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# On the Role of Migration on the Satisfaction of European Researchers: Evidence from MORE2\*

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## Abstract

The aim of this study is to disentangle the role of international migration on the job satisfaction of academic researchers. Using a relatively novel database, MORE2, that tracks the migratory behaviour of European researchers, and correcting for potential sorting behaviour of individuals via a multinomial treatment model, we find that more migratory groups tend to demonstrate higher levels of satisfaction regarding pecuniary outcomes. They also present higher levels of satisfaction regarding career advancement and social status, both crucial components in the lives of PhD holders. Our results survive in a battery of robustness checks, corroborating our main findings.

*JEL classification:* I26, J28, J61, R23

*Keywords:* subjective-well-being; high-skilled migration; job satisfaction; European researchers

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*“The happy life is thought to be one of excellence; now an excellent life requires exertion, and does not consist in amusement. If Eudaimonia, or happiness, is activity in accordance with excellence, it is reasonable that it should be in accordance with the highest excellence; and this will be that of the best thing in us.”*

Aristotle, The Nicomachean Ethics

## 1. Introduction

A large body of the economics literature has dealt with the phenomenon of migration, whereby the focus has been to analyse the mechanisms under which individuals decide whether to migrate or not, along with the pecuniary outcomes of such an action. In recent decades, with the increase of international migration of individuals with tertiary education, a subset of migration literature has put the spotlight on skilled workers.<sup>1</sup> From an economics perspective this is important, since the migration of highly-skilled individuals is perceived as a mechanism to diffuse and develop new ideas, knowledge and innovation. Among the skilled workers, academics and researchers are a sub-group who are internationally very mobile (Hunter et al., 2009; Ioannidis, 2004; Tripl, 2013). Not only these people increase knowledge sharing by moving to another country, but they also do so with short visits, such as visiting positions, conferences, co-authoring with people from other countries and co-patenting. In that sense, academic researchers are different from the general population of skilled-workers in that their moves are not necessarily permanent (Newland, 2009).<sup>2</sup>

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<sup>1</sup> For recent reviews see Czaika and Parsons (2017) and Kerr et al. (2016). Specifically, for the case of OECD countries, for the years 2000/2001 and 2010/2011, immigration of individuals with tertiary education has increased about 70% (Arslan et al., 2014).

<sup>2</sup> For a recent literature regarding international migration of students and highly-skilled workers see, among others, Beine et al. (2014), Freeman (2010), OECD (2005), and Skeldon (2009). Regarding the diffusion of knowledge see

In this study, we turn our attention to migrants that hold a PhD degree. That is, individuals who possess specialized knowledge and constitute an important sub-sample of the general population. In the economics literature, although a large body of research deals with several aspects of a person's socioeconomic conditions (one of them being migration), it remains relatively silent about doctorate holders. Yet, this group of people presents some interesting traits worth investigating. Namely, the highly educated are typically more mobile than other education groups (Docquier & Marfouk, 2006) and tend to gain most from migration (Sabot, 1987; Yankow, 2003). In addition, academic researchers tend to move more often than the rest of the workers, as they try to find the best potential match for their abilities and career perspectives. To this end, they do not only move within a country, but, oftentimes, they might decide to immigrate to other countries which may vary markedly from their country of origin.

Important for our study is the view that migration can be perceived as a form of investment in human capital (Sjaastad, 1962).<sup>3</sup> Different aspects of a person's life change considerably when migration takes place. This is because an individual, through migration for example, may attend a better educational institution, or find a more appropriate job that matches her abilities. Especially the highly-skilled economic agents will have higher motives to try and reap the rewards of their long and on-going process of investment in human capital. These rewards need not be only pecuniary, but be also driven by non-economic factors.<sup>4</sup> Such factors are recognition by peers,

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Döring & Schnellenbach (2006), Edler et al. (2011), Goldin et al. (2011), Miguélez & Moreno (2014), Møen (2005), OECD (2008), Schiller & Revilla-Diez (2010), Thorn & Holm-Nielsen (2008), Trippl (2013), Williams (2007), Zucker & Darby (2006), Zucker et al. (2002), and Zucker et al. (1998).

<sup>3</sup> Human capital theory assumes economic agents weigh the cost and benefits of migrating and decide whether to migrate or not. These economic agents who migrate are selected individuals in the sense that they are more likely to migrate to get higher education and find a better job that matches their educational background (Faggian et al., 2007a; Jewell and Faggian, 2014; Kazakis and Faggian, 2017).

<sup>4</sup> The mobility decisions of academic researchers are less likely to be driven by economic motives compared to other highly-skilled workers (Baruffaldi and Landoni, 2016; Mahoney, 1979; Merton, 1979; Sauermann & Cohen, 2010) and more likely to be driven by non-economic factors (Mahroum, 2000; Roach & Sauermann, 2010; Salt, 1997; Sauermann & Cohen, 2010; Stern, 2004).

independence, intellectual curiosity and challenge, and academic freedom, among others. One of these aspects in a person's life is satisfaction (which can be seen as a proxy for utility), an important parameter that affects an individual's performance either at work or other life activities. Particularly for academic researchers, moving to a specific location might have multiple implications in their academic career (e.g., academic network, grant possibilities) and social life. Therefore, a researcher's satisfaction is expected to be affected by her migration decisions.

Past research has focused on the decision to migrate and the selectivity of migrants, as well as the impact of mobility of academic researchers on productivity, citation rates and career development (Aksnes et al., 2013; Azoulay et al., 2012; Baruffaldi & Landoni, 2012; De Filippo et al., 2009; Franzoni et al., 2014; Hunter et al., 2009; Levin & Stephan, 1999; Veugelers & Bouwel, 2015). Few studies have focused on the satisfaction of academic researchers.

Satisfaction is one domain of overall happiness. The notion of happiness has occupied the mind of many excellent thinkers in the past, and among others, Aristotle, who defines well-being (eudemonia) as the action of doing well and living well.<sup>5</sup> Many a year passed before the economic discipline started to shyly put more attention on subjective well-being in trying to understand workers' decisions (Clark, 1996, 2001). This is somewhat surprising, given the importance satisfaction plays in working environment (Clark, 2001) and in later employment decisions for academic researchers (Baruffaldi & Landoni, 2016).

We firstly focus on job satisfaction as a measure of utility from work and we are interested in whether migration behaviour helps to optimize job satisfaction. Job satisfaction is a multi-faceted concept and we focus on several aspects of it. When individuals first start a job, they have only limited information. This information includes, among others, knowledge about the location

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<sup>5</sup> For reviews of the Economics of Happiness literature the reader can look at Dolan et al. (2008) and MacKerron (2012), among others.

and salary. As people gain more experience, they get to know their working environment better and thus update their beliefs. It is through that period when concerns about job and location arise. Secondly, job satisfaction is important, as it has been linked to productivity (Oswald et al., 2015; Patterson et al., 2004), quits (Clark, 2001; Clark et al., 1998; Green, 2010), and retirement (Clark et al. 2015). Thus, job satisfaction may be one mechanism through which migration may improve productivity.

We contribute to the literature in several ways. First, by using a novel database, MORE2, the environment of our study concerns European researchers for whom heterogeneities are expected to be larger, than, say, U.S. citizens who move between different states, or individuals who move within a country.<sup>6</sup> The MORE2 allows us to track individuals' different migratory paths at an international level (between countries) based on the country of citizenship, the country where their highest degree—in our case PhD—was awarded, and, lastly, the country of employment. Based on this information, we construct five different migratory groups (repeat-migrants, return-migrants, late-movers, university-stayers, and non-movers). Second, understanding that different migratory paths during ones' lifetime may indicate that a person has latent characteristics, which may lead to specific sorting behaviour and thus render some econometric models invalid due to bias, we perform a multinomial treatment technique based on the five migratory categories presented above to deal with selectivity issues. We find that individuals who are the most migratory—and especially those who move to different countries—are more likely to express higher levels of satisfaction, thus corroborating our economic intuition of sorting based on abilities and career perspectives. Our results survive a battery of robustness tests that account for the dynamic nature of migration (specifically, in this case we determine migratory paths based on the

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<sup>6</sup> The full name of MORE 2 is: Mobility Survey of the Higher Education Sector: Mobility and Career Paths of Researchers in Europe.

location the PhD was awarded and previous experience in working abroad), differences between males and females (although males and females document some differences in specific satisfaction categories), and the use of a general satisfaction index constructed through Item Response Theory (IRT).

Our paper is organized along the following lines. We present a simple theoretical model in Section 2, followed by data description in Section 3. Section 4 presents our empirical strategy, while Section 5 analyses the outcomes. Section 6 concludes.

## 2. Theory

To incorporate our thoughts into an economic model, we develop a similar scheme as in Lévy-Garboua and Montmarquette (2004). Specifically, assume that  $Z$  is an experience good that, among others, is determined by the migratory path (MP) of a person. We define subjective well-being (SWB) as:

$$S = \begin{cases} 1, & u(Z(MP_k)) > u(Z(MP_{-k})) \\ 0, & u(Z(MP_k)) \leq u(Z(MP_{-k})) \end{cases} \quad (1)$$

, with MP dictating the categories of migration by taking into consideration the country of citizenship, the country a person's PhD degree was awarded, and finally the country of employment. Thus, following the typology of Faggian (2005) and Faggian et al. (2007a; 2007b), we have the following migration categories (details on how these categories are defined are given later):

$$k = \{repeat - migrant, return - migrant, late - mover, university - stayer, non - mover\}.$$

$S$  denotes a vector of job related satisfaction categories, such as salary satisfaction, career development, job security etc.

An individual at a specific point in time,  $\tilde{t}$ , is asked about her satisfaction. The person takes into consideration her experience so far to answer these questions. A job satisfaction index is:

$$I_{k\tilde{t}} = \begin{cases} 1, & \psi_{k\tilde{t}} + \omega_{k\tilde{t}} > \psi_{-k\tilde{t}} + \omega_{-k\tilde{t}} \\ 0, & \psi_{k\tilde{t}} + \omega_{k\tilde{t}} \leq \psi_{-k\tilde{t}} + \omega_{-k\tilde{t}} \end{cases} \quad (2)$$

, with  $\psi$  representing pecuniary outcomes and  $\omega$  non-pecuniary outcomes. We set  $\omega$  to be a function of personal characteristics,  $\nu$ , and job-specific characteristics,  $\xi$ . Following Lévy-Garboua and Montmarquette (2004) we set the “pecuniary value of job”, taking into consideration future income flows, be:

$$\psi_{k\tilde{t}} = \sum_{t=1}^{\tilde{t}} \frac{\mu_{kt} - \mu_{-kt}}{(1+r)^{t-1}} + \frac{\mathbb{E}_{\tilde{t}}V_{kt} - \mathbb{E}_{\tilde{t}}V_{-kt}}{(1+r)^{\tilde{t}}} \quad (3)$$

, with  $\mu_{kt}$  denoting the wages a person has received from his choices at time  $t$ , while  $\mu_{-kt}$  represents the wages a person could have taken should her choices have been different. The discount rate is denoted by  $r$ .  $V_{kt}$  denotes the expected pecuniary outcomes should the person continue with the same choice as before, while  $(V_{-kt})$  represents the expected future value for alternate choices.

The general satisfaction index is defined as:

$$\Phi_{k\tilde{t}} = \sum_{t=1}^{\tilde{t}} \frac{\mu_{kt} - \mu_{-kt}}{(1+r)^{t-1}} + \frac{\mathbb{E}_{\tilde{t}}V_{kt} - \mathbb{E}_{\tilde{t}}V_{-kt}}{(1+r)^{\tilde{t}}} + \omega_{k\tilde{t}} - \omega_{-k\tilde{t}} \quad (4)$$

It follows from the previous analysis that:

$$I_{k\tilde{t}} = \begin{cases} 1, & \Phi_{k\tilde{t}} > 0 \\ 0, & \Phi_{k\tilde{t}} \leq 0 \end{cases} \quad (5)$$

To incorporate this theory in a regression scheme, we perform a slight modification. More specifically we set:



$$S = \begin{cases} 1, & h(\psi, \omega) = \beta_0 + \beta_1\psi + \vec{\gamma}\vec{\omega} + \epsilon > 0 \\ 0, & \text{else} \end{cases} \quad (6)$$

, with  $\psi = \psi(\mathbf{MP})$  and  $\omega = \omega(\mathbf{MP})$ , since the migration path could affect both pecuniary outcomes and other aspects of life that might alter an individual's level of satisfaction.

### 3. Data

To conduct our research, we use the Mobility Survey of the Higher Education Sector: Mobility and Career Paths of Researchers in Europe, 2012 (MORE2). This survey collected data for 27 EU countries and six other countries: Associated Countries (Switzerland, Norway, Iceland) and Candidate Countries (Turkey, Macedonia (FYROM) and Croatia). A complete list of the countries can be found in Table A1 of the Appendix.

The MORE2 database meets a minimum level of accuracy by using different methodologies to obtain accurate results. The data were collected through two main methods: (a) computer-assisted telephone interviews (CATI) and (b) computer-assisted web interviews (CAWI). The project managers took all the necessary measures for the two projects to interact, to avoid unnecessary outcomes, such as contacting the same people. A follow-up survey completed the data. In addition, measures of refinement that account for seasonal effects were adopted. The final sample had 10,547 participants. In our research, we concentrated on individuals between the ages of 25 to 65. Furthermore, all individuals had to be fully employed, to have obtained their PhD degree and work in western European countries (see also Table A1). This leads to a sample of slightly more than 3,000 observations for our preferred empirical approach.

The database provides useful information regarding the most favourite destinations of European researchers and their motivation to migrate. As shown in Figure 1, in the event of migrating abroad, European researchers choose the United States of America as their first

destination. There are many reasons for this. First, the U.S. is among the leading countries in terms of research output, academic wages and fares well in R&D funding opportunities.<sup>7</sup> Second, since most of the academic literature is written in English, it is easier for them to adopt to an English-speaking country. For similar reasons, albeit in a smaller extent, we see the United Kingdom to be the second most favourite destination country for European researchers, followed by Germany, France, Switzerland, and the Netherlands. Regarding the motivation for moving to another country, Figure 2 corroborates the intuition we developed above. Specifically, most people mention career progression as their main driver to migrate to another country, followed by availability of research funding, suitable positions, and research network among others. From the same figure, we deduce that pecuniary outcomes (remuneration) score low as an incentive for migration.

**[Insert Figure 1 and Figure 2 about here]**

Table 1 presents summary statistics of the final database used in our research. Given the main satisfaction indicators (individuals are asked whether they are satisfied or not with each domain, and hence these indicators are of a binary nature), we see that European researchers tend to document lower satisfaction concerning their salaries, career advancement, and benefits, whereas they are more satisfied regarding independence, social status, or social contribution, among others. As for the migration indicators, we find that about 26% of the interviewees have been awarded their PhD abroad, while 53% had an experience of working abroad. Furthermore, migrants—those who are employed in a country different from their country of citizenship—

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<sup>7</sup> Based on OECD and World Bank data, the U.S. spend the most (about \$473 billion gross) for R&D reasons. This translates to about 2.74% of the U.S. GDP. However, in per capita terms, other countries outperform the U.S. Namely, Singapore, Switzerland, South Korea, Sweden, and Denmark. Information from the OECD can be found here: <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>, while data from the World bank can be retrieved from the following link: <https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS>.

consist about 22% of the population in our sample. About 5% are repeat-migrants, 15% are return-migrants, 6% are university-stayers, 11% are late-movers, and a large percentage are non-movers.

**[Insert table 1 about here]**

Females represent 34% of the whole sample. Most individuals live with a partner (married, or unmarried) and have children. The plethora of researchers are conducting research in social sciences, closely followed by natural and medical sciences. Based on their major degree and research field, we find about 12% to be mismatched. Our final database consists mostly of established researchers, followed by leading researchers, and recognized researchers (see also Table A2 for a description of the variables). About 71% of the researchers have a permanent contract, while a 9% of them hold a dual position.

As far as teaching activities are concerned, most interviewees reported that their teaching activities require about 26% to 50% of their time. There is also a small number of people whose main duty is teaching; they represent about 6% of the sample. On the contrary, 10% of our sample consists of individuals without any teaching activities.

Regarding their confidence for the future, on a scale of 1 to 4, interviewees document an average value of 3.03. Having a permanent job could be a reason for this, as people who do not fear that negative shocks will affect their employment tend to document such findings. The respondent's average age is about 45, with those belonging in the [40, 44] frame being the majority. To account for potential asymmetric information regarding funding opportunities within Europe, we have included two indicators relevant to the knowledge of Euraxess and Marie Curie fellowship. Although most people appear to know Marie Curie fellowship, they seem to have limited knowledge about Euraxess. This seems to be an oxymoron, in the sense that the Euraxess initiative is expected to provide information for researchers who want to migrate to other countries

to seek employment. This could indicate issues of effective advertisement and lack of awareness for this initiative.

To account for socioeconomic criteria that might affect individuals' migration decisions, we have included country level data based on the country of citizenship. Our list of controls contains the following variables: growth rate of GDP per capita, empowerment rights index, human capital index, Gini coefficient, openness, Polity scores, employment protection, gross savings, out-of-pocket health expenditures, compensation for tertiary education, government expenditures for tertiary education, and unemployment (youth unemployment and unemployment for those with higher degrees). Description of these variables along with their sources and use can be found in Tables A2 and A3 of the Appendix.

#### 4. Empirical strategy

We categorize individuals according to two sequential migration decisions using the typology of Faggian (2005; 2007a, b)—whether to migrate to study and whether to migrate for employment. We focus on international migration i.e., migration between countries, and we have information on individuals' country of citizenship, country where their PhD was awarded, and the country of employment. Since migration is perceived as an investment in human capital, those who are more migratory, are expected to have obtained higher quality of education. In addition, they are likely to adapt better to more difficult situations and be able to address asymmetric information more efficiently. Ergo, we characterize as *non-movers* those citizens who have not moved outside their country of citizenship to pursue a PhD degree or employment. *Late-movers* are these individuals who finished their PhD degree in their country of citizenship, yet they are employed in another country. Likewise, individuals who are employed in the country where they undertook their PhD

studies (but different from their country of origin) are described as *university-stayers*. The most migratory group are *repeat-migrants*, that is individuals who were awarded their PhD degree in a country different from their country of citizenship and are employed in another country (different from both the country of citizenship and country where their PhD was awarded). Finally, those who returned to their country of citizenship, after they pursued a PhD program in another country, are *return-migrants*. Figure 3 summarises the five migration strategies.

**[Insert Figure 3 about here]**

Based on the previous analysis, we deduce that there is a sorting behaviour of individuals regarding their migration decisions. Secondly, migration could be seen as an investment in human capital, or even a mechanism that, to some extent, might capture grit.<sup>8</sup> The fact that perseverance to achieve long-term goals may differ between people, indicates self-selectivity in choice. This could potentially undermine our analysis and effort to disentangle the role of migration choices on European researchers' different perceptions of satisfaction. To this end, we implement a technique introduced by Deb and Trivedi (2006b). This method has been applied recently in Kazakis and Faggian (2017) and Abreu et al. (2015). Herein, we provide a summary of this technique.

The Deb and Trivedi (2006b) two-stage technique corrects self-selectivity when the nature of selection is polychotomous. The five different migration categories analysed above, are all mutually exclusive and will be labelled as “treatments” ( $k = 1, 2, 3, 4, 5$ ). Having non-movers as a base category, we set the indirect utility for treatment  $k$  and individual  $i$  be:

$$V_{ik} = \mathbf{z}_i \alpha_k + \delta_k l_{ik} + \eta_{ik}, \quad (7)$$

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<sup>8</sup> Credé et al. (2017) argue that grit might have a larger effect on individuals with above the average cognitive ability, while Duckworth et al. (2007) state that grit could potentially be instilled in individuals from a young age. In a recent working paper, Light and Nencka (2017) document that for high-skilled students grit and cognitive ability are complements and that their inter-relationship is stronger for more challenging tasks.

where  $\mathbf{z}_i$  describes our knowledge of observables, while  $l_{ik}$  is a vector of latent characteristics that could affect both the treatment and the outcome. Using the observed treatment—belonging to one of the five migration categories—the researcher can deduce important insights about the nature of the selection process. Thus, we model the migration choice as a mixed multinomial logit (first-stage model):

$$\Pr(\mathbf{d}_i | \mathbf{z}_i, l_i) = \frac{\exp(\mathbf{z}'_i \alpha_k + l_{ik})}{1 + \sum_{n=1}^K \exp(\mathbf{z}'_i \alpha_n + l_{in})} \quad (8)$$

The second-stage, which models satisfaction perceptions of European researchers, has the following form:

$$E(S_i) = \mu(\mathbf{x}'_i \boldsymbol{\beta} + \sum_{k=1}^K \gamma_k d_{ik} + \sum_{k=1}^K \lambda_k l_{ik}), \quad (9)$$

with  $\mathbf{x}$  denoting observables for individuals,  $d$  denoting migration dummies, and  $\lambda_k l_{ik}$  are the correction terms. Letter  $\mu$  indicates the functional form that has been used; in our case is a linear one, which means the model in the second stage is a linear probability model.

To account for longer-term migration decisions we utilize a second indicator that we constructed based on whether individuals were awarded a PhD abroad and whether they have ever worked abroad. This leads to four mutually exclusive groups. Namely, economic agents who, (i) have been awarded their PhD abroad and have experience working abroad, (ii) have experience working abroad, but their PhD was not awarded abroad, (iii) have their PhD from abroad, but do not have experience working abroad, and finally, (iv) have neither a PhD awarded from a country abroad, or worked abroad.

## 5. Results

## 5.1 Main results

Table 2 presents the results for the Multinomial Treatment Model for various satisfaction indicators with the main explanatory variables being the sequential migration categories.<sup>9</sup> With *non-movers* as our reference group, we find that the most migratory group, *repeat-migrants*, document a positive and significant coefficient for all satisfaction categories except social contribution, job location, and employer's esteem. Our interpretation to this is that frequent movers, tend to form weaker ties with the region/country they live temporarily, and thus, it is relatively harder for them to contribute to the local society, even with their high-level of expertise. Furthermore, we find repeat-migrants to document a large and statistically significant coefficient regarding their career advancement satisfaction indicator (0.299). We interpret this as the tendency of the most-migratory group to reap all possible benefits of migration, with the ultimate goal being to further increase their position in the ladder of their respective disciplines.

As for *return-migrants*, they enter with a negative and significant coefficient for the following satisfaction categories: salary, social contribution, career, job location, and employer's esteem. There are many reasons a person would like to return to his country of origin; psychic reasons being one of them. Yet, we could argue that people were unable to succeed in foreign countries (*e.g.*, they were unable to find a suitable position) and, thus, have to return to their origin. Especially, if the country where they return is relatively poor (compared to where they were awarded their degree), then these individuals are more likely to express less satisfaction for the categories mentioned above. We find *university-stayers* to also document lower levels of satisfaction regarding their salaries, independence, social contribution, and job location. Among

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<sup>9</sup> In results not shown (available on request) we find that controlling for country fixed effects and selection is important in model's explanatory power.

others, it could be that these individuals might have wanted to move to a more advanced country (where salaries are higher for example), yet they were unable to do so due to their lack of abilities, fierce competition for available positions, or due to a job mismatch. *Late-movers*, on the other hand, seem to be more satisfied with their salary, independence, and benefits, but not with career perspectives, compared to *non-movers*. This migration group tends to have a good understanding of their local economy, as they have lived there for a longer time, yet when the time comes for them to migrate for work purposes, they may have already achieved a level of recognition—since this group may be of a higher ability compared to non-movers—that allows them to get jobs in more senior positions that pay better. By and large, our findings show that at least for pecuniary outcomes, more migratory groups document higher levels of satisfaction.

Moving to the rest of the controls, we find that younger researchers present lower levels of salary satisfaction compared to those belonging to the 60-65 age group. This is to be expected, as older workers have more years of experience and thus enjoy higher salaries, a natural outcome of their career progression. On the contrary, younger researchers report higher levels of satisfaction regarding independence, career, social mobility and job location. Our results indicate that female researchers are less satisfied regarding their salary, social status, benefits, and employer's esteem. Past research has shown that women tend to have higher levels of job satisfaction than men (Clark, 1997); this is particularly true for women working part time (Booth and Van Ours, 2008, 2009). Our outcome corroborates the findings of Clark (1997) who argues that different expectations by men and women may drive this result, and we expect more educated women and full time working women to have higher expectations. This is relevant to the vast literature that studies the gender wage gap, which seems to also be present in academia (Della Giusta and Faggian, 2008). Nonetheless, women are more satisfied about their independence, social contribution, career, and



mobility. Past evidence suggests women report higher job satisfaction than men but this observed gender satisfaction differential has decreased over time (Clark, 1997; Kaiser, 2007; Sousa-Poza & Sousa-Poza, 2003). Those having children, report lower satisfaction in the following categories: salary, career, mobility, social status, benefits, and employer's esteem. Having children might affect a family's life in multiple ways. For example, it might be more difficult for the family to move because kids need to attend school, or because there may be higher psychic costs for children leaving their familiar environment—this may affect them later in life. Apart from the obvious cost of raising kids, not being able to move affects a family in that parents may end up with sub-optimal jobs given their abilities. On the contrary, those with children tend to be more satisfied regarding independence and social contribution.

As for researchers who collaborate internationally, we find them being more satisfied salary-wise. They are also more satisfied regarding potential future mobility. This could be a result of an extended network that has important positive effects on someone's academic outcome, but also acts as a bridge for seeking future employment elsewhere. Regarding the type of research, having research in agriculture as our reference group, we find that all other research categories report higher salary satisfaction. The same holds true for career advancement. Those who are mismatched, that is their PhD field and research field are different, document lower satisfaction in salary, career advancement, mobility, and social status. We conjecture that these people were not able to find a good match in the labour market, and, thus, have to work on a field for which they do not have previous experience. This indicates that they may need to invest in the accumulation of new human capital required by their new research activities. This adds negatively to the satisfaction categories mentioned above and its effect might become more pronounced given that researchers enter the labour market at an older age due to their PhD studies.

Interestingly, researchers at an earlier stage of their careers tend to be more satisfied regarding their salary and benefits. One reason for this is that relatively younger researchers may be happier to find a job and move from the frugal life of a PhD student to that of an employee. Furthermore, as people become older and create their own families, they need to update their expectations and lifestyle to meet the financial needs of their extended household.<sup>10</sup> Those with a permanent contract are more satisfied as far as their career, social status, job security, and job location are concerned. We expect these results, as permanent contracts immunize these people from future negative shocks and creates job security. Job security may make individuals less likely to select alternative jobs that might provide them better pecuniary outcomes but also greater uncertainty about the future. Those holding a dual position are less satisfied in all categories except career advancement; this could indicate that these individuals are still struggling to find a better job match. Those who teach moderately, tend to report higher satisfaction regarding their social status, which could reflect the high-status teachers have in some societies, but they do less well in the other satisfaction categories. Finally, we find that more confident researchers tend to document higher levels of satisfaction in all categories.

In tables where we use the multinomial treatment approach, we show the selection outcomes along with likelihood ratio tests (Deb & Trivedi, 2006a). For most cases (except job security), the results suggest that there is endogeneity regarding the migratory path a researcher follows confirming the appropriateness of this method.

**[Insert Table 2 about here]**

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<sup>10</sup> As it is mentioned by Bentley et al. (2013), academics present different levels of job satisfaction at different ages, yet, due to limitations from cross-country data, we cannot precisely infer specific patterns in the relationship between age and satisfaction.

We now proceed with the results of the first stage, where we present marginal effects in Table 3. We find that age is a parameter that enters negatively in someone being a *repeat-migrant*, *university-stayer*, or *late-mover*. This indicates that as people become older, they tend to either not migrate that often, or return to their country of origin. A reason for this could be family responsibilities, such as children, elderly parents that need care, or homesickness. Concerning gender, female researchers tend to be less migratory (Comunian et al., 2017), and generally more likely to be non-movers than men. As for the European programs aimed to further assist in researchers' migration between European countries, such as Euraxess, or programs that aim at providing researchers with funding to perform their research, *i.e.*, the Marie Curie program, we find that researchers who are more familiar with them tend to be more migratory. Those having children are less likely to migrate. Those with a degree in humanities are more likely to be *return-migrants* and at the same time less likely to be *non-movers*.<sup>11</sup> Previous research has found that graduates in humanities' subjects tend to have poorer outcomes in the labour market (Comunian et al., 2014), thus they may need to migrate in order to find a job relevant to their human capital. Finally, those with a degree in medicine are less likely to be *repeat-migrants*.<sup>12</sup>

As for the macroeconomic variables at the country of citizenship, we find that countries with higher growth are more likely to keep their people, by either not "sending" them away, or because they return after their studies. Individuals who come from countries where their rights are protected by the government are less likely to migrate and more likely to return, indicating the importance of institutions in potential migration decisions. Countries with higher human capital

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<sup>11</sup> This is consistent with the findings of Comunian and Jewell (2017), Faggian (2005), and Faggian et al. (2014).

<sup>12</sup> Apart from the usual reasons regarding family issues, language, and cultural barriers, doctors who are willing to move to another country might need to learn anew the healthcare system. In some countries, they may need to re-take medical examinations, a requirement for work and visa purposes. Furthermore, they may be unfamiliar with the technical terms used in the profession in the destination country.

index, tend to produce individuals who are more likely to be *repeat-migrants*, or late-movers. This could indicate that labour supply in these countries is high enough and that people might need to migrate to find a better employment. In countries where the Gini coefficient is higher, we find that people are less likely to be *late-movers* and more likely to be *non-movers*. This at first might come as a surprise, but it could be that those with tertiary education, and in fact PhD holders, enjoy a better life than the rest of the population and, thus, prefer to keep this prerogative by not moving, as they are more likely to be placed further right in the distribution of income. In countries where out-of-pocket health expenditures are higher people are more likely to be *return-migrants*, and less likely to be *university-stayers*, or *late-movers*. Although this is puzzling, it could indicate that people might find the countries where private health system thrives, to be better and more efficient regarding treatment and time. In countries where the compensation for tertiary education is high, people tend to be *non-movers*. Generally, when government expenditures for tertiary education are high, people tend to be less migratory. In countries where unemployment with tertiary degree is high, people are more likely to be *late-movers*. Furthermore, in countries where youth unemployment is higher, researchers tend to be *non-movers*. This could indicate that high unemployment drains resources for potential migration. People may want to migrate—either for study, or work purposes—but they cannot, due to anaemic savings, or appropriate resources to pursue such an act.

**[Insert Table 3 about here]**

## 5.2 Robustness Checks

We perform a battery of tests based on the multinomial treatment approach to check the robustness of our results. First, in Table 4 we repeat the same exercise as that of Table 2, but now we separate our sample into males and females. Regarding salary satisfaction dummy, we find that the value

for *repeat-migrants* is close between the two genders, although males document somewhat higher values. A striking difference is that of *late-movers*. Specifically, we find female *late-movers* to enter with a positive and significant sign (21.9%), while for males we find a significant and negative sign (-6.8%). As for the independence dummy, our results indicate that *repeat-migrants* document higher values for both genders (higher for males). In this category females enter with a positive sign for *return-migrants* and *late-movers* categories. Regarding social contribution for the category of *repeat-migrants* and *late-movers*, females document positive values, while males negative or insignificant values. As for career advancement, we get higher positive coefficients for male *repeat-migrants* than females (23.4% vs. 4%). However, females report higher coefficients for the category of *university-stayers* (24.8% vs. 4.3%). Both genders document a lower satisfaction level regarding career advancement for the case of *late-movers*, with the effect being more pronounced for males.

*Repeat-migrant* males are more satisfied regarding their social status (the coefficient for males is 11% while that of females -6.1%) and job security (10.2% vs. 4.1%). The coefficient for males is also positive for *return-migrants* (4.2%), while this is not the case for females (-6.9%). Being a *late-mover* affects negatively more males than females (-25.7% vs. -16.1%). Females are less satisfied regarding benefits in most migration categories except *university-stayers*. They also document lower values for job security (only 4.1% of *repeat-migrant* females will answer that they are satisfied with the benefits they receive, while this number is 10.2% for male workers). Finally, regarding self-esteem, females are less likely to report lower values compared to males, which indicates that employer's esteem might be more important for males.

**[Insert Table 4 about here]**

Unfortunately, our database does not have an overall measure of satisfaction. Yet, we investigate whether our main results hold when we create cumulated satisfaction measures by (i) adding satisfaction proxies, and (ii) by computing latent satisfaction based on the Item Response Theory (IRT) technique.<sup>13</sup> Our results, found in Table 5, are qualitatively in accordance with our main findings. Specifically, *repeat-migrants* document higher satisfaction for the whole sample, but also for males and females separately. *Return-migrants* have a positive and statistically significant coefficient for the whole sample and males, yet this is not the case for females. Female *late-movers* enter with a positive satisfaction coefficient, while males with a negative.

**[Insert Table 5 around here]**

As a final robustness check, we perform the multinomial treatment approach, based on the migratory behaviour of individuals regarding the location they have chosen for their PhD and whether they have experience working abroad. This differs from our previous approach in that we could potentially capture longer career perspectives. Results can be found in Table 6.

Having the least migratory group as our reference (PhD in their country of citizenship and no work experience abroad) and in accordance with our previous findings, we find that more migratory individuals—captured by the indicator *Work\_PhD1* (have both obtained their PhD abroad and have an employment history abroad)—document higher levels of satisfaction in several categories (i.e., salary, independence, social contribution, social status, benefits, job security, and job location). On the contrary, those who have obtained their PhD in another country, but do not have work experience abroad (*Work\_PhD3*), express lower levels of satisfaction regarding their

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<sup>13</sup> The IRT technique allows for the calculation of latent variables, in our case overall satisfaction, based on people's responses to specific questions. Here, we perform this analysis for IRT models for dichotomous data using the `gsem` command in Stata.

salary, benefits, and job location. Furthermore, we find that those without experience from abroad, report higher values of satisfaction regarding their employer's esteem.

By and large, our results corroborate our main findings and resonate as a signal pinpointing the importance of migration on several aspects of European researchers' job satisfaction categories.

**[Insert Table 6 around here]**

## 6. Conclusion

This work asks whether the migratory paths individuals follow in their lives affect different dimensions of their satisfaction. To answer this question, we based our research on a rich and relatively novel database, MORE2, which studies a sub-sample of the population, European researchers, thus, providing fruitful insights about this specific category.

To deal with the selectivity issue that afflicts migration choices, we utilized a multinomial treatment model approach, where individuals are categorized in five distinct groups given their country of citizenship, the country their PhD was awarded, and, finally, the country where they were employed at the time of the survey. Our findings indicate that more migratory individuals tend to express higher levels of satisfaction compared to those who never moved. This further strengthens our argument that individuals who migrate the most, do so to reap the fruits of their investment in human capital. Through migration, economic agents find better employment opportunities that match their abilities, they further develop their network, and see their careers advance.

Our work stresses the importance of migration for researchers, who oftentimes need to spend a considerable amount of time—a period of stress and uncertainty—until they find an

appropriate employment given their expertise. From the perspective of policy makers, we suggest more initiatives by the EU that will further assist in the process of the diffusion of human capital within the EU via researchers' movement and international collaboration. However, although better job matching may avail researchers and the country they will settle down, it is important to note that this will likely cause a "brain-drain" in the country of origin. At a European level, this would mean that researchers will chose traditional destinations that offer better conditions, both for research and living (e.g., United Kingdom, The Netherlands, Germany, Nordic countries). As such, many countries—a current example are southern European states that face government debt problems, or former communist states—are expected to lose an important part of their human capital that could be crucial for the reformation of their economies and future growth. The problem becomes even worse if we consider that high-skilled migrants were educated there in the first place. For this reason, European leaders need to put more effort in the process of convergence of the European countries.

This work provided important insights about researchers' migration choices and their satisfaction. We suggest the following avenues for future research. First, one can study how perceptions of satisfaction differ based on the culture at the destination country. That is, to study whether migration to countries closer to the country of origin (*e.g.*, culturally or geographically) has any effect on satisfaction. Second, our research showed that there are differences in the satisfaction categories between men and women. Thus, a future research question could shed more light on the differences in satisfaction between male and female researchers.



## References

- Abreu, M., Faggian, A., & McCann, P. (2015). Migration and Inter-Industry Mobility of UK Graduates. *Journal of Economic Geography*, 15(2), 353–385.
- Aksnes, D. W., Rørstad, K., Piro, F. N., & Sivertsen, G. (2013). Are Mobile Researchers More Productive and Cited than Non-Mobile Researchers? A Large-Scale Study of Norwegian Scientists. *Research Evaluation*, 22(4), 215–223.
- Arslan, C., Dumont, J.-C., Kone, Z., Moullan, Y., Parsons, C., Özden, Ç., & Xenogiani, X. (2014). A New Profile of Migrants in the Aftermath of the Recent Economic Crisis (OECD Social, Employment and Migration Working Paper No. 160). Paris, France: OECD.
- Azoulay, P., Zivin, J., & Sampat, B. (2012). *The Diffusion of Scientific Knowledge across Time and Space*. (J. Lerner & S. Stern, Eds.) (Vol. Rate and d). University of Chicago Press.
- Baruffaldi, S. H., & Landoni, P. (2012). Return Mobility and Scientific Productivity of Researchers Working Abroad: The Role of Home Country Linkages. *Research Policy*, 41(9), 1655–1665.
- Baruffaldi, S. H., & Landoni, P. (2016). Mobility Intentions of Foreign Researchers: The Role of Non-economic Motivations. *Industry and Innovation*, 23(1), 87–111.
- Beine, M., Noël, R., & Ragot, L. (2014). Determinants of the international mobility of students. *Economics of Education Review*, 41, 40–54.
- Bentley, P. J., Coates, H., Dobson, I. R., Goedegebuure, L., & Meek, V. L. (2013). Academic Job Satisfaction from an International Comparative Perspective: Factors Associated with Satisfaction across 12 Countries. In *Job Satisfaction around the Academic World* (pp. 239–262). Springer Netherlands.
- Booth, A.L. and Van Ours, J.C. (2008) Job satisfaction and family happiness: the part-time work puzzle, *Economic Journal*, 118, 77-F99.
- Booth, A.L. and Van Ours, J.C. (2009) Hours of work and gender identity: Does part-time work make the family happier? *Economica*, 76, 176-196.
- Clark, A. E. (1996). Job Satisfaction in Britain. *British Journal of Industrial Relations*, 34(2), 189–217.
- Clark, A. E. (1997). Job Satisfaction and Gender: Why are Women so Happy at Work?", *Labour Economics*, 4, 341-372.
- Clark, A. E. (2001). What Really Matters in a Job? Hedonic Measurement Using Quit Data. *Labour Economics*, 8(2), 223–242.
- Clark, A., Georgellis, Y., & Sanfey, P. (1998). Job Satisfaction, Wage Changes, and Quits: Evidence from Germany. *Research in Labor Economics*, 17, 95–121.
- Clark, A.E., Mavromaras, K. and Wei, Z. (2015) Happy to Stay: Job Satisfaction and Retirement. Flinders University, mimeo.

- Comunian R., Faggian, A., & Jewell, S. (2014) Embedding arts and humanities in the creative economy: the role of graduates in the UK, *Environment and Planning C: Government and Policy*, 32, 426-450
- Comunian, R., Faggian, A., & Jewell, S. (2017). *Graduates Migration in the UK: An Exploration of Gender Dynamic and Employment Patterns*. (J. Corcoran & A. Faggian, Eds.). Edward Elgar, New Horizons in Regional Science.
- Comunian, R., & Jewell, S. (2017) Young, talented and highly mobile’: exploring creative human capital and graduates mobility in the UK, unpublished manuscript.
- Credé, M., Tynan, M. C., & Harms, P. D. (2017). Much ado about grit: A meta-analytic synthesis of the grit literature. *Journal of Personality and Social Psychology*, 113(3), 492.
- Czaika, M., & Parsons, C. R. (2017). The Gravity of High-Skilled Migration Policies, *Demography*, 54(2), 603-630.
- De Filippo, D., Casado, E. S., & Gómez, I. (2009). Quantitative and Qualitative Approaches to the Study of Mobility and Scientific Performance: A Case Study of a Spanish University. *Research Evaluation*, 18(3), 191–200.
- Deb, P., & Trivedi, P. K. (2006a). Maximum Simulated Likelihood Estimation of a Negative Binomial Regression Model with Multinomial Endogenous Treatment. *Stata Journal*, 6(2), 246–255.
- Deb, P., & Trivedi, P. K. (2006b). Specification and Simulated Likelihood Estimation of a non-normal Treatment-Outcome Model with Selection: Application to Health Care Utilization. *Econometrics Journal*, 9, 307–331.
- Docquier, F., & Marfouk, A. (2006). *International Migration by Educational Attainment (1990-2000)*. (Ç. Özden & M. Schiff, Eds.). Palgrave Macmillan: New York.
- 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(1), 94-122.
- Döring, T., & Schnellenbach, J. (2006). What do we Know about Geographical Knowledge Spillovers and Regional Growth?: A Survey of the Literature. *Regional Studies*, 40(3), 375–395.
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087.
- Edler, J., Fier, H., & Grimpe, C. (2011). International Scientist Mobility and the Locus of Technology Transfer. *Research Policy*, 40, 791–805.
- Faggian, A. (2005). *Human Capital, Migration and Local Labour Markets: The Role of the Higher Education System in Great Britain*. University of Reading.
- Faggian A, Comunian R, & Li QC (2014) Interregional migration of human creative capital: The case of “Bohemian graduates”, *Geoforum*, 55, 33-42
- Faggian, A., & Della Giusta, M. (2008). An Educated Guess: Gender Pay Gaps in

- Academia. University of Reading, Henley Business School website. Retrieved from: <http://www.henley.ac.uk/web/FILES/management/058.pdf>.
- Faggian, A., McCann, P., & Sheppard, S. (2007a). Human Capital, Higher Education and Graduate Migration: An Analysis of Scottish and Welsh Students. *Urban Studies*, 44(13), 2511–2528.
- Faggian, A., McCann, P., & Sheppard, S. (2007b). Some Evidence that Women Are More Mobile than Men: Gender Differences in U.K. Graduate Migration Behavior. *Journal of Regional Science*, 47(3), 517–539.
- Franzoni, C., Scellato, G., & Stephan, P. (2014). The Mover’s Advantage: The Superior Performance of Migrant Scientists. *Economics Letters*, 122(1), 89–93.
- Freeman, R. B. (2010). Globalization of Scientific and Engineering Talent: International Mobility of Students, Workers, and Ideas and the World Economy. *Economics of Innovation and New Technology*, 19(5), 393–406.
- Goldin, I., Cameron, G., & Balarajan, M. (2011). *How Migration Shaped our World and Will Define our Future*. Princeton University Press: Princeton, NJ.
- Green, F. (2010). Wellbeing, Job Satisfaction and Labour Mobility, *Labour Economics*, 17 (6), 897-903
- Hunter, R. S., Oswald, A. J., & Charlton, B. G. (2009). The Elite Brain Drain. *Economic Journal*, 119(538), F231–F251.
- Ioannidis, J. P. A. (2004). Global Estimates of High-Level Brain Drain and Deficit. *Journal of the Federation of American Societies for Experimental Biology*, 18, 936–939.
- Jewell, S., & Faggian, A. (2014). *Interregional Migration “Wage Premia”: The Case of Creative and Science and Technology Graduates in the UK*. (K. Kourtit, P. Nijkamp, & R. Stimson, Eds.). Springer Berlin Heidelberg.
- Kerr, S. P., Kerr, W., Özden, Ç., & Parsons, C. (2016). Global Talent Flows. *The Journal of Economic Perspectives*, 30(4), 83-106.
- Kaiser, L.C., (2007). Gender-job satisfaction differences across Europe. An indicator for labour market modernization, *International Journal of Manpower*, 28, 75-94.
- Kazakis, P., & Faggian, A. (2017). Mobility, Education and Labor Market Outcomes for U.S. Graduates: Is Selectivity Important? *Annals of Regional Science*, 59(3), 731-758.
- Levin, S. G., & Stephan, P. E. (1999). Are the Foreign Born a Source of Strength for US Science? *Science*, 285(5431), 1213–1214.
- Lévy-Garboua, L., & Montmarquette, C. (2004). Reported Job Satisfaction: What Does it Mean? *The Journal of Socio-Economics*, 33(2), 135–151.
- Light, A., & Nencka, P. (2017, September 28). Predicting Educational Attainment: Does Grit Compensate for Low Levels of Cognitive Ability?. Retrieved from [osf.io/h49dg](https://osf.io/h49dg)
- MacKerron, G. (2012). Happiness economics from 35,000 feet. *Journal of Economic Surveys*, 26(4), 705-735.

- Mahoney, M. J. (1979). Review Paper: Psychology of the Scientist: An Evaluative Review. *Social Studies of Science*, 9(3), 349–375.
- Mahroum, S. (2000). Highly Skilled Globetrotters: Mapping the International Migration of Human Capital. *R&D Management*, 30(1), 23–32.
- Merton, R. K. (1979). *The Sociology of Science: Theoretical and Empirical Investigations*. University of Chicago Press: Chicago.
- Miguélez, E., & Moreno, R. (2014). What Attracts Knowledge Workers? The Role of Space and Social Networks. *Journal of Regional Science*, 54(1), 33–60.
- Møen, J. (2005). Is Mobility of Technical Personnel a Source of R&D Spillovers? *Journal of Labor Economics*, 23(1), 81–114.
- Newland, K. (2009). Circular Migration and Human Development. *Human Development Research Paper*, 42, 1–22.
- Organisation for Economic Co-Operation And Development (OECD). (2005). Trends in International Migration.
- Organisation for Economic Co-Operation And Development (OECD). (2008). The Global Competition for Talent. Mobility of the Highly Skilled.
- Oswald, A., Proto, E., & SgROI, D. (2015). Happiness and Productivity. *Journal of Labor Economics*, 33(4), 789–822.
- Patterson, M., Warr, P., & West, M. (2004). Organizational Climate and Company Productivity: The Role of Employee Affect and Employee Level. *Journal of Occupational and Organizational Psychology*, 77(2), 193–216.
- Roach, M., & Sauermann, H. (2010). A Taste for Science? PhD Scientists' Academic Orientation and Self-Selection into Research Careers in Industry. *Research Policy*, 39(3), 422–434.
- Sabot, R. H. (1987). *Internal Migration and Education*. (G. Psacharopoulos, Ed.) *Economics of Education Research and Studies*. Pergamon Press, Oxford.
- Salt, J. (1997). International Movements of the Highly Skilled. *OECD Social, Employment and Migration Working Papers, No. 3, Paris: OECD Publishing*.
- Sauermann, H., & Cohen, W. M. (2010). What Makes them Tick? Employee Motives and Firm Innovation. *Management Science*, 56(12), 2134–2153.
- Schiller, D., & Revilla-Diez, J. (2010). Local Embeddedness of Knowledge Spillover Agents: Empirical Evidence from German Star Scientists. *Papers in Regional Science*, 89, 275–294.
- Sjaastad, L. A. (1962). The Costs and the Returns of Human Migration. *Journal of Political Economy*, 70(5), 80–93.
- Skeldon, R. (2009). Of skilled Migration, Brain Drains and Policy Responses. *International Migration*, 47(4), 3–29.
- Sousa-Poza, A. & Sousa-Poza, A.A. (2003). Gender differences in job satisfaction in Great Britain, 1991-2000: permanent or transitory??. *Applied Economics Letters*, 10(11), 691-694

- Stern, S. (2004). Do Scientists Pay to be Scientists? *Management Science*, 50(6), 835–853.
- Thorn, K., & Holm-Nielsen, L. (2008). *International Mobility of Researchers and Scientists: Policy Options for Turning a Drain into a Gain*. (A. Solimano, Ed.) (Vol. The Intern). Oxford University Press, Oxford.
- Trippel, M. (2013). Scientific Mobility and Knowledge Transfer at the Interregional and Intraregional Level. *Regional Studies*, 47(10), 1653–1667.
- Veugelers, R., & Bouwel, L. Van. (2015). The Effects of International Mobility on European Researchers: Comparing Intra-EU and U.S. Mobility. *Research in Higher Education*, 56(4), 360–377.
- Williams, A. (2007). International Labour Migration and Tacit Knowledge Transactions: A Multi-Level Perspective. *Global Networks*, 7, 29–50.
- Yankow, J. J. (2003). Migration, Job Change, and Wage Growth: A New Perspective on the Pecuniary Return to Geographic Mobility. *Journal of Regional Science*, 43(3), 483–516.
- Zucker, L., & Darby, M. (2006). Movements of Star Scientists and Engineers and High-Tech Firm Entry. *National Bureau of Economic Research (NBER)*, (Working Paper Number 12172).
- Zucker, L., Darby, M., & Armstrong, J. (2002). Commercializing Knowledge: University Science, Knowledge Capture and Firm Performance in Biotechnology. *Management Science*, 48, 138–153.
- Zucker, L., Darby, M., & Brewer, M. (1998). Intellectual Human Capital and the Birth of U.S. Biotechnology Enterprises. *American Economic Review*, 88, 290–306.

**Table 1: Summary statistics**

Variable	Mean	Std. Dev.	Min	Max
<i>Satisfaction indicators</i>				
Salary	0.59	0.49	0	1
Independence	0.87	0.33	0	1
Social contribution	0.86	0.35	0	1
Career advancement	0.57	0.50	0	1
Mobility perspectives	0.61	0.49	0	1
Social status	0.83	0.38	0	1
Benefits	0.56	0.50	0	1
Job security	0.74	0.44	0	1
Job location	0.89	0.31	0	1
Employer's esteem	0.86	0.34	0	1
<i>Migration indicators</i>				
PhD abroad	0.26	0.44	0	1
Migrant	0.22	0.41	0	1
Worked abroad	0.53	0.50	0	1
Worked abroad and PhD abroad	0.15	0.36	0	1
Worked abroad, no PhD abroad	0.37	0.48	0	1
Not worked abroad, PhD abroad	0.10	0.30	0	1
Neither worked abroad or PhD abroad	0.36	0.48	0	1
Repeat-migrant	0.05	0.22	0	1
Return-migrant	0.15	0.35	0	1
Non-movers	0.64	0.48	0	1
University-stayers	0.06	0.24	0	1
Late-movers	0.11	0.31	0	1
<i>Individual specific characteristics</i>				
Female	0.34	0.47	0	1
International collaboration	0.78	0.41	0	1
Couple with children	0.60	0.49	0	1
Couple w/o children	0.19	0.39	0	1
Single with children	0.01	0.10	0	1
Research: engineering	0.14	0.35	0	1
Research: humanities	0.11	0.31	0	1
Research: medical sciences	0.22	0.41	0	1
Research: natural sciences	0.23	0.42	0	1
Research: social sciences	0.27	0.45	0	1
Degree in engineering	0.14	0.35	0	1
Degree in humanities	0.12	0.32	0	1
Degree in medical sciences	0.18	0.39	0	1
Degree in natural sciences	0.27	0.45	0	1

Degree in social sciences	0.25	0.43	0	1
Research mismatch	0.12	0.33	0	1
Recognized researcher	0.25	0.43	0	1
Established researcher	0.41	0.49	0	1
Permanent contract	0.71	0.45	0	1
Dual position	0.09	0.29	0	1
Teaching: 25% of less	0.30	0.46	0	1
Teaching: 26%-50%	0.38	0.48	0	1
Teaching: 51%-75%	0.16	0.37	0	1
Teaching: 76%-100%	0.06	0.24	0	1
Confidence for the future	3.03	0.82	1	4
Age 25-29	0.03	0.16	0	1
Age 30-34	0.13	0.34	0	1
Age 35-39	0.17	0.37	0	1
Age 40-44	0.19	0.39	0	1
Age 45-49	0.17	0.37	0	1
Age 50-54	0.14	0.35	0	1
Age 55-59	0.10	0.30	0	1
Age	44.83	9.35	25	65
Knows Euraxess	0.13	0.34	0	1
Knows Marie Curie	0.73	0.44	0	1

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**Table 2:** Multinomial Treatment Model results for various satisfaction indicators

VARIABLES	Salary	Ind/nce	Soc. Contr.	Career	Mobility	Social status	Benefits	Job security	Job location	Employer's esteem
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
<i>Reference: Non-mover</i>										
Repeat-migrant	0.097*** (0.002)	0.047*** (0.003)	-0.095*** (0.004)	0.299*** (0.001)	0.239*** (0.002)	0.176*** (0.002)	0.072*** (0.001)	0.129*** (0.049)	0.042*** (0.011)	-0.067*** (0.004)
Return-migrant	-0.364*** (0.002)	-0.000 (0.004)	-0.306*** (0.006)	-0.025*** (0.002)	0.182*** (0.001)	0.090*** (0.001)	0.364*** (0.001)	0.058 (0.046)	0.069*** (0.007)	-0.076*** (0.003)
University-stayer	-0.043*** (0.001)	-0.237*** (0.006)	-0.040*** (0.005)	0.152*** (0.001)	0.334*** (0.001)	0.016*** (0.001)	0.120*** (0.002)	0.041 (0.056)	0.283*** (0.022)	-0.015 (0.011)
Late-mover	0.090*** (0.002)	0.117*** (0.005)	-0.026*** (0.004)	-0.245*** (0.001)	0.032*** (0.004)	-0.258*** (0.001)	0.084*** (0.001)	0.047 (0.045)	0.066*** (0.011)	-0.280*** (0.006)
<i>Reference: Age 60-65</i>										
Age 25-29	-0.060*** (0.002)	0.051*** (0.008)	-0.158*** (0.005)	0.081*** (0.004)	0.138*** (0.003)	0.058*** (0.003)	0.147*** (0.006)	-0.041 (0.062)	0.061*** (0.023)	-0.055*** (0.012)
Age 30-34	-0.112*** (0.002)	0.032*** (0.005)	-0.070*** (0.003)	0.115*** (0.004)	0.102*** (0.004)	-0.018*** (0.003)	0.011*** (0.002)	-0.079** (0.032)	0.041*** (0.012)	-0.028*** (0.006)
Age 35-39	-0.148*** (0.002)	-0.054*** (0.005)	-0.063*** (0.003)	0.063*** (0.002)	-0.002 (0.003)	-0.017*** (0.002)	0.020*** (0.001)	-0.046* (0.024)	-0.009 (0.012)	-0.032*** (0.004)
Age 40-44	-0.188*** (0.002)	-0.102*** (0.004)	-0.083*** (0.003)	-0.004** (0.002)	-0.026*** (0.003)	-0.024*** (0.002)	0.004*** (0.001)	-0.068*** (0.023)	0.029*** (0.011)	-0.011*** (0.002)
Age 45-49	-0.140*** (0.002)	-0.041*** (0.004)	-0.042*** (0.003)	0.033*** (0.001)	-0.014*** (0.002)	0.018*** (0.003)	0.010*** (0.001)	-0.031 (0.021)	0.006 (0.010)	-0.016*** (0.003)
Age 50-54	-0.159*** (0.002)	-0.061*** (0.004)	-0.042*** (0.003)	0.060*** (0.002)	-0.025*** (0.002)	-0.033*** (0.002)	0.051*** (0.001)	0.014 (0.021)	0.007 (0.011)	-0.012** (0.005)



Age 55-59	-0.061*** (0.001)	-0.061*** (0.005)	-0.012*** (0.003)	-0.063*** (0.002)	0.004 (0.002)	-0.006** (0.003)	-	0.029*** (0.001)	0.020 (0.022)	-0.016 (0.011)	-0.052*** (0.004)
Female	-0.020*** (0.001)	0.022*** (0.003)	0.021*** (0.002)	0.011*** (0.001)	0.010*** (0.001)	-0.011*** (0.001)	-	0.025*** (0.001)	0.020 (0.013)	0.006 (0.005)	-0.012*** (0.002)
International collaboration	0.018*** (0.001)	-0.025*** (0.003)	-0.009*** (0.001)	-0.057*** (0.001)	0.043*** (0.001)	-0.017*** (0.001)	-	0.028*** (0.001)	-0.047*** (0.015)	0.019*** (0.006)	-0.044*** (0.004)
<i>Reference: Single without children</i>											
Couple w/ children	-0.068*** (0.001)	0.017*** (0.003)	0.017*** (0.004)	-0.023*** (0.001)	-0.021*** (0.001)	-0.008*** (0.001)	-	0.064*** (0.001)	-0.021 (0.017)	0.028*** (0.006)	-0.022*** (0.002)
Couple w/o children	-0.113*** (0.001)	-0.023*** (0.003)	0.015*** (0.002)	-0.051*** (0.002)	-0.002 (0.001)	-0.037*** (0.001)	-	0.078*** (0.001)	-0.039* (0.021)	0.039*** (0.007)	-0.058*** (0.004)
Single w/ children	-0.027*** (0.003)	0.049*** (0.003)	0.044*** (0.009)	-0.203*** (0.002)	-0.093*** (0.007)	-0.136*** (0.002)	-	0.174*** (0.001)	-0.101 (0.071)	0.070*** (0.009)	0.058*** (0.010)
<i>Reference: Research in agriculture</i>											
Research: engineering	0.026*** (0.002)	0.012** (0.006)	0.108*** (0.005)	0.015*** (0.002)	0.099*** (0.003)	-0.114*** (0.002)	-	0.033*** (0.002)	-0.003 (0.038)	-0.023** (0.011)	-0.002 (0.004)
Research: humanities	0.051*** (0.002)	-0.020*** (0.004)	0.068*** (0.003)	0.025*** (0.001)	-0.023*** (0.003)	-0.076*** (0.002)	-	0.081*** (0.002)	-0.016 (0.039)	0.034*** (0.010)	-0.013*** (0.003)
Research: medical	0.079*** (0.001)	-0.017*** (0.004)	0.098*** (0.005)	0.078*** (0.001)	-0.008*** (0.003)	-0.041*** (0.002)	-	0.011*** (0.002)	0.018 (0.037)	0.000 (0.008)	0.056*** (0.002)
Research: natural sciences	0.063*** (0.002)	0.030*** (0.004)	0.052*** (0.004)	0.018*** (0.002)	-0.004 (0.003)	-0.075*** (0.003)	-	0.005*** (0.002)	0.003 (0.037)	0.029*** (0.007)	0.036*** (0.004)
Research: social sciences	0.057*** (0.001)	0.008* (0.005)	0.063*** (0.005)	-0.001 (0.001)	0.034*** (0.003)	-0.066*** (0.002)	-	0.034*** (0.002)	-0.001 (0.037)	-0.015** (0.007)	0.049*** (0.003)

Research mismatch	-0.035*** (0.001)	0.000 (0.003)	0.003** (0.001)	-0.056*** (0.001)	-0.040*** (0.001)	-0.037*** (0.001)	-	0.039*** (0.001)	-0.008 (0.019)	0.012** (0.005)	0.005** (0.002)
<i>Reference: Leading researcher</i>											
Recognized researcher	0.033*** (0.001)	-0.084*** (0.006)	-0.053*** (0.007)	-0.063*** (0.002)	-0.049*** (0.002)	0.004*** (0.001)	0.012*** (0.001)	-0.032 (0.022)	0.038*** (0.010)	0.017*** (0.005)	
Established researcher	0.015*** (0.001)	-0.020*** (0.002)	-0.030*** (0.003)	-0.051*** (0.001)	-0.057*** (0.001)	-0.010*** (0.001)	0.014*** (0.001)	0.011 (0.013)	0.037*** (0.006)	-0.021*** (0.004)	
Permanent contract	-0.002** (0.001)	-0.016*** (0.003)	0.012 (0.007)	0.031*** (0.001)	-0.027*** (0.002)	0.023*** (0.001)	0.012*** (0.001)	0.477*** (0.023)	0.035*** (0.009)	-0.027*** (0.002)	
Dual position	-0.032*** (0.002)	-0.000 (0.007)	-0.003 (0.002)	0.076*** (0.001)	0.000 (0.001)	-0.009*** (0.002)	0.022*** (0.001)	0.012 (0.021)	0.061*** (0.008)	-0.037*** (0.003)	
<i>Reference: No teaching</i>											
Teaching 25% or less	-0.062*** (0.001)	-0.008*** (0.003)	0.006 (0.004)	0.039*** (0.001)	0.009*** (0.002)	0.035*** (0.002)	-0.001 (0.001)	-0.001 (0.030)	-0.008 (0.009)	-0.003 (0.005)	
Teaching 26% to 50%	-0.048*** (0.001)	0.006* (0.003)	-0.026*** (0.003)	0.042*** (0.002)	-0.036*** (0.001)	0.049*** (0.002)	0.028*** (0.001)	0.054* (0.029)	-0.020** (0.010)	-0.006 (0.005)	
Teaching 51% to 75%	-0.080*** (0.002)	-0.019*** (0.005)	-0.042*** (0.003)	0.001 (0.002)	-0.067*** (0.002)	0.047*** (0.002)	0.042*** (0.001)	0.041 (0.032)	0.065*** (0.010)	-0.043*** (0.008)	
Teaching 76% to 100%	-0.124*** (0.002)	-0.072*** (0.005)	-0.034*** (0.010)	-0.038*** (0.002)	-0.100*** (0.002)	-0.031*** (0.002)	0.025*** (0.001)	0.028 (0.037)	0.068*** (0.010)	-0.123*** (0.004)	
Confidence for the future	0.065*** (0.001)	0.083*** (0.001)	0.073*** (0.001)	0.216*** (0.001)	0.139*** (0.001)	0.104*** (0.001)	0.094*** (0.000)	0.097*** (0.009)	0.058*** (0.003)	0.066*** (0.002)	
Country indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Constant	0.384*** (0.006)	0.781*** (0.011)	-0.198*** (0.014)	-0.263*** (0.005)	0.306*** (0.009)	0.362*** (0.004)	0.547*** (0.004)	0.203* (0.113)	0.785*** (0.024)	0.420*** (0.008)	
<i>Selection outcomes</i>											
Ln( $\sigma$ )	-5.795***	-4.979***	-5.303***	-5.899***	-5.840***	-5.588***	-	6.052***	-1.178***	3.955***	-5.073***

	(0.150)	(0.119)	(0.132)	(0.169)	(0.108)	(0.129)	(0.089)	(0.077)	(0.111)	(0.140)
$\lambda$ repeat-migrant	-0.090*** (0.001)	-0.017*** (0.001)	0.031*** (0.001)	-0.217*** (0.000)	-0.280*** (0.000)	-0.081*** (0.000)	0.006*** (0.000)	-0.074* (0.038)	0.052*** (0.005)	-0.007*** (0.001)
$\lambda$ return-migrant	0.414*** (0.000)	-0.007*** (0.001)	0.340*** (0.001)	0.007*** (0.000)	-0.179*** (0.000)	-0.085*** (0.001)	0.456*** (0.000)	-0.061 (0.044)	0.026*** (0.002)	0.014*** (0.001)
$\lambda$ university-stayer	0.087*** (0.001)	0.321*** (0.001)	-0.028*** (0.001)	-0.122*** (0.000)	-0.313*** (0.000)	-0.017*** (0.001)	0.105*** (0.000)	-0.061 (0.042)	0.292*** (0.002)	-0.038*** (0.001)
$\lambda$ late-mover	-0.085*** (0.000)	-0.080*** (0.001)	-0.026*** (0.002)	0.377*** (0.000)	-0.021*** (0.001)	0.354*** (0.000)	0.045*** (0.000)	-0.037 (0.045)	0.014*** (0.003)	0.345*** (0.001)
Observations	3,161	3,185	3,051	3,023	2,978	3,059	2,978	3,162	3,189	3,081
Wald $\chi^2$	1904537.3 2	68484.93	225487.03	4331113. 6	6296785.4 1	1109147. 6	3351261	3376.36	6510.12	174160.96
Log pseudolikelihood	-4231.675	- 3449.5253	- 3329.5182	-4138.726	-4124.9906	-3558.262	-4126.83	-3521.417	-3182.68	- 3396.4367
Likelihood Ratio (LR)	268.6952	185.10924	214.36383	253.1064 3	266.64579	261.7866 5	310.8413	2.190786 7	81.55287	199.04232
LR p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.701	0.000	0.000

NOTES: This table documents results obtained through a multinomial treatment model with 2000 simulation draws. Robust standard errors in parentheses. Stars indicate significance levels, \*\*\* at 1%. \*\* at 5%, and \* at 10% respectively.

**Table 3** First stage results for the multinomial treatment model

	Repeat-migrant	Return-migrant	Non-mover	University-stayer	Late-mover
Age	-0.0015*** (0.0004)	0.0028*** (0.0005)	0.0041*** (0.0008)	-0.0018*** (0.0005)	-0.0035*** (0.0006)
Female	-0.0206** (0.0085)	-0.0025 (0.0104)	0.0430*** (0.0158)	-0.0002 (0.0078)	-0.0197* (0.0110)
Knows Euraxess	0.0397*** (0.0078)	0.0086 (0.0138)	-0.0937*** (0.0201)	0.0044 (0.0100)	0.0410*** (0.0128)
Knows Marie Curie	0.0148 (0.0096)	0.0253** (0.0121)	-0.0661*** (0.0172)	-0.0028 (0.0080)	0.0287** (0.0120)
Couple w/ children	-0.0098 (0.0084)	-0.0103 (0.0130)	0.0481*** (0.0185)	0.0040 (0.0096)	-0.0320*** (0.0118)
Couple w/o children	0.0073 (0.0094)	0.0141 (0.0157)	-0.0268 (0.0220)	0.0203** (0.0102)	-0.0148 (0.0144)
Single w/ children	0.0386 (0.0290)	0.0528 (0.0367)	-0.1306* (0.0766)	0.0456 (0.0332)	-0.0063 (0.0654)
Degree: engineering	-0.0094 (0.0178)	0.0128 (0.0247)	-0.0204 (0.0459)	0.0042 (0.0269)	0.0127 (0.0355)
Degree: humanities	0.0048 (0.0187)	0.0529** (0.0253)	-0.1095** (0.0474)	0.0168 (0.0271)	0.0350 (0.0359)
Degree: medical sciences	-0.0342* (0.0194)	0.0183 (0.0241)	-0.0240 (0.0454)	0.0167 (0.0266)	0.0232 (0.0351)
Degree: natural sciences	-0.0005 (0.0165)	0.0141 (0.0238)	-0.0657 (0.0444)	0.0140 (0.0262)	0.0381 (0.0343)
Degree: social sciences	0.0106 (0.0165)	0.0280 (0.0234)	-0.0522 (0.0443)	0.0140 (0.0261)	-0.0005 (0.0349)
Growth rate of GDP per capita	-0.2478*** (0.0880)	0.5240*** (0.2029)	0.2371 (0.2103)	-0.0113 (0.0980)	-0.5021*** (0.2757)
Empowerment Rights Index	-0.0321*** (0.0063)	0.0323*** (0.0121)	0.1195*** (0.0185)	-0.0356*** (0.0067)	-0.0841*** (0.0119)
Human Capital Index	0.0648* (0.0354)	-0.0947** (0.0458)	-0.1214** (0.0659)	0.0483 (0.0370)	0.1030** (0.0464)
Gini	0.0024 (0.0019)	-0.0073 (0.0061)	0.0154** (0.0073)	0.0007 (0.0028)	-0.0112*** (0.0038)
Openness	-0.0004 (0.0003)	0.0017*** (0.0006)	0.0009 (0.0007)	-0.0007* (0.0004)	-0.0016*** (0.0005)
Polity IV	-0.0002 (0.0020)	-0.0005 (0.0045)	0.0016 (0.0055)	-0.0032* (0.0018)	0.0023 (0.0033)
Employment protection	-0.0088 (0.0110)	0.0108 (0.0301)	-0.0039 (0.0278)	-0.0008 (0.0166)	0.0027 (0.0257)

Gross savings (% GDP)	-0.0013 (0.0017)	-0.0088** (0.0041)	0.0038 (0.0034)	0.0052*** (0.0016)	0.0011 (0.0027)
Health expenditure, private (% of GDP)	-0.0064 (0.0098)	0.0823*** (0.0163)	-0.0174 (0.0210)	-0.0253*** (0.0084)	-0.0332** (0.0132)
Compensation (tert. educ)	-0.0004 (0.0010)	-0.0032 (0.0021)	0.0043* (0.0024)	-0.0003 (0.0008)	-0.0005 (0.0016)
Govt. expend. (tert. Educ.)	-0.0069*** (0.0024)	0.0033 (0.0050)	0.0239*** (0.0072)	-0.0062** (0.0025)	-0.0141*** (0.0045)
Unemployment (w/ tert. Degree)	0.0030 (0.0019)	0.0016 (0.0032)	-0.0145*** (0.0053)	-0.0002 (0.0023)	0.0101*** (0.0034)
Youth unemployment	-0.0034** (0.0014)	0.0018 (0.0020)	0.0092*** (0.0029)	-0.0006 (0.0013)	-0.0070*** (0.0018)
Observations			3331		
Wald $\chi^2$			767.77		
Prob > $\chi^2$			0.000		
Pseudo R <sup>2</sup>			0.1808		
Log pseudolikelihood			-2707.051		

NOTES: The coefficients shown are marginal effects for the five migratory groups based on individual specific and country-of-origin characteristics. Robust standard errors are in parentheses. Stars indicate significance levels, \*\*\* at 1%. \*\* at 5%, and \* at 10% respectively.

**Table 4: Multinomial Treatment Model by satisfaction category and gender**

	Salary	Indep/nce	Soc. contrib.	Career advance.	Mobility persp.	Social status	Benefits	Job security	Job location	Empl. esteem
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
<i>PANEL A: Females</i>										
Repeat-migrants	0.117*** (0.009)	0.021** (0.009)	0.034*** (0.010)	0.040*** (0.011)	-0.065*** (0.007)	-0.061*** (0.006)	-0.135*** (0.004)	0.041** (0.017)	-0.144 (0.101)	-0.034** (0.015)
Return-migrants	-0.379*** (0.003)	0.059*** (0.008)	-0.092*** (0.019)	-0.429*** (0.004)	0.137*** (0.007)	-0.069*** (0.005)	0.246*** (0.002)	-0.083*** (0.008)	0.156 (0.118)	-0.013 (0.015)
University-stayer	0.008 (0.006)	-0.216*** (0.008)	-0.302*** (0.009)	0.248*** (0.004)	-0.372*** (0.005)	0.011 (0.012)	0.225*** (0.003)	0.161*** (0.013)	0.095* (0.050)	-0.161*** (0.012)
Late-mover	0.219*** (0.010)	0.163*** (0.007)	0.188*** (0.015)	-0.043*** (0.004)	0.310*** (0.011)	-0.161*** (0.006)	0.140*** (0.004)	0.048*** (0.016)	-0.203*** (0.046)	0.134*** (0.010)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,102	1,108	1,063	1,064	1,040	1,059	1,036	1,104	1,111	1,072
<i>PANEL B: Males</i>										
Repeat-migrants	0.125*** (0.007)	0.094** (0.047)	-0.121** (0.049)	0.234*** (0.008)	0.250 (0.197)	0.110*** (0.016)	-0.019** (0.008)	0.102* (0.056)	-0.009 (0.046)	-0.387*** (0.023)
Return-migrants	-0.225*** (0.007)	-0.016 (0.041)	-0.265*** (0.030)	-0.041*** (0.007)	0.208*** (0.064)	0.042*** (0.010)	0.308*** (0.012)	0.006 (0.120)	0.072** (0.030)	-0.078*** (0.017)
University-stayer	-0.120*** (0.014)	-0.136** (0.058)	-0.107 (0.083)	0.043*** (0.015)	0.165 (0.141)	-0.058*** (0.018)	0.201*** (0.013)	0.100 (0.070)	-0.245*** (0.051)	-0.021 (0.024)
Late-mover	-0.068*** (0.005)	0.028 (0.033)	0.037 (0.037)	-0.221*** (0.010)	-0.106 (0.098)	-0.257*** (0.012)	0.245*** (0.008)	-0.021 (0.097)	-0.024 (0.034)	-0.062*** (0.017)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,059	2,077	1,988	1,959	1,938	2,000	1,942	2,058	2,078	2,009

Notes: This is a truncated table following the same specification as Table 2. \*\*\* indicates significance at 1%, \*\* at 5%, and \* at 10%.

**Table 5: Migratory decisions and cumulative satisfaction measures**

	Whole sample		Females		Males	
	Satisfaction (sum)	Satisfaction (IRT)	Satisfaction (sum)	Satisfaction (IRT)	Satisfaction (sum)	Satisfaction (IRT)
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Main results (Reference: non-mover)</i>						
Repeat-migrants	0.746** (0.304)	0.203** (0.088)	0.756*** (0.030)	0.144*** (0.007)	0.800** (0.317)	0.301*** (0.016)
Return-migrants	0.879*** (0.174)	0.421*** (0.056)	-0.675*** (0.033)	-0.311*** (0.025)	1.081*** (0.138)	0.429*** (0.011)
University-stayers	0.417 (0.317)	-0.124 (0.094)	-0.206*** (0.024)	-0.359*** (0.036)	0.190 (0.275)	0.027** (0.013)
Late-movers	0.120 (0.196)	0.212*** (0.061)	0.680*** (0.070)	0.393*** (0.012)	-0.479*** (0.156)	-0.215*** (0.010)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Country indicators	Yes	Yes	Yes	Yes	Yes	Yes
<i>Selection results</i>						
ln( $\sigma$ )	0.219 (0.138)	-1.088*** (0.164)	-3.271*** (0.192)	-4.600*** (0.187)	-1.040 (1.339)	-3.810*** (0.197)
$\lambda$ : repeat-migrants	-0.693*** (0.249)	-0.140** (0.061)	-1.040*** (0.011)	-0.011 (0.009)	-0.727*** (0.077)	-0.299*** (0.003)
$\lambda$ : return-migrants	-1.037*** (0.149)	-0.494*** (0.039)	0.599*** (0.011)	0.367*** (0.006)	-1.536*** (0.214)	-0.559*** (0.003)
$\lambda$ : university-stayers	-0.483* (0.266)	0.159** (0.063)	0.179*** (0.007)	0.545*** (0.004)	-0.336*** (0.098)	-0.139*** (0.003)
$\lambda$ : late-movers	-0.245 (0.212)	-0.230*** (0.052)	-1.455*** (0.016)	-0.195*** (0.003)	0.553*** (0.165)	0.196*** (0.003)
Obs.	3,238	3,239	1,128	1,128	2,111	2,111
LR-test	11.25	9.76	153.56	174.07	8.94	121.59
LR-test p-value	0.024	0.044	0.000	0.000	0.06	0.000

Notes: This is a truncated table following the same specification as Table 2. \*\*\* indicates significance at 1%, \*\* at 5%, and \* at 10%.

**Table 6:** Multinomial Treatment Model results for various satisfaction indicators (alternative migration proxies)

Variables	Salary	Ind/nce	Social contrib.	Career	Mobility	Social status	Benefits	Job security	Job location	Empl. esteem
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
<i>Reference: Neither worked or obtained PhD abroad -- Work_PhD4</i>										
Work_PhD1	0.197*	0.008**	0.136***	0.012	0.173	0.150***	0.441***	0.146**	0.040***	-0.046***
	(0.109)	(0.004)	(0.002)	(0.076)	(0.119)	(0.002)	(0.001)	(0.074)	(0.007)	(0.002)
Work_PhD2	0.064	-0.301***	0.156***	-0.127	0.135***	0.204***	0.097***	0.200***	0.045***	-0.316***
	(0.070)	(0.003)	(0.001)	(0.166)	(0.031)	(0.002)	(0.001)	(0.033)	(0.005)	(0.004)
Work_PhD3	-0.305***	0.086***	0.095***	0.182	-0.237***	0.073***	-0.007***	0.089	-0.300***	-0.046***
	(0.109)	(0.004)	(0.002)	(0.126)	(0.084)	(0.004)	(0.001)	(0.084)	(0.011)	(0.004)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country indicators	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>Selection outcomes</i>										
Ln( $\sigma$ )	-2.246***	-4.850***	-5.338***	-0.929***	-1.540***	-5.273***	-5.806***	-1.845***	-4.177***	-5.057***
	(0.739)	(0.115)	(0.078)	(0.085)	(0.254)	(0.108)	(0.115)	(0.202)	(0.110)	(0.132)
$\lambda$ work_PhD1	-0.222*	-0.028***	-0.211***	-0.067	-0.162	-0.193***	-0.455***	-0.144	-0.053***	-0.024***
	(0.131)	(0.001)	(0.001)	(0.077)	(0.129)	(0.001)	(0.000)	(0.089)	(0.003)	(0.001)
$\lambda$ work_PhD2	-0.108	0.345***	-0.235***	0.130	-0.116***	-0.296***	-0.112***	-0.245***	-0.109***	0.356***
	(0.074)	(0.001)	(0.001)	(0.198)	(0.030)	(0.001)	(0.000)	(0.038)	(0.003)	(0.001)
$\lambda$ work_PhD3	0.349***	-0.051***	-0.159***	-0.148	0.360***	-0.127***	0.086***	-0.106	0.284***	0.012***
	(0.106)	(0.001)	(0.001)	(0.133)	(0.078)	(0.000)	(0.000)	(0.083)	(0.002)	(0.001)
Observations	3,161	3,185	3,051	3,023	2,978	3,059	2,978	3,162	3,189	3,081
Wald $\chi^2$	3413.23	78975.65	845986.54	1699.31	1303.66	216830	1959469	3342.93	17941.23	158122.93
Prob > $\chi^2$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Log-likelihood	-5202.7992	-4301.1267	-4146.9579	-5078.9813	-5062.668	-4442.4773	-4968.8758	-4381.5443	-4014.6057	-4220.3684
LR test	22.581772	192.66092	222.03972	3.4735047	9.6904863	171.29352	244.16982	8.6687427	133.58177	200.44493
LR p-value	0.000	0.000	0.000	0.324	0.021	0.000	0.000	0.034	0.000	0.000

NOTES: This is a truncated table following the same specification as Table 2. *Work\_PhD1* indicates those individuals who were awarded their PhD abroad and have an experience of working abroad, *Work\_PhD2* is for those who have obtained their PhD degree in the country of their citizenship and have a working experience abroad, while



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*Work\_PhD3* is for those who did their PhD abroad, but did not work abroad. *Work\_PhD4* refers to those who have neither moved either for obtaining their PhD or to work abroad. This table documents results obtained through a multinomial treatment model with 2000 simulation draws. Constant term is not reported. Robust standard errors in parentheses. \*\*\* indicates significance at 1%, \*\* at 5%, and \* at 10%.

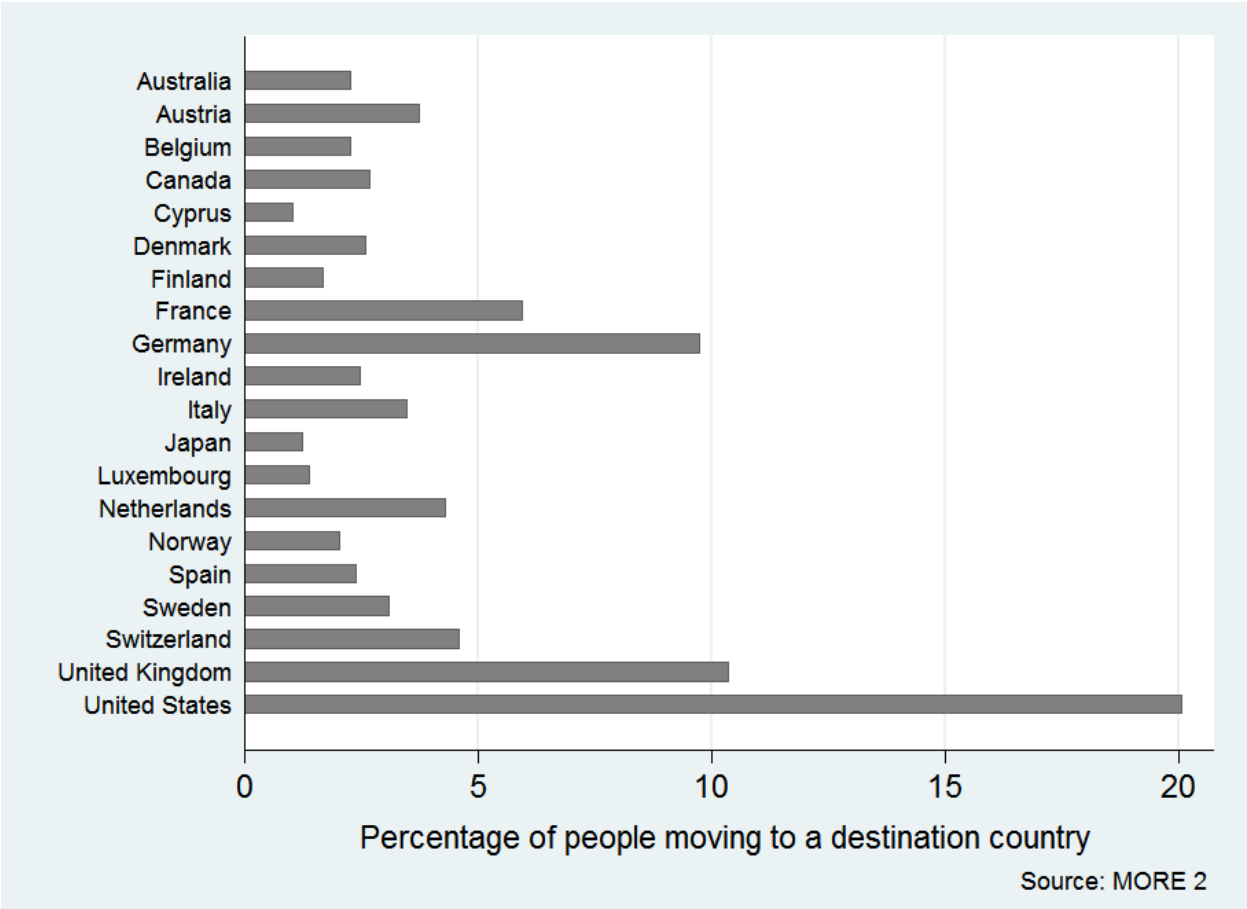


Figure 1: Moves to international destinations for European citizens.

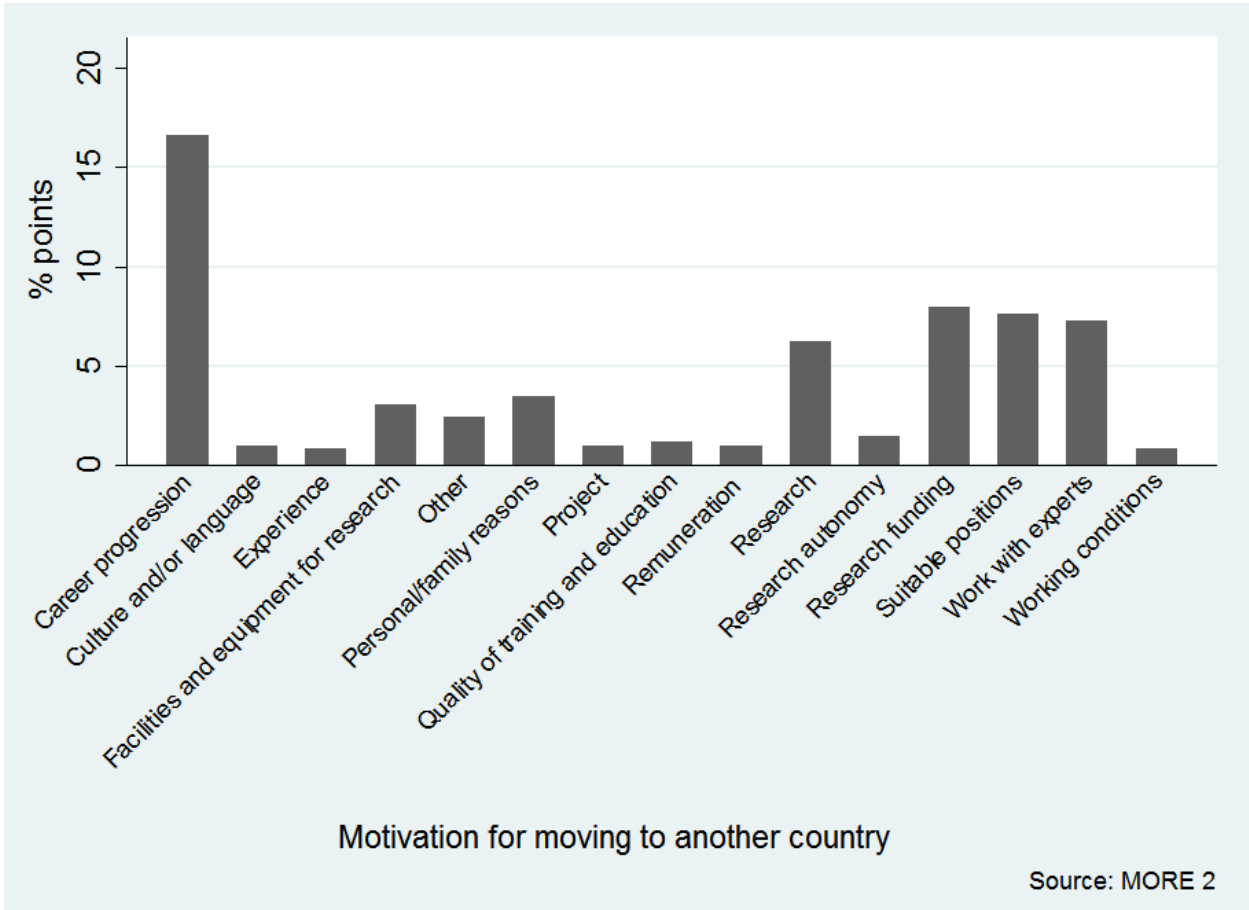


Figure 2: Motivation for moving to another country based on the last international move.

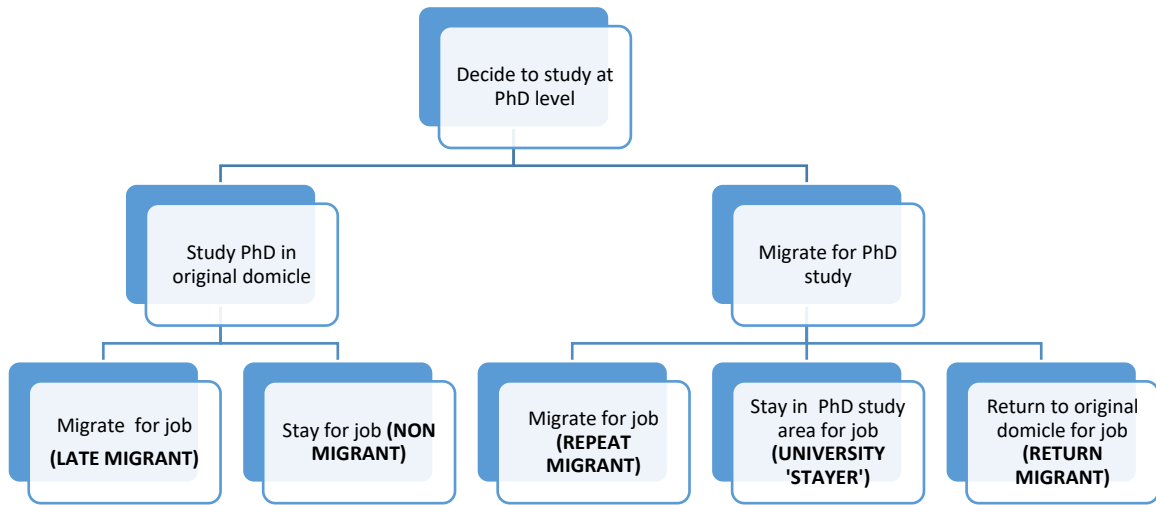


Figure 3: Sequential migration typologies. *Source:* Jewell and Faggian (2014)

## Appendix

**Table A1:** Country list based on the country of employment

<i>Core countries of the survey</i>	
Austria	Lithuania
Belgium	Luxembourg
Bulgaria	Macedonia (FYROM)
Croatia	Malta
Cyprus	Netherlands
Czech Republic	Norway
Denmark	Poland
Estonia	Portugal
Finland	Romania
France	Slovakia
Germany	Slovenia
Greece	Spain
Hungary	Sweden
Iceland	Switzerland
Ireland	Turkey
Italy	United Kingdom
Latvia	
<i>Western countries (not related to the former Eastern Bloc)</i>	
Austria	Italy
Belgium	Luxembourg
Cyprus	Malta
Denmark	Netherlands
Finland	Norway
France	Portugal
Germany	Spain
Greece	Sweden
Iceland	Switzerland
Ireland	United Kingdom

**Table A2: Description of variables**

Variable	Description	Source
Salary	= 1 if person satisfied with salary	MORE2
Independence	= 1 if person satisfied with independence in his employment	MORE2
Social contribution	= 1 if person satisfied with his/her social contribution	MORE2
Career advancement	= 1 if person satisfied with his/her career advancement	MORE2
Mobility perspectives	= 1 if person satisfied with the mobility perspectives of his/her job	MORE2
Social status	= 1 if person satisfied with his/her social status	MORE2
Benefits	= 1 if person satisfied with the benefits he/she enjoys	MORE2
Job security	= 1 if person satisfied with job security	MORE2
Job location	= 1 if person satisfied with job location	MORE2
Employer's esteem	= 1 if person satisfied with employer's esteem	MORE2
PhD abroad	= 1 if person was awarded a PhD outside his country of citizenship	MORE2
Work_PhD1	= 1 if person was awarded a PhD abroad and has experience working abroad	Own calculation based on MORE2
Work_PhD2	= 1 if person worked abroad, but did not receive a PhD abroad	Own calculation based on MORE2
Work_PhD3	= 1 if person did not work abroad, but PhD was awarded abroad	Own calculation based on MORE2
Work_PhD4	= 1 if the person has neither worked abroad or was awarded a PhD from abroad	Own calculation based on MORE2
Migrant	= 1 if a person's country of citizenship differs from the country of his/her employment	Own calculation based on MORE2
Repeat-migrant	= 1 if a person's country of employment differs from the country he/she obtained the PhD degree and the country of citizenship	Own calculation based on MORE2
Return-migrant	= 1 if a person was awarded a PhD degree in another country from his citizenship, but eventually returned home.	Own calculation based on MORE2
Non-mover	= 1 for those individuals who did not make any change in their residence up to the time of this survey	Own calculation based on MORE2
University-stayer	= 1 for those who migrated to a different country from their origin to get their PhD and stayed there for employment	Own calculation based on MORE2
Late-mover	= 1 for those who obtained their PhD in the same country as their origin, but move later for employment	Own calculation based on MORE2
Female	= 1 if the person is female	MORE2
International collaboration	= 1 if the person has cooperation with colleagues internationally	MORE2
Couple with children	= 1 if a couple has children	MORE2
Couple w/o children	= 1 if a couple does not have any children	MORE2
Single with children	= 1 if person is single and has children	MORE2
Single w/o children	= 1 if person is single without children	MORE2
Research: engineering	= 1 if person does research in this field	MORE2
Research: humanities	[same as above]	MORE2
Research: medical sciences	[same as above]	MORE2
Research: natural sciences	[same as above]	MORE2
Research: social sciences	[same as above]	MORE2
Degree in engineering	= 1 if person was awarded the PhD in this field	MORE2
Degree in humanities	[same as above]	MORE2
Degree in medical sciences	[same as above]	MORE2

Degree in natural sciences	[same as above]	MORE2
Degree in social sciences	[same as above]	MORE2
Research mismatch	= 1 if research field is different from degree field	Own calculation based on MORE 2
Recognized researcher	= 1 for PhD holder or equivalent who is not yet fully independent; post-doctoral stage)	MORE2
Established researcher	= 1 for researcher who has developed a level of independence; research specialist or manager, senior lecturer, senior scientist, etc.	MORE2
Leading researcher	= 1 for researcher leading his/her research area or field; professor stage)	MORE2
Permanent contract	= 1 if a person is under permanent contract	MORE2
Dual position	= 1 if person holds a dual position	MORE2
Teaching indicators	These are dummies indicating the amount of time a person gives for teaching activities	MORE2
Confidence for the future	Takes values 1 to 4, with 4 indicating extreme confidence	MORE2
Age	= 2012 – year of birth	Own calculation based on MORE2
Age a-b	These are dummies for people belonging to this age group	Own calculation based on MORE2
Knows Euraxess	= 1 if person knows Euraxess program	MORE2
Knows Marie Curie	= 1 if person knows Marie Curie program	MORE2
Growth rate of GDP per capita	This is the growth rate of GDP per capita for the country of origin	Penn World Tables 7.1
Empowerment Rights Index	This is an additive index constructed from the Foreign Movement, Domestic Movement, Freedom of Speech, Freedom of Assembly & Association, Workers' Rights, Electoral Self-Determination, and Freedom of Religion indicators. It ranges from 0 (no government respect for these seven rights) to 14 (full government respect for these seven rights).	CIRI
Human Capital Index	Human Capital Index. Index of human capital per person, based on years of schooling and returns to education.	Penn World Tables 7.1
Gini	GINI index (World Bank estimate)	World Development Indicators
Openness	Calculated as (Imports + Exports)/2	World Development Indicators
Polity	Polity scale (-10 strongly autarchic, 10 strongly democratic) Version 1 of this indicator measures the strictness of regulation of individual dismissal of employees on regular/indefinite contracts. It incorporates 8 data items.	Polity IV
Employment protection		EPL -- OECD
Gross savings (% GDP)	Gross savings (% of GDP)	World Development Indicators
Health expenditure, private (% of GDP)	Health expenditure, private (% of GDP)	World Development Indicators
Compensation (tert. educ)	All education staff compensation, tertiary (% of total expenditure in tertiary public institutions)	World Development Indicators
Govt. expend. (tert. Educ.)	Expenditure on tertiary as % of government expenditure on education (%)	World Development Indicators
Unemployment (w/ tert. Degree)	Unemployment with tertiary education (% of total unemployment)	World Development Indicators
Youth unemployment	Unemployment, youth total (% of total labor force ages 15-24) (national estimate)	World Development Indicators





**Table A3:** List of variables used in each stage

Variable Name	Main Stage	First stage
<i>Individual level variables</i>		
Age	✓	✓
Female	✓	✓
Knows Euraxess		✓
Knows Marie Curie		✓
Marital and children status indicators	✓	✓
PhD degree field indicators		✓
Research field (after PhD)	✓	
Status of researcher	✓	
Contract type	✓	
Dual position	✓	
Teaching indicators	✓	
Confidence for the future	✓	
Migration indicators	✓	
<i>Country of origin variables</i>		
Growth rate of GDP per capita		✓
Empowerment Rights Index		✓
Human Capital Index		✓
Gini		✓
Openness		✓
Polity IV		✓
Employment protection		✓
Gross savings (% GDP)		✓
Health expenditure, private (% of GDP)		✓
Compensation (tertiary education)		✓
Government expenditure (tertiary education)		✓
Unemployment (w/ tertiary degree)		✓
Youth unemployment		✓