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Measuring and assessing talent attractiveness in OECD countries, second edition: Methodology paper

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Measuring and assessing talent attractiveness in OECD countries, second edition

Methodology paper

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Abstract

OECD countries are increasingly competing to attract highly skilled migrants to fill skill shortages and support economic growth and innovation. The OECD Indicators of Talent Attractiveness (ITA), first released in 2019, is a benchmarking tool to compare how countries fare in attracting talented migrants. This paper describes the methodology and key outcomes of the second edition of ITA. The second edition includes some minor adjustments to the original framework and two important extensions: the inclusion of an optional new dimension capturing health system performance as well as a new ranking for international start-up founders.

Table of contents

FIGURES

TABLES

1 Introduction

Access to talented and skilled individuals is a key resource for knowledge-based economies and an important driver of innovation, growth, and future prosperity. Talent mobility plays a critical role for enterprises and governments to fill skills shortages. As a result, there is a global competition to attract skilled workers, and many countries have adopted immigration policies or programmes favouring importation of skilled foreign labour.

To capture strengths and weaknesses in national capacity to attract talent, the OECD and the Bertelsmann Stiftung joined forces in 2017 to construct a new set of indicators aimed at benchmarking capacity to attract and retain talented migrants. The first edition of the OECD *Indicators of Talent Attractiveness* (ITA) was released in 2019 and allows countries to compare their relative attractiveness for different types of talented migrants. The multidimensional framework captures strength and weaknesses of OECD countries to attract three specific categories of talented migrants: highly qualified workers, university students, and foreign entrepreneurs. The benchmarking tool offers valuable information for potential migrants and employers, as well as for policy makers to elaborate effective policies aimed at increasing their appeal to specific high-skilled migrant groups.

The second edition of the OECD *Indicators of Talent Attractiveness* was released in March 2023, allowing for a comparison of national talent attractiveness over time. The new edition includes minor adjustments to individual indicators as well as two important extensions to the current framework: a new dimension capturing health system performance and a new ranking measuring the capacity of countries to attract innovative start-up founders. The updated methodology builds on literature reviews, discussions with experts, and input from members of an informal Task Force with representatives from key institutions in a selected number of OECD Member countries (see Annex Table 6.A.1 for the list of institutions represented in the Task Force). Since the preparation of the first edition of the OECD *Indicators of Talent Attractiveness*, three new countries have become members of the OECD: Lithuania (2018), Colombia (2020), and Costa Rica (2021). These countries are for the first time included in the ITA rankings.

This paper presents the updated methodology of the ITA framework, detailing the adjustments and extensions to the framework compared to the 2019 edition. The paper starts by providing a brief overview of the construction of the OECD *Indicators of Talent Attractiveness* and its main conceptual and methodological framework. Section 3 introduces the adjustments to the original ITA framework and the inclusion of a new dimension capturing health system performance. Section 4 presents the extension of the framework to include the new international start-up founder ranking. Section 5 presents some robustness and sensitivity analysis, and Section 6 highlight some key results of the second edition of the OECD *Indicators of Talent Attractiveness.* Further elaboration of the results are also available in two dedicated policy briefs: What is the best country for global talents in the OECD? and What are the top OECD countries for start-up talents? , and on the dedicated ITA webpage.

2 The OECD Indicators of Talent Attractiveness framework in brief

Determinants of talent attractiveness are multidimensional. The ability to attract and retain talent does not only depend on the openness of the migration policies to skilled talents, but also depends on the capacity to recognise and reward international talents (Tuccio, 2019[1]). Attractiveness is also not limited to economic factors, but dependent on the ability for migrants to integrate into the host society as well as the wider economic and social environment.

The OECD *Indicators of Talent Attractiveness* is an innovative tool to measure relative talent attractiveness from a multidimensional perspective focusing on different categories of migrants. The original framework is composed of seven dimensions, each representing a distinct aspect of talent attractiveness (Figure 1). The seven dimensions respectively include a set of variables providing detailed information on the main drivers of talent mobility across the economic and social sphere. In addition, the framework includes an overarching dimension of accessibility in terms of migration policies that jointly determines how attractive a country is to international talents.

In the default framework, the seven dimensions are equally weighted to create the benchmark indicator score. Once the indicator score is calculated, the additional migration policy dimension is introduced in the form of a penalty to capture how difficult it is for prospective migrants with the required skills to obtain a visa or residence permit. The second edition of the OECD *Indicators of Talent Attractiveness* further offers the possibility to add an optional health dimension to the framework (see Section 3 for more details on the new health system performance dimension).

Figure 1. Determinants of talent attractiveness in the ITA framework

Seven core dimensions and one optional dimension

Note: The seven core dimensions were developed in the original framework. The health dimension is a new and optional dimension available for users in the second edition of OECD Indicators of Talent Attractiveness
Source: OECD Secretariat

The attractiveness of a country to international talents may vary depending on how talent is defined. However, there is no universal definition of the term *talent*. The OECD *Indicators of Talent Attractiveness*

therefore takes a broader approach and defines talent by distinguishing between four different types of talent:

- Highly educated workers, including workers with Master or Doctoral degrees (ISCED 7-8)
- Entrepreneurs, including business founders and active investors
- International students in higher education
- Start-up founders

The first category is based on education level, which is a common way to define talent, and includes those with a Master or PhD degree. However, talent is not limited to those with tertiary education qualifications. A second migrant category therefore focuses on entrepreneurs who run businesses in which they have actively invested. Entrepreneurs are kay assets for host countries as they are contributing to the economy through job creation, innovation, and trade. Many OECD countries therefore have specific policies to attract foreign entrepreneurs. In addition, the competition for talent also concerns international enrolment in higher education. International students are increasingly seen as a resource and a strategic input in the domestic talent pipeline (OECD, 2022[2]). The third migration category includes international students in university education (bachelor level or higher). The fourth category was added in the second edition and includes foreign start-up founders. In recent years, many countries have introduced start-up visas to attract entrepreneurs with an innovative business idea but that do not necessarily meet the requirements of entrepreneur visas. Start-up programmes can be distinguished from entrepreneur visa streams by their focus on innovative, scalable, and potentially high-impact businesses in their inception phase. As such, start-up visa programmes focus on the potential of business idea, rather than capital invested or existing jobs in the company (OECD, 2022[3]).

The distinction between different migrant profiles constitutes an important innovation in respect to other benchmarking exercises in measuring talent attractiveness. Based on the migrant profiles, the second edition of ITA now includes four separate ITA indicators. The indicators respectively comprise between 22 and 32 variables across the seven core dimensions, accounting for both economic and non-pecuniary factors (Table 1). Some variables in the framework are profile-specific, while others are common to one or more of the four migrant profiles. The benchmark indicators are based on default equal weights across the seven core dimensions of talent attractiveness, with the possibility to reassign weights according to user preferences in the ITA webtool. For more details on the composite index methodology underlying the ITA, see Tuccio (2019[1]).

Another unique feature of the OECD *Indicators of Talent Attractiveness* is the inclusion of migration policy as a factor to measure attractiveness. The chances of visa approval will have an impact on the country's overall attractiveness, and high barriers to admission makes other dimensions of attractiveness less compelling. The measure of stringency of migration policies and practices is therefore not treated as an additional dimension in the Talent indicator framework. Instead, the policy dimension is introduced as a penalty applied to the total indicator score, with tailored policy variables associated with the four migrant profiles respectively (Table 1). The policy mechanism reflects the most favourable case of a migrant that already has a job offer from an employer based in a destination country prior to migration, for a position that matches the skill level of the individual.

Table 1. Overview of dimensions and variables in the Talent Indicator framework

Dimensions	Workers	Entrepreneurs	Students	Start-up founders (new)
Quality of opportunity	Migrant unemployment rate Migrant over-qualification rate Migrants with temrpoary contracts Migrants with part-time contract	Strrictness of employement protection Product market regulations Trade openess Ease of doing business index	Universities ranked in the World's top 500	Unicorns Multinational companies Coworking spaces Top-ranked ecoystems Trade openess Product market regulations
Income and tax	Earnings of highly educted workers Price level index Tax wedge	Earnings of highly educated workers Price level index Corportate tax	Earnings of skilled workers Price level index Difference in universtity tuition fees between domestic and foreign students Hours/week international students are allowed to work	Access to venture capital Corporate tax Tax subsidy on R&D Price level index
Future Prospects	Dependency ratio in 2050 Acquisition of nationality Ease of status change from temporary to permanent	Dependency ratio in 2050 Acquisition of nationality Ease of status change from temporary to permanent	Dependency ratio in 2050 Acquisition of nationality Ease of status change from study to temporary Months allowed to stay in the country after graduation	Dependency ratio 2050 Acquisition of nationality Duration of initial visa/permit Ease of status change from temporary to permanent
Family environment	Right for spouse to join migrant and to work Easiness for children of migrants to get citizenship PISA math test scores Public expenditure on family benefits Participation tax rate for second earner parent	Right for spouse to join migrant and to work Easiness for children of migrants to get citizenship PISA math test scores Public expenditure on family benefits Participation tax rate for second earner parent	Right for spouse to join migrant and to work Easiness for children of migrants to get citizenship PISA math test scores Public expenditure on family benefits Participation tax rate for second earner parent	Right for spouse to join migrant and to work Easiness for children of migrants to get citizenship PISA math test scores Public expenditure on family benefits Participation tax rate for second earner parent
Skills environment	Fixed broadband subscriptions **(new)** Share of fibre in total fixed broadband **(new)** English proficiency Spending on R&D Patents	Fxied broadband subscriptions **(new)** Share of fibre in total fixed broadband **(new)** English proficiency Spending on R&D Patents	Fixed broadband subscriptions **(new)** Share of fibre in total fixed broadband **(new)** English proficiency Tertiary education spending	fixed broadband subscriptions Share of fibre in total fixed broadband English proficiency Spending on R&D Patents Top-ranked universities Share of STEM graduates Cyber security
Inclusiveness	Share of highly educated migrants in working age population Migrant Acceptance Index **(new)** SIGI Gender Equality Index	Share of migrants in self-employed population Migrant Acceptance Index **(new)** SIGI Gender Equality Index	Share of international students enrolled in tertiary education Migrant Acceptance Index **(new)** SIGI Gender equality Index	International patent co-operation Migrant Acceptance Index Share of women inventors Share of women in company boards
Quality of life	OECD Better Life Index	OECD Better Life Index	OECD Better Life Index	OECD Better Life Index
Visa and admission policy	Visa refusal rates Visa processing time Digitization of the visa process **(new)** Quota for highly skilled workers	Minimum capital requirement Job creation requirement Digitization of the visa process **(new)**	Level of university tuition fees Share of international students in the total student population in relation to the share of foreign-born individuals in the total population	Lack of start-up visa Captial requirement Digitization of the visa process Start business post-graduation visa Financial support Pathway for start-up employees
Health system performance (new, optional)	Out-of-pocket health spending Satisfaction with health care Avoidable mortality	Out-of-pocket health spending Satisfaction health care Avoidable mortality	Out-of-pocket health spending Satisfaction with health care Avoidable mortality	Out-of-pocket health spending Satisfaction with health care Avoidable mortality

Note: The start-up founder ranking is a novelty in the second edition of ITA. Variables marked “new” indicate changes in the framework between the first and the second edition. Comparative price level indices are the ratios of purchasing power parities to market exchange rates and measures. The price level index and tax-related variables are inverted in the creation of the indicator, so that a higher price level/ tax level implies a less attractive country.
Source: OECD Secretariat

3 Adjustments and extensions to the original indicator framework

The second edition of the OECD *Indicators of Talent Attractiveness* includes minor adjustments to the initial indicator framework, as well as some more important extensions to include a new dimension (health system performance) and a new migrant category (start-up founders). The revisions are based on interviews with national and international experts and regular consultation with members of the informal Task Force that was formed to guide the revised ITA framework. The aim of the revision was to make sure that the framework considers the most relevant factors for talent attractiveness given a continuously evolving world and new data and evidence made available, while at the same time maintaining comparability over time. The final adjustments were subject to sensitivity and robustness tests.

Several important factors have profoundly affected the global labour market for talent since the launch of the first edition of the ITA. Lockdowns and border closure during the COVID-19 pandemic has shifted work and migration patterns and helped accelerating the speed and scale of the digital transformation. This underlines the importance of digital infrastructure not only for economic growth but also for talent attractiveness and retention and resulted in some adjustments in the selection of variables in the *Skills dimension* as discussed below. Furthermore, the pandemic also had direct and indirect impacts on other variables included in the ITA framework, such as international trade and employment outcomes. To avoid transitory impacts of the pandemic on the ITA ranking, data covering the first and most intense year of the pandemic, 2020, have to the extent possible been excluded in favour of more recent data when updating the variables for the second edition. In cases where no data for 2022 was available, data for 2020 and 2021 were carefully investigated to rule out major impacts of the pandemic. If the data were judged to be significantly influenced by the pandemic, data from 2019 or earlier years were used.

3.1 New variables in the second edition

Four new variables have been added to the second edition of the ITA (Table 2). Three of the variables concerns all three of the original migrant profiles (highly skilled workers, entrepreneurs, and international students), while the fourth variable related to digitization of the visa process only applies to the ITA framework for highly skilled workers and entrepreneurs.

Table 2. Overview of new variables in the second edition

Variable	Definition	Data source	Year	Dimension	Migrant profile
Migrant acceptance index	Based on three questions: whether people think migrants living in their country, becoming their neighbours, and marrying into their families are good things or bad things.	Gallup World Poll	2019	Inclusiveness (replaces variable for whether respondents think migration should be decreased/increased or kept at current levels)	All
Fixed broadband subscriptions	Fixed broadband subscriptions per 100 inhabitants (all technologies)	OECD Broadband Statistics	2021 (December)	Skills environment (replaces variable for access to internet)	All

Access to fibre	Share of high-speed fibre subscriptions in total fixed broadband, %	OECD Broadband Statistics	2021 (December)	Skills environment (replaces variable for access to internet)	All
Digitization of the visa process	How digitalized the visa process is in terms of filing and issuing (qualitative measure)	Computed by OECD Secretariat based on data from Fragomen	2022	Skills environment	Highly skilled workers and entrepreneurs

Note: Data for broadband subscriptions are from December 2021.
Source: OECD Secretariat

The COVID-19 pandemic has, among other things, accelerated an already ongoing digital transformation and underlined the potential of digital technologies and communication infrastructure. Ensuring widespread access to digital technology is key to create attractive societies. The first edition of the ITA included a variable on the percentage of households who report that they have access to internet, as a proxy for technological advancement and communication infrastructure.

Given the growing importance of connectivity, and an increasing number of variables that better captures communication infrastructure becoming available in the OECD broadband statistics portal, the original variable of household access to internet has been replaced by two more refined variables capturing access to high-speed internet connections: *number of fixed broadband connections per 100 inhabitants* and *percentage of fibre subscriptions in total fixed broadband subscriptions*. Figure 2 shows the relationship between the original variable (household access to internet) and the new variables *number of fixed broadband connection per 100 inhabitants* (upper panel) and *fibre as share of all broadband connections* (lower panel). While access to internet is high across most of the OECD countries, there is a larger digital divide across countries when it comes to access to broadband, and especially high-speed fibre broadband. Countries with relatively high share of households with access to internet but less developed broadband infrastructure includes for example Costa Rica, Chile, and Türkiye. In the other end of the scale, Japan has relatively well-developed broadband infrastructure but was lagging when considering access to internet among households, which is largely explained by the fact that data on household access to internet for Japan is not available after 2012. However, about half of the OECD countries obtain similar scores in the normalised ITA sub-indicators capturing internet access and broadband subscription. Access to high-speed internet displays much more diversity across countries (Figure 2, lower panel). While high-speed fibre subscriptions are rapidly expanding across the OECD area, some countries are still lagging. In 2022, fibre as a share of all fixed broadband subscriptions represents 75% or more of the subscriptions in Korea, Japan, Spain, Sweden, Lithuania, and Iceland, and exceeded 50% in another seven countries. At the same time, fibre connections constituted less than 10% of all broadband connections in Germany, the United Kingdom, Austria, Belgium, and Greece[1].

Another aspect of digital technology is related to the level of digitization of the visa process. Electronic visa applications and issuing of visas do not only simplify and speed up the visa process, but also sends a signal to prospective migrants about the level of digitalisation in the destination country more generally. The data underlying this variable originates from Fragomen, an international law firm specialised in immigration services. The Fragomen immigration system digitization scoreboard, which evaluates the availability of online systems in the main immigration processes, includes eight categories related to the

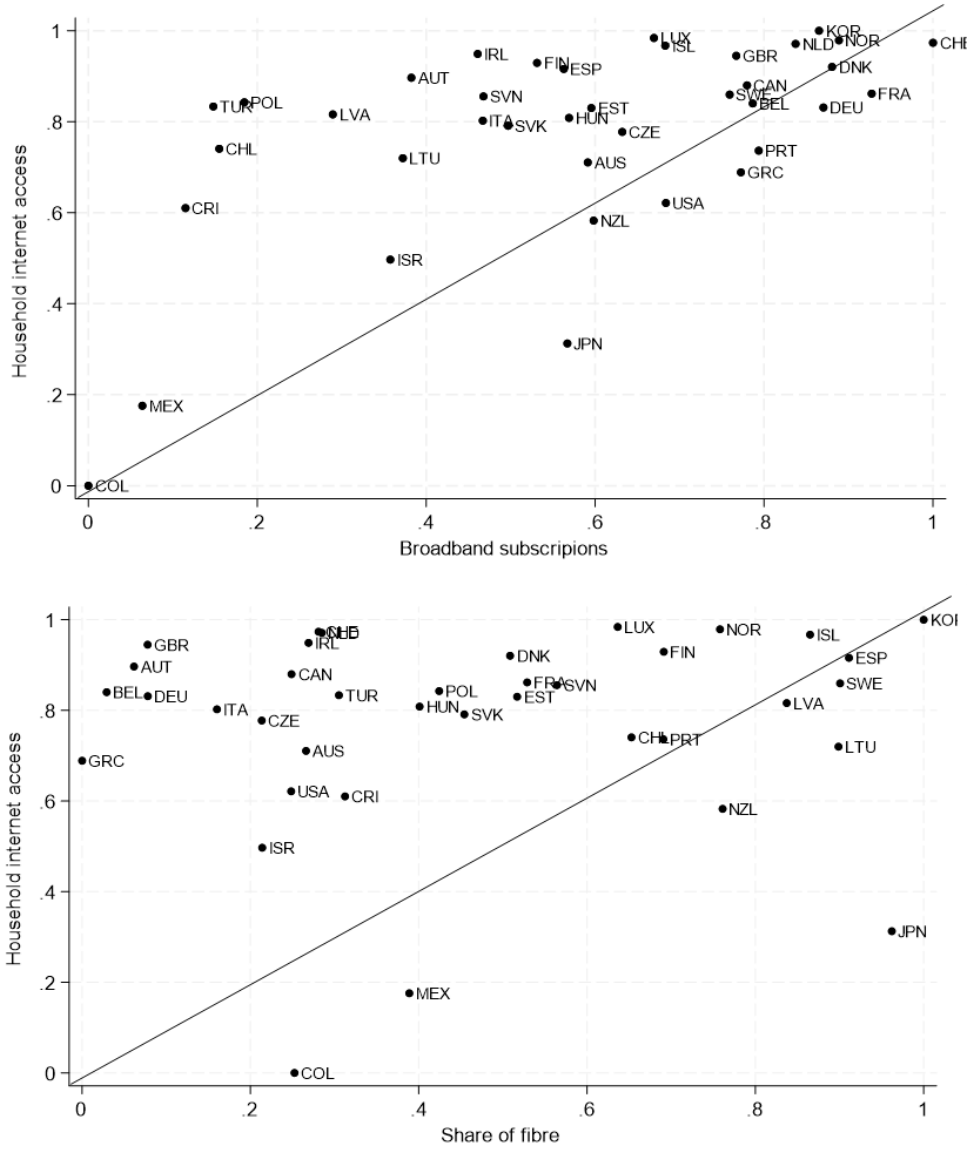
[1] Broadband technologies such as fibre is continuously growing in OECD countries, and OECD broadband statistics are updated bi-annually. Since COVID, total fibre connections in OECD countries have surged by 73%, growing from 122 million in December 2019 to 211 million at year-end 2023. Fibre connections accounted for 42% of all fixed broadband subscriptions by the end of 2023, compared to 38% a year earlier. More information can be found here.

visa journey, showing how digitized the process is from application and issuance to visa renewal[2]. Since the primary focus of the ITA is the attractiveness of a country from the standpoint of a potential migrant about to choose his or her destination country, the variable capturing visa digitization includes the part of the Fragomen scoreboard that captures digitization in the application and issuance process but excludes the categories related to post-arrival and visa renewal (i.e., e-COVID, e-Post Arrival and e-Renewals). To transform the scoreboard into a visa and admission penalty, countries were distributed into terciles based on their digitization score, and penalties between 0 to 2.5% were assigned to the overall ITA score. The visa digitization variable is not included in the framework for students as pathways for international students are different from those of workers and entrepreneurs and not captured by the Fragomen scoreboard.

[2] The Fragomen original scoreboard is based on the following eight categories: e-Information, e-Forms, e-File, e-Interview, e-Issuance, e-COVID, e-Post Arrival, e-Renewals.

Figure 2. Comparing original variable of access to internet with new broadband and fibre variables

Relationship between share of households having access to internet (y-axis) and (1) number of broadband subscriptions (x-axis, upper panel) and (2) share of fibre in broadband subscriptions (x-axis, lower panel)



Note: Data have been normalised to a scale from 0 to 1. Countries below the diagonal line obtain a higher score in the adjusted framework compared to the original framework. The data used in the figure is from December 2021. The data OECD Broadband Statistics database is updated every six months.
Source: OECD

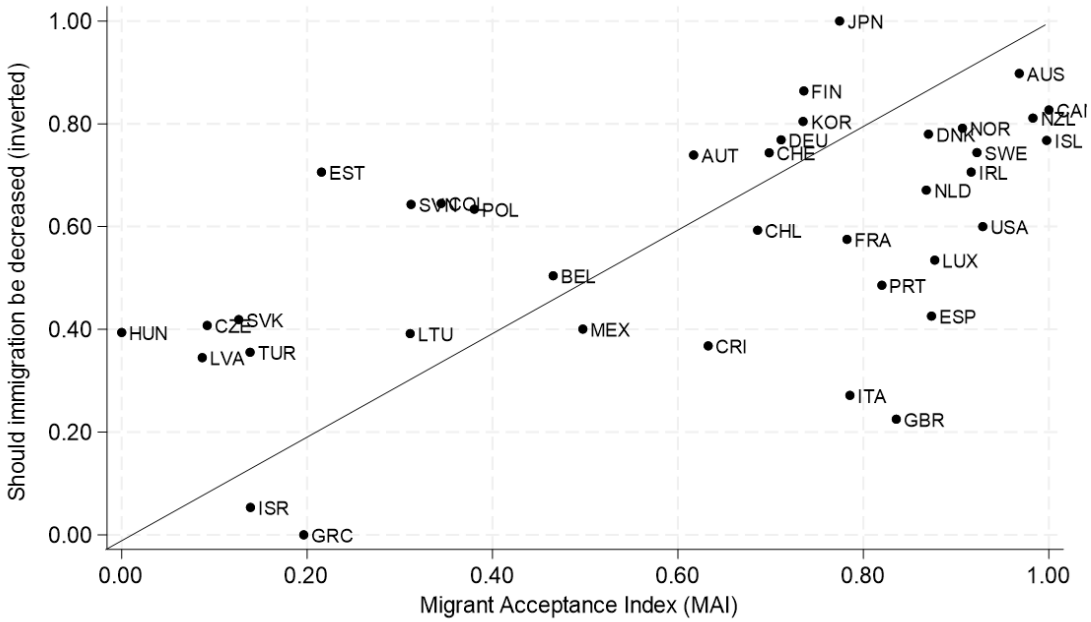
Finally, an updated measure of public opinions towards migrants has been introduced to better capture how accepted migrants are in the destination country. In the first edition of the ITA, acceptance of migrants was captured through Gallup data on the share of the population that thought that immigration should be decreased. The second ITA edition instead includes a relatively new Gallup index that captures the acceptance toward immigrants in society, the so-called Migrant Acceptance Index (MAI). The index is based on three questions: whether people think migrants living in their country, becoming their neighbours, and marrying into their families are good things or bad things. The reason for the adjustment in the ITA

framework is two-fold. Firstly, the question on satisfaction with immigration levels have not been updated since the first edition of the ITA and is therefore quite outdated. Secondly, MAI is a better proxy for how inclusive the society is towards immigrants as it specifically focuses on public opinion towards the social inclusion of migrants rather than attitudes towards immigration more generally.

Figure 3 compares the ITA scores for the MAI variable with the scores of the original variable on public opinion towards immigration levels. A majority of the countries (23 countries) obtain a higher score when replacing the original variable with the MAI (countries below the horizontal line). The higher score post-adjustment is particularly high in a few countries, notably Italy and the United Kingdom. Other countries, such as Estonia, Slovenia, Hungary, obtains substantially lower scores on migrant acceptance in the adjusted framework.

Figure 3. Comparing original and new measure on openness to migrants

Relationship between question about whether immigration should be decreased and Gallup Migrant Acceptance Index



Note: The value for variable related to the question "Should immigration be decreased" have been inverted so that the higher the score the more positive attitude towards immigration. The Migrant Acceptance Index is a sum of the points across the three questions, with a maximum possible score of 9.0 (all three are good things) and a minimum possible score of zero (all three are bad things). The higher the score, the more accepting the population is of migrants. Data in the Figure have been normalised to a scale from 0 to 1. Countries below the diagonal line obtain a higher score in the adjusted framework compared to the original framework.
Source: Gallup World Poll

3.2 A new dimension in the second edition: Health system performance

Public goods such as health and education systems can influence the migration decision-making process and strong health care systems can act as a pull factor to attract different types of migrants (Geis, Uebelmesser and Werding, 2013[4]; Czaika and Reinprecht, 2020[5]). The COVID-19 pandemic has shed extra spotlight on the quality of healthcare systems, and migrants may now put more emphasis on the resilience and performance of health systems in their selection of destination countries. The 2019 edition

of the ITA already included some aspects of health through the inclusion of the OECD Better Life Index. The Better Life index takes into account health dimensions of life quality through two sub-indicators: self-rated health and life expectancy. Literature has however shown a relative weak influence of population health status on migration decisions of highly skilled migrants, and it has been pointed out that quality and access to health services may have a stronger impact on migration decision-making (Czaika and Reinprecht, 2020[5]). The second edition of ITA therefore includes an extension to the core framework by introducing a specific health dimension. This health dimension, which is an optional feature in the sense that users can decide whether it should be included or not. A reason for keeping the dimension optional is to maintain comparison across times.

Measuring health system performance is complex and multi-dimensional, reflecting aspects such as access to care, quality of health services, and capacity and resources (OECD, 2021[6]). It is not straightforward to identify variables that are accurately capturing all relevant aspects in a comparable way across countries. The *Health system performance* dimension is composed of a sub-set of three key variables, mixing subjective and objective measures of health system performance in three dimensions:

- **Cost** - measured as households out-of-pocket spending on health care as share of total spending. Out-of-pocket payments are expenditures borne directly by a patient in the case where neither public nor private insurance cover the full cost of the health good or service.
- **Quality** - measured as subjective satisfaction with the availability of quality health care services provided in the city or area where they live.
- **Avoidable mortality** –avoidable mortality is the sum of preventable (causes of death that can be mainly avoided through effective public health and primary prevention interventions) and treatable mortality (causes of death that can be mainly avoided through timely and effective health care intervention).

Table 3 provides an overview of the variable definitions and data sources. On average, just over one fifth of all spending on health care in OECD countries comes directly from patients through out-of-pocket payments (OECD, 2021[6]). The share of household consumption spent on health care provides an aggregate assessment of the financial burden of out-of-pocket health expenditure.

Data on satisfaction with the health care system is collected by Gallup World Poll (generally based on a representative sample of 1000 citizens in each country) and to the percentage of people who answered “satisfied” to the question: “In the city or area where you live, are you satisfied or dissatisfied with the availability of quality health care?”. In 2016, on average 70% of citizens in OECD countries reported being satisfied with the availability of quality health care in the city or area where they live (OECD, 2017[7]).

Avoidable mortality is important when assessing health system performance as it captures the system’s ability to avoid premature mortality from preventable and treatable causes of death. The concept of treatable and preventable mortality is based on the idea that certain deaths could be ‘avoided’ among people aged less than 75 years. In other words, these avoidable deaths would not have occurred at this stage if there had been more effective public health and/or medical interventions in place. A mortality is considered as treatable if the death could have been avoided through optimal quality health care. The concept of preventable deaths covers deaths that could have been avoided by public health interventions focusing on wider determinants of public health, such as behaviour and lifestyle factors, socioeconomic status, and environmental factors.

Table 3. Variables constituting the health dimension

Variable	Description	Source	Year
Out-of-pocket health spending	Share of out-of-pocket spending in relation to all spending	OECD	2019
Citizen satisfaction with the availability of	Share of citizens stating that they are	Gallup World	2019

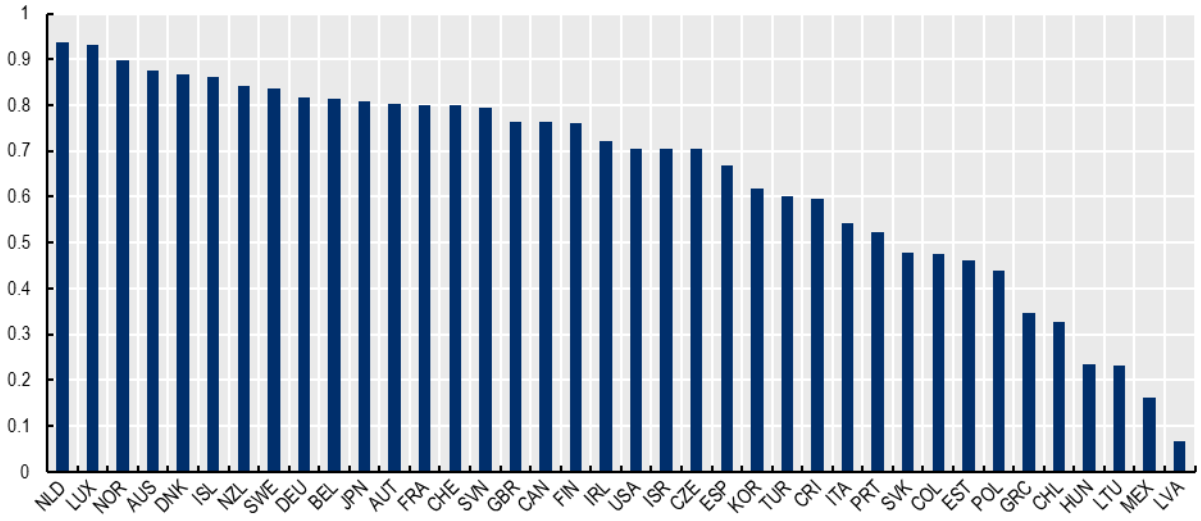
quality health care	satisfied with the availability of quality health care in their city/area of residence.	Poll	
Avoidable mortality	Number of cases of avoidable (preventable + treatable) causes of mortality per 100 000 inhabitants (among people aged less than 75 years).	OECD	2017

Note: Variables for out-of-pocket spending and avoidable mortality are inverted to reflect that higher data points indicate a stronger health performance system.
Source: OECD Secretariat

To create the health dimension composite sub-indicator, the three variables were first normalised to values ranging between 0 and 1 given their different measurement units. In the case of out-of-pocket expenditures and avoidable mortality, the scales were also inverted so that higher data points (closer to 1) reflect a more attractive environment (see Tuccio (2019[1]) for more details on the index methodology). The variables are finally aggregated into a composite indicator for health using equal weights. The health indicator scores are reported in Figure 4. The top-performing countries in the health sub-index are the Netherlands, Luxembourg, Norway, Australia, Denmark, Iceland, New Zealand, and Sweden. The least attractive countries in terms of health system performance are Latvia, Mexico, Lithuania, Hungary, and Chile.

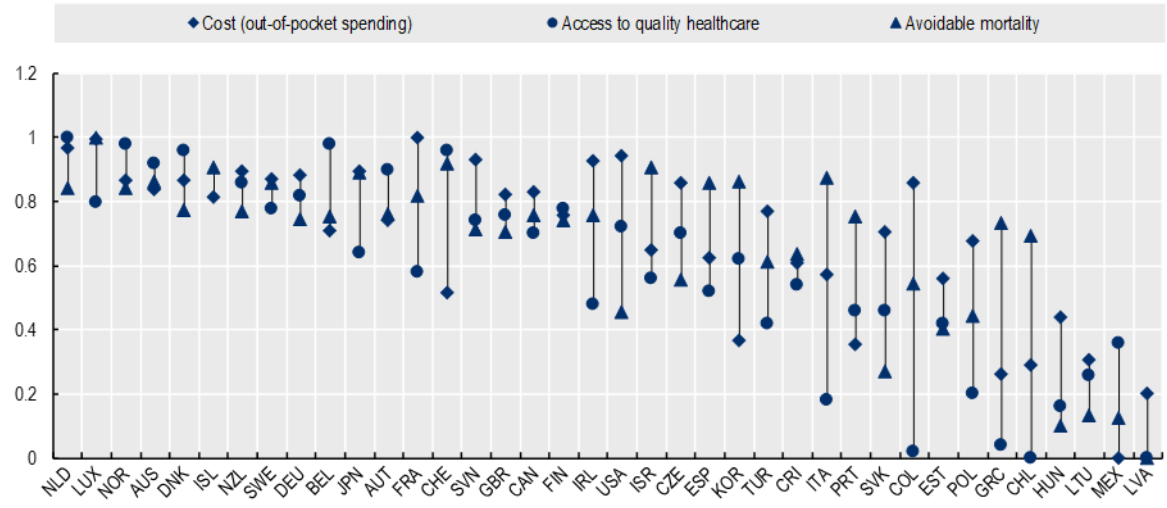
Figure 4. Health dimension: overall scores

Sub-indicator scores for the health system performance dimension



Note: Values closer to 1(0) represent higher (lower) attractiveness. Ranking based on default equal weights across variables. The score for Iceland has been calculated using only two variables due to missing values satisfaction with the availability of quality health care services.
Source: OECD Secretariat

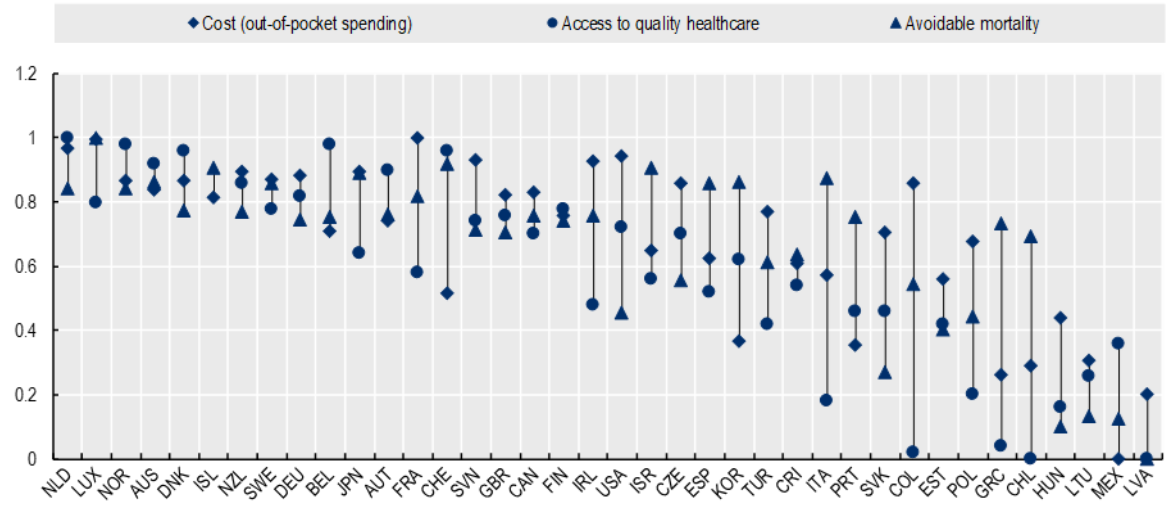
Breaking down the overall sub-indicator health score by its three variable scores provides more details on which variables that are driving the overall score (Figure 3.5. Health dimension: individual variable scores



Note: Values closer to 1(0) represent higher (lower) attractiveness. Data for access to quality healthcare missing for Iceland.
Source: OECD Secretariat

). The countries being most attractive in terms of overall health performance perform relatively well in all three aspects of the health dimension, while countries that are less attractive often show more diversity in variable outcomes. For example, Chile and Greece are scoring relatively well when it comes to avoidable mortality but have much lower scores when it comes to health access and spending.

Figure 3.5. Health dimension: individual variable scores



Note: Values closer to 1(0) represent higher (lower) attractiveness. Data for access to quality healthcare missing for Iceland.
Source: OECD Secretariat

To ensure statistical and conceptual coherence of the structure of the data and the underlying variables, the variables selected for the health dimension should be correlated but not excessively correlated to avoid the risk of double counting (Nardo et al., 2005[8]). A common non-parametric test used to measure association between continuous and ordinal variables is the Spearman rank-order correlation coefficient, where 0 implies no association and 1 implies perfect association. Table 4 presents the correlation between the three variables in the health dimension, showing moderate (between 0.37 and 0.59) positive correlation between the variables, which indicates that there is low risk of double counting. Section 6.2 provides further elaboration on the implications of adding the health dimension to the overall ITA score.

Table 4. Correlation between variables within the health system performance dimension

	Mortality	Spending	Satisfaction
Mortality	1.0000		
Spending	0.3671	1.0000	
Satisfaction	0.5624	0.5938	1.0000

Note: The table displays Spearman rank-order correlation coefficient.
Source: OECD Secretariat

4 An extension to include a new migrant profile: start-up founders

Recent years have seen a growing interest from OECD countries in attracting foreign entrepreneurs to fuel economic growth, job creation and innovation, and make countries more competitive in the globalised knowledge economy. The search to attract and retain foreign start-up founders has led to a proliferation of start-up visa policy schemes in OECD countries (OECD, 2022[3]). Since 2010, 22 OECD countries have introduced start-up visa programmes: Australia, Austria, Canada, Chile, Denmark, Estonia, Finland, France, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, the Netherlands, New Zealand, Poland[3], Portugal, Spain, the United Kingdom, and the United States (Figure 6). While these schemes have a common aim to attract international talents with innovative ideas, the admission conditions, selection process, the definition of an "innovative idea", and the nature of the policies differ across countries (Annex Table 6.A.2).

Figure 6. Introduction and reform of start-up visa programmes in OECD countries

Source: OECD (2022[3])

Against this background, the second edition of the OECD *Indicators of Talent Attractiveness* includes a new ranking focusing on the most attractive countries for start-up founders. The ranking is developed for a sub-set of OECD countries that are actively looking to attract start-up talent, including all 22 countries with a start-up visa. In addition, the ranking also includes countries with favourable policies for start-up founders through other visa pathways. Pathways for entrepreneurs and self-employment often have requirements on business track record, minimum capital and job creation that are hard for start-up founders to meet. However, some countries offer a self-employment visa with no or low capital or job requirements, notably Sweden and Germany. These countries have to date not introduced specific start-up visas but are included in the start-up founder ranking as they offer other pathways that facilitate for migrant start-up entrepreneurs to enter the country.

[3] Poland has introduced a dedicated visa issuance procedure for start-up founders but does not provide a separate visa.

4.1 Defining start-up founders

There is no universal definition of start-up founders. In the context of the OECD *Indicators of Talent Attractiveness*, the definition of a start-up founder takes its starting point in start-up visa programmes, which aims at facilitating the conditions under which foreign nationals wishing to start up a new business can obtain a visa or a residence permit (OECD, 2022[3]). The criteria to define start-up founders and businesses eligible for a start-up visa differ across countries. The requirements often involve a scalable, promising, and viable business idea or recently created business with high/global growth potential. The requirements on the founder also vary, but start-up visas normally target individuals that would otherwise not qualify for an entrepreneur visa. In defining eligibility, some countries focus on the potential of the business while others on the characteristics of the founder. The requirements could be objective (e.g., recently created business or business related to a specific sector) or subjective (e.g., judged potential to create economic impact and employment), or both (OECD, 2022[3]). Moreover, start-up visa conditions usually require the business to be "innovative" with potential to create additional value through implementing new ideas, business models or technologies (EMN, 2018[9]).

4.2 Determinants of a conducive start-up environment

While policies such as start-up visa programmes can send positive signals to start-up founders looking to relocate, the choice of destination will also largely depend on factors beyond immigration policy. Founders will choose a location based on an environment with the highest likelihood of start-up and scale-up success.

A favourable environment for new and innovative businesses to thrive involves a mix of policies and framework conditions. Studies examining the determinants of entrepreneurial activity have identified a number of regulatory, institutional and socio-economic factors that are important to support entrepreneurship and stimulate business start-up and scale-up (see for example (Van Roy and Nepelski, 2016[10]; Mason and Brown, 2014[11]; Brown and Mason, 2017[12]; European Commission, 2021[13]; OECD, 2015[14]; Calvino, Criscuolo and Verlhac, 2020[15]; Calvino and Criscuolo, 2019[16])). Factors identified to affect the emergence and early growth of firms with relevance to the OECD *Indicators of Talent Attractiveness* start-up founder ranking include[4]:

- **Tax and business regulatory frameworks**. These include rules and regulations pertaining to things such as starting and closing a business, tax and product market regulations, and intellectual property protection.
- **Access to finance**. Difficulties in accessing finance is recognised as one of the major obstacles for starting and growing a new business. Access to finance, and particularly capital destined to early stages of firm creation such as venture capital and angel investors, is therefore an important determinant for start-up founders to expand, hire, and grow their business.
- **Market conditions and reach.** This includes how open and connected the economy is to trade, but also how many other leading companies and successful start-up firms the economy hosts, as a positive environment can act as an enabler and large established businesses can help develop the start-up ecosystem.

[4] An additional framework condition included in many theoretical frameworks is "culture", which can incorporate factors such as entrepreneurial motivation and education, risk aversion, or societal views and opinions about entrepreneurs. Such variables are typically operationalised using subjective survey data. Since the OECD *Indicators of Talent Attractiveness* aims to favour quantitative data over subjective qualitative data, entrepreneurial culture is not considered in the creation of the start-up founder index.

- **Access to talent.** Being able to recruit qualified personnel is key for start-up founders. The demand for skilled workers varies depending on business sector, but start-ups are in general in need of highly skilled workers, particularly in the fields of science, technology, engineering, and mathematics (STEM).
- **Creation and diffusion of knowledge.** Start-up firms are characterised by a high level of innovation, and therefore dependent on an innovation conducive environment with processes to transfer knowledge between different institutions such as universities and the private sector. To foster business research and development (R&D) investment and innovation, governments adopt a mix of various financial and non-financial measures. Financial support can take the form of direct government funding (e.g., R&D grants, government procurement of R&D services) or of tax incentives that grant preferential treatment to R&D expenditures or to the income derived from R&D and innovation.
- **Level of digitalisation and connectedness**. Digital infrastructure is critical for start-ups to develop new products and enable them to grow, adapt and scale more quickly. Digitalisation can also help start-up founders to become part of the globalised economy, stay connected, and access better services.

A growing number of approaches to measuring entrepreneurial activity and entrepreneurial ecosystems have emerged in the past two decades, including indices such as the OECD/Eurostat Entrepreneurship Indicators Programme (EIP), the EU Entrepreneurship and Scale-up Indices (ESIS), and the Global Entrepreneurship Monitor (GEM). More recently, specific start-up ecosystem rankings have been developed at country and city level by firms such as StartupGenome and StartupBlink (StartupGenome, 2022[17]; StartupBlink, 2022[18]). An entrepreneurial or start-up ecosystem is typically defined as the interactions and relations between key actors, institutions and processes that enables productive entrepreneurship[5]. It entails key framework conditions such as the number of successful start-ups and available capital, support functions and mechanisms such as accelerators and incubators, promotional and mentoring programmes, as well as spaces and events that brings together key actors in the system. Existing entrepreneurship and start-up indices are however not specifically focused on attracting immigrant entrepreneurs. The OECD *Indicators of Talent Attractiveness* ranking is the first tool of its kind to assess the top destination countries for international start-up founders.

4.3 Selecting the variables for the start-up founder ranking

The framework for start-up founders follows the same set-up as the framework for the other migrant categories, with seven core dimensions and an additional layer of visa and admission policies. The framework partly builds on the existing framework for entrepreneurs, as similar factors are likely to affect both types of migrant profiles. However, start-ups hold specific characteristics that distinguish them from other businesses, requiring a new framework with variables tailored to the realities of start-up businesses. The selection of variables under each dimension is based on the four selection criteria guiding the original framework:

[5] There is no official definition of “entrepreneurial ecosystems” and similar conceptual terms such as “innovation ecosystems” and “start-up ecosystems”. Mason and Brown (2014[11]) provide the following synthesised definition of an entrepreneurial ecosystem: “a set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organisations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, numbers of high growth firms, levels of ‘blockbuster entrepreneurship’, number of serial entrepreneurs, degree of sellout mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment”.

- *Conceptual relevance.* The variables should correctly measure an aspect of talent attractiveness and be closely tied to the conceptual framework outlined in the original OECD *Indicators of Talent Attractiveness* framework (Tuccio, 2019[1]) as well as the key determinants for a conducive start-up environment outlined above.
- *Distinction.* Different variables should measure different aspects of talent attractiveness.
- *Statistical association.* Different variables within a dimension should be statically associated without being redundant.
- *Data quality.* The variables should come from reliable high-quality sources, and to the extent possible be standardised across countries with full country coverage.

In the second edition of the ITA, *data availability over time* is added to the list of criteria to ensure that variables can be updated for future editions of the indicators. Whenever possible, the OECD *Indicators of Talent Attractiveness* use quantitative over qualitative information, due to their greater transparency and replicability. An exception is certain policy variables that are constructed from qualitative information that has been coded and transformed into quantifiable variables (see Box 1 for further details on the coding of qualitative policy variables).

Quality of opportunity

The *Quality of opportunity* dimension captures factors related to market conditions and reach, the start-up ecosystem, and business regulations (Table 5). Firstly, start-up founders are interested in relocating to areas with other start-ups and successful businesses as it gives access to relevant networks and knowledge to support the development and scaling of a business ideas. The presence of global firms can further help start-ups access global markets and offers an important source of skilled talent and R&D. The *Quality of opportunity* dimension therefore includes two measures of presence of successful businesses: the **number of unicorns formed in the past five years**, and the **number of multinational enterprises**.

Furthermore, a vibrant start-up ecosystem is often seen as conducive to start-up success. This is proxied by a variable capturing the **number of city-level ecosystems a country has in the global top 150-ranking**. As discussed above, there are different ways of measuring start-up ecosystems, and several indices and rankings have been developed in recent times. The variable included in the ITA framework builds on the StartupBlink Global Startup Ecosystem ranking, which includes 1000 cities and 100 countries worldwide. The StartupBlink score is calculated based on three sub-scores measuring *Quantity* (e.g., number of start-ups and accelerators), *Quality* (e.g., number of startup events and number of investor-backed start-ups), and *Business environment* (e.g., availability of technological services and patent per capita)[6]. The StartupBlink ranking builds on a combination of multiple private and public data sources as well as crowdsourced data, which allows to capture aspects of the ecosystem beyond what is normally available in public databases. The choice of including a variable reflecting the number of top-rated ecosystems, rather than the ecosystem score, is due to that the methodology underlying the StartupBlink ranking has been subject to adjustments over time and scores are not perfectly comparable from year to year.

The dimension also considers the **presence of coworking spaces**. Access to affordable office space and basic equipment helps limiting initial business operating costs during the start-up phase. Furthermore, coworking spaces can offer access to professional networks, advisory support, and stimulate knowledge

[6] Naturally, a limited number of variables in the ecosystem ranking are similar or partly overlaps with other variables included in the ITA Quality of opportunity and Skills dimensions (e.g., number of unicorns, coworking spaces, English proficiency, and R&D investments). However, as shown in Annex Table 6.A.3, the correlation between the ecosystem variable and other variables within the Quality of opportunity dimension is moderate (highest correlation is 0.67), indicating that there is limited risk of double counting.

transfers. This is captured through a variable counting available coworking spaces on the global platform *coworker.com*.[7]

Market opportunities and reach is captured through a variable on **trade openness**. Trade is important to start-up founders as it enables growth and provides more market opportunities and access to international innovation. In terms of market regulations, the dimension includes a **product market regulation index** that captures how competition friendly the market is[8].

Table 5. Quality of opportunity dimension for start-up founders

Variable	Description	Source	Year
Number of unicorns	Number of new venture-backed companies that have raised a round at post-money valuation of $billion since the beginning of 2016	Pitchbook	2022
Number of multinational companies	Number of multinational companies in the OECD Analytical Database on Individual Multinationals and Affiliates (ADIMA	OECD	2021
Number of coworking spaces	Number of available coworking spaces listed on coworker.com as share of employed population	Coworker.com	2022
Number of ecosystems in the top 150-ranking	Number of ecosystems at city-level ranked in the world's top 150	StartupBlink	2022
Trade openness	Ratio of country's total trade (i.e., the sum of exports plus imports) to the country's gross domestic product	OECD	2019
Product market regulation index	Product market regulation index	OECD	2018

Source: OECD Secretariat

Income and tax

The *Income and tax* dimension captures financial and fiscal-related pull factors of destination countries and is made up of four variables (Table 6). A key aspect for start-up success is access to funding, and particularly early-stage funding such as venture capital destined at young companies with innovation and growth potential but untested business models and no track record. The development of the venture capital industry is thus considered an important framework condition to stimulate innovative entrepreneurship. In terms of measuring venture capital, there are no standard international definitions of either venture capital or venture capital investments by development stage. In the OECD *Entrepreneurship Financing Database*, venture capital constitutes the sum of early stage (pre-seed, seed, start-up, and other early-stage capital) and later stage venture capital. As there are no harmonised definitions of venture capital stages across venture capital associations and other data providers, original data have been aggregated to fit the OECD classification of venture capital by stages. However, to date Korea and New Zealand do not provide breakdowns of venture capital by stage. To allow cross-country comparison, the variable capturing access to funding includes aggregated (early and later stage) **venture capital as share of Gross Domestic Product** (GDP).

[7] Ideally, a variable capturing the number of incubators and/or accelerators would also have been included, but no publicly available data covering the number of incubators/accelerators for the OECD area was identified. The number of accelerators is indirectly covered as it is included in the ecosystem ranking variable.

[8] Other key aspect related to market regulations include efficient insolvency systems and contract enforcement (Calvino, Criscuolo and Menon, 2016[22]). Cross-country data measuring such regulations are available in the *World Bank Doing Business index* but have not been included in the framework as the Doing Business report has been discontinued and data have not been updated since 2019. However, the ranking is in

The dimension also includes two tax-related variables. The first is the **corporate income tax rate**, to proxy for the financial burden that firms must pay in the host country. In addition, tax incentives that grant preferential treatment to research and development (R&D) expenditures has become a widely used policy tool to promote innovation. The OECD collects data on the effective tax rate for R&D for all its member countries[9]. The economic argument for public support for business R&D rests on the notion that, in the absence of support, there would be an underinvestment in R&D relative to the socially optimal level due to the risky and uncertain nature of R&D and the higher cost of financing of such investments, which is particularly relevant for young and small firms (González Cabral, Appelt and Hanappi, 2021[19]). A variable capturing **implied tax subsidy on research and development** is hence included in the framework.

Finally, the overall costs of living and working in a country may also attract start-up founders in search of destinations with lower living costs, which is proxied by an inverted **price level index**[10].

Table 6. Income and tax dimension for start-up founders

Variable	Description	Source	Year
Access to venture capital	Access to venture capital as share of GDP (%)	OECD	2021
Corporate tax	Corporate income tax rate	OECD	2021
Implied tax subsidy on R&D	Implied tax subsidy on R&D	OECD	2021
Price level index	Price level index	OECD	2021

Note: The corporate tax and price level index variables are inverted in the creation of the indicator, so the higher price level/corporate tax implies the less attractive the country is.
Source: OECD secretariat

Future prospects

The *Future prospect* dimension captures the longer-term prospects to stay in the country for international start-up founders (Table 7). Existing start-up visa programmes differ in how much time start-up founders are given to prove that their business idea is viable before their initial permit expires and they must renew or change to a different permit. In most cases, start-up visa programmes offer temporary residence permits, valid between one and two years before visa holders must demonstrate progress to be able to renew their permit or apply to another visa stream. Australia and Canada are the only countries offering permanent residency for start-up founder visa holders from day one (OECD, 2022[3]). Allowing more time to develop the business ideas or visa programmes that automatically grants permanent residency to start-up founders can act as a pull factor for start-up founder relocation. In the longer perspective, migrants also take acquisition of nationality into account. Consequently, the dimension includes a variable capturing the **number of years that the original visa or permit gives founders to develop their ideas**, and a variable that captures the **easiness of status change from temporary to permanent status**.

Furthermore, the dimension includes a variable accounting for **how common it is for migrants to become nationals of the destination country after 10 years of residence**, and the **demographic structure in the economy** (dependency ratio) as a proxy for future labour force demand driven by the size of the working population.

[9] Information on whether OECD countries have favourable tax treatments specifically targeting SMEs and young firms is also available in the OECD database, but this information is not available for all countries in the ITA start-up ranking and is therefore not included in the framework.

[10] Besides overall price level, affordability and availability of housing was further mentioned as an important aspect of attracting talent in the consultation process. This aspect is covered through three variables included in the OECD *Better Life Index* under the “Quality of Life” dimension (see Table 11).

Table 7. Future prospects dimension for start-up founders

Variable	Description	Source	Year
Acquisition of nationality	Share of nationals among the foreign-born with 10+ residence	Computed by OECD based on LFS data	2020
Duration of initial visa/permit before change is required	Length (in years) the permit for start-up founders is valid before status change or change to another permit is required.	OECD Secretariat	2022
Ease of status change from temporary to permanent residence	Ease of status change from temporary to permanent residence	OECD Secretariat	2022
Dependency ratio 2050	Ratio of population aged 0-14 and 65+ per 100 population 15-64	UNDESA	2022

Note: The data underlying the "acquisition of nationality" is derived from OECD (2020). For EU countries, the variable only includes third-country nationals. Data for Colombia and Costa Rica are missing, and the future prospect dimension is calculated without taking this variable into account. Data for Japan and Korea are estimates.
Source: OECD Secretariat

Family environment

This dimension is intended to capture the opportunities opened to family members of potential migrants in the destination countries. It includes a variable related to **working possibilities for accompanying spouses**, as well as two more general measures of public policy related to **family benefits** (expenditures per head) and **participation tax rates for second earner** (taking into account the tax burden of a second adult member of the family entering the labour market). Finally, the **PISA math test scores** are included to proxy the quality of the school system (Table 8).

Table 8. Family environment dimension for start-up founders

Variable	Description	Source	Year
Possibility for joining spouse to work	Possibility for joining spouse to work	OECD Secretariat	2022
Ease for children of migrants to get citizenship	Ease for children of migrants to get citizenship	OECD Secretariat	2022
Public expenditure on family benefits	Public expenditure on family benefits (per head, PPP 2010)	OECD	2019
PISA math test scores	PISA math test scores	OECD	2018
Participation tax rate for second earner parent entering employment	Participation tax rate for second earner parent entering employment	OECD	2021

Note: The "ease for children of migrants to get citizenship" variable is based on the Global Database on Modes of Acquisition of Citizenship (GlobalCit) by the European University Institute. The variable looks at both the birthrights of children born in a country irrespectively of parents' citizenship, and the acquisition rights of children born in a country after birth. Participation tax rate for second earner is inverted in the creation of the indicator, so that a higher tax level implies a less attractive country.

Source: OECD Secretariat

Skills environment

The *Skills environment* dimension includes variables related to human capital, creation and diffusion of knowledge, and digitalisation and connectedness (Table 9). Access to a skilled workforce is key for start-up businesses to develop and grow. Many start-ups operate in the tech industry and are specifically in need of skills related to the fields of science, technology, engineering, and mathematics (STEM). The dimension therefore includes three variables capturing access to a human capital and skilled workforce: the **number of top-ranked universities in the country**, the **share of graduates in STEM as a share of total graduates**, and the **level of English proficiency**.

Another key aspect for the skills environment dimension is knowledge creation. The dimension includes two variables related to R&D: **gross domestic spending on R&D** and the **number o filed patents**. Finally, as discussed above, digitalisation and access to high-speed internet is key to attract international entrepreneurs and start-up founders. Three variables related to digitalisation and connectedness are therefore included: **broadband subscriptions**, **share of fibre in total broadband**, and a **cyber security index**.

Table 9. Skills environment dimension for start-up founders

Variable	Description	Source	Year
Fixed broadband subscriptions	Fixed broadband subscriptions per 100 inhabitants	OECD Broadband Statistics	2021
Share of fibre	Share of fibre in total broadband	OECD	2021
English proficiency	English proficiency	EF English Proficiency Index	2021
Gross Domestic Spending on R&D	Gross Domestic Spending on R&D (%)	OECD	2020
Patents	Total count of patents that have been filed (IP5)	OECD	2018
Top-ranked universities	Number of universities ranked in the World's top-500	ARWU	2022
STEM graduates as share of total graduates	Share of graduates in STEM as share of total graduates	OECD	2020
Cyber security index	International Telecommunication Union (ITU) Global Cybersecurity index	ITU	2020

Note: English-speaking countries (Australia, Canada, Ireland, New Zealand, the United Kingdom, and the United States) are automatically assigned the highest value for English proficiency. English First does not produce the English Proficiency Index for Island, Israel, and Slovenia, hence English proficiency for these countries is estimated using the median proficiency across the OECD area.
Source: OECD Secretariat

Inclusiveness

The *Inclusiveness* dimension captures attitudes towards immigrants in destination countries, as well as how diversified and inclusive the society is. For start-up founders, the dimension has been tailored to diversity and gender equality indicators that are particularly relevant to immigrant start-up owners.

Two variables related to openness to immigrants are included: the **share of patents owned by foreign inventors**, and the **Gallup Migrant Acceptance Index** described in Section 3. In addition, two measures of gender equality in the business sector are included: the **share of patents registered by women** and the **share of women in company boards** (Table 10).

Table 10. Inclusiveness dimension for start-up founders

Variable	Description	Source	Year
International patent co-operation	Share of patents owned by foreign inventors (%)	OECD	2020
Migrant Acceptance Index (MAI)	Gallup's Migrant Acceptance Index (MAI)	Gallup	2019
Share of women inventors	Share of patents registered by women (%)	OECD	2019
Share of women in company boards	Share of women in company boards (%)	OECD	2021

Note: Data on share of patents registered by women is not available for Korea and Latvia, values have been imputed using averages for their respective regions.
Source: OECD Secretariat.

Quality of life

This dimension is intended to capture the amenities and quality of life of destination countries. In line with the framework for the other migrant profiles, this is captured by the **OECD Better Life Index**. The Better Life Index is a composite index including 11 dimensions and 24 variables to capture key aspects of material living conditions and quality of life. The variables included in the index are: number of dwellings without basic facilities, housing expenditure, rooms per person, household net adjusted disposable income, household net financial wealth, labour market insecurity, employment rate, long-term unemployment rate,

personal earnings, quality of support network, educational attainment, student skills, years in education, air pollution, water quality, stakeholder engagement for developing regulations, voter turnout, life expectancy, self-reported health, life satisfaction, feeling safe walking alone at night, homicide rate, employees working very long hours, time devoted to leisure and personal care.

Table 11. Quality of life dimension for start-up founders

Variable	Description	Source	Year
OECD Better Life Index	OECD Better Life Index	OECD	2022

Note: The index used in the OECD Indicators of Talent Attractiveness framework is constructed using equal weights.
Source: OECD Secretariat.

Visa and admission policy dimension

Finally, the policy dimension for start-up founders includes five variables, three that assigns a penalty and two that gives a bonus to the overall composite index score (Table 12).

Start-up visas are specifically tailored to the reality of start-up founders and are thus seen as an advantage in the admission process. Countries that **lack a start-up visa** or permit are therefore assigned a penalty. Current start-up visas and permits differ in terms of their minimum investment capital requirements (see Annex Table 6.A.2). Having a **capital requirement**, no matter the size, generates a penalty. In addition, a few countries have an indirect capital requirement through a point system for start-up visas with access to own capital as one of the key criteria. In the case where it is judged very difficult to obtain a visa if the capital condition is not met, the country is here considered to have a minimum capital requirement and is assigned a penalty in the framework. The third variable that generates a penalty is **low level of digitization of the visa process** (see section 3.1 for further details on the creation of this variable).

Countries that provide international start-up founders with **access to capital through grants or prize competitions** and countries offering a **pathway for international start-up employees** are assigned a bonus on the overall indicator score. Box 1 provides further details on the operationalisation and size of penalty and bonus scores.

Table 12. Policy dimension for start-up founders

Variable	Description	Source	Year
Lack of start-up visa (penalty)	Country does not offer start-up visa	Computed by OECD Secretariat	2022
Minimum capital requirement (penalty)	Minium capital requirement	Computed by OECD Secretariat	2022
Visa digitization score (penalty)	Level of digitization of visa process	Computed by OECD Secretariat based on Fragomen digitization scoreboard	2022
International students not allowed to start a business on post-graduation visa (penalty)	International students not allowed to start a business on post-graduation visa	Computed by OECD Secretariat	2022
Provide financial support (bonus)	Provide financial support in the form of grant or competition	Computed by OECD Secretariat	2022
Provide pathway for start-up employees (bonus)	Provide pathway for start-up employees	Computed by OECD Secretariat	2022

Source: OECD Secretariat

Box 1. Assigning scores to qualitative policy variables

The framework for startup founders includes several policy variables that are based on qualitative data that requires a transformation into quantitative values:

- Duration of initial visa/permit before change is required
- Ease of status change from temporary to permanent residence
- Possibility for joining spouse to work
- Ease for children of migrants to get citizenship
- Lack of start-up visa
- Capital requirement
- Low visa digitization score
- International students not allowed to start business on post-graduation visa
- Provision of financial support to international start-up founders
- Provision of pathway for international start-up employees

The variables are mainly based on information from OECD internal migration policy databases. Information about citizenship of immigrant children is based on data from the EUI database, and the visa digitization score is based on the Fragomen visa digitization scoreboard (Table 12).

The first two policy variables are relatively straightforward to code as they build on quantitative information (i.e., months before change of visa/permit is required and years of residence before it is possible to switch to permanent residency). The duration of initial visa/permit variable takes on value 1 if permanent visa is issued from the start, 0.7 if it is issued for 3 years or more, 0.5 if it is issued for 1-3 years, 0.3 if it is issued for 1 year, and 0 if the initial duration is less than 12 months. The ease of status change from temporary to permanent is also based on duration and coded in the following way: 1 if the process takes less than 2 years; 0.7 if the process takes 2-3 years; 0.5 if the process takes 4-6 years; and 0 if the process takes more than 6 years.

The variables related to family environment (possibility for spouse to work and ease for children of migrants to get citizenship) are coded as follows: 1 implies automatically allowed, 0.5 allowed with restrictions, and 0 not directly allowed.

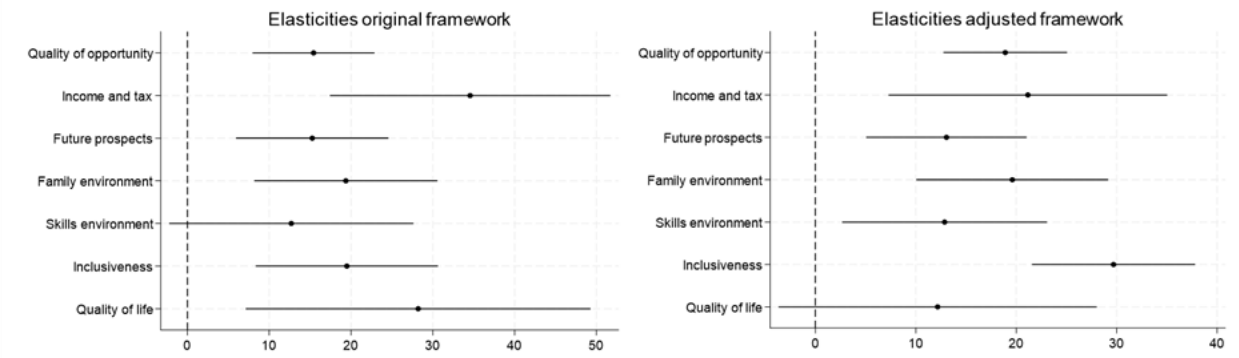
A set of variables related to visa and admission policies assigns a 2.5% penalty per variable (not having a start-up visa in place; having a minimum capital requirement; not allowing students to start a business on a post-graduation visa) or a 2.5% bonus per variable (visa/permit offers financial support in the form of grants or competition with prize money; visa/permit provides a pathway for international start-up employees) on the overall score. Finally, countries are ranked according to their visa digitization score, and assigned into three groups (terciles). A penalty of 2.5% is assigned to countries that score in the bottom third of the visa digitization scoreboard, and a 1.25% penalty for those that score in the second tercile. The maximum visa and admission policy penalty that a country can obtain is thus 10% and the maximum bonus is 5%.

5 Robustness and sensitivity tests

The adjustments and extensions applied in the second edition of the OECD *Indicators of Talent Attractiveness* was subject to several sensitivity analysis and robustness tests, with specific focus on the new start-up founder ranking.

Firstly, the implication of the adjustments to the original ITA framework is investigated. Figure 7 examines the role each dimension plays for the overall attractiveness of OECD countries to highly skilled workers in the original (left panel) and the adjusted (right panel) ITA framework respectively. The adjusted framework reflects the additional variables introduced in the second edition of the ITA as explained in Section 3.1. The elasticities are obtained by regressing the indicators ranks (with equal weights) on the normalised dimensions. In the original framework, the *Income and tax* dimension strongly contributed to the overall rank of a country while the *Skills environment* played a relatively less important role. In the adjusted framework, the *Inclusiveness* and *Quality of opportunity* dimensions now play a more important role in determining talent attractiveness. The precision for the *Skills environment* dimension also improved and is now statistically significant, while the *Quality of life* dimension is not. Further sensitivity analysis were also performed to test the importance of each of the new variables for the respective dimensions as well as the aggregated ITA score.

Figure 7. The role of each dimension for the ITA ranking, before and after framework adjustments, highly skilled workers



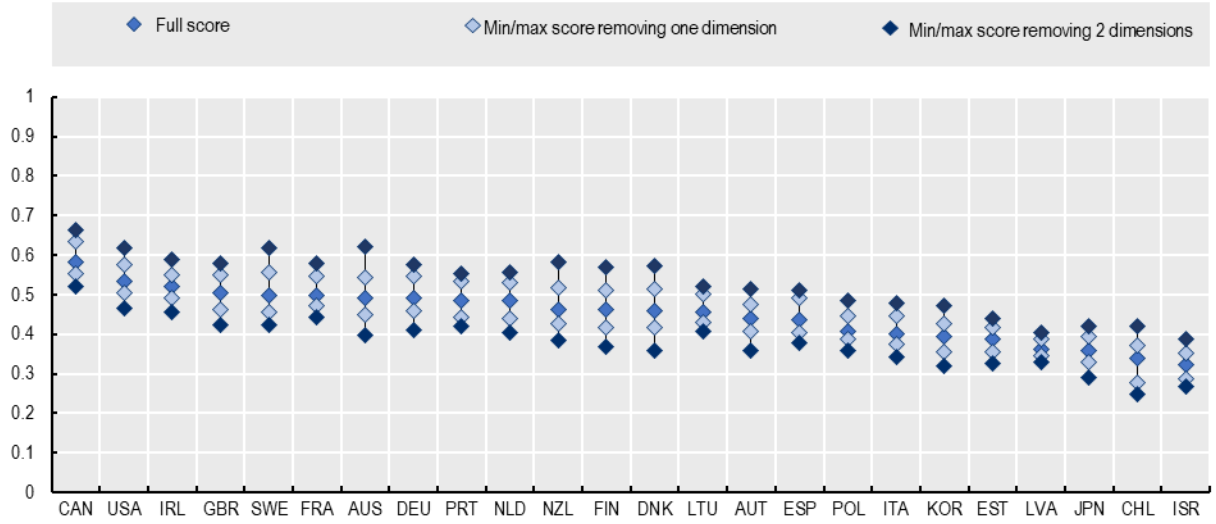
Note: The figure shows the elasticities of the OECD Indicators of Talent Attractiveness to the seven talent attractiveness dimensions for highly skilled workers. Elasticities are obtained regressing the OECD Indicators of Talent Attractiveness ranks (with equal weights) on the normalised dimensions. The dots represent point estimates, and the lines represent their 95% confidence intervals. The original framework (left panel) shows the elasticities when keeping the framework identic to the first (2019) edition of the ITA, and the adjusted framework reflects the changes in the Inclusiveness, Skills and Visa and admission policy dimension introduced in the second edition of the ITA as explained in Section 3.1.
Source: OECD Secretariat.

Several robustness checks were implemented for the new start-up founder ranking. As a start, correlation analyses were carried out within and across dimensions. As discussed in Section 3.2, variables within a dimension should ideally demonstrate some correlation but not be overly correlated to avoid double counting and justify their aggregation within a dimension. An investigation of the association between

variables within each dimension (using Spearman rank-order correlation coefficient) confirms that certain variables are naturally relatively strongly correlated, such as the number of unicorns and multinational enterprises within the *Quality of opportunity* dimension and the number of top universities and the number of patents within the *Skills dimension* (Annex Table 6.A.3). However, as noted by Nardo (2005[8]), the selection of variables should not only be determined by statistical analysis but also by analysing the individual and composition of indicators vis-à-vis the phenomenon they jointly aim to capture. In the case of number of top universities/number of patents and number of unicorns/multinational enterprises, they are as discussed in Section 4 judged to capture different aspects of their respective dimensions which motivates their inclusion on an equal weight basis. Most other variables in the framework are only weakly or moderately correlated.

Another concern that might be raised is that the country ranking obtained through equal weighting is driven by extreme performances of OECD countries on certain dimensions. One of the drawbacks with equal weighting is that it does not reward countries with a balanced score across dimensions. This implies that there is a risk that outliers are driving the outcomes of certain countries if they are performing exceptionally well in one dimension relative to other. To test for any potential outlier bias, new composite indicator scores were calculated by systematically excluding one or two dimensions from the aggregated ITA score and then compare the new scores obtained with the original score taking all seven dimensions into account. Figure 8 presents the value of the composite indicator for workers using equal weights to aggregate all seven dimensions ("full score"), as well as the minimum and maximum value obtained when removing one or two of the dimensions respectively. For countries placed in the top and bottom part of the ranking, the overall score is relatively unsensitive to removing one or two dimensions from the composite index, while the removal of dimensions has a larger effect for countries in the middle of the ranking.

Figure 8. Effect of removing one or two dimensions on the overall ITA score, start-up founders

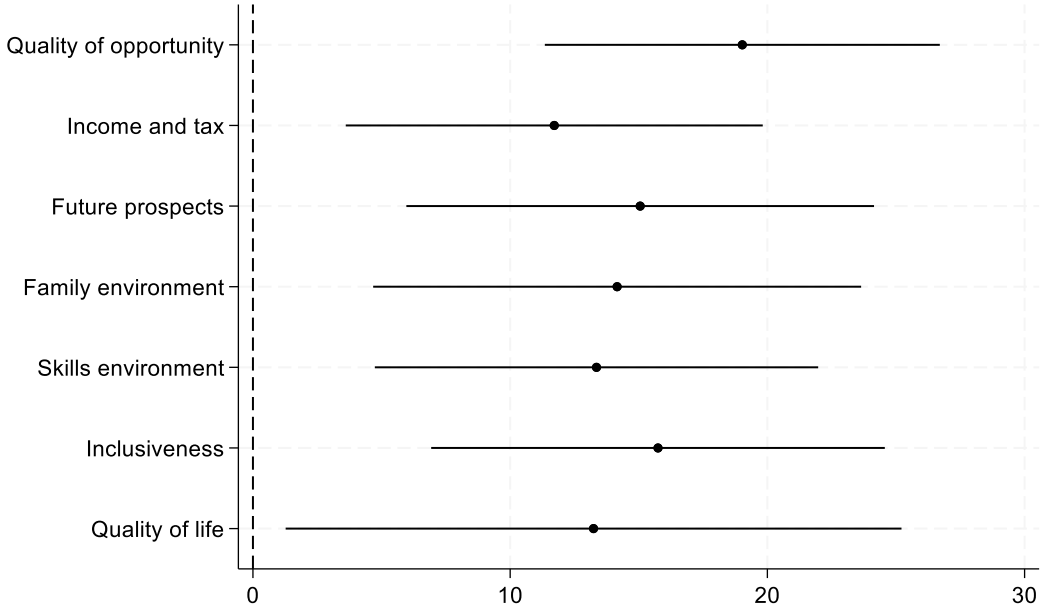


Note: The figure compares the default ITA score ("full score") when all seven dimensions are considered to the minimum and maximum scores obtained when systematically removing one or two of the dimensions.
Source: OECD Secretariat.

In addition, it is interesting to examine which dimensions count the most for the attractiveness of OECD countries for start-up founders. Figure 9 shows the elasticities of the ITA start-up ranking to their seven underlying dimensions, obtained by regressing jointly the indicator ranks (with equal weights) on the normalised dimensions. The results show a relatively balanced contribution of the seven core dimensions, with *Quality of opportunity* being the dimension with the strongest influence on the overall ITA score,

followed by *Inclusiveness* and *Future prospects*. Furthermore, sensitivity analysis to test the impact of individual variables to the aggregated score were also performed to ensure that the framework is balanced across dimensions.

Figure 9. The role of each dimension for the ITA ranking, start-up founders



Note: The figure shows the elasticities of the OECD Indicators of Talent Attractiveness to the seven talent attractiveness dimensions for start-up founders. Elasticities are obtained regressing the OECD Indicators of Talent Attractiveness ranks (with equal weights) on the normalised dimensions. The dots represent point estimates, and the lines represent their 95% confidence intervals.
Source: OECD Secretariat.

6 Elaboration of results of the second edition of OECD Indicators of Talent Attractiveness

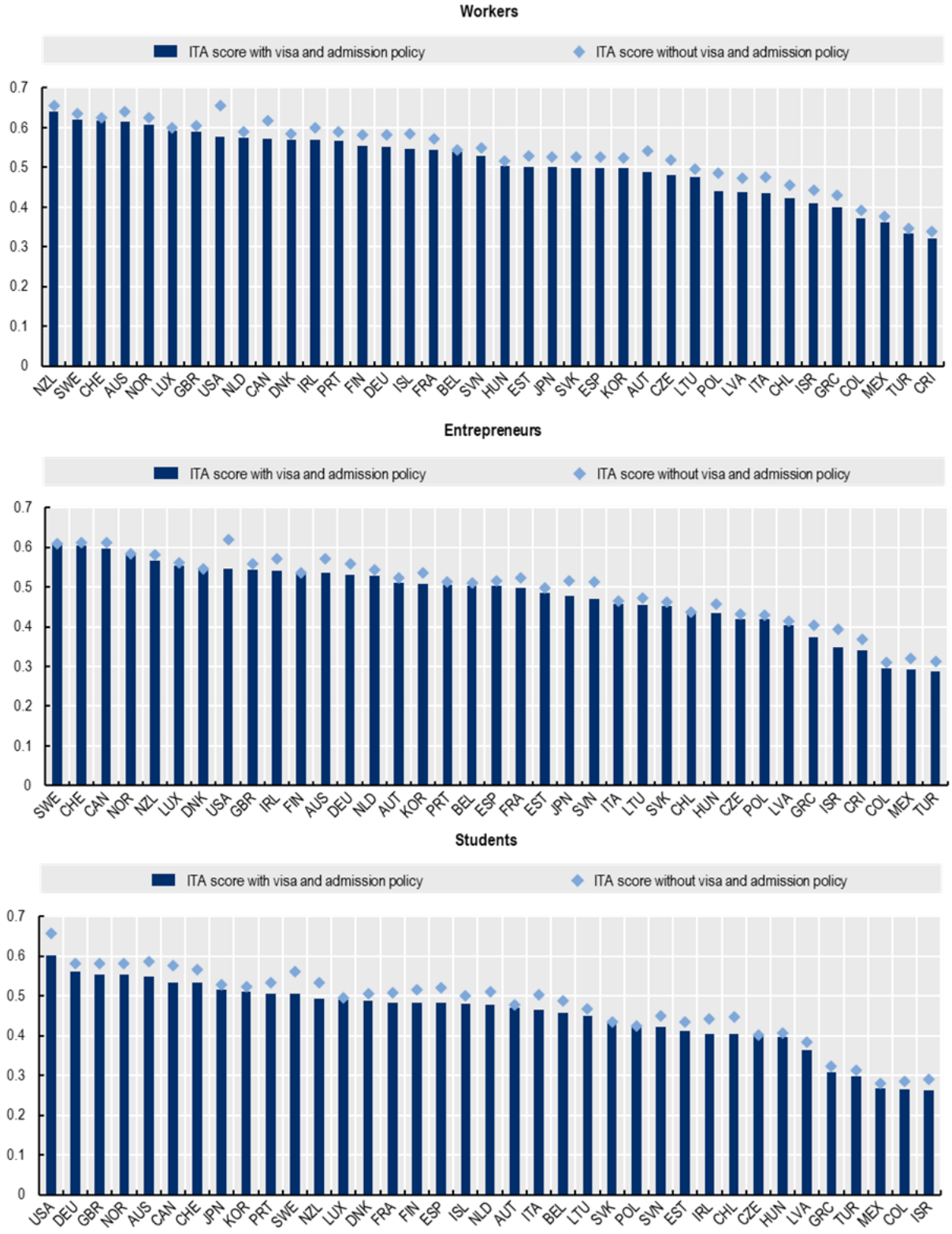
This section provides an overview of the results of the second edition of the OECD *Indicators of Talent Attractiveness* when using the default equal weights across the seven core dimensions. Users interested in tailoring the ranking according to their preferences can create individual rankings by alternating the weights, and adding the health dimension, using the webtool on the ITA webpage. The rankings are also discussed in two dedicated policy briefs for workers entrepreneurs and students (OECD, 2023[20]) and start-up founders (OECD, 2023[21]).

6.1 Rankings for workers, entrepreneurs, and students

Figure 10 presents the rankings for highly skilled workers, entrepreneurs, and international students with and without taking into account the visa and admission policy framework. The indicators represent the attractiveness of OECD countries to highly skilled migrants under the assumption that the prospective migrant has a profile that enables him/her to fulfil the requirements of the visa programme, which allows for comparison of migration policies across countries.

Figure 10. OECD second edition ITA ranking for workers, entrepreneurs, and students

ITA score with and without taking into account the visa and admission policy practices for admission



Note: Values closer to 1 (0) represent higher (lower) attractiveness.

Source: OECD Secretariat

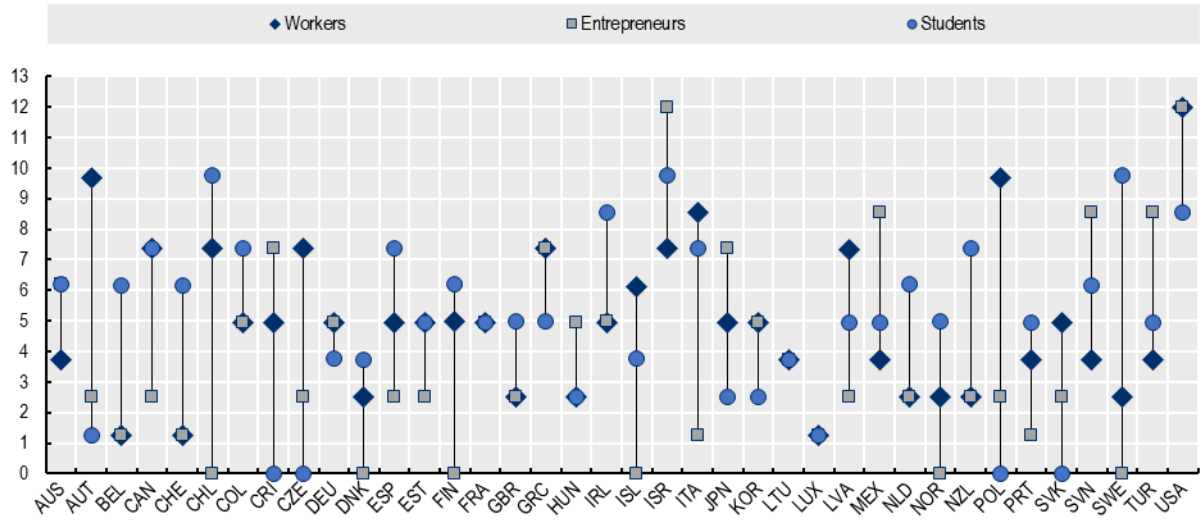
New Zealand, Sweden, Switzerland, Australia, and Norway are the top destination countries for highly skilled workers (Figure 10, top panel). Conversely, the United States, Austria, Poland, Italy, and Canada impose the highest visa and admission penalties for workers (Figure 11), primarily due to high refusal rates and low digitization of the visa process. The United States also faces a significant penalty because of a quota for highly skilled workers. Without these visa and admission policy constraints, the United States would rank as the second most attractive country for highly skilled migrants, following New Zealand, and ahead of Australia. Luxembourg and Switzerland, with minimal visa and admission policy penalties, rise in the rankings when these factors are considered.

Four out of five top countries for highly skilled workers - Sweden, Switzerland Norway, and New Zealand- also rank highly in attracting entrepreneurs (Figure 10, middle-panel). In addition, Canada is among the top-five in attracting entrepreneurs. Additionally, Canada is among the top five for attracting entrepreneurs. The United States, however, is heavily penalized in this regard due to stringent job creation and minimum capital requirements. The United States, however, is heavily penalized in this regard due to stringent job creation and minimum capital requirements.

The ranking for international students differs slightly from the other two migrant profiles, with United States being the most attractive country followed by Germany and the United Kingdom (Figure 10, bottom panel).. Despite significant penalties from visa and admission policies, the United States remains the top choice due to its high overall scores. Sweden, despite being very attractive for workers and entrepreneurs, does not rank among the top ten for international students, largely due to its strict visa and admission policies (Figure 11).

Figure 11. Visa and admission policy penalties

Percentage reduction in the ITA score due to visa and admission policy framework



Note: The visa and admission policy penalties are deducted from the ITA score. The maximum penalties are 17.5% for workers, 12.5% for entrepreneurs, and 10% for students.
Source: OECD Secretariat.

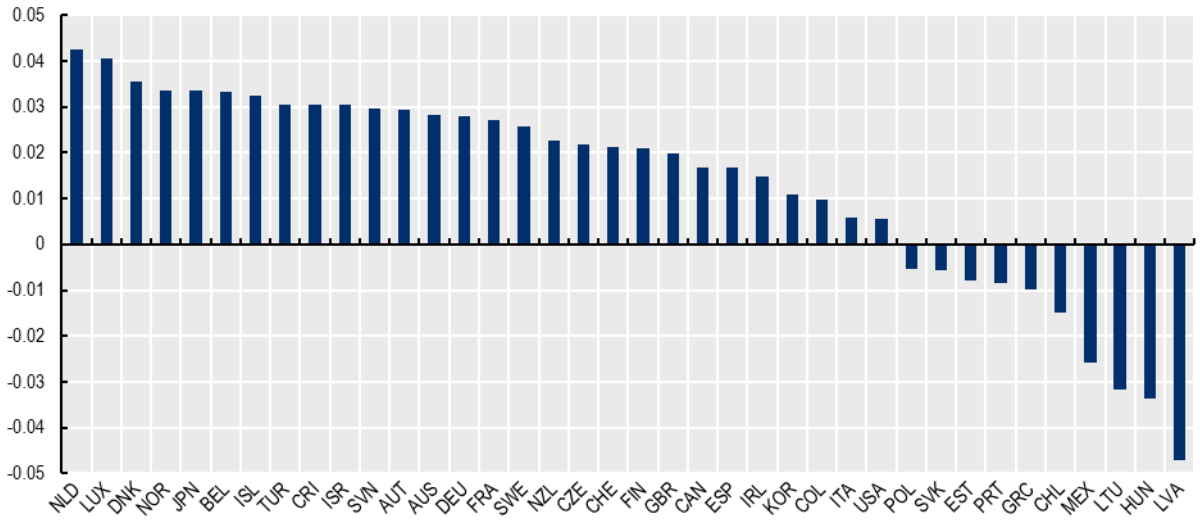
A handful of countries consistently rank at the lower end for all migrant profiles, including Türkiye, Costa Rica, Colombia, Mexico, Greece, and Israel. The results indicate that countries often cannot attract all types of migrants simultaneously. Norway is the only country that ranks in the top five for all three profiles. Additionally, four countries—Australia, New Zealand, Sweden, and Switzerland—maintain top-five positions in two out of three migrant profiles. Other countries, like Germany and Japan, show more varied results. For instance, they rank among the top countries for attracting students but lag in attracting highly skilled workers and entrepreneurs.

6.2 The effect of adding a health dimension to the indicator framework

For most countries, adding the health dimension increased the aggregated ITA score (Figure 12). The Benelux countries (Belgium, the Netherlands and Luxembourg), some Nordic countries (Denmark, Norway, and Iceland) and Japan see the biggest improvements in their overall scores due to the inclusion of the health sector. On the other end of the scale, ten countries face a drop in attractiveness score when considering the health dimension.

The implication of the health dimension for the overall ranking is relatively limited (Figure 13). The top and bottom five countries remain unchanged when considering the health dimension, although their order of precedence changes slightly. The United States falls back four places in the ranking and is no longer among the top-ten most attractive countries when consider health system performance. The largest drop in the ranking is found for Hungary (dropping seven places in the ranking) followed by Portugal (dropping five places in the ranking), while Austria is gaining four places in the ranking when considering health system performance. Other countries see no or small changes in the ranking from the introduction of the health dimension. Similar results are found when adding the health dimension to the entrepreneur and student rankings (Annex Figure 6.A.1).

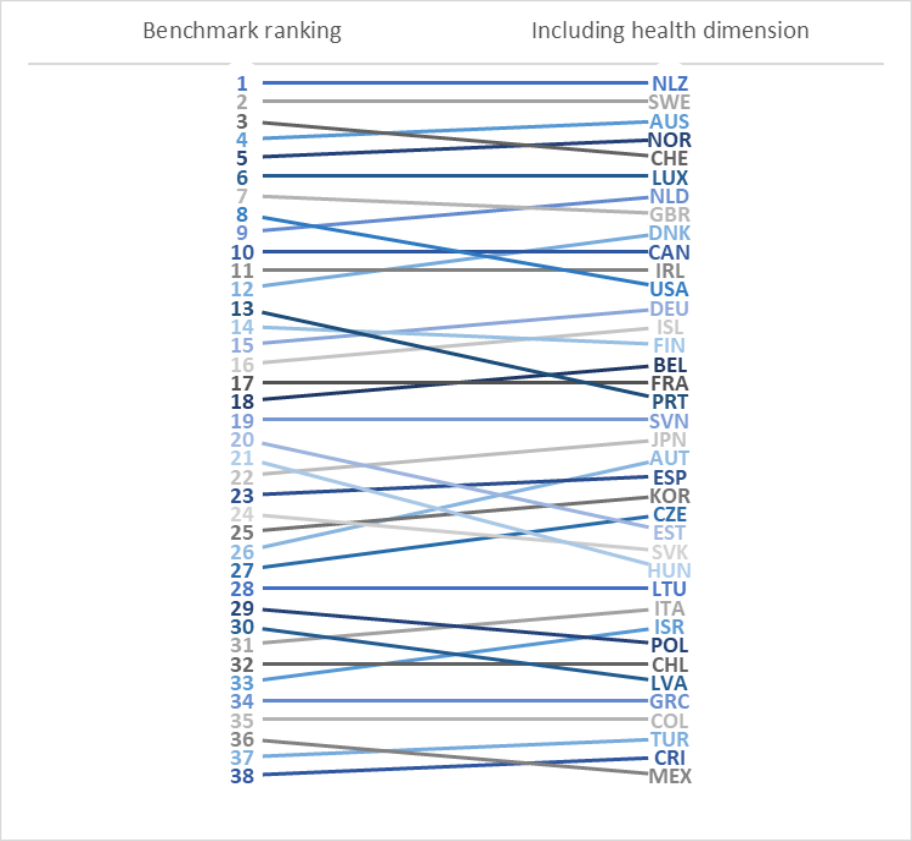
Figure 12. Change in overall ITA score after applying the health dimension, highly skilled workers



Note: The figure displays the change in composite index score with default equal weights across the seven and eight dimensions respectively.
Source: OECD Secretariat

Figure 13. Implication of adding the health dimension for overall ITA ranking

ITA ranking with and without including the health dimension, highly skilled workers

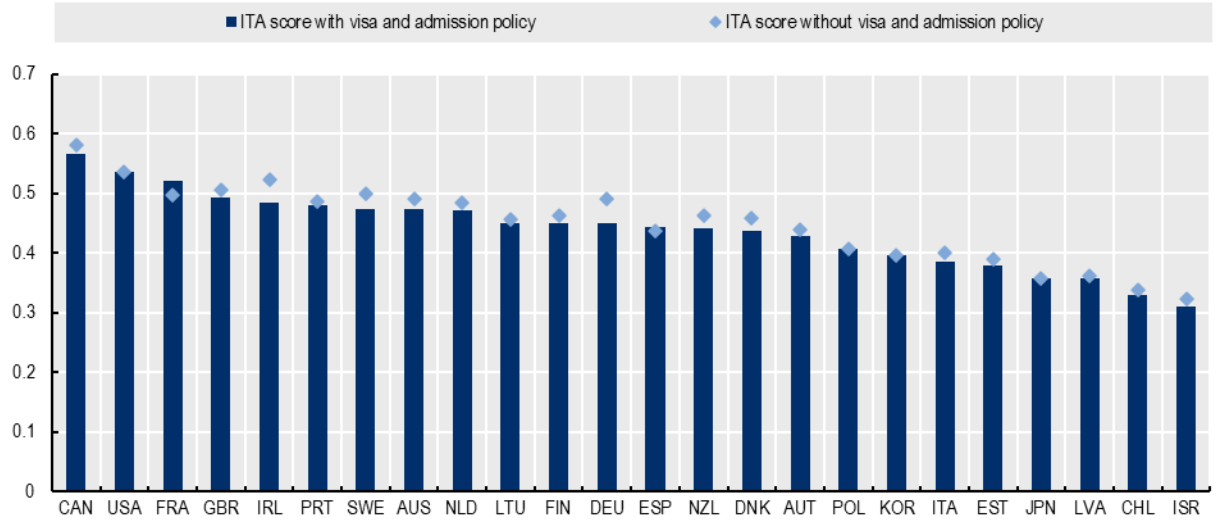


Note: Ranking based on default equal weights across dimensions. The benchmark ranking includes the seven original dimensions.
Source: OECD Secretariat

6.3 Results for start-up founders

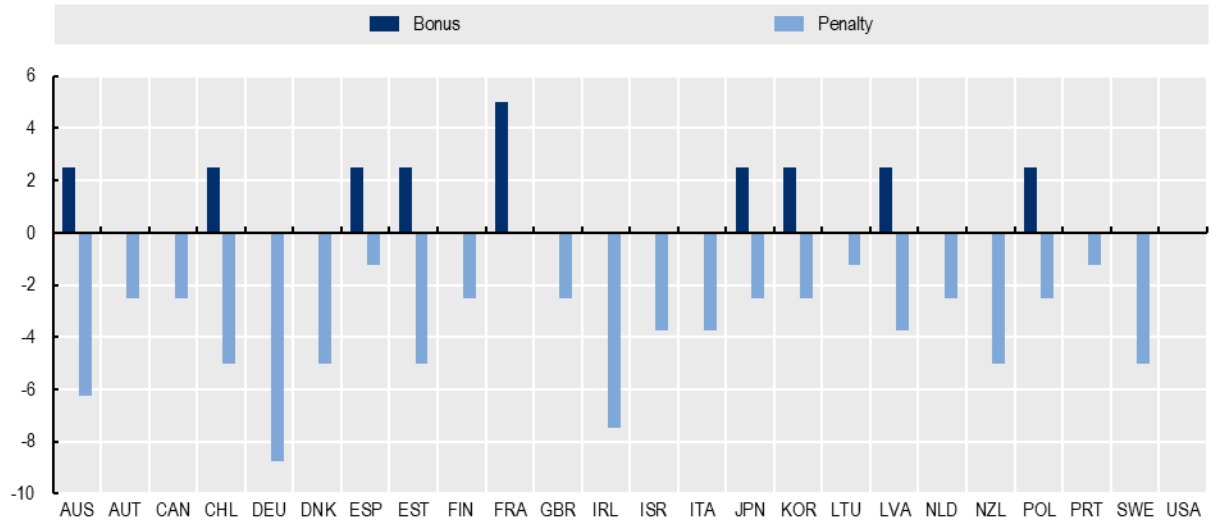
The most attractive countries for start-up founders are Canada, the United States, and France, followed by the United Kingdom and Ireland (Figure 14). France has the most favourable visa and admission policies for start-up founders, and the only country with a higher score when visa policies are considered due to the bonus points received for offering financial support and providing a pathway for international startup staff (Figure 15). Ireland and Germany are on the other hand falling back in the ranking when considering visa and admission policies, which is due to minimum capital requirements and in the case of Germany the lack of provision of a specific start-up visa.

Figure 14. ITA score with and without visa policy, start-up founders



Note: Values closer to 1 (0) represent higher (lower) attractiveness.
Source: OECD Secretariat.

Figure 15. Visa and policy admission penalty and bonus, start-up founders



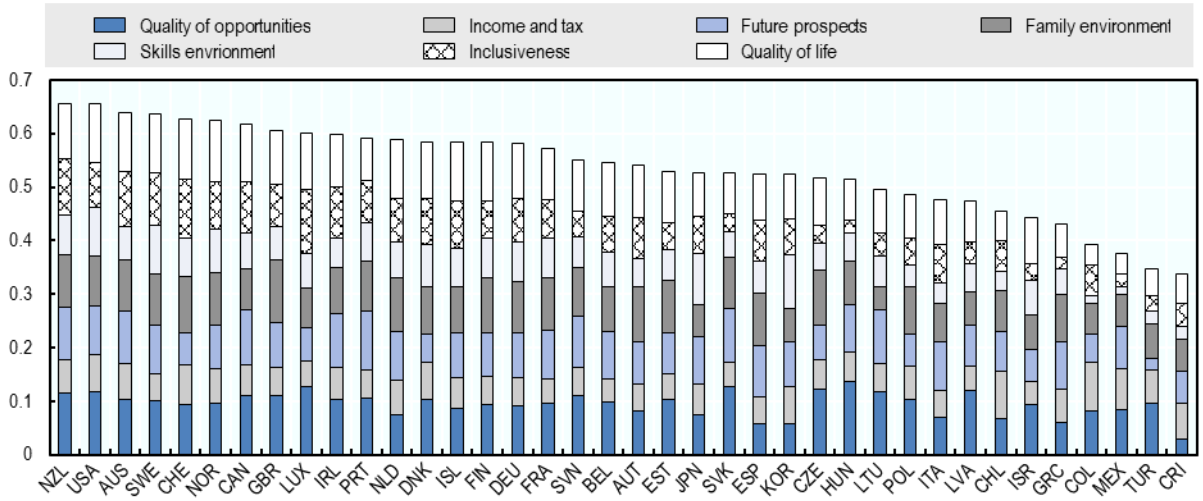
Note: The maximum bonus score is 5% and the maximum penalty score is 10%.
Source: OECD Secretariat

6.4 Comparing the relative importance of different dimensions

The composite indicators can also be decomposed to investigate the contribution of the different dimensions and variables to the aggregated ITA score. Figure 16 compares the relative importance of the seven dimensions to the overall composite index score for highly skilled workers before the visa and admission policy penalty is taken into account.

Countries at the top of the ranking typically excel across most dimensions, particularly when it comes to *Inclusion, Family Environment*, and *Quality of Life*. In contrast, the *Income and Tax* dimension generally contributes less to the overall score, especially for Canada and the Nordic countries. Conversely, countries at the lower end of the ranking tend to perform better in the *Income and Tax* dimension due to low taxes and cheaper living conditions. Korea and Japan, for example, have strong Skills Environment scores but limited performance in the Family Environment dimension.

Figure 16. Comparing relative importance of dimensions, highly skilled workers



Note: The figure displays the relative contribution of dimensions to the overall ITA score without visa and admission policies. Countries are ordered according to the ranking without applying the visa and admission policy penalties.
Source: OECD Secretariat

6.5 Results over time

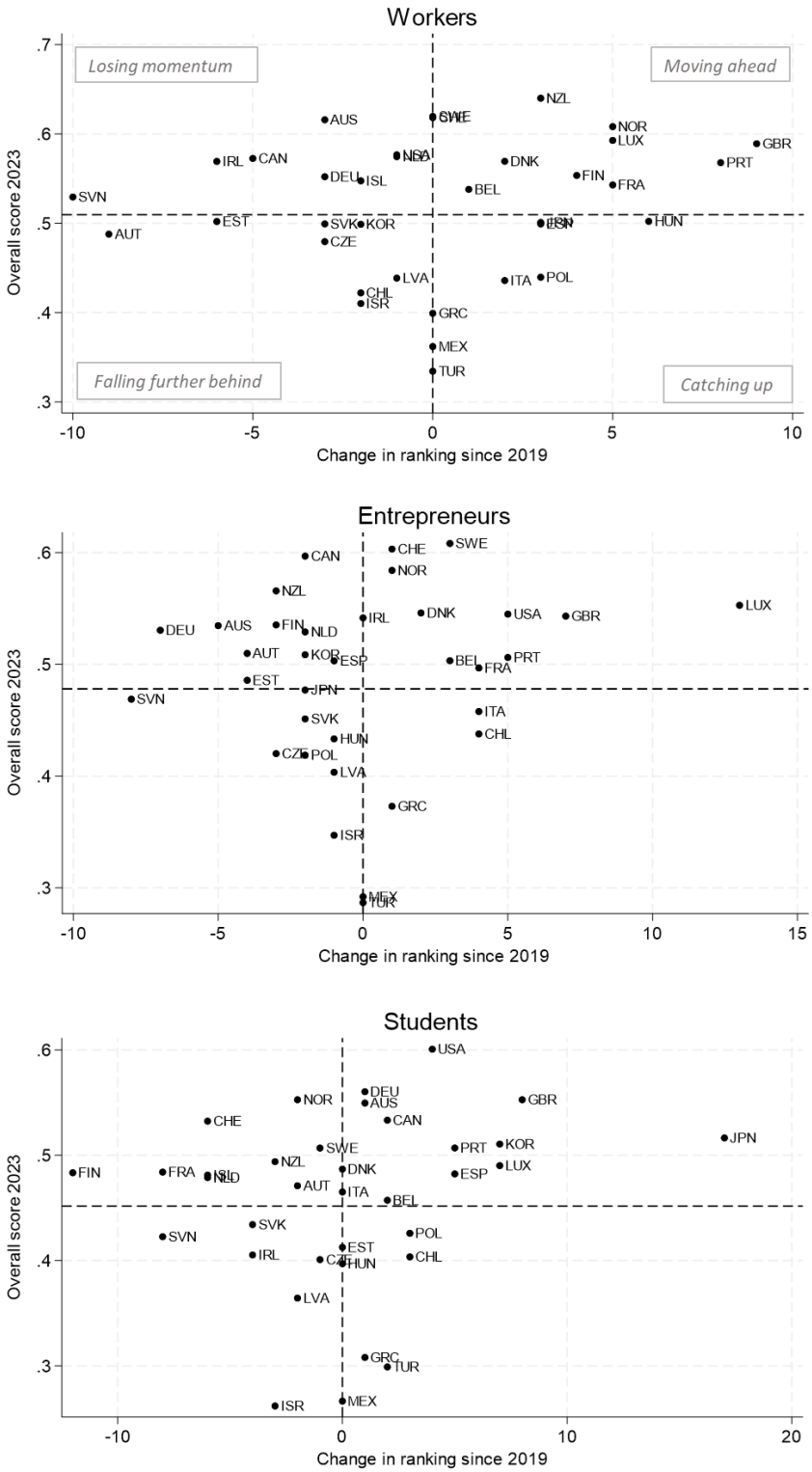
The second edition of the OECD Indicators of Talent Attractiveness allows for the comparison of countries' relative attractiveness to international talent over time. However, this comparison must be done cautiously due to adjustments to the framework between editions (as detailed in Section 3.1) and occasional changes in data collection and aggregation methodology for individual variables within the framework. These adjustments impact the aggregated ITA scores, making the absolute levels of the scores not directly comparable between editions. Nonetheless, it is possible to compare the relative positions of countries in the rankings over time. Changes in ranking positions are influenced by improvements or deteriorations in countries' policy and socio-economic frameworks, adjustments in the ITA framework, and the inclusion of additional countries since the first edition.

Trend diagrams are a useful tool for presenting trends in country performance based on composite indicators (Nardo et al., 2005[8]). Figure 17 displays a trend diagram with aggregated ITA scores on the x-axis and changes in the relative position of countries in the ranking (measured as number of places gained or lost) since 2019 on the y-axis. The two dotted axes divide the area into four quadrants Countries in the upper quadrant are classified as "moving ahead," having an ITA score above the OECD average and an improved ranking position since 2019. Countries in the bottom left quadrant are "falling further behind," with ITA scores below the OECD average and a decline of at least one place in the ranking since 2019. The other classifications include countries that score above the average ITA score but lost ranking places

since 2019 ("losing momentum") and countries with scores below the average but gained ranking places since 2019 ("catching up"). Any changes in the ranking due to the introduction of three new OECD member countries (Colombia, Costa Rica, and Lithuania) since the first edition have been removed in the diagram.

The United Kingdom has experienced one of the most notable improvements in the rankings across all three migrant profiles. This may seem paradoxical given that Brexit, which occurred between the first and second editions of the ITA, made it more difficult for migrants from EU member countries to immigrate and stay in the UK. However, the indicators measure the attractiveness of OECD countries to highly skilled third-country nationals. For these migrants, Brexit-related policy reforms, such as the abolition of quotas for highly skilled workers, lowered entry barriers. Other countries, like France and Japan, show varied developments in their attractiveness over time across different migrant profiles. France is advancing in attracting workers and entrepreneurs but is falling behind in attracting international students due mainly to higher tuition fees for foreign students. Conversely, Japan has significantly improved its position in attracting international students and is catching up in attracting workers, but it is falling behind in attracting entrepreneurs.

Figure 17. Change in the ranking between first and second edition



Note: The horizontal line represents the average ITA score in 2023 for workers, entrepreneurs, and students respectively. The change in ranking is adjusted to ignore changes due to the most recent OECD member countries (Lithuania, Colombia, and Costa Rica) being added to the rankings in the second edition.
Source: OECD Secretariat

6.6 Policy simulations

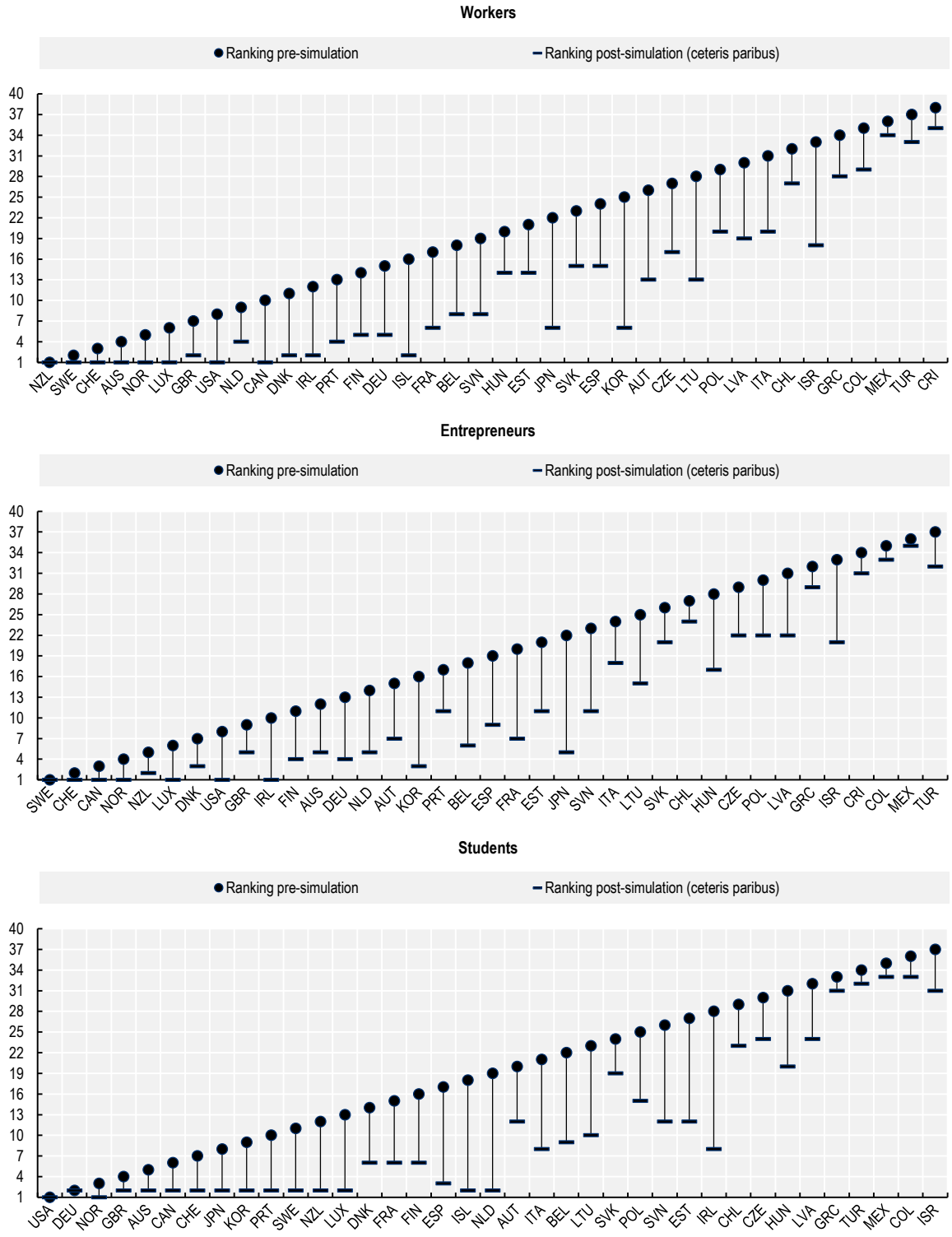
Policy simulations reveal how much countries could improve their position in the ITA ranking by implementing more favourable migration policies. The ITA framework includes a broad set of migration policies beyond visa and admission policies, such as family reunification practices, the ease of changing from temporary to permanent status, and the ease of naturalization for children. The post-simulation outcomes in Figure 18 and Figure 19 show the potential ranking of a country if all migration policies were the most favourable (ceteris paribus).

For highly skilled workers, seven of the top ten countries could achieve first place by adopting the most favourable migration policies. The exceptions are the United Kingdom, which would rank second, and the Netherlands, which would rank fourth post-simulation. Japan (22nd pre-simulation) and Korea (26th pre-simulation) would see the largest gains, reaching 6th place post-simulation.

For entrepreneurs, most top-ten countries could become the most attractive in the OECD with improved migration policies. For international students, the gap to the most attractive country (the United States) is too large for any country but Norway to overcome, even with the most favourable policies. However, many countries could significantly improve their rankings and position themselves just behind the United States with better policies.

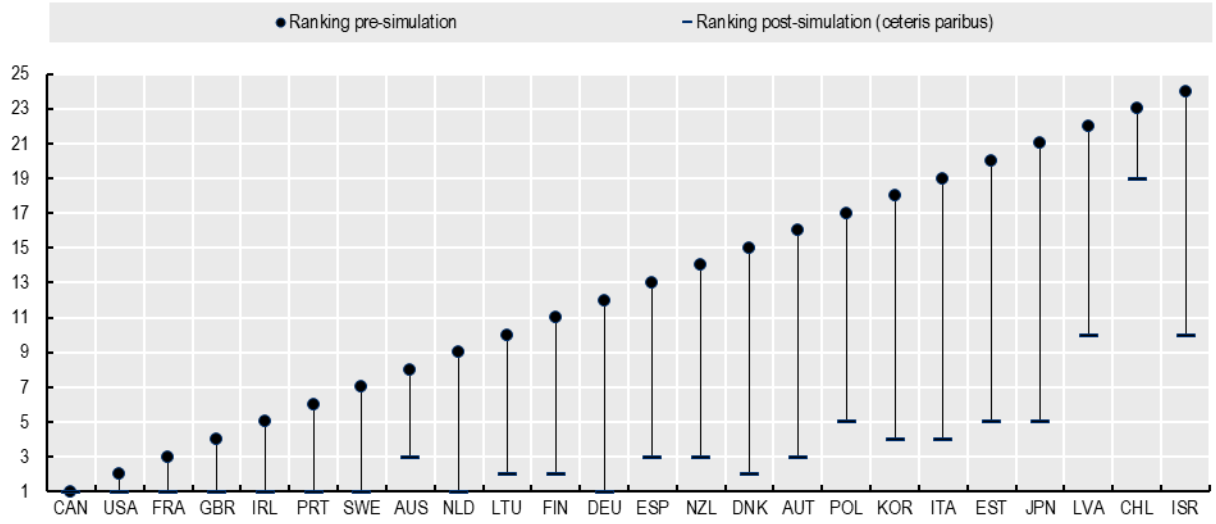
Policy simulations for the start-up founder ranking show that eight countries (USA, France, the United Kingdom, Ireland, Portugal, Sweden, Germany, and the Netherlands) could reach first place with the most generous migration policies. All countries but three (Latvia, Chile, and Israel) could be in the top five if their migration policies were the most favourable (Figure 19).

Figure 18. Policy simulation, highly skilled workers, entrepreneurs, and students



Note: The pre-simulation ranking displays how far in terms of number of places in the ranking a country is from the top-performing country with current migration policies in place. The post-simulation ranking shows the gap to the top-performing country if the most favourable migration policies would be adopted.
Source: OECD Secretariat

Figure 19. Policy simulation start-up founders



Note: The pre-simulation ranking displays how far in terms of number of places in the ranking a country is from the top-performing country with current migration policies in place. The post-simulation ranking shows the gap to the top-performing country if the most favourable migration policies would be adopted.
Source: OECD Secretariat

Annex 6.A.

Annex Table 6.A.1. Members of the OECD Indicators of Talent Attraction internal task force

Country	Institutions
OECD Member countries	
Australia	Global Business and Talent Attraction Taskforce, Department of Home Affairs
Austria	Austrian Business Agency
Canada	Immigration, Refugees and Citizenship Canada
Czech Republic	Czech National Agency for International Education and Research
Finland	Ministry of Economic Affairs and Employment
France	Ministère de l'Économie, des Finances et de la Souveraineté industrielle et numérique/ Business France
Germany	Federal Ministry of Labour and Social Affairs
Other institutions	
Fragomen lawfirm	
Bertelsmann Stiftung	

Source: OECD Secretariat.

Annex Table 6.A.2. Summary of Start-Up Visa programmes in OECD countries

Country	Program	Special (S) or fast-track standard visa (F)	Cap in 2022	Permit type	Family admitted with work rights
Australia	Global Talent visa	S	8000	Permanent	Yes
Austria	Red-White-Red card for start-up founders	F	Uncapped	Temporary 2 years, then change to RWR+ with fixed-term settlement	Yes
Canada	Start-Up Visa (SUV)	S	1000	Permanent	Yes
Chile	Start up Chile	F	Uncapped	Temporary 1 year renewable	Yes
Denmark	Start up Denmark	F	75	Temporary self-employment 2 year, renewable for 3 years	Yes
Estonia	Start up Visa	S	Uncapped	Temporary, 1 year, renewable for six months, then entrepreneur permit	Yes
Finland	Start Up Entrepreneur	S	Uncapped	Temporary 2 year renewable	Yes
France	Tech Ticket	F	Uncapped	Temporary 4 year, then change to entrepreneur permit	Yes
Ireland	Start-up Entrepreneur Programme - STEP	S	Uncapped	Temporary 2 years, renewable for 3 years	Yes
Israel	Innovation Visa (pilot)	S	Uncapped	Temporary 2 years, non-renewable	No
Italy	Italy Start Up Visa	F	Uncapped	Fast-Track Temporary, 1 year, renewable for 2 years, then change to other permit	Yes
Japan	Business manager/investor	F	Uncapped	Temporary 6 months, can be extended as "business manager" for 12 months, then status change required	No
Korea	Technology and Business Start-Up Visa	S	Uncapped	Temporary 2 years, renewable	No
Latvia	Start up Visa	S	Uncapped	Temporary up to 3 years, then	Yes

				change to other permit	
Lithuania	Start up Visa	S	Uncapped	Temporary 1 year, renewable for 1 year, then change to other permit	Yes
New Zealand	Global Impact Visa (pilot)	S	Uncapped	Temporary up to 3 years, then change to permanent	Yes
Netherlands	Start up Visa	S	Uncapped	Temporary 1 year, then change to self-employed permit	Yes
Poland	Poland Prize	F	Uncapped	Fast-Track Temporary 1 year, renewable	
Portugal	Start up Visa	S	Uncapped	Temporary 1 year, renewable for 1 year periods	Yes
Spain	Visa for Innovative Entrepreneur	S	Uncapped	Temporary 1 or 2 years, renewable	Yes
United Kingdom	Tier 1 "Start-Up" Visa	S	Uncapped	Temporary 2 year, renewable	Yes
United States	International Entrepreneur Rule	F	Uncapped	Temporary 2.5 years, with one renewal – total 5 year stay.	No

Source: OECD Secretariat

Annex Table 6.A.3. Correlation matrix within dimensions, start-up founders

Spearman rank-order correlation coefficients

		Quality of opportunities						
	Unicorns	Multinationals	Coworking	Ecosystems	Trade	PMR		
Unicorns	1							
Multinationals	0.7646*	1						
Coworking	-0.0581	0.0348	1					
Ecosystems	0.6576*	0.5407*	0.1518	1				
Trade openness	-0.3536	-0.3579	0.1948	-0.5591*	1			
PMR	0.1388	0.076	-0.4191	-0.0276	-0.2417	1		
		Income and tax						
	VC	Corporate tax	Tax subsidy R&D	Price level index				
Venture capital	1							
Corporate tax	0.1239	1						
Implied tax subsidy on R&D	-0.3053	-0.1018	1					
Price level index	-0.4089	0.2292	0.3571	1				
		Future prospects						
	Initial permit	Residency	Nationality	Dependency				
Initial permit time	1							
Permanent residency	0.3968	1						
Nationality	0.328	0.0619	1					
Dependency ratio	-0.5224*	-0.4759	-0.4831	1				
		Family environment						
	Spouse work	Citizenship	PISA	Family exp.	Tax second			
Spouse work	1							
Citizenship children	-0.0539	1						
PISA	-0.0591	-0.1474	1					
Family expenditures	0.3549	-0.2146	0.3106	1				
Tax second earner	0.5301*	-0.0014	-0.1036	0.3005	1			
		Skills environment						
	Universities	Broadband	Fibre	English	STEM	Patents	GERD	Cyber
Top universities	1							
Broadband	0.5314*	1						
Fibre	-0.4307	-0.0174	1					
English	0.2788	0.3084	-0.4729	1				
STEM students	-0.0666	0.2261	-0.0443	0.0775	1			
Patents	0.8580*	0.4965	-0.2426	-0.0081	0.1061	1		
GERD	0.5231*	0.4687	-0.1113	0.0426	0.4635	0.6965*	1	
Cyber security	0.4413	0.3657	0.0922	-0.0605	-0.0409	0.3853	0.2009	1
		Inclusiveness						
	MAI	Inventors	Board	Patents				
MAI	1							
Female inventors	-0.0322	1						
Female company boards	0.5139	-0.3609	1					
International patents	-0.1287	0.2788	0.0148	1				

Note: *= significant at 1% level. The corporate tax, participation tax rate of second earner, and price level index variables are inverted so that a higher price/tax level implies a less attractive country.

Source: OECD Secretariat.

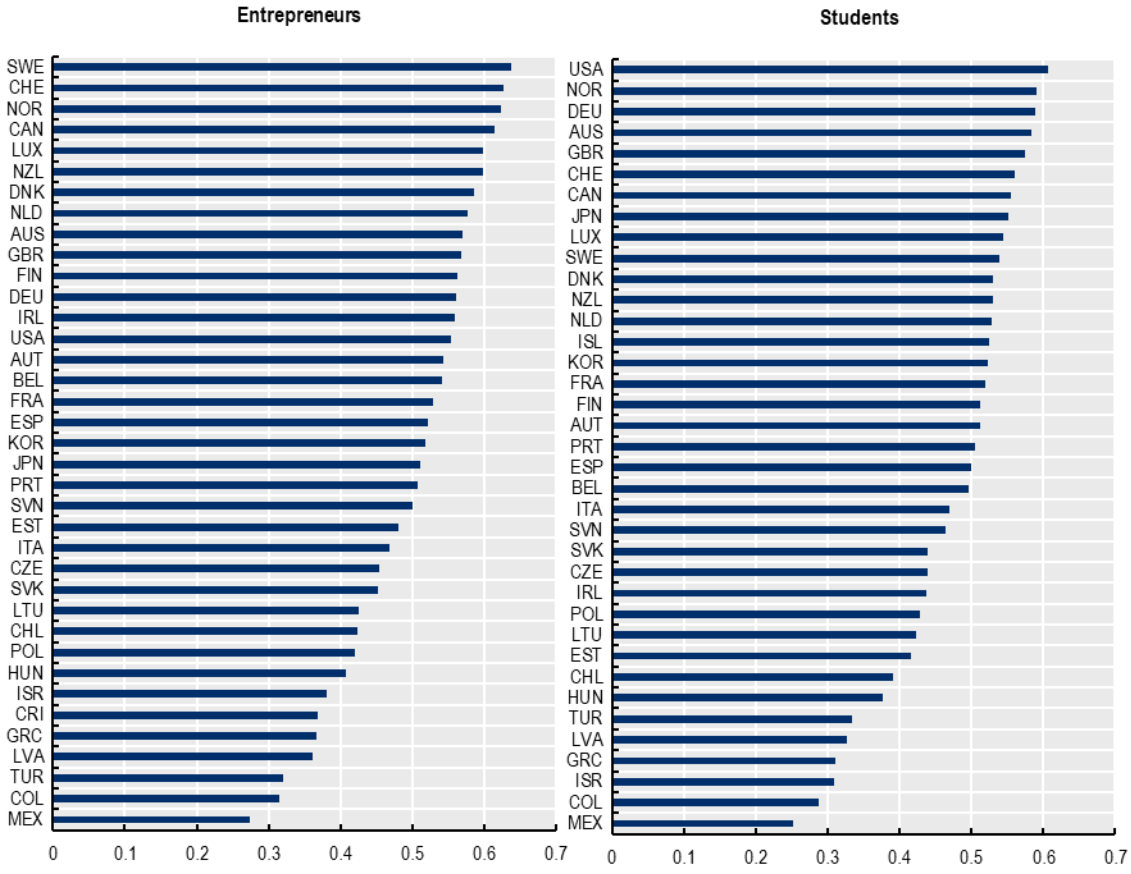
Annex Table 6.A.4. OECD Indicators of Talent Attractiveness rankings, 2023 and 2019

	2023				2019		
	Workers	Entrepreneurs	Students	Start-up founders	Workers	Entrepreneurs	Students
Australia	4	12	5	8	1	7	6
Austria	26	15	20	16	17	11	18
Belgium	18	18	22		19	21	24
Canada	10	3	6	1	5	1	8
Chile	32	27	29	23	29	30	31
Colombia	35	35	36				
Costa Rica	38	34					
Czech Republic	27	29	30		24	25	28
Denmark	11	7	14	15	13	9	14
Estonia	21	21	27	20	15	17	26
Finland	14	11	16	11	18	8	4
France	17	20	15	3	22	24	7
Germany	15	13	2	12	12	6	3
Greece	34	32	33		33	32	33
Hungary	20	28	31		26	26	30
Iceland	16	38	18		14	35	12
Ireland	12	10	28	5	6	10	23
Israel	33	33	37	24	30	31	32
Italy	31	24	21	19	32	28	21
Japan	22	22	8	21	25	20	25
Latvia	30	31	32	22	28	29	29
Lithuania	28	25	23	10			
Luxembourg	6	6	13		11	19	20
Mexico	36	36	35		34	33	34
Netherlands	9	14	19	9	8	12	13
New Zealand	1	5	12	14	4	2	9
Norway	5	4	4		10	5	2
Poland	29	30	25	17	31	27	27
Portugal	13	17	10	6	21	22	15
Slovakia	23	26	24		20	23	19
Slovenia	19	23	26		9	15	17
South Korea	25	16	9	18	23	14	16
Spain	24	19	17	13	27	18	22
Sweden	2	1	11	7	2	4	10
Switzerland	3	2	7		3	3	1
Türkiye	37	37	34		35	34	35
United Kingdom	7	9	3	4	16	16	11
United States	8	8	1	2	7	13	5

Note: Costa Rica, Colombia, and Lithuania were not included in the 2019 edition of the OECD Indicators of Talent Attractiveness.
Source: OECD Secretariat

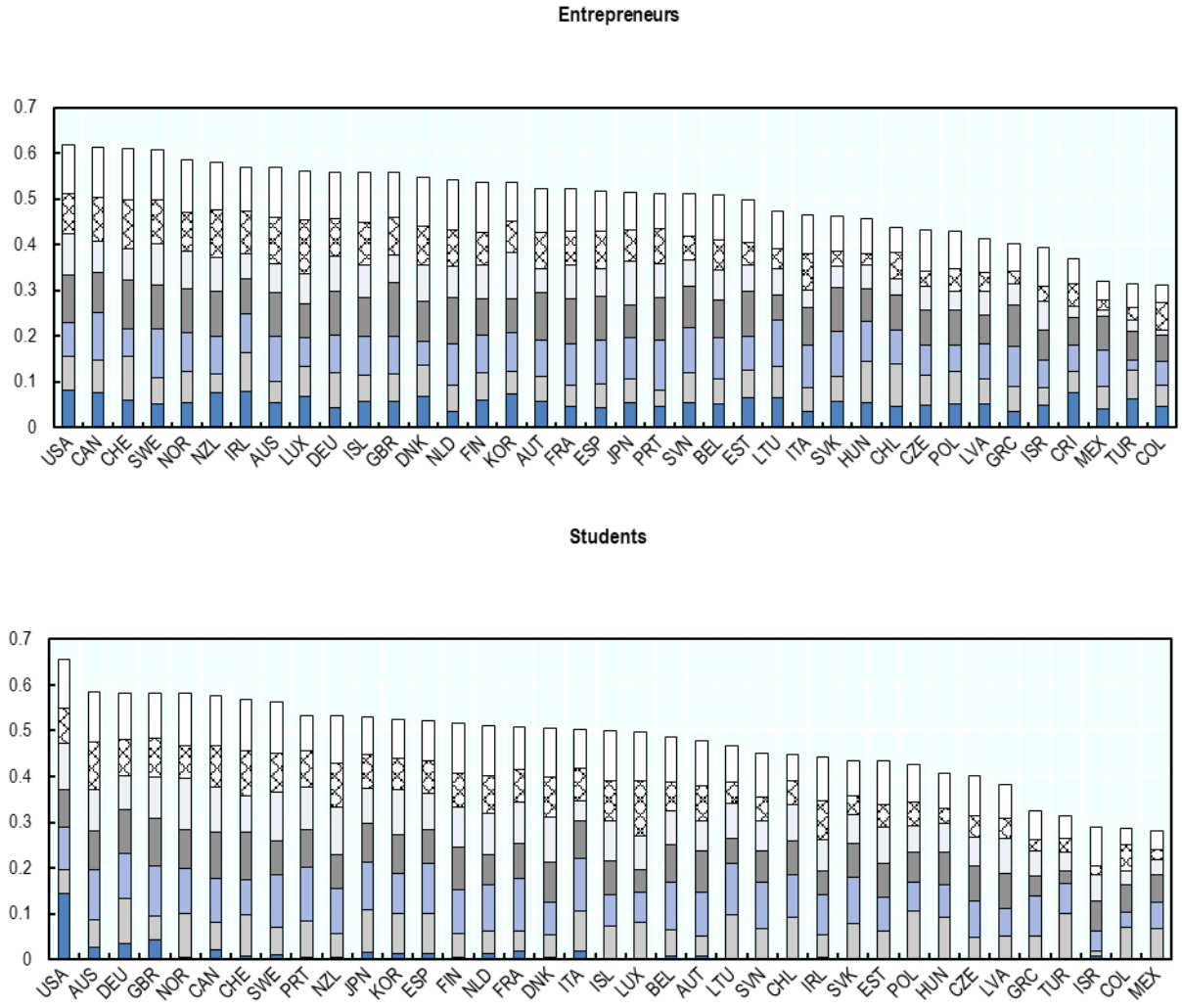
Annex Figure 6.A.1. Overall ITA ranking when considering the health dimension

OECD Indicators of Talent Attractiveness rankings taking into account the health dimension



Note: Values closer to 1(0) represents higher (lower) attractiveness. Ranking based on default equal weights across dimensions, and include the seven core dimensions as well as the optional health system performance dimension.
Source: OECD Secretariat

Annex Figure 6.A.2. Comparing relative importance of dimensions: entrepreneurs and students



Note: The figure displays the relative contribution of dimensions to the overall ITA score without visa and admission policies. Countries are ordered according to the ranking without applying the visa and admission policies.
Source: OECD Secretariat.