(0.21)	(0.21)			
% of students that will consider starting their own firm five years after graduation(yes/no)[1]	**78%**	71	82	83	93		99	
Probability of starting her own firm five years after graduation[2]	**0.64**	0.58	0.712	0.68	0.75	0.7	94.5	0.000
	(0.25)	(0.25)	(0.23)	(0.24)	(0.10)			
Probability of working in her own firm five years after graduation[3]	**0.58**	0.54	0.63	0.6	0.65	0.60	99.3	0.000
	(0.25)	0.26	0.24	0.25	0.15			
Expected wage as an employee in Bogotá one year after graduation	**779.4**	739	814.3	804.7	857.2	700.77	98.1	0.000
	(339.0)	(301.5)	(375.2)	(361.8)	(334.2)			
Expected wage as an employee in Bogotá five years after graduatio	**1634.9**	1641.3	1776.2	1577.8	1580.2	1401.5	97.5	0.000
	(826.1)	(823.2)	(808.9)	(828.3)	(875)			
Expected earnings as a firm owner five years after graduation (USD)[5]	**2040.5**	2130.7	2112.4	1942.4	1713.3	1751.9	89.69	0.000
	(1641.4)	(1788.9)	(1523.6)	(1538.4)	(1248.3)			
Self-assessed cost of establishing her own firm (USD)	**42674.8**	49263.4	48994.6	33905.4	28007.4	17519	90.90	0.000
	(74745.5)	(86044.2)	(79984.7)	(58378.8)	(40939.7)			
		N						
	747	329	111	276	30			

1. The question asked was: "Imagine yourself five years after graduation will you start your own firm? Yes/ No"
2. The question asked was:"what is the percent chance that you will start your own firm as your main ocupation five years after graduation in a no debt scenario?"
3. The question asked was:"what is the percent chance that you will start and work in your own firm as your main occupation five years after graduation?"
4. Values in COP converted to USD using exchange rate of the month in which the data were collected (July -September 2015)
5. The question asked was: "Imagine yourself five years after graduation you don't have school debt how much will you earn monthly as a business owner?"

When asking about the probability of finding a job in Bogotá, one year after graduation, the students report an average probability of 73%. The difference between the probabilities of finding a job one year after graduation across the university types is practically non-existent. In a five years after graduation scenario, this probability increases by 10 percentage points. The average probability is 80%, with a standard deviation of almost twenty percentage points. In the five years after graduation scenario,

some differences between the students start to appear. The students from more selective universities report average probabilities of finding a job at 82%, which is higher by seven percentage points if compared to the students from the universities that are at the lower end of the ranking (51-100).

The first measure of entrepreneurial intention was a yes/no question *"Imagine yourself five years after your graduation; you don't have any school debt. Will you start your own business?"* Using this wording, on average 71% of the students will start their own firm, and analysing the different universities, 71% of the students from the most selective universities will start their own firm, compared to 93% from the less selective ones.

When the probabilistic expectation of the entrepreneurial intention is elicited from the following question *"Visualize yourself five years after graduation, you don't have schooling debt. What is the chance that you will start your own firm and that this firm will be your main job*?, the average reported probability is 64%. Notice that in the first scenario of a yes/ no question, 71% of the sample will start a new firm but when the decision of starting a new firm is asked using probabilities, the average probability is 64%. It is, not all those who say yes in the first question answer a 100 percent chance in the second one. Only 9 % of those who say yes in the first question report a 100 percent chance to start a new firm. The answers of the 41% of the students who answer yes in the first question changes when the question is asked using percent chances. They report chances of starting a new firm between 50 and 70 in the second question. The other 50% of these students report percent chances between 71 and 100. The third probabilistic measure of entrepreneurial intentions is obtained from the question: "*Imagine yourself five years after graduation, what is the percent chance that you will*

work in your own firm, a firm related to your degree, as your main occupation?" For this question the average reported probability is 58%. Of those who answer yes in the first question, 37% report a percent chance between 75 and 100 in the third measure. The differences between the values across the three different measures of the individual entrepreneurial intentions show that including subjective expectations leads to the expression of more uncertainty and that there is an important amount of heterogeneity in the individual beliefs. Also there and there are some differences between the types of universities. For the students from the top 10 universities, the probability of starting a new firm is 54% on average; while for those who study in the less selective universities (51-100), the probability is 65%. The heterogeneity in the individual beliefs can also be seen in Figure 1 in which I show the distribution of the subjective probability of starting a new firm and in Figure 2 in which I show the distribution of the individual subjective probability of working in her own firm five years after graduation.

The intention to become an entrepreneur changes between university students and actual graduates. This is visible in the data of 2014 of graduates from the Colombian Ministry of education[14] who ask graduates about their job situation and their long term plans. The question asked is "What have you thought to do in the long term?" And one of the options besides working as an employee and doing postgraduate studies is to create a firm. Five years after graduation 27 % of the graduates have considered starting a firm in the long term. While in the sample 77% of the engineering students , 71% of the law students, 80% of the economic students and 78 % of the business students answer yes to

[14]The graduate survey or "Encuesta de Seguimiento a Graduados" is a representative survey in terms of the total amount of Colombian graduates and the number of graduates by type of degree and field of study. The survey has three different questionnaires, one year after graduation, three years after graduation and five years after graduation.The sample size of student who graduate five years ago is 4655 graduates; of those graduates 1271 belong to the four field of studies included in my sample; and 174 graduates declare that their main occupation is working in their own firm.

the question *"Imagine yourself five years after your graduation; you don't have any school debt. Will you start your own business?"*

The findings of my survey are in line with other surveys on entrepreneurial intentions of university students like the GUESS project (2016) who found that after five years of graduation 67% of the surveyed students see themselves as founders of their own firm. In the graduates survey one year after graduation only 28% of the engineering graduates 21% of the lawyers, 30% of the economists and 27% of the business graduates declare they would like to become an entrepreneur in the long term.

FIGURE 3.1 SUBJECTIVE PROBABILITY OF STARTING A NEW FIRM FIVE YEARS AFTER GRADUATION IN A NO DEBT SCENARIO.

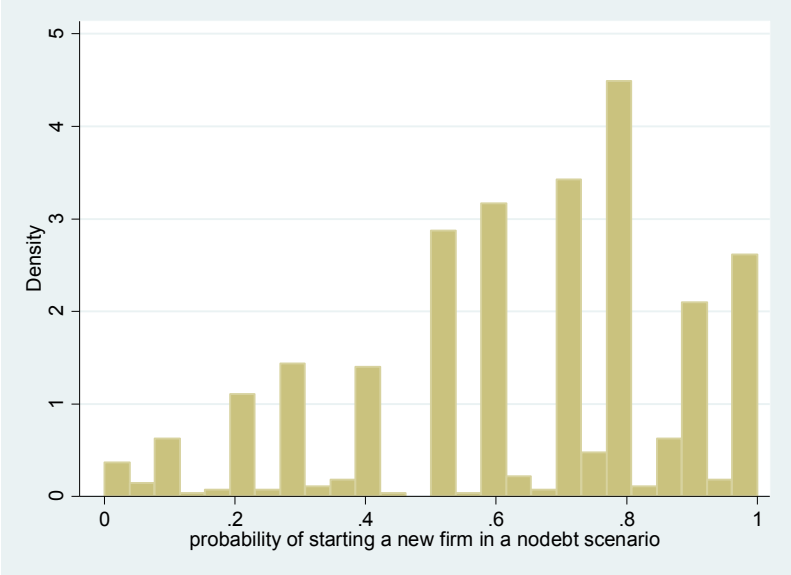
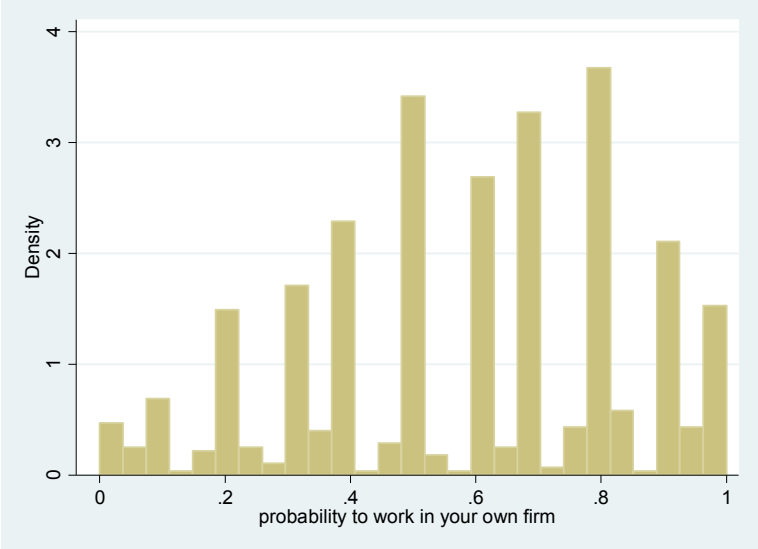


Figure 3.2 Subjective probability of working in her own firm five years after graduation.

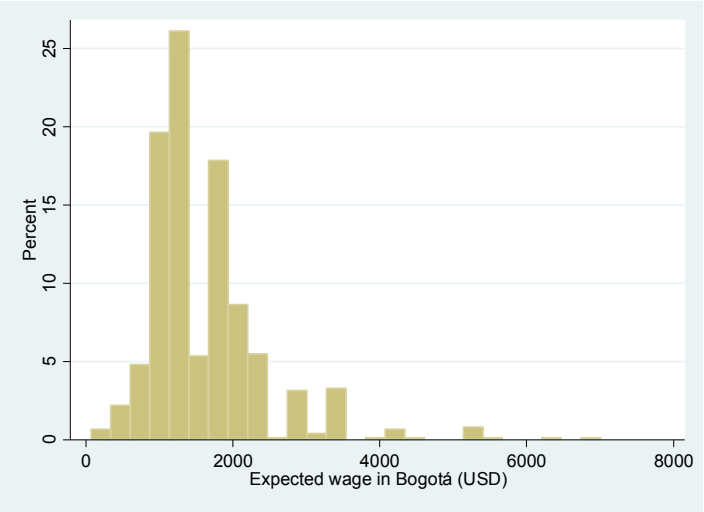


The distribution shows an important amount of heterogeneity in the beliefs (Figures 1 and 2). Inside the sample, 1.3% considers that starting a new firm is an event that will not happen, while 9.9% consider it a certain event. 22% of the students report a probability between 0 and below 0.5; 28.8% of the students declare a probability higher than 0.5 but lower than 0.8; 38.8% of the sample declare that the probability of starting a new firm is

somewhere between 0.8 and 1. When compared to the probability of working in your own firm as a main occupation, more students declare chances of 50% or more, but the distribution shows clear heterogeneity of the elicited probabilities.

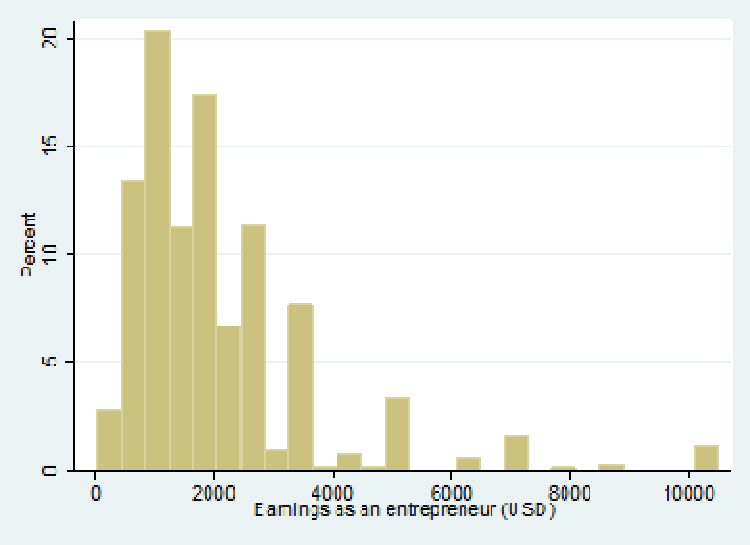
The expected wages one year after graduation (Table 3) show differences in the personal beliefs of the students; it also shows differences across the universities. The students from the top universities are not the ones who report the higher expected wages one year after their graduation. The students who report the higher expected wages are those located in the middle of the ranking. This could be explained by the socioeconomic characteristics of the students. Many of the students from the universities in positions 11-50 of the ranking are already fulltime workers. Consequently, their expectations and knowledge about the job market in Bogotá are different from those who are only studying, as is the case with most of the students from the top 10 universities. Also, one of the top universities is public, and there is evidence that graduates from public universities tend to earn less in their first employment (Forero and Ramirez, 2008).Five years after graduation, those who study in the second group of universities (11-25) expect higher wages, in comparison with the other groups. Overall, the wage that the students expect five years after the graduation as an entrepreneur is higher (2,040.5 USD) than the salary that they expect as an employee in Bogotá five years after graduation (1,634.9 USD). In Figure 3, I show the expected wage of the students five years after graduation and in figure 4 I show the expected earnings as an entrepreneur in a no-debt scenario. The wages are reported in USD but the questions were asked using Colombian pesos as currency. The exchange rate was calculated using the official rate for July 2015 (2854 COP =1USD) since in Colombia the exchange rate is highly volatile.

Figure 3.3 Expected wage as an employee in Bogotá five years after graduation



The students in the sample expect different wages in a paid employment option. The majority of the sample (85.3%) expects a monthly wage of up to 2,102 USD, while within the 85.3% of the sample there is also variation. The median was 1,627.5 USD. Compared to the self-reported data of actual graduates from the Ministry of Education, the students have higher expectations about their wages. On average, current graduates report a wage of 810.9 USD. The engineering students in my sample report an average wage of 1,564 USD compared to the 836 USD reported by engineering graduates. The students of law report an average wage of 1,956 USD, while current law graduates report a wage of 1,163 USD. The students of economics report a wage of 1,624 USD compared to economists that report a wage of 938 USD; finally, the business students report an expected wage of 1,414 USD five years after graduation, compared to current business graduates that report a wage of 735 USD.

Figure 3.4 Expected earnings as an entrepreneur in Bogotá five years after graduation

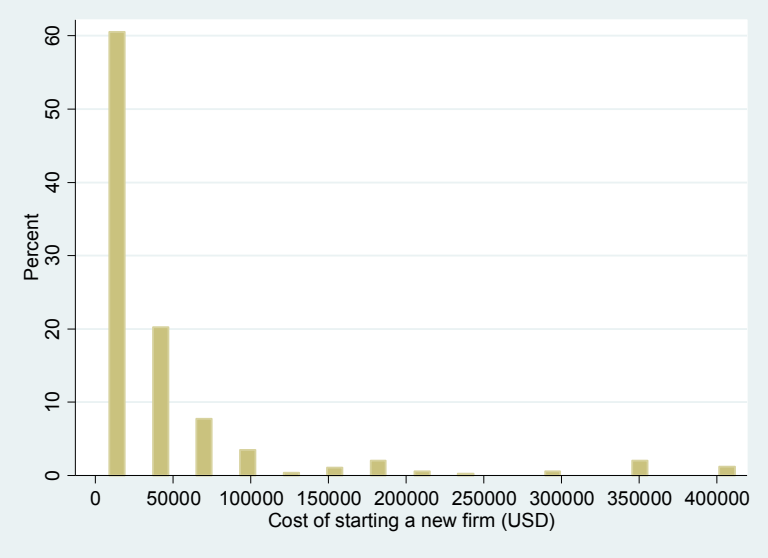


We can compare these figures with the expected earnings as an entrepreneur on average graduates expects 2,125 USD with a standard deviation of 2,397 USD. While as an employee on average they expect 1635 USD with a standard deviation of 826 USD. The expected earnings as an entrepreneur (Table 3) of the students from the universities that are in the first 25 positions of the ranking are approximately 200 and 500 USD higher than the salaries expected from students from the universities in positions 25-50 and 51-100 respectively. There could be various sources of the heterogeneity of the student expected earnings as entrepreneurs: some of the students recognize that during the first years of the firm a possible outcome is to have low earnings, so they picture themselves as starter entrepreneurs, while other students understand that after the first years, when the business is solid, the earnings are potentially higher. In the Ministry of Education graduate survey, five years after graduation only 124 individuals declare their main occupation is their own firm. Here I report their monthly earnings by field of study and compare the expected earnings reported by the students in the sample. Current engineering entrepreneurs report average monthly earnings of 1,754 USD, while

engineering students report expected earnings of 1,904 USD. Political science and law entrepreneurs report average earnings of 2,055 USD, while law students report earnings of 2,558 USD. Economics entrepreneurs report average earnings of 1,909 USD, while the students of economics report on average earnings of 2,064 USD. Finally the students of business report earnings of 1,555 USD, while business entrepreneurs report earnings of 559 USD.

Another important aspect of entrepreneurial decision is the cost and the financial constraints of starting a firm. In this chapter I only address whether, if students perceive that starting a firm will be very expensive, it will deter them from their intention of becoming an entrepreneur. Therefore, I elicit their expected cost in establishing their own firm. In Figure 5 I show the distribution of the elicited cost of establishing a firm.

Figure 3.5 Self-assessed cost of starting a new firm



On average students report a cost of establishing a firm at 46,019 USD. The majority of the students, at 73.7% of the sample, assess a cost between 37,000 USD to 40,000 USD. Another 26.22% of the sample assessed costs between the interval of 40,000 USD and

420 USD. While 14.6% of the sample assessed costs between 40,000 and 100,000 USD, 8.1 % of the sample assessed costs of between 105,116 USD and 280,308 USD. Finally, 3.5 % of the sample assessed costs between 350,385 and 420,462 USD.

The average value of the assets of a nascent firm in Colombia was 6,550 USD in 2016 for firms registered as societies, if it has more than one owner, and 1,000 USD for a single proprietor, who is defined as an individual who registers himself in order to be visible as an individual legal entity and to be available to hire as a contractor (Confecamaras, 2016). The answers of the students show that some of them picture the entrepreneurial activity as a single proprietor, while others consider the cost of being employers or other technological costs. Also the variation in the assessment of the cost could be derived from the type of firms the students want to have. For example, students from economics will think in terms of a consultancy firm, while students from an engineering background will probably have the consultancy option in mind too, but may also be thinking about a firm with a higher industrial content. The average cost of establishing a firm reported by the students of engineering is 58,310 USD while for political science and law it is 29,714 USD; for the students of economics the average reported cost was 33,929 USD and finally for the business students the cost of establishing a firm was declared as 53,399 USD.

As shown in the previous figures there are important differences manifested in the student beliefs, expectations and assessment of the costs of establishing a firm. Another factor that should be analysed is the non-response item of the variables related with the entrepreneurial behaviours, which will be considered in the next subsection.

3.5.4 Analysis of the item "non response"

As seen in Table 3, approximately 10% of the sample does not answer the question about the expected cost to create a firm (9.1%); 5.76% does not answer regarding the earnings as an entrepreneur and around 7% of the sample does not provide an answer concerning the probability of becoming an entrepreneur. All these item non responses could be signals of uncertainty about the outcomes of the entrepreneurial activities. In Table 3.4 I present the average marginal effects of three different logit models: in the first column, the dependent variable is the item non response behaviour relating to the cost variable, the second column represents the item non response for the earnings as an entrepreneur and in the third column the dependent variable is the item non response for the probability of starting a firm. The item non responses are binary variables in which 1 indicates an item non response. All items were studied not only as a function of the monetary variables, such as the cost of establishing a firm, the expected earnings as an entrepreneur and the expected wage as an employee in Bogotá, but also as a function of individual and socioeconomic characteristics. Table 3.4 shows the average marginal effects for the main controls, the complete list of the estimates is shown in the appendix 3.2

Table 3.4 Analysis of the item non response for: cost of starting a firm, earnings and probability of becoming an entrepreneur. Marginal effects of a Logit model

	Dependent Variable 1= Missing cost of starting a new firm b/se	Dependent Variable 1= Missing earnings as an entrepreneur b/se	Dependent Variable 1= Missing probability of becoming an entrepreneur b/se
Non response about the probability of starting a new firm in a no debt scenario	0.082**	0.095***	
	[0.037]	[0.022]	
Non response about earnings as an entrepreneur	0.083		-0.005
	[0.057]		[0.038]
Logarithm of the earnings as an entrepreneur	-0.002		-0.013**
	[0.008]		[0.006]
Logarithm of the expected wage as an employee	-0.026	-0.030**	-0.013***
	[0.023]	[0.014]	[0.003]
Not answer about the expected wage as an employee	-0.178	-0.125	
	[0.179]	[0.100]	
Non response of the cost of establishing their own firm		0.063**	0.045**
		[0.022]	[0.022]
Self reported cost of establishing a firm		0.186	0.115
		[0.168]	[0.207]
Reporting a high Cost of establishing a firm		-0.053	-0.027
		[0.042]	[0.043]
Female	0.048**	0.009	0.000
	[0.022]	[0.016]	[0.015]
Not born in Bogotá	-0.016	-0.004	0.039**
	[0.025]	[0.019]	[0.018]
Currently working	0.016	0.029	-0.053*
	[0.031]	[0.026]	[0.028]
Low level of income of the family	0.042	0.001	-0.041*
	[0.029]	[0.021]	[0.021]
Strata 1	Ommited	Ommited	0.081**
	[.]	[.]	[0.036]
Strata 4	0.042	0.017	-0.044**
	[0.029]	[0.020]	[0.021]
Strata 5	0.024	0.04	-0.005
	[0.053]	[0.031]	[0.041]
Strata 6	0.133**	0.02	-0.025
	[0.059]	[0.053]	[0.069]
Previous experience of unemployment in the Family	-0.007	0.031*	0.01
	[0.022]	[0.017]	[0.017]
top_10	0.703***	0.590***	0.124
	[0.154]	[0.109]	[0.082]
Public University	-0.677***	-0.576***	-0.141*
	[0.153]	[0.107]	[0.082]
Engineering	-0.018	-0.015	-0.009
	[0.026]	[0.020]	[0.019]
Business	-0.100**	-0.04	-0.05
	[0.050]	[0.039]	[0.037]
Political Sciences and Law	-0.663***	-0.546***	-0.157**
	[0.139]	[0.101]	[0.073]
Weekly hours of work if working in their own firm	-0.001*	-0.001	0
	[0.001]	[0.001]	[0.000]
Weekly hours of work if working in a job that they like	0.002**	-0.001**	0.001
	[0.001]	[0.001]	[0.001]
Self reported importance of networks to obtain a job (0-10)	0	-0.008*	-0.009*
	[0.007]	[0.005]	[0.004]
self reported value given to being his her own boss	-0.004	-0.010**	0.002
	[0.006]	[0.003]	[0.004]
Not assesing a cost of establishing their own firm		0.063**	0.045**
		[0.022]	[0.022]
N	731	731	739

The type of university, in particular being part of a top 10 university, increases the probability of not answering about the expected cost of establishing a firm, the monthly expected earnings as an entrepreneur and the probability of becoming an entrepreneur. On the other hand, being a student of the public university and a student of political sciences and law increases the probability of answering the questions about the three

characteristics. Other fields of study, such as business, increase the probability of answering about the cost and the probability of starting a new firm but with a lower statistical significance. One possible explanation is that the students of top 10 universities might consider that their university gives them an advantage in the job market, therefore being an entrepreneur could be a less interesting career choice.

The different expectations about income and cost influences, in various ways, the item non response. A higher self-expected earnings as an entrepreneur increases the probability of answering the questions concerning the costs of starting a firm and the probability of becoming an entrepreneur. There is important uncertainty about the process of becoming an entrepreneur and about the individual capabilities required. This uncertainty is shown by the fact that not answering the cost question also increases the probability of not answering about earnings and the probability of becoming an entrepreneur.

The self-reported expected wage as an employee in Bogotá five years after graduation is a determinant of responding about the earnings as an entrepreneur and the probability of becoming one. This could show that students who express less uncertainty about earnings and wages in the markets are more prone to answer about other activities that are less common, like becoming an entrepreneur. Other individual characteristics, like being born in a different city from Bogotá, also explain why the probability of becoming an entrepreneur is not answered. This could be justified by the fact that since students come to Bogotá to pursue higher education, they expect to find a job as employees after graduation, therefore they will be less interested in starting an entrepreneurial activity. Other events, like a previous experience of unemployment in the family, explain the item non response of only one variable: the earnings as an entrepreneur.

The importance given to aspects like networks as a job finding channel increase the probability of answering about expected earnings as an entrepreneur and the probability of becoming one. While other aspects such as independence, expressed as the importance given to being their own boss, increases only the probability of answering about the earnings as an entrepreneur. Female students are less prone to answer about the cost of establishing a firm; this result is consistent with the GEM (2016). In Colombia in 2016 the rate of entrepreneurial activity of men was 30.2 %, compared with 24.7% for women.

3.6 The determinants of entrepreneurial intentions

This chapter examines the determinant of entrepreneurial intentions of university graduates in Bogotá Colombia using as a dependent variable the elicited subjective probability of starting a firm five years after the graduation in a scenario of no schooling debt. I hypothesize the relevance of the entrepreneurial attitudes such as the preference for income, willingness to take risks, exposure to entrepreneurial environments; effort, independence and ownership (Steffens et al. 2006) together with the socioeconomic and educational characteristics of an individual are determinants of the entrepreneurial intentions.

I estimate an equation of the following functional form with robust standard errors clustered at the survey identifier:

$$Y_i = \lambda_1 W_i + \gamma_2 C_i + \alpha_3 X_i + \varepsilon_I$$

Where

Y_i = is the subjective probability of student (i) of starting a firm five years after graduation in a no schooling debt scenario.

$$W_i = P_{i,success} * \left(\ln w_{\ ent,i}\right) - P_{i,job\ bog} * \left(\ln w_{i,emp}\right)$$

C_i = is the self -assessed cost of establishing his own firm.

X_i = is the vector of the individual and educational characteristics associated with entrepreneurial attitudes.

Since the dependent variable is between 0 and 1. I use an extension of the generalized linear model (GLM) for fractional response data (Papke and Wooldridge, 1996). I use the

self- reported probability of working in their own firm, a firm related to their field of study, as a measure of the probability to success as an entrepreneur. Although is not a perfect measure of success as an entrepreneur, it is worth exploring its effect in the estimates

In Table 3.5 I present five different models of the entrepreneurial decision. Column 1 presents the estimates of the monetary variables, the second column includes the main individual and socioeconomic characteristics, column 3 includes educational characteristics and finally column 4 includes all the previous columns or set of controls and the non-cognitive traits associated with entrepreneurial attitudes. Table 3.5 only presents a selected sect of controls. The full set of estimates is included in Appendix 3.3.

The item non response for the dependent variable is 5%, amounting to 41 observations. Usually when the dependent variable is a proportion as in this case, the best approach to follow is to use a GLM model (Papke and Wooldridge, 1996) as in chapter 1 and 2. I present here the average marginal effects of the GLM model that have statistical significance.

Table 3.5 Determinants of the Decision to become an Entrepreneur. Dependent variable: probability of becoming an entrepreneur five years after graduation in a no-debt scenario.

		(1+2)	(1+2+3)	(1+2+3+4)
	b/se	b/se	b/se	b/se
Difference between expected earnings as an entrepreneur and expected wage as an employee	0.036***	0.037***	0.033***	0.026***
	[0.004]	[0.004]	[0.004]	[0.004]
Not reporting earnings as an entrepreneur or as an employee	-0.196***	-0.188***	-0.192***	-0.161***
	[0.045]	[0.046]	[0.045]	[0.040]
Self assessed cost of starting a firm	-0.000*	-0.000*	0.00	-0.000*
	[0.000]	[0.000]	[0.000]	[0.000]
Low income of the parents		-0.044**	-0.029	-0.01
		[0.022]	[0.021]	[0.021]
High income of the parents		0.011	0.01	0.012
		[0.023]	[0.023]	[0.021]
Strata_6 (Affluent)		-0.092	-0.120*	-0.151**
		[0.059]	[0.064]	[0.057]
Study in a top 25 university			0.045	0.070**
			[0.031]	[0.028]
Study in a top 100 university			0.037	0.066**
			[0.030]	[0.031]
Study in a public university			0.033	0.011
			[0.055]	[0.069]
Having a high GPA			-0.055**	-0.041**
			[0.019]	[0.018]
Study Business			0.061*	0.041
			[0.033]	[0.031]
Study Political Science and Law			0.131**	0.093
			[0.044]	[0.065]
Self-reported willingness to take risks (0-10)				0.031***
				[0.005]
Self-reported level of trust in others (0-10)				-0.009**
				[0.004]
Self -reported importance of creativity at work (0-10)				0.013**
				[0.006]
Self-reported value given to being his/ her own boss				0.028***
				[0.005]
A member of the family have or had their own business				0.044**
				[0.017]
N	706	705	705	702

The difference between the expected earnings as an entrepreneur and the expected wage as an employee in Bogotá, five years after graduation, is a determinant of the entrepreneurial intention of university graduates. A difference of 20% between the two earnings explains an increase of 0.5% in the probability of becoming an entrepreneur.[15] This figure is derived from the model in Column 4, when all the non-cognitive traits were included. When only the monetary variables are included, the difference in earnings of 20% is associated with an increase of 0.3 percentage points. The logarithm of the self-assessed cost of establishing a firm is not statistically significant as a determinant of entrepreneurial intentions.

The individual and socioeconomic characteristics appear to not be relevant to explaining a change in the probability of becoming an entrepreneur. The only exception is in the case of the highest socioeconomic strata (6). The socioeconomic strata are categorised from 1 to 6, with 6 being the highest level for public services fees, and traditionally associated with being affluent. The results show that declaring a socioeconomic stratification of 6 decreases the probability of becoming an entrepreneur by 15 percentage points.

The educational characteristics play an important role in explaining the decision. Lee and Ventakaram (2006) have pointed out that when an individual considers his knowledge is not valued well by the market, he will consider other options such as self-employment. The estimates support this hypothesis. Being a student from universities in the positions 11-25 in the Ministry of Education ranking is associated with an increase of the

[15]My original variable is $P_{i,success} * (\ln W_{ent,i})$ - $P_{i,job\ bog} (\ln W_{i,emp})$. For practical purposes, I found the value of this difference using the average of all the values this will be X1. Then I create a variable that is $P_{i,success} * (\ln W_{ent,i} * 1.2)$ - $P_{i,job\ bog} (\ln W_{i,emp})$. This will be X2.Then x2-x1 which will be the value that I will multiply the coefficient of the original difference in earnings if the earnings as an entrepreneur increase by 20%. This is the result that I am presenting.

probability of becoming an entrepreneur by 7.1 percentage points and being a student of universities located in the lowest placed rankings will increase the probability of becoming an entrepreneur by 6.5 pp. These results are also supported by the negative effect of having a high GPA in the probability of becoming an entrepreneur. In the case of having a GPA equal or higher to 4, (GPA in Colombia is measured from 0 to 5), the probability of becoming an entrepreneur will decrease by 4.2 percentage points.

The field of study does not consistently affect the probability of becoming an entrepreneur. The statistical significance of the variable fades when other non-cognitive traits are included. Business is a field of study traditionally investigated in entrepreneurial studies, however in this case being a business student is not associated with a change in the probability of starting a new firm. Another unexpected result was that being a student from law and political science will increase the probability of becoming an entrepreneur: the effect was significant in column 3, when educational characteristics were included. In column 4, the model that includes non-cognitive traits, the result is significant at 10%.

The non-cognitive traits associated with entrepreneurial attitudes, like the willingness to take risks, the importance of creativity at work and the importance given to being their own boss, are relevant to explaining the probability of becoming an entrepreneur. The more the student considers himself prepared to take risks, the more the probability increases of becoming an entrepreneur. The willingness to take risks together with the importance given to being his own boss is also associated with an increase in the probability of becoming an entrepreneur by 3 percentage points. How important the students consider creativity at work explains an increase of 1 percentage point. An unexpected result is that expressing trust in others is related with a decrease of the probability. The exposure to an entrepreneurial environment, measured by having a

family member who has or had their own business is associated with an increase of the probability of becoming an entrepreneur by 4.4 percentage points.

Using different specifications about the reported expected earnings as an entrepreneur and the expected wages as an employee in Bogotá could lead to a different size in the effects. In Table 3.6 I present the average marginal effects of the three different specifications of a GLM model: in the first specification (column 1), the earnings as an entrepreneur in a no schooling debt scenario and the wages in Bogotá five years after graduation are presented as a logarithm of the self-reported earnings and wages. In column 2, I use separately the elicited expected earnings as an entrepreneur and the expected wage in Bogotá. The expected earnings as an entrepreneur variable is the multiplication of the self- reported probability of succeed as an entrepreneur, by the self-reported expected earnings as an entrepreneur in a scenario of no schooling debt. Both variables are measured in a scenario of five years after graduation. As a separate variable, I include the logarithm of the expected wage as an employee in Bogotá five years after graduation, also multiplied by the probability of finding a job in Bogotá five years after graduation. The third column presents the difference between the earnings and wage used in column 2. In the three estimations, I include a variable for the item non response.

Table 3.6 Three different specifications of the expected earnings. Dependent variable: probability of becoming an entrepreneur five years after graduation in a no-debt scenario.

	1	2	3
	b/se	b/se	b/se
Logarithm of the expected earnings as an entrepreneur	0.067***		
	[0.014]		
Not reporting earnings as an entrepreneur	0.340**		
	[0.113]		
Logarithm of the expected wage as an employee in Bogotá five years after graduation	-0.024		
	[0.019]		
Not reporting expected wage as an employee in Bogotá	-0.171		
	[0.169]		
Probability of having a job in Bogotá*Ln (Expected Wage in Bogotá)		0.002	
		[0.006]	
Not reporting expected wage or probability of having a Job in Bogotá		0.02	
		[0.071]	
Probability of working as an entrepreneur*Ln (Expected earnings as an entrepreneur)		0.043***	
		[0.004]	
Not reporting expected earnings as an entrepreneur or probability of working as an entrepreneur		0.005	
		[0.049]	
[Prob of working as an entrepreneur*Ln (Expected earnings as an entrepreneur)]-			0.026***
			[0.004]
Not reporting difference in wages			-0.161***
			[0.040]
Self-assessed cost of starting a firm	-0.000**	-0.000*	-0.000*
	[0.000]	[0.000]	[0.000]
Not making an asssesment of the cost	-0.018	0.003	-0.011
	[0.035]	[0.035]	[0.037]
Female	0.023	0.030*	0.027*
	[0.016]	[0.016]	[0.016]
strata_6 (High)	-0.127**	-0.153**	-0.151**
	[0.056]	[0.051]	[0.057]
Mom who attended college	-0.01	-0.01	-0.017
	[0.020]	[0.019]	[0.020]
Previous experience of unemployment in the family	0.005	0.014	0.006
	[0.017]	[0.015]	[0.016]
Semester	-0.001	-0.002	0.001
	[0.006]	[0.006]	[0.006]
Study in a top 10 University	0.019	0.013	-0.019
	[0.075]	[0.072]	[0.074]
Study in a top 25 University	0.060**	0.047*	0.070**
	[0.028]	[0.026]	[0.028]
Study in a top 100 University	0.083**	0.063**	0.066**
	[0.032]	[0.028]	[0.031]
Study in a public university	-0.052	-0.039	0.011
	[0.070]	[0.067]	[0.069]
Having a high GPA	-0.041**	-0.033*	-0.041**
	[0.018]	[0.018]	[0.018]
diiference between expected daily hours working in their own firms minus hours worked in a job that they like	0.001	-0.001	0.000
	[0.003]	[0.003]	[0.003]
Self-reported willingness to take risks (0-10)	0.034***	0.025***	0.031***
	[0.005]	[0.005]	[0.005]
Self-reported level of trust in others (0-10)	-0.006	-0.010**	-0.009**
	[0.004]	[0.004]	[0.004]
Self-reported importance of creativity at work (0-10)	0.014**	0.011**	0.013**
	[0.005]	[0.006]	[0.006]
Self-reported importance given to being His/ her own boss	0.029***	0.023***	0.028***
	[0.005]	[0.005]	[0.005]
A member of the family have or had their own business	0.052**	0.040**	0.044**
	[0.017]	[0.016]	[0.017]
	702	702	702

Using only the self-reported expected earnings as an entrepreneur; the estimates show that an increase by 20% in the expected earnings as an entrepreneur increases the probability of becoming an entrepreneur by 1.3 percentage points (column 1) and the effect of the earnings non response is statistically significant. In the second specification, the reported earnings are multiplied by the probability of succeeding as an entrepreneur, and the effect of an increase of 20% in the expected earnings is an increase in the probability by 0.8 percentage points. In both specifications the effect is driven by the expected earnings as an entrepreneur, rather than by the expected wage as an employee in Bogotá five years after graduation. The difference in wages (column 3) shows that a 20% difference between the expected earnings as an entrepreneur and the expected wage as an employee in Bogotá will increase the probability of becoming an entrepreneur by 0.5 percentage points.

An interesting result is how the inclusion of the self-reported probabilities, in the expected earnings and wages, changes the size of the effect in certain variables; for example, the effect of being affluent increases by 3 percentage points when the difference in wages is used. Being a student from a less selective and lower ranked university in the first specification increases the probability of becoming an entrepreneur by 6 percentage points; while when the expected earnings times the probability of becoming an entrepreneur is used (column 2 and column 3), the effect reduces by 2 percentage points. The field of study, in particular being a student of business is associated with an increase of the probability of becoming an entrepreneur by 6.6 percentage points but only in the first specification. Notice that the size of the effect of the earnings non response reduces from 0.3 (column 1) to 0.13, but also show a change in the sign of the estimate (Column 3). Other variables that in the first specification were not statistically significant become

significant when the elicited probabilities were included, for example the level of trust in others.

3.7 Conclusions and discussion

The decision to become an entrepreneur is a complex choice in which a student must evaluate simultaneously his capabilities and preferences but also his expectations of this activity as a main source of employment. I show that eliciting the subjective probabilities of becoming an entrepreneur is a valid way to know the outcome of this self-evaluation. The use of subjective probabilities allows the students to express not only their beliefs about their own self efficacy and their preference for being an entrepreneur but the uncertainty about future unknown outcomes such as their occupation after graduation. A measure that combines beliefs, preferences and uncertainty is not possible to derive from a yes /no question. Once this measure is obtained the analysis of the decision of becoming an entrepreneur could be centred in the relevance of the earning expectations about self-employment and employment, the cost of establishing a firm, individual and educational characteristics and the set of entrepreneurial attitudes.

I found that the preference for income expressed as the expected earnings as an entrepreneur is associated with an increase of the probability of becoming an entrepreneur. This result is statistically significant across the use of different specifications, such as the subjective probability of working in their own firm, and the probability of finding a job, to building the expected earnings and wages, and the use of a difference in earnings. If the decision to become an entrepreneur is a trade-off between the expected earnings as an entrepreneur and the expected wage as an employee, then the approach should be using the difference between the two expected earnings: as an entrepreneur and as an employee. However treating earnings as an entrepreneur and employee separately, the driving factor is the expected earnings as an entrepreneur, since the expected wage turns out to be statistically non-significant. These results must be

handled with caution, since my sample size is limited and I do not include all fields of academic study in the sample.

The findings show that being a student of a university located in a lower position in the ranking will increase the probability of becoming an entrepreneur by 6 percent points. In this case, the literature points out the differences between aspiration and expectations (Lee and Venkataraman, 2006). The students from less selective universities, according to the MIDE ranking, consider that their knowledge and skills will not be valued by the job market; therefore they will tend to seek self-employment alternatives. In the graduate survey all the entrepreneurs declare that his firm is directly related to their field of study therefore there is value added transferred from the fact of being a graduate. By now the role of the cost expectations of the students is still unclear and could become an area of future research.

The estimates obtained for entrepreneurial attitudes that have already been studied, such as risks and the desire for independence, show that the use of subjective probabilities as a way to elicit individual preferences will lead to results in line with the theory, and with other types of questions yet to be measured. For example the role of fear of failure in the expectations and specific measures that links risk and income, like asking the probability of being involved in different scenarios of self- employment that, in the case of success, lead to a higher income, but in the case of failure lead to a higher loss.

This chapter to the best of my knowledge the first in using subjective expectations as a measure of entrepreneurial intentions, shows that it is worthwhile to promote the use of subjective expectations measurements in the entrepreneurial scales and surveys, such as the Global Entrepreneurship Monitor and The GUESSS project. Moreover HEI in

developed and developing countries are designing, implementing and measuring programs of entrepreneurial education. Therefore they have their own surveys about their student's prospects. Some of the HEI have also information about their alumni progress. Collecting and analysing data on expectations would lead to a stronger research agenda and improved methods to studying entrepreneurial intentions and the transition from potential to actual entrepreneurs and, most importantly, it will lead to the creation of comparable studies.

Understanding the determinant of the entrepreneurial expectations and how they change with time will help to design policies that promote entrepreneurial activities and most important what is needed to create an entrepreneur. One area of future research is using this data together with experiments to create tailored entrepreneurial education programmes in different stages of the education. Gertler (2017) show that teaching soft and hard skills in a short course in Uganda, three years after the training, participants of the course shoe increasing levels of business knowledge and non cognitive skills. The programme could increase the number of firms with aggregated value in Colombia, creating new sources of employment and help the graduates to use the skills learned at the university, reducing the unequal distribution of the returns from education.

Conclusion

This thesis examined two major strategies for human capital allocation: migration and entrepreneurship, in the form of the subjective expectations of college graduates about these two decisions. The rising level of youth unemployment rates around the globe has made it imperative to study alternatives for those who pursue higher education.

Recent research on subjective expectations has shown that there is substantial heterogeneity in beliefs, and expectations tend to vary with observable characteristics like income, age, wealth and academic performance in the same way as actual outcomes. In chapter one, we add to the high skilled migration literature by studying the socioeconomic differences within the already selected group of the highly skilled migrants and to the subjective expectations literature by analyzing migration expectations and their relation with location specific capital such as languages and opinion of the destination. To the best of my knowledge chapter 2 this is the first attempt to study internal graduate migration in Colombia using subjective expectations, and chapter 3 is the first attempt to use subjective expectations to elicit individual entrepreneurial intentions.

In this thesis I want to understand how subjective expectations help to understand decisions about migration and entrepreneurship. The answer that I found through the three chapters is subjective expectations help to elicit uncertainty about behaviour in a quantitative form and what could be the source of this uncertainty. Also subjective expectations provide what should be the information given to potential migrants and entrepreneurs in order to increase the probabilities of both events happening. In the first chapter the probability of migration to USA and China ,the destinations that are less familiar to the students , are the one that were more affected by the opinion , while those

who report the lower expectations about the provision of public goods in three less developed cities in Colombia are those less prone to migrate there. The subjective expectation of becoming an entrepreneur is driven by a combination of the expected earnings as an entrepreneur and non cognitive traits like creativity and desire for independence and the exposure to entrepreneurial environment. All these results provide information to design migration policies and entrepreneurial education programs. Yet, testing who effective are information campaigns is by itself another research agenda.

Eliciting subjective expectations in developing countries has raised issues concerning not only the ability of the respondents to provide expectations in a probabilistic format but also the length of the surveys concerned; these concerns have been refuted by other studies (Delavande, 2014) and also refuted by the three chapters presented in this thesis. The use of fully detailed scenarios, and in particular those scenarios of migration when the wage offered is fixed, help to deal with the information asymmetries and financial constraints that will prevent an individual to migrate. In the first chapter we found that together with the expected gain of migration, the opinion about the USA, China and Saudi Arabia is a determinant of the probability of migration to these countries, and the effect of these opinions vary across different socioeconomic backgrounds. We found that individuals that have received different types of educations react in a different way to the same job offer if the offer is placed in two different countries. Providing objective information about the cost of living, job opportunities and lifestyle to all students regardless their institution of enrolment could help to have accurate information sets about potential destination of migration.

In Chapter 2 I investigate about a less common flow of migration from a developed urban city to a less developed one. I study the determinants of the migration decision of students

from one the capital city of Bogotá in Colombia to less developed cities: Arauca, Quibdó and Riohacha. The three cities are royalties' receptors yet the three of them trail behind in their social and economic development. I designed the study following Delavande and Zafar (2017), but aiming to cover a different set of amenities: the provision of three types of public goods. The amenities covered were security, access to schools, roads and hospitals. The purpose of studying this migration decision was to find the required incentives that the Colombian government must give, in order to attract graduates that could help in the design of better investment projects that are royalties funded.

The results suggest that although the expected wage is an important driver of migration and the provision of public goods have a positive impact on the probability of migration, the type of university also affects the probability of migration. Those students from the top universities will be less willing to migrate to less developed areas, despite the fact that the hypothetical migration scenarios offered competitive wages, while students from universities located in the middle of the ranking will be more prone to migrate. From a policy perspective, eliciting knowledge of the wage required to mobilize the human capital required to strengthen the institutional development at regional levels, is valuable information for the policy design. For example by offering a monthly wage of 2 million pesos (701 USD) which is a competitive salary for a recent graduate, the average probability of migration to Arauca is 0.4.

Bogotá differs considerably from Arauca, Quibdo and Riohacha. Currently there is not any "region familiarity" between the cities. This is also shown in the different probabilities of migration reported. According to the results, two possible ways could be considered by the regional and national governments to increase the region familiarity; the first approach is improving the provision of public goods in order to change the

perception that the rest of the country has about these territories. The second method, that also provides a future research agenda, is to study the migration expectation of those graduates that are from similar regions. For example, can we determine the subjective expectations of migration of other graduates of the Caribbean region, where Riohacha is located?

These results could be helpful to design a regional policy. First, the probabilities of migration show, to some extent, the perception that graduates have about less developed areas. Second, the hypothetical scenarios suggest what could be an appropriate wage and highlight the amenities that make graduates consider migration. With this information, a regional policy that offers a first employment to recent graduates could have two main goals in the short term. The first objective is improving regional institutional development by providing human capital and the second is giving graduates a first employment, which is a determinant to gaining experience and as a consequence improving their chances to succeed in the labour market.

In Chapter 3 I study subjective expectations about entrepreneurial behaviours. In particular I examine the role of expected earnings in self employment and as a paid employee, I found that the expectations about earnings in the entrepreneurial activity increases the probability of becoming an entrepreneur while the expectations as a paid employee or about the cost of a firm are not significant. I found that students have different expectations about their earnings as an entrepreneur but also personal beliefs about the importance of being independent and creative affect positively this probability. The previous exposure to entrepreneurial environments also affects positively this probability. Being from an affluent background and having a high graduate point average (GPA) decreases the subjective probability of becoming an entrepreneur. These results

are valuable starting point and future research of the design of a tailored entrepreneurial education program and also to understand a question made by Gertler (2017) how to make an entrepreneur?

Subjective expectations of becoming an entrepreneur could be also used as a measure of entrepreneurial intentions. Despite the vast literature about the determinants of becoming an entrepreneur there is not a unique metric to test entrepreneurial intentions. The proposed methods in the literature use ordinal measurements of the preferences of becoming an entrepreneur and of the three key theoretical concepts of entrepreneurial intention research: self-efficacy, subjective norm and perception of control. Collecting data about probabilistic expectations allows us to have responses that are comparable between individuals and one probability that comprises the three concepts. The hypothetic scenarios enable an understanding of how different combinations of risk and expected earnings change the individual probability of becoming an entrepreneur.

I test three different measurements of entrepreneurial intention. The first measure asks for the intention of becoming an entrepreneur five years after graduation in a scenario of no schooling debt. The first question is a yes/no question. The second measure uses subjective probabilities of starting their own firm in a similar scenario and finally the third measure asks for the probability of working in their own firm. The results show that the yes/no question cannot capture fully the uncertainty of becoming an entrepreneur. The answers provided to the questions also show how individuals recognize the different wording of the questions and how these questions represent different stages, as the second question is about the process of starting up as an entrepreneur while the third one is about working in your own firm, which is to some extent an imperfect measure of success as an entrepreneur. Then I test different specifications of the expected earnings as an

entrepreneur, finding that the expectations in the other possible job alternative, becoming an employee, are not the main driver of the earning component, yet the earnings as an entrepreneur is the driver of the effect. This result is relevant for the design of entrepreneurial education models, since providing information about the entrepreneurial process and the potential earnings at different stages of undergraduate studies could change students' beliefs about entrepreneurship, and also change their entrepreneurial intentions. This is a further path of research.

The students expectations about becoming an entrepreneur vary with observable characteristics like income, age, wealth and academic performance, in the same way as other results on entrepreneurial intentions are reported in the literature (Zhang et al. 2015, Kacperczyk 2013, Stephens et al.2006). This proves that expectations are valuable in order to understand the role of the non-observable behaviours, and eliciting the private information of the potential entrepreneurs. Although many surveys about entrepreneurial intentions ask extensively about observable and non-observable characteristics, the use of ordinal measures does not capture fully the uncertainty and the self- assessment of the individual's own skills, capabilities and will to become an entrepreneur.

Many of the potential entrepreneurs do not become actual entrepreneurs. Therefore, subjective expectations could be useful in helping to understand the broken link between potential entrepreneurs and actual entrepreneurs.

Bibliography

Acemoglou, D. and Robinson, J. 2010. The Role of Institutions in Growth and Development. In Leadership and Growth edited by David Brady and Michael Spence. World Bank e-library

Agencia Nacional de Hidrocarburos (ANH). 29th October 2015. Estrategia territorial para la gestión equitativa y sostenible del sector hidrocarburos. Diagnóstico socioeconómico del departamento de Arauca. URL: http://www.anh.gov.co/.

Ahmad, N. 5th June 2017. Can Pakistan's brain drain be reversed? The Express Tribune. URL: https://tribune.com.pk/story/1427498/can-pakistans-brain-drain-reversed/.

Ajzen, I. 1991. The theory of planned behavior. Organizational behavior and human decision processes, 50(2), 179–211.

Ali, S. 2009. Islam and education: Conflict and conformity in Pakistan's madrassas. Karachi: Oxford University Press.

Attanasio O, Meghir C, Vera-Hernández M. 2005. Elicitation, validation, and use of probability distributions of future income in developing countries. Working. Paper., University College London.

Attanasio, O., 2009. Expectations and perceptions in developing countries: their measurement and their use. American Economic Review Papers and Proceedings 99 (2), 87–92.

Attanasio, O., 2014 Education choices and returns to schooling: Mothers' and youths' subjective expectations and their role by gender. Journal of Development Economics 109 (2014), 203–216.

Attanasio, O., Kaufmann, K, 2009. Educational choices, subjective expectations, and credit constraints, NBER Working Paper No. 15087.

Attanasio, O., Meghir,C., Vera-Hernández M. 2005. "Elicitation, validation, and use of probability distributions of future income in developing countries." Paper presented at the 2005 Econometric Society Meeting.

Autor, D. 2003 Lecture Note: Self-Selection — The Roy Model. MIT 14.661 Spring 2003

Barbiano di Belgiojoso, E. 2016 Intentions on desired length of stay among immigrants in Italy.Genus 72: 1. https://doi.org/10.1186/s41118-016-0006-y

Bandura, A. 1977. Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review. 84 (2), 191-215.

Bandura, A. 1993. Perceived self-efficacy in cognitive development and functioning. Educational Psychologist. 28 (2), 117-148.

Bano, M. 2012. The rational believer: Choices and decisions in the madrasas of Pakistan. Ithaca, New York: Cornell University Press.

Barón J D., 2012, Primeras experiencias laborales de los profesionales colombianos: probabilidad de empleo formal y salarios. Lecturas de Economía - No. 76. Medellín, enero-junio 2012.

Baum, C 2013 Generalized Lineal Models. URL: http://fmwww.bc.edu/EC-C/S2013/823/EC823.S2013.nn06.slides.pdf

Baumol, W., 1990, "Entrepreneurship: Productive, Unproductive and Destructive." Journal of Political Economy 98 (5), 893–921.

Beine, M., Docquier, F, Rapoport, H. 2008 Brain Drain and Human Capital Formation in Developing Countries: Winners and Losers. The Economic Journal, 118 (April), 631–652

Beine, M., Docquier, F.and Özden, C. 2009. Diasporas. Policy research working paper The World Bank. Development Research Group Trade and Integration Team

Bellemare, M., 2008. Insecure land rights and reverse share tenancy in Madagascar, Mimeo. Duke University.

Berman, E., Lang,K. and Siniver,E.2003.Language-skill complementarity: returns to immigrant language acquisition, Labour Economics, Volume 10, Issue 3, June 2003, 265-290, ISSN 0927-5371, http://dx.doi.org/10.1016/S0927-5371(03)00015-0.

Bird, R. 2012 Fiscal Decentralization in Colombia: A Work (Still) in Progress. International Center for Public Policy Working Paper 12-23.

Blanchflower, D., and Oswald, A.1998 What Makes an Entrepreneur? Journal of Labor Economics 1998 16:1, 26-60

Bollard, A., McKenzie. D, Morten, M. and Rapoport H. 2011. Remittances and the Brain Drain Revisited: The Microdata Show that More Educated Migrants Remit More, World Bank Economic Review, 25, 1: 132-156.

Bonet, J., Urrego J. 2014. El Sistema General de Regalías: ¿mejoró, empeoró o quedó igual? Documentos de trabajo sobre economía regional. Documentos de Trabajo sobre Economía Regional – Banco de la República. No 198.

Bonilla, L, Bottan, N.L., Ham, A., 2016. Information policies and higher education choices experimental evidence from Colombia. Banco de la Republica Colombia.URL: http://www.banrep.gov.co/sites/default/files/eventos/archivos/sem_423.pdf

Borjas G. 1987. Self-selection and the earnings of immigrants. The American Economic Review 77 (4), 191-215.

_____ 1991. Immigration and Self-Selection in Immigration, Trade and the Labor Market. University of Chicago Press (p. 29-76). URL http://www.nber.org/books/abow91-1

Burda, M.C., Härdle, W., Müller, M., Werwatz, A., 1998. Semiparametric analysis of German East–West migration intentions: facts and theory. Journal of Applied Econometrics, 13 (5), 525-541.

Burke, A., FitzRoy, F., Nolan, M., 2002. Self-employment wealth and job creation: The roles of gender, non-pecuniary motivation and entrepreneurial ability. Small Business Economics 19, 255–270.

Campbell, C.A. 1992. A decision theory model for entrepreneurial acts. Entrepreneurship Theory and Practice. Fall: 21–27.

Cárdenas, M., Medina, C., Trejos, A. 2010. Measuring economic and social impacts of migration in Colombia: New evidence. Borradores de economía, Banco de la República.

Cárdenas, M., Mejía C. 2006. Migraciones internacionales en Colombia: ¿qué sabemos? Working papers series, Fedesarrollo.

Cassar, G., Friedmann, H. 2009. Does self-efficacy affect entrepreneurial investment? Strategic Entrepreneurship Journal 3 (3), 241–260.

Cepeda, L. 2012. ¿Fuga interregional de cerebros? El caso colombiano. Documentos de Trabajo sobre Economía Regional y Urbana. Editorial Banco de la República, Cartagena Colombia.

Ciriaci, D. 2011. University quality, interregional brain drain and spatial inequality. The case of Italy. LLEE Working Paper Series.

Confederación Colombiana de Cámaras de Comercio (Confecamaras). 2016. Nacimiento y supervivencia de las empresas en Colombia. URL: http://www.eam.edu.co/centrodeinvestigaciones/Politica-publica-s/NACIMIENTO-Y-SUPERVIVENCIA-DE-LAS-EMPRESAS-INFORME.pdf

Confederación Colombiana de Cámaras de Comercio (Confecamaras). 21th July 2016. 17 % aumentó la creación de empresas en el país en el primer semestre del año. URL: http://www.confecamaras.org.co/noticias/462-17-aumento-la-creacion-de-empresas-en-el-pais-en-el-primer-semestre-del-ano-2 accessed 18/08/2016.

Coniglio, N. D., Prota, F. 2008. Human capital accumulation and migration in a peripheral EU region: The case of Basilicata. Papers in Regional Science 87 (1), 77–96.

Corcoran, J., Faggian, A., McCann, P. 2010. Human capital in remote and rural Australia: The role of graduate migration, growth and change 41(2), 192–220.

Departamento Administrativo Nacional de Estadística (DANE). 2010. Colombia. Boletín censo general 2005.

Departamento Administrativo Nacional de Estadística (DANE). 2014. Pobreza monetaria y multidimensional en Colombia. Boletín Técnico.

Departamento Administrativo Nacional de Estadística (DANE). 2015. Estimaciones de migración 1985-2020. URL: http://www.dane.gov.co/index.php/poblacion-y-demografia/series-de-poblacion, accessed 28th May 2017.

Departamento Administrativo Nacional de Estadística (DANE). 2015. Información Estadística. Anexo pobreza por departamentos. URL:http://www.dane.gov.co/index.php/esp/component/content/article/87-sociales/calidad-de-vida/6507-pobreza-monetaria-y-multidimensional-2015, accessed 28th May 2017.

Departamento Administrativo Nacional de Estadística (DANE). 2016. Boletín Técnico Pobreza monetaria 2015. Chocó. URL: https://www.dane.gov.co/files/investigaciones/condiciones_vida/pobreza/2015/Choco_Pobreza_2015.pdf, accessed 28th May 2017.

Departamento Administrativo Nacional de Estadística (DANE). 2016. Boletín Técnico Pobreza monetaria 2015. La Guajira. URL: https://www.dane.gov.co/files/investigaciones/condiciones_vida/pobreza/2015/Guajira_Pobreza_2015.pdf, accessed 28th May 2017.

DaVanzo, Julie, 1976, Why families move: A model of the geographic mobility of married couples, R-1972-DOL (The Rand Corporation, Santa Monica, CA).

DaVanzo, Julie. 1981, Repeat migration, information costs, and location specific capital, Population and Environment 4, 45-73.

Davidsson, P., Benson, H. 2003. The role of social and human capital among nascent entrepreneurs. Journal of Business Venturing 18 (3), 301-331.

Dawn. 8th March 2013. For many Pakistanis, China is 'the new West' URL:https://www.dawn.com/news/791165/for-many-pakistanis-china-is-the-new-west, accessed 4th October 2014.

De Jong, G., Abad, R., Arnold, F., Carino, B., Fawcett, J., Gardner, R. 1983. International and internal migration decision making: A value-expectancy based analytical framework of intentions to move from a rural Philippine province. International Migration Review 17(3), 470-484.

De Jong, G. 2000. Expectations, gender, and norms in migration decision-making. Population Studies 54(3), 307-319.

De Mel, S., McKenzie, D., Woodruff, C. 2008. Returns to capital: Results from a randomized experiment. Quarterly Journal of Economics 123 (4), 1329–1372.

Delavande, A., Giné, X., McKenzie, D. 2011. Measuring subjective expectations in developing countries: A critical review and new evidence. Journal of Development Economics 94 (2011), 151–163.

Delavande, A., Zafar, B. 2017. Gender discrimination and social identity: Evidence from urban Pakistan. Economic Development and Cultural Change. (In Press)

Delavande, A., Zafar, B. 2015. Stereotypes and madrassas: Experimental evidence from Pakistan Journal of Economic Behavior & Organization 118: 247-267

Delavande, A., Zafar, B. 2014. University choice: the role of expected earnings, non-pecuniary outcomes and financial constraints. ISER Working Paper Series 2014-38.

Delavande, A., Zafar, B. 2013. Subjective expectations about the returns to schooling and the decision to go to university. Conference Paper. Understanding Society Research Conference, 24-26 July 2013, University of Essex.

Delavande A. 2014. Probabilistic expectations in developing countries. The Annual Review of Economics 6: 1-20.

Delavande, A., Kohler, H. 2009. Subjective expectations in the context of HIV/AIDS in Malawi. Demographic Research 20 (31), 817–874.

Dinero.com. 17th September 2016. Una empresa en Colombia vive en promedio 12 años. URL: http://www.dinero.com/empresas/articulo/mortalidad-empresas-colombia/200984/, accessed 15/08/2016.

Dinero.com. 14th April 2016. Mipymes generan alrededor del 67% del empleo en Colombia. URL: http://www.dinero.com/edicion-impresa/pymes/articulo/evolucion-y-situacion-actual-de-las-mipymes-en-colombia/222395 accessed 15/08/2017

Docquier, F., Lohest, O., Marfouk, A. 2007. Brain drain in developing countries. World Bank Economic Review 21 (2) 193-218.

Dominitz, J., Manski, C., 1997. Using expectations data to study subjective income expectations. Journal of the American Statistical Association 92 (439), 855–867.

Douglas E., Shepherd D. 1999. Entrepreneurship as a utility maximizing response. Journal of Business Venturing 15:231–251.

Douglas, E., Shepherd, D. 2002 Self-employment as a career choice: attitudes, entrepreneurial intentions, and utility maximization. Entrepreneurial Theory and Practice 26(3): 81-90.

Espenshade, T., & Fu, H. (1997). An Analysis of English-Language Proficiency among U.S. Immigrants. *American Sociological Review, 62*(2), 288-305. Retrieved from http://www.jstor.org/stable/2657305

Elempleo.com. 31th of July 2015. Cuánto tarda un egresado en encontrar trabajo? URL: http://www.elempleo.com/co/noticias/noticias-laborales/cuanto-tarda-un-egresado-en-encontrar-trabajo-4739, accessed 12th July 2017.

Espiritu-Olmos R., Sastre-Castillo M.A. 2015. Personality traits versus work values: Comparing psychological theories on entrepreneurial intention. Journal of Business Research (68): 1595–1598.

Fair C. 2006 Religious education in Pakistan: A trip report. USIP http://www.usip.org/events/2006/trip_report.pdf.

Faggian A., McCann P. 2009. Human capital, graduate migration and innovation in British regions. Cambridge Journal of Economics 33: 317–333.

Faggian A. and McCann P. (2009) "Human Capital and Regional Development" in Capello R. and Nijkamp P. (eds.), Handbook of Regional Growth and Development Theories, Edward Elgar,Cheltenham, pp. 131-151, ISBN 978-1-84720-506-3

Faggian, A., McCann P., and Sheppard S. 2007. Some evidence that women are more mobile than men: Gender differences in U.K. graduate migration behavior. Journal of Regional Science 47 (3), 517- 539.

Faggian, A., McCann P., Sheppard S. 2009. Human capital, higher education and graduate migration: An analysis of Scottish and Welsh students. Urban Studies (44): 2511–2528.

Falck, O., Gold, R., Heblich, S. 2011. "Entrepreneurship Education". In Handbook of Research on Innovation and Entrepreneurship. Cheltenham, UK: Edward Elgar Publishing. Retrieved Aug 18, 2016, from <http://www.elgaronline.com/view/9781848440876.00041.xml

Fayolle A., Liñán F. 2014. The future of research on entrepreneurial intentions. Journal of Business Research (67): 663–666.

Fayolle, A., Gailly, B. 2015. The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. Journal of Small Business Management 53(1), 75–93.

Farooq, S and Ahmad, E. 2017 Brain Drain from Pakistan: An Empirical Analysis Forman Journal of Economic Studies.(13) pp. 55-81

Fishbein, M., Ajzen, I. 1975. Belief, attitude, intention, and behavior: An introduction to theory and research. reading, MA: Addison-Wesley.

Fitzsimmons, J. and Douglas, E. 2005. Entrepreneurial attitudes and entrepreneurial intentions: A Cross-Cultural study of potential entrepreneurs in India, China, Thailand and Australia. Paper presented to the Babson-Kaufman Entrepreneurial Research Conference. Wellesley, MA. June 2005.

Fitzsimmons, J. Douglas, E. 2011. Interaction between feasibility and desirability in the formation of entrepreneurial intentions. Journal of Business Venturing, 26 (4), 431-440.

Florida, R. Mellander, C. Stolarick K.2008.Inside the black box of regional development human capital, the creative class and tolerance. Journal of Economic Geography, (8) pp. 615–649. doi:10.1093/jeg/lbn023

Friebel, G., Gallego J., Mendola, M. 2013. Xenophobic attacks, migration intentions and networks: Evidence from the south of Africa. Journal of population economics 26:555–591. doi 10.1007/s00148-012-0455-3

Fritsch, M., Rusakova A. 2010. Personality traits, self-employment, and professions. SOEP papers on Multidisciplinary Panel Data Research. http://www.diw.de/documents/publikationen/73/diw_01.c.366336.de/diw_sp0343.pdf

Gasse Y., Tremblay M. 2008. Entrepreneurial beliefs and intentions: A cross-cultural study of university students in seven countries. International Journal of Business, 16 (4), 303-314.

Gazdar, H. 2003. A review of migration issues of Pakistan. Collective for Social Science Research, Karachi, Pakistan.

Gennaioli, N., La Porta R., Lopez-de Silanes F., Shleife A. 2013. Human capital and regional development. The Quarterly Journal of Economics, 128 (1), 105-164.

Ghulam N., Liñán F. 2011. Graduate entrepreneurship in the developing world: intentions, education and development. Education + Training 53(5), 325 – 334.

Gibbons, F. 2008. Intention, Expectation, and Willingness. National Cancer Institute-Division of Cancer Control & Population Sciences. URL:https://cancercontrol.cancer.gov/brp/research/constructs/intent-expect-willingness.html, accessed 24th February 2018.

Gibbons, F. X., & Gerrard, M. (1997). Health images and their effects on health behavior. in B. P. Buunk, & F. X. Gibbons (Eds.), Health, coping, and well-being: Perspectives from social comparison theory. (pp. 63-94).

Gibson J., McKenzie, D. 2011. The microeconomic determinant of emigration and return migration of the best and brightest: Evidence from the pacific. Journal of Development Economics. 95 (2011), 18-29.

Gibson, J., Mckenzie, D. 2007. The impact of an ex-ante job offer requirement on labor migration: The New Zealand- Tongan experience. In Çaglar Özden, Maurice W. Schiff (Eds). International Migration, Economic Development and Policy. World Bank. Washington DC 215-233.

Gibson, J.,Mckenzie, D. 2011. The microeconomic determinant of emigration and return migration of the best and brightest: Evidence from the pacific. Journal of Development Economics 95 (2011), 18-29.

Giné, X., Townsend, R., Vickery, J. 2009. Forecasting when it matters: Evidence from semi-arid India, Mimeo World Bank.

Giné, X., Klonner, S. 2007. Technology adoption with uncertain profits: The case of fiber boats in South India, Mimeo World Bank.

Glaeser E., Gottlieb J. 2009. "The Wealth of Cities: Agglomeration Economies and Spatial Equilibrium in the United States," Journal of Economic Literature , vol. 47(4), pages 983-1028, December.

Glaesser E., Mare D. 1994. Cities and Skills. NBER Working Paper.

Global Entrepreneurship Monitor (GEM). 2016-2017. Global Report.

Global Entrepreneurship Monitor (GEM). 2016. Actividad Empresarial en Colombia.

Global Entrepreneurship Monitor (GEM). 2015. Colombia. 2014. URL: http://gemcolombia.org/publicaciones/

Gomez Caceres, N. Three essays on human capital and labour markets for college graduates in Colombia. PhD Dissertation Graduate Program in Agricultural, Environmental and Development Economics. The Ohio State University. Columbus, Ohio. 2015

González-Velosa, C., Rucci G., Sarzosa Ml, Urzúa S. (2015) Returns to higher education in Chile and Colombia (IDB Working Paper Series587). URL: https://publications.iadb.org/bitstream/handle/11319/6858/Returns_to_Higher_Education_in_Chile_and_Colombia.pdf?sequence=2

Grogger, J. and Hanson,G. 2011. Wage maximization and the selection and sorting of international migrants. Journal of Development Economics 95 (2011), 42-57.

GUESS (2016). El espíritu emprendedor de los estudiantes en Colombia. Resultados del proyecto GUESS Colombia 2016.

Guveli, A. (2015). Intergenerational Consequences of Migration : Socio-economic, Family and Cultural Patterns of Stability and Change in Turkey and Europe. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan.

Haapanen, M and Tervo, H. 2012. Migration Of The Highly Educated: Evidence From Residence Spells Of University Graduates. Journal of Regional Science, vol. 52 (4), 587–605.

Harris, J., Todaro, M. 1970. Migration, unemployment and development: a two-sector analysis. The American Economic Review 60(1), 126-142.

Hattab Hala W. 2014. Impact of Entrepreneurship Education on Entrepreneurial Intentions of University Students in Egypt. The Journal of Entrepreneurship 23(1) 1–18.

Heering, L., Van der Erf, R, Van Wisen L. The Role of Family Networks and Migration Culture in the Continuation of Moroccan Emigration: A Gender Perspective. Journal of Ethnic and Migration Studies. 30, (2), pp. 323–337

Heckman, J. J., Honoré, B. E. (1990): The Empirical Content of the Roy Model. Econometrica 58(5), pp. 1121-1149.

Hernandez, A and Herrera F.2015. Evaluación del Sistema General de Regalias. United Nations Development Programme. Cuadernos PNUD.

Hicks, N. 1996. An Analysis of the Index of Unsatisfied Basic Needs (NBI) Of Argentina With Suggestions for improvements. URL: http://www.cepal.org/deype/mecovi/docs/TALLER5/9.pdf, accessed 24th October 2016.

Hill RV. 2010. Liberalisation and producer price risk: examining subjective expectations in the Ugandan coffee market. Journal of. African. Economics. 19:433–58

_____. Using stated preferences and beliefs to identify the impact of risk on poor households. Journal of Development Studies. 45:151–171.

Hofstede, G. 1980. Culture's Consequences: International Differences in Work-Related Values. Beverly Hills, CA: Sage Publications.

Hugo, G.J. (1981) 'Village-community ties, village norms and ethnic and social networks: a review of evidence from the Third World', in De Jong, G.F. and Gardner, R.W. (eds) Migration Decision Making; Multidisciplinary Approaches to Micro level Studies in Developed and Developing Countries. New York: Pergamon Press, 187–218

Hurd, Michael, 2009. Subjective probabilities in household surveys. Annual Review of Economics 1: 543–564.

Iakovleva, T., Kolvereid, L., Ute, S. 2011 "Entrepreneurial intentions in developing and developed countries", Education + Training, 53 (5), 353-370.

Ibañez, A., Velez C. Civil Conflict and Forced Migration: The Micro Determinants and Welfare Losses of Displacement in Colombia. World Development
Volume 36, Issue 4, April 2008, Pages 659-676

Innpulsa 2017. Mapeo y Caracterización del Ecosistema de Emprendimiento En Colombia, con Énfasis en la Localización de las Startups. URL: https://www.innpulsacolombia.com/sites/default/files/1.2._analisis_y_descripcion.pdf

International Labour Organization (ILO). 2014 Strengthening labour migration governance in Pakistan. Information brief about strengthening labour migration governance in Pakistan. URL:

http://www.ilo.org/islamabad/whatwedo/publications/WCMS_241600/lang--en/index.htm, accessed 09th May 2017.

International Labour Organization (ILO). 2014. Measuring Decent Work in Pakistan. The Decent Work Country Profile at a Glance. URL: http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-islamabad/documents/publication/wcms_317602.pdf, accessed 09th May 2017.

International Labour Organization (ILO). 2015 Labour migration from Pakistan: 2015 status report.

International Labour Organization (ILO). 2016. The cost of migration: What low-skilled migrant workers from Pakistan pay to work in Saudi Arabia and the United Arab Emirates.

International Organization for Migration (IOM) 2018. WORLD MIGRATION REPORT 2018.

Iyigun, Murat Fand. Ann L. Owen. 1998. Risk, entrepreneurship, and human-capital accumulation. The American Economic Review 88(2), 454-457.

Jaeger, D., Dohmen T., Falk, A., Huffman, D., Sunde, U., and Bonin, H. 2010. Direct evidence on risk attitudes and migration. The Review of Economics and Statistics 92 (3), 684-689.

Juster, T. 1964. Anticipations and Purchases: An Analysis of Consumer Behavior. Princeton: Princeton University Press.

Kaiser, B. (2015). Detailed decompositions in nonlinear models. Applied Economics Letters, 22(1), 25-29.

Kacperczyk, A. 2013. Social Influence and Entrepreneurship: The Effect of University Peers on Entrepreneurial Entry. Organization Science 24(3), 664-683

Kahneman, D., Tversky, A. 1979. Prospect theory: an analysis of decision under risk. Econometrica 47(2), 263-291.

Karimi S., Biemans H., A, Lans, T, Chizari, M., Mulder, M. 2016. The Impact of Entrepreneurship Education: A Study of Iranian Students' Entrepreneurial Intentions and Opportunity Identification. Journal of Small Business Management 54(1), 187–209.

Karimi, S.,Biemans J., Lans, T., Chizari, M, Mulder M, Mahdei Karim. 2013. Understanding role models and gender influences on entrepreneurial intentions among college students. Procedia - Social and Behavioral Sciences. 93: 204 – 214.

Kaufmann K. 2012. Understanding the income gradient in college attendance in Mexico: the role of heterogeneity in expected returns. Working Paper., Bocconi University., Milan.

Kennan,J. and Walker,J. 2011. The role of expected wage on individual migration decisions. Econometrica 72 (5), 1329–1376.

Kennan,J., Walker, J. 2012. Modelling Individual migration decisions. Iza working Paper. URL: http://www.ssc.wisc.edu/~jkennan/research/MigIzaR2.pdf, accesssed 10th October 2014.

Khuong Mai N, Huu An, N. 2016. The factors affecting entrepreneurial intention of the students of Vietnam National University - A mediation analysis of perception toward entrepreneurship. Journal of Economics, Business and Management 4(2), 104-111.

Kihlstrom R, Laffont, J. 1979. A General Equilibrium Theory of Firm Formation based on Risk Aversion. The Journal of Political Economy 87(4), 719-748.

Kolvereid L, Iakovleva T, Kickul J. 2008. Entrepreneurship, culture, finance and economic development "an integrated model of entrepreneurial intentions" Doctoral Track and Conference. URL:https://www.unicaen.fr/colloques/Entrepreneurship_Conference_2008/An_integrated_model_of_entrepreneurial_intentions.pdf Accesssed 10th June 2016

Koser, K. 18th February of 2014. Migration, Security and Development: Understanding the Linkages. People Move. A blog about migration, remittances, and development. The World Bank.

Labour Force Survey. 2013. Government of Pakistan Statistics Division. Pakistan Bureau of Statistics. November 2013.

Laczko, F.; Aghazarm, C. 2009 Migration, environment and climate change: assessing the evidence. International Organization for Migration (IOM)

Lazear, Edward P. 2005. Entrepreneurship. Journal of Labor Economics 23(4), 649-680.

Lee J.-H., Venkataraman S. 2006. Aspirations, market offerings, and the pursuit of entrepreneurial opportunities. Journal of Business Venturing 21 (2006), 107– 123.

Liñan F, Chen Y. 2009. Development and Cross-Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions. Entrepreneurship Theory and Practice 33(3), 593-617.

Liu, Y., and Shen, J. 2014. Jobs or Amenities? Location Choices of Interprovincial Skilled Migrants in China, 2000–2005. Population, Space and Place 20: 592–605.

Lucas, R. 1978. On the Size Distribution of Business Firms. The Bell Journal of Economics 9(2), 508-523.

_____ (1988): “On the Mechanics of Economic Development,” Journalof Monetary Economics, 22, 3–42

Lüthje, Christian. Franke, Nikolaus. 2003. The ‘making’ of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT. R&D Management 33 (2), 135-147.

Mahmood, T, Sher., A, Mahmood., T 2012. Entrepreneurial Intentions among University students of Punjab a Province of Pakistan, International Journal of Humanities and Social Science 2(14), 114-120.

Maldonado, N. 2017. Migration of graduates in Mexico. In Graduate Migration and Regional Development, 2017, 173-201.

Manski, C. F. 1990. The use of intentions data to predict behavior: a best-case analysis. Journal of the American Statistical Association. 85 (412), 934–940.

Manski, C. F. 1999. Analysis of Choice Expectations in Incomplete Scenarios. Journal of Risk and Uncertainty, 19(1/3), 49-65.

Manski, C. F. 2004. Measuring Expectations. Econometrica 72 (5), 1329- 1376.

Maresch, D. , Harms, R., Kailer N., Wimmer-Wurm, B. The impact of entrepreneurship education on the entrepreneurial intention of students in science and engineering versus business studies university programs. Technological Forecasting & Social Change 104 (2016), 172–179.

Massey, D.1990. Social structure, household strategies, and the cumulative causation of migration. PopulationIndex56: 3-26.

Massey, D., Arango, J., Hugo, G., Kouaouci, A., Pellegrino, A. and Taylor, J.E. 1998 Worlds in Motion. Oxford: Clarendon Press

Mathur,V.1999. Human Capital-Based Strategy for Regional Economic Development Economic Development Quarterly Vol 13, Issue 3, pp. 203 - 216 https://doi.org/10.1177/089124249901300301

McKenzie, D. 2012. Learning about migration through experiments. CREAM Discussion Paper SeriesCDP No 07/12.

McKenzie, D. Gibson J., Stillman, S. 2013. A land of milk and honey with streets paved with gold: Do emigrants have over-optimistic expectations about wages abroad? Journal of Development Economics 102 (2013), 116-127.

McKenzie, D., Rapoport, H. 2007. Network effects and the dynamics of migration and inequality: Theory and evidence from Mexico. Journal of Development Economics 84 (2007), 1–24.

Mincer, Jacob, 1978, Family migration decisions, Journal of Political Economy 86, Oct., 749-179.

Ministerio de Educación Nacional (MEN). 2016 .Perfil académico y condiciones de empleabilidad: graduados de educación superior (2001 –2014) Obatorservio Laboral Para La Educación. Ministerio de Educación Nacional Colombia. URL: http://www.graduadoscolombia.edu.co/html/1732/articles-348102_recurso_3.pdf, accessed 5th May 2016.

Ministerio de Educación Nacional (MEN). 2014. Educación Superior 2014-Síntesis Estadística Departamento de La Guajira. URL: http://www.mineducacion.gov.co/sistemasdeinformacion/1735/article-212352.html. accessed 1rst June 2016

Ministerio de Educación Nacional (MEN). 2016. Educación Superior 2014-Síntesis Estadística Departamento del Chocó. URL:

http://www.mineducacion.gov.co/sistemasdeinformacion/1735/article-212352.html. accessed 1rst June 2016

Ministerio de Educación Nacional (MEN). 2017. Encuesta de seguimiento a graduados. Momento 5. URL: http://www.graduadoscolombia.edu.co/html/1732/w3-article-346772.html, accessed 27th September 2017.

Ministerio de Educación Nacional (MEN). 2015. Educación Superior 2014-Síntesis Estadística Departamento De Arauca. URL: http://www.mineducacion.gov.co/sistemasdeinformacion/1735/article-212352.html, accessed 1rst June 2016.

Ministerio de Educación Nacional (MEN). 2017. Observatorio laboral para la educación. Bases de Información/Bases anonimizadas. URL: http://www.graduadoscolombia.edu.co/html/1732/w3-article-346772.html, accessed 1st of April 2017.

Ministerio de Tecnologías de la Información y las Comunicaciones de Colombia (MINCIT). 2015. Definición Tamaño Empresarial Micro, Pequeña, Mediana o Grande. Ministerio de Comercio Industria y Turismo de Colombia. URL: http://www.mincit.gov.co/mipymes/publicaciones/2761/definicion_tamano_empresarial_micro_pequena_mediana_o_grande, accessed 1st of June 2017.

Morgan, J., Sisak, D. 2016. Aspiring to succeed: A model of entrepreneurship and fear of failure. Journal of Business Venturing 31: 1–21.

Moriano, J., Gorgievski, M., Ute, S., & Zarafshan K. 2012. A Cross-Cultural Approach to Understanding Entrepreneurial Intention. Journal of Career Development 39(2), 162-185.

Myers, S., 2000. The Impact of Religious Involvement on Migration Author. Social Forces, Vol. 79, No. 2, pp. 755-783

Myrdal,G.1957. Rich Lands and Poor. NewYork: Harper and Row

Naudé , W. 2010 The Determinants of Migration from Sub-Saharan African Countries, Journal of African Economies, 19 (3), 330–356, https://doi.org/10.1093

Nbaye L,M 2017 Climate change, natural disasters, and migration. IZA World of Labor. URL: https://wol.iza.org/uploads/articles/346/pdfs/climate-change-natural-disasters-and-migration.pdf?v=1

Neudörfer, P. and Dresdner, J. (2014), Does religious affiliation affect migration?. Papers in Regional Science , 93: 577-594. doi:10.1111/pirs.12016

Neumayer, E 2005.Bogus refugees? The determinants of asylum migration to Western Europe. [online]. London: LSE Research Online

OECD 2015, Connecting with Emigrants: A Global Profile of Diasporas, OECD URL: http://www.keepeek.com/Digital-Asset-Management/oecd/social-issues-migration-health/connecting-with-emigrants_9789264239845-en#page93, accessed 10th of June 2014.

Observatorio del Mercado de Trabajo y la Seguridad Social (OMTSS). 2016. Boletín del Observatorio del Mercado de Trabajo y la Seguridad Social No 16. Universidad Externado De Colombia.

Oosterbeek H, van Praag M, Ijsselstein A. 2010. The impact of entrepreneurship education on entrepreneurship skills and motivation. European Economic Review. 54: 442–454.

Osorio T., Fabián F. Londoño R Juan C. 2015. Intención emprendedora de estudiantes de educación media: extendiendo la teoría de comportamiento planificado mediante el efecto exposición. Cuadernos de Administración, 28 (51), 103-131.

Oteiza, E. 1967. La Emigración de Personal Altamente Calificado de la Argentina: Un Caso de "Brain Drain" Latinoamericano. Buenos Aires: Economic Research Center, Instituto Torcuato di Tella.

Ozaralli N., and Rivenburgh N. 2016. Entrepreneurial intention: antecedents to entrepreneurial behavior in the U.S.A. and Turkey Journal of Global Entrepreneurship Research (2016).

Palloni, A., Massey, D., Ceballos, M., Espinosa, K., & Spittel, M. (2001). Social Capital and International Migration: A Test Using Information on Family Networks. American Journal of Sociology, 106(5), 1262-1298. doi:10.1086/320817

Pakistan Bureau of Statistics. 12th September 2015. Provisional summary results of 6th population and housing census-2017. URL: http://www.pbscensus.gov.pk/

Papke, L and Wooldridge J., 1996 Econometric Methods for Fractional Response Variables with an Application to 401 (K) Plan Participation rates. Journal of Applied Econometrics 11(6), 619-632.

Parker, S. 2004. The Economics of Self-Employment and Entrepreneurship. Cambridge: Cambridge University Press.

Portes, Alejandro, 1976. Determinants of the brain drain. International Migration Review 10 (4), 489–508.

Premand P., Brodmann S., Almeida R., Grun R., Barouni M. 2016. Entrepreneurship Education and Entry into Self-Employment Among University Graduates. World Development 77: 311–327.

Pruett, M., Shinnar R., Toney B., Llopis,F., Fox, J. 2009. Explaining entrepreneurial intentions of university students: a cross-cultural study. International Journal of Entrepreneurial Behaviour & Research 15(6), 571 – 594.

Quintana, M. 28th June 2015. Conozca los sueldos de los profesionales recién egresados. El Tiempo. URL:http://www.eltiempo.com/archivo/documento/CMS-16158218, accessed 24th June 2016.

Rabe, B., and Taylor M,. 2012. Differences in Opportunities? Wage, Employment and House-Price Effects on Migration. Oxford Bulletin of Economics And Statistics 74(6), 831-855.

Rahman, T. 2008. "Madrasas: the potential for violence in Pakistan?" in J. Malik (ed), Madrassas in South Asia. Teaching terror? Routledge Contemporary South Asia Series, London and New York URL:https://www.researchgate.net/profile/Jamal_Malik2/publication/227563865_Madrasah_in_South_Asia/links/5559b4c608ae6943a876d295/Madrasah-in-South-Asia.pdf

Rodríguez, C.A. & Prieto Pinto, F.A. (2009). La sensibilidad al emprendimiento en los estudiantes universitarios. Estudio comparativo Colombia-Francia. Innovar, Especial en Educación, dic. 2009, 73-90.

Rojas A. 2015 Reforma al régimen de regalías y desarrollo regional: la experiencia de los departamentos de Arauca y Casanare. Trabajos de Grado CIDER.33. URL: https://cider.uniandes.edu.co/Documents/Trabajos%20de%20grado/Reforma_regimen_regalias33.pdf

Romero, J. 2010, El éxito económico de los costeños en Bogotá: migración interna y capital humano." Documentos de trabajo sobre economía regional 007294, Banco de la República.

Rosenzweig, M. 2007. Yale University: Mimeo.

Rosenzweig, M. 2007. Education and Migration: A Global Perspective. Mimeo, Yale.

Roy, A.D. 1951 Some Thoughts on the Distribution of Earnings. Oxford Economic Papers, New Series, (3), 2, pp. 135-146

Shapero, A., Sokol, L. 1982. The Social Dimensions of Entrepreneurship. In: Encyclopedia of Entrepreneurship, Vol. , p. 72-90.

Shapero, A. 1975. The Displaced, Uncomfortable Entrepreneur. Psychology Today 9(6), 83-88.

Sieger, P., Fueglistaller, U., Zellweger, T. (2014). Student Entrepreneurship Across the Globe: A Look at Intentions and Activities. St.Gallen: Swiss Research Institute of Small Business and Entrepreneurship at the University of St. Gallen (KMU-HSG).

Silva, A., and González P. 2009. "Un análisis espacial de las migraciones internas en Colombia (2000-2005)" Revista de la Facultad de Ciencias Económicas - Universidad Militar Nueva Granada XVII (1), 23—144.

Silva, C., Guataquí J., González P. 2007. The Effect of Internal Migration on the Colombian Labour Market. Global Journal of Business Research (1): 70-82.

Soria K., Honores G., Gutiérrez J., 2016. Gender and Social Legitimacy of Entrepreneurship: Contribution to Entrepreneurial Intention in University Students from Chile and Colombia. Journal of Technology Management and Innovation 11(3).

Souitaris,V., Zerbinati, S., Al-Laham, A. 2007. Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. Journal of Business Venturing 22 (2007), 566–591.

Steffens P, Fitzsimmons, J., Douglas E. 2006. A Choice Modelling Approach to Predict Entrepreneurial Intentions from Attitudes and Perceived Abilities. Frontiers of Entrepreneurship Research 26(8).

Stull, W. 2014 Taking the Plunge: Teaching the Microeconomics of Entrepreneurship. International Advances in Economic Research 20:139–150.

Tarozzi A, Bennear L, Balasubramanya S, Pfaff A, Matin AK, van Geen L. 2009.Subjective risk assessment and reactions to health-related information: evidence from Bangladesh. Working Paper, Pompeu Fabra University, Barcelona

Todaro, M. 1969. A Model of Labor Migration and Urban Unemployment in Less Developed Countries. The American Economic Review 59(1), 138-148.

Turker, D., Sönmez Selçuk, S. 2009. "Which factors affect entrepreneurial intention of university students?" Journal of European Industrial Training 33(2), 142– 159.

Uebelmesser, S. 2006. To go or not to go: emigration from Germany. German Economic Review. 7 (2), 211–231.

Valencia Arias, A; Montoya Restrepo, I; Montoya Restrepo, A. 2016. University students' entrepreneurial intentions: A bibliometric study. Intangible Capital 12(4), 881-922.

Venhorst V., VanDijk, J., and Van Wissen, L. 2010. Do the best graduates leave the peripheral areas of the Netherlands? Tijdschrift voor Economische en Sociale Geografie 101(5), 521–537.

Venhorst, V. 2013. Graduate migration and regional familiarity. Tijdschrift voor economische en sociale geografie 104(1), 109–119.

Vezzoli, S and Flahaux M. 2017 How do post-colonial ties and migration regimes shape travel visa requirements? The case of Caribbean nationals, Journal of Ethnic and Migration Studies 43:7, 1141-1163.
DOI: 10.1080/1369183X.2016.1228446

Vivarelli, M. 2012. Entrepreneurship in Advanced and Developing Countries: A Microeconomic Perspective. IZA Discussion Paper No. 6513. April.

Warshaw, P. R., & Davis, F. D. (1984) Self-understanding and the accuracy of behavioral expectations. Personality & Social Psychology Bulletin, 10, 111-118.

Werner, A, Gast J, and Kraus S. 2014. The effect of working time preferences and fair wage perceptions on entrepreneurial intentions among employees. Small business Economics. 43:137.

Whisler, R., Waldorf, B., Mulligan, G., and Plane D. 2008. Quality of Life and the Migration of the College-Educated: A Life-Course Approach.

Wilson, F., Kickul, J., Marlino, D. 2007. Gender, Entrepreneurial Self-Efficacy, and Entrepreneurial Career Intentions: Implications for Entrepreneurship Education. Entrepreneurship Theory and Practice 31(3), 387-406.

World Bank. 2017. Unemployment youth total dataset.
URL: https://data.worldbank.org/indicator/SL.UEM.1524.ZS. Accesed 27th September 2017

_____ 2016.Migration and Remittances Factbook 2016, 3rd edition. Washington, DC: World Bank. doi:10.1596/978-1-4648-0319-2.

Wiswall, M., Zafar B. 2018 Preference for the Workplace, Investment in Human Capital, and Gender" The Quarterly Journal of Economics 133 (1), P 457–507, https://doi.org/10.1093/qje/qjx035

Zhang, P., Wang, D., Owen, D., Crystal, L. 2015. A Study of Entrepreneurial Intention of University Students. Entrepreneurship Research Journal 5(1), 1-22.

Appendices

Appendix 1.1 GLM estimates when the wage offer is twice the highest expected wage in Pakistan. Dependent variable: Subjective probability of migration

	USA	China	Saudi Arabia
	b/se	b/se	b/se
Logarithm of expected migration earnings if wage is twice	0.018**	0.017**	0.017**
	[0.008]	[0.007]	[0.006]
Sum up index of wealth	0.001	-0.001	0.004
	[0.004]	[0.004]	[0.004]
% of parents with income between 2000 and 18000 rps	0	0.027	0.003
	[0.019]	[0.018]	[0.018]
% of parents with income between 100.000 and more than on	-0.039	-0.01	-0.007
	[0.028]	[0.029]	[0.028]
Father with no education	-0.039**	-0.058**	-0.034*
	[0.019]	[0.020]	[0.019]
Age	-0.004*	-0.006**	0.001
	[0.002]	[0.002]	[0.003]
Islamic University	0.117**	0.062	-0.006
	[0.038]	[0.040]	[0.042]
Selective University	0.106**	0.06	-0.038
	[0.042]	[0.044]	[0.046]
Very Selective	0.150***	-0.034	-0.144**
	[0.044]	[0.047]	[0.046]
Student of social sciences	0.042	0.06	0.026
	[0.040]	[0.043]	[0.044]
Students of Engineering	0.047	0.041	0.073
	[0.041]	[0.043]	[0.046]
Students of Business	0.029	0.033	0.023
	[0.033]	[0.035]	[0.037]
Proficiency in spoken English	0.033**	0.046**	-0.017
	[0.016]	[0.016]	[0.016]
Proficiency in spoken Arabic	0.012	-0.011	-0.001
	[0.018]	[0.018]	[0.018]
Religiosity level (0-10)	0.006	-0.002	0.007*
	[0.004]	[0.004]	[0.004]
Expected number of children at age 40	-0.008**	-0.005	0.004
	[0.003]	[0.003]	[0.003]
Risk general	0.001	0.001	0
	[0.002]	[0.002]	[0.002]
Trust People	-0.003	-0.001	-0.005**
	[0.002]	[0.002]	[0.002]
Opinion of Pakistan (0-10)	0.003	-0.003	-0.001
	[0.002]	[0.002]	[0.002]
Opinion of the country (0-10)	0.018***	0.006*	0.012***
	[0.002]	[0.003]	[0.003]
	2110	2110	2110

Appendix 1.2 GLM estimates when the wage offer is ten times the highest expected wage in Pakistan. Dependent variable: Subjective probability of migration

	USA	China	Saudi Arabia
	b/se	b/se	b/se
Logarithm of expected migration earnings if wage is ten times	0.020**	0.020**	0.008
	[0.008]	[0.006]	[0.005]
Sum up index of wealth	0.006	0	0
	[0.005]	[0.004]	[0.003]
% of parents with income between 2000 and 18000 rps	-0.015	-0.002	-0.014
	[0.020]	[0.019]	[0.016]
% of parents with income between 100.000 and more than one mill	-0.038	-0.015	-0.005
	[0.033]	[0.031]	[0.023]
Father with no education	-0.024	-0.035*	0.01
	[0.022]	[0.019]	[0.016]
Age	-0.007**	-0.005**	0
	[0.003]	[0.002]	[0.002]
Islamic University	0.200***	0.119**	0.035
	[0.046]	[0.042]	[0.032]
Selective University	0.154**	0.112**	0.03
	[0.051]	[0.047]	[0.034]
Very Selective	0.116**	-0.068	-0.117***
	[0.053]	[0.047]	[0.034]
Student of social sciences	0.062	0.107**	0.063*
	[0.049]	[0.043]	[0.033]
Students of Engineering	0.058	0.069	0.053
	[0.050]	[0.045]	[0.034]
Students of Business	0.024	0.048	0.023
	[0.039]	[0.034]	[0.027]
Proficiency in spoken English	0.039**	0.001	0.003
	[0.019]	[0.018]	[0.013]
Proficiency in spoken Arabic	0.015	-0.017	-0.004
	[0.020]	[0.018]	[0.015]
Religiosity level (0-10)	0.004	-0.001	0
	[0.005]	[0.004]	[0.003]
Expected number of children at age 40	-0.009**	-0.004	-0.001
	[0.003]	[0.003]	[0.002]
Risk general	0.005**	0.006**	-0.001
	[0.003]	[0.002]	[0.002]
Trust People	-0.005*	-0.002	-0.004*
	[0.003]	[0.003]	[0.002]
Opinion of Pakistan (0-10)	0.006**	0.001	0.001
	[0.003]	[0.002]	[0.002]
Opinion of the country (0-10)	0.022***	0.009**	0.011***
	[0.003]	[0.003]	[0.002]
N	2110	2110	2110

Appendix 1.3 Full set of estimates of a GLM model with interactions

Part A	b/se
China	0.207
	[0.300]
USA	0.088
	[0.337]
Expected migration earnings gain	0.136***
	[0.029]
China*Expected migration earnings gain	-0.046
	[0.028]
USA*Expected migration earnings gain	-0.099**
	[0.034]
Sum up index of wealth	0.008
	[0.015]
% of parents with income between 2000 and 18000 rps	-0.004
	[0.067]
% of parents with income between 100.000 and more than one million rps	-0.069
	[0.102]
Father with no education	-0.125*
	[0.068]
Age	0.017
	[0.012]
China*Age	-0.037**
	[0.012]
USA*Age	-0.045**
	[0.014]
Islamic University	0.541***
	[0.134]
Selective University	0.476**
	[0.150]
Very Selective	-0.026
	[0.151]
Student of social sciences	0.229*
	[0.137]
Students of Engineering	0.188
	[0.146]
Students of Business	0.059
	[0.109]
Proficiency in spoken English	0.087
	[0.060]
Proficiency in spoken Arabic	-0.044
	[0.065]

Part B	
Self reported level of religiosity	0.052**
	[0.016]
China*Self-reported level of religiosity	-0.052***
	[0.010]
USA*Self-reported level of religiosity	-0.055***
	[0.012]
Expected Children at age 40	-0.013
	[0.009]
Risk	-0.019*
	[0.010]
China*Risk	0.040***
	[0.009]
USA*Risk	0.040***
	[0.011]
Trust in others (1-10)	-0.015
	[0.011]
China*Trust	0.012
	[0.010]
USA*Trust	-0.003
	[0.012]
Country opinion	0.032***
	[0.009]
China*Country opinion	0.012
	[0.012]
USA*Country opinion	0.076***
	[0.015]
Opinion of Pakistan	-0.019*
	[0.010]
China*Opinion of Pakistan	0.013
	[0.010]
USA*Opinion of Pakistan	0.032**
	[0.012]
N	6330

Appendix 1.4 Oaxaca decomposition for four major determinants of the probability of migration: expected gain of migration, individual preferences, Opinion of Pakistan and Opinion of the arrival country.

Probability of Migration	Coeficients	Std. Err.	z	P>z	[95% Conf.	Interval]
Differential						
Prediction_1	0.398	0.012	33.950	0.000	0.375	0.421
Prediction_2	0.966	0.002	630.820	0.000	0.963	0.969
Difference	-0.569	0.012	-48.140	0.000	-0.592	-0.545
Endowments						
Expected gain of Migration	-0.001	0.000	-1.670	0.095	-0.002	0.000
Preferences	0.000	0.000	-1.270	0.205	-0.001	0.000
Opinion of Pakistan	0.000	0.000	-0.710	0.476	0.000	0.000
Opinion of Arrival Country	-0.001	0.000	-2.630	0.009	-0.002	0.000
Total	-0.002	0.001	-3.320	0.001	-0.004	-0.001
Coefficients						
Expected gain of Migration	-0.068	0.025	-2.730	0.006	-0.117	-0.019
preferences	-0.050	0.032	-1.550	0.122	-0.114	0.013
Opinion of Pakistan	0.011	0.013	0.890	0.375	-0.014	0.036
Opinion of Arrival Country	0.011	0.023	0.470	0.639	-0.035	0.057
_cons	-0.477	0.046	-10.460	0.000	-0.566	-0.388
Total	-0.573	0.012	-46.340	0.000	-0.597	-0.549
Interaction						
Expected gain of Migration	0.005	0.003	2.100	0.036	0.000	0.011
preferences	0.002	0.002	1.150	0.252	-0.001	0.005
Opinion of Pakistan	0.001	0.001	0.780	0.437	-0.001	0.003
Opinion of Arrival Country	-0.001	0.003	-0.470	0.641	-0.007	0.004
Total	0.007	0.005	1.440	0.148	-0.002	0.016

The first part (differentials) refers to the estimated average probability for each group, prediction 1 refers to the estimated average probability of those who report a probability below 0.7 and prediction 2 refers to the estimated probability of those who report a probability higher than 0.7. The relevant information in this part is that the difference between the two groups is statistically significant.

Second Block relates to the effect of the distribution of the independent variables over the probability differential, it means for example the effect of the amount of the migration gain, the preferences or the opinion of Pakistan and the opinion of the arrival country into the probability differential.

The expected migration gain has a significant and negative effect into the probability differential. Then the expected migration gain contributes to increase the probability of migration which make the differences between probabilities more negative. The same effect happens with opinion of the arrival country.

Third block coefficients relates to the effect of the independent variables, and has the same interpretation as in the second block. Finally the interaction block measures the simultaneous effects of the probability differential in the endowments and the coefficients. As seen in the table the main effect is driven by the coefficients (third block). In the third block (Coefficient) it could also be seen that the major effect is the expected migration gain followed by the preferences but the preferences are not significant.

Appendix 2.1Average marginal effects for a GLM model and OLS estimates of the probability to migrate to city m given a job offer. City baseline Quibdó.

Part A	OLS b/se	GLM b/se
Arauca in comparison to Quibdó	0.070***	0.070***
	[0.007]	[0.009]
Riohacha in comparison to Quibdó	0.045***	0.046***
	[0.006]	[0.007]
ln (Wage offered in arrival destination)- [P(job Bog) *ln (expected wage)]	0.024***	0.024***
	[0.007]	[0.003]
Gender (male)	-0.019	-0.020**
	[0.017]	[0.007]
Age	-0.004	-0.004**
	[0.003]	[0.001]
Semester	0.001	0.001
	[0.006]	[0.003]
Married	-0.082**	-0.090***
	[0.041]	[0.018]
Having at least one child (dummy)	-0.004	-0.008
	[0.030]	[0.014]
Low income of the parents	0.007	0.005
	[0.023]	[0.009]
High income of the parents	-0.063**	-0.066***
	[0.022]	[0.009]
strata_1 (Low)	0.162**	0.151***
	[0.080]	[0.028]
strata_2	0.018	0.019**
	[0.023]	[0.009]
strata_4	0.008	0.005
	[0.024]	[0.009]
strata_5 (High)	-0.02	-0.02
	[0.039]	[0.016]
strata_6 (High)	-0.192***	-0.221***
	[0.047]	[0.026]
Born in Bogotá	-0.031	-0.032***
	[0.022]	[0.009]
Students who work	-0.084**	-0.089***
	[0.026]	[0.010]
Living with parents	-0.033	-0.031**
	[0.025]	[0.010]
top_10	-0.338***	-0.315***
	[0.064]	[0.039]
top_25	-0.023	-0.019
	[0.030]	[0.012]
top_100	-0.01	-0.007
	[0.042]	[0.017]
Study in a public University	0.287***	0.265***
	[0.057]	[0.037]
Having a High GPA > 4	-0.039**	-0.038***
	[0.019]	[0.008]
Business	0.061*	0.060***
	[0.034]	[0.012]
Law & Political Science	0.406***	0.383***
	[0.051]	[0.035]
Engineering	0.057**	0.053***
	[0.021]	[0.008]

Part B	OLS	GLM
Self-reported willingness to take Risk (0-10)	0.010*	0.010***
	[0.005]	[0.002]
Self-reported level of trust in others (0-10)	0.016***	0.016***
	[0.004]	[0.002]
Preference for present returns (Impatience) (0-4)	-0.017**	-0.017***
	[0.008]	[0.003]
Self-reported importance of Persistence in live (1-10)	0.003*	0.003***
	[0.001]	[0.001]
Self-reported importance of networks to access to labor market (1-10)	0.002	0.002
	[0.005]	[0.002]
Self-reported level of attachment to fhe Family	0.000	-0.001
	[0.002]	[0.001]
Mom who attended College	-0.029	-0.027***
	[0.021]	[0.008]
Previous experience of migration in the Family	-0.008	-0.008
	[0.019]	[0.007]
Previous experience of family unemployment	-0.015	-0.016**
	[0.017]	[0.007]
Difference in reported security level in city m and Bogotá (0-10)	0.007**	0.007***
	[0.003]	[0.001]
Difference in reported probability of being robbed in city m and Bogotá (0-10)	-0.009	-0.005
	[0.037]	[0.016]
Difference in reported probability of being victim of a violent act in city m and Bogotá (0-10)	-0.032	-0.037**
	[0.034]	[0.015]
Probability of commuting to Bogotá during the weekends	-0.017	-0.020*
	[0.026]	[0.011]
Difference in probability of finding good schools in City m and in Bogotá	0.228***	0.229***
	[0.039]	[0.018]
Difference in probability of finding good roads in City m and in Bogotá	0.058*	0.058***
	[0.035]	[0.016]
Difference in probability of finding good hospitals in City m and in Bogotá	-0.034	-0.035*
	[0.044]	[0.020]
	[0.101]	
N	6713	6713

Appendix 2.2. Average marginal effects for a GLM Subsample excluding those who answer the same probability of migration.

	Main Effects	socio economic	University	Non Cognitive traits	City Perceptions
	b/se	b/se	b/se	b/se	b/se
ln (Wage offered in arrival destination)- [P(job Bog) *ln (expected wage)	0.014***	0.011***	0.006**	0.010***	0.008**
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
Arauca in comparison to Quibdo	0.084***	0.084***	0.084***	0.086***	0.072***
	[0.010]	[0.010]	[0.010]	[0.010]	[0.009]
Riohacha in comparison to Quibdo	0.071***	0.070***	0.070***	0.070***	0.057***
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
Gender (male)		-0.018**	-0.011	-0.012	-0.014*
		[0.007]	[0.007]	[0.007]	[0.007]
Age		-0.003*	-0.002	-0.003**	0.001
		[0.002]	[0.002]	[0.002]	[0.002]
Semester		0.010***	0.009**	0.008**	0.010***
		[0.003]	[0.003]	[0.003]	[0.003]
Married		-0.092***	-0.093***	-0.093***	-0.092***
		[0.020]	[0.019]	[0.020]	[0.019]
Having at least one child (dummy)		-0.036**	-0.046**	-0.046**	-0.052***
		[0.015]	[0.015]	[0.015]	[0.015]
Low income of the parents		0.022**	0.022**	0.023**	0.012
		[0.009]	[0.009]	[0.009]	[0.009]
High income of the parents		-0.068***	-0.070***	-0.075***	-0.072***
		[0.010]	[0.010]	[0.010]	[0.010]
Strata_1 (Low)		0.094***	0.111***	0.126***	0.137***
		[0.028]	[0.028]	[0.027]	[0.030]
Strata_2		0.002	0.007	0.012	0.011
		[0.010]	[0.010]	[0.010]	[0.010]
Strata_4		0.022**	0.015	0.032**	0.035***
		[0.010]	[0.010]	[0.011]	[0.010]
Strata_5 (High)		-0.027*	-0.03	-0.013	-0.002
		[0.016]	[0.018]	[0.018]	[0.017]
Strata_6 (High)		-0.173***	-0.194***	-0.174***	-0.182***
		[0.026]	[0.027]	[0.028]	[0.027]
Born in Bogotá		-0.01	-0.008	-0.014	-0.008
		[0.009]	[0.009]	[0.009]	[0.009]
Students who work		-0.048***	-0.064***	-0.071***	-0.075***
		[0.011]	[0.012]	[0.012]	[0.011]
Living with parents		-0.062***	-0.054***	-0.064***	-0.057***
		[0.010]	[0.010]	[0.010]	[0.010]
Top_10			-0.282***	-0.290***	-0.247***
			[0.042]	[0.043]	[0.043]
Top_25			-0.027**	-0.046***	-0.015
			[0.013]	[0.013]	[0.013]
Top_100			-0.053**	-0.054**	-0.041**
			[0.019]	[0.018]	[0.018]
Study in a public University			0.217***	0.228***	0.198***
			[0.041]	[0.042]	[0.042]
Having a High GPA > 4			-0.029***	-0.028**	-0.021**
			[0.009]	[0.009]	[0.008]
Missing correction for having a high GPA			0.073***	0.075***	0.044**
			[0.016]	[0.016]	[0.016]
Business			0.081***	0.074***	0.063***
			[0.014]	[0.014]	[0.013]
Law & Political Science			0.299***	0.295***	0.261***
			[0.039]	[0.040]	[0.040]
Engineering			0.047***	0.040***	0.032***
			[0.009]	[0.009]	[0.009]
Self reported willingness to take Risk (0-10)				0.009***	0.008**
				[0.002]	[0.002]
Self reported level of trust in others (0-10)				0.020***	0.019***
				[0.002]	[0.002]
Preference for present returns (0-4)				-0.009**	-0.014***
				[0.003]	[0.003]
Self-reported importance of Persistence in live (1-10)				0.004***	0.003***
				[0.001]	[0.001]
Self-reported Importance of networks to access to labor market (1-10)				0.001	0.005**
				[0.002]	[0.002]
Self-reported level of attachment to fhe Family				-0.001	-0.003
				[0.002]	[0.002]
Mom who attended College				-0.007	-0.015*
				[0.009]	[0.009]
Previous experience of migration in the Family				-0.026**	-0.018**
				[0.008]	[0.008]
Previous experience of family unemployment				-0.012	-0.01
				[0.007]	[0.007]
Difference in reported security level in city m and Bogotá (0-10)					0.006***
					[0.002]
Difference in reported probability of being robbed in city m and Bogota (0-10)					0.022
					[0.018]
Difference in reported probability of being victim of a violent act in city m and Bogota (0-10)					-0.030*
					[0.017]
Probability of commuting to Bogotá during the weekends					0.011
					[0.012]
Difference in probability of finding good schools in City m and in Bogotá					0.245***
					[0.021]
Difference in probability of finding good roads in City m and in Bogotá					0.088***
					[0.017]
Difference in probability of finding good hospitals in City m and in Bogota					-0.021
					[0.022]
N	5761	5571	5531	5437	5119

Appendix 2.3 Determinants of migration intention to Arauca, Quibdó and Riohacha Individual Fixed effect estimates. Subsample

ln (Wage offered in arrival destination)- [P(job Bog) *ln (expected wage)]	0.262***
	[0.006]
Arauca	0.042***
	[0.006]
Riohacha	0.049***
	[0.005]
Self-reported security level in arrival destination (0-10)	0.007***
	[0.001]
Self-reported probability of being robbed in arrival destination	0.009
	[0.025]
Self-reported probability of being victim of a violent act in destination	-0.084***
	[0.023]
Probability of commuting to Bogotá during the weekends	-0.054**
	[0.022]
Probability of finding good schools in arrival destination	0.117***
	[0.029]
Probability of finding good roads in arrival destination	0.167***
	[0.027]
Probability of having access to a good hospital in Arrival destination	0.132***
	[0.033]
Not reporting the difference of security	0.003
	[0.027]
Not reporting the difference between probability of being victim of a violent ac	0.118
	[0.121]
Not reporting the difference between probability of being robbed	0.001
	[0.095]
Not reporting the probability of commuting	-0.318***
	[0.062]
Not reporting the probabilities of finding a good school	-0.036
	[0.027]
Not reporting perceptions of finding a hospital	-0.411***
	[0.046]
Not reporting perceptions of finding good road	-0.031
	[0.034]
Constant	0.084***
	[0.021]
N	5761

Appendix 2.4 GLM estimates by destination city and by the four offered wages. Average marginal effects.

Quibdó	If Salary is 2.5 b/se	If Salary is 2 b/se	if Salary is 1.6 b/se	If Salary is 1 b/se
ln (Real wage in destination)- ln (expected wage in Bogotá)	0.047**	0.041**	0.044**	0.034*
	[0.024]	[0.021]	[0.021]	[0.020]
gender	0.005	0	-0.012	-0.024
	[0.022]	[0.020]	[0.019]	[0.019]
top_10	-0.04	-0.050*	-0.041	-0.025
	[0.030]	[0.028]	[0.026]	[0.025]
top_25	-0.008	-0.021	-0.013	-0.014
	[0.036]	[0.035]	[0.034]	[0.034]
top_100	-0.029	0.004	-0.049	-0.014
	[0.066]	[0.055]	[0.061]	[0.051]
Age	0	-0.002	-0.001	0.004
	[0.005]	[0.005]	[0.004]	[0.004]
Semester	-0.007	-0.001	-0.003	-0.002
	[0.008]	[0.007]	[0.007]	[0.007]
Having a High GPA > 4 (Dummy)	-0.033	-0.01	-0.015	-0.003
	[0.025]	[0.023]	[0.021]	[0.021]
Married	-0.019	-0.064	-0.08	-0.064
	[0.055]	[0.054]	[0.053]	[0.050]
Child	0.001	-0.025	-0.015	-0.051
	[0.043]	[0.042]	[0.038]	[0.037]
Business	0.031	0.041	0.04	0.045
	[0.041]	[0.035]	[0.029]	[0.028]
Law & Political Science	0.160**	0.130**	0.118**	0.102**
	[0.051]	[0.046]	[0.043]	[0.042]
Engineering	0.071**	0.052**	0.039*	0.032
	[0.027]	[0.025]	[0.023]	[0.022]
Born in Bogotá	-0.061**	-0.031	-0.013	-0.009
	[0.028]	[0.026]	[0.025]	[0.023]
strata_1 (Low)	0.048	0.062	0.053	0.150**
	[0.113]	[0.103]	[0.083]	[0.056]
strata_5 (High)	-0.119**	-0.045	-0.06	-0.076
	[0.048]	[0.049]	[0.048]	[0.050]
strata_6 (High)	-0.281**	-0.193**	-0.202***	-0.107
	[0.097]	[0.083]	[0.060]	[0.069]
Low income of the parents	0.007	-0.006	-0.006	-0.011
	[0.028]	[0.026]	[0.024]	[0.023]
High income of the parents	-0.046	-0.062**	-0.065**	-0.053**
	[0.029]	[0.027]	[0.026]	[0.025]
Self reported willingness to take Risk*	0.003	0.001	0.004	0.004
	[0.006]	[0.005]	[0.004]	[0.004]
Self reported Importance of networks to access to labor market (1-10)	0.000	0.002	0.001	0.002
	[0.002]	[0.002]	[0.002]	[0.001]
Living with parents	-0.033	-0.046	-0.043	-0.032
	[0.033]	[0.029]	[0.027]	[0.025]
Self reported level of attachment to fhe Family	-0.001	-0.002	0	0.002
	[0.004]	[0.003]	[0.003]	[0.003]
Dad who attended College	-0.007	0.011	0.021	0.028
	[0.026]	[0.024]	[0.023]	[0.020]
Previous experience of migration in the Family	-0.007	-0.003	0.002	-0.007
	[0.024]	[0.023]	[0.021]	[0.020]
Previous experience of family unemployment	-0.013	-0.003	-0.007	-0.002
	[0.022]	[0.020]	[0.019]	[0.018]
Students who work	-0.096**	-0.084**	-0.094**	-0.092**
	[0.034]	[0.031]	[0.031]	[0.030]
Difference in security level in arrival vs origin destination	0.003	0.002	0.003	0.002
	[0.004]	[0.004]	[0.004]	[0.003]
Difference between probability of being robbed in Quibdo vs being robbed in Bogotá	-0.071	-0.047	-0.028	-0.018
	[0.050]	[0.046]	[0.044]	[0.045]
Difference between probability of being victim of a violent act in Quibdo vs being robbed in Bogotá	-0.051	-0.04	-0.034	-0.071*
	[0.046]	[0.043]	[0.042]	[0.041]
Probability of commuting to Bogotá during the weekends	-0.048	-0.068**	-0.045	-0.042
	[0.036]	[0.032]	[0.029]	[0.028]
Difference between probability of finding good schools in Quibdo vs Bogotá	0.300***	0.273***	0.179**	0.150**
	[0.066]	[0.060]	[0.058]	[0.058]
Difference between probability of finding good roads in Quibdo vs Bogotá	-0.002	-0.005	-0.007	-0.02
	[0.051]	[0.050]	[0.047]	[0.047]
Difference between probability of having access to a good hospital in Quibdo vs Bogotá	-0.07	-0.032	0.018	0.039
	[0.066]	[0.062]	[0.064]	[0.065]
N	628	627	626	627

Riohacha	If Salary is 2.5 b/se	If Salary is 2 b/se	if Salary is 1.6 b/se	If Salary is 1 b/se
ln (Real wage in destination)- ln (expected wage in Bogotá)	0.073**	0.068**	0.056**	0.035*
	[0.027]	[0.025]	[0.023]	[0.020]
gender	0.006	0.002	-0.018	-0.025
	[0.021]	[0.021]	[0.020]	[0.020]
top_10	-0.065**	-0.086**	-0.067**	-0.038
	[0.030]	[0.028]	[0.027]	[0.026]
top_25	-0.015	-0.018	0.008	0.011
	[0.035]	[0.037]	[0.036]	[0.039]
top_100	0.012	-0.018	-0.036	-0.014
	[0.057]	[0.049]	[0.057]	[0.056]
Age	-0.005	-0.006	-0.005	-0.007
	[0.005]	[0.005]	[0.005]	[0.005]
Semester	0.003	0.006	0.002	0.001
	[0.008]	[0.008]	[0.008]	[0.007]
Having a High GPA > 4 (Dummy)	-0.066**	-0.041*	-0.038*	-0.016
	[0.024]	[0.023]	[0.022]	[0.022]
Married	-0.117**	-0.144**	-0.124**	-0.082
	[0.057]	[0.061]	[0.061]	[0.061]
Child	0.026	0.004	0.005	-0.016
	[0.046]	[0.048]	[0.044]	[0.047]
Business	0.048	0.082**	0.077**	0.066**
	[0.042]	[0.039]	[0.035]	[0.034]
Law & Political Science	0.159***	0.129**	0.125**	0.097**
	[0.045]	[0.043]	[0.041]	[0.043]
Engineering	0.090***	0.059**	0.049**	0.034
	[0.026]	[0.026]	[0.024]	[0.024]
Born in Bogotá	-0.025	-0.019	-0.012	-0.015
	[0.028]	[0.027]	[0.026]	[0.026]
strata_1 (Low)	0.083	0.106	0.104	0.201***
	[0.114]	[0.100]	[0.092]	[0.056]
strata_5 (High)	-0.072	-0.029	-0.014	-0.068
	[0.046]	[0.048]	[0.045]	[0.051]
strata_6 (High)	-0.250**	-0.298***	-0.285***	-0.167**
	[0.091]	[0.088]	[0.072]	[0.071]
Low income of the parents	-0.004	-0.027	-0.013	-0.02
	[0.027]	[0.026]	[0.025]	[0.025]
High income of the parents	-0.033	-0.078**	-0.062**	-0.067**
	[0.027]	[0.027]	[0.026]	[0.027]
Self reported willingness to take Risk*	0.005	0.006	0.007*	0.006
	[0.004]	[0.004]	[0.004]	[0.004]
Self reported Importance of networks to access to labor market (1-10)	0.004	0.004	0.003	0.004*
	[0.003]	[0.003]	[0.002]	[0.002]
Living with parents	-0.054*	-0.047	-0.035	-0.028
	[0.032]	[0.030]	[0.028]	[0.028]
Self reported level of attachment to fhe Family	0.002	-0.002	-0.002	-0.001
	[0.003]	[0.004]	[0.004]	[0.004]
Dad who attended College	-0.013	0.008	0.02	0.033
	[0.026]	[0.026]	[0.024]	[0.022]
Previous experience of migration in the Family	-0.016	-0.006	-0.006	-0.021
	[0.024]	[0.023]	[0.022]	[0.022]
Previous experience of family unemployment	-0.023	-0.01	-0.002	-0.01
	[0.021]	[0.021]	[0.020]	[0.020]
Students who work	-0.070**	-0.090**	-0.098**	-0.096**
	[0.032]	[0.033]	[0.032]	[0.032]
Difference in security level in Arauca vs Bogotá	0.013**	0.009*	0.009*	0.011**
	[0.005]	[0.005]	[0.005]	[0.005]
Difference between probability of being robbed in Riohacha vs Bogotá	0.008	0.018	0.037	0.024
	[0.052]	[0.052]	[0.051]	[0.051]
Difference between probability of being victim of a violent act in Riohacha vs Bogotá	-0.003	-0.021	-0.038	-0.014
	[0.050]	[0.050]	[0.050]	[0.052]
Probability of commuting to Bogotá during the weekends	-0.041	-0.028	0.003	0.014
	[0.038]	[0.037]	[0.035]	[0.033]
Difference between probability of finding good schools in Riohacha vs Bogotá	0.257***	0.241***	0.211***	0.151**
	[0.066]	[0.064]	[0.059]	[0.056]
Difference between probability of finding good roads in Riohacha vs Bogotá	0.109**	0.097**	0.068	0.049
	[0.050]	[0.050]	[0.048]	[0.050]
Difference between probability of having access to a good hospital in Riohacha vs Bogotá	-0.115*	-0.088	-0.059	0.003
	[0.064]	[0.063]	[0.060]	[0.058]
N	629	628	630	628

Arauca	If Salary is 2.5 b/se	If Salary is 2 b/se	if Salary is 1.6 b/se	If Salary is 1 b/se
ln (Real wage in destination)- ln (expected wage in Bogotá)	0.060**	0.048**	0.043**	0.034
	[0.025]	[0.023]	[0.022]	[0.023]
gender	0.009	0.004	-0.008	-0.011
	[0.022]	[0.021]	[0.020]	[0.020]
top_10	-0.047	-0.045	-0.03	-0.005
	[0.030]	[0.028]	[0.026]	[0.026]
top_25	-0.031	-0.034	-0.003	0.024
	[0.035]	[0.035]	[0.034]	[0.035]
top_100	-0.011	-0.006	-0.033	0.009
	[0.056]	[0.054]	[0.056]	[0.056]
Age	-0.008*	-0.010**	-0.007	-0.005
	[0.005]	[0.005]	[0.004]	[0.005]
Semester	0.001	0.006	-0.004	-0.003
	[0.008]	[0.008]	[0.007]	[0.007]
Having a High GPA > 4 (Dummy)	-0.060**	-0.038	-0.034	-0.019
	[0.025]	[0.024]	[0.022]	[0.022]
Married	-0.05	-0.087	-0.069	-0.034
	[0.058]	[0.060]	[0.060]	[0.059]
Child	0.015	0.016	0.015	-0.04
	[0.043]	[0.046]	[0.042]	[0.043]
Business	0.033	0.043	0.046	0.044
	[0.040]	[0.038]	[0.034]	[0.033]
Law & Political Science	0.128**	0.109**	0.111**	0.098**
	[0.048]	[0.043]	[0.042]	[0.042]
Engineering	0.062**	0.035	0.041*	0.028
	[0.026]	[0.025]	[0.024]	[0.023]
Born in Bogotá	-0.018	-0.01	0.02	0.013
	[0.027]	[0.026]	[0.027]	[0.027]
strata_1 (Low)	0.057	0.093	0.076	0.183***
	[0.114]	[0.103]	[0.085]	[0.052]
strata_5 (High)	-0.039	-0.003	-0.012	-0.031
	[0.052]	[0.048]	[0.048]	[0.047]
strata_6 (High)	-0.297**	-0.286**	-0.231**	-0.126*
	[0.100]	[0.088]	[0.072]	[0.067]
Low income of the parents	0.029	0.001	0.014	0.01
	[0.027]	[0.026]	[0.025]	[0.025]
High income of the parents	-0.016	-0.055**	-0.054**	-0.065**
	[0.029]	[0.027]	[0.026]	[0.026]
Self reported willingness to take Risk*	-0.005	-0.008	-0.003	-0.001
	[0.005]	[0.005]	[0.005]	[0.004]
Self reported Importance of networks to access to labor market (1-10)	-0.002	-0.001	-0.002	-0.001
	[0.002]	[0.002]	[0.002]	[0.002]
Living with parents	-0.042	-0.067**	-0.050*	-0.032
	[0.033]	[0.031]	[0.030]	[0.029]
Self reported level of attachment to fhe Family	0.001	-0.003	-0.002	0.001
	[0.004]	[0.004]	[0.004]	[0.003]
Dad who attended College	-0.025	-0.004	-0.002	0.014
	[0.026]	[0.025]	[0.023]	[0.022]
Previous experience of migration in the Family	-0.007	0	0.012	0.007
	[0.023]	[0.023]	[0.022]	[0.023]
Previous experience of family unemployment	-0.004	0.009	0.012	0.006
	[0.022]	[0.021]	[0.020]	[0.020]
Students who work	-0.063*	-0.051	-0.064**	-0.076**
	[0.034]	[0.033]	[0.031]	[0.031]
Difference in security level in Arauca vs Bogotá	0.005	0.003	0.003	0.003
	[0.004]	[0.003]	[0.003]	[0.003]
Difference between probability of being robbed Arauca vs Bogotá	-0.093*	-0.063	-0.06	-0.034
	[0.053]	[0.051]	[0.049]	[0.051]
Difference between probability of being victim of a violent act in Arauca vs Bogotá	-0.101**	-0.105**	-0.088**	-0.083*
	[0.048]	[0.046]	[0.044]	[0.044]
Probability of commuting to Bogotá during the weekends	-0.053	-0.046	-0.01	-0.002
	[0.037]	[0.036]	[0.033]	[0.032]
Difference between probability of finding good schools in Arauca vs Bogotá	0.331***	0.267***	0.261***	0.190***
	[0.064]	[0.064]	[0.062]	[0.057]
Difference between probability of finding good roads in Arauca vs Bogotá	0.03	0.019	0.03	0.033
	[0.051]	[0.049]	[0.049]	[0.049]
Difference between probability of having access to a good hospital in Arauca vs Bogotá	-0.171**	-0.093	-0.1	-0.052
	[0.067]	[0.065]	[0.063]	[0.059]
N	633	634	633	634

Appendix 3.1Different questions used in entrepreneurial intentions surveys.

Global Entrepreneurial Monitor 2011

Have you received or do you expect to receive money—loans or equity investments--from any of the following to start this business? Answer Yes or No

1) Yourself, either savings or income
2) Close family member, such as a spouse, parent, or sibling
3) Other relatives, kin, or blood relation
4) Work colleagues
5) Employer
6) Friends or neighbours
7) Banks or other financial institutions
8) Government programmes
9) Any other source

The Guess project

The GUESSS project measures entrepreneurial intentions following the scale proposed by Liñan and Chen (2009). The entrepreneurial intention is a number between 1 and 7 that is the average of 6 items. Each item was measured in a scale from 1 meaning strongly disagree to 7 strongly agree. The items were:

1. I am ready to do anything to become an entrepreneur.
2. My professional goal is to become an entrepreneur.
3. I will make every effort to start and run my own firm.
4. I am determined to create a firm in the future.

5 I have seriously thought of starting a firm.

6. I have a strong intention to start a firm someday.

Kolvereid et al. (2008)

Kolvereid, Iakovleva and Kickul (2008) use three questions as measures of entrepreneurial intention: the first one is a measurement of entrepreneurial intention, followed by "I would rather own my own business than earn a higher salary".

In the case of subjective norms they used the following question "My closest family think that I should pursue a career as self-employed", and then they used the following "To what extent do you care about what your closest family members think as you decide on whether or not to pursue a career as self-employed or employed by someone else". Other questions proposed were: "How likely is it that you will pursue a career as self-employed" and also the statement "I will probably start and run my own business" were used employing a Likert scale.

Finally for the perceived behavioural control they used the following question: "If I wanted to, I could easily become self-employed /start and run a business".

In the case of desirability, they proposed the following question: "How attractive is starting your own business/being self-employed?" They also proposed "How feasible would it be for you to start your own business/to become self-employed?"

Cassar and Friedmann (2009) were:

(1) If I work hard, I can successfully start a business;
(2) Overall, my skills and abilities will help me start a business;
(3) My past experience will be very valuable in starting a business;
(4) I am confident I can put in the effort needed to start a business.

Appendix 3.2 Analysis of the Item non response for the cost of stating a firm, earnings and probability of becoming an entrepreneur. Marginal effects of a logit model.

	Dependent Variable 1= Missing cost of starting a new firm	Dependent Variable 1= Missing earnings as an entrepreneur	Dependent Variable 1= Missing probability of becoming an entrepreneur
	b/se	b/se	b/se
Non response about the probability of starting a new firm in a no debt scenario	0.082**	0.095***	
	[0.037]	[0.022]	
Non response about earnings as an entrepreneur	0.083		-0.005
	[0.057]		[0.038]
Logarithm of the earnings as an entrepreneur	-0.002		-0.013**
	[0.008]		[0.006]
Logarithm of the expected wage as an employee	-0.026	-0.030**	-0.013***
	[0.023]	[0.014]	[0.003]
Non response about the expected wage as an employee	-0.178	-0.125	
	[0.179]	[0.100]	
Non response about the cost of establishing their own firm		0.063**	0.045**
		[0.022]	[0.022]
Self-reported cost of establishing a firm		0.186	0.115
		[0.168]	[0.207]
Reporting a high cost of establishing a firm		-0.053	-0.027
		[0.042]	[0.043]
Female	0.048**	0.009	0.000
	[0.022]	[0.016]	[0.015]
Age	0	0.002	0.002
	[0.003]	[0.002]	[0.002]
Living with Parents	0.021	0.033	0.035
	[0.028]	[0.026]	[0.026]
Married	-0.011	-0.031	0.048
	[0.056]	[0.058]	[0.030]
Having a child	0.011	-0.05	0.007
	[0.047]	[0.064]	[0.031]
Not born in Bogotá	-0.016	-0.004	0.039**
	[0.025]	[0.019]	[0.018]
Currently working	0.016	0.029	-0.053*
	[0.031]	[0.026]	[0.028]
Low level of income of the family	0.042	0.001	-0.041*
	[0.029]	[0.021]	[0.021]
High level of income of the family	0.02	-0.038	0.006
	[0.029]	[0.025]	[0.017]
Strata 1	0.000	0.000	0.081**
	[.]	[.]	[0.036]
Strata 2	-0.023	0.027	0.008
	[0.032]	[0.026]	[0.024]
Strata 4	0.042	0.017	-0.044**
	[0.029]	[0.020]	[0.021]
Strata 5	0.024	0.04	-0.005
	[0.053]	[0.031]	[0.041]
Strata 6	0.133**	0.02	-0.025
	[0.059]	[0.053]	[0.069]
Mom who attended College	-0.022	0.027	0.018
	[0.024]	[0.017]	[0.021]
Previous experience of unemployment in the family	-0.007	0.031*	0.01
	[0.022]	[0.017]	[0.017]
Semester	-0.009	-0.004	-0.002
	[0.007]	[0.003]	[0.004]
top_10	0.703***	0.590***	0.124
	[0.154]	[0.109]	[0.082]
top_25	0.025	0.015	0.014
	[0.034]	[0.024]	[0.026]
top_100	0.042	0.005	-0.007
	[0.059]	[0.051]	[0.051]
Public University	-0.677***	-0.576***	-0.141*
	[0.153]	[0.107]	[0.082]
High GPA	-0.032	-0.021	-0.005
	[0.024]	[0.017]	[0.017]
Engineering	-0.018	-0.015	-0.009
	[0.026]	[0.020]	[0.019]
Business	-0.100**	-0.04	-0.05
	[0.050]	[0.039]	[0.037]
Political Sciences and Law	-0.663***	-0.546***	-0.157**
	[0.139]	[0.101]	[0.073]
Self-reported willingness to take risks (0-10)	0.007	0.001	-0.003
	[0.007]	[0.006]	[0.006]
Self-reported level of trust in others (0-10)	-0.001	-0.001	-0.006
	[0.005]	[0.004]	[0.004]
Time preference (1-4)	-0.009	0.015	-0.001
	[0.009]	[0.009]	[0.006]
Self-reported importance of persistence in life (0-10)	0.01	-0.005	0.005
	[0.010]	[0.006]	[0.007]
Weekly hours of work if working in her own firm	-0.001*	-0.001	0
	[0.001]	[0.001]	[0.000]
Weekly hours of work if working in a job that she likes	0.002**	-0.001**	0.001
	[0.001]	[0.001]	[0.001]
Self reported importance of networks to obtain a job (0-10)	0.000	-0.008*	-0.009*
	[0.007]	[0.005]	[0.004]
Self reported importance of creativity at work (0-10)	0.006	0.003	-0.001
	[0.007]	[0.007]	[0.005]
Self-reported importance given to being her own boss	-0.004	-0.010**	0.002
	[0.006]	[0.003]	[0.004]
Has a business owner in her family	0.005	-0.007	0.017
	[0.021]	[0.015]	[0.017]
Not assesing a cost of establishing her own firm		0.063**	0.045**
		[0.022]	[0.022]
Self-reported cost of establishing a firm		0.186	0.115
		[0.168]	[0.207]
Reporting a high Cost		-0.053	-0.027
		[0.042]	[0.043]
	731	731	739

Appendix 3.3 Determinants of the decision to become an entrepreneur. Average marginal effects of a GLM model. Full list of estimates

	(1) b/se	(2) b/se	(3) b/se	(4) b/se
Difference between expected earnings as an entrepreneur and expected wage as an employee	0.036***	0.037***	0.033***	0.026***
	[0.004]	[0.004]	[0.004]	[0.004]
Not reporting earnings as an entrepreneur or as an employee	-0.196***	-0.188***	-0.192***	-0.161***
	[0.045]	[0.046]	[0.045]	[0.040]
self assessed cost of starting a firm	-0.000*	-0.000*	0	-0.000*
	[0.000]	[0.000]	[0.000]	[0.000]
Not reporting ean assessment of the cost	-0.017	-0.013	-0.007	-0.011
	[0.040]	[0.040]	[0.040]	[0.037]
Female		0.028	0.018	0.027*
		[0.017]	[0.017]	[0.016]
Age		0.004	0.003	0.003
		[0.003]	[0.003]	[0.003]
Living with their parents		-0.033	-0.023	-0.009
		[0.025]	[0.025]	[0.022]
Married		-0.009	-0.005	-0.01
		[0.045]	[0.045]	[0.043]
Having a Child		-0.011	-0.023	-0.009
		[0.038]	[0.038]	[0.036]
Born in other city than Bogotá		-0.019	-0.022	-0.016
		[0.023]	[0.022]	[0.019]
Being a student who work		0.035	0.018	0.013
		[0.025]	[0.027]	[0.026]
Low income of the parents		-0.044**	-0.029	-0.01
		[0.022]	[0.021]	[0.021]
High income of the parents		0.011	0.01	0.012
		[0.023]	[0.023]	[0.021]
Not reporting family income		0.197	0.154	0.169
		[0.172]	[0.159]	[0.144]
strata_1 (Low)		0.044	0.074	0.059
		[0.057]	[0.058]	[0.052]
strata_2		0.023	0.025	0.001
		[0.025]	[0.024]	[0.023]
strata_4		-0.001	-0.003	-0.016
		[0.023]	[0.024]	[0.021]
strata_5 (Affluent)		-0.039	-0.046	-0.06
		[0.041]	[0.042]	[0.040]
strata_6 (Affluent)		-0.092	-0.120*	-0.151**
		[0.059]	[0.064]	[0.057]
Mom who attended college		-0.006	-0.009	-0.017
		[0.021]	[0.022]	[0.020]
Previous experience of unemployment in the family		0.004	0.011	0.006
		[0.017]	[0.017]	[0.016]
Semester			0.003	0.001
			[0.007]	[0.006]
Study in a top 10 University			-0.091	-0.019
			[0.063]	[0.074]
Study in a top 25 University			0.045	0.070**
			[0.031]	[0.028]
Study in a top 100 University			0.037	0.066**
			[0.030]	[0.031]
Study in a public university			0.033	0.011
			[0.055]	[0.069]
Having a high GPA			-0.055**	-0.041**
			[0.019]	[0.018]
Study Engineering			0.01	0
			[0.021]	[0.019]
Study Business			0.061*	0.041
			[0.033]	[0.031]
Study Political Science and Law			0.131**	0.093
			[0.044]	[0.065]
diff between expected daily hours working in their own firms and hours worked in a job that				0.00
				[0.003]
Self reported willingness to take risks (0-10)				0.031***
				[0.005]
Self reported level of trust in others (0-10)				-0.009**
				[0.004]
Impatience (1-4)				0.007
				[0.007]
Self reported importance of persistence in life (0-10)				0.001
				[0.007]
Self reported importance of networks to obtain a job (0-10)				0.008
				[0.005]
Self reported importance of creativity at work (0-10)				0.013**
				[0.006]
self reported value given to being his her own boss				0.028***
				[0.005]
A member of the family have or had their own business				0.044**
				[0.017]
	706	705	705	702

Appendix 3.4 Determinants of the decision to become an entrepreneur. Using a standardized version of the cost variable. Average marginal effects of a GLM model.

	1	2	3	4
	b/se	b/se	b/se	b/se
Difference between expected earnings as an entrepreneur and as an employee	0.036***	0.037***	0.033***	0.026***
	[0.004]	[0.004]	[0.004]	[0.004]
Not reporting earnings as an entrepreneur or as an employee	-0.186***	-0.176***	-0.181***	-0.156***
	[0.048]	[0.050]	[0.048]	[0.043]
Standarized cost of starting a firm (self assessed cost/ earnings as an entrepreneur)	-0.000**	-0.000**	-0.000*	-0.000**
	[0.000]	[0.000]	[0.000]	[0.000]
Female		0.026	0.016	0.024
		[0.017]	[0.017]	[0.016]
Age		0.004	0.003	0.003
		[0.003]	[0.003]	[0.003]
Low income of the parents		-0.043**	-0.029	-0.009
		[0.022]	[0.021]	[0.020]
Strata_6 (Affluent)		-0.09	-0.116*	-0.147**
		[0.058]	[0.063]	[0.056]
Mom who attended college		-0.005	-0.008	-0.016
		[0.021]	[0.022]	[0.020]
Previous experience of unemployment in the family		0.006	0.012	0.009
		[0.017]	[0.017]	[0.016]
Study in a top 10 university			-0.093	-0.027
			[0.063]	[0.074]
Study in a top 25 university			0.042	0.067**
			[0.030]	[0.027]
Study in a top 100 university			0.035	0.063**
			[0.030]	[0.031]
Study in a public university			0.031	0.013
			[0.055]	[0.069]
Having a high GPA			-0.053**	-0.038**
			[0.020]	[0.018]
Not reporting GPA			0.079*	0.038
			[0.045]	[0.039]
Study Engineering			0.013	0.004
			[0.021]	[0.020]
Study Business			0.060*	0.041
			[0.032]	[0.030]
Study Political Science and Law			0.128**	0.095
			[0.044]	[0.065]
Not reporting the field of study			0.134	0.124**
			[0.091]	[0.043]
Self-reported willingness to take risks (0-10)				0.031***
				[0.005]
Self-reported level of trust in others (0-10)				-0.009**
				[0.004]
Self reported importance of networks to obtain a job (0-10)				0.008*
				[0.005]
Self -reported importance of creativity at work (0-10)				0.013**
				[0.006]
Self-reported value given to being his/ her own boss				0.028***
				[0.005]
A member of the family have or had their own business				0.044**
				[0.017]
	706	705	705	702