

## RESEARCH ARTICLE

WILEY

# Highly educated skilled migrants are attracted to global cities: The case of Greek PhD holders

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## Abstract

In this paper, we investigate to what extent highly educated skilled Greek migrants are attracted to global cities. With the use of a novel database, we find that highly educated Greek migrants are attracted more to cities indexed as global than to cities that are not indexed as global. Moreover, the more the international indexes that list a city as global, the greater the number of such migrants this city receives; that is, these migrants prefer to live in those global cities that are considered to have the most attributes to be classified as such. We provide information on which specific cities these migrants live in, thus filling a gap in the relevant literature. Our data further support a well-documented argument that there is a mutual beneficial relationship between skilled migrants and global cities to the extent that global cities create a favourable socio-economic environment that attracts highly skilled migrants.

## KEYWORDS

brain drain, global cities, Greece, highly skilled migration, PhD holders

## 1 | INTRODUCTION

In her seminal work, Sassen (1991) argued that the global economy is governed by a relatively small number of urban centres, namely, Global Cities, cities wherein banking, capital and high-level services, and high-tech production are concentrated. These advanced services and high-tech production tasks require a highly educated and skilled labour force. In that sense, a high demand for skilled labour constitutes a special feature of global city labour markets (Castells, 2000).

The need for a specialised labour force is further increased by the digital revolution and the importance of information communication technology (ICT) for the knowledge economy of the cities. Various notions and policy models such as wired cities (Dutton, 1987), creative cities (Florida, 2005), knowledge-based cities (Carrillo, 2006), and digital cities (Komninos, 2008) reflect this reality. The later concept of smart cities (Tranos & Gertner, 2012), describing territories that build their innovative capacity in the creativity of their labour and in their ability to produce and absorb knowledge, indicates the major role that skilled labour plays in the formation of knowledge-based urban economies. Indeed, smart industries attract skilled people, who, in turn, help create and cement their role as “smart” cities, thus creating a

positive feedback loop (Betz et al., 2016). In fact, the capacity of smart cities to attract highly skilled human capital may be considered an important reason behind the growing disparities between these cities and the cities, especially those at the European periphery, that have been left behind in recent decades. (Buch et al., 2017).

Furthermore, the globalisation of the economy has strengthened the tendency of human capital to be concentrated in urban areas. According to the The World Bank (2020), approximately 55% of the world's population is now living in cities, generating more than 80% of global GDP. Furthermore, as is pointed out in the report of the Economist Intelligence Unit (EIU) (2013), 120 cities with a combined population of about 750 million generated some US\$20.2trn dollars in gross domestic product (GDP) in 2008 or about 29% of the global total, whereas they constitute only 11.1% of world population. In this global urbanisation context, not only specific countries, but global cities as well, accumulate a significant number of skilled migrants (Sassen, 1991; Sassen & Portes, 1993). Artuç et al. (2015) estimated that, in 2000, two thirds of all highly skilled migrants worldwide lived in Organisation for Economic Co-operation and Development (OECD) countries, although these countries together account for less than one-fifth of the world's population. In addition, their distribution is

extremely asymmetric, with four Anglo-Saxon countries (the United States, Canada, Australia, and the United Kingdom) hosting more than two thirds of all highly skilled migrants in OECD countries. Although this concentration has decreased over time, it remains extremely substantial. Moreover, there is also a further concentration of highly skilled migrants within these countries, that is, in specific cities, such as Boston, New York, Miami, Seattle, and London, as well as in innovation clusters (e.g., Silicon Valley) (Kerr et al., 2017).

Skilled migration is a key process in global city formation, reflecting the role of these cities as nodes and hubs for the global economy. Global cities act as a magnet both for talented people from around the world and for firms. The latter prefer global cities because they can grow their business in situ and worldwide and work with global clients, supported by a diverse skilled labour force. In fact, cultural diversity may be a strong determinant for global city success in terms of economic performance (e.g., economic growth), because it is strongly related to production complementarities, dissemination of knowledge, export activities, entrepreneurial performance, and innovation (Bosetti et al., 2015; Eraydin et al., 2010; Fassio et al., 2019; Hunt & Gauthier-Loiselle, 2010; Nathan & Lee, 2013; Ottaviano & Peri, 2006; Ozgen et al., 2011).

On the other hand, global cities embody a series of characteristics that are crucial as a point of attraction for the highly skilled migrants. Knowledge-intensive services, high-tech industries, innovation linkages, highly ranked universities, high wages, a creative employment environment, and the concentration of well-educated and diverse populations may well attract the highly skilled (Beaverstock & Smith, 1996; Castles & Miller, 2003; Chacko, 2007; Glaeser & Gottlieb, 2009). Furthermore, high-quality amenities such as schools, hospitals, public transport, connections (air traffic, trains, etc.), city life (theatres, concert halls, markets, wine bars, pubs, restaurants, gyms, conference centres, and hotels), and rich cultural capital may further boost the attractiveness of global cities (Ewers, 2007; Faist et al., 2017).

Thus, it seems there is a mutual attraction force between global cities and skilled migrants. On the one hand, skilled migrants shape these cities' globalised character, and on the other, skilled migrants are attracted by facilities, amenities, and resources, which are abundant in cities, and simultaneously match their profile and meet their needs. In fact, the fierce competition among countries to attract the most talented human capital (Czaika & Parsons, 2017; Docquier & Rapoport, 2009; Kerr et al., 2016) has expanded in cities, which compete with one another for various production factors, skilled people included (Ewers, 2007).

Regarding Greece, the severe impact of the 2008 economic crisis, that hit Greece harder than any other European Union (EU) country, led to an unprecedented emigration of skilled individuals (Labrianidis & Sykas, 2017; Labrianidis & Sykas, 2021), thus aggravating a phenomenon that was not new in Greek society, namely, the brain drain, which goes back to the '70s and increased in the '90s. It has been estimated that, at the end of 2010, between 119,000 and 139,000 Greek professionals lived and worked abroad (Labrianidis, 2011), an outflow that increased during 2010–2015,

ranging from 280,000 to 350,000 people (Labrianidis & Pratsinakis, 2016). The crisis exacerbated the chronic structural weaknesses of the Greek economy, such as the low demand for skilled labour, which may be attributed to the fact that the Greek economy is producing low value products and services. Indeed, whereas the average rate of the ICT personnel in total employment, between 2009 and 2019, was 3.9% for the EU-28, the average rate for Greece was only 2.4%. This means that, in order to increase the demand for skilled workers and limit brain drain, Greece has to move along the value supply chain with firms investing in knowledge-intensive and tech-driven production of both products and services.

Despite the importance of this science diaspora as a potential enabler for instigating domestic economic growth through a variety of mechanisms and means (know how transfer, direct investment, networking, research and development [R&D] collaboration, etc.), a series of issues related to the destination choices of these highly educated skilled migrants have not been adequately explored: for example, in which specific cities the highly skilled migrants live, to what extent these cities are defined as global, which factors pull them to these cities, and what the possible implications of the concentration of highly skilled migrants in global cities are. In fact, some of these issues are also under-researched in the international context (Ewers, 2007). The aim of our study is to fill this literature gap. Drawing on a totally new database that includes all the Greek PhD holders, we show that highly skilled Greek migrants are attracted more to cities that are indexed as global than to cities that are not indexed as global. Additionally, the more the international indexes that include a city as global (i.e., the “more global” is considered), the greater the number of highly skilled Greek migrants that this city receives.

The paper is structured as follows. In the next section, we review the relevant literature. In Section 3, we describe the methodology and the database. In Section 4, the results are discussed. Section 5 concludes.

## 2 | LITERATURE REVIEW

### 2.1 | The mutually beneficial relationship between global cities and skilled migration

Skilled migrant labour is a constitutive element of a global city's profile, function, and reputation. At the same time, global cities offer a series of resources such as education, employment, remuneration, and lifestyle that match skilled immigrants' educational and skills level, profile, and aspirations, thereby making global cities a desirable location. Hence, the resulting match between skilled immigrant labour demand and supply leads to a large pool of skilled migrants in global cities, a match that is beneficial for both parties (Castells, 2000; Florida, 2002; Hospers, 2003; Plöger & Becker, 2015). Below, we further develop these arguments.

Global cities enjoy significant competitive advantages compared with other urban centres, in the sense that they are characterised by concentration, on the one hand, of financial and service industries

and, on the other, of large pools of highly skilled labour. Therefore, they act as hubs within a globalised economic system. As Sassen (1991) argues in the *Age of globalization*, the activities of production are scattered on a global basis. These complex, globalised production networks require new forms of financial and producer services to manage them. These services are often complex and, in turn, require highly specialised skills. Thus, they are subject to agglomeration economies and tend to cluster in a limited number of cities. Due to the agglomeration effects and the need for specialised skills, there is a high demand for skilled human capital, which is also gradually concentrated in these cities.

In other words, the spatial clustering of the highly skilled labour in selected global cities mirrors the spatial concentration of economic activities in those cities (Tranos & Gertner, 2012). Castells (2000) views global cities not as a place but as a process by which centres of production and consumption are interlinked in a global network and direct production inputs and human resources in specific core cities. Taking further into consideration today's digital, knowledge-intensive, and highly globalised economy of these cities, we can reasonably suggest that the presence of an international, educated, and mobile skilled labour force constitutes a strong determinant of their present and future economic performance (Caragliu et al., 2011).

Findlay et al. (1996) assert that global cities are very attractive locations, on the one hand, for skilled people and, on the other hand, for large companies, and more specifically, transnational companies (TNCs). Large companies and TNCs employ more skilled people and skilled international migrants than small ones, and within global cities, they can find both categories in large numbers. What is more, TNCs from the global cities can exercise their "global control functions" more effectively, that is, control their branch plants and outsourcing orders that they have scattered to sites around the globe (see also Nagel, 2005). These demanding control functions require a highly skilled labour force, largely diversified, that can be more easily found in global cities. At the same time, the concentration of TNCs in global cities renders them an attractive location for highly skilled migrants. Thus, the existence of a pool of skilled, mainly international, labour is both a prerequisite and a consequence of being a global city (Ewers, 2007).

Furthermore, within the TNCs, there is a preference for frequent short term/non-permanent circulation over long-term/permanent migration, and this has produced a "transient" pattern of migration and has established a highly mobile, cross-border transnational managerial elite. These highly skilled professionals, who circulate within and between transnational corporations as intercompany transferees, are important constituents of the global economic system. Thus, in effect, the traditional expatriate is now disappearing only to be replaced by the "nomadic worker" (Beaverstock, 2005). A recent form of the nomadic worker, that is, the digital nomad, is highly associated with developed urban environments. For example, European cities of Berlin and Prague have been recognised as important digital nomad cities (Orel, 2020). In that sense, global cities reshape the form of international skilled migration within the globalised economic system, and concurrently, skilled migrants' professional profile

(e.g., intracompany transferees, posted workers) may correspond to these new patterns of skilled labour migration (OECD, 2019).

In addition, as Berry and Glaeser (2005) have stressed, the growth and the competitiveness of a city are largely determined by its educated labour force. Therefore, the increasing competition between countries to attract and retain the best and the brightest (Czaika & Parsons, 2017; Docquier & Rapoport, 2009) has now been expanded to cities as a strategy for socio-economic development (Ewers, 2007).<sup>1</sup>

In order to attract the most talented human capital, global cities have created very favourable conditions for the demand of highly skilled labour, by way of offering rapid opportunities for professional development, for highest levels of remuneration and most cosmopolitan lifestyle choices (Beaverstock, 2012). It has been recognised that knowledge-based activities (e.g., universities and R&D), economic structure (e.g., high-tech industries and modern services), advanced labour market (meaning employment in the field of studies, high payment, and professional development), cultural activities (e.g., cultural amenities and creative arts), quality of life (e.g., physical infrastructure, advanced transportation, and favourable conditions for family life as well family reunification), and social environment and life (e.g., concentration of educated people, diversity, openness, entertainment, and media) are fundamental constituents of a global city's magnetism (Chacko, 2007; Ewers, 2007; Florida, 2002; Mihi-Ramirez et al., 2016; Yusuf & Wu, 2002). It is exactly in these domains that global cities compete with each other in order to attract the best skilled migrants.

In fact, these components largely meet the criteria that young and creative people usually take into consideration when they are in the process of deciding to which country/region/city to migrate (Florida, 2002; Lloyd & Clark, 2001; Straubhaar, 2000). In a push-pull factor theoretical context, skilled migrants are attracted by economic factors, such as economic growth and high per capita GDP; employment factors, such as easier access to the labour market, professional development prospects, and efficient labour market and welfare system policies; and scientific factors, such as the high quality of the educational system and high-level universities. They are also attracted by political factors, such as robust institutional environment, advanced public services, and low corruption, and socio-cultural factors, such as cultural potential, lifestyle, demographic composition, diversity, tolerance, and friendly environment in which their children can grow up, and so on (Baruch et al., 2007; Cavallini et al., 2018; European Commission [EC], 2018; Gökbayrak, 2012; Khoo et al., 2011; Kurekova, 2013; OECD, 2002).

Within this context, skilled immigrants may thrive, fulfil their potential, and make multilevel contributions to the economies of global cities. As Beaverstock (2002) argues, highly skilled migrants bring specific knowledge, skills, and networks into the city, which, in turn, significantly contribute to their agglomeration economies, wealth creation, and global reach. As it is well-documented in endogenous growth theory (Lucas, 1988; Romer, 1986), agglomeration economies may augment productivity and growth. Global cities act as centres for the circulation of ideas and knowledge diffusion, advancing thus their

productive capacity, their technological upgrading, and their innovative performance (Feldman & Audretsch, 1999; Glaeser & Gottlieb, 2009; Moretti, 2012; Ozgen et al., 2011). A growing body of literature stresses the importance of the cultural diversity of skilled migrants in making a positive contribution to innovation, knowledge and technology diffusion, productivity, and job creation at the national, regional, and firm level (Bosetti et al., 2015; Fassio et al., 2019; Kerr et al., 2016). Focusing on global cities, the concentration of a culturally diversified population may stimulate new ideas, knowledge spillovers, specialisation, export activities, entrepreneurial performance, innovation linkages, and growth. This is especially so when there are skill complementarities between skilled migrants, natives, and other migrant groups (Bosetti et al., 2015; Fassio et al., 2019; Hunt & Gauthier-Loiselle, 2010; Nathan & Lee, 2013; Ottaviano & Peri, 2006; Ozgen et al., 2011). Skilled migrants may also broaden the knowledge base of a city and increase its local human capital (Andersson et al., 2009; Cowan & Zinovyeva, 2013). However, a few studies show a neutral impact on innovation (Bratti & Conti, 2018), because diversity may aggravate cultural, language, and skill differences and hence undermine communication, cooperation, and innovation (Alesina & la Ferrara, 2005; Bosetti et al., 2015). Furthermore, skilled migrants bring with them well-established cosmopolitan networks, cultural practices, and social relations and some of them (i.e., technocratic-financial-managerial elite) form what it is called “transnational elites.” As Castells (2000) argues, these transnational elites occupy leading positions of command and control in the world system, and they require specific spatialities (the global cities) to reproduce their cosmopolitan interests and practices.

The above analysis shows that there is a mutually beneficial interaction between global cities and skilled migrants. On the one hand, global cities provide an environment rich in resources, opportunities, and amenities that allows skilled migrants to thrive, to exercise their skills, and fully use their human capital. On the other hand, the skilled migrants make multilevel contributions to the societal and economical orientation and structure of global cities, enabling characteristics (agglomeration effects, knowledge dissemination, innovation, proliferation of firms) that further their global profile and reach (Glaeser & Gottlieb, 2009; Ozgen et al., 2011; Yeoh & Lam, 2016).

The contribution of our study is articulated on three levels. First, it tries to shed light on a relatively under-researched topic, namely, which cities highly skilled migrants choose to settle in. As Ewers (2007, p. 128) states: “We clearly do not know to which cities the highly-skilled [broadly defined] migrate in the global economy.” Our research tries to fill this literature gap. Second, despite the intense and the severe impact of brain drain from Greece, there is a lack of information on (a) which cities the highly skilled Greek migrants live in and (b) the pull and push factors that shaped their migration decision. Third, it makes use of a unique national database that includes all the Greek PhD holders. Focusing on the highest scale of the educational ladder, this is important for two reasons. Firstly, because we can plausibly assume that global cities are specifically attractive for doctorate holders and secondly because it contributes to a limited number of studies focusing on cities and using data on PhD holders (e.g., Ozgen

et al., 2011). The main research hypothesis is that highly skilled Greek migrants are attracted more to cities that are indexed as global than to cities that are not indexed as global. Additionally, the more the international indexes that label a city as global, the greater the number of highly skilled Greek migrants that this city receives.

### 3 | DATA AND METHODS

As mentioned before, we focus on the PhD holders that have obtained their doctorate from a Greek tertiary institution or one such institution abroad. Between May and July 2020, the Greek National Documentation Centre (EKT) and the Regional Development and Planning Research Unit of the University of Macedonia conducted an electronic survey on PhD holders. EKT is the organisation responsible, by law, for the collection, development, and maintenance of the National Archive of PhD Theses (N.A.Ph.D.). N.A.Ph.D. is the official database for PhD holders in Greece and was the source of the population surveyed in this paper. It collects and stores the PhD theses from all Higher Education Institutions in Greece, as well as those PhD degrees awarded to Greeks by foreign universities and certified by the Hellenic National Recognition and Information Center<sup>2</sup> (Hellenic NARIC). It also contains data such as author's email addresses. It spans a period of more than 30 years (1985–2020).

The survey was carried out on those individuals registered in N.A. Ph.D. that had obtained their PhD between 1985 and 2018. Also, an online open call to Greek PhD holders that had not submitted their thesis to N.A.Ph.D. was issued through social media. This two-staged approach turned up 22,349 email addresses. Following validation against inconsistencies or incorrect addresses, they were uploaded to LimeSurvey. Questionnaires were sent out using LimeSurvey. By the end of the survey (September 24, 2020), a total number of 10,295 answers (46.1%) had been successfully completed and submitted. The survey consisted of various multivariate questions ranging from demographics, socio-economic, geographical, and employment mobility to social and career satisfaction. In addition, it was specifically customised to cater for the various employment statuses of the PhD holders (employed, unemployed, retired, etc.).

Of the total, 31.3%, that is 3,222 PhD holders, have experienced migration abroad, and they comprise the highly skilled migrants of our study. This subsample includes those who now live abroad and those who used to live abroad in the past but at some point in time returned to Greece, where they now live. According to overall analysis, this group of highly skilled migrants, which forms the population examined in this paper, has lived in the past or is currently residing in 559 different cities around the globe.

In order to assess the level of “magnetism” of foreign global cities for the highly skilled Greek migrants, we needed to create a list of global cities. To do so in a comprehensive manner, the latest reports (2020) on Global city indexes produced and issued by five international reputable institutions were used. These institutions are (1) “The Mori Memorial,” which used the Global Power City Index taking into consideration the functions of Economy, R&D, Cultural Interaction,

Livability, Environment, and Accessibility; (2) the “A.T. Kearney” (2020) using Global City Index, which reveals leadership in the areas of business activity, human capital, political engagement, information and technology, and cultural experience; (3) the “Knight Frank” Prime Global Cities Index (2020), which tracks the movement in prime residential price; (4) the Loughborough University using Globalisation and World Cities Research Network (2021), which ranks cities based on their connectivity through four advanced producer services: accountancy, advertising, banking/finance, and law; (5) “The Brookings Institution” (2016) using Global Cities Initiative (Global giants), which utilises a series of factors, namely, tradable clusters, innovation, human capital, and infrastructure connectivity.

Thus, we created a continuum of what is considered to be a global city ranging from those most widely accepted as global cities (i.e., those that were included in all five indexes) to the least widely accepted as such (i.e., those that were included in only one index). Then a list of all the cities included in those five indexes was subsequently made. Cities that were included in at least one of the five rankings were recorded as “global cities.”<sup>3</sup> Each city of current or former stay indicated by the PhD holders was then classified as either “global city” or “other city,” based on whether it appeared in the above list or not. With the use of this list, we created five dummy variables, depending on how many indexes record a city as global. The variables are “No index” (coded as 1, if a city was not recorded as global in each of the five indexes and 0 otherwise), “1 Index” (coded as 1, if a city was recorded as global in one out of the five indexes, and 0 otherwise), “2 Indexes” (coded as 1, if a city was recorded as global in two out of the five indexes, and 0 otherwise), “3 Indexes” (coded as 1, if a city was recorded as global in three out of the five indexes, and 0 otherwise), “4 Indexes” (coded as 1, if a city was recorded as global in four out of the five indexes, and 0 otherwise), and “5 Indexes” (coded as 1, if a city was recorded as global in all the five indexes, and 0 otherwise). The dependent variable—Highly Skilled Migrants—is the number of PhD holders in each of the 559 cities. In order to estimate the impact of global cities on the Greek highly skilled migrants' destination choice, we applied ordinary least squares (OLS) method using the abovementioned dummies as independent variables; “5 Indexes” dummy was selected as the reference category.

In the following section, the findings from the EADD database and the estimation results are presented.

## 4 | RESULTS

The highly skilled Greek migrants are mainly males; 30–49 years old; are very well educated (22.7% hold a postdoc degree, and 20.1% have at least one degree from one of the 100 top world universities); come from a medium to higher socio-economic background; work as professionals, academics, and researchers; and most of them hold a staff position of high prestige (Table 1). Furthermore, the profession of approximately 50% of the highly skilled migrants, that is, academics and researchers, is related to knowledge and technology production. Being at the forefront of scientific research, they seek educational and socio-cultural environments where they can employ their high qualifications and skills. Thus, one can ascertain that in addition to degrees of the highest calibre (PhD), these qualified people have an advanced socio-economic, educational, and professional profile—a profile that one can expect to allow them to make multiple contributions in their host country.

Table 2 focuses on the reasons for migrating. The majority of them seek destinations that may help them to improve their professional status and fully employ their skills and educational level (e.g., professional development, better working conditions, finding jobs in the scientific field, and dynamic environment). Undoubtedly, economic reasons (e.g., better wages) form a critical pull factor. Nevertheless, Greek PhD holders do not seem to have been hard hit by unemployment, because the 2008 Greek economic crisis has not exercised a strong impact on their decision to migrate. Socio-cultural pull factors (e.g., experiencing new cultures, tolerant and open society) also play a significant role but to a lesser extent. However, the negative political environment in Greece, further aggravated during the recession and by the chronic structural deficiencies of Greece (e.g., nepotism, patron–client relationships, and corruption), has firmly shaped their decision to migrate. Analysis of their answers indicates that doctorate holders offer an array of reasons for migration (that both push and pull them), signalling a well-argued migration plan shaped by their desire to find a multifaceted context and achieve their professional goals in their host countries; that is, highly skilled migrants pursue a dynamic professional, scientific, and socio-cultural environment that corresponds to their high educational and skills profile and their high aspirations. As it is analysed in the Section 2, global cities have the capacity to provide such an environment and, therefore, may attract large numbers of highly skilled migrants.

**TABLE 1** Demographic and social characteristics of highly skilled Greek migrants

Gender (%)	Age groups (%)	University ranking <sup>a</sup>	Post-PhD	Family income <sup>b</sup>	Profession (%)	Staff position
Male: 62.6	Up to 29: 0.4	At least one degree	Holding a postdoc	Very low: 2.4%	Professionals: 40.5	No staff position: 14.7%
Female: 37.4	30–39: 40.1	from one of the top	degree: 22.7%	Low: 9.3%	Academics: 35.7	Staff position: 23.4%
	40–49: 42.8	100 universities:		Medium: 48.5%	Researchers: 14.2	Staff position of high
	50–59: 13.7	20.1%		High: 34.0%	Managers: 8.3	social prestige: 61.9%
	60–69: 2.6			Very high: 5.8%	Other: 1.3	
	Over 70: 0.4					

<sup>a</sup>According to the 2021 QS World University Rankings: <https://www.topuniversities.com/university-rankings/world-university-rankings/2021>.

<sup>b</sup>Family income is measured using a 5-point Likert scale: 1—very low to 5—very high.

Source: EKT/RDPRU PhD holders survey, calculations by the authors.

**TABLE 2** Reasons to migrate

Pull factors	%	Push factors	%
Professional development	41.7	Low professional development	48.0
Higher wages	39.4	Not finding job in my scientific field	39.9
Better working conditions	34.6	Lower wages	33.6
Finding job in my scientific field	34.2	Unattractive working conditions	32.8
Finding job	19.5	Lack of meritocracy in Greece	25.5
Dynamic environment (e.g., talented people and dynamic industries)	19.0	Negative political atmosphere in Greece	10.2
Live in a more meritocratic society	18.8	Economic crisis in Greece	6.5
Meeting new culture	11.2	My partner had already lived there	6.3
Live in a more tolerant and safe society	8.7	Uncertainty for my children	3.7
My partner had already lived there	5.5	Relatives and friends had already lived there	1.3
A better future for my children	3.0		
Migration package (e.g., transparency and rule of law)	2.3		
Relatives and friends had already lived there	2.1		

Source: EKT/RDPRU PhD holders survey, calculations by the authors.

**TABLE 3** Distribution of Greek highly skilled migrants (PhD holders) between “Global” and “Other” cities

	Indexes	Number of highly skilled migrants	Rate of highly skilled migrants (%)	Number of cities	Rate of cities (%)
Other cities	No index	760	24.8	363	64.9
Global cities	1 Index	753	24.6	105	18.8
	2 Indexes	282	9.2	48	8.6
	3 Indexes	176	5.7	14	2.5
	4 Indexes	310	10.1	11	2.0
	5 Indexes	786	25.6	18	3.2
	Total	3,067	100	559	100

Source: 2020 Global Power City Index, 2020 Global City Index, 2020 Prime Global Cities Index, 2020 Globalization and World Cities Research Network, 2020 Global Cities Initiative, and EKT/RDPRU PhD holders survey, calculations by the authors.

Indeed, Table 3 below highlights this argument and provides a robust affirmation of our research hypothesis: 75.2% of our sample are concentrated in global cities. These cities comprise only 35.1% of the total number of cities where highly skilled Greek migrants have lived. In fact, 35.7% of the sample lived in the past or now live in those cities for which there is a broad consent on their global profile, that is, that have been classified as global by aggregately “4 Indexes” and “5 Indexes.” These cities account for only 5.2% of the cities in our sample.

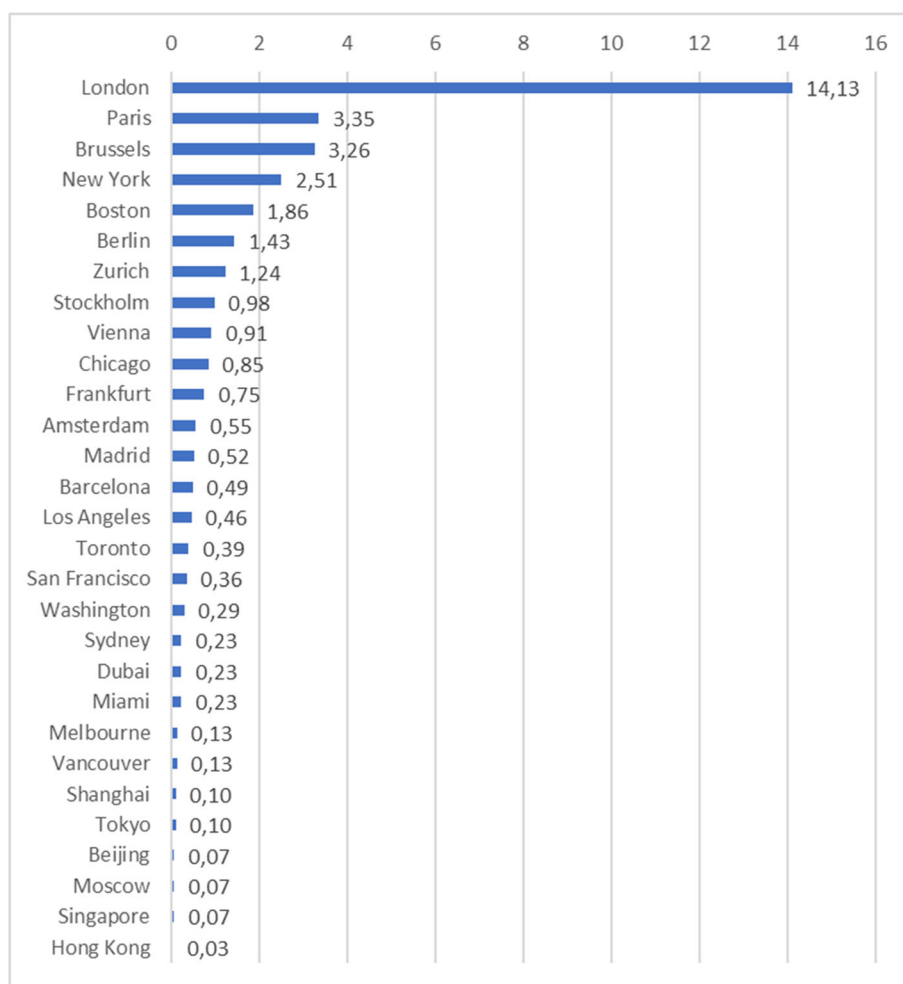
Figure 1 below depicts the 29 cities listed as global by taking account of the “4 Indexes” and “5 Indexes” in which the 35.7% identified in Table 3 of our sample now live or used to live in the past. To the best of our knowledge, this is the first record of the destination choices of the highly educated skilled Greek migrants at the city level. The majority of them are clustered in major European cities due to the geographical and cultural proximity to Greece. However, distant urban centres in the United States, Canada, and, to a lesser extent, UAE, China, Japan, and Russia also comprise preferable locations. In

the case of EU cities, this stands as reasonable if we take into consideration that Greece is part of the EU, where freedom of movement is an EU principle (of stay, work, and legal provisions) enabling the mobility of the highly educated. Figure 1 combined with Tables 2 and 3 above shows a specific migration pattern further supporting our research hypothesis. The need to achieve professional development, to find a job in their scientific field, to search for better working conditions, and to live in a dynamic socio-cultural environment (see Table 2) drives highly skilled migrants to a relatively small number of cities that are indexed as global (see Table 3 and Figure 1). In these cities, they feel that they can fulfil their aspirations.

OLS estimates are reported in Table 4. These estimates further support our hypothesis that highly skilled Greek migrants are attracted more to cities that are indexed as global than to cities that are not indexed as global; that is, on average, a city that is not indexed as global receives approximately 42 highly skilled migrants less than a city that is recorded as global in all the five indexes used in our study (“5 Indexes”). Similarly, a city that is indexed as global in one index (“1



**FIGURE 1** Global cities that attract most of the highly educated skilled Greek migrants (%). Source: EKT/RDPRU PhD holders survey, calculations by the authors



**TABLE 4** OLS estimates: The impact of global cities on highly skilled migrants' destination choice

Independent variables	Coefficients	p value
No index	−41.559	0.000***
1 Index	−36.495	0.000***
2 Indexes	−37.792	0.000***
3 Indexes	−31.095	0.000***
4 Indexes	−15.485	0.036**
Number of countries: 559		
R <sup>2</sup> : 15.4		
F test: 20.062		

Note: The dependent variable—Highly Skilled Migrants—is the number of highly skilled migrants in each of the 559 cities.

Abbreviation: OLS, ordinary least squares.

\* $p < 0.10$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

Index”) receives approximately 36 highly skilled migrants less than a city listed as global by all the five indexes (“5 Indexes”). With the exception of cities that are recorded as global in two of the five indexes (“2 Indexes”), the higher the number of indexes in which a city is registered as global, the lower the number of highly skilled migrants

it receives, in comparison with a city that is catalogued as global in all the five indexes (“5 Indexes”), our reference category. Additionally, the more the international indexes label a city as global, the greater the number of highly skilled Greek migrants that this city receives.

Our study further supports the argument commonly shared in the literature, namely, the mutual beneficial relationship between skilled migrants and global cities. This relationship stems, on the one hand, from the capacity of global cities to meet the demanding requirements of highly skilled migrants. On the other hand, it emerges from the high educational and professional skills of the Greek migrants. These sought-out skills help to make adaptation within the educational and socio-cultural environment of global cities rather efficient.

Specifically, as we have already mentioned (see Table 2), highly skilled Greek migrants seek a dynamic environment in terms of employment, career opportunities, remuneration, science, and socio-cultural life. Global cities are able to provide this kind of environment, thereby attracting the majority of Greek PhD holders. Specifically, we can distinguish some common features of global cities, captured by the five indexes used that correspond to personal pull factors. These features are a global city's economic environment including high per capita GDP, concentration of the world's top companies and global services, good working conditions, variety of workplace, high wage

level, and capital markets (see the “Mori Memorial”—Global Power City Index, the “A.T. Kearney”—Global City Index, and “The Brookings Institution”—Global Cities Initiative). Furthermore, their scientific environment comprises skilled human resources (which may stimulate agglomeration economies), concentration of researchers, international schools, top universities, high R&D expenditures, and the number of startups (see the “Mori Memorial”—Global Power City Index, the “A.T. Kearney”—Global City Index, and “The Brookings Institution”—Global Cities Initiative). Another feature is their political environment including international organisations, robust institutions, think tanks, equality, and social democratic freedoms (see the “Mori Memorial”—Global Power City Index, the “A.T. Kearney”—Global City Index, and “The Brookings Institution”—Global Cities Initiative). A final feature is their socio-culture environment and quality of life incorporating international conferences, cultural and sports events, museums, theatres, nightlife options, culinary offerings, shopping options, residential prices, transportation, doctors and hospitals, and environmental health (e.g., air and water quality, renewable energy) (see all five indexes). All these individual environments meet highly skilled Greek migrants' needs and aspirations and make global cities attractive to the vast majority of them.

On the other hand, as mentioned before (see Table 1), highly skilled Greek migrants have very high educational and professional qualifications that can be effectively implemented and further upgraded within the scientific, professional, and socio-cultural conditions provided by the cities that are indexed as global. This allows them to make several contributions in terms of scientific research, knowledge transfer, and innovative activities, which, in turn, may further boost the economic performance and reach of global cities. In that sense, there is a match between skilled immigrant labour demand and supply, which is beneficial both for migrants and the global cities.

## 5 | CONCLUSIONS

Undoubtedly, all global cities are not of equal attractiveness, and each migrant considers her/his migration decision according to a web of city-based factors (Ewers, 2007), as well as her/his personal and social characteristics and her/his migration plan. In this study, we investigate to what extent highly skilled Greek migrants are attracted by global cities. Drawing on a totally new dataset that includes all the Greek PhD holders and a list of global cities made on the basis of the latest reports (2020) on Global city indexes, we find that highly skilled Greek migrants are attracted more to cities that are indexed as global than to cities that are not indexed as global. In fact, the more the international indexes that list a city as global, the greater the number of highly skilled Greek migrants that this city receives. Moreover, our study sheds light on an under-researched topic, namely, that the highly educated skilled Greek migrants live primarily in those global cities that are most widely considered to be global. Furthermore, although it is well-documented in recent research that international skilled migrants are attracted by global cities, there is a lack of information on their specific urban destinations. Our study fills this gap in

the literature in the case of the highly educated skilled Greek migrants: the majority of our sample live in major EU cities, due to the benefits they have as European citizens and due to the geographical proximity to Greece.

In addition, our study supports a broadly discussed literature finding on the mutual beneficial relationship between skilled migration and global cities. As indicated by the global indexes used, global cities share a series of attributes that meet the needs, the skill level, and the aspirations of highly skilled migrants, thereby making them favourable destinations. Such attributes are knowledge-intensive industries, high-tech startups, innovation linkages, top universities, employment in the field of their studies, high wages, professional development, rich socio-cultural life, tolerance to difference, and secured democratic freedoms. These attributes create an environment that is very attractive to the highly educated skilled migrants as their personal pull factors match the above resources and amenities. Within this environment, highly skilled migrants may thrive, practice their skills, transfer their broad knowledge, and fulfil their potentials, thereby making a multidimensional contribution to the economy of global cities and further extending their global reach. This, in turn, may potentially draw more highly skilled migrants into global cities. In other words, a virtuous cycle emerges, in the sense that global cities attract highly skilled migrants, and at the same time, highly skilled migrants boost the global profile of global cities. In fact, recent changes in migration policies of major host countries, where many global cities are located and which aim to attract the most talented migrants, may further augment this virtuous cycle (OECD, 2020).

Conversely, the emigration of highly skilled migrants denotes a loss of valuable human capital, knowledge, creative ideas, scientific research, and innovation spirit for the home cities/regions, which may further downgrade their scientific, innovative, and economic performance and stimulate more outflows of skilled emigrants. This reverse reality for the home countries/cities may lead to a vicious cycle, where there is a complementary interchange between meagre economic development and skilled emigration. These antithetical effects (virtuous vs. vicious cycles) may exacerbate the developmental gap between global cities and home countries/cities, thus further increasing regional inequalities (see Buch et al., 2017) as well as inequalities between the global South and the global North. A shift towards the knowledge economy for the countries of origin (e.g., through investing in education, supporting knowledge-intensive industries, and innovation activities) could break the abovementioned vicious cycle, amplify productivity and growth, and counter-balance the potential increase in the above-mentioned developmental gap. These highly skilled migrants with a living and working experience in global cities can prove of significant impetus for the economies of their countries of origin. This can be the case, by way of both physical return and virtual return<sup>4</sup> while they remain abroad.

As for Greece, the low position of the country's economy in the value supply chain has resulted in a low demand for specialised labour (Labrianidis, 2011) and has severely increased the outflow of emigrants, especially during recent decades. In fact, the departure of the Greek PhD holders who comprise the most dynamic part of the Greek



society may pose serious barriers for Greece in the endeavour to turn towards a knowledge economy. As already mentioned, a shift in the country's economic development pattern towards knowledge-based production could be an effective solution in the long term. Major Greek cities (e.g., Athens, Thessaloniki, and Patra) could play a leading role in this effort, because they enjoy place-based advantages (e.g., universities, social life, good weather, and cultural amenities).<sup>5</sup> These advantages combined with concrete and targeted migration and education policies, and policies taking into account the major pull factors that attract highly skilled migrants to global cities, could result in both regaining the "brain drainers" and attracting international skilled migrants.

Greek cities could also play a considerable role in tackling massive skilled emigration in the short run; that is, because we can plausibly assume that most of the highly skilled Greek emigrants are not going to return home in the immediate future (Labrianidis & Vogiatzis, 2013), a virtual return option may be activated. Thus, policies that bridge Greek PhD holders, while they remain abroad, with Greek industries, universities, and professionals that are mostly located in Greek cities, may well create innovation linkages and knowledge transfer conditions. In turn, these may boost the innovative capacity of Greek cities, thereby increasing their competitiveness and limit brain drain in the near future. At the same time, these bridges give the highly skilled migrants the opportunity to enjoy the benefits of both worlds (global cities and home countries/cities) while keeping the possibility of a permanent return in the long-term open.

## CONFLICT OF INTEREST

No competing interests are reported.

## ENDNOTES

<sup>1</sup> In all probability, this competition will be intensified and will involve not only European cities versus other cities all over the world but rather incite intra-European competition. As for the latter, a select list of European cities, namely, in Germany and London in the United Kingdom, has no trouble in luring highly educated individuals from all over the world. Other cities, such as Vienna, have been moving up in the global comparison ladder as a magnet for the highly educated. Indeed, these cities have been quite aggressive in advertising their (sub)urban benefits in a manner that aims to tackle this competitive pressure that is building up also from their European counterparts (Faist et al., 2017; Rilla et al., 2018).

<sup>2</sup> Hellenic NARIC is the Greek public organisation responsible for the academic recognition of titles awarded by foreign universities and for providing information on educational systems and accreditation of Greek and foreign universities and titles (The Hellenic NARIC, 2021).

<sup>3</sup> The concept of global city is multifaceted, and hence, it can be approached from different perspectives. Therefore, coding a city as "global" is a multiparameter endeavour. As such, the five indexes used are composed of different sub-indexes, have different methodologies, different perspectives, and thus, they should not be used as homologous criteria in order for a city to be coded as global. However, because each of the five indexes highlights different aspects of a global city's character and function, using them in combination can help us to make a more accurate classification of the cities where our sample have lived between global and nonglobal.

<sup>4</sup> It takes two forms; that is, the diaspora is involved either in networks with the economy of their country of origin, or they work simultaneously in both their country of origin and their host country by reciprocating (back and forth) movement between the two countries.

<sup>5</sup> For example, Athens is indexed as global city in two out of the five Global city indexes used in our study, which are the indexes issued by The Brookings Institution and The Loughborough University. However, it has a medium ranking, which, on the one hand, denotes its present narrow global reach and, on the other hand, the possibility to extend its global impact in the future. No other Greek city is indexed as global.

## DATA AVAILABILITY STATEMENT

The sensitive nature of these data means that they are only available internally. For external researchers, ethical approval may be obtained via formal request and application to the National Documentation Centre (EKT) for a specific research project. Interested parties are advised to contact the corresponding author (nkarampekios@ekt.gr) to discuss the application.

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**How to cite this article:** Labrianidis, L., Sykas, T., Sachini, E., & Karampekios, N. (2021). Highly educated skilled migrants are attracted to global cities: The case of Greek PhD holders. *Population, Space and Place*, e2517. <https://doi.org/10.1002/psp.2517>