working papers

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DO HAPPINESS INDEXES TRULY REVEAL HAPPINESS? MEASURING HAPPINESS USING REVEALED PREFERENCES FROM MIGRATION FLOWS

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Abstract

In this paper we attempt to establish a nexus between migration decisions and self-assessed happiness, where migration is taken as a mechanism for revealing preferences. The happiness literature has proposed both economic and non-economic determinants of happiness which are very similar to the factors that may be thought of as determinants of migration: absolute income, relative income, demographic and social characteristics, social development, relationship with others and characteristics of the place where we live. To these we add bilateral gravity variables, migration policies, and two survey-based happiness indexes. First, these two indexes are negatively correlated to net migration flows. Second, almost all the other explanatory variables are significant and as such survey-based happiness indexes fail to account for them. Third, we show how an international happiness ranking changes by taking into account those omitted factors. Finally, our migration-based ranking shows that, although many countries "truthfully" reveal happiness levels, in fact 19 countries are net migration senders even though they are self-proclaimed happy in surveys, whereas 23 countries are net migration recipients, even though in surveys they are self-proclaimed unhappy. We identify the sources of this mismatch and suggest where action could be taken to bring people's self-assessment of happiness in line with revealed preferences.

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1. Introduction

There is a general consensus among academics and politicians on the fact that GDP growth does not fully capture the level of welfare in a country (see Fleurbaey (2009) for a recent survey). Due to this limitation, worldwide happiness surveys are widely used both in academic research and in the construction of worldwide happiness indexes (Kahneman and Krueger, 2006; Frey, 2008; Easterlin, 2010; MacKerron, 2012). However, most of these indicators are based on answers to subjective questionnaires and their results are subject to a number of caveats. First, happiness indexes can be seen as the outcome results to economic and social policies, and so there are strong incentives by governments to manipulate them. As Frey (2011) indicates, "What is important will be manipulated by the government". Moreover, even if national indexes of happiness are not manipulated by politicians, they are not fully reliable as they are based on subjective appreciations by individuals that largely depend on their cultural values and/or different types of cognitive bias.[4]

For this reason, a natural answer to this question should be based on the revealed preference principle. However, although holding a referendum on every aspect that involves happiness would result in prohibitively high transaction costs, it is still possible to analyze the factors that influence "foot voting", the most universal and primitive form of revealing preferences. In this paper we take people's actions, namely the decision to migrate to another country, as a mechanism of preference revelation. Our starting hypothesis is that migration decisions are highly influenced by the perception that people have about their level of happiness in the destination country compared to the origin country.On the aggregate, international migration flows will reveal an

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[4] In many cases the answers to questionnaires are irrational for a number of reasons that even the respondent is not aware of (see for example Tversky and Kahneman (1974)).

international happiness ranking that will allow us to build a new happiness index based on revealed preferences rather than on happiness surveys. We find the use of revealed preferences more objective and therefore more reliable than people's subjective assessment of their own happiness.

The happiness literature has proposed both economic and non-economic determinants of happiness which are very similar to the factors that may be thought of as determinants of migration. Dolan et al (2008) classify those factors into: absolute income, relative income, demographic and social characteristics, social development, time use, relationship with others and characteristics of the place where we live. We take into account variables measuring these various aspects, plus typical bilateral gravity variables (distance, common border, and common language) and migration policies. This very large pool of (potentially relevant) variables is included in a panel regression in addition to two typical happiness indexes originated from survey data. In this way, we are able to show whether the migration decision is correlated with this index. At the same time we are able to identify the additional factors that the index fails to measure and consequently how an international happiness ranking changes by taking into account those omitted factors.

The remainder of the paper is organized as follows: section 2 provides some background on happiness indexes as usually taken from survey data and determinants of happiness usually proposed by the happiness literature; section 3 presents the details on the empirical strategy, which consists of estimating a gravity model of migration to reveal preferences, using the FEVD panel estimation methodology of the migration gravity model; section 4 presents and discusses the panel estimation results; section 5 proposes a happiness index based on preferences revealed through migration. Finally, section 6 concludes.

2. Background on happiness indexes and determinants

The use of happiness indexes built from survey data to measure Subjective Wellbeing (SWB) goes back to the 1970s (Easterlin, 1994).[5] The typical survey question that has been repeated over and over again is: "Are you happy?" (Easterlin, 2001). The answer to this question is based on the individual's own assessment and is therefore highly subjective. It is influenced by moods, perceptions, and general beliefs, which are not comparable across individuals or countries, and may even be endogenous to the state of happiness itself. As such the findings of the behavioral economics research that uses happiness indexes based on data from this typical survey question may not be the most reliable.

Most authors have been trying to circumvent this difficulty by incorporating in surveys more sophisticated versions of Easterlin's question. Roysamb et al. (2002), for example, used the sum-score of four items: a) ``When you think about your life at present, would you say you are mostly satisfied with your life, or mostly dissatisfied?''; b) ``Are you usually happy or dejected?''; c) ``Do you mostly feel strong and fit or tired and worn out?''; d)``Over the last month, have you suffered from nervousness, felt irritable, anxious, tense, or restless?'. This formulation is an attempt to separate the cognitive aspect of happiness (general life satisfaction) from the affective aspect (happy, strong, tired, nervous). In turn, Ferrer-i-Carbonell (2005) used the question from the German Socio Economic Panel (GSEP): "How happy are you at present with your life as a whole?", whilst Mentzakis and Moro (2009) used the question introduced in the British Household Panel Survey (BHPS): "How dissatisfied or satisfied are you with your life overall?". Finally, Pedersen y Schmidt (2011) use a question regarding self-reported

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[5] Strictly, subjective well-being includes happiness (the emotional or affective component) and satisfaction (the cognitive component). However, most authors, including Easterlin and Frey, use the terms happiness and subjective well-being interchangeably.

satisfaction with work or main activity taken from the European Community Household Panel (ECHP).

If we move away from the individual's subjective assessment of happiness and try to build an objective measure we are faced with an open debate about the determinants of happiness. For example, Krueger and Shakade (2008) mention that subjective wellbeing research has been linked to such heterogeneous issues as studies of the tradeoff between inflation and unemployment, the effect of cigarette taxes on welfare, German reunification, lottery winnings, labor turnover, productivity or health. A very complete review of the economic literature associated to human happiness can be found in Dolan et al. (2008). They sort out a list of all possible factors affecting wellbeing into seven broad groups: (1) absolute and relative income; (2) personal characteristics; (3) social development characteristics; (4) how we spend our time; (5) attitudes and beliefs toward self/others life; (6) relationships; and (7) the wider economic, social and political environment.

The idea that people with higher absolute income levels would report higher levels of happiness has not been fully supported by the literature. Easterlin's Paradox says that, although this should apparently be so, the fact is that wants and aspirations also increase with income (Easterlin, 1995). Since individuals report happiness levels relative to their aspirations, the reported levels of happiness do not seem to increase with absolute income in empirical studies. When panel data is used, a positive correlation between happiness and absolute income appears in the between variation (cross-section dimension), but not in the within variation (time-series dimension). At the macro level, this would mean that countries with higher average income levels would

appear in an international happiness ranking with higher average happiness levels, but in one single country an increase in average income levels over time would not increase the average happiness level (see Blanchflower and Oswald (2004) or Pedersen and Schmidt (2011)).

Easterlin (2001) proposed a correction to solve the Paradox: happiness is more dependent on relative than on absolute income. This happens because each individual compares her own income to the average income of her reference group, that is, the socio-economic group with a similar educational and/or professional level within which the individual maintains her social relationships. Testing this proposal for German data, Ferrer-i-Carbonell (2005) finds that the income of the reference group is about as important as the own income for individual happiness. Individuals are happier the larger their income is in comparison to the average income of their reference group. For British data, Mentzakis and Moro (2009) consider both absolute and relative income, also finding the latter to be more relevant for happiness. At the macro level, the concept of relative income is related to the level of income inequality within a country and can be measured by an inequality measure such as the Gini index.

The second group of determinants of happiness suggested by Dolan et al. (2008) is formed by personal characteristics such as age, gender, ethnicity, household size, number of kids, education and marital status. Peiró (2006) finds that age, health and marital status are strongly associated with happiness and satisfaction. In addition, Roysamb et al. (2002) find that women are, on average, happier than men. Moreover, happiness tends to follow a U-curve with age, reaching a minimum around 35-40 years old (see, for example, Blanchflower and Oswald (2008), Mentzakis and Moro (2009),

and Realo and Dobewall (2011)). Further, Pedersen and Schmidt (2011) find that the level of and change in self-reported health has a strong impact on satisfaction.

A third group concerns social development characteristics, which include education, health (or life expectancy), sector of work (agriculture, manufacturing, services), unemployment. Peiró (2006) finds that unemployment does not appear to be associated with happiness, although it is clearly associated with satisfaction. This is because income is strongly associated with satisfaction, but its association with happiness is weaker. These results point to happiness and satisfaction as two distinct spheres of well-being. While the first would be relatively independent of economic factors, the second would be strongly dependent on them. Moreover, Pedersen and Schmidt (2011) find a strong negative impact on satisfaction from being unemployed and a somewhat weaker impact from being inactive, supposedly because the latter depends more on a deliberate choice by the individual.

Fourth, how we spend our time can be described by variables such as hours worked, commuting, care for others, community involvement and volunteering, and religion activities. At the macro level, a great deal of these behaviours is shaped by factors such as the dominant religion in a country.

Fifth, the characteristics of relationships with others can be described with respect to marriage and intimate relationships, family and friends. At the macro level, relationship attitudes can be proxied by the percentage of married and single people in a country, importance given to family and friends, population density or urban/rural location.

Finally, the wider economic, social and political environment is represented by a variety of country characteristics such as inflation, welfare system and public insurance, economic freedom, climate, natural environment, safety, political freedom and nature of

policies. Among these, a factor of concern in many countries is the phenomenon of terrorism, which has been studied by Abadie (2006) and Abadie and Gardeazabal (2008). At the macro level, Peiró (2006) examines the relationship between socio-economic conditions and happiness in 15 countries. Finally, relevant sport events are incorporated to examine their possible impact on Happiness as some recent literature suggests (see for example Kavetsos and Szymanski, 2010).

The purpose of this paper is to further contribute to the move towards an objective measure of happiness. This is done using revealed preferences through migration choices and taking into account the determinants of happiness described previously. The detailed explanation of the empirical strategy followed in this paper is the object of the next section.

3. Empirical strategy

3.1. The revelation of preferences through migration

The aim of this paper is to provide an objective measure of happiness at the country level using preferences revealed through migration flows. We conjecture that *ceteris paribus* countries with higher happiness levels attract more migrants and thus migration flows should contain information about country-level average happiness. The migration literature at the country level has traditionally used gravity models to account for the determinants of migration flows (see, for example, the recent work by Felbermayr and Toubal (2012), or Hanson and McIntosh (2012)). Gravity models relate bilateral flows of trade, investment, or in our case, migration, to the size of the partner countries and the inverse of the distance between them. More generally, the gravity

literature includes a number of variables capturing factors that facilitate or hinder migration. Among them, our focus variables are those somehow linked to subjective wellbeing and described in section 2.

In line with the gravity model literature, we test for the determinants of migration using the following baseline specification:

$$F_{ijt} = \alpha_0 + \sum_{i=1}^{p_1} \beta_i{}' s_{it} + \sum_{j=1}^{p_2} \gamma_j{}' d_{jt} + \sum_{r=1}^{p_3} \delta_r{}' x_{rt} + u_{ijt} \quad (1)$$

where F_{ijt} is the net flow of people moving from country i to j at time t; s_{it} is a vector of country-specific variables for the country of origin, d_{jt} is a vector of country-specific variables for the country of destination; x_{rt} is a vector pairwise variables between the origin and destination country; α_0, β_i, γ_j and δ_r are vector of parameters of the model; and u_{ijt} is the error term for countries i and j at time t. As we explain later u_{ijt} could include individual effects for each pair of countries. Moreover, we will also allow for lagged values of the dependent variable, F_{ijt}, among the regressors in expression (1) to account for the potential serial correlation in the migration decisions between each pair of countries.

In particular, the pairwise variables in our model are the distance between each pair of countries, and two dummy variables that take value 1 when the pair of countries shares a common language and a common border respectively and zero otherwise.

In the course of data collection we were faced with a large number of missing values for the explanatory variables and even for the dependent variables, particularly for very small countries and for pairs of countries between which there are no migration flows. The problem of missing data brings up the need to distinguish between a missing value

and a zero flow, which might introduce selection effects and force the use of a Tobit.[6] Instead we decided in favour of considering two different samples: (i) Sample 1 includes countries with the least number of missing values in the dependent variable (net migration flows); (ii) Sample 2 includes the larger countries as measured by GDP. The Appendixes explain in detail the construction of the samples (Appendix 1), the countries included (Appendix 2) and the final variables selected (Appendix 3), including the data sources.

The country-specific variables for the countries of origin and destination have already been described in section 2 and refer to a wide range of variables that can be thought to be potential determinants of happiness, plus migration policies.[7]

We also explicitly use as explanatory variables two traditional happiness indicators taken from survey data. We selected two of the most widely cited: (i) Happiness Index 1 from the World Values Survey (http://www.worldvaluessurvey.org/) carried out by the World Values Survey Association, a non-profit association based in Stockholm, Sweden; (ii) Happiness Index 2 from the World Happiness Database (http://www1.eur.nl/fsw/happiness/) built by the Erasmus University Rotterdam. Their distribution reveals that most answers cluster around zero with a tendency towards a slightly negative assessment of happiness: "not very happy" is the answer chosen by many respondents (see Figure 1 for the histograms of these indexes).[8] The distribution of the two indexes is remarkably similar in both samples, with correlation coefficients

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[6] The investigation of selection effects is still work in progress.

[7] Migration policies have been widely used as explanatory variables of the migration decision (see, among others, Marques (2010) and Egger and Nelson (2012)).

[8] The index provided by the World Values Survey is given by a weighted average of the percentage of each answer calculated as 2*very happy + quite happy-not very happy-2*not at all happy. The index provided by the World Happiness Database considers different answer possibilities to the question "How happy would you say you are these days?". The weighted average of the percentage of each answer is calculated as very happy*4+happy*3+not very happy*2+not at all happy*1.

of 0.894 in Sample 1 and 0.888 in Sample 2. The inclusion of these two widely used indexes in our regressions makes it possible to identify the relationship between the traditional survey variables and our revealed preference measure (migration) and show the impact of the additional explanatory variables. The significance of this impact demonstrates the incompleteness of the traditional happiness indicator.

FIGURE 1 HERE

3.2. FEVD panel estimation

Since both data samples constitute a panel, we are able to exploit panel data features instead of following the cross-section structure typical of the research that uses happiness indicators from survey data. For example, the use of panel data allows us to exploit the time-series dimension and make use of lagged variables to account for endogeneity, similarly to what Mentzakis and Moro (2009) had done for self-assessed health and unemployment, although these authors had used an ordinal SWB index. Indeed, whereas happiness indicators from surveys are ordinal, our dependent variable is quantitative (cardinal) and, more importantly, it is objective instead of resulting from a subjective self-assessment. Thus we are able to create a meaningful country ranking. Moreover, by using a panel structure we are able to account for Easterlin's Paradox, according to which cross-sectional variations in happiness may not be matched by time-series variations due to the adjustment of expectations over time (Ferrer-i-Carbonell and Frijters (2004)).

We start by taking into account the potential correlation between u_{ijt}, the error component in equation (1), and the different covariates in the model, by running the

standard Hausman (1978) test based on the difference between the random and fixed effect estimators. The null hypothesis can be rejected at all the conventional levels for the two samples, which suggests the convenience of considering a fixed effect model that provides unbiased estimation in this case. Moreover, by using fixed effects we are able to account for all unobservable factors that the traditional survey-based cross-section analysis is not able to account for.

However, a traditional fixed effect model eliminates time invariant variables such as distance, common border and common language, whilst the estimation of the impact of these covariates on migration is an important part of this analysis. This problem is circumvented by using the fixed-effects vector decomposition (FEVD henceforth) proposed by Plümper and Troeger (2007). Breusch et al. (2011) show that this model is just an IV estimator with a particular set of instruments: the time-invariant variables and the time-variant variables expressed in deviations with respect to its mean. This estimator is an alternative to the Hausman and Taylor (1978) model (HT henceforth). The former can be also expressed as an IV estimator that partitions both time-variant and time-invariant variables into exogenous and endogenous variables. As explained by Breusch et al. (2011), a consistent estimator such as HT will be preferable to the FEVD for sufficiently large sample size. However, for small sample size with a small endogeneity problem, it might be preferable to include time-invariant endogenous variables as instruments as FEVD does.[9] Given that none of these procedures dominate each other we considered both in our analysis for completeness.[10]

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[9] The issue of endogeneity is further handled by introducing lagged values for some variables.
[10] The HT results are available from the authors upon request. In any case, the signs of the HT coefficients are the same as for FEVD, although their significance levels are consistently higher using FEVD, which is also supported by the Hausman test.

4. Estimation results

Since the Hausman test confirmed that FEVD should be preferred over HT, the estimation results for FEVD regressions are presented in Table 1. The signs of the coefficients are robust across the two samples for the majority of variables. The inclusion of the lagged dependent variable reveals the significant persistence of the geography of migration flows over time, which is a common result in the migration literature. Moreover, having a coefficient close to 0.5, suggests that there is no need to incorporate any correction for non-stationarity. Using the coefficient of the lagged dependent variable, it is possible to obtain long-run coefficients and their long-run significance for the remaining explanatory variables. The long-run results do not differ qualitatively from those of the short-run, although the long-run impact amplifies that of the short-run due to the positive sign of the lagged dependent variable coefficient. The cumulative nature of this result confirms the high persistence and increasing impact of migration determinants over time.

TABLE 1 HERE

The two survey-based happiness indexes mentioned in section 3 are negatively correlated to migration flows. Simple correlation coefficients vary between -0.078 (Sample 2) and -0.043 (Sample 1) for the World Values Survey index and -0.057 (Sample 2) and -0.028 (Sample 1) for the World Happiness Database index. These values do not change much after accounting for all the other factors that impact on migration in Table 1 regressions. This result reveals that subjective assessments of one's own happiness are biased and clearly at odds with observed actions in terms of country preferences revealed through migration. If this was not the case, countries

with a positive self-assessed happiness differential should be net recipients of migrants. We obtain exactly the opposite result. Further to their biasedness, the main test of the incompleteness of these happiness indexes is the significance of almost all additional explanatory variables we consider: traditional gravity variables, migration policy variables, and various other variables that influence happiness grouped around the broad groups described in section 2.

In particular, all the traditional gravity model variables are significant at 1%. Migration depends positively on distance as well as on common border and language. The positive impact of distance on migration here simply translates the fact that the dependent variables are migration flows from all corners of the world into OECD countries and more distant countries supply more migrants. It is however a very small coefficient. Moreover, being a landlocked country increases migration at origin and decreases it at destination. These are country-level factors that are not considered in the two survey-based happiness indexes.

When the dependent variable is migration flows it is very important to control for migration policies. In the destination countries, liberal policies are expected to facilitate and therefore increase migration flows, whereas restrictive policies should have the opposite effect. Out of the four variables that measure policies towards migration in the destination countries, three have the expected sign in both samples.[11] The emigration policy dummy only applies to Mexico and Russia and for this reason the sign of its coefficient changes with the sample.[12]

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[11] Note however that restrictive policy only produces an effect after one period lag. It is likely that endogeneity is an issue for this variable. Marques (2010) lagged migration policy variables up to two periods. A similar strategy was used here.

[12] Mexico imposed a restrictive emigration policy by applying higher border controls to illegal emigration. On the contrary, Russia allows the stay of Russian nationals in Lithuania for up to 30 days without visa.

Also significant is a large number of individual and country characteristics which are not taken into account either by the survey-based happiness indexes or by the traditional gravity variables. The happiness literature has highlighted the importance of absolute and relative income and so has the migration literature. Indeed we find that migrants flow from poorer to richer countries and from more unequal to less unequal countries. Presumably, this is because both absolute and relative income influence preferences as has been reported by the happiness literature.

We also control for a number of personal characteristics which are aggregated at the country level either by taking means or by calculating the percentage of population that bears such characteristic in the country. The results that are robust across samples show that there is more emigration from origin countries with higher mean age, higher percentage of single people, and higher percentage of men in the population. The effect of education at the destination country is clearly positive. Generally, countries with higher educational levels may offer broader employment opportunities. Similarly, having higher educational levels decreases emigration as educated people are more sought after even in their home country. This result underscores the importance of years of education in the domestic and foreign labour markets.

Next we take into account social development characteristics such as unemployment and life expectancy. It would be expected that migration would increase (decrease) with unemployment at the origin (destination). In general, these expectations are confirmed by the results. Life expectancy is a more complex variable because countries where people live longer supply more migrants over time but on the other hand provide less labour market vacancies. To account for endogeneity and non-linearity, this variable was lagged one period and its square was included as an additional explanatory variable. After carrying out these modifications, life expectancy is found to decrease (increase)

migration at the origin (destination) but at a decreasing rate in both cases. These results are consistent with the hypothesis that life expectancy proxies for general well-being in a country rather than representing labour market considerations.

Another group of factors influencing country preferences would be the migrant's attitudes and beliefs. For example, there is more emigration out of countries where more people attribute more importance to friends and politics, as well as being proud of their nationality. Perhaps this result is due to the migrants having friends abroad or going abroad too, and also to migration being more likely the more the migrants are attuned to politics or nationality. On the contrary, there is less emigration out of countries where higher average importance is given to family and work. The result that migration diminishes (increases) with the level of priority given to men in the origin (destination) country seems to imply that the majority of migrants are men, which seems plausible at the world level.

The final group of variables concerns several general country characteristics that make them more or less attractive. The results indicate that there is more emigration out of countries with more pollution, higher altitude, more corruption, less peaceful, less civil liberties,[13] and more authoritarian regimes. These are all undesirable characteristics for most people. On the contrary, emigration is lower out of countries with a freer economy, although this effect stabilizes with the degree of freeness. On the other hand, immigration is higher into countries with higher population density, lower pollution, higher rainfall, lower altitude, lower corruption levels, and a freer economy. Indeed, many of these variables are simply proxies for a high level of economic activity and social interaction, therefore better employment opportunities.

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[13] This variable also presents endogeneity and non-linearities. Both at origin and at destination its effect operates at a decreasing rate.

The final set of variables relates to the organization of World Cups or Olympic Games in the previous four years and its taking place within four future years. Generally, hosting the World Cup or the Olympics reduces emigration out of a country. It also increases immigration into the organizing country in the case of a forthcoming World Cup, but paradoxically it is a negative incentive to immigration in the case of the Olympics. There is in any case a lack of consensus regarding the role of these variables in the happiness literature (see the discussion in Kavetsos and Szymanski, 2010).

5. A proposal for a happiness index based on revealed preferences

The previous results have shown that happiness indexes based on surveys are insufficient to explain why people prefer some countries over others. Moreover, individuals' own assessment of their happiness is at odds with their actions, that is, their cross-country flows. Since we are taking migration flows as a mechanism of preference revelation, it is natural to see countries that are net recipients of migrants as happier countries. In this sense, we take the estimation results from the previous section and use them to build a happiness index based on revealed preferences. This index is obtained using the estimated impact that the different happiness-related variables grouped as in Section 1 have been shown to have on migration flows. The index is presented in Table 2 for the full predicted migration flows and for the five variable groups that influence happiness and discussed in the previous section. The final column of Table 2 provides the average value of the two survey-based happiness indexes.

TABLE 2 HERE

The values presented in Table 2 result from an averaging of coefficients and values taken by explanatory variables across the two samples. The coefficients themselves are the mean point of a confidence interval and themselves represent a mean behavior. Therefore, in interpreting the index values for each country, an ordinal rather than a cardinal perspective should be employed. For many countries, a positive value of the survey-based indexes (average positive self-assessed happiness in the country) is matched by positive net migration flows (average net desirability of the country).

The most interesting cases are those for which average self-assessed happiness and average observed net desirability are clearly at odds. Here we distinguish two main types of countries: those self-proclaimed happy but regarded as undesirable (19 mostly middle-income and emerging economies), and those self-proclaimed unhappy but regarded as desirable (23 mostly high-income countries). The study of the five groups of determinants of happiness reveals why this mismatch occurs (see Tables 3 and 4).

TABLE 3 HERE

TABLE 4 HERE

Table 3 countries fare poorly on issues of economic, social and political environment, as well as on absolute and relative income in most cases, but some of them achieve a positive score on attitudes and beliefs. These are countries with a difficult recent history, not typically sought after as a place of residence by foreign nationals, but where their own nationals' attitudes and beliefs may lead them to regard themselves as happy.

Table 4 countries seem to group into two different cases. On the one hand, there are middle-income countries whose economy is emerging fast, but which fare poorly in

terms of average absolute income and income inequality. These countries are sought after from outside, but their nationals are still negatively affected by income issues. As growth continues and income inequality is dealt with, these countries may in the future join those that are both sought after and self-declared happy. On the other hand, there is a group of high-income countries where attitudes and beliefs make their nationals self-assess as unhappy, even though these countries are sought after from abroad. Within these, five countries (France, Netherlands, United States, Japan and Ireland) also fare poorly in terms of economic, social and political environment. If these aspects were improved, these countries' citizens' self-assessment of happiness might in the future be brought in line with their countries' international popularity.

6. Conclusions

In this paper we attempt to establish a nexus between migration decisions and self-assessed happiness, where migration is taken as a mechanism for revealing preferences. We estimate the impact of a large and diverse number of variables on migration flows, in addition to two survey-based indexes widely used to rank country happiness. Applying a FEVD estimation methodology to a gravity model specification for a large panel dataset, we are able to estimate both short and long-run coefficients for the explanatory variables. Using these estimated coefficients, we build an alternative ranking based on revealed preferences.

The estimation results reveal that the two survey-based indexes provide biased and incomplete results. Moreover, the migration-based ranking shows that, although many countries "truthfully" reveal happiness levels, in fact 19 countries are net migration senders even though they are self-proclaimed happy in surveys, whereas 23 countries

are net migration recipients, even though in surveys they are self-proclaimed unhappy.

Inspection of the role played by the five groups of determinants of happiness included in the regressions reveals that the former group has a poor economic, social and political environment, as well as absolute and relative income issues. Their high score on attitudes and beliefs may lead them to regard themselves as happy, but to be able to join those that are both sought after and self-declared happy they need to improve on their lagging issues. The latter group contains both emerging economies that need to improve their average income level and decrease income inequality, and high-income countries where attitudes and beliefs make their nationals self-assess as unhappy. In some cases the reasons for this low self-assessment are linked to the economic, social and political environment.

There is still room for improvement in our analysis and a more detailed investigation of the robustness of our ranking is required. Nevertheless, any ranking of this type should be looked at under an ordinal rather than a cardinal perspective. Our ranking has the additional advantage of being based on an objective variable that is not subject to personal evaluation. An additional contribution lies in identifying where action could be taken to bring people's self-assessment of happiness in line with revealed preferences. In any case, it is clear that a mismatch exists and that survey-based happiness indexes are both biased and incomplete.

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Figures

Figure 1: Distribution of happiness index data

Happiness Indexes — Sample 1 / Sample 2 — World Values Survey / World Happiness Database
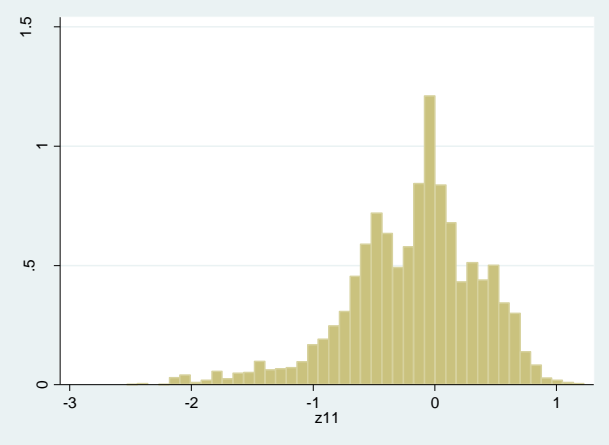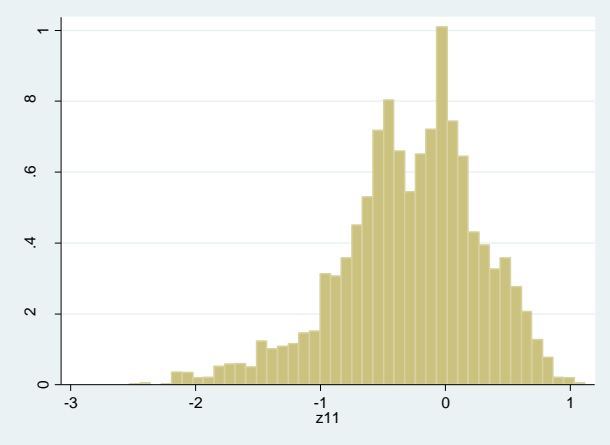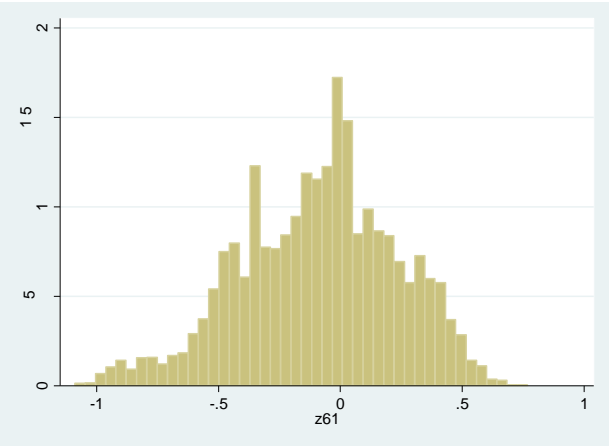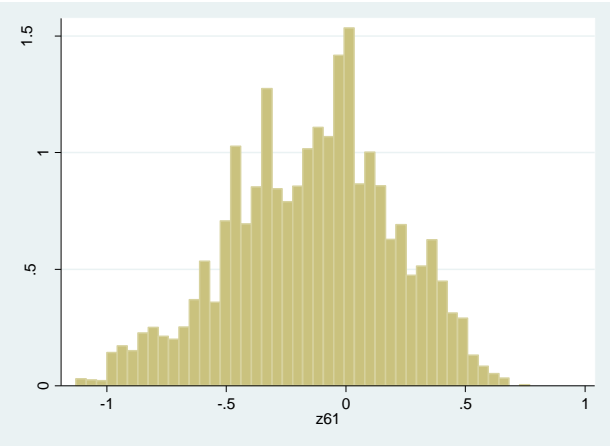
Tables

Table 1: Regression results

Variable	Type	Sample 1				Sample 2			
		short-term		*long-term*		*short-term*		*long-term*	
		coefficient	*sd. error*	*coefficient*	*sd. error*	*coefficient*	*sd. error*	*coefficient*	*sd. error*
Lagged dependent variable									
		0.59(***)	9.4E-05	-	-	0.60(***)	9.4E-05	-	-
Happiness Indexes									
Happiness Index WVS	origin-destination	-0.06(***)	3.4E-03	-0.15(***)	8.5E-03	-0.13(***)	2.9E-03	-0.33(***)	7.3E-03
Happiness Index WDH	origin-destination	-0.01(**)	4.2E-03	-0.03(**)	1.0E-02	-0.01(***)	3.9E-03	-0.03(***)	9.8E-03
Gravity variables									
Distance	bilateral	3.5E-05(***)	1.4E-07	8.8E-05(***)	3.5E-07	3.0E-06(***)	1.3E-07	7.5E-06(***)	3.3E-07
Border	bilateral	1.64(***)	2.6E-03	4.02(***)	6.2E-03	0.99(***)	2.2E-03	2.45(***)	5.4E-03
Language	bilateral	1.68(***)	1.9E-03	4.13(***)	4.6E-03	0.99(***)	1.7E-03	2.45(***)	4.2E-03
Landlocked Country	origin	0.58(***)	3.3E-03	1.41(***)	8.2E-03	0.51(***)	2.0E-03	1.26(***)	4.9E-03
Landlocked Country	destination	-2.14(***)	2.6E-03	-5.26(***)	6.5E-03	-2.05(***)	2.4E-03	-5.07(***)	6.0E-03
Migration policy variables									
Lag-Restrictive Policy	destination	-0.02(***)	2.9E-04	-0.04(***)	7.2E-04	-0.02(***)	2.7E-04	-0.04(***)	6.8E-04
Liberal Policy	destination	0.02(***)	3.8E-04	0.04(***)	9.4E-04	0.01(***)	3.6E-04	0.02(***)	8.9E-04
Conservative	destination	-0.12(***)	1.2E-03	-0.30(***)	2.9E-03	-0.10(***)	1.1E-03	-0.25(***)	2.7E-03
Emigration Policy	origin	-0.13(***)	7.0E-03	-0.31(***)	1.7E-02	2.9E-03	6.5E-03	0.01	1.6E-02
Absolute and relative income									
GDP per capita	origin	-7.6E-05(***)	1.6E-07	-1.9E-04(***)	4.0E-07	-4.1E-05(***)	1.3E-07	-1.0E-04(***)	3.3E-07
GDP Per Capita	destination	1.7E-05(***)	2.2E-07	4.1E-05(***)	5.3E-07	1.5E-05(***)	2.0E-07	3.8E-05(***)	5.0E-07
Income Inequality	origin	0.02(***)	1.2E-04	0.04(***)	3.0E-04	0.02(***)	1.1E-04	0.04(***)	2.6E-04

Income Inequality	destination	-0.04(***)	2.1E-04	-0.10(***)	5.3E-04	-0.04(***)	2.0E-04	-0.09(***)	5.0E-04

Personal characteristics								
Age Mean	origin	0.05(***)	4.4E-04	0.13(***)	1.1E-03	0.02(***)	3.9E-04	0.05(***)	9.8E-04
Age St. Deviation	origin	-7.1E-04	7.5E-04	-1.8E-03	1.9E-03	0.04(***)	7.2E-04	0.10(***)	1.8E-03
Married	origin	-0.74(***)	9.8E-03	-1.83(***)	2.4E-02	0.85(***)	8.0E-03	2.11(***)	2.0E-02
Single	origin	0.08(***)	4.5E-03	0.21(***)	1.1E-02	0.12(***)	4.2E-03	0.30(***)	1.1E-02
Female Percentage	origin	-3.17(***)	2.3E-02	-7.80(***)	5.6E-02	-4.54(***)	2.1E-02	-11.24(***)	5.1E-02
Fertility Rate	origin	0.18(***)	5.6E-03	0.45(***)	1.4E-02	-0.31(***)	4.0E-03	-0.76(***)	9.9E-03
Fertility Rate^2	origin	-3.4E-03(***)	9.8E-04	-0.01(***)	2.4E-03	0.10(***)	6.4E-04	0.25(***)	1.6E-03
Years of Education	origin	-0.13(***)	5.9E-04	-0.32(***)	1.5E-03	-0.02(***)	4.5E-04	-0.05(***)	1.1E-03
Years of Education	destination	0.25(***)	6.1E-04	0.63(***)	1.5E-03	0.19(***)	5.7E-04	0.48(***)	1.4E-03

Social development characteristics								
Unemployment	origin	0.01(***)	1.6E-04	0.02(***)	4.0E-04	0.02(***)	1.5E-04	0.06(***)	3.8E-04
Lag-Life Expectancy	origin	-0.05(***)	2.4E-03	-0.12(***)	5.9E-03	-0.01(***)	2.0E-03	-0.03(***)	5.0E-03
Lag-Life Expectancy^2	origin	1.1E-03(***)	1.8E-05	2.8E-03(***)	4.4E-05	5.6E-04(***)	1.5E-05	1.4E-03(***)	3.7E-05
Unemployment	destination	-0.20(***)	2.6E-04	-0.49(***)	6.5E-04	-0.17(***)	2.4E-04	-0.42(***)	6.1E-04
Lag-Life Expectancy	destination	0.23(***)	2.4E-03	0.56(***)	5.9E-03	0.25(***)	2.0E-03	0.62(***)	5.0E-03
Lag-Life Expectancy^2	destination	-2.8E-03(***)	1.7E-05	-0.01(***)	4.1E-05	-2.7E-03(***)	1.4E-05	-0.01(***)	3.6E-05

Attitudes and beliefs toward self/others life								
Family Importance	origin	-1.23(***)	9.7E-03	-3.02(***)	2.4E-02	-1.41(***)	8.6E-03	-3.49(***)	2.1E-02
Friends Importance	origin	0.04(***)	2.4E-03	0.10(***)	5.8E-03	0.14(***)	1.9E-03	0.35(***)	4.7E-03
Work Importance	origin	-2.53(***)	3.4E-03	-6.23(***)	8.4E-03	-2.28(***)	3.2E-03	-5.65(***)	7.9E-03
Politic Importance	origin	0.20(***)	1.4E-03	0.50(***)	3.5E-03	0.25(***)	1.3E-03	0.62(***)	3.3E-03
Proud of Nationality	origin	0.67(***)	2.7E-03	1.66(***)	6.7E-03	0.57(***)	2.2E-03	1.41(***)	5.4E-03
Men Priority	origin	-0.11(***)	1.8E-03	-0.28(***)	4.5E-03	-0.10(***)	1.8E-03	-0.24(***)	4.4E-03

Men Priority	destination	0.79(***)	2.6E-03	1.94(***)	6.5E-03	0.66(***)	2.5E-03	1.63(***)	6.1E-03

Economic, social and political environment

Density	origin	-3.3E-04(***)	6.2E-06	-8.0E-04(***)	1.5E-05	2.1E-04(***)	1.1E-06	5.1E-04(***)	2.7E-06
Density	destination	0.01(***)	1.0E-05	0.02(***)	2.6E-05	0.01(***)	9.8E-06	0.02(***)	2.5E-05
Pollution	origin	7.0E-08(***)	2.9E-10	1.7E-07(***)	7.2E-10	6.3E-08(***)	2.4E-10	1.6E-07(***)	6.0E-10
Pollution	destination	-4.7E-07(***)	3.6E-10	-1.1E-06(***)	8.8E-10	-4.3E-07(***)	3.3E-10	-1.1E-06(***)	8.3E-10
Corruption	origin	0.56(***)	6.4E-04	1.37(***)	1.6E-03	0.23(***)	5.2E-04	0.58(***)	1.3E-03
Free Economy	origin	-0.05(***)	7.4E-04	-0.13(***)	1.8E-03	-0.05(***)	6.7E-04	-0.12(***)	1.7E-03
Free Economy^2	origin	5.3E-04(***)	6.0E-06	1.3E-03(***)	1.5E-05	4.1E-04(***)	5.3E-06	1.0E-03(***)	1.3E-05
Corruption	destination	-0.37(***)	1.0E-03	-0.90(***)	2.5E-03	-0.32(***)	9.3E-04	-0.80(***)	2.3E-03
Free Economy	destination	0.01(***)	1.6E-04	0.03(***)	4.0E-04	0.01(***)	1.5E-04	0.03(***)	3.8E-04
Precipitation	origin	-3.1E-04(***)	1.6E-06	-7.6E-04(***)	3.9E-06	6.6E-05(***)	1.5E-06	1.6E-04(***)	3.6E-06
Elevation	origin	0.05(***)	9.2E-05	0.13(***)	2.3E-04	0.02(***)	7.0E-05	0.06(***)	1.7E-04
Lag_Civil Liberty	origin	-0.56(***)	2.7E-03	-1.37(***)	6.6E-03	-0.43(***)	2.4E-03	-1.06(***)	5.9E-03
Lag_Civil Liberty^2	origin	0.09(***)	3.8E-04	0.22(***)	9.4E-04	0.07(***)	3.4E-04	0.17(***)	8.4E-04
Precipitation	destination	3.4E-04(***)	3.2E-06	8.2E-04(***)	7.8E-06	5.2E-04(***)	3.0E-06	1.3E-03(***)	7.4E-06
Elevation	destination	-0.09(***)	8.7E-05	-0.21(***)	2.2E-04	-0.08(***)	8.2E-05	-0.19(***)	2.0E-04
Lag_Civil Liberty	destination	0.20(***)	3.5E-03	0.49(***)	8.5E-03	0.19(***)	3.2E-03	0.46(***)	8.0E-03
Lag_Civil Liberty^2	destination	-0.09(***)	5.9E-04	-0.21(***)	1.4E-03	-0.08(***)	5.5E-04	-0.20(***)	1.4E-03
Peace Index	origin	-1.18(***)	2.0E-03	-2.90(***)	4.8E-03	-0.75(***)	1.8E-03	-1.87(***)	4.4E-03
Peace Index	destination	0.03(***)	2.3E-03	0.07(***)	5.6E-03	0.02(***)	2.1E-03	0.04(***)	5.3E-03
Authoritarian Country	origin	-0.55(***)	1.1E-02	-1.34(***)	2.7E-02	-0.01	1.1E-02	-0.02	2.6E-02
World Cup (-4)	origin	0.30(***)	3.5E-03	0.73(***)	8.6E-03	0.16(***)	3.5E-03	0.41(***)	8.6E-03
World Cup (+4)	origin	-0.21(***)	7.7E-03	-0.51(***)	1.9E-02	-0.07(***)	7.7E-03	-0.17(***)	1.9E-02

Olympic Games (-4)	origin	-0.35(***)	3.2E-03	-0.87(***)	7.8E-03	-0.30(***)	3.1E-03	-0.74(***)	7.8E-03
Olympic Games (+4)	origin	-0.18(***)	3.3E-03	-0.45(***)	8.1E-03	-0.17(***)	3.3E-03	-0.42(***)	8.1E-03
World Cup (-4)	destination	-0.02(***)	3.7E-03	-0.04(***)	9.0E-03	9.1E-04	3.5E-03	2.3E-03	8.8E-03
World Cup (+4)	destination	5.76(***)	1.5E-02	14.17(***)	3.7E-02	5.74(***)	1.5E-02	14.23(***)	3.7E-02
Olympic Games (-4)	destination	-0.37(***)	3.5E-03	-0.90(***)	8.6E-03	-0.26(***)	3.2E-03	-0.65(***)	8.0E-03
Olympic Games (+4)	destination	-0.43(***)	3.9E-03	-1.06(***)	9.6E-03	-0.31(***)	3.6E-03	-0.77(***)	8.9E-03
Residual Stage2	-	1.00(***)	1.6E-04	-	-	1.00(***)	1.7E-04	-	-
Robustness tests									
R-square 1st stage	0.52					0.58			
R-square 2nd stage	0.12					0.10			
R-square 3rd stage	0.99					0.99			
F-statistic	438.8(***)					516.9(***)			
Hausman test	921.1(***)					923.7(***)			

(***), (**), and (*) implies significance at 1%, 5%, and 10%, respectively.

Table 2. Happiness ranking

Country	Index	Absolute and relative income	Personal characteristics	Social development characteristics	Attitudes and beliefs toward self/others life	Economic, social and political environment	Happiness Indexes
Hong Kong	72.37	1.99	0.25	4.28	0.00	65.85	0.01
Singapore	68.40	1.76	0.50	3.21	-0.37	63.41	-0.10
New Zealand	12.13	1.15	1.01	3.32	2.60	4.15	-0.10
Switzerland	9.73	1.73	-1.20	4.03	2.20	3.12	-0.14
Norway	8.74	2.98	0.01	3.79	1.52	0.53	-0.10
Israel	7.76	1.00	1.23	3.27	0.47	1.79	0.00
Korea	7.48	1.56	0.95	3.86	1.17	-0.05	0.00
Sweden	7.08	2.65	0.78	3.08	-1.75	2.44	-0.10
Canada	6.84	2.31	1.31	2.94	-2.13	2.52	-0.12
Australia	6.40	2.09	1.39	3.83	-3.14	2.34	-0.12
Austria	5.18	1.89	-0.99	3.29	-0.13	1.21	-0.09
Belgium	4.54	1.46	-0.76	2.30	0.46	1.20	-0.13
Slovenia	4.47	1.26	-0.13	2.55	1.33	-0.60	0.06
United Arab Emirates	4.14	1.99	0.09	1.14	0.00	0.92	0.00
Bangladesh	4.14	-0.78	-0.94	-1.38	2.59	4.61	0.04
Qatar	4.04	3.93	-0.04	1.65	0.00	-1.50	0.00
Trinidad and Tobago	3.95	1.34	0.78	0.21	0.00	1.63	-0.01
Denmark	3.95	2.01	0.13	2.42	-1.39	0.92	-0.15
United Kingdom	3.88	1.84	-0.47	2.76	-2.27	2.10	-0.08
Armenia	3.81	-0.38	1.84	0.58	0.58	1.10	0.10
Chile	3.76	-1.24	0.41	1.90	1.14	1.58	-0.03
France	3.47	1.83	-0.13	2.80	0.36	-1.31	-0.08
Malaysia	3.39	-0.88	0.50	1.72	0.00	2.06	-0.01
Saudi Arabia	3.05	0.25	1.47	0.93	-0.55	1.07	-0.13
Czech Republic	2.93	1.69	0.86	2.08	-0.21	-1.49	0.00
Finland	2.85	1.77	-0.47	2.26	-2.18	1.61	-0.14
Netherlands	2.62	2.62	0.10	4.02	-0.95	-3.04	-0.13
United States	2.54	2.36	1.21	1.77	1.16	-3.86	-0.11
Albania	2.51	0.11	1.37	1.63	1.59	-2.29	0.09
Lebanon	2.38	-0.21	-0.03	-0.06	0.00	2.68	0.00
El Salvador	2.15	-1.61	-0.23	-0.14	2.53	1.70	-0.09
Lithuania	1.81	0.29	0.38	-1.19	3.65	-1.39	0.07
Greece	1.56	1.33	1.39	2.40	-0.74	-2.86	0.04

Japan	1.51	2.39	0.43	4.40	1.26	-6.77	-0.20
Algeria	1.48	-0.37	0.00	0.06	2.76	-0.98	0.01
Ireland	1.47	2.30	1.15	1.61	-2.85	-0.63	-0.12
Sri Lanka	1.40	-1.00	0.77	1.02	0.00	0.61	0.00
Peru	1.31	-1.50	0.61	0.37	2.86	-1.07	0.06
Portugal	1.15	0.69	-1.00	1.92	-0.59	0.13	0.00
Georgia	0.93	-0.92	0.66	0.41	3.17	-2.45	0.06
Uruguay	0.75	-0.78	-0.18	1.31	2.21	-1.85	0.03
Slovak Republic	0.54	1.41	0.49	0.01	0.34	-1.81	0.09
Oman	0.41	0.53	0.92	0.10	0.00	-1.15	0.00
Jamaica	0.31	-0.99	0.49	-0.31	0.00	1.13	0.00
Viet Nam	0.24	-0.73	-0.63	0.72	-0.25	1.25	-0.12
Italy	0.10	1.34	-0.41	3.26	-1.31	-2.81	0.02
Kuwait	0.03	0.00	-0.80	0.55	0.00	0.29	0.00
Hungary	0.03	1.09	0.43	0.20	-0.53	-1.23	0.07
Spain	-0.10	1.48	-0.26	0.71	-2.30	0.29	-0.02
Mexico	-0.12	-0.72	0.17	2.23	1.67	-3.33	-0.15
Iran	-0.38	-0.63	-0.21	0.01	1.16	-0.80	0.10
Costa Rica	-0.44	-1.25	-0.27	2.03	0.00	-0.94	0.00
Tunisia	-0.50	-0.60	-0.78	0.68	0.00	0.20	0.00
Brazil	-0.70	-1.72	-0.01	0.22	2.85	-2.02	-0.01
Germany	-0.74	2.40	0.88	2.75	-1.57	-5.21	0.00
Kyrgyzstan	-0.79	-0.44	0.75	-0.96	-1.96	1.83	-0.01
Belarus	-0.86	0.42	-0.24	-0.63	-1.21	0.69	0.11
Tajikistan	-0.93	-0.63	-0.19	-1.68	0.00	1.57	0.00
Ukraine	-1.15	0.00	0.49	-1.19	3.44	-4.28	0.39
Thailand	-1.24	-0.86	-0.72	2.34	0.00	-1.98	-0.01
Moldova	-1.39	-0.59	0.87	-0.38	1.43	-2.79	0.08
Bulgaria	-1.46	0.43	-0.49	0.79	-0.44	-1.99	0.24
Croatia	-1.61	0.90	-0.14	1.16	-0.75	-2.82	0.03
Uzbekistan	-1.77	-0.91	0.03	-1.54	0.00	0.65	0.00
Poland	-1.86	0.54	-0.10	1.25	-0.79	-2.78	0.03
Dominican Republic	-1.87	-1.48	1.56	0.17	-0.49	-1.65	0.01
Jordan	-1.93	-0.71	0.25	-0.51	-1.06	0.09	0.00
Philippines	-2.31	-1.39	0.20	-1.07	1.01	-0.99	-0.07
Iraq	-2.38	-1.01	-0.38	-1.44	1.99	-1.71	0.15
Indonesia	-2.51	-0.63	-1.46	-1.11	2.82	-2.05	-0.07
Colombia	-2.67	-1.94	-0.41	-0.53	1.21	-0.91	-0.08
Libya	-2.69	-0.08	0.05	0.53	0.00	-3.18	0.00
Syria	-2.71	-0.87	-1.19	1.05	0.00	-1.70	0.00
Russian Federation	-2.85	-0.12	0.69	-1.20	0.94	-3.48	0.32
Yemen	-3.06	-0.65	1.22	-2.77	0.00	-0.85	0.00
Kazakhstan	-3.21	0.01	0.52	-0.97	0.00	-2.76	0.00

Country							
Nepal	-3.54	-1.79	-2.95	-1.33	0.00	2.53	0.00
Serbia	-3.69	-0.44	-0.40	-1.48	0.71	-2.16	0.07
Guyana	-3.70	-1.02	0.09	-0.93	0.00	-1.84	0.00
Argentina	-3.94	-0.97	0.16	1.07	0.66	-4.83	-0.03
Ecuador	-4.10	-1.70	-0.26	1.54	0.00	-3.68	0.00
Sudan	-4.13	-1.01	0.32	-3.96	0.00	0.52	0.00
Macedonia	-4.20	-0.28	0.21	-5.00	1.72	-0.87	0.02
Romania	-4.28	0.25	-0.23	0.68	-1.93	-3.30	0.25
Nicaragua	-4.42	-1.33	-1.36	0.50	0.00	-2.23	0.00
Haiti	-4.92	-2.66	-2.39	-3.55	0.00	3.69	0.00
Guatemala	-5.10	-2.06	-1.32	-0.61	0.00	-1.11	0.00
Myanmar	-5.39	-1.04	-1.40	-2.89	0.00	-0.06	0.00
Pakistan	-5.55	-0.49	-0.94	-2.48	0.04	-1.69	0.02
Cambodia	-5.61	-1.29	-1.71	-3.34	0.00	0.73	0.00
Honduras	-5.88	-1.99	-1.32	0.20	0.00	-2.77	0.00
Azerbaijan	-5.94	-0.34	0.26	-0.70	-0.77	-4.42	0.04
Angola	-5.99	-0.77	3.29	-7.41	0.00	-1.10	0.00
Côte d'Ivoire	-6.23	-1.47	0.86	-6.26	0.00	0.65	0.00
Turkmenistan	-6.23	-0.66	-0.14	-2.43	0.00	-3.00	0.00
Venezuela	-6.47	-0.92	-0.51	0.81	-1.53	-4.21	-0.11
Paraguay	-6.99	-2.26	-0.87	0.04	0.00	-3.91	0.00
India	-7.03	-0.88	-2.23	-2.56	1.32	-2.72	0.03
Ghana	-7.33	-1.28	-1.66	-2.89	0.00	-1.49	0.00
Turkey	-7.33	-0.57	-0.54	-0.96	-2.31	-3.00	0.04
Egypt	-7.34	-0.49	-0.61	-0.05	-4.70	-1.46	-0.02
Morocco	-8.04	-0.97	-0.38	-0.58	-4.49	-1.61	-0.01
Bolivia	-8.11	-2.42	0.56	-2.16	0.00	-4.09	0.00
Ethiopia	-8.37	-0.59	0.53	-7.70	0.00	-0.61	0.01
Tanzania	-10.40	-0.81	1.03	-5.49	-2.28	-2.67	-0.19
Cameroon	-10.50	-1.52	-0.62	-7.27	0.00	-1.09	0.00
Senegal	-10.79	-1.16	-3.01	-4.50	0.00	-2.11	0.00
Kenya	-11.19	-1.42	-0.11	-5.58	0.00	-4.08	0.00
Nigeria	-11.77	-1.46	1.35	-7.15	-1.40	-2.95	-0.16
Afghanistan	-12.97	-1.24	-2.40	-8.13	0.00	-1.20	0.00
South Africa	-13.10	-1.79	-0.10	-10.62	-1.71	1.14	-0.02
China	-13.17	-1.30	-0.03	1.32	-1.19	-12.03	0.05

Table 3. Explanatory factors of undesirable countries' self-assessment as happy

Absolute and relative income	Personal characteristics	Social development characteristics	Attitudes and beliefs toward self/others life	Economic, social and political environment
Iran	Iran	Belarus	Belarus	Iran
Moldova	Belarus	Ukraine	Bulgaria	Ukraine
Dominican Republic	Bulgaria	Moldova	Croatia	Moldova
Iraq	Croatia	Iraq	Poland	Bulgaria
Russian Federation	Poland	Russian Federation	Dominican Republic	Croatia
Serbia	Iraq	Serbia	Romania	Poland
Macedonia	Serbia	Macedonia	Azerbaijan	Dominican Republic
Pakistan	Romania	Pakistan	Turkey	Iraq
Azerbaijan	Pakistan	Azerbaijan	China	Russian Federation
India	India	India		Serbia
Turkey	Turkey	Turkey		Macedonia
Ethiopia	China	Ethiopia		Romania
China				Pakistan
				Azerbaijan
				India
				Turkey
				Ethiopia
				China

Table 4. Explanatory factors of desirable countries' self-assessment as unhappy

Absolute and relative income	Personal characteristics	Social development characteristics	Attitudes and beliefs toward self/others life	Economic, social and political environment
Chile	Switzerland	El Salvador	Singapore	France
Malaysia	Belgium		Sweden	Netherlands
El Salvador	Austria		Canada	United States
Viet Nam	United Kingdom		Australia	Japan
	France		Austria	Ireland
	Finland		Denmark	
	El Salvador		United Kingdom	
	Viet Nam		Saudi Arabia	
			Finland	
			Netherlands	

Ireland	
Viet Nam	

Appendix 1. *Data description*

The dependent variable in the gravity model corresponds to net migration flows with respect to the OECD countries (plus Russia). In order to deal with the missing data in the net flows, the sample considers the 90 countries of origin with the least amount of missing information (missing values) in the annual period 1995-2010. Nevertheless, to avoid any misinterpretation of the results, a second sample is considered in the analysis. In this way, the 90 countries of origin with the highest GDP are considered as an alternative sample. A detail of the countries used in the alternative sample is provided in Appendix 2.

Regarding the regressors of the model, we initially took into account a total of 225 variables for the annual period between 1995 and 2010. However, it was not possible to use a number of these variables due to missing observations and because of this we dropped from the analysis regressors with more than 25% of missing values. For the remaining variables note that, even if the number of gaps is very small, the fact that they are located in different observations for the different regressors can make the estimation not feasible. Therefore, we tackle such data irregularities in a factor model framework by using the EM algorithm together with PC decomposition, see for example Stock and Watson (2002). More specifically, using the sample information available for the regressors, we estimate by principal components the most important common factors that explain their volatility. Then, in a second step, the regression of each of the individual variables on the common factor is used to complete the missing values. The EM algorithm repeats steps 1 and 2 until convergence.

Our list of explanatory variables is reported in Appendix 3. In this database, apart from the variables related to subjective wellbeing (see section 2) other important variables were also considered (migration policies, happiness indicator, sports events).

Appendix 2. *Countries used in the samples*

Countries of Origin		Countries of destination
Sample 1	*Sample 2*	
Afghanistan, Albania, Algeria, Argentina, Armenia, Australia, Azerbaijan, Bangladesh, Belarus, Bolivia, Brazil, Bulgaria, Cambodia, Cameroon, Canada, Chile, China, Colombia, Croatia, Czech Republic, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, France, Georgia, Germany, Ghana, Greece, Guatemala, Guyana, Haiti, Honduras, Hong Kong, Hungary, India, Indonesia, Iran	Algeria, Angola, Argentina, Australia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bolivia, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Côte d'Ivoire, Croatia, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, Ethiopia, Finland, France, Germany, Greece, Guatemala, Hong Kong, Hungary, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Japan, Kazakhstan, Kenya, South Korea, Kuwait, Lebanon, Libya, Lithuania, Malaysia, Mexico, Morocco, Myanmar, Netherlands, New Zealand, Nigeria, Norway, Oman, Pakistan, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russian Federation, Saudi Arabia, Serbia, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syria, Tanzania, Thailand, Tunisia, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Uzbekistan, Venezuela, Viet Nam, and Yemen	Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States, and Russian Federation
Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, South Korea, Kyrgyzstan, Lebanon, Lithuania, Macedonia, Malaysia, Mexico, Moldova, Morocco, Nepal, Netherlands, New Zealand, Nicaragua, Nigeria, Pakistan, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Senegal, Serbia, Slovak Republic, South Africa, Spain, Sri Lanka, Sweden, Syria, Tajikistan		
Thailand, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Ukraine, United Kingdom, United States, Uzbekistan, Venezuela, and Viet Nam		

Sample 1 and 2 consider countries with the least amount of missing data in net migrant flows and countries with the highest GDP, respectively.

Appendix 3. *Detail of Variables*

Variable	Type of Country	Detail	Source
Net Migration	Bilateral	Inflow minus Outflow where thousands is the unit of measure	OECD
Distance	Bilateral	Km between the most important economic centers	CEPII
Language	Bilateral	It takes value 1 if countries share common language and zero otherwise	CEPII
Border	Bilateral	It takes value 1 if countries share common border and zero otherwise	CEPII
Female Percentage	Origin	Percentage of sample	WVS
Married	Origin	Percentage of sample	WVS
Proud of Nationality	Origin	2*very+rather-not very-2*not at all where very, rather, not very, and not at all are the respective percentages of answers to the question: How proud are you of nationality?	Own elaboration using data from WVS
GDP per capita	Origin and Destination	Constant 2000 US$	WDI
Peace Index	Origin and Destination	Index that considers internal or external wars fought, number of death in external and internal conflicts, relation with neighboring countries, political instability, terrorists acts, jailed per 100.000, police/security officers per 100.000, and military capacity. It goes from -1 to -5 where -1 is the highest level of peacefulness	WDH
Landlocked Country	Origin and Destination	It takes the value 1 if country is landlocked and zero otherwise	CEPII
Fertility Rate	Origin	Percentage of births per woman	WDH
Pollution	Origin and Destination	(CO2+HFC+PFC+SF6)*Population/Area where CO2 corresponds to metric tons per capita and HFC, PFC, and SF6 correspond to thousand metric tons of CO2 equivalent	Own elaboration using data from WDI
Single	Origin	Percentage of sample	WVS
Precipitation	Origin and Destination	mm per year	WDI
Life Expectancy	Origin and Destination	Years	WDI
Men Priority	Origin and Destination	Percentage of agreement to the statement: Men should have more right to a job than women	WVS
Mean Age	Origin	Mean of the sample	WVS
Income Inequality	Origin and Destination	Gini index	WDH
Politic Importance	Origin	2*very+rather-not very-2*not at all where very, rather, not very, and not at all are the respective percentages of answers to the statement: Politics is important in life	Own elaboration using data from WVS

CEPII, WDI, WVS, WDH, BF, BPB, MIS, IMM, MIPEX, and HF refers to the databases Center d'Etudes Prospetives et d'Informations Internationales, World Development Indicators, World Values Survey, World Database of Happiness, Benedetti Foundation, Bundeszentrale für Politische Bildung, Migration Information Source, International Migration for Migration, Migrant Integration Policy Index, and Heritage Foundation, respectively.

Appendix 3. *Detail of variables (continuation)*

Variable	Type of Country	Detail	Source
Family Importance	Origin	2*very+rather-not very-2*not at all where very, rather, not very, and not at all are the respective percentages of answers to the statement: Family important in life	Own elaboration using data from WVS
Corruption	Origin and Destination	Perception of abuse of public officers for private gains where higher value indicates more corruption	WDH
Friends Importance	Origin	2*very+rather-not very-2*not at all where very, rather, not very, and not at all are the respective percentages of answers to the statement: Friends important in life	Own elaboration using data from WVS
Density	Origin and Destination	Number of people/area (km^2)	Own elaboration using data from WDI and CEPII
Unemployment	Origin and Destination	Percentage of total labor force	WDI
Work Importance	Origin	2*very+rather-not very-2*not at all where very, rather, not very, and not at all are the respective percentages of answers to the statement: work is important in life	Own elaboration using data from WVS
Free Economy	Origin and Destination	Index that considers rule of law, limited government, regulatory efficiency, and open markets. It goes from 0 to 100 where 100 represents the highest level of freedom	HF
Elevation	Origin and Destination	Percentage of total land area where elevation is below 5 meters	WDI
Age Standard Deviation	Origin	Standard deviation of the sample	WVS
Civil Liberty	Origin and Destination	Index based on eleven items, it goes from 1 to 7 where the highest value implies the least liberty	WDH
Years of Education	Origin and Destination	Average years of education	BL

CEPII, WDI, WVS, WDH, BF, BPB, MIS, IMM, MIPEX, and HF refers to the databases Center d'Etudes Prospetives et d'Informations Internationales, World Development Indicators, World Values Survey, World Database of Happiness, Benedetti Foundation, Bundeszentrale für Politische Bildung, Migration Information Source, International Migration for Migration, Migrant Integration Policy Index, and Heritage Foundation, respectively.

Appendix 3. *Detail of variables (final)*

Variable	Type of Country	Detail	Source
Authoritarian Country	Origin	It takes the value 1 for countries with an authoritarian regime	FH
World Cup (-4)	Origin and Destination	It takes the value one for countries that have organized a world cup in the previous four years	Own elaboration
World Cup (+4)	Origin and Destination	It takes the value one for countries that will organize a world cup in the posterior four years	Own elaboration
Olympic Games (-4)	Origin and Destination	It takes the value one for countries that have organized the olympic games in the previous four years	Own elaboration
Olympic Games (+4)	Origin and Destination	It takes the value one for countries that will organize the olympic games in the posterior four years	Own elaboration
Conservative Country	Destination	It takes the value one for conservative government periods	Own elaboration
Happiness Index WVS	Origin minus Destination	2*very happy+quite happy-not very happy-2*not happy at all where very happy, quite happy, not very happy, and not happy at all are percentages	Own elaboration using data from WVS
Happiness Index WDH	Origin minus Destination	4*very happy+3*happy+2*not very happy+not happy at all where very happy, quite happy, not very happy, and not happy at all are percentages	WDH
Restrictive Policy	Destination	Variable that adds one to any new restrictive policy to immigration	BF, BPB, MI, IMM, and MIPEX
Liberal Policy	Destination	Variable that adds one to any new liberal policy to immigration	MIPEX
Emigration Policy	Destination	Variable that takes the value one for a policy related to emigration	BPB, MI, IMM, and MIPEX

CEPII, WDI, WVS, WDH, BF, BPB, MIS, IMM, MIPEX, and HF refers to the databases Center d'Etudes Prospetives et d'Informations Internationales, World Development Indicators, World Values Survey, World Database of Happiness, Benedetti Foundation, Bundeszentrale für Politische Bildung, Migration Information Source, International Migration for Migration, Migrant Integration Policy Index, and Heritage Foundation, respectively.