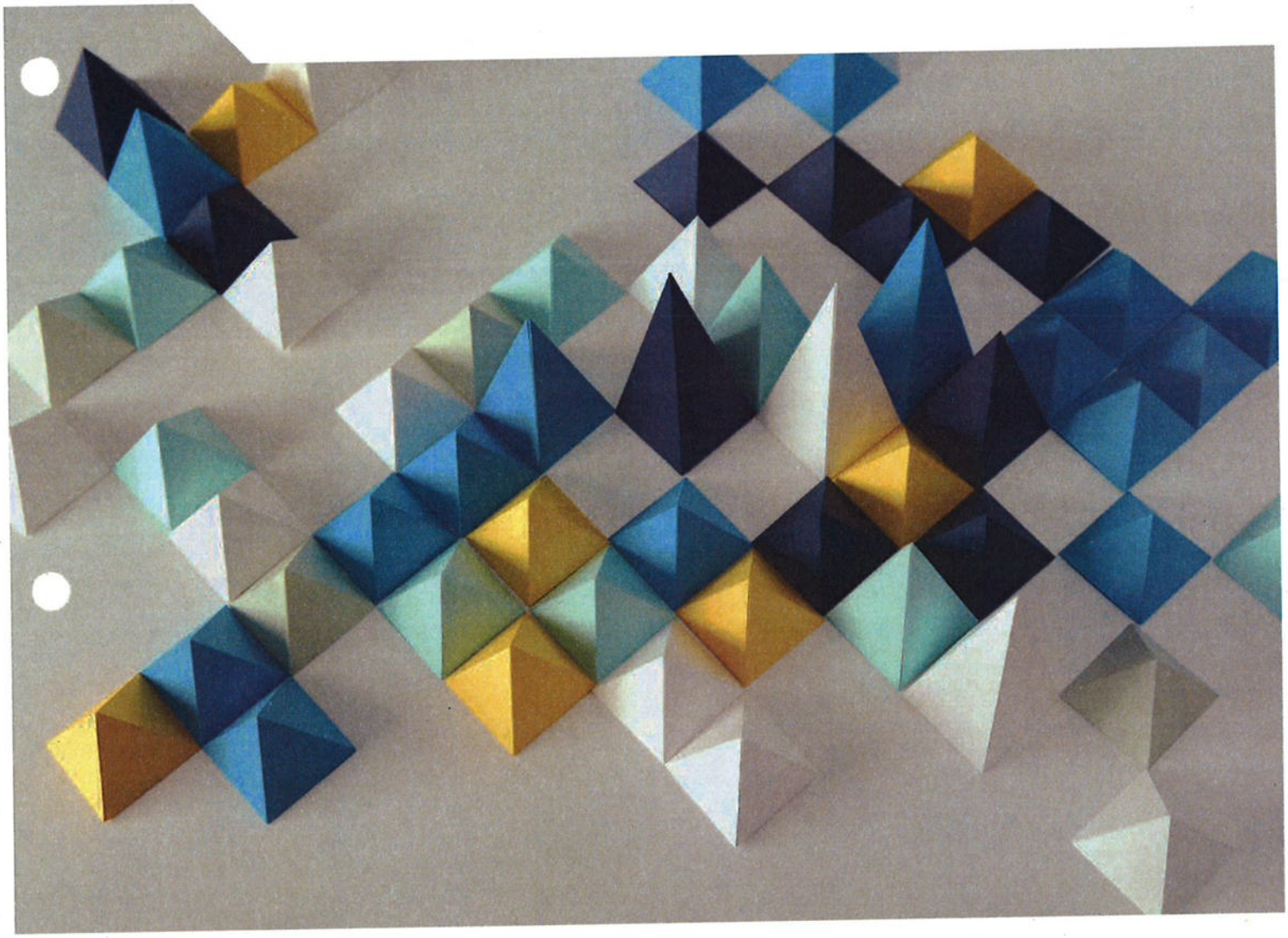
Higher Education

Benchmarking Higher Education System Performance



OECD

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BETTER POLICIES FOR BETTER LIVES

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Foreword

The scope of contemporary higher education is broad, and concerns about the performance of higher education systems are widespread. The number of young people with a higher education qualification is expected to surpass 300 million in OECD and G20 countries by 2030. Higher education systems are faced with many challenges, which include expanding access, containing costs, and ensuring the quality and relevance of provision.

During 2017-2018, the OECD Higher Education Policy team carried out a benchmarking review of higher education systems. The review involved the compilation and analysis of statistical data related to higher education (ISCED levels 5-8) for all OECD countries, as well as a review of indicators, policies and practices for four jurisdictions that elected to participate in a deeper benchmarking exercise: Estonia, the Flemish Community of Belgium, the Netherlands and Norway. The evidence compiled for the review spanned the inputs, activities, outputs and outcomes of higher education systems, with a view to assessing their relative performance.

The analysis in this synthesis report for the project provides a comprehensive and empirically rich review of the higher education landscape across OECD countries, taking stock of how well systems are performing in meeting their education, research and engagement responsibilities. This report represents the first extensive examination of higher education systems undertaken by the OECD in more than a decade, and is timely given the continuing shifts in the higher education landscape in recent years. It presents an analysis of the state of higher education across the OECD today; the wider context in which it operates; how it is resourced; outputs and outcomes of education and research activities; and the range of actions higher education institutions are increasingly taking to improve engagement with the wider world and their relevance to society.

This review also finds that the necessary evidence base to guide higher education policy is trailing behind the quickly moving developments in higher education systems. While higher education is by far the most internationalised level of education, with systems competing globally for students and researchers, there are almost no international comparisons available of how teaching, learning and research are organised within the "black box" of higher education institutions.

Furthermore, higher education grows more costly every year. Yet, despite continuously increasing public and private expenditure, the body of available evidence required to measure the value achieved for this investment is less developed compared to other levels of education. Tackling core data gaps on the quality of education services provided and the impact of higher education on students' development of skills and knowledge is essential to demonstrate the value provided by higher education systems and illuminate the areas in which performance needs to be improved.

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Statistical coverage

The statistics reported in this publication cover the entire respective national higher education system, including higher education research and development, within the national or jurisdictional territory and regardless of ownership, sponsorship and mode of delivery, except when differently specified. All higher education students, graduates, staff and programmes are included, following internationally agreed definitions (UNESCO Institute for Statistics, OECD and Eurostat, 2018[1]; OECD, 2018[2]; OECD, 2015[3]). Deviations from this general rule are reported in the text or notes within this publication.

Country and jurisdiction coverage

The indicators in this publication cover all OECD countries for which data is available, and in some cases subnational units when data are specifically available at that level (for example, England (United Kingdom) or the French Community of Belgium). The policy analysis carried out in this publication focuses primarily on the four jurisdictions that participated in the 2017-2018 Benchmarking Higher Education System Performance exercise. These four jurisdictions are Estonia, the Flemish Community of Belgium, the Netherlands and Norway, and are referred to as the "participating jurisdictions" throughout the report. Policies from other jurisdictions are discussed throughout the report when relevant.

As the Flemish Community of Belgium is a participating jurisdiction in the benchmarking exercise, data have been included for the jurisdiction wherever possible. Data sources for the Flemish Community of Belgium include OECD Regional Statistics, and a special data collection conducted for the benchmarking exercise in collaboration with the Flemish Ministry for Education and Training. The Flemish Community of Belgium is referred to throughout as "The Flemish Community". In some cases, data are reported for the region of Flanders; this is specified within the text.

Use of the term "higher education" in this report

The term "higher education" in this publication is equivalent to the term "tertiary education", as defined in the ISCED 2011 classification (UNESCO Institute for Statistics, 2012[4]): "Tertiary education builds on secondary education, providing learning activities in specialised fields of education. It aims at learning at a high level of complexity and specialisation. Tertiary education includes what is commonly understood as academic education but also includes advanced vocational or professional education". This comprises the short-cycle, bachelor's, master's or doctoral levels of education (Table 1). The term "higher education" is used throughout this report rather than "tertiary education" due to its wider use in academic and policy literature.

Table 1. Higher education levels in the ISCED 2011 classification

Label (as used in the publication)	Complete name and description
Short-cycle programmes	*Short-cycle tertiary education (ISCED level 5)*: Programmes at ISCED level 5 aim to provide professional knowledge, skills and competencies. Typically, they are practically based, occupationally specific and prepare students to enter the labour market, but may also provide a pathway to other higher education programmes. Academic higher education programmes below the bachelor's level are also classified as ISCED level 5. Programmes classified at ISCED level 5 may be referred to as (higher) technical education, community college education, technician or advanced/higher vocational training, an associate degree, or the *bac*+2.
Bachelor's programmes	*Bachelor's or equivalent level (ISCED level 6)*: Programmes at ISCED level 6 aim to provide intermediate academic and/or professional knowledge, skills and competencies, leading to a first degree or equivalent qualification. Programmes are typically theoretically based, but may include practical components and are informed by research and/or best professional practice. Programmes at this level do not necessarily involve the completion of a research project or thesis, but if they do, it is less advanced, less independent or is undertaken with more guidance than those at ISCED level 7 or 8. Programmes classified at ISCED level 6 may be referred to as a bachelor's programme, a *licence*, or the first university cycle.
Master's programmes	*Master's or equivalent level (ISCED level 7)*: Programmes at ISCED level 7 are designed to provide advanced academic and/or professional knowledge, skills and competencies, leading to a second degree or equivalent qualification. Typically, programmes at this level are theoretically based, but may include practical components and are informed by state-of-the-art research and/or best professional practice. Programmes at this level may involve the completion of a research project or thesis that is more advanced than those expected at ISCED level 6 and less advanced than those expected at ISCED level 8. Master's programmes can be also entirely coursework-based in some countries, or there may be a differentiation between a coursework programme and a research programme. Programmes classified at ISCED level 7 may be referred to in many ways, for example: master's programmes, magister, or MPhil.
Doctoral programmes	*Doctoral or equivalent level (ISCED level 8)*: Programmes at ISCED level 8 lead to an advanced research qualification. Programmes at this ISCED level are devoted to advanced study and original research, and are typically offered only by research-oriented higher education institutions, such as universities. Doctoral programmes exist in both academic and professional fields, and usually conclude with the submission and defence of a thesis, dissertation or equivalent written work of publishable quality, representing a significant contribution to knowledge in the respective field of study. In some education systems, ISCED level 8 programmes contain very limited course work, or none at all, and individuals working towards a doctoral degree engage in research mostly independently or in small groups with varying degrees of supervision. Other countries require the completion of coursework before the doctoral candidates can progress to the thesis component of the programme (see Chapter 6). Programmes classified at ISCED level 8 may be referred to in many ways, for example: PhD, DPhil, D.Lit, D.Sc, LL.D, Doctorate or similar terms.

Note: Descriptions are taken from the UNESCO Institute for Statistics (2012[4]). Short-cycle programmes at the ISCED 5 level are not recognised as part of the higher education system in Norway and are offered through vocational colleges. Norway offers a two-year programme at ISCED 6 level (*høgskolekandidatgrad*) and students who successfully complete the two-year programme can enter into the third year of a bachelor's programme in the same field.

Calculation of the averages

Unless otherwise specified in the text, the averages presented in the charts and tables of this publication are the unweighted arithmetic averages across the OECD jurisdictions with available data, following the rules outlined in Table 2.

Table 2. Rules used for the calculation of averages

Jurisdictions used for the calculation	All jurisdictions with available data on all of the series presented in a chart are used to calculate the average. There are some exceptions to this general rule, reported within this table.
Calculation of averages of indicators by level of higher education	When indicators are broken down by higher education level, the average for the bachelor's, master's and doctoral levels includes all jurisdictions with available data for all of the series presented in the chart, except for the series related to the short-cycle level. The average for the short-cycle level is calculated separately, for all jurisdictions with available data for this level of education. This choice has been made because short-cycle programmes do not exist in a number of OECD jurisdictions.
Exclusion of Flemish data	Whenever data are available for both Belgium and the Flemish Community (or the Region of Flanders), the latter is excluded from the calculation of the average.
Non-applicable data	In some instances, data are "not applicable" for a jurisdiction. For example: if short-cycle programmes do not exist in a jurisdiction, enrolment at the short-cycle level is not applicable; if a public student loan scheme does not exist in a jurisdiction, then the amount of money spent on loans is not applicable. In the calculation of indicators, non-applicable data is treated as zero (e.g. zero students enrolled in short-cycle programmes and zero dollars spent on loans). When data are not applicable both at the numerator and the denominator of an indicator (e.g. proportion of international students at the short-cycle level over total enrolment at the short-cycle level), then the data are treated as missing in the calculation of the average.

Data sources

The majority of the indicators in this publication come from OECD data collections, for example the joint UNESCO-OECD-Eurostat (UOE) data collection, the OECD Indicators of Education Systems (INES) data collection, the Survey of Adult Skills, or the OECD Career of Doctorate Holders Survey. When possible, OECD data have been extracted from the OECD Education Statistics (OECD, 2018[5]) or from the OECD Science, Technology and R&D Statistics (OECD, 2018[6]) databases. In the other cases, the data collection is indicated as the data source.

Other data sources, from outside the OECD, have been used for selected indicators within the publication. For example, some indicators on financial and human resources are based on the European Register for Tertiary Education (ETER) dataset; and data from the World Economic Forum and the European Community Innovation Survey have been used to present indicators on higher education engagement.

In addition, a survey was issued to the four participating jurisdictions to collect data on a variety of topics, including a number of statistics broken down by subsector (universities and professional higher education institutions). The survey results are published in a number of tables within the publication. In these cases the source is stated as "adapted from data/information provided by the participating jurisdictions".

Data updates

This publication makes use of the most recent available data at the time of its preparation. Data released after 31 December 2018 have not been included in the analysis, except for the data on human resources in Chapter 6, which were released in early 2019, in order to standardise as much as possible the reference years used in Chapter 6.

A note on the statistical collaboration with LinkedIn

Box 5.10 was produced in collaboration with LinkedIn, a platform for professional networking. These data cover self-reported information on professional and educational experiences; and information on individual skills, either self-reported or reported by other individuals on the professional platform.

LinkedIn staff extracted the data on request of the OECD. The data provided by LinkedIn cover around 2 710 000 members who indicated that they earned their first master's degree between 2010 and 2013 in eight jurisdictions (Australia, Canada, Estonia, the Flemish Community, France, the Netherlands, Norway and the United States). By comparison, the OECD estimated the number of first-time master's graduates covering the same period and jurisdictions to be around 5 000 000 (based on data returned by jurisdictions in UNESCO-OECD-Eurostat (UOE) data collection). Graduates who reported over seven educational and professional experiences in the five years after graduating (1.5% of the total) were excluded from the analysis.

To check the robustness of the results, the same data extraction and calculations have been performed for both first-time bachelor's and master's graduates. In addition, the extraction of data on interpersonal skills has been performed based on two different skill lists: LinkedIn's own list; and a list of skills closely matching (as agreed by the OECD and LinkedIn) the list of keywords on intrapersonal, interpersonal and problem-solving skills provided by (Binkley et al., 2005[7]). The conclusions discussed in Box 5.10 hold for all variations of the analysis carried out.

Sources of qualitative information

A substantial amount of qualitative information has been collected to prepare this publication. The main sources of this information are:

- documents sent by the participating jurisdictions (one per jurisdiction) describing their higher education systems and policies
- discussions between the OECD and the participating jurisdictions' project coordinators held during six workshops between February 2017 and November 2018
- other meetings and webinars with the participating jurisdictions' project coordinators and national experts on higher education policies or statistics.

Throughout the publication, the information gathered from these sources is referred to as "adapted from information provided by the participating jurisdictions".

The publication also makes use of structured qualitative data on university autonomy in Europe from the European University Association (EUA) (Bennetot Pruvot and Estermann, 2017[8]); and on higher education academic staff categories from Eurydice (European Commission, EACEA and Eurydice, 2017[9]). Both organisations (EUA and Eurydice) gave permission to the OECD to use their qualitative data collection for additional data collection or validation. For example, qualitative data on the autonomy of professional HEIs and independent private institutions were collected by the OECD through interviews of representatives of these institutions or government officials, based on the EUA tool.

Symbols for missing data and abbreviations

The following symbols and abbreviations are used to convey statistical information in the linked files to the figures presented (*statlinks*) throughout this publication:

b There is a break in the time series, implying that comparisons across time should be made with caution

c There are too few observations to provide reliable estimates

d Difference in methodology

e Estimated value

m Data are not available (missing)

p Provisional value

q Data have been withdrawn at the request of the country concerned.

r Values are below a certain reliability threshold and should be interpreted with caution

w The indicator is overestimated because it includes data from another category

x Data are included in another category or column within the table

z Data are not applicable because the category does not apply

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Executive summary

Higher education provides graduates with favourable economic and social outcomes, but the low basic skills of some graduates is a cause for concern

The share of young people achieving a higher education qualification has increased steadily in recent years. Across the OECD, the proportion of 25-34 year-olds with a higher education qualification is now larger than the proportion with upper secondary education only. Moreover, despite the growth in higher education attainment across the OECD in recent decades, the employment premium enjoyed by higher education graduates has remained steady. Young higher education graduates also attract a strong premium on earnings; on average bachelor's graduates in the OECD earn one-third more, and master's graduates close to two-thirds more, than those with upper secondary or post-secondary non-tertiary education.

Apart from positive economic outcomes, higher education graduates also tend to report more favourable social and health outcomes than those without a higher education qualification. They are less likely to report suffering from depression and more likely to report to be in good or excellent health, to volunteer, to indicate trust in others and to feel a sense of political efficacy than those with upper secondary or post-secondary non-tertiary education only.

However, nearly one-third of higher education graduates have poorer information processing skills than might be expected of graduates at this level. According to the OECD Survey of Adult Skills, a worrying proportion (around 30%) of graduates from OECD higher education systems do not reach the literacy and numeracy proficiency skill level required to carry out moderately complex information processing tasks.

Higher education spending per student is increasing rapidly, with households paying about one-fifth of the costs

Higher education costs more than education at other levels, and spending has increased rapidly in recent years. Between 2005 and 2015, while the number of students in higher education increased by around 10%, total expenditure grew by more than 30%.

Governments continue to be the main source of higher education funding, accounting for two-thirds of expenditure on higher education institutions on average across OECD countries. The widespread provision of grants and scholarships to students, as well as public loans, has helped to make higher education more accessible and affordable. In many OECD countries, the average government expenditure per student on grants, scholarships and loans exceeds the average annual household expenditure on education institutions per student.

Households contribute about one-fifth of the cost of higher education, although funding by other private sources and international sources remains marginal in most OECD countries.

Inequity of access by socio-economic and migration background is a persistent challenge

Many governments maintain horizontal differentiation in the system with the goal of enabling the higher education system to serve a wide variety of students and purposes. In many countries, a binary divide between academically oriented (universities) and professionally oriented (professional HEIs) institutions exists. Available data indicate that professional HEIs in binary systems tend to enrol more part-time students, older students and more students from disadvantaged groups than universities.

However, overall, equal access to higher education is far from a reality. Across the OECD, an average of 60% of today's young people will enter higher education over their lifetimes. Nevertheless, the most recent evidence available indicates that 18-24 year-olds whose parents do not have a higher education qualification are still between 40% and 60% less likely than other individuals to enter a bachelor's level programme. Similarly, across OECD countries with available data, the children of foreign-born parents are between 10% and 60% less likely to enter a bachelor's level programme.

Only 4 in 10 bachelor's students are able to complete on time, and 2 in 10 do not complete at all

Delayed completion and non-completion of studies is common in OECD education systems. On average, just 40% of new entrants to a bachelor's level programme graduate within the expected duration of the programme and over one-fifth of students leave without completing a qualification. The high level of non-completion can reflect failures in the guidance process from upper secondary to higher education, low admission standards, inadequate academic support, poor programme quality and the financial cost of education.

Recent policy responses to low completion rates include better matching of applicants with higher education programmes, for example through in-depth information sessions and compulsory, non-binding self-assessment tests. In addition, financial incentives to increase timely completion have been introduced in some jurisdictions through formula funding or performance agreements between the government and higher education institutions.

Young doctorate holders in higher education employment find less job security than their predecessors and their peers in other sectors

According to data from the OECD Careers of Doctorate Holders survey, around one-third of doctorate holders are employed in the education sector on average across OECD countries with available data. This may indicate a limited absorptive capacity in the academic labour market for doctorate holders. However, in general, only a small percentage of doctoral graduates are not employed, signalling a demand for the skills and knowledge provided by doctoral education in the wider labour market, and suggesting that doctorate holders are employable in a variety of economic sectors.

On average across OECD countries, half of academic staff in the higher education sector are under 45 years of age. Evidence from the participating jurisdictions shows that younger academic staff with teaching duties are less likely to have a permanent contract compared to older teaching staff in some jurisdictions. Insecurity about career prospects often associated with early-stage careers in research (and in some countries, the accumulation of debt over this period) can make academic jobs less attractive than jobs in

other sectors offering greater job security and benefits for similar levels of skills and experience.

Higher education research and development relies heavily upon public funding, and establishes limited collaboration with businesses on innovation, especially for small and medium enterprises

R&D undertaken by higher education is heavily financed by government funds, which make up two-thirds of the funding for the sector, on average. The links between business, higher education research sectors, and the wider economy and society appear to be less developed than in other sectors of research across the OECD. Together, business enterprises and the private non-profit sector still contribute less than 10% of higher education R&D funding. Surveys of business enterprises indicate that 15% of businesses report co-operation with the higher education sector on developing innovative products or processes. In addition, other evidence suggests that the collaboration with the higher education sector is more active amongst large businesses than amongst SMEs.

However, some OECD jurisdictions are working to increase collaboration between higher education institutions and businesses. In some cases, targeted industrial research funds are awarded by governments to institutions to engage in technology transfer activities, such as licensing, patenting and spin-offs. In other cases, consortia have been established between higher education institutions and private or public organisations to conduct applied research, based on a mixture of public targeted funding and private resources.

There is an increasing focus on engagement activities, but frameworks for measuring activities do not yet exist

Governments and stakeholders are increasingly asking higher education institutions to engage more effectively with the wider world through developing human capital (e.g. through developing entrepreneurial skills and providing continuing education), supporting innovation, promoting regional development and civic engagement, creating a culturally rich environment, increasing environmental awareness and contributing to achieve broader social goals on sustainability. At the same time, funding for engagement activities in higher education appears to be mainly project-based, and mechanisms for institutions to report on engagement outcomes in a systematic and comparable way have not yet been widely developed.

Open access to scientific documents remains limited

Higher education systems can contribute to the wider community through ensuring that the knowledge generated by their research is available for the benefit of all of society. Open access to publications has become a policy target in many OECD countries, and is relevant to the promotion of open science, i.e. the efforts to make the outputs of research more widely accessible in digital format to the scientific community and to society more broadly. Nevertheless, the main model of disseminating scientific research in OECD countries remains one of closed access. Recent analysis of a random sample of 100 000 publications found that only around 10% were published in gold open access journals (i.e. readers are able to access the publication at no charge), on average across OECD countries.

Although quality is difficult to measure, governments are increasingly trying to link funding and other policies to the quality of teaching and research

Although quality in higher education is especially difficult to measure, governments are using a variety of approaches to ensure quality in research and teaching. Research

funding systems rely increasingly on bibliometric indicators that yield information about the number of publications and their impact. Policies in several OECD jurisdictions also aim at ensuring the relevance of research for society and economic activities, for example by rewarding applied research with a demonstrable economic impact. Competitive funding is widely used to award financial resources only to the most promising research projects and, more recently, to projects related to teaching. In addition, some OECD jurisdictions have introduced higher education teaching certifications based on peer review and training, with the aim of creating a community of teachers who share best practices for teaching and learning.

Data limitations prevent comprehensive performance assessment of higher education systems, but improvements in measurements are possible

The benchmarking exercise provided an opportunity to review the current state of higher education in OECD countries and identify some pressing performance issues facing higher education systems. Reviewing a set of 45 indicators at the country level demonstrates the complexity of making summary judgments about the performance of higher education systems. At the same time, considering a large volume of information together helps to identify areas of strengths and challenges relative to other OECD countries.

While some experimental measures of efficiency and cost-effectiveness are described in this report, the development of actionable measures of efficiency in the higher education sector is complicated by the multiplicity of inputs, outputs and outcomes that cannot be directly mapped to each other. There are also difficulties in measuring inputs themselves, ascertaining the level of control over the inputs, and attaching an importance weighting to the outputs and outcomes.

Many national governments are working on initiatives to improve the data available to assess the performance of higher education. These initiatives cover areas as diverse as the standardised assessment of student outcomes, implementing large-scale surveys of student satisfaction and collecting more granular labour market outcome information on graduates. International efforts to develop new methodologies and standards for the collection of data on higher education outcomes and policies also represent important steps forward in the development of the evidence base to measure higher education performance.

Chapter 1. Higher education and the wider social and economic context

This chapter describes the wider economic and social context within which higher education systems operate, and the core challenges that higher education systems are facing today.

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1.1. Higher education today

Across the world, countries face challenges related to the economic and social transformations which have come about as a result of globalisation, mass migration, ageing societies and technological development. Higher education is increasingly expected to play a central role in responding to these challenges. A comprehensive OECD review of higher education policy, carried out approximately a decade ago, acknowledged the expanding scope and importance of higher education and the increasing prominence of higher education issues on national policy agendas (OECD, 2008[1]).

Since then, the economic and social context surrounding higher education systems has continued to evolve. The 2007-2008 financial crisis led to a worsening of the economic situation in many OECD countries, while deepening inequalities have created new social divisions. Against this background, higher education systems have continued to grow in scale and scope, on the basis that social and economic benefits attributable to a high-performing higher education system can play a crucial role in both taking advantage of the opportunities and responding to the challenges presented by recent economic and social changes.

Economic success relies on human capital, i.e. "the knowledge, skills, competencies and other attributes embodied in individuals that are relevant to economic activity" (OECD, 1998[2]). Higher education plays a key role in developing high-value knowledge, skills and competencies. Higher education graduates themselves also receive significant economic benefits, such as higher employment rates, higher earnings and faster earnings progression (OECD, 2018[3]).

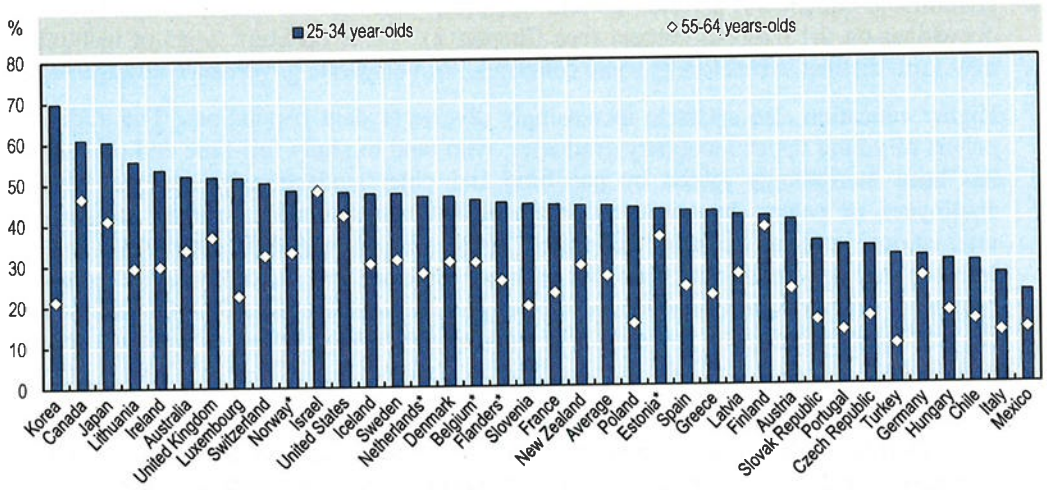
Moreover, in most OECD countries, higher education is the core provider of basic research, which produces the foundational knowledge required for innovation. The applied research and experimental development carried out by the higher education sector also plays an important role in the production of new technologies.

By providing social and cultural contributions to their communities, higher education institutions can help improve general well-being and produce better social and health outcomes, cultural capital, urban and rural regeneration and environmental sustainability (OECD, 2007[4]). These engagement activities have direct benefits for society by improving general health, welfare, and social cohesion; producing lively cultural surroundings; and supporting a clean and sustainable environment.

Given these economic and social benefits, many countries have invested in expanding their higher education systems in recent years. In 2017, on average across OECD countries, 44% of 25-34 year-olds had obtained a higher education qualification, while nine OECD countries, including Canada, Japan and the United Kingdom, achieved attainment rates of over 50% (Figure 1.1). At the same time, many higher education systems outside the OECD have expanded, particularly in emerging Asian countries such as China and India. As a result, the number of 25-34 year-olds with a tertiary education degree in OECD and G20 countries is expected to grow over the next decades, from 137 million in 2013 to 300 million by 2030 (Figure 1.2) (OECD, 2015[5]).

Figure 1.1. Population with higher education qualifications (2017)

Share by age group



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
Chile: Data refer to 2015.
Source: Adapted from OECD (2018[6]), *OECD Education Statistics*, http://dx.doi.org/10.1787/edu-data-en; data provided by the Flemish Ministry of Education and Training.

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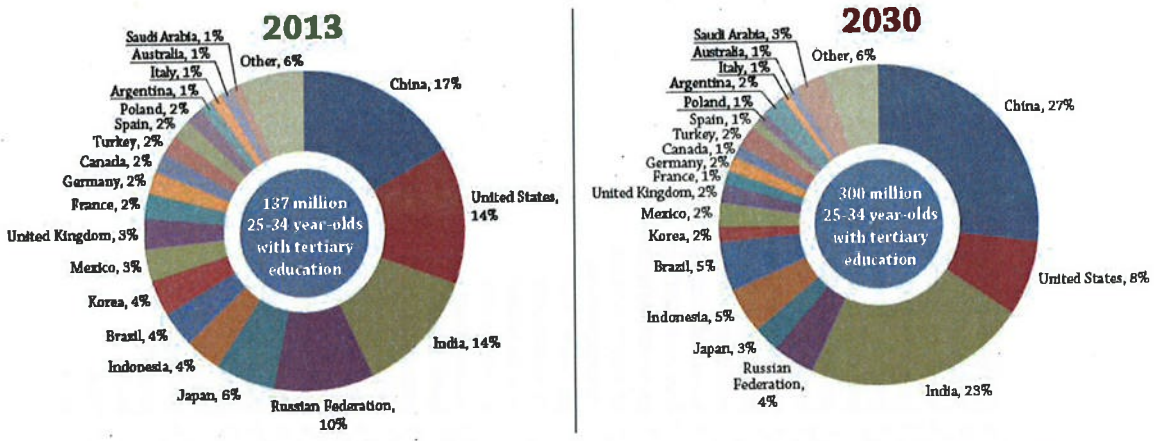
Figure 1.2. Share of 24-34 year-olds with a tertiary degree across OECD and G20 countries (2013 and 2030)



Note: The figures in these graphs are estimates based on available data. The population estimations are based on the OECD annual population projections.
Source: OECD (2015[5]), "How is the global talent pool changing (2013, 2030)?", *Education Indicators in Focus*, No. 31, https://doi.org/10.1787/5js33lf9jk41-en.

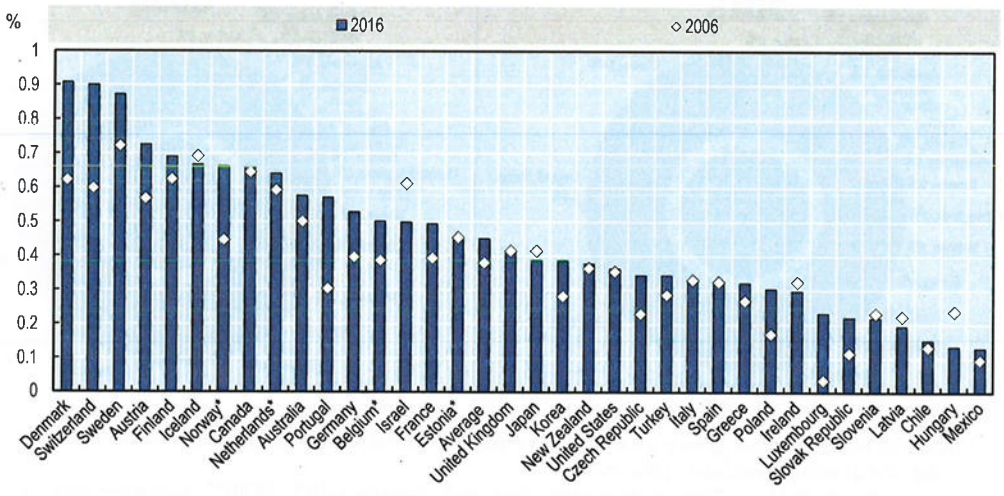
The rising demand for higher education has also led to a notable increase in the number and types of higher education institutions worldwide. It is estimated that there are now over 18 000 higher education institutions across over 180 countries offering at least a

post-graduate degree or a four-year professional diploma (International Association of Universities, 2018[7]). The diversity of higher education systems today is reflected in different institutional models of higher education institutions, including public, government-dependent private, private for-profit and private non-profit institutions, depending on the national context (see Chapter 2). These different types of institutions may form distinct subsectors in some countries, with disparate governance arrangements.

Higher education also caters to increasingly diverse student populations. The traditional cohort of young upper secondary graduates, who tend to study full-time and on campus, has been increasingly joined by part-time and older students who may be full-time employees or carers. Increased student mobility has resulted in greater numbers of international students on many campuses. These groups have different motivations and learning needs, creating a need for a more diverse and flexible higher education provision. Higher education systems in most jurisdictions therefore face the challenge of responding coherently to the continued increase in demand from a complex student population.

Higher education plays an integral role in globalisation and in the knowledge economy, as it facilitates the flow of people, ideas and knowledge across countries. Higher education therefore acts as an engine for 'brain circulation' between countries. The number of international students in higher education has increased from 2 million in 1999 to 5 million in 2016, at an average annual rate of 5% among OECD countries and 6% among non-OECD countries (OECD, 2018[3]). Internationalisation can also be found in other forms, such as staff mobility, transnational branch campuses, joint and double degree programmes between institutions in different countries, international internships and training experiences abroad, franchise and twinning arrangements, online education delivered across the world and global research networks.

Figure 1.3. Higher education expenditure on R&D as a percentage of GDP (2006 and 2016)



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
Chile: the 2006 data refer to 2007. Australia, Switzerland: the 2016 data refer to 2015. New Zealand: the 2006 and 2016 data refer to 2005 and 2015.
Source: Adapted from OECD (2018[8]), *OECD Science, Technology and R&D Statistics* https://doi.org/10.1787/strd-data-en.

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Moreover, investment in higher education research and development (HERD) increased in most OECD countries between 2006 and 2016 (Figure 1.3). The number of higher education researchers (full-time equivalent) across OECD countries also increased from around 1 200 000 in 2006 to more than 2 300 000 in 2016 (OECD, 2018[8]) (see Chapter 6).

These trends show the extent of the expansion, diversification and globalisation of the higher education sector in recent years across the OECD. But these changes also raise questions about how well higher education is contributing to societies through education, research and engagement activities. Ultimately, there is increasing pressure to demonstrate that the substantial public and private investment in higher education creates positive economic, social, and cultural returns.

1.2. Economic and social background of OECD higher education systems

Each country faces a distinct set of policy issues related to higher education. The macro-economic situation affects the level of spending on higher education, and has consequences for employment and labour market outcomes. Demographic and social trends also influence the environment in which higher education systems operate, along with broader political processes and macro-institutional factors, often shaped by historical circumstances.

In this section, an overview of some economic and social contextual factors which form the background of higher education systems across the OECD is presented, with a focus on the four participating jurisdictions of the benchmarking project (Estonia, the Flemish Community of Belgium, the Netherlands and Norway).

1.2.1. Higher education and the economic context

OECD economies have largely recovered from the crisis...

Higher education has a role to play in meeting some of the pressing economic challenges faced by OECD countries, many of which are the legacy of the recent global financial and economic crisis. OECD economies have largely recovered from the effects of the crisis, and while more recently economic growth has slowed in many jurisdictions, Gross Domestic Product (GDP) per capita remains close to pre-crisis levels in several countries (Figure 1.4).

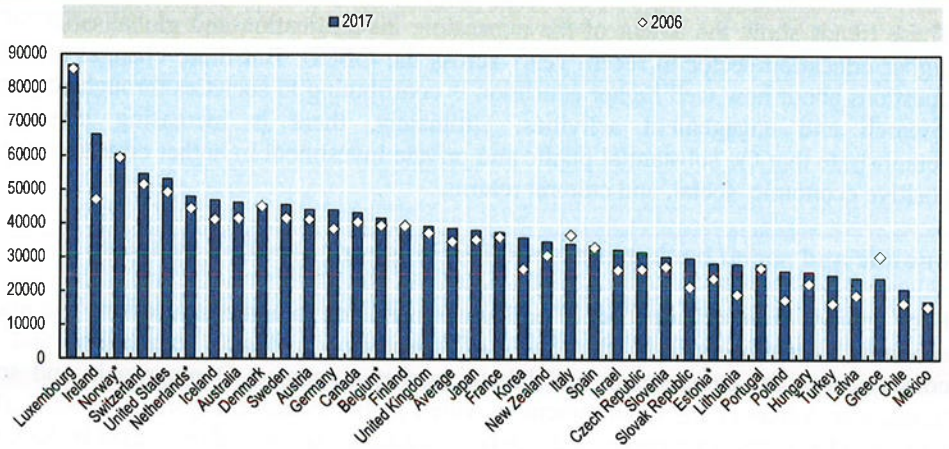
On average across OECD countries, GDP per capita was around USD 39 000 in 2017. The wide variation in GDP per capita across OECD jurisdictions affects the relative abilities of governments to invest in higher education systems. As this report shows, GDP per capita is very closely associated with the level of expenditure per student in higher education, even though it is not strongly associated with higher education expenditure as a fraction of GDP or of total public expenditure (see Chapter 3).

In the four participating jurisdictions, GDP per capita in 2017 ranged from above the OECD average in Norway (close to USD 60 000), Belgium and the Netherlands (between USD 40 000 and USD 50 000), while it was below the OECD average (around USD 30 000) in Estonia. These differences highlight the difficulties that some countries have to maintain and increase investment on higher education systems in a globally competitive

environment, despite the policy priority that may be placed by governments on higher education.

Figure 1.4. GDP per capita (2006 and 2017)

Measured in US dollars at constant prices and 2010 PPPs



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
Latvia: data for 2006 and 2017 are not comparable due to changes in methodologies.
Source: Adapted from OECD (2018[19]), *OECD Productivity Statistics*, http://dx.doi.org/10.1787/pdtvy-data-en.

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Some countries have reduced the disparity between their level of GDP per capita and the OECD average in recent years. This could imply that countries with GDP per capita below the OECD average could improve capacity for higher education spending in the future, depending on other commitments and contextual factors.

....but the majority of countries have increased their debt levels.

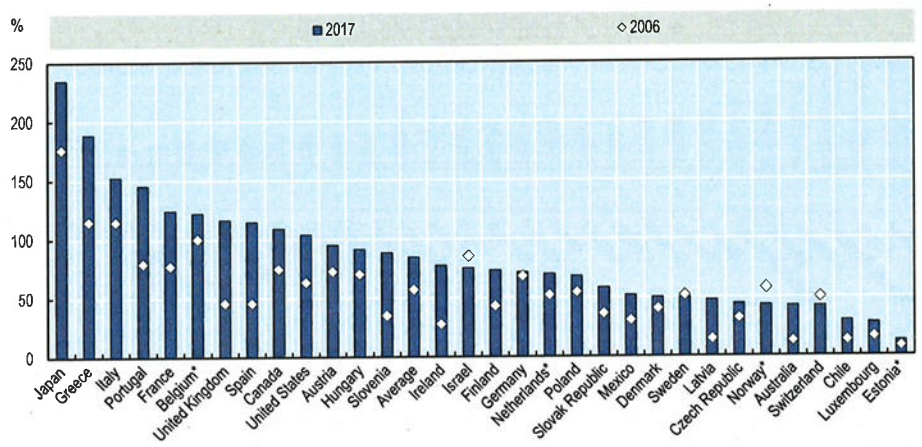
While GDP levels after the economic crisis have generally recovered across the OECD area, the crisis left the large majority of OECD countries with higher levels of government debt (Figure 1.5). This means that governments across the OECD have less room to expand public expenditure in areas in need of resources. For example, capital investment in higher education may suffer from the financial constraints imposed on governments by the post-crisis economic environment; some evidence reviewed in Chapter 3 suggests that higher education capital expenditure tends to increase more than proportionally when the general government expenditure increases.

The levels of government debt vary greatly across the four jurisdictions participating in the benchmarking exercise. Norway was among very few OECD countries that reduced their public debt level between 2006 and 2017, by around 15 percentage points. Estonia has enacted prudent fiscal policies over the past decades which have resulted in a very low (less than 15%) level of public debt, both before the crisis and more recently. Over the same period, the level of government debt increased in the Netherlands, but it was still relatively low in 2017 at 70% of GDP.

In contrast, Belgium had one of the highest levels of government debt in the OECD area, both in 2006 (around 100% of GDP) and in 2017 (120%). This relatively high level of debt could limit the possibilities of finding public resources for higher education in the future, particularly in a country where the large majority of higher education funding comes from the government (see Chapter 3).

Figure 1.5. General government debt as a percentage of GDP (2006 and 2017)

Excluding unfunded pension liabilities



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018. Israel, Japan, Luxembourg, Mexico and Switzerland: the latest available data refer to 2016.
Source: Adapted from OECD (2018[10]), *OECD National Accounts Statistics*, http://dx.doi.org/10.1787/na-data-en.

StatLink https://doi.org/10.1787/888933940189

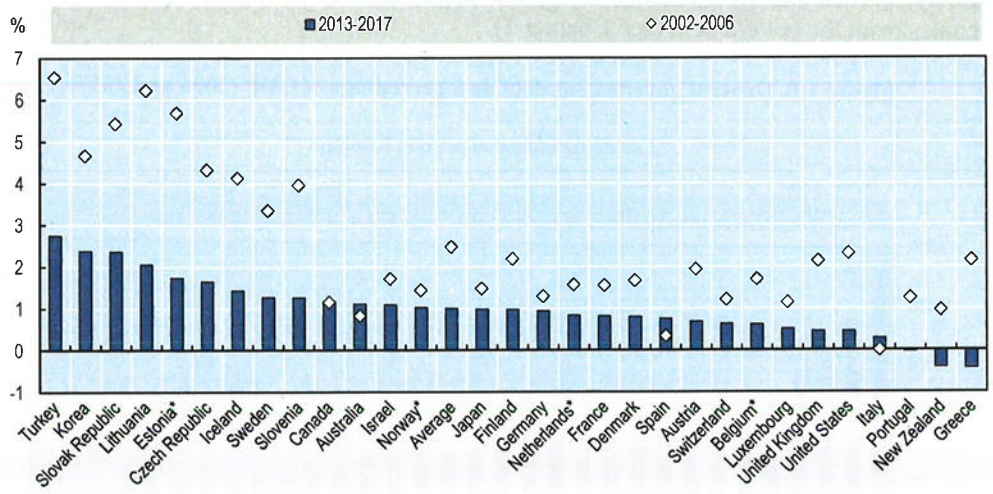
Growth in labour productivity has not recovered to levels seen before the crisis…..

The improvement of labour productivity is high on the political agenda in many OECD countries, as labour productivity growth in OECD countries has not yet returned to its pre-crisis level. Across the OECD area, GDP per hour worked increased by 2.5% per year, on average, between 2002 and 2006, but only by 1% per year, on average, between 2013 and 2017 (Figure 1.6). While the relationship between human capital and labour productivity is complex, lower growth puts greater focus on the role of higher education in increasing labour productivity, as a place where skills are developed and highly qualified workers are trained for their future roles in the workplace.

Across the four participating jurisdictions, Estonia experienced the highest average annual productivity increase (1.7%) during the 2013-2017 period, but also the largest difference in the average growth between 2002-2006 and 2013-2017. Norway's average annual productivity growth over the 2013-2017 period was similar to the OECD average level, at around 1%. The average productivity growth was lower than average in the Netherlands and Belgium for both of the periods 2002-2006 and 2013-2017, with the lowest in Belgium for the period 2013-2017 (0.6%).

Figure 1.6. Annual average productivity growth (2002- 2006 and 2013- 2017)

GDP per hour worked, constant prices



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
Countries with a data break in this series during the period 2002-2017 have been excluded (Chile, 2012; Hungary, 2010; Ireland, 2011 and 2017; Latvia, 2006; Mexico, 2010; Poland, 2010).
Japan, Turkey, the United States and the OECD total: the 2013-2017 data refer to 2013-2016.
Source: Adapted from OECD (2018[9]), *OECD Productivity Statistics*, http://dx.doi.org/10.1787/pdtvy-data-en.

StatLink https://doi.org/10.1787/888933940208

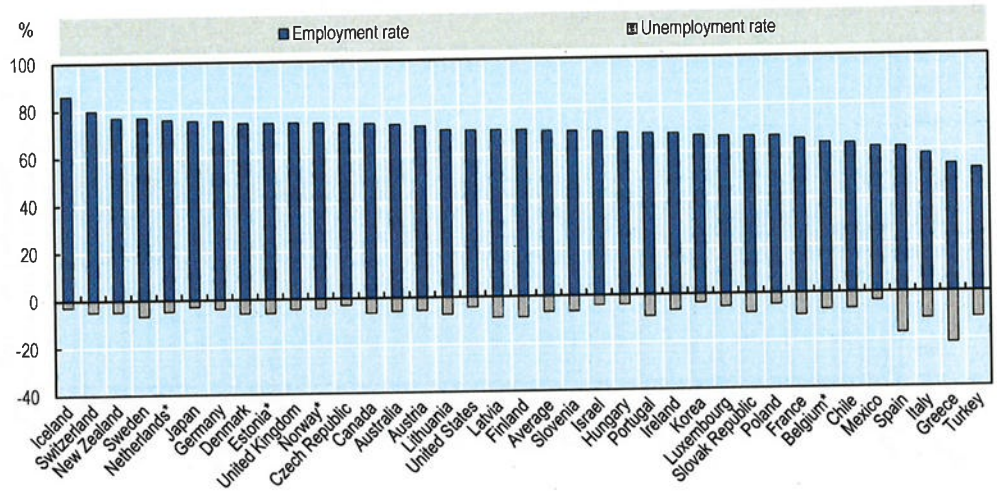
...though employment rates have surpassed pre-crisis levels

The general employment rate in a country is a crucial piece of contextual information to interpret the employment rate of higher education graduates (a key indicator of higher education performance – see Chapter 5). The OECD employment rate was 2 percentage points above the pre-crisis level in 2017, while the OECD average unemployment rate was below the pre-crisis level of 6% and projected to fall further (Figure 1.7) (OECD, 2018[11]). However, prime-age and youth employment rates were only at, or still below, pre-crisis levels in many countries (OECD, 2018[12]).

In 2017, the employment rate was relatively high (around 75%) in Estonia, the Netherlands and Norway, while it was below the OECD average in Belgium (less than 65%).

Figure 1.7. Employment and unemployment rates (2017)

15-64 year-olds



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
Source: Adapted from OECD (2018[13]), *Main Economic Indicators*, http://dx.doi.org/10.1787/mei-data-en.

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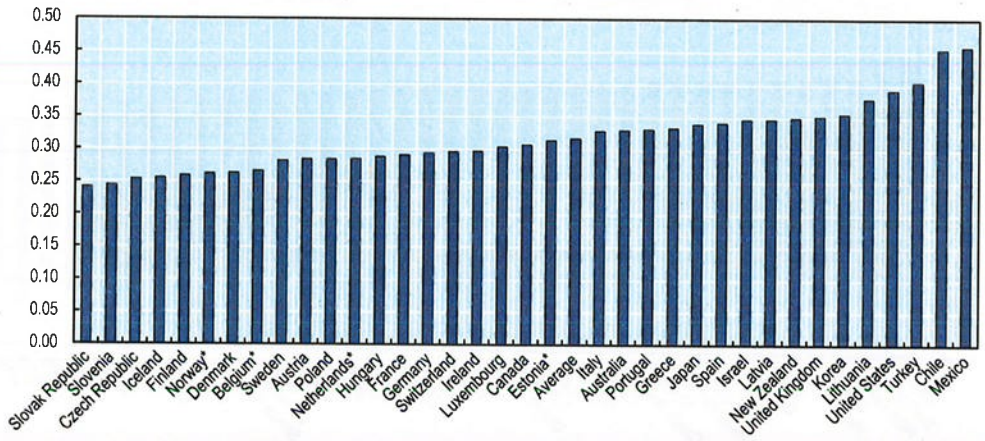
One of the key roles for education in society is to compensate for initial inequalities and provide all students with the skills needed to succeed in the labour market and in life in general (OECD, 2018[14]). Dealing directly with the root causes of income inequality, such as education and skills inequality, is considered more effective than trying to fix the symptoms at later stages of life, through redistribution policies like taxes and transfers (OECD, 2015[15]). However, despite the continuously increasing levels of educational attainment in the population, income inequality in OECD countries is at its highest level in over 30 years, and wealth is even more unevenly distributed.

The Gini coefficient is a key indicator of income inequality. Values close to 0 indicate completely equal incomes, while values close to 1 indicate very high inequality. The Gini coefficient was around 0.3 on average across OECD countries in 2016 (Figure 1.8). It ranged from 0.24 in the Slovak Republic, the most egalitarian country, to 0.46 in Mexico, the country with the most unequal income distribution. Income inequality in Belgium, the Netherlands and Norway was lower than the OECD average, while in Estonia it was just around the average.

Figure 1.8. Income inequality (2016)

Gini coefficient (based on disposable income, post taxes and transfers - new income definition since 2012), 0 = complete equality; 1 = complete inequality



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
The latest available year is 2016 for Finland, Israel, Latvia, the Netherlands, Sweden, the United Kingdom and the United States; 2014 for Australia, Hungary, Iceland and Mexico; 2012 for Japan.
Source: Adapted from OECD (2018[16]), *OECD Social and Welfare Statistics*, https://doi.org/10.1787/socwel-data-en.

StatLink https://doi.org/10.1787/888933940246

1.2.2. Higher education and social conditions

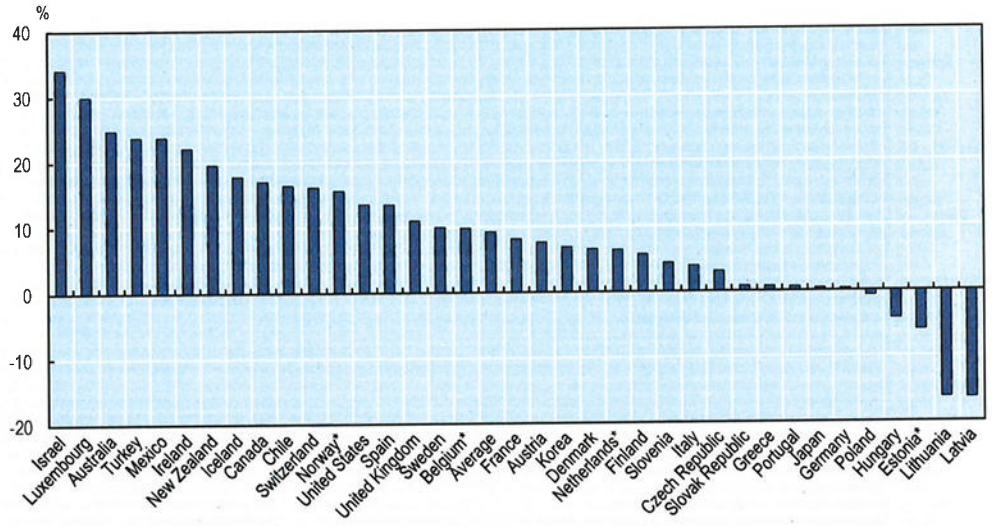
Demographic changes have implications for higher education systems

Demography influences higher education in a variety of ways (OECD, 2008[17]; Ritzen, 2010[18]). A decreasing population, especially among the young cohorts who typically compose the majority of higher education students, can result in difficulties recruiting students, with potential effects on expenditure per student. It can also threaten the survival of some institutions, particularly those located in remote areas or offering less prestigious programmes. Decreasing population can also contribute to tightening labour market conditions, putting pressure on higher education to provide graduates with the necessary skills to boost the economy (OECD, 2017[19]).

On average across OECD countries, the population grew by 9% between 2000 and 2015, but with a very large variation between countries (Figure 1.9). While the population of Israel grew by over 30% in that time period, that of Latvia and Lithuania decreased by more than 15%. The population increased by between 5% and 10% in Belgium and the Netherlands, and by more than 15% in Norway; in contrast, it decreased by 6% in Estonia.

Figure 1.9. Population growth rates (2000-2015)

Reference year: 2000



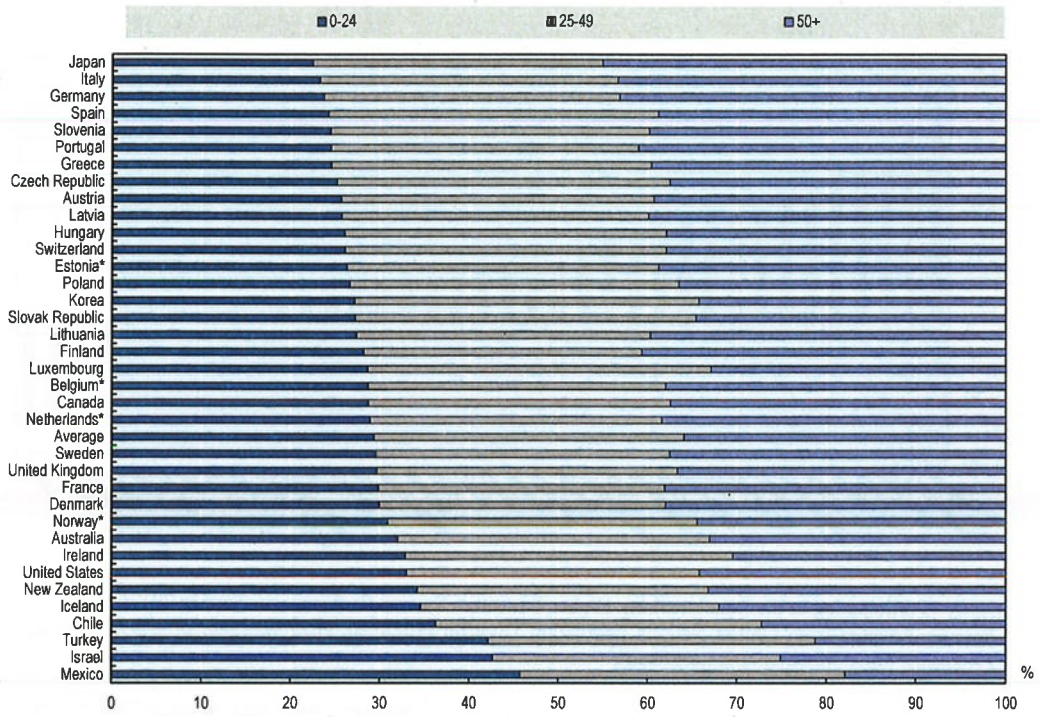
Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
Source: Adapted from United Nations Population Division (2018[20]), *2017 Revision of World Population Prospects*, https://population.un.org/wpp/.

StatLink https://doi.org/10.1787/888933940265

Norway has a demographic profile very similar to the OECD average. Belgium, Estonia and the Netherlands presented a slightly older profile in 2015, with almost 40% of individuals aged 50 or older. However, while the share of the population younger than 25 was closer to the OECD average in Belgium and the Netherlands, it was three percentage points lower in Estonia.

A declining population is related to ageing and emigration, which also reflect on the age structure of the population. Therefore, population growth is closely related to the age structure of the population (the correlation between the population growth rates from Figure 1.9 and the share of individuals older than 50 from Figure 1.10 is 0.69). On average across OECD countries in 2015, about 30% of the population was younger than 25, about 35% was 25- 49 years old, and the remaining 35% was 50 or older (Figure 1.10).

Figure 1.10. Age structure of population (2015)



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
Source: Adapted from United Nations Population Division (2018[20]), *2017 Revision of World Population Prospects*, https://population.un.org/wpp/.

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Migration is increasing across the world

Global migration flows are increasing. The number of international migrants in the world was over 230 million in 2013 (one-third greater than the number in 2000), and it is likely to have grown further in recent years. Migrants can counterbalance the labour shortages caused by declining population, especially those who are highly skilled, who constitute a growing fraction of the overall migrant population. In addition, migrants can establish social, business and cultural international networks from which both their host and home countries can benefit (OECD, 2015[21]).

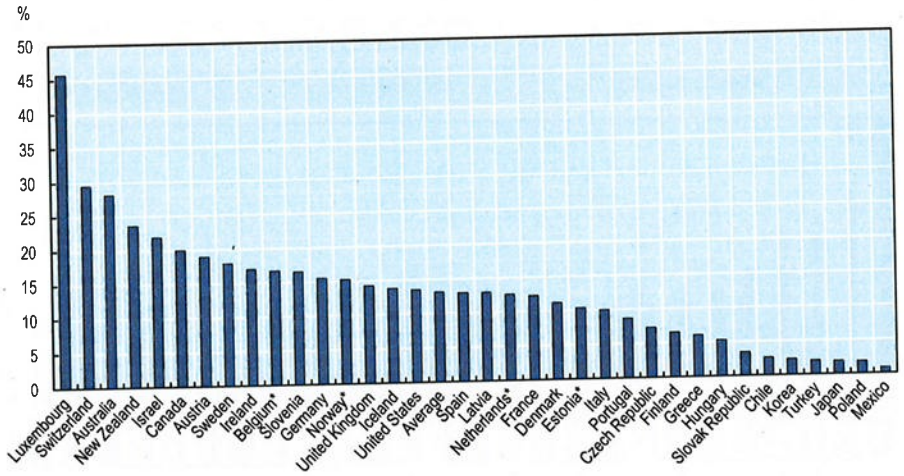
When the share of foreign-born people (and their descendants) in the population is substantial, the higher education system must adapt to ensure that suitable learning opportunities are available. This includes both ensuring accessibility for young second-generation immigrants and providing lifelong learning opportunities for first-generation immigrants as well as for other adults (see Chapter 5).

On average across OECD countries, foreign-born people accounted for 13% of the total population in 2017 (Figure 1.11). In the Netherlands, the share of foreign in the population was close to the average, while in Belgium and Norway it was over 15%.

Estonia presents specific challenges not only in attracting skilled workers, but also in retaining them. The share of foreign-born people in the Estonian population was around 10% in 2017. Emigration has been high in Estonia in the recent past; however, immigration started to exceed emigration in 2015 (Statistics Estonia, 2019[22]).

Figure 1.11. Foreign-born population (2017)

% of the total population



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
The latest available year is 2016 for France, Ireland, Mexico and Turkey; 2015 for Chile; 2014 for New Zealand; 2012 for Czech Republic, Poland and Portugal; 2011 for Canada.
Japan and Korea: data refer to the foreign population rather than the foreign-born population.
Source: Adapted from OECD (2018[23]), *International Migration Outlook 2018*, http://dx.doi.org/10.1787/migr_outlook-2018-en.

StatLink https://doi.org/10.1787/888933940303

Higher education is associated with more favourable social outcomes across the OECD

Education is important to supply the skills the economy needs, but it is also important as a way to foster democratic engagement among citizens, civil society participation and other positive social outcomes. The achievement of higher education is generally associated with better well-being and social outcomes, including in health, interpersonal trust and political efficacy.

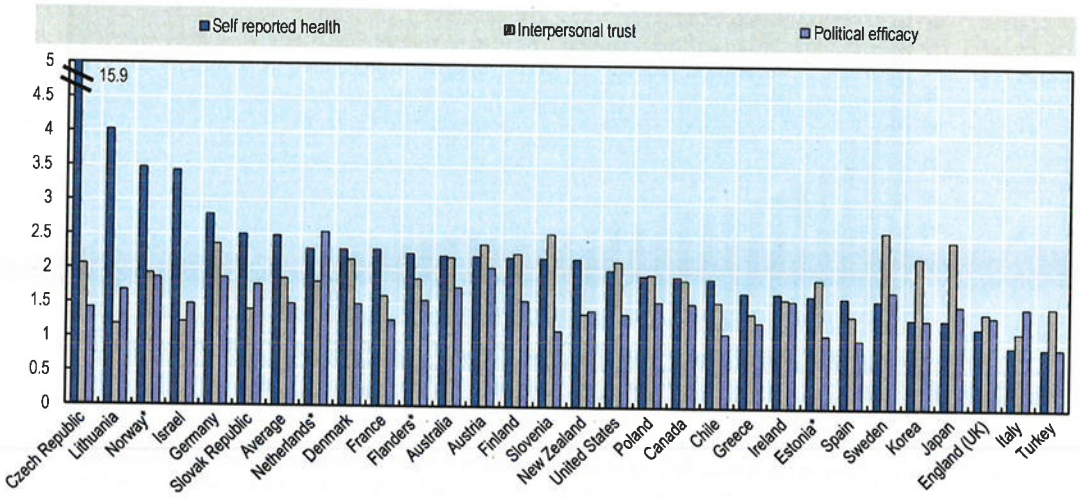
The proportion of 16-34 year-olds reporting to be in good health is higher than the average across OECD countries participating in the Survey of Adult Skills in Norway, close to the average in the Flemish Community and the Netherlands, and lower than the average in Estonia. The proportion of 16-34 year-olds reporting that they trust others is around the average in the all participating jurisdictions. The proportion of 16-34 year-olds reporting that they have a say in government is higher than the average in the Flemish Community, the Netherlands and Norway, while it is lower than the average in Estonia.

On average across OECD countries and economies participating in the Survey of Adults Skills, adults younger than 35 with a higher education degree have about 2.5 times the odds of reporting to be in good or excellent health, compared to people of the same age

with only an upper secondary education degree. They also have almost twice the odds of disagreeing with the statement that only few people can be trusted and 1.5 times the odds of disagreeing that people like them have no say in what the government does (a measure of political efficacy) (Figure 1.12).

Figure 1.12. Relative level of self-reported health, interpersonal trust and political efficacy of higher education graduates, 16-34 year-olds (2012 or 2015)

Odds ratio to report good or excellent health, to disagree with the statements "only few people can be trusted" and "people like me don't have any say about what the government does" (upper secondary education = 1)



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
The adjusted odds ratios are computed through a logistic regression model and take account of differences associated with other factors: age, gender, immigrant and language background and parents' educational attainment. The probability differences are significantly different from 1 for all countries and economies except: Austria, England, Greece, Ireland, Italy, Japan, Northern Ireland, Slovenia, Spain, Sweden and Turkey for self-reported health; Chile, Greece, Israel, Italy, New Zealand, Northern Ireland, the Slovak Republic and Spain for interpersonal trust; Chile, the Czech Republic, England (United Kingdom), Estonia, France, Greece, Italy, Slovenia, Spain and Turkey for political efficacy. Countries are ranked in descending order of the relative level of self-reported health.
Source: Adapted from OECD (2018[24]), *OECD Survey of Adult Skills*, www.oecd.org/skills/piaac/data/.

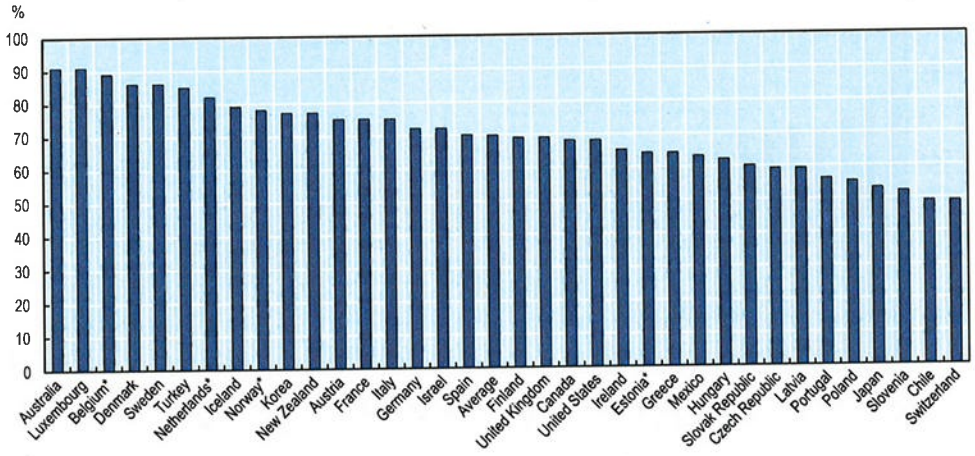
StatLink https://doi.org/10.1787/888933940322

Fostering a sense of political efficacy and participation in democratic life is fundamental to the functioning of democracy. Voter participation provides a good measure of civic and political engagement. However, caution is needed in the interpretation of this measure, which can also be influenced by institutional differences in electoral systems (for example, voting is compulsory in some countries).

On average across OECD countries, around 70% of the population registered to vote cast a vote at the most recent election (Figure 1.13). This proportion was substantially higher than average (around 80%) in the Netherlands and Norway, and reached close to 90% in Belgium, but was lower than average (around 65%) in Estonia.

Figure 1.13. Voter turnout (latest available year)

% of votes cast by the population registered to vote



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
The latest available year is 2017 for France, Korea, the Netherlands and the United Kingdom; 2016 for Australia, Iceland, Ireland, Lithuania, the Slovak Republic, Spain and the United States; 2015 for Canada, Denmark, Estonia, Greece, Israel, Poland, Portugal, Switzerland and Turkey; 2014 for Belgium, Hungary, Japan, Latvia, New Zealand, Slovenia, Sweden; 2013 for Austria, Chile, the Czech Republic, Germany, Italy, Luxembourg, Norway; and 2012 for Finland, Mexico.
Source: Adapted from OECD (2018[25]), *OECD Better Life Index*, http://www.oecdbetterlifeindex.org/.

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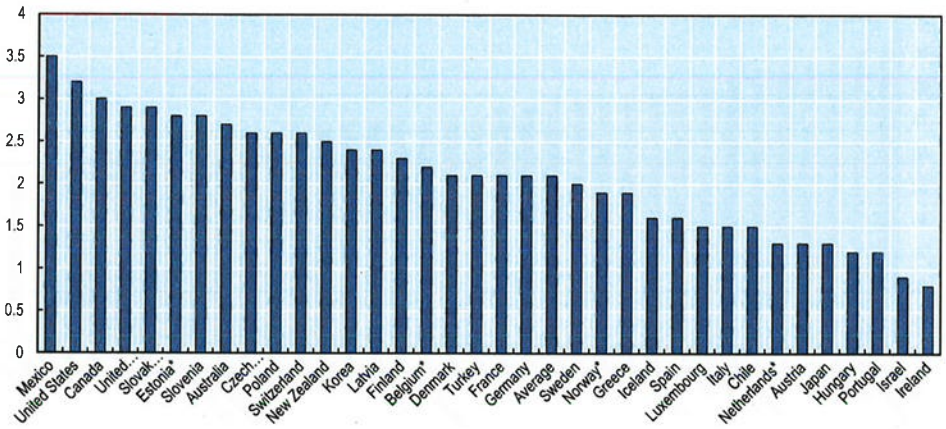
Voter turnout is not the only indicator of democratic engagement. Another fundamental characteristic of democratic policy-making is the involvement of stakeholders in decision processes. It is difficult to generate a single measure of stakeholder involvement, but Figure 1.14 presents an average across a number of indicators on this topic for 2014. Estonia has a high level of stakeholder engagement relative to other OECD countries according to this measure, while Belgium was just above the OECD average, and the Netherlands and Norway were below average.

Figure 1.14. Stakeholder engagement for developing regulations (2014)

Level of formal stakeholder engagement in developing primary laws and subordinate regulations, a scale from 0 to 4



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018.
The indicator is calculated as the simple average of two composite indicators (covering respectively primary laws and subordinate regulations) that measure four aspects of stakeholder engagement, namely i) systematic adoption (of formal stakeholder engagement requirements); ii) methodology of consultation and stakeholder engagements; iii) transparency of public consultation processes and open government practices; and iv) oversight and quality control, which refers to the existence of oversight bodies and publicly available information on the results of stakeholder engagement. The maximum score for each of the four dimensions/categories is one and the maximum aggregate score for the composite indicator is then four.
Source: Adapted from OECD (2018[25]), *OECD Better Life Index*, http://www.oecdbetterlifeindex.org/.

StatLink https://doi.org/10.1787/888933940360

1.3. Performance challenges in higher education

The expansion of access to higher education to a broader range of students has unquestionably produced many benefits for individuals and society, and these benefits create strong incentives to invest in higher education. However, higher education institutions and those responsible for steering and funding systems have had to cope with substantial expansion in a relatively short period of time. As a result, many higher education systems are facing challenges in streamlining their contributions to high quality education, research and engagement and sustaining them into the future in an increasingly competitive and globalised environment.

The continuously increasing costs and funding requirements that have accompanied the expansion of higher education raise concerns about its future financial sustainability. Countries are also grappling with challenges associated with the quality and equity of higher education. While access to higher education has improved for a broader range of students, there are increasing concerns about how well non-traditional students fare in higher education programmes and whether they graduate with high quality degrees. There is also continuing debate about the ability of higher education to meet future labour market demands and broader societal needs.

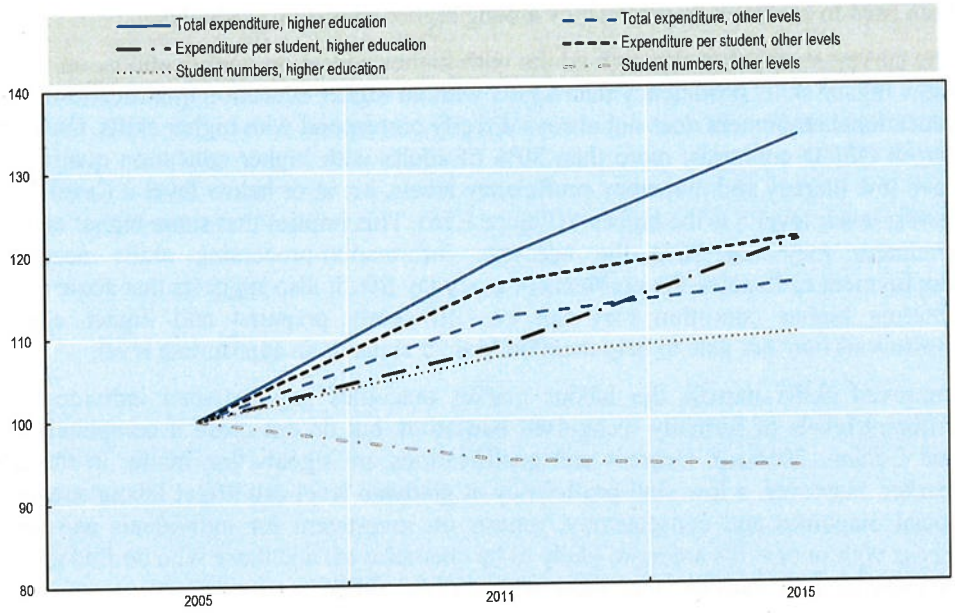
1.3.1. Challenges with financing higher education

Between 1995 and 2004, higher education expenditure per student grew in most countries with available data, although at a substantially lower pace than in other levels of education (OECD, 2008[1]). Since 2005, expenditure per student in higher education has grown at a similar pace as that of other levels of education, on average across OECD countries. At the same time, the number of students in higher education has increased rapidly (by around 10% between 2005 and 2015). Combined with the rising per student cost, this rising number of students produced an increase of more than 30% in total expenditure between 2005 and 2015 (Figure 1.15).

The expansion of expenditure has raised the question of who should pay for higher education. In many OECD countries, governments are the main source of funding. On average across OECD countries, 66% of higher education expenditure was financed by governments in 2015. The public returns on investment in higher education are high in all OECD countries; on average across OECD countries, the total public cost to attain higher education is USD 48 500 for a man and USD 44 700 for a woman, while the total public benefits are USD 188 100 and USD 116 800 respectively (OECD, 2018[3]).

Figure 1.15. Trends in expenditure and students numbers (2005, 2011 and 2015)

Higher education as compared to other levels combined, OECD average, 2005=100



Source: Adapted from OECD (2018[3]), *Education at a Glance 2018*, https://doi.org/10.1787/eag-2018-en.

StatLink https://doi.org/10.1787/888933940379

To ensure that higher education remains financially sustainable, students and families are increasingly being asked to share the costs of higher education. The proportion of private expenditure is greater in the higher education sector, compared to other education sectors. On average across the OECD, private funding amounted to 31% at the tertiary education level, compared to 9% at the primary, secondary and post-secondary non-tertiary levels in

2015 (OECD, 2018[3]). The contribution of students and their families to funding higher education raises expectations and creates new forms of accountability for higher education institutions, which increasingly need to demonstrate that they deliver value for money.

1.3.2. Challenges of connecting higher education to human capital development

As noted earlier in this chapter, the OECD defines human capital as "the knowledge, skills, competencies and other attributes embodied in individuals that are relevant to economic activity" (OECD, 1998[2]). Future growth of knowledge economies depends on a well-functioning system of education and training that provides opportunities for upskilling and acquiring new knowledge throughout an individual's life.

But there are questions around the effectiveness of higher education systems in contributing to human capital formation. Evidence on the skills levels of graduates, completion rates and the extent to which disadvantaged and non-traditional students can access higher education points to a number of performance challenges.

Graduate skills

There are little data on the learning outcomes of higher education and none available at the system level or internationally comparable level at present. In the absence of an international measure of student learning outcomes, the OECD Survey of Adult Skills has been used to assess skills proficiency among higher education graduates.

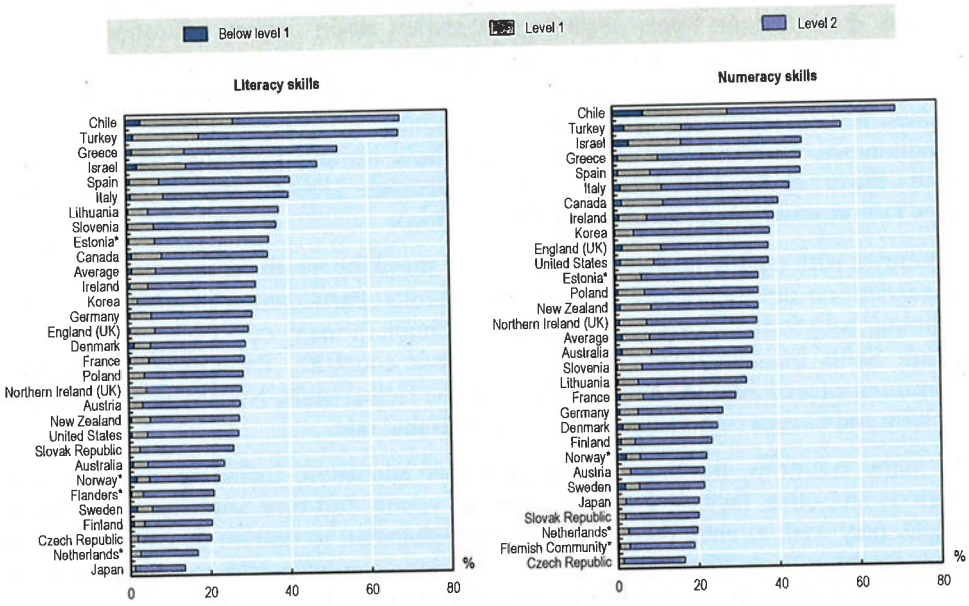
The survey shows that although adults with higher education qualifications, on average, show higher skills proficiency than adults without higher education qualifications, higher educational attainment does not always directly correspond with higher skills. On average across OECD countries, more than 30% of adults with higher education qualifications have low literacy and numeracy proficiency levels, i.e. at or below level 2 (level 1 is the lowest level; level 5 is the highest) (Figure 1.16). This implies that some higher education graduates may not have the adequate information-processing skills needed for employment or to solve the problems of everyday life. It also suggests that some students entering higher education may not be sufficiently prepared and higher education institutions may not able to help them build their skills to an appropriate level.

Improved skills narrow the labour market outcomes gap between individuals with different levels of formally recognised education, but do not close it completely (Lane and Conlon, 2016[26]). Degrees and qualifications are signals that matter in the labour market. However, a low skill proficiency at graduate level can affect labour market and social outcomes and consequently, returns on investment for individuals and society. Those with poor skills are more likely to be unemployed; and those who do find a job will be more likely to earn less than those with stronger skills.

In countries where student loans are the norm, graduates with poorer labour market outcomes may not earn sufficiently to pay back their student loans (i.e. they will default on their loans or not earn enough to meet the thresholds in income-contingent loan schemes). Much of the cost of higher education could then fall on the taxpayer, if the government guarantees the loans or has to accept unpaid debt.

Figure 1.16. Percentage of adults with higher education qualifications at low literacy and numeracy proficiency levels (2012 or 2015)

25-65 year-olds



Note: *Participating in the Benchmarking Higher Education System Performance exercise 2017/2018. There are six levels (from below level 1 – the lowest – to level 5 – the highest). Tasks completed successfully at the literacy level 2 require respondents to make matches between the text and information, and may require paraphrasing or low-level inferences. Some competing pieces of information may be present. Some tasks require respondents to cycle through or integrate two or more pieces of information based on criteria; compare and contrast or reason about information requested in the question; or navigate within digital texts to access and identify information from various parts of a document. Tasks completed successfully at the numeracy level 2 require respondents to identify and act on mathematical information and ideas embedded in a range of common contexts where the mathematics content is fairly explicit or visual with relatively few distractors. Tasks tend to require the application of two or more steps or processes involving calculation with whole numbers and common decimals, percentages and fractions; simple measurement and spatial representation; estimation; and interpretation of relatively simple data and statistics in texts, tables and graphs.

Source: OECD (2016[27]), *Skills Matter: Further Results from the Survey of Adult Skills*, https://doi.org/10.1787/9789264258051-en.

StatLink https://doi.org/10.1787/888933940398

In addition to the risks of graduating with low skills, many students do not graduate at all. On average across OECD countries with available data, around 20% of students who enter a bachelor's programme leave without a qualification within the theoretical duration plus three years (OECD, 2016[28]). The high level of non-completions can reflect failures in the guidance process from compulsory to higher education, low admission standards, inadequate academic support, poor programme quality and the financial cost of education (OECD, 2008[11]) (see Chapter 5).

Access for disadvantaged and non-traditional students

Despite widening access policies, disadvantaged students remain disproportionately under-represented in higher education, particularly within the more prestigious institutions (Jerrim and Vignoles, 2015[29]). Only one-third of 30-44 year-olds whose parents do not attain upper secondary education attain tertiary education themselves, compared with over two-thirds of adults in the same age group, who have at least one parent who attain tertiary education (OECD, 2017[30]). In addition to being under-represented in higher education, and concentrated in less prestigious institutions and programmes, disadvantaged students tend to have lower progression rates and graduate with lower skills and labour market outcomes (Jerrim and Vignoles, 2015[29]; OECD/European Union, 2015[31]; OECD, 2016[28]).

Countries with rapidly ageing populations and shrinking youth cohorts may become more dependent on developing the skills of older adults. Participation in adult education and training, both formal and informal, is now common in many countries, but the Survey of Adult Skills indicates major differences across countries. Participation rates in adult education exceed 50% in Denmark, Finland, the Netherlands, Norway and Sweden, while in Italy and Greece they remain well below half that rate.

In many countries, the organisation of higher education, including curriculum, study periods and other factors, typically caters to young, full-time students. However, older adults may wish to enter (or re-enter) higher education to re-train or up-skill throughout their working lives. Firms and other organisations may also seek to engage with higher education institutions to provide training for their workers to deal with new products, technologies and business processes.

Many adults may also wish to undertake short courses that do not lead to a qualification, simply to acquire new knowledge and skills for work or personal interests. However, those with existing work and caring commitments may find it difficult to access higher education unless it is more flexible in its delivery.

Internationalisation

Countries that attract international students are tapping the global pool for talent. Some countries have eased their immigration policies to encourage the temporary or permanent immigration of international students in order to benefit from better access to skills. Countries that charge international students the full cost of education also reap significant economic benefits. For this reason, several countries have policies to attract international students on a revenue-generating, or at least cost-recovery, basis. However, this can result in high costs for students and risks limiting mobility to only students who can afford it.

Internationalisation can involve inward and outward mobility of students, but also curriculum changes that promote an international and intercultural dimension to the learning and teaching process. These changes also benefit domestic students who are not able to travel abroad, by providing them with opportunities to develop a global perspective of their study field, and develop cross-cultural perspectives from interactions with international students (OECD, 2019[32]).

However, some countries have less success in attracting international students and researchers, which hinders their competitiveness and the economic impact of their higher education system. It also diminishes the exposure of domestic students to international students, and thus their capacity to operate in global environments later on. The benefits

of internationalisation are also vulnerable to changes in government policy on migration or changes in circumstances within sending countries.

Despite general movement towards compliance with the UNESCO/OECD *Guidelines for Quality Provision in Cross-Border Higher Education* (OECD, 2005[33]), it is often too difficult for students and other stakeholders to easily access the information they need to assess the quality of cross-border provision or to understand the process of quality assurance that foreign providers or programmes undergo (OECD, 2015[34]).

1.3.3. Challenges of contributing to knowledge, innovation, social and cultural development

Concerns related to performance also extend into the research mission of higher education. In some countries, there are limited career opportunities for doctoral graduates and other early-career researchers. There are persistent issues with gender equity in research as well. For example, while the rate of women doctoral graduates are on a par with men in some fields, they make up less than one-quarter of engineering graduates. There are also considerable differences across countries in the share of women among authors who are designated as corresponding authors, a proxy for leadership in the context of research collaboration.

Scientific collaboration tends to be associated with research excellence. However, high quality research tends to be highly concentrated in certain countries and major institutions, which can reduce the possibilities for collaboration across the wider higher education system. Scientific collaboration can also be supported through international mobility, and scientists with a history of mobility are more likely to publish in high-impact journals; but resources and processes to promote international programmes and activities are scarce in some countries.

Research is also becoming increasingly specialised, while higher education systems in many countries do not play to their strengths in research. In some countries, the quantity and quality of scientific production do not always coincide; some countries produce most in areas where they do not excel, and less in areas where they have a comparative advantage in terms of the quality of research (OECD and SCImago Research Group, 2016[35]).

Basic research is concentrated in universities and government research organisations, and spending on basic research has been increasing faster than applied research and experimental development. The measure of scientific impact of research tends to be higher for publications that report basic research rather than applied research or experimental development. As a result, higher education institutions often concentrate on basic research and pay less attention to applied research and experimental development. This has an effect on the perception of the contribution of higher education to innovation, with only 10% of product and/or process-innovating firms regarding higher education or government as highly important sources of knowledge for innovation (OECD, 2015[36]). Industry funding accounted for only around 5% of public research funding, on average across the OECD in 2014 (OECD, 2016[37]).

Though the volume of research output has expanded substantially, mounting evidence has highlighted large-scale problems concerning the ability to reproduce results, and the prevalence of questionable research practices, which may affect the reliability of a proportion of output. This has serious consequences for the quality of research and, as a

result, the quality of the knowledge which informs decision-making processes across society.

Higher education activities can also produce economic, social, cultural and environmental impact in the wider community, be it at the local, regional, national or global level. Governments and stakeholders are increasingly asking higher education institutions to engage more effectively with the wider world through the provision of continuing education; technology transfer and innovation and social engagement.

However, there are many barriers to making progress with this policy agenda. For example, academics and institutions are typically provided with few incentives to perform well in this dimension (Ćulum, Turk and Ledić, 2015[38]). Measuring higher education's contribution to social cultural and environmental well-being is also problematic (Bornmann, 2013[39]). It is difficult to assess the scientific impact of arts, humanities and social sciences, and even more difficult to measure the societal impact of any kind of research (Van Raan, 2004[40]). Technology transfer is easier to measure (via licencing of patents, royalty income, number of spin-off and start-up companies). For this reason, government policies related to engagement often prioritise the uptake and development of tangible technologies, while mechanisms to support social entrepreneurship and innovation for wider needs have been more limited. ONE does not allow me to edit this source

Finally, higher education systems can contribute to the wider community through ensuring that the knowledge they generates is available for the benefit of all of society. Open access (OA) to publications is relevant to the promotion of open science, i.e. the efforts to make the outputs of research more widely accessible in digital format to the scientific community and to society more broadly. However, in most OECD countries, the share of documents published in OA journals is less than 10%, as the implied citation "prestige" of journals, as measured by citation indicators, is higher for documents published in non-OA journals.

1.4. The OECD benchmarking higher education system performance project

The benchmarking higher education system performance project is a comprehensive review of where OECD countries currently stand across the full spectrum of issues related to higher education performance. The report reviews comparative indicators of the performance of OECD countries across a range of topics, including financial and human resources and the inputs, activities and outcomes of higher education systems. For the four participating jurisdictions, recent policy activity related to each of the topics is also reviewed. The report is structured as follows:

This chapter has provided some context for higher education systems in OECD countries in general and the four participating countries in particular, including their economic and social context, and the core challenges that higher education systems are facing today.

Chapter 2 describes the structure and governance of higher education systems and the policies and practices driving performance in the participating jurisdictions.

Chapter 3 provides a discussion of financial resources in higher education, including the cost of higher education and policies on funding and accountability.

Chapter 4 includes an overview of human resources in higher education, including the profile of higher education staff, working conditions and professional development.

Chapter 5 provides an analysis of the education function of higher education, including policies on equity, participation, internationalisation, digitalisation, lifelong learning and links to the labour market.

Chapter 6 looks at the research function of higher education, including the distribution of research expenditure, the profile of research personnel, internationalisation and research productivity and impact.

Chapter 7 presents an analysis of the engagement function of higher education, covering three main thematic areas: building human capital, contributing to innovation and supporting wider development.

Chapter 8 includes an assessment and reflection on the conduct of the project, the obstacles to measuring higher education system performance which were encountered, key gaps in evidence and lessons learned from the benchmarking process.

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Chapter 2. The structure and governance of higher education of higher education systems

This chapter describes how higher education systems and their activities are structured and governed across the OECD, including in the participating jurisdictions. It also provides an overview of the policy directions that participating jurisdictions are taking to improve system performance.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

2.1. Introduction

Policy priorities and policy outcomes are highly dependent on the environment in which policies are conceived and implemented (OECD, 2018[1]). While indicators on performance can illustrate differences between systems in terms of inputs, activities, outputs and outcomes, contextualising these indicators ensures that the comparison across systems is meaningful. Knowledge of how higher education systems are organised and governed can help to understand and explain performance.

Higher education has a broader range of actors and stakeholders than lower levels of the education system, because of greater diversity of institutions and the stronger influence of market forces. Additionally, the research and engagement functions of higher education often involve the private sector and the wider community. Among each of the stakeholders, actors and contextual elements, there is a complex set of relationships, interconnections and dependencies, which operate at the institutional, local, national, regional or international level (Jongbloed, Enders and Salerno, 2008[2]).

Recent OECD research emphasises the need to take account of the contextual dynamics of complex systems for effective policy-making (Love and Stockdale-Otárola, 2017[3]). More data on inputs, outputs and outcomes have become available in recent years to support higher education policy-making. This chapter describes many of the key features of higher education systems across the OECD. Nonetheless, complex higher education systems are difficult to describe comprehensively. Challenges remain in understanding how system structures, governance, policies and practices work together to produce the results reflected in performance indicators.

2.2. Structure of higher education systems

Many factors influence the structure of higher education systems, including national cultures and traditions, policy objectives, student expectations and labour market needs. As demand for higher education has grown in recent decades, systems have expanded in size and scope, and the issue of designing the most relevant and appropriate system structures is consistently prominent on the policy agenda in many countries (Guri-Rosenblit, Šebková and Teichler, 2007[4]).

The discussion of the structures of higher education systems in this section includes types of higher education programmes, horizontal and vertical divides between institutions; and pathways into and through higher education.

2.2.1. Classifications of higher education programmes

The key international classification of education programmes is the International Standard Classification of Education (ISCED), first developed by UNESCO (United Nations Educational, Scientific and Cultural Organization) in the 1970s and most recently revised in 2011. According to the ISCED 2011 classification, higher education programmes are divided into four levels according to the qualification awarded: level 5 (short-cycle tertiary education programmes), level 6 (bachelor's or equivalent level programmes), level 7 (master's or equivalent level programmes) and level 8 (doctoral or equivalent level programmes) (UNESCO Institute for Statistics, 2012[5]).

Within the ISCED classifications there is a great deal of variety in the structure of programmes across different higher education systems. These differences can make it difficult to recognise qualifications across jurisdictions and can hinder student mobility

and the transfer of credits outside national borders. As education institutions and economies in general become more globalised, there have been a number of efforts in recent years to create internationally comparable higher education systems and degree structures to address these issues.

The most significant initiative in this area is the creation of the European Higher Education Area (EHEA) across 48 countries, including the participating jurisdictions. The agreement to develop a system of comparable and compatible qualifications in higher education that could be easily understood and recognised across Europe was a key feature of the Joint Declaration of the European Ministers of Education convened in Bologna on 19 June 1999 (Bologna Declaration) (Bologna Declaration, 1999[6]) (Box 2.1). This led to the development of the three cycles in higher education: bachelor's (first cycle), master's (second cycle) and doctoral (third cycle).[1] Most countries in the EHEA, including the participating jurisdictions, have adopted the three-cycle structure.

The overarching framework of qualifications for the EHEA (the EHEA Framework or QF-EHEA), outlining the three cycles and setting the parameters for countries in the EHEA to develop national qualifications frameworks (NQFs), was adopted at the Ministerial Conference in Bergen in 2005 (Bergen Communiqué) (Bergen Communiqué, 2005[7]). However, there are some programmes outside the Bologna framework, including long first-degree programmes that lead to a master's qualification in Estonia and Norway (European Commission, EACEA and Eurydice, 2018[8]) (Table 2.1).

Table 2.1. Programmes outside the Bologna framework in the participating jurisdictions

Jurisdiction	Programmes
Estonia	Programmes in the following fields of study are based on integrated curricula of bachelor's and master's studies (ISCED level 7): • medicine and veterinary science (nominal duration of six years; 360 European Credit Transfer and Accumulation System credits (ECTS); students awarded a degree in medicine or in veterinary science) • architecture, civil engineering, dentistry, pharmacy and teacher education (nominal duration of five years; 300 ECTS; students awarded a master's degree).
Norway	Programmes in the following fields of study are based on integrated curricula of bachelor's and master's studies (ISCED level 7): • medicine, psychology, and theology (nominal duration of six years; 360 ECTS) • veterinary medicine (five to six years; 330-360 ECTS) • odontology, pharmacy, fish science, architecture, law, teacher education (five years; 300 ECTS).

Note: Table excludes programmes not classified under the International Standard Classification of Education (ISCED) of higher education programmes (e.g. specific teaching programmes in the Flemish Community, which will be replaced by programmes within the Bologna framework from the academic year 2019-2020).

The Flemish Community also offers an advanced bachelor's programme (*bachelor-na-bachelor)* (ISCED level 6) and an advanced master's programme (*master-na-master*) (ISCED level 7) for students who already hold a bachelor's or master's qualification; however, they are included in the first cycle and second cycle respectively (each advanced programmes is at least 60 ECTS).

The Bologna three-cycle structure originally did not include short-cycle tertiary education programmes (ISCED 5 level) in the QF-EHEA. However, at the Ministerial Conference