Non-pecuniary Effects of Migration Inflows to Ecuador: Is Residents' Life Satisfaction Affected?

Grace Carolina Guevara-Rosero[1] (iD) · Andrea Gabriela Bonilla-Bolaños[1] (iD)

Abstract

The migration phenomenon has important implications in both the receiving and sending countries. Regarding developing countries, much less attention has been devoted to their role as receiving countries. This study focuses on Ecuador, a developing country whose migration inflows have significantly increased since its economy formally dollarized. The aim is to know how residents' perceived life satisfaction is affected by international migration not only at an aggregated level but also at a disaggregated level (by gender, occupation, and nationality). To do so, a multiple-choice econometric model, a generalized ordinal logit, is estimated using pooled data from 2014 to 2015. Results evidence that the effect of international migration on life satisfaction is not linear: it depends on the individuals' life satisfaction level. Moreover, results evidence that immigrants' gender, nationality, and occupation matter when studying residents' perceived life satisfaction. An increase in the share of male migrants is associated with low levels of life satisfaction of residents. While the increase of the share of some nationalities is associated with lower levels of life satisfaction, the increase of others is associated with higher or intermediate levels of life satisfaction. Interestingly, an increase in the share of working immigrants is not associated with low levels of life satisfaction of locals.

✉ Grace Carolina Guevara-Rosero
carolina.guevara@epn.edu.ec

Andrea Gabriela Bonilla-Bolaños
andrea.bonilla@epn.edu.ec

Extended author information available on the last page of the article

Introduction

Concerning migration studies, the so-called developing economies have traditionally been studied as *sending* countries, i.e., countries whose citizens move to a foreign country in search of better living conditions. Notwithstanding, some of these countries are also *receivers*. For instance, some developing countries, such as Ecuador, are chosen by retired foreigners as residential places (Hayes 2014). Moreover, developing nations also receive refugees from neighboring countries because of geographical location, e.g., Ecuador has hosted Colombian refugees (Ortega and Ospina 2012; Ramírez and Montúfar 2007). So, as developing countries are both receiving and sending countries, their residents (those who have not migrated) must be recognized not only as benefitting from remittances they have received or as harmed by familiar separation—as is the case when they are sending countries—but also as affected by the aggregate economic impacts, labor market impacts, urbanization impacts, fiscal impacts, and perception impacts caused by immigrants living in their country (Brunow et al. 2015).

Because developing countries also receive migrants, the so-called south-south migration phenomenon—migration flows between developing countries—have started to be discussed (Bakewell 2009). In fact, although migration studies have mainly focused on "south-north" labor migration, e.g., workers' movements from developing to developed countries (Docquier and Rapoport 2011; Panizzon et al. 2015), most international movements do not occur between countries with different development levels. Indeed, 60% of total worldwide international migration corresponds to movements among developed countries and among developing ones, e.g., the internal migration within Europe and within Africa accounts for 59% and 52% of their respective total migration (United Nations Development Programme 2009).

Focusing on Latin America, although it has been positioned as a sending region (Chiswick and Miller 2015), a set of appealing characteristics emerges when exploring its internal regional migration. Indeed, some Latin American countries attract a considerable number of migrants. For instance, since the formal dollarization of its economy in January 2000, Ecuador has become an attractive country for migrants. According to the data from the Ecuadorian National Census of Population and Dwelling, the annual growth of the foreign-born population living in Ecuador was 2.3% before dollarization (from 1990 to 2000) and 7.1% after dollarization (from 2001 to 2010). Furthermore, Ecuador is the fifth hosting country of South American immigrants (IOM 2017). Therefore, Ecuador is a Latin American country suitable for analyzing not only the "south-south" migration dynamics but also, and especially, the implications of being a receiver developing country.

On the one hand, it is worth noting that the "south-south" migration phenomenon can be understood by reflecting on the fact that, no matter whether the mobility is internal or international, either to a developed or to a developing country, the main reason behind the decision to migrate is the same: people move to improve their income level and their quality of life (United Nations Development Programme 2009), i.e., migration is closely linked to some kind of well-being representation (Herrera 2014). Therefore, the notable augmentation of foreign-born residents during recent years in Ecuador might be very likely linked to an improvement in Ecuadorian living conditions. On the other hand, as a developing country, the role of Ecuador as a receiver country has hardly been studied. Indeed, to the best of our knowledge, the existing

migration studies for Ecuador focus on emigration dynamics—particularly on the impacts of received remittances in domestic health (Ponce et al. 2011), poverty, and inequality (Acosta et al. 2005, 2006; Olivié et al. 2009). Moreover, studying the life satisfaction implications of dwelling in a receiving country is important since inhabitants face perception concerns about migration, including security and crime, and socioeconomic and cultural factors (Brunow et al. 2015). The impact of migration inflows on residents' life satisfaction very likely depends on the nature of immigration. For instance, male and female migrants can be perceived differently. As the labor participation ratio for male migrants is higher than that of female migrants (ILO 2018), men can be perceived as a threat for residents in the labor market. As for women, when migrating, they are twice as likely as their male counterparts to bear financial and caretaking responsibility for children (Blagg 2013). Thus, the higher vulnerability of female migrants might be perceived as a negative situation that can reduce the life satisfaction of residents. The perception of citizens can also vary depending on the nationality of immigrants (Gott 2007; Hayes 2015). European immigrants might be well-perceived by residents because of their race (Dustmann and Preston 2007) and because residents relate them to their countries' development, which is higher than that of developing countries. By contrast, South American or African immigrants might be perceived poorly, also, because of their relation to their home economies or their race. Indeed, Kuroki (2018) shows that in the USA, an increase of the share of non-white migrants is associated with a reduction in life satisfaction. Moreover, immigrants who speak a different language may have problems with insertion in the host society (Beier and Kroneberg 2013). Finally, a citizen's perception also depends on the occupation status of the immigrant. Economic immigrants (workers) might be seen as competitors for the labor market whereas student immigrants do not constitute a threat (Liu-Farrer 2009; Warnes 2009).

Therefore, this study intends to contribute to the discussion regarding life satisfaction conditions of the inhabitants in the *receiver* developing countries. Specifically, the objective is to know how Ecuadorian residents' perceived life satisfaction is affected by international migration at both an aggregated and disaggregated level. Three disaggregation levels are retained: immigrants by gender, immigrants by occupation, and immigrants by nationality.

As the focus is on international migration and perceived life satisfaction, two main data sources are used: (i) the National Survey of Employment, Unemployment and Underemployment, whose perception module reports information on self-reported life satisfaction at the level of the head of household, and (ii) the National Census of Population and Dwelling, which provides information for computing the proportion of international migrant inhabitants and the disaggregation by gender, occupation, and nationality. The empirical relationship between these two variables is modeled by means of a generalized ordinal logit model, and empirical evidence is provided affirming that the effect of international migration on local residents' life satisfaction is not linear: it depends on the life satisfaction level of individuals. Indeed, an increase in the immigrant population affects local citizens' likelihood of reporting having a high, medium, or low level of life satisfaction in different ways. Moreover, the results evidence that the gender, nationality, and occupation of the immigrant matter when studying local residents' perceived life satisfaction.

The remainder of this paper is structured as follows: the "A Brief Literature Review" section presents a brief literature review on migration studies concerning receiving countries, including Ecuador. The "Immigration in Ecuador" section geographically describes the migratory settlements in Ecuador by nationality and by occupation. The "Method" section details the modeling strategy including data sources description, specification and estimation of the econometrical model. The "Results" and "Conclusions" sections discuss the results and conclude, respectively.

A Brief Literature Review

Immigration is associated with several effects for the receiving country,[1] namely, (i) aggregate economic impacts, (ii) labor market impacts, (iii) urbanization impacts, (iv) fiscal impacts, and (v) perception concerns about migration, including security and crime, and socioeconomic and cultural factors (Brunow et al. 2015). This study is concerned with the abovementioned fifth aspect: perception. When immigration flows are considered, the receiving country's residents might change their life satisfaction perception due to among others:

- security and crime perception—immigration is associated with a rise in crime rates (Altindag and Xu 2017; Butcher and Piehl 1998)
- socioeconomic factors—residents' fear about decreasing real salaries and employment positions (Savona et al. 1996)
- economic and educational segregation (Massey and Sánchez 2009)
- disturbances in the political climate (O'Rourke and Sinnott 2003)
- cultural aspects—cultural adaptation can be costly for the receiving country's residents regarding gastronomy, lifestyle, religious beliefs, acceptance of ethnic diversity, etc. (Castles et al. 2014; Kleemans and Klugman 2009).

All these perception aspects can cause either a rise or a decrease in residents' life satisfaction. Disentangling the dominant effect is an empirical question.

Regarding the Ecuadorian case, studies on migration mainly focus on emigration flows. More specifically, literature concentrates on the following: (i) the effects of remittances on Ecuadorian residents, (ii) psychological costs of emigrating, and (iii) emigration motivations, among others. Studies dealing with the effects of remittances on welfare evidence that the increased income of migrants' relatives has a positive health effect (Ponce et al. 2011) and a positive education effect (Calero et al. 2009). Moreover, positive impacts of remittances on poverty and inequity have also been widely reported (Acosta et al. 2005, 2006; Bertoli et al. 2013; Olivié et al. 2009). Furthermore, the psychological cost on people who leave Ecuador (Boccagni 2011, 2012, 2014; Boccagni and Lagomarsino 2011) and the motivations for emigrating (Bertoli et al. 2013; Gray and Bilsborrow 2013; Jokisch and Pribilsky 2002; Kalir 2005) have been widely studied. Other issues regarding emigration such as the brain drain due to migrants leaving Ecuador (Osvaldo Esteban 2012) and illegal emigration as a business (Kyle and Liang 2001) have also caught the attention of researchers.

---

[1] The effects of migration on the origin country are beyond the scope of this study.

In contrast to the large number of studies on Ecuadorian emigration flows, there are few works dealing with immigration flows. To the best of our knowledge, the only case study widely discussed is the case of Colombian residents in Ecuador. Two studies stand out: by Ortega and Ospina (2012) and by Ramírez and Montúfar (2007).[2] These studies do not deal with the non-pecuniary effects of immigration on Ecuadorian residents, as proposed here, but instead, they focus on the level of well-being of the Colombian population living in Ecuador. The lack of studies on this subject along with the increased number of immigrants to Ecuador justify the importance of studying the effects of immigration on Ecuadorian residents' life satisfaction.

Furthermore, the impact of migration inflows on local residents' life satisfaction is very likely to depend on the nature of immigration—e.g., attitudes towards immigration differ according to the race, nationality, gender, and occupation of the immigrant (Dustmann and Preston 2007). Nationality matters: North American migrants (from the United States and Canada) are racialized by residents, creating a separation between them where the position of "gringos" is higher than that of residents (Gott 2007; Hayes 2015). Nevertheless, such separation is not always the case. In some societies, ethnic diversity is positively correlated with social and economic outcomes in the host society. For instance, in Germany, ethnic diversity has a positive effect on the well-being of German citizens (Akay et al. 2014). This shows that the migrants' nationality effect may depend on the race or nature of the host population. Likewise, residents' life satisfaction may depend on the occupation of immigrants. When a migrant is studying, he/she might be retained in science and engineering, which could increase the skilled labor in the local market (Liu-Farrer 2009). Regarding retired migrants, they can positively influence the attitudes and aspirations of residents (Warnes 2009). Regarding gender, male migrants record a high labor market participation (ILO 2018), so they can be perceived as a threat for residents. Female migrants face distinct challenges as they are more vulnerable and are more likely to take care of children (Blagg 2013). Therefore, women can suffer violence and poverty, leading to a reduction of the society's welfare. This article contributes to this discussion by empirically testing the relationship between a subjective measure of residents' welfare (the self-reported life satisfaction) and aggregated and disaggregated (by gender, nationality, and occupation) immigration inflows.

Immigration in Ecuador

Ecuador has been a host country for immigrants not only from Latin America but also from Europe and North America. According to the 2010 Census, the immigrant population represented 1.27% of the total Ecuadorian population (200,000 immigrants). At a sub-national level, the cantons hosting the most immigrants are Quito (54,500 immigrants) and Guayaquil (21,900 immigrants) as they are the most populated cantons. However, there are other cantons, normally those located at border provinces, which host more immigrants as a proportion of their total population. Indeed, as shown in Fig. 1, cantons located at the Ecuador-Colombia border, such as Sucumbíos and

---

[2] These studies were developed as part of the program called "Colombia and Ecuador: For a Soon and Solid Reunion" at Universidad Andina Simón Bolívar.
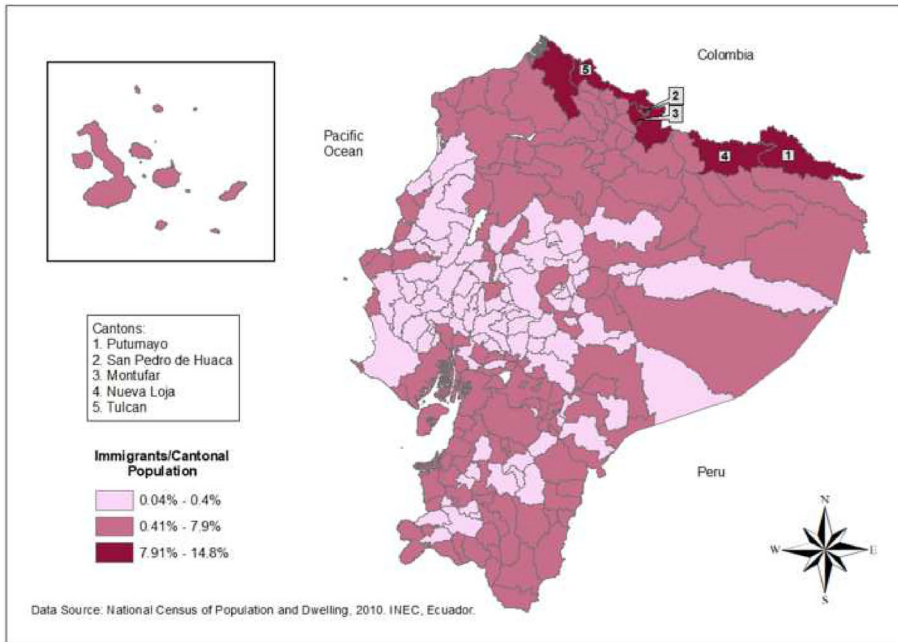
Fig. 1 Immigrants in Ecuador as percentage of total population by canton

Carchi, host a large quantity of immigrants (these cantons are numbered in Fig. 1). For instance, the immigrants in Putumayo (Sucumbíos province) represent 14% of the total cantonal population, in San Pedro (Carchi province) 11% and in capital cantons as Nueva Loja (Sucumbíos province) and Tulcán (Carchi province) 8%.

Regarding the origin of immigrants, in 2010, Ecuador hosted a great number of Colombians which represented 49% of total immigrants. The massive arrival of Colombian people in Ecuador was caused by the internal Colombian conflict with the FARC (Revolutionary Armed Forces of Colombia) guerilla group. Thus, most Colombian immigrants in Ecuador were refugees. The second largest population of immigrants living in Ecuador is North Americans representing 9% of total immigrants. Other representative nationalities in Ecuador are Peruvians (8.5%), Spaniards (7.7%), Europeans other than Spaniards (6%), Cubans (3.7%), and Venezuelans (2.6%).

At a cantonal level, as shown in Fig. 2,[3] Colombian immigrants represent more than 80% of the total immigrant population living in cantons located at the Ecuador-Colombia border such as Carchi (San Pedro, Montúfar, Tulcán), Sucumbíos (Putumayo, Nueva Loja), Orellana (La Joya), and Esmeraldas (San Lorenzo).

Regarding occupation status, most immigrants living in Ecuador are workers (49%) and students (21%). Moreover, many of them are dedicated to household services (13%) and only 2.4% are unemployed. The rest are inactive (6%).

At a regional level, as shown in Fig. 3, the employment rate of the immigrant population in most cantons (135 out of 221) is at least 40%. The cantons that employ more than 70% of their total immigrant population are

---

[3] Due to space limitations, only maps illustrating the percentage of migrants from Colombia in each canton and the percentage of active worker immigrants are included.
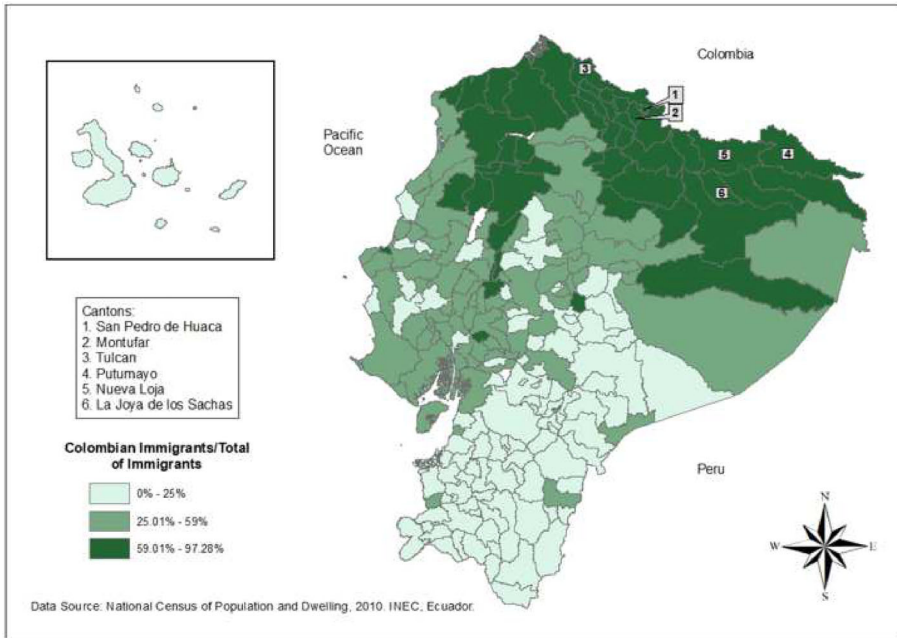
Fig. 2 Colombian immigrants in Ecuador as percentage of total population by canton

Camilo Ponce (Azuay province), Isabela (Galápagos province), and Isidro Ayora (Guayas province) with 75%, 72.4%, and 72.2% immigrant employment rates, respectively. As observed in Fig. 3, the distribution of cantons with high immigrant employment rates does not present a spatial pattern as it occurs with the distribution of migrants by nationality (Fig. 2). Instead, regarding employment, the location decision of immigrants could reflect the economic performance of cantons. Moreover, cantons with a numerous migrant population such as Quito, Guayaquil, and Cuenca record employment rates of 55%, 50%, and 44%, respectively. By contrast, there is an unemployment rate of less than 4% among migrants in most cantonal economies (185 out of 221). Cantons that record high rates of immigrant unemployment are Olmedo (17%), Alausí (12.5%), Logroño (6.6%), and Portovelo (6.3%), providing information about the less favorable economic conditions that those cantons offer immigrants.

Moreover, in 136 out of 221 cantons, at least 20% of the immigrant population is studying. The cantons with the highest proportions of student immigrants are El Pan (75%), Girón (65.7%), and Chunchi (64.4%). This is surprising since these cantons are not reputed to have good educational institutions. The cantons which host the best educational centers, such as Quito, Guayaquil, and Cuenca, only record 18%, 21%, and 31% of their immigrant population as students, respectively. Finally, in 62 out of 221 cantons, at least 15% of immigrants are employed in household services. Zapotillo, Espejo, and Patate record the highest rates of immigrants dedicated to household services with 31%, 29%, and 28%, respectively. In Guayaquil and Quito, only around 10% of total immigrants do housework.
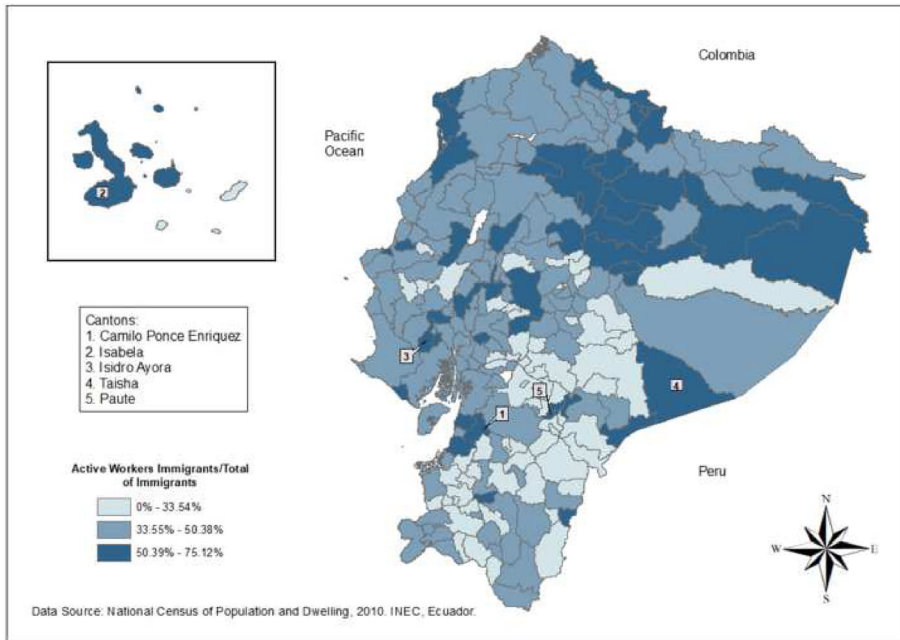
Fig. 3 Active worker immigrants in Ecuador as percentage of total population by canton

Method

Data Sources

Two main data sources are used to estimate the effect of international migration on Ecuadorian heads of household's life satisfaction perception: the National Survey of Employment, Unemployment and Underemployment (ENEMDU, Spanish acronym) and the National Census of Population and Dwelling. Specifically, information on self-reported life satisfaction (LS) at the head of household level is recovered from the perception module of the ENEMDU, which is available only for 2014 (30,365 observations) and 2015 (29,921 observations). On the other hand, the proportion of international migrant inhabitants at a cantonal level is recovered from the 2010 National Census. The final database is a pool that includes 60,286 observations representing the heads of household interviewed in 2014 and 2015. As the data is at an individual level, the proportion of international migration, which is at a cantonal level, is merged so that individuals living in the same canton record the same proportion of cantonal immigration. The 2014 and 2015 observations are independent over time (pool data); thus, it is possible to obtain robust estimators by avoiding the problem of autocorrelation in the error term.

Model Specification

The Dependent Variable: Self-reported Life Satisfaction

The self-reported level of life satisfaction is retained as a proxy to welfare perception (non-pecuniary measure). According to the ENEMDU design, this variable is reported

on a scale from 0 to 10 where 0 represents the lowest level of life satisfaction and 10 the highest. Because of parsimony reasons and the modeling assumption of proportionality, the 10 LS scales are sub-grouped into three categories of life satisfaction: low, medium, and high as detailed in Table 1. The re-classification criterion is such that each category includes at least 10% of individuals and only three categories are retained. According to the retained criteria, the first 5 LS levels are re-categorized as Low Life Satisfaction Level (LLS), LS levels 6 and 7 are re-categorized as Medium Life Satisfaction Level (MLS), and finally, LS levels 8 through 10 are re-categorized as High Life Satisfaction Level (HLS).

The Variable of Interest: International Immigration

The international immigration variable, measured as the proportion of immigrant population over the total population by canton, is obtained from the 2010 National Census of Population and Dwelling. In order to recover only the foreign-born population living in Ecuador in 2010, the data was filtered using two questions from the census, namely, (i) where were you born? and (ii) where do you live?

It is worth noting that the only non-biased data source at a cantonal level for immigration information is the National Census, and the latest edition is from 2010. Therefore, the available data allows us to estimate the effect of immigration up through 2010 on the 2014–2015 life satisfaction level (lagged effect of immigration on LS). Such a medium-term analysis is relevant because the influence of migratory settlements on life satisfaction is very likely to be a structural aspect rather than a temporary one.[4] Indeed, the medium-term effects of immigration have been related to the level of income, poverty, unemployment, urbanization, and educational attainment, which are main determinants of life well-being (Islam and Khan 2015; Sequeira et al. 2017). Consequently, the lagged migration, instead of being a shortcoming, is a specificity of this study: little attention has been paid to the effects of immigration on a subjective aspect such as people's life satisfaction in the medium term. The question is then as

Table 1 Distribution of the self-reported level of live satisfaction

Original scale	% Cumulative	Re-classification
0	0.07	1.1.1.1.1.1. Low life satisfaction level (LLS)
1	0.25	
2	0.67	
3	1.58	
4	3.91	
5	12.24	
6	24.15	1.2. Medium life satisfaction level (MLS)
7	45.19	
8	74.16	3. High life satisfaction level (HLS)
9	89.19	
10	100.00	

Source: National Survey of Employment, Unemployment and Underemployment, 2014–2015

follows: does the presence of immigrants affect the self-reported life satisfaction of residents in the medium term?

Moreover, because the LS of Ecuadorian residents might be affected differently by the type of immigration, the international migration variable is disaggregated by gender, nationality, and occupation so that alternative specifications of the model can be estimated (see the "The Control Variables" section). As summarized in Table 2, the disaggregation is as follows:

(i)   regarding the gender of immigrants: women and men
(ii) regarding the nationality of immigrants, 12 sub-classifications are retained according to their share in the total number of migrants shown in the "Immigration in Ecuador" section, namely, Colombia, Cuba, Peru, Venezuela, Mercosur (Argentina, Brazil, Paraguay and Uruguay), North America (the USA and Canada), the rest of the Americas (Bolivia, Chile, Mexico, and Central America), Spain, Europe (other than Spain), Asia, Africa, and Oceania
(iii) regarding the occupation of immigrants, 6 sub-classifications are retained, namely, unemployed, employed, students, retired, housework, and other economically inactive population (EIP), including rentiers and people with disabilities.

The Control Variables

Empirical literature distinguishes two types of characteristics as influencing population life satisfaction: individual features and external conditions. For the first group, we consider variables such as gender, age, marital status, education level, ethnic self-identification, pecuniary income, labor status, recreational activities, and medical insurance (Altindag and Xu 2017; Appleton and Song 2008; Boes and Winkelmann

Table 2 Immigrant disaggregation by occupation, by gender, and by origin

By Occupation				By Nationality	
	Frequency	Percentage		Frequency	Percentage
Workers	89 982	49.1	Colombia	90 182	49.3
EIP	15 624	8.5	Peru	15 715	8.6
Retired	2 576	1.4	Cuba	6 728	3.7
Students	38 798	21.2	Venezuela	4 732	2.6
Housework	23 661	12.9	Mercosur	4 284	2.3
Non-specified	12 443	6.8	North America	15 972	8.7
	183 084		Rest of America	9 937	5.4
By Gender			Spain	14 055	7.7
	Frequency	Percentage	Europe	10 728	5.9
Women	90 130	49.2	Asia	5 963	3.3
Men	92 954	50.8	Africa and Oceania	806	0.4
			Non-specified	3 982	2.2
	183 084			183 084	

Source: National Census of Population and Dwelling, 2010

2004; Dolan et al. 2008; Easterlin 2006; Ferrer-i-Carbonell and Gowdy 2007; Helliwell 2003; Jiang et al. 2012; Knight et al. 2009). As detailed in Appendix Table 9, men's expected life satisfaction effect is higher than women's (Appleton and Song 2008; Jiang et al. 2012; Knight et al. 2009). Regarding the effect of age on life satisfaction, some authors assert that life satisfaction shows an inverted-U shape: it increases until midlife and then decreases (Alesina et al. 2004; Easterlin 2006). It is possible, however, to observe a U-shaped effect (Hellevik 2017; Jiang et al. 2012; Knight et al. 2009; Margolis and Myrskylä 2013): age might reflect a proxy of unobservable variables which are correlated with other regressors causing the effect to be ambiguous (Ferrer-i-Carbonell and Frijters 2004). Concerning the influence of the individual's education level, labor status, and income level on life satisfaction, the relationship is positive: higher levels of these variables improve life satisfaction (Altindag and Xu 2017; Graham 2008; Jiang et al. 2012). In addition, the bulk of evidence suggests that the effect of higher income is steeper in developing countries than in developed ones. That is, when a certain income threshold is reached, a higher income level does not promote higher levels of life satisfaction (Clark et al. 2008). Regarding recreational activities, as expected, they positively affect life satisfaction (Ferrer-i-Carbonell and Gowdy 2007). In this study, the fact that an individual plays sports is considered a recreational activity that proxies leisure. By including both components, work and leisure, the model specification retained here accounts for the typical work-leisure trade off—theoretically, a detrimental effect of less leisure is offset by a higher status that comes with higher income derived from more hours of work (Clark et al. 2008).

Regarding the second group of factors influencing LS, variables related to the external context of individuals are considered. For instance, the geographical region where people are located, and the rural or urban context are included. In fact, people living in urban areas are happier than people living in rural areas (Glaeser et al. 2016); however, this is a non-generalizable conclusion. As an additional external factor, the internal migration of the canton is also considered.

Because the endogenous variable is a perception attribute, other perception variables need to be included as controls. Indeed, an individual's perception of his/her own life satisfaction is directly and closely related to the perception about his/her social relationships (Ateca-Amestoy et al. 2014; Dolan et al. 2008; Frey and Stutzer 2000). Three perception variables are included relating to the government, family, and social relationships. The ENEMDU provides information about these three aspects of perception of life satisfaction: with family, with the government, and with social relationships. These three aspects are reported on a scale from 0 to 10. As shown in Table 3, the perception variables are also re-categorized into three sub-categories: low, medium, and high satisfaction level. Moreover, local crime also affects life satisfaction (Ferrer-i-Carbonell and Gowdy 2007), and therefore, a dichotomous variable is included, which takes the value of 1 if the individual has suffered any type of crime. Finally, even if Ecuadorian immigration policy is very likely to influence people's perception of immigrants and immigration, no control variable is included to capture this factor, and therefore, it is captured by the error term. This is due to two reasons: (i) since 2008, the Constitution of the Republic of Ecuador guarantees the right to free mobility in its ninth article: "Foreign persons who are in Ecuadorian territory will have the same rights

and duties as Ecuadorian residents" and as such, a National Equality Agenda for Human Mobility[5] is periodically approved and implemented, and (ii) the open-hands government immigration policy did not change during the studied period (2014–2015).

Appendix Table 9 summarizes the variables included in the model specification. The included control variables are carefully chosen considering the LS determinants reported by literature. The variable of interest, international immigration, is included at an aggregate and a disaggregated level (differentiating the nationality and the occupation of the immigrant population). Consequently, three specifications of the model are estimated: (i) a base model including the aggregate international migration, (ii) an alternative specification disaggregating the migration by nationality, and (iii) an alternative specification disaggregating the migration by occupation. Each subcategory of nationality and occupation is introduced in the model as a percentage of the total cantonal population.

Estimation Strategy

As the dependent variable, namely, the self-reported life satisfaction level, is an ordinal variable, the modeling strategy consists of estimating an ordered logit (ologit) model. In formal terms, the observed ordinal variable is denoted as Y and is a function of an unobserved continuous latent variable, Y^*. The assessment of an individual with respect to his/her LS can be defined as a latent variable, Y^*, which is a function of a set of explanatory variables, Xs (the retained explanatory variables are described in the "Model Specification" section). The range of Y^* can be subdivided into ordered intervals for obtaining Y. The ordered relationship can be described for an ordinal outcome variable with M categories as in Eq. (1).

$$Y = \begin{cases} 0, & \text{if } Y^* \leq 0 \\ 1, & \text{if } 0 < Y^* \leq \mu_1 \\ 2, & \text{if } \mu_1 < Y^* \leq \mu_2 \\ \vdots & \vdots \\ M, & \text{if } \mu_{M-1} < Y^* \end{cases} \tag{1}$$

Therefore, Y depends on whether or not Y^* has crossed a particular threshold, μ_j. These thresholds, unknown a priori, must be such that $\mu_1 \leq \mu_2 \leq \ldots \leq \mu_{M-1}$. The distribution function that relates the dependent variable to the explanatory variables, Xs, can be written as in Eq. (2).

$$Prob(Y_i < j) = g(X\beta) = \frac{\exp\left(\mu_j + X_i\beta\right)}{1 + \left\{\exp\left(\mu_j + X_i\beta\right)\right\}}, \quad j = 1, 2, \ldots, M-1 \tag{2}$$

In order for the use of the ologit model to be valid, the proportional odds/parallel lines assumption must hold. This assumption is tested by running a series of *cumulative logit models* which consist of collapsing the original ordinal variable into two categories and

Table 3 Distribution of perception variables

Escale	Satisfaction with family		Satisfaction with government		Satisfaction with social relationships	
	% Cumulative	Categories	% Cumulative	Categories	% Cumulative	Categories
0	0.11	Low	3.26	Low	0.29	Low
1	0.32		5.60		0.66	
2	0.76		8.74		1.63	
3	1.58		12.99		3.72	
4	3.17		19.34		7.89	
5	7.43	Medium	36.79	Medium	18.87	Medium
6	12.89		49.62		31.55	
7	22.54		65.50		50.70	
8	40.51	High	82.83	High	75.14	High
9	60.15		91.70		87.84	
10	100.00		100.00		100.00	

Source: National Survey of Employment, Unemployment and Underemployment, 2014–2015

running a series of binary logistic regressions. If the assumption of the parallel lines holds, the coefficients (other than the constants) should be the same across the binary logistic regressions and the odds ratios should also be the same for each of the ordered dichotomizations of the outcome variable (Williams 2016). To test this condition, the Brant test—which is a proportionality likelihood ratio test—is performed (Brant 2006). The result of the Brant test, shown in Table 4, demonstrates that such an assumption is not met, meaning that the estimation of an ologit will fail to accurately reflect the nature of the influence of international migration on life satisfaction. As the coefficients of the binary logistic regressions and the resulted odds ratios are not the same, the coefficients of the ologit regression might over- or underestimate the impact of international migration. As explained by Williams (2016), a more flexible model for dealing with the no satisfaction of the proportional odds assumption is the so-called generalized ordered logit (gologit) model.

The gologit model allows measuring of the differentiated effect of explanatory variables on the dependent variable across its levels. This cannot be identified in ologit models, which do not consider asymmetric effects between variables: the ologit model assumes that, for each cumulative logit model that can be estimated, the effect of X on Y is the same (Williams 2016). Therefore, the retained modeling strategy for estimating the influence of international immigration in the self-reported life satisfaction level is a gologit/partial proportional odds (PPO) whose assumptions are not violated and does not include many extraneous and unnecessary parameters. In fact, for the Brant test to conclude that the proportional odds assumption is not met, it is enough that only one of the explanatory variables violates the assumption. Consequently, the gologit PPO model allows us to relax the proportional odds assumption only for those variables where it is violated while constraining the others (Williams 2016).[6]

---

[6] The Stata *autofit* option, part of the gologit2 routine, is used to identify the partial proportional odds models that fit the data.

The gologit model relates the endogenous variable Y to the explanatory variables Xs through the Eq. (3)

$$\text{Prob}(Y_i < j) = g(X\beta_j) = \frac{\exp\left(\mu_j + X_i\beta_j\right)}{1 + \left\{\exp\left(\mu_j + X_i\beta_j\right)\right\}}, \quad j = 1, 2, \ldots, M-1 \quad (3)$$

where M is the number of categories of the ordinal variable, three in this case. The included categories are as follows: high life satisfaction (HLS), medium life satisfaction (MLS), and low life satisfaction (LLS). As the outcome variable has three categories, there are two unknown thresholds, so the gologit model will have two sets of coefficients.

The gologit model is estimated by running a series of binary logistic regressions. The first binary regression contrasts the LLS category versus the MLS and HLS categories taken as a whole. The second binary regression contrasts the LLS and MLS categories versus the HLS category. In each regression, the lower values are recoded to zero (base category) and the higher values are recoded to one. Thus, a positive (negative) coefficient means that an increase in the explanatory variable leads to higher (lower) levels of life satisfaction.

Results

Three model specifications are retained: a base model focusing on the effect of general immigration on life satisfaction (Table 5), a model including the effect of immigration by country of origin (Table 6), and a model including the effect of immigration by occupation (Table 7).[7] In each table, the results of the generalized logit model and the marginal effects are presented. All tables present the binary logistic models contrasting category LLS vs. MLS and HLS and contrasting categories LLS and MLS vs. HLS—columns (1) and (2). The marginal effects corresponding to the LLS, MLS, and HLS are shown in columns (a), (b), and (c), respectively.

Only the sign of the estimated coefficients can be interpreted, and therefore, the marginal effects must be calculated for the magnitude of the estimated effects. A positive (negative) sign indicates that an increase in a variable X makes some outcomes (low, medium, or high level of life satisfaction) more (less) likely to occur. For instance, regarding the magnitudes, according to the estimations reported in Table 5, men are 1.5% less likely to report a low level of life satisfaction as compared to women; 0.1% less likely to report a medium level of satisfaction; and 1.6% more likely to report

Table 4 Proportionality test

Proximity test of proportionality likelihood ratio
Ho: Complies with the proportionality assumption
chi2(41) = 2135.34
Prob>chi2 = 0.000

a high level of satisfaction. Note that the sum of marginal effects is zero: as some responses become more likely, others become less likely.

Regarding our variable of interest, an increase of 1% in the proportion of immigrants by canton is associated with a 19.8% (1.7%) higher probability of reporting an LLS (MLS). By contrast, the same 1% increase in the proportion of immigrants by canton makes residents 21.5% less likely to report an HLS. It seems that Ecuadorian residents' life satisfaction is negatively associated with international immigration. One can think that the informal context in each canton could be perceived by local residents as mainly related to migrants (Darling 2017). Moreover, even if this result could indicate that Ecuadorian residents are not open to cohabitating with foreigners and even that they may have xenophobic attitudes (Crush and Ramachandran 2010), further evidence is necessary to assert it. Considering that since 2008, the Ecuadorian immigration policy guarantees the equity of rights and duties (Art. 9 of the Ecuadorian Constitution), a negative association between Ecuadorian residents' perceived life satisfaction and the proportion of immigrants is not because of the existence of a hostile and xenophobic political climate.

With respect to the individual characteristics, the individual's income level positively impacts his/her LS. In line with the expected higher effect in developing countries (Clark et al. 2008), the resulted effect of income is highly significant: the likelihood of reporting an HLS (MLS) increases 1.4% (0.7%) after a 1% increase of income. Consequently, the likelihood of reporting an LLS decreases by 2.1%. This result is in line with the general assertion that money does buy happiness in the developing world (Altindag and Xu 2017; Boes and Winkelmann 2004; Clark et al. 2008; Jiang et al. 2012).

Regarding the traditional life satisfaction determinants, as the education level evolves towards superior levels, the likelihood of reporting an HLS increases from 4.2% (basic education) to 7.8% (master's degree) with respect to people who do not have any level of formal education. People are rewarded in terms of life satisfaction for investing in human capital (Helliwell 2003; Jiang et al. 2012). Furthermore, as expected, compared to unemployed people, employed individuals have a 2.1% higher likelihood of reporting an HLS: unemployment conditions are crucial for life satisfaction in both developed and developing countries (Clark and Oswald 1994; Graham 2008; Oswald 1997; Ravallion and Lokshin 2001). Additionally, recreational activities improve well-being (Ferrer-i-Carbonell and Gowdy 2007): the estimations confirm that people who play sports are 2.1% more likely to report an HLS compared to people who do not play sports. As remarked by Clark et al. (2008), leisure time is an important component of the utility. Contrary to Clark et al. (2008), our result shows that the effect of income (1.4%) is lower than the effect of leisure activities (2.4%). In complement, the likelihood of reporting an HLS of people having some type of medical insurance is 1.7% higher than that of people who do not have any medical insurance.

---

[0] The Stata *autofit* option, part of the gologit2 routine, is used to identify the partial proportional odds models that fit the data.

[0] Tables 7 and 8, which show the estimations with international immigration by country and occupation, present only the coefficient estimates of the variables of interest: countries or groups of countries and occupation status, respectively. The estimated coefficients corresponding to the control variables are not presented here due to space limitations. It is worth noting that the signs and significance of the estimates of those control variables are retained in those models.

Table 5 Generalized ordered logit model estimations: international migration (base model)

Variables	(1) LLS vs MLS&HLS	(2) LLS&MLS vs HLS	a Marginal effect LLS	b Marginal effect MLS	c Marginal effect HLS
Internal migration	0.0151	0.0151	−0.002	0	0.002
	(0.19)	(0.19)			
International migration	−1.354**	−1.354**	0.198	0.017	−0.215
	(−2.80)	(−2.80)			
Men	0.0994***	0.0994***	−0.015	−0.001	0.016
	(3.62)	(3.62)			
Age	−0.00511	−0.00511	0.001	0	−0.001
	(−1.50)	(−1.50)			
Squared age	0.0000608	0.0000608	0	0	0
	(1.88)	(1.88)			
Worked	0.132***	0.132***	−0.019	−0.002	0.021
	(5.05)	(5.05)			
ln(Income)	0.142***	0.0859***	−0.021	0.007	0.014
	(10.16)	(6.23)			
Insurance	0.106***	0.106***	−0.015	−0.001	0.017
	(5.46)	(5.46)			
Recreational activities	0.135***	0.135***	−0.02	−0.002	0.021
	(6.32)	(6.32)			
Crime	−0.0911*	−0.0911*	0.013	0.001	−0.014
	(−2.23)	(−2.23)			
Alphabetization	0.0469	0.0469	−0.007	−0.001	0.007
	(0.47)	(0.47)			
Category of reference: no formal education					
Primary school	0.0680	0.0680	−0.01	−0.001	0.011
	(1.66)	(1.66)			
Basic school	0.266**	0.266**	−0.039	−0.003	0.042
	(3.07)	(3.07)			
Secondary education	0.159***	0.159***	−0.023	−0.002	0.025
	(3.51)	(3.51)			
Middle education	0.388***	0.388***	−0.057	−0.005	0.062
	(5.04)	(5.04)			
Superior no university	0.286**	0.286**	−0.042	−0.004	0.045
	(3.19)	(3.19)			
University	0.470***	0.373***	−0.069	0.009	0.059
	(7.97)	(7.00)			
Post-grade	0.491***	0.491***	−0.072	−0.006	0.078
	(5.48)	(5.48)			
Urban area	0.0773***	0.0773***	−0.011	−0.001	0.012
	(3.66)	(3.66)			
Population by canton	6.13e-08***	−0.000000145***	0	0	0

Table 5 (continued)

Variables	(1) LLS vs MLS&HLS	(2) LLS&MLS vs HLS	a Marginal effect LLS	b Marginal effect MLS	c Marginal effect HLS
	(3.31)	(−7.83)			
Category of reference: Sierra region					
Coast region	−0.0994***	0.00328	0.015	−0.015	0.001
	(−3.52)	(0.12)			
Amazon region	−0.0881**	0.0411	0.013	−0.019	0.007
	(−2.59)	(1.24)			
Galapagos Islands	0.870***	0.870***	−0.127	−0.011	0.138
	(9.23)	(9.23)			
Category of reference: low satisfaction with government					
Middle satisfaction with government	1.075***	0.264***	−0.157	0.115	0.042
	(40.51)	(10.32)			
High satisfaction with government	1.314***	1.488***	−0.192	−0.044	0.236
	(31.95)	(52.47)			
Category of reference: low satisfaction with social relationships					
Middle satisfaction with social relation	1.307***	0.570***	−0.191	0.1	0.09
	(53.14)	(20.03)			
High satisfaction with social relation	1.717***	1.717***	−0.251	−0.022	0.272
	(62.37)	(62.37)			
Category of reference: low satisfaction with family					
Middle satisfaction with family	0.890***	0.190***	−0.13	0.1	0.03
	(26.98)	(3.48)			
High satisfaction with family	1.383***	1.225***	−0.202	0.007	0.194
	(43.33)	(24.68)			
Category of reference: mestizo					
Indigenous	−0.0984**	−0.0984**	0.014	0.001	−0.016
	(−3.16)	(−3.16)			
Afro-Ecuadorian	0.162*	0.162*	−0.024	−0.002	0.026
	(2.31)	(2.31)			
Black	0.0766	0.0766	−0.011	−0.001	0.012
	(1.13)	(1.13)			
Mulato	−0.0972	0.224*	0.014	−0.05	0.036
	(−0.96)	(2.23)			
Montubio	0.0222	0.0222	−0.003	0	0.004
	(0.41)	(0.41)			
White	0.170*	0.170*	−0.025	−0.002	0.027
	(2.46)	(2.46)			
Other	0.322	0.322	−0.047	−0.004	0.051
	(0.79)	(0.79)			
Category of reference: single					
Married	−0.0262	−0.0262	0.004	0	−0.004

Table 5 (continued)

Variables	(1) LLS vs MLS&HLS	(2) LLS&MLS vs HLS	a Marginal effect LLS	b Marginal effect MLS	c Marginal effect HLS
	(−0.75)	(−0.75)			
Separated	−0.120**	−0.120**	0.017	0.002	−0.019
	(−2.98)	(−2.98)			
Divorced	−0.0602	−0.0602	0.009	0.001	−0.01
	(−1.19)	(−1.19)			
Widowed	−0.151***	−0.151***	0.022	0.002	−0.024
	(−3.52)	(−3.52)			
Free union	−0.0713	−0.0713	0.01	0.001	−0.011
	(−1.95)	(−1.95)			

Correct prediction percentage: 62.1%

Significance level: *** = 1%; ** = 5%; * = 10%

Focusing on the perceived satisfaction with the government, social relationships, and family, results confirm that these factors have significant effects on life satisfaction. In fact, they seem to be more important than the individual and contextual variables. As people have more optimistic expectations with respect to the government, the likelihood of reporting an HLS increases from 4.2 to 23.6% compared to those who reported an LLS with regard to the government. This result evidences that as people believe in positive effects of governmental policies, they will be more confident that their own situation will improve. This finding is in line with the results of the World Happiness Report 2017, which shows a negative effect of perceptions of corruption (Helliwell et al. 2017). Likewise, the probability of reporting an HLS increases as the individual's satisfaction with respect to social relationships and family increases. Specifically, the probability of people having a medium satisfaction level with their social context to report an HLS increases from 9 to 27%, compared to people perceiving poor social relationships. As evidenced by Ateca-Amestoy et al. (2014), bonding and bridging social interactions do associate to a higher LS. The perceived familiar context does matter as well: the probability of reporting an HLS increases from 3% when the

Table 6 Generalized ordered logit model estimations: international migration by gender

Variables	(1) LLS vs MLS & HLS	(2) LLS & MLS vs HLS	a Marginal effect LLS	b Marginal effect MLS	c Marginal effect HLS
Female migrants (prop total pop)	11.867***	−8.631	−1.732	3.101	−1.36951
	6.071	6.068			
Male migrants (prop total pop)	−14.618**	5.520	2.133	−3.009	0.876
	6.650	6.812			

Correct prediction percentage: 62%

Significance level: *** = 1%; ** = 5%; * = 10%

Table 7 Generalized ordered logit model estimations: international migration by origin

Variables	(1)	(2)	a	b	c
	LLS vs MLS & HLS	LLS & MLS vs HLS	Marginal effect LLS	Marginal effect MLS	Marginal effect HLS
Category of reference: Colombia					
Cuba	218.3***	− 2821	− 31.876	32.324	− 0.447
	− 4.62	(− 0.06)			
Peru	2504	2504	− 0.366	− 0.031	0.397
	− 0.57	− 0.57			
Venezuela	− 5821	− 154.1***	0.850	23.585	− 24.435
	(− 0.13)	(− 3.70)			
Mercosur	− 403.8**	278.6*	58.965	− 103.133	44.168
	(− 2.92)	− 2.25			
Central America	170.9**	− 37.19	− 24.954	30.851	− 5.897
	− 2.83	(− 0.68)			
North America	4025	4025	− 0.588	− 0.050	0.638
	− 0.53	− 0.53			
Spain	− 19.39	− 19.39	2.832	0.243	− 3.074
	(− 1.78)	(− 1.78)			
Europe	24.96	24.96	− 3.645	− 0.312	3.958
	− 0.81	− 0.81			
Asia	33.14	− 111.6*	− 4.840	22.538	− 17.698
	− 0.56	(− 2.03)			
Africa and Oceania	− 1058.5***	− 1058.5***	154.562	13.249	− 167.811
	(− 4.05)	(− 4.05)			

Correct prediction percentage: 62.1%

Significance level: *** = 1%; ** = 5%; * = 10%

individual has a medium level of satisfaction with his/her family and to 27.8% when he/she is highly satisfied with his/her family. Good perceptions of family relationships do increase life satisfaction (Margolis and Myrskylä 2013).

For the contextual variables, the estimations evidence that a person who lives in an urban area has a 1.2% higher probability of reporting an HLS with respect to someone who lives in a rural area. The geographical region where the individual lives constitutes an important factor in determining the level of satisfaction with life (Glaeser et al. 2016). For instance, living in the Galápagos Islands increases the likelihood of reporting an HLS by 13.8% with respect to the Sierra (Highlands) region. By contrast, living in the Amazon region or the Coastal region increases the probability of having an LLS by 1.3% and 1.5%, respectively.

So far, the general effect of immigration on the level of LS has been studied. Nevertheless, such a general effect might hide important differences across groups of immigrants. Indeed, the effect on perceived life satisfaction is very likely to depend on the nature of immigration (Dustmann and Preston 2007). For instance, as male migrants have a higher labor force participation rate (ILO 2018), they could be seen as a threat

by the non-migrant population. Then, a negative effect of male migrants on life satisfaction of residents is expected. Moreover, European citizens might be welcomed and positively affect the life satisfaction of residents (because of potential financial income from migration) while other South American citizens might be rejected or excluded (because of the potential labor market competition or xenophobic attitudes) (Gott 2007; Hayes 2015). Likewise, citizens' perception of student immigrants is different from citizens' perception of retired immigrants and economic (workers) immigrants (Liu-Farrer 2009; Warnes 2009). An immigrant who is a student might not pose a threat while a working immigrant might. Therefore, alternative specifications of the model are estimated to analyze the effect on perceived LS of (i) international migration by gender (Table 6), (ii) international migration by country of origin (Table 7), and (iii) international migration by occupation (Table 8). In general, these models record a high percentage of correct classification of 62.1%, 62%, and 62%, respectively.

Regarding the gender of immigrants, the results reported in Table 6 evidence that male and female immigrants are differently associated with the perceived life satisfaction of residents. A 1% increase in the proportion of male immigrants in a canton is associated with a 213% higher probability of residents to report an LLS. By contrast, a 1% increase in the proportion of female immigrants positively impacts the residents' probability of reporting an MLS. These findings might be explained by the fact that the labor force participation of male migrants is 60.5% while that of female migrants is only 37.5%.

As for the nationality of immigrants, 10 sub-groups are analyzed (see Table 7)—the sub-clustering considers the share of migrants by country of origin on the total cantonal population. The retained categorization of migrants by origin considers Colombian immigrants as the base category. According to the results, which are summarized in Table 7, the perception of Ecuadorian residents' life satisfaction is significantly associated with immigrants from Cuba, Venezuela, Africa, Oceania, Asia, and the rest of Latin America. Ecuadorian citizens have different levels of life satisfaction depending on the nationalities of migrants that exist in their region of residence. Moreover, Ecuadorian residents seem to be indifferent in terms of life satisfaction when Peruvian, North American, Spanish, and other European immigrants live in their region of residence: the concerning variables are not statistically significant. With respect to certain nationalities, namely, Cuban, Central American, and Asian, residents are more likely to have an intermediate posture of life satisfaction: Ecuadorian residents tend to report to have neither high nor low life satisfaction levels but medium ones. For instance, an increment of 1% in the proportion of Cuban (Central American/Asian) immigrants is related to a 32.3% (30.9%/22.5%)[8] higher probability for the residents to report a medium level of satisfaction. In contrast, a 1% increase in the proportion of Venezuelan immigrants is related to a 24% lower probability of reporting an HLS. Regarding immigration from Mercosur, Ecuadorian residents are more likely to take extreme postures of satisfaction (HLS or LLS instead of MLS): a 1%

---

[8] To ease the interpretation, marginal effects higher than 10 are divided by 100 and then interpreted as percentage. As the marginal effects must sum zero, a re-scaling of the marginal effects does not affect results. In this manner, we avoid high percentages such as 3224% for Cuba, for example.

Table 8 Generalized ordered logit model estimations: international migration by occupation

Variables	(1)	(2)	a	b	c
	LLS vs MLS & HLS	LLS & MLS vs HLS	Marginal effect LLS	Marginal effect MLS	Marginal effect HLS
Category of reference: unemployed					
Employed	30.28***	4.421	− 4416	3715	0.701
	(4.71)	(0.71)			
Student	− 19.12**	− 19.12**	2788	0.244	− 3033
	(−2.74)	(−2.74)			
EIP[a]	68.54*	68.54*	− 9996	− 0.876	10,871
	(2.02)	(2.02)			
Retirees	− 59.99	− 59.99	8748	0.766	− 9515
	(− 1.12)	(− 1.12)			
Household services	− 79.33***	− 27.60*	11,569	− 7192	− 4377
	(− 6.19)	(− 2.16)			

Correct prediction percentage: 62.0%

Significance level: *** = 1%; ** = 5%; * = 10%

[a] The other economically inactive population (EIP) includes rentiers, disabled, and unemployed population

increase in the proportion of Mercosur immigrants increases the probability of reporting an LLS (HLS) by 58% (44%). This might reflect the opposite opinions of Ecuadorian residents with respect to the immigrants from Mercosur. Some people are not open to the variety of cultures or are more reluctant with regard to specific ones. Surprisingly, it is 167% less likely for local residents to report an HLS when the proportion of immigrants from Africa and Oceania increases in comparison to Colombian immigrants. Even though the number of immigrants from these regions is low in most cantons, the negative effect is significant. This result could be related to the language barriers between the migrant and native populations (Beier and Kroneberg 2013).

Regarding the occupation of immigrants, 6 categories are considered: unemployed (category of reference), employed, students, retired, housework, and other economically inactive population (EIP) including rentiers and people with disabilities. As shown in Table 8, the results evidence that the distinction of immigrants by occupation status matters when analyzing perceived life satisfaction. As expected, the LS of people is significantly affected by the fact that immigrants are actively working (Gomberg-Muñoz 2010). Interestingly, an increase of 1% in the proportion of occupied immigrants increases the probability of reporting an MLS (HLS) by 3.7% (0.7%): the locals' life satisfaction is positively related to immigrant workers. A plausible explanation might be the complementary role of immigrants to local workers in the labor market. Migrants are more likely to start businesses than non-migrants: according to the 2010 Census, 15.4% of total migrants own businesses while only 12.6% of non-migrants own businesses. Thus, not only do migrants not constitute a threat for non-migrants but they also stimulate job creation. Another explanation could be that in relative terms,

migrants may have worse working conditions (no payroll deductions and benefits) than natives, so the latter do not view migrants as threats. According to the 2010 Census, the proportion of migrants that do not have payroll deductions and benefits is 65.4% whereas that proportion for non-migrants is 54.3%. At this point, it is important to point out a possible contradiction with the negative life satisfaction effect associated with male immigrants: although male immigrants are more likely to be employed, it is not the fact of being employed that harms life satisfaction perception. Locals may perceive male migrants as a threat simply because they are male (possibly related to violence). Moreover, there are 1.6% more male migrants than female ones. On the contrary, the individuals that live in cantons with a higher proportion of immigrants who study are 3% less likely to report an HLS. This might be explained by the difference in the level of qualification. When immigrants are more qualified than local residents, the latter are less favorable to immigration (Facchini and Mayda 2009). In fact, most Ecuadorians achieved only primary education (31.8%) and very few achieve a university degree (12.9%). As for migrants, 26.8% of them achieve primary education and 24.1% achieve a university degree. Finally, the fact that immigrants are employed in household services negatively impacts the perceived life satisfaction. An increase of 1% in the proportion of immigrants dedicated to household services makes local residents 11.6% more likely to report an LLS. It seems that immigrants dedicated to basic household labor could be perceived negatively because of their low job security and their vulnerability to poverty and homelessness which make them more likely to work informally and face poverty (Banerjee 1983). Contrary to the null expected effect, a 1% increase in the proportion of the inactive population makes Ecuadorian residents 10.9% more likely to report a high level of life satisfaction.

Conclusions

Results show that individual life satisfaction is not only determined by individual characteristics but also by external aspects. The latter are important since people live in a social context that affects them. In Ecuador, the self-reported life satisfaction level of Ecuadorian residents is, indeed, harmed by an important external factor: international immigration. This negative immigration effect on LS indicates some discomfort among residents due to cohabitation with foreign people. However, such a general effect hides important differences across immigration types. In fact, the impact of migration inflows on locals' life satisfaction depends on the gender, occupation status, and nationality of immigrants. Regarding immigration flows by nationality, some nationalities are related to increases in life satisfaction, while other nationalities are related to decreases in life satisfaction of the local population. On the one hand, Ecuadorian citizens seem to have an intermediate position of life satisfaction when the proportion of Cuban, Central American, and Asian immigrants increases. On the other hand, counter-migration LS effects are in play when the proportion of immigrants from Venezuela, Africa, and Oceania increases. Regarding immigration by occupation, Ecuadorian residents tend to have an intermediate LS position with respect to worker immigrants.

Though, the LS effect of male migrants is negative, indicating a sort of discomfort with respect to a high labor participation of male migrants. However, other aspects of being male could have negative effects since the LS effect of occupied workers is not negative. Therefore, believing that the receiving country citizens are negatively affected by the fact that immigrants take away their jobs is not always verified. Instead, immigrants could be carrying out jobs complementary to those of local workers. For instance, immigrants take jobs in the informal sector without benefits (payroll deductions and benefits) that attract residents to a lesser extent. A large proportion of immigrants create small businesses (e.g., restaurants, beauty salons) and potentially stimulate local employment. On the other hand, and surprisingly, the effect of an increase in the proportion of student immigrants negatively affects local life satisfaction, indicating a sort of jealousy of the local less-educated population. Finally, the inactive population, instead of having a null effect, has a significant positive effect for the self-reported life satisfaction of Ecuadorian citizens.

Important public policy recommendations are derived from this study. As for migration, the negative perception of immigrants might be improved by implementing social programs seeking to make life conditions more equal between migrants and non-migrants living in the same canton. For instance, more access to higher education levels for immigrants and non-migrants might not only create further relationships between them but also reduce residents' negative perception on migrants. Moreover, since the fact that the positive effect of female immigrants on Ecuadorian's life perception could be related to low female labor participation, more attention to this group is needed. Regarding other determinants of LS, to improve the perceived life satisfaction of the Ecuadorian population, access to higher education must be guaranteed, employment policies must be reinforced, and crime must be reduced. The insights of this study could be considered to complement the Ecuadorian National Equality Agenda for Human Mobility.

The evidence provided by this study might be complemented by exploring the effect of immigrants by occupation while also considering the occupation of residents. Moreover, it would be very interesting to determine how the race of residents affects their perception of migration. In the present study, this analysis is not carried out since the specific perception of migrants is not available. The limitations of this study are related to the lagged effect of migration (2010) on perceived life satisfaction (2014–2015). To solve this issue, a more recent census is needed. However, it will not be available until 2021.

Compliance with Ethical Standards

Appendix

Table 9 Description of variables, expected sign, and referred studies

Variable	Description	Expected Sign	Referred study
Source: National Census of Population and Dwelling (2010)			
Internal migration	Proportion of internal immigrants over the total population by canton.	(−)	
International migration	Proportion of international immigrants over the total population by canton	(−)	
Source: National Survey of Employment, Unemployment and Underemployment (2014–2015)			
Male	Dichotomous variable set to one if the householder is a man.	(+)	(Appleton and Song 2008; Jiang et al. 2012; Knight et al. 2009)
Age	Householder's age in years	(±)	U shape (Dolan et al. 2008; Knight et al. 2009) Inverted U shape (Alesina et al. 2001; Easterlin 2006)
Squared age	Square of householder's age	(±)	
Worked	Dichotomous variable set to one if the person did work last week.	(+)	(Jiang et al. 2012; Knight et al. 2009)
ln(Income)	Total income received by the household expressed in logarithm.	(+)	(Altindag and Xu 2017; Jiang et al. 2012)
Insurance	Dichotomous variable set to one if the person does have insurance.	(+)	(Dolan et al. 2008; Fang and Sakellariou 2016)
Recreational activities	Dichotomous variable set to one if the person did play any sport last week.	(+)	(Ferrer-i-Carbonell and Gowdy 2007)
Level of education	Categories: None, alphabetization, primary school, basic school, secondary education, middle education superior no university, university, and post-grade	(+)	(Helliwell 2003; Jiang et al. 2012)
Area of residence	Dichotomous variable set to one if the residence area is urban.	(+)	(Glaeser et al. 2016)
Natural region	Categories: Sierra, Coast, Amazon, and Galapagos Islands	n/a	
Government satisfaction	Categories: Low, middle, and high satisfaction level.	(+)	(Dolan et al. 2008; Helliwell 2003)
Social relationships satisfaction	Categories: Low, middle, and high satisfaction level.	(+)	(Ateca-Amestoy et al. 2014; Dolan et al. 2008)
Family satisfaction	Categories: Low, middle, and high satisfaction level	(+)	(Dolan et al. 2008; Margolis and Myrskylä 2013)
Ethnic	self-identification	Categories: Mestizo, Indigenous	Indigenous, Afro-Ecuadorian, Black, Mulato, Montubio, White, other (−) (Shams 2016)
Crime		(−)	

Table 9 (continued)

Variable	Description	Expected Sign	Referred study
	Dichotomous variable set to one if the person has suffered any kind of crime.		(Ferrer-i-Carbonell and Gowdy 2007)
Civil status	Categories: married, separated, divorced, widowed, free union, and single	Married (+)	(Appleton and Song 2008; Jiang et al. 2012)

References

Acosta, A., López, S., & Villamar, D. (2005). Las Remesas y su aporte para la economía ecuatoriana. In G. Herrera, M.C. Carillo & A. Torres. (Eds.), *La migración ecuatoriana: transnacionalismo, redes e identidadesLa migración ecuatoriana: transnacionalismo, redes e identidades*. Quito, Ecuador: FLACSO Ecuador.

Acosta, A., López, S., & Villamar, D. (2006). *La migración en el ecuador : oportunidades y amenazas*. Quito, Ecuador: Universidad Andina Simón Bolívar / Corporación Editora Nacional.

Akay, A., Constant, A., & Giulietti, C. (2014). The impact of immigration on the well-being of natives. *Journal of Economic Behavior & Organization, 103*(C), 72–92.

Alesina, A., Tella, R., & Macculloch, R. (2004). Inequality and happiness: are europeans and americans different?. *Journal of Public Economics* 88(9–10), 2009–2042.

Altindag, D. T., & Xu, J. (2017). Life satisfaction and preferences over economic growth and institutional quality. *Journal of Labor Research, 38*(1), 100–121. https://doi.org/10.1007/s12122-016-9235-2.

Appleton, S., & Song, L. (2008). Life satisfaction in urban China: components and determinants. *World Development, 36*(11), 2325–2340. https://doi.org/10.1016/j.worlddev.2008.04.009.

Ateca-Amestoy, V., Aguilar, A. C., & Moro-Egido, A. I. (2014). Social interactions and life satisfaction: evidence from Latin America. *Journal of Happiness Studies, 15*(3), 527–554. https://doi.org/10.1007/s10902-013-9434-y.

Bakewell, O. (2009). *South-south migration and human development*

Banerjee, B. (1983). The role of the informal sector in the migration process: a test of probabilistic migration and labour market segmentation for India. *Oxford Economic Papers, 35*(3), 399–422. https://doi.org/10.1093/oxfordjournals.oep.a041604.

Beier, H., & Kroneberg, C. (2013). Language boundaries and the subjective well-being of immigrants in Europe. *Journal of Ethnic and Migration Studies, 39*(10), 1535–1553.

Bertoli, S., Moraga, J. F.-H., & Ortega, F. (2013). Crossing the border: self-selection, earnings and individual migration decisions. *Journal of Development Economics, 101*, 75–91. https://doi.org/10.1016/j.jdeveco.2012.09.004.

Blagg, D. (2013). What shapes the experience of immigrants and their children? Experts gathered at Radcliffe to find out. Radcliffe Magazine (Hardvard University). https://www.radcliffe.harvard.edu/news/radcliffe-magazine/considering-immigration-and-gender-in-americas. Accessed 11 Oct 2020.

Boccagni, P. (2011). Migrants' social protection as a transnational process: public policies and emigrant initiative in the case of Ecuador. *International Journal of Social Welfare, 20*(3), 318–325. https://doi.org/10.1111/j.1468-2397.2010.00747.x.

Boccagni, P. (2012). Practising motherhood at a distance: retention and loss in Ecuadorian transnational families. *Journal of Ethnic and Migration Studies, 38*(2), 261–277. https://doi.org/10.1080/1369183X.2012.646421.

Boccagni, P. (2014). What's in a (migrant) house? Changing domestic spaces, the negotiation of belonging and home-making in Ecuadorian migration. *Housing, Theory and Society, 31*(3), 277–293. https://doi.org/10.1080/14036096.2013.867280.

Boccagni, P., & Lagomarsino, F. (2011). Migration and the global crisis: new prospects for return? The case of Ecuadorians in Europe. *Bulletin of Latin American Research, 30*(3), 282–297. https://doi.org/10.1111/j.1470-9856.2010.00494.x.

Boes, S., & Winkelmann, R. (2004). Income and happiness: new results from generalized threshold and sequential models. In *IZA Discussion Papers (No. 1175)*.

Brant, R. (2006). Assessing proportionality in the proportional odds model for ordinal logistic regression. *Biometrics, 46*(4), 1171–1178. https://doi.org/10.2307/2532457.

Brunow, S., Nijkamp, P., & Poot, J. (2015). Chapter 19 - the impact of international migration on economic growth in the global economy. In B. R. Chiswick & P. W. Miller (Eds.), Handbook of the economics of international migration (Vol. 1, pp. 1027–1075). North-Holland, Netherlands: Elsevier Science. https://doi.org/10.1016/B978-0-444-53768-3.00019-9.

Butcher, K. F., & Piehl, A. M. (1998). Recent immigrants: unexpected implications for crime and incarceration. *Industrial and Labor Relations Review, 51*(4), 654–679. https://doi.org/10.2307/2525013.

Calero, C., Bedi, A., & Sparrow, R. (2009). Remittances, liquidity constraints and human capital investments in Ecuador. *World Development, 37*(6), 1143–1154.

Castles, S., de Haas, H., & Miller, M. J. (2014). *The age of migration: international population movements in the modern world (fifth)*. New York: The Guilford Press.

Chiswick, B., & Miller, P. (2015). *Handbook of the economics of international migration* (1st ed.). North-Holland, Netherlands: Elsevier Science. https://doi.org/10.1016/B978-0-444-53764-5.09981-3.

Clark, A., & Oswald, A. (1994). Unhappiness and unemployment. *Economic Journal, 104*, 648–659. https://doi.org/10.2307/2234639.

Clark, A., Frijters, P., & Shields, M. A. (2008). Relative income, happiness, and utility: an explanation for the Easterlin paradox and other puzzles. *Journal of Economic Literature, 46*(1), 95–144. https://doi.org/10.1257/jel.46.1.95.

Crush, J., & Ramachandran, S. (2010). Xenophobia, international migration and development. *Journal of Human Development and Capabilities, 11*, 209–228. https://doi.org/10.1080/19452821003677327.

Darling, J. (2017). Forced migration and the city: irregularity, informality, and the politics of presence. *Progress in Human Geography, 41*(2), 178–198. https://doi.org/10.1177/0309132516629004.

Docquier, F., & Rapoport, H. (2011). Globalization, brain drain and development. *Journal of Economic Literature, 50*, 681–730. https://doi.org/10.1257/jel.50.3.681.

Dolan, P., Peasgood, T., & White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology, 29*, 94–122. https://doi.org/10.1016/j.joep.2007.09.001.

Dustmann, C., & Preston, I. (2007). Racial and economic factors in attitudes to immigration. In *The B.E. Journal of Economic Analysis & Policy* (Vol. 7). https://doi.org/10.2202/1935-1682.1655.

Easterlin, R. A. (2006). Life cycle happiness and its sources: intersections of psychology, economics, and demography. *Journal of Economic Psychology, 27*(4), 463–482. https://doi.org/10.1016/j.joep.2006.05.002.

Facchini, G., & Mayda, A. M. (2009). Does the welfare state affect individual attitudes toward immigrants? Evidence across countries. *The Review of Economics and Statistics, 91*(2), 295–314 https://econpapers.repec.org/RePEc:tpr:restat:v:91:y:2009:i:2:p:295-314.

Fang, Z., & Sakellariou, C. (2016). Social insurance, income and subjective well-being of rural migrants in China: an application of unconditional quantile regression. *Journal of Happiness Studies, 17*(4), 1635–1657. https://doi.org/10.1007/s10902-015-9663-3.

Ferrer-i-Carbonell, A., & Frijters, P. (2004). How important is methodology for the estimates of the determinants of happiness? *Economic Journal, 114*(497), 641–659.

Ferrer-i-Carbonell, A., & Gowdy, J. M. (2007). Environmental degradation and happiness. *Ecological Economics, 60*(3), 509–516. https://doi.org/10.1016/j.ecolecon.2005.12.005.

Frey, B. S., & Stutzer, A. (2000). Happiness, economy and institutions. *The Economic Journal, 110*(466), 918–938. https://doi.org/10.1111/1468-0297.00570.

Glaeser, E., Gorrlieb, J., & Zib, O. (2016). Unhappy cities. *Journal of Labor Economics, 129–182*, 27546979.

Gomberg-Muñoz, R. (2010). Willing to work: agency and vulnerability in an undocumented immigrant network. *American Anthropologist, 112*(2), 295–307. https://doi.org/10.1111/j.1548-1433.2010.01227.x.

Gott, R. (2007). Latin America as a white settler society. *Bulletin of Latin American Research, 26*(2), 269–289. https://doi.org/10.1111/j.1470-9856.2007.00224.x.

Graham, C. (2008). Measuring quality of life in Latin America: what happiness research can (and cannot) contribute. (Working paper No. 652). Inter-American Development Bank (BID), Research Department. https://worlddatabaseofhappiness-archive.eur.nl/hap_bib/freetexts/graham_c_2008a.pdf.

Gray, C., & Bilsborrow, R. (2013). Environmental influences on human migration in rural Ecuador. *Demography, 50*(4), 1217–1241. https://doi.org/10.1007/s13524-012-0192-y.

Hayes, M. (2014). 'We gained a lot over what we would have had': the geographic arbitrage of North American lifestyle migrants to Cuenca, Ecuador. *Journal of Ethnic and Migration Studies, 40*(12), 1953–1971. https://doi.org/10.1080/1369183X.2014.880335.

Hayes, M. (2015). 'It is hard being the different one all the time': Gringos and racialized identity in lifestyle migration to Ecuador. *Ethnic and Racial Studies, 38*(6), 943–958. https://doi.org/10.1080/01419870.2014.943778.

Hellevik, O. (2017). The U-shaped age–happiness relationship: real or methodological artifact? *Quality & Quantity, 51*(1), 177–197. https://doi.org/10.1007/s11135-015-0300-3.

Helliwell, J. (2003). How's life? Combining individual and national variables to explain subjective well-being. *Economic Modelling, 20*(2), 331–360. https://doi.org/10.1016/S0264-9993(02)00057-3.

Helliwell, J., Huang, H., & Wang, S. (2017). *The social foundations of world happiness*. In book: World Happiness Report 2017 (pp. 8–47). Chapter: 2. Publisher: UN SDSN Editors: John F. Helliwell, Richard Layard, Jeffrey Sachs. Project: World Happiness Report series.

Herrera, G. (Coordinadora)(2014). *El vínculo entre migración y desarrollo a debate Miradas desde Ecuador y América Latina*. FLACSO Ecuador, Académie de Recherche et d'Enseignement Supérieur, Commission de la Coopération au Développement; Universite Catholique de Louvain.

ILO (International Labour Organization). (2018). ILO global estimates on international migrant workers – results and methodology. https://www.ilo.org/global/publications/books/WCMS_652001/lang%2D%2Den/index.htm. Accessed 17 April 2020.

IOM, I. O. for M. (2017). South American Migration Report No. 1: migration trends in South America. https://cimal.iom.int/sites/default/files/Report_Migration_Trends_South_America_EN.pdf. Accessed 20 April 2020

Islam, F., & Khan, S. (2015). The long run impact of immigration on labor market in an advanced economy: evidence from US data. *International Journal of Social Economics, 42*, 356–367. https://doi.org/10.1108/IJSE-12-2013-0291.

Jiang, S., Lu, M., & Sato, H. (2012). Identity, inequality, and happiness: evidence from urban China. *World Development, 40*(6), 1190–1200. https://doi.org/10.1016/j.worlddev.2011.11.002.

Jokisch, B., & Pribilsky, J. (2002). The panic to leave: economic crisis and the "new emigration" from Ecuador. *International Migration, 40*(4), 75–102. https://doi.org/10.1111/1468-2435.00206.

Kalir, B. (2005). The development of a migratory disposition: explaining a "new emigration.". *International Migration, 43*(4), 167–196. https://doi.org/10.1111/j.1468-2435.2005.00337.x.

Kleemans, M., & Klugman, J. (2009). Public opinions towards migration.

Knight, J., Song, L., & Gunatilaka, R. (2009). Subjective well-being and its determinants in rural China. *China Economic Review, 20*(4), 635–649. https://doi.org/10.1016/j.chieco.2008.09.003.

Kuroki, M. (2018). Racial diversity, immigrants and the well-being of residents: evidence from US counties. *Journal of Population Economics, 31*(1), 107–133.

Kyle, D., & Liang, Z. (2001). *Migration merchants: human smuggling from Ecuador and China*. San Diego: Center for Comparative Immigration Studies, University of California.

Liu-Farrer, G. (2009). Educationally channeled international labor mobility: contemporary student migration from China to Japan. *International Migration Review, 43*(1), 178–204. https://doi.org/10.1111/j.1747-7379.2008.01152.x.

Margolis, R., & Myrskylä, M. (2013). Family, money, and health: regional differences in the determinants of life satisfaction over the life course. *Advances in Life Course Research, 18*(2), 115–126. https://doi.org/10.1016/j.alcr.2013.01.001.

Massey, D., & Sánchez, R. M. (2009). *Restrictive immigration policies and Latino immigrant identity in the United States*. (Human Development Research Paper 2009/43). United Nations Development Programme. http://hdr.undp.org/sites/default/files/hdrp_2009_43.pdf

O'Rourke, K., & Sinnott, R. (2003). Migration flows: political economy of migration and the empirical challenges. https://econpapers.repec.org/RePEc:tcd:tcduee:20036. Accessed 13 Oct 2020.

Olivié, I., Ponce, J., & Onofa, M. (2009). *Remesas, Pobreza y Desigualdad: el caso de Ecuador*. Madrid, España: Real Instituto Elcano.

Ortega, C., & Ospina, Ó. (2012). *No se puede ser refugiado toda la vida..." : refugiador urbanos: el caso de la población colombiana en Quito y Guayaquil* Ecuador: FLACSO Ecuador.

Osvaldo Esteban, F. (2012). La migración calificada de latinoamericanos: perspectiva histórica y tendencias actuales. *Quaderns de Ciències Socials., 21*, 3–48.

Oswald, A. J. (1997). Happiness and economic performance. *The Economic Journal, 107*(445), 1815–1831. https://doi.org/10.1111/j.1468-0297.1997.tb00085.x.

Panizzon, M., Zürcher, G., & Fornalé, E. (2015). *The Palgrave handbook of international labour migration: law and policy perspectives*. London: Palgrave and Macmillan.

Ponce, J., Olivié, I., & Onofa, M. (2011). The role of international remittances in health outcomes in Ecuador: prevention and response to shocks. *International Migration Review, 45*(3), 727–745. https://doi.org/10.1111/j.1747-7379.2011.00864.x.

Ramírez, S., & Montúfar, C. (2007). *Colombia-Ecuador: cercanos y distantes*. Bogotá, Colombia: Instituto de Estudios Políticos y Relaciones Internacionales (IEPRI) de la Universidad Nacional de Colombia.

Ravallion, M., & Lokshin, M. (2001). Identifying welfare effects from subjective questions. *Economica, 68*(271), 335–357. https://doi.org/10.1111/1468-0335.00250.

Savona, E. U., Di Nicola, A., & Da Col, G. (1996). Dynamics of migration and crime in Europe: new patterns of an old nexus.

Sequeira, S., Nunn, N., & Qian, N. (2017). *Migrants and the making of America: the short and long run effects of immigration during the age of mass migration(No. 23289; Issue 23289)*. https://doi.org/10.3386/w23289.

Shams, K. (2016). Developments in the measurement of subjective well-being and poverty: an economic perspective. *Journal of Happiness Studies, 17*(6), 2213–2236. https://doi.org/10.1007/s10902-015-9691-z.

United Nations Development Programme. (2009). Overcoming barriers: human mobility and development.

Warnes, T. A. M. (2009). International retirement migration. In P. Uhlenberg (Ed.), *International handbook of population aging* (pp. 341–363). Dordrecht: Springer Netherlands. https://doi.org/10.1007/978-1-4020-8356-3_15.

Williams, R. (2016). Understanding and interpreting generalized ordered logit models. *The Journal of Mathematical Sociology, 40*(1), 7–20. https://doi.org/10.1080/0022250X.2015.1112384.

Affiliations

Grace Carolina Guevara-Rosero[1] · **Andrea Gabriela Bonilla-Bolaños**[1]

[1]   Quantitative Economics Department, Escuela Politécnica Nacional, Ladrón de Guevara E11·253, PO·Box 17-01-2759, Quito, Ecuador