



Resourcing higher education in Denmark – Thematic policy brief



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About this thematic policy brief

Denmark has a well-developed and differentiated network of public higher education institutions, encompassing universities, university colleges, business academies and specialist institutions. With 47.1% of young adults aged 25-34 holding a higher education qualification in 2019, the country also has a tertiary attainment rate above the OECD average of 44.9% (OECD, 2020^[1]). The national policy framework in Denmark emphasises the role of higher education as a public good (Danish Government, 2017^[2]), with institutions receiving the vast majority of their funding from public sources and students supported through a comprehensive system of public grants and loans.

In 2017, Denmark embarked on an ambitious reform of its system for funding higher education institutions. This aimed to improve teaching quality, graduates' transition to the labour market and institutional leadership and profiling (Danish Government, 2017^[2]). Implemented in 2019, the new system introduced a larger fixed funding component, reduced the proportion of institutional funding allocated on the basis of credits passed by students and increased the share of funds linked to other aspects of performance. All three elements of the new funding system (see Box 1) are scheduled to be reviewed in 2023 (Danish Government, 2017^[2]).

Against this backdrop, the Danish Ministry of Higher Education and Science asked the OECD Resourcing Higher Education Project to provide a Thematic Policy Brief to compare the new Danish system with systems in peer OECD jurisdictions and to identify policy issues that may warrant further attention as part of the future review.

Detailed questions were agreed with the Ministry of Higher Education and Science at the outset of the work (see Annex A). Following a brief overview of higher education resourcing in Denmark, the analysis in this brief is structured into three substantive sections:

- First, a review of the level of spending on higher education institutions in Denmark and other OECD jurisdictions and the processes public authorities use to establish the budget envelope for institutional funding. This section also includes an analysis of the variation in expenditure between higher education institutions and the extent to which expenditure and costs can be disaggregated by subject area.
- Second, an overview of the ways in which OECD jurisdictions design models for allocating public funding to higher education institutions to reward institutional performance and promote specific policy objectives, such as social inclusion and the regional distribution of higher education provision.
- Finally, a comparative examination of the level of autonomy institutions have over the use of resources and, in particular, rules governing their ability to reallocate public resources internally and decide on the programmes and number of study places they offer.

The Thematic Policy Brief draws on international literature and data, policy documents and the results of the 2020 Higher Education Policy Survey (HEPS) among 29 OECD jurisdictions (Golden, Troy and Weko, 2021^[3]) to assess how Denmark's higher education resourcing model compares to that of its peers. For each main topic, the brief draws key conclusions that may help inform future policy in Denmark, as the country seeks to refine its approach to funding higher education institutions.

The brief was prepared in the OECD Secretariat by Luka Boeskens and Simon Roy. Particular thanks go to Ken Thomassen, David Vestergaard Eriksen and Lars Lebek Jensen from Denmark's Ministry of Higher Education and Science for their input to the brief and feedback on draft versions of the text.

1. Resourcing higher education in Denmark

1.1 The Danish higher education system

Denmark has a diverse network of public higher education institutions (HEIs), supervised by the Ministry of Higher Education and Science. In 2019, there were 35 HEIs in mainland Denmark, including eight universities, seven university colleges, eight business academies, three cultural education institutions and five maritime engineering colleges, as well as two universities in the overseas territories of Greenland and the Faroe Islands (see Table 1). Universities deliver academic bachelor's programmes (International Standard Classification of Education (ISCED) level 6), master's programmes (level 7) and doctoral training (level 8), university colleges deliver professional bachelor's programmes (also at ISCED level 6) and certain short-cycle Academy Profession (AP) programmes (ISCED level 5), while business academies offer AP programmes and some professional bachelor's programmes.

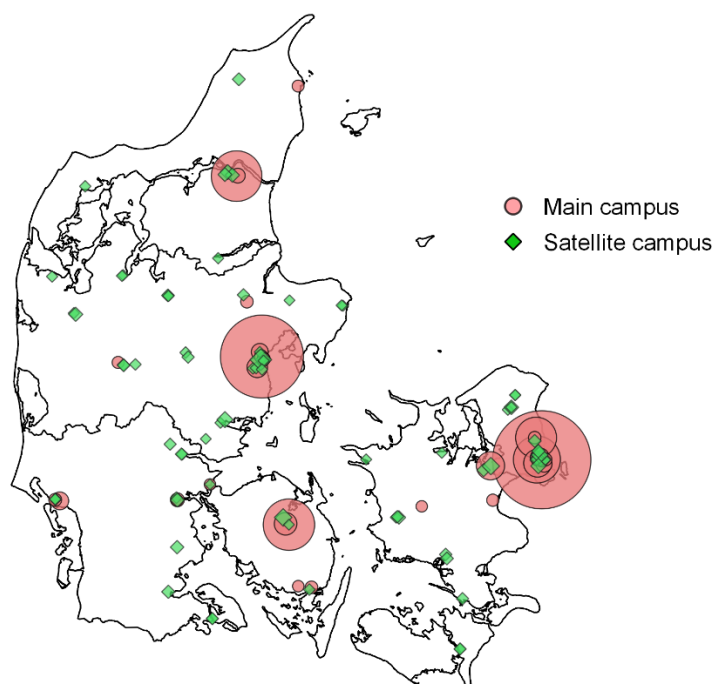
Table 1. Higher education institutions in Denmark (location of main campus)

Region (NUTS 2)	Universities	University colleges	Business academies	Other
Hovedstaden / Capital Region of Denmark (DK01)	University of Copenhagen IT University of Copenhagen Copenhagen Business School Technical University of Denmark	University College Copenhagen	Copenhagen Business Academy KEA - Copenhagen School of Design and Technology	The Royal Danish Academy of Fine Arts, Schools of Architecture, Design and Conservation Copenhagen School of Marine Engineering and Technology Management
Sjælland / Zealand (DK02)	Roskilde University	University College Absalon	Zealand Institute of Business and Technology	
Syddanmark / Southern Denmark (DK03)	University of Southern Denmark	University College Lillebaelt University College South Denmark	EA Business Academy SouthWest IBA (International Business Academy)	Design School Kolding SIMAC - Svendborg International Maritime Academy Fredericia Maskinmesterskole The Independent Academy for Free School Teaching, Ollerup
Midtjylland / Central Denmark (DK04)	Aarhus University	Danish School of Media and Journalism VIA University College	Business Academy Aarhus Business Academy of higher education MidWest Dania Academy	Aarhus School of Architecture Aarhus School of Marine and Technical Engineering
Nordjylland / North Denmark (DK05)	Aalborg University	University College of Northern Denmark		MARTEC - Maritime and Polytechnic College
Overseas territories	University of the Faroe Islands University of Greenland			

Note: The list excludes some institutions with fewer than 30 full-time equivalent (FTE) academic staff and 200 students and institutions not overseen by the Ministry of Higher Education and Science. The list was initially based on 2016 data from the European Tertiary Education Register (ETER), subsequently updated by the Danish Ministry of Higher Education and Science.

The capital region is home to the largest number of HEIs and there is a concentration of students in the country's four largest cities, Copenhagen, Aarhus, Odense and Aalborg. A well-developed network of satellite campuses further extends the geographic distribution of higher education (see Figure 1), which is an important policy priority for the Danish higher education system (see below).

Figure 1. Location of Danish higher education institutions and satellite campuses



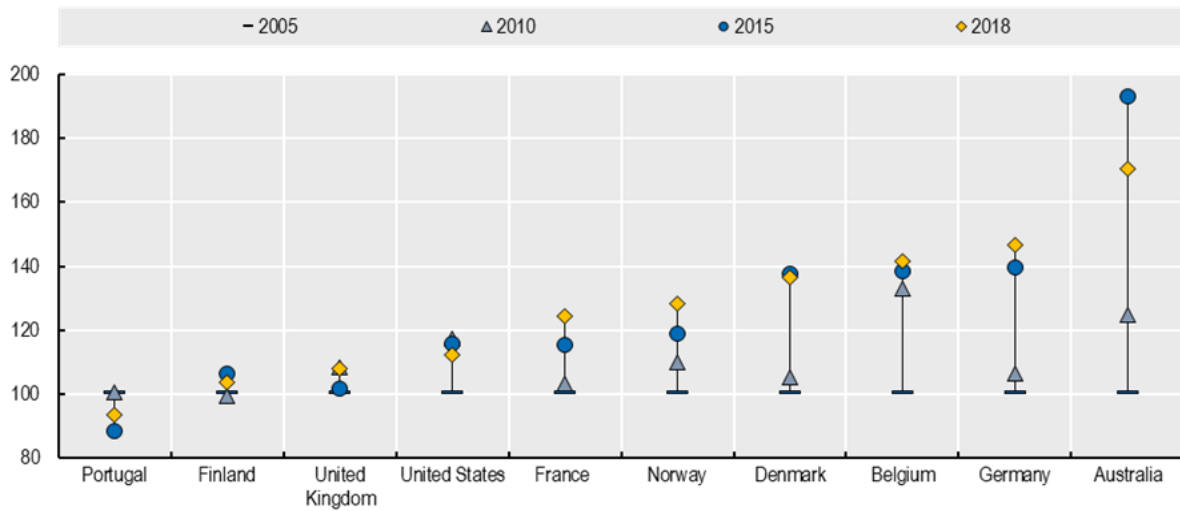
Note: The circles indicate the location of HEIs' main campuses and diamonds indicate the location of satellite campuses in 2020. The marker sizes of main campuses indicate the level of student enrolment.

Source: Ministry of Higher Education and Science for HEI locations and enrolment; OECD model map for administrative boundaries.

Just over half (53%) of young adults in Denmark are expected to enter tertiary education for the first time by the age of 25, compared to the OECD average of 49% (OECD, 2020_[1]). Enrolment in higher education has increased rapidly over recent years, reaching almost 311 000 individual students (full and part-time) in 2018 (OECD, 2020_[1]). A period of steady enrolment growth in the early 2000s was followed by a rapid increase (of over 30%) in the total number of students in higher education between 2010 and 2015, in the wake of reforms to the institutional landscape (see Figure 1). The timing and scale of enrolment growth in Denmark largely mirrors that seen in neighbouring Germany in the period since 2005, although overall entry rates to higher education in Denmark are higher than those in Germany. Almost 70 000 students were offered a higher education place in 2020, surpassing the previous record of 67 000 in 2016. However, the number of places offered fell back to 67 500 in 2021 and, more generally, the pace of enrolment growth in higher education has slowed in recent years and is expected to be modest over the next decade (Ministry of Higher Education and Science, 2018, p. 70_[4]). In 2018, 11% of tertiary students were enrolled in short-cycle programmes (ISCED 5), 63% in programmes at the bachelor's level (ISCED 6), 23% in programmes at the master's level (ISCED 7), and 3% at the doctoral level (ISCED 8) – a distribution in line with the OECD average (OECD, 2020_[1]).

Figure 2. Trends in enrolment in tertiary education (2005-2018)

Change in the headcount of full and part-time students (ISCED 5-8) in public and private institutions, 2005=100

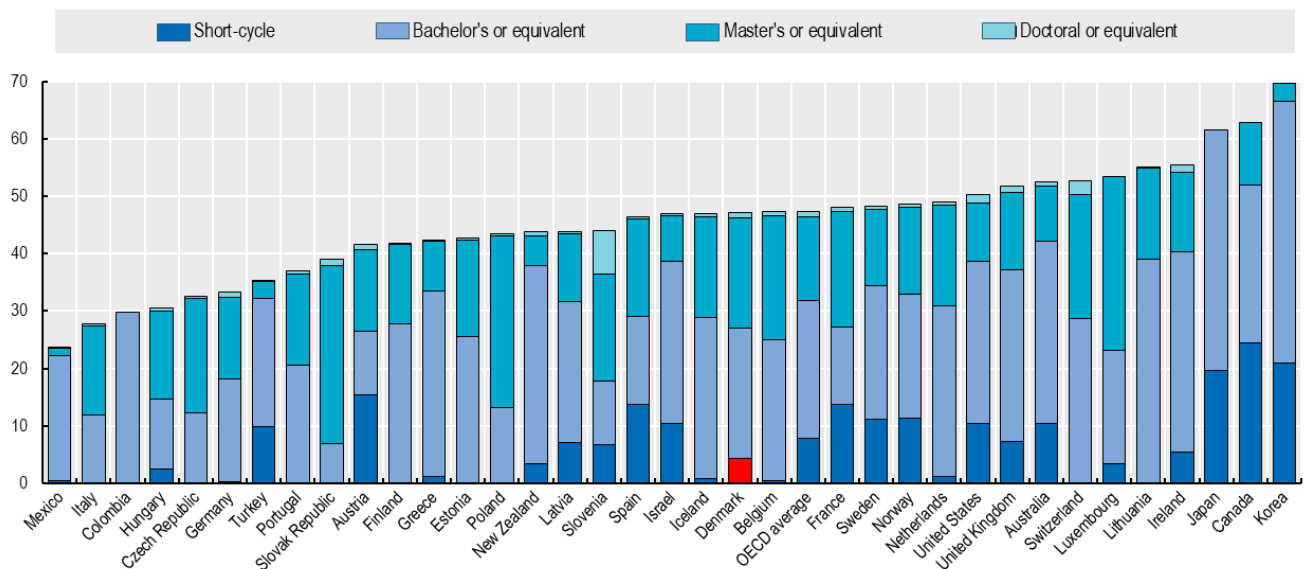


Note: Selected OECD jurisdictions with comparable data on enrolment by age.

Source: Education at a Glance database, https://www.oecd-ilibrary.org/education/data/education-at-a-glance_eag-data-en (accessed on 2 June 2021).

A relatively large proportion of students in Denmark progress beyond the bachelor’s level, with 20.1% of 25-34-year-olds holding a qualification at the master’s level or above in 2019 – significantly above the OECD average of 15.6% (see Figure 3). Recent employment rates among young graduates (at 84% among 25-34 year-olds in 2019) are broadly in line with the average across EU and OECD economies (OECD, 2020, p. 82₍₁₎).

Figure 3. Tertiary-educated population by highest level of attainment at age 25-34 (2019)



Note: Countries are ranked in ascending order of the total share of the population aged 25-34 having completed tertiary education

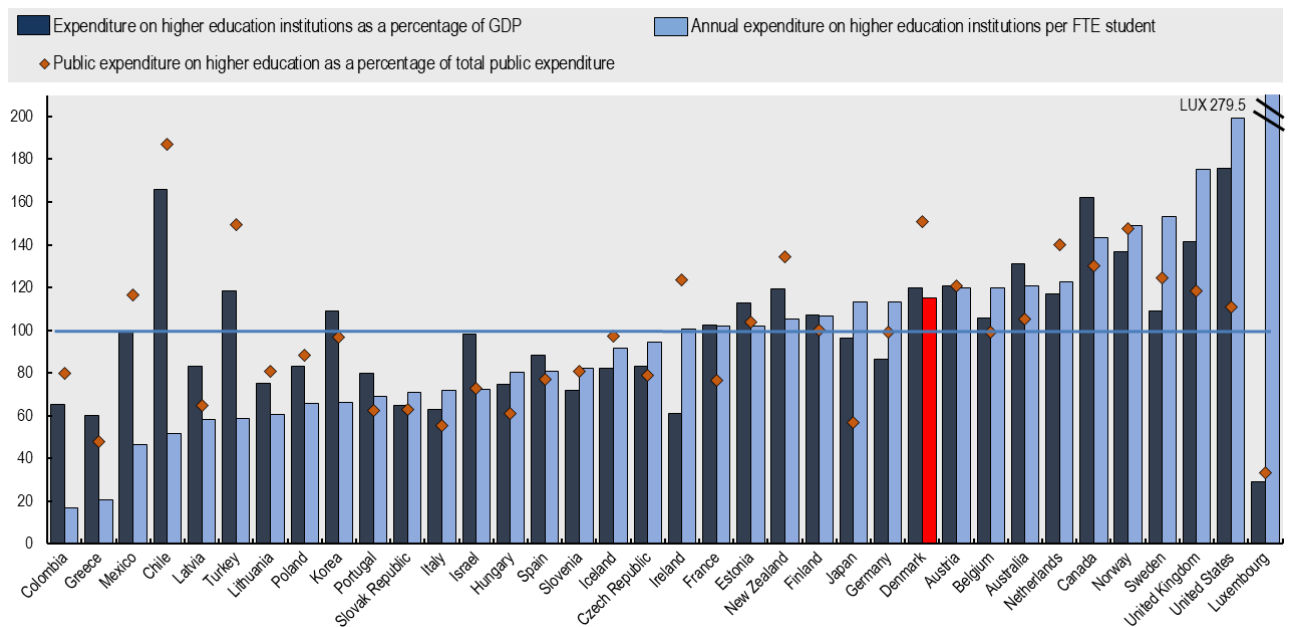
Source: OECD Education at a Glance database, https://www.oecd-ilibrary.org/education/data/education-at-a-glance_eag-data-en (accessed on 2 June 2021).

1.2 Overall expenditure on higher education in Denmark

Higher education institutions in Denmark receive the vast majority of their income from public sources. As illustrated in Figure 4, total expenditure (from all sources) per full-time equivalent (FTE) student on higher education institutions in Denmark for education, research and development, and ancillary services was around 15% above the OECD average in 2018, at USD 19 684 per student after adjusting for Purchasing Power Parity (PPP). This was around the same level as Germany, Japan, Austria and Belgium, although significantly lower than average spending per FTE student in systems such as Canada (24% higher than Denmark), Norway and Sweden (around 30% higher), the United Kingdom (52% higher) and the United States (73% higher).

Figure 4. Expenditure on higher education institutions (2018)

Selected measures of expenditure on higher education institutions (ISCED 5-8), OECD average = 100



Note: Expenditure on higher education includes spending from public and private sources on education, research and development, and ancillary services for students. The OECD average expenditure on HEIs as a percentage of Gross Domestic Product (GDP) in 2018 was 1.4%, average annual expenditure per student was USD 17 065, and average public expenditure on higher education as a percentage of total public expenditure was 2.9%.

Korea: Data exclude expenditure on some educational programmes provided by ministries other than the Ministry of Education (e.g. military academies); Norway: Educational expenditures are reported as percentage of mainland GDP (excluding offshore oil and international shipping); United States: Data include some post-secondary, non-tertiary education that occurs within HEIs. Comparable data for Costa Rica and Switzerland are not available and thus not included.

Source: OECD (2021^[5]) Education at a Glance 2021: OECD Indicators, Tables C2.2, C4.1 and C1.2, <https://doi.org/10.1787/b35a14e5-en>.

Denmark’s public spending on higher education consumed one of the highest proportions of total public spending of all OECD economies at 4.35%, compared to only 2.9% on average in OECD member countries. This is a level surpassed only by that in Chile (5.4%) and significantly above those in Sweden (3.6%), the United Kingdom (3.4%), Finland or Germany (both 2.9%). Spending as a proportion of Gross Domestic Product (GDP) in Denmark, at 1.7%, was closer to the OECD average of 1.43%, but below Australia, Norway, the United Kingdom, Canada, Chile and the United States (see Figure 4).

1.3 Denmark’s system for funding higher education institutions

The new system for allocating public funding for instruction and operations to higher education institutions, adopted by Parliament in 2017 (Danish Government, 2017^[2]), came into force on 1 January 2019. The reform aimed to increase the focus on teaching quality and preparing students for the labour market, while supporting strengthened institutional leadership and institutional profiling. The new model comprises three main funding components (grant types), which are intended to cover the cost of staff, infrastructure and day-to-day operating expenses in all types of public higher education institution. These core grants are complemented by separate funding allocations for basic and applied research to universities and considerably smaller grants for practice-oriented research to university colleges and business academies. The largest share of core funding is allocated through an “activity grant” allocated based on the number of full-time equivalent years of study successfully completed by students. This is complemented by a “basic grant”, which combines historical funding with a smaller performance-related component and a “results grant”, which adds additional funding based on fixed performance indicators (see Box 1).

Box 1. The components of Denmark’s core funding model for higher education institutions

The three components of the core funding model for instruction in HEIs in Denmark are:

1. The basic grant (*Grundtilskud*) is a fixed amount, established for a period of four years (initially 2019 to 2023), equal to around 25% of the educational subsidy received by each institution in 2017. The basic grant provides a historical funding component that provides HEIs a degree of stability in their income. After a four-year period, the continued payment of 5% of the value of the basic grant (1.25% of total core funding) is dependent on institutions’ meeting targets established in four-year strategic framework contracts (*Strategiske rammekontrakter*), agreed between each HEI and the government’s Agency for Higher Education and Science. The continued payment of another 5% of the basic grant value depends on institutions’ meeting fixed quality criteria assessed through a survey of students – the Learning Barometer (*Læringsbarometer*). The main basic grant is complemented by more limited additional funding for “decentralised educational provision” by institutions that – in addition to their main campus – provide education on campuses outside Denmark’s four main university cities, as well as funds for international exchange students taking credits at the institution for at least three months (Ministry of Finance, 2020^[6]). If HEIs experience a significant change in FTE student numbers (+/- 15%), the level of the basic grant can be amended by the government.
2. The activity grant (*Aktivitetstilskud*) is used to distribute the largest share of HEIs’ funding. The grant was modelled on the pre-existing “taximeter” system and is awarded annually based on the number of credits passed by students (expressed in units of 60 credits, equivalent to a full year’s study), with varying payments rates for different fields of study (see below). Although the reform reduced the relative value of the activity grant to give greater weight to historical and performance-based funding, it still accounts for about 67.5% of public education subsidies to higher education institutions.
3. The results grant (*Resultatstilskud*), which is worth 7.5% of total funding for education, is calculated annually and awarded based on institutions’ performance in relation to two performance indicators. These are: a) the average study duration for bachelor’s and master’s students compared to a standardised, expected study duration and b) the average employment rate of graduates from the institution (measured between 12 and 23 months after graduation) in relation to the average employment rates in the working-age population.

The design of the performance components in the Danish funding model means that a proportion of the total funding initially budgeted for these components may not be paid because institutions do not achieve

their targets. Institutions might fail to meet goals in their strategic framework contracts, they might achieve a lower-than-targeted quality assessment from students in the Learning Barometer or they might miss targets in relation to average study duration or graduate employment that influence payment of the results grant. Funds that are budgeted but not disbursed for these performance-related reasons are reallocated to a “quality pool” (*kvalitetspulje*), with separate funding pots for universities and for non-university institutions. Between 2019 and 2021, for example, only 87% of the funds set aside for the results grant (6.5% of total funding out of a possible 7.5%) was paid to institutions based on their performance in relation to the study duration and graduate employment indicators. The remaining 13% of funds initially budgeted for the results grant, as well as money not disbursed through the performance-linked components of the basic grant have fed into the quality pool.

In 2021, the quality pool provided a total of DKK 83 million to universities – equivalent to 1% of total grant funding for education to the sector – and DKK 42 million to non-university institutions – or around 0.7% of total grant funding for education for these institutions (Danish Government, 2020, p. 60^[71]). Resources from the quality fund are earmarked to support specific government priorities, such as the deployment of technology in education programmes, and are awarded to institutions based on their share of total credits passed in the system. Actions at institutional level using the funds are agreed jointly between the institutions and the Ministry of Higher Education and Science (Danish Government, 2017^[2]).

To provide higher education institutions with time to adapt to the new grant system, transition measures were put in place for the first years of implementation to compensate institutions that experienced a reduction of their funding as a result of the new allocation methods (Danish Government, 2017^[2]). Institutions that – due to the change in the funding system – experienced a reduction in grants between one and two per cent have been compensated for any reduction exceeding one per cent in 2019, 2020 and 2021. Institutions experiencing a reduction of more than two per cent will be compensated for any reduction exceeding two per cent for the duration of this first phase of the new funding system. The Danish School of Media and Journalism, the Independent Academy for Free School Teaching in Ollerup and the maritime educational institutions have been fully compensated for any reduction in funding they experienced (Danish Government, 2020^[71]).

2. The budget envelope for HEIs and key design features of the funding system

This section of the brief takes a closer look at the amount of money that goes to higher education institutions in Denmark, how this varies across institutions and fields of study and how these patterns compare to those observed in other OECD jurisdictions. It then focuses on the processes by which different OECD jurisdictions establish their global budget envelopes for higher education, including whether systems take into account information on costs in setting funding levels. The section examines, in turn:

- Danish higher education institutions’ sources of funding and the level of expenditure per student in international comparison.
- Spending patterns across sub-sectors (universities and universities of applied sciences) in Denmark’s higher education system and those of other OECD jurisdictions.
- The extent to which public authorities in the OECD have been able to disaggregate institutions’ expenditure data by field of study and the information that is required to do so.
- The process by which OECD jurisdictions set the overall resource envelope for the core public funding of higher education institutions and the methods they use to allocate this funding to individual institutions.
- The extent to which OECD jurisdictions make use of unit costs or cost models to inform the allocation of funding and how Denmark’s approach compares to these practices.

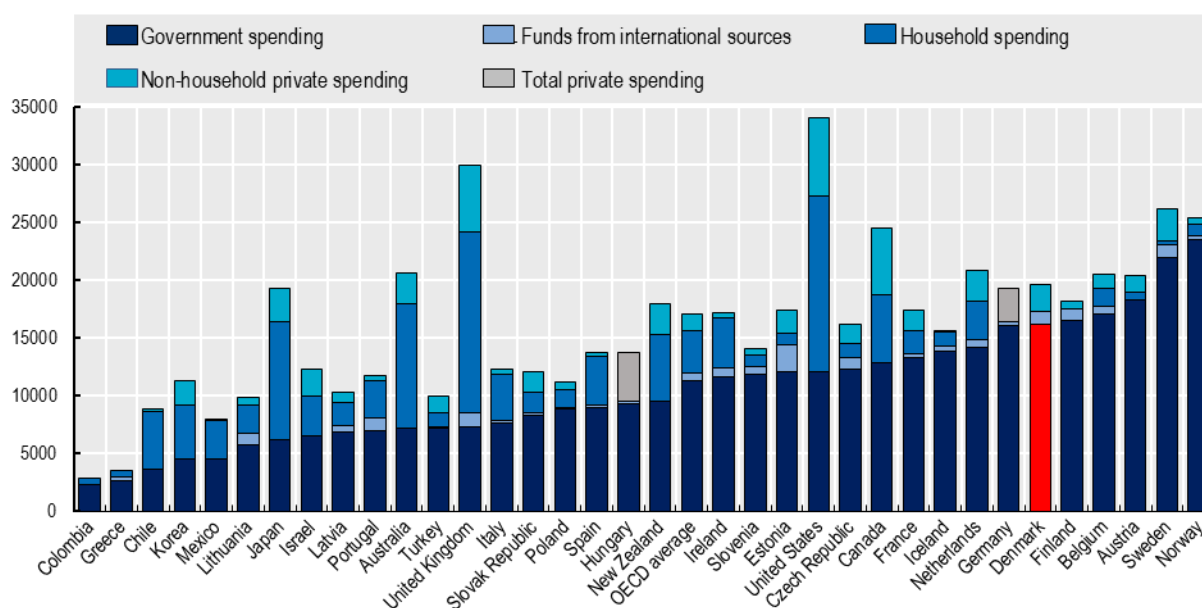
2.1 Spending on higher education institutions: how Denmark compares

Denmark spends slightly more than the OECD average on higher education institutions for each student enrolled, with nearly all spending from public sources

As illustrated in Figure 4 in the previous section, Denmark's overall per-student expenditure on higher education institutions, adjusted for Purchasing Power Parity, was 15% above the OECD average in 2018. Figure 5 presents the per-student expenditure data for OECD jurisdictions disaggregated by the source of the funds. This shows that government spending accounted for 82% of total expenditure on higher education institutions in Denmark in 2018. Public spending thus accounted for a similar proportion of total spending on higher education institutions in Denmark as in Germany, Belgium and Sweden, but a lower proportion than in Luxembourg, Finland and Norway, where public spending accounted for over 90% of total spending on institutions. On average in OECD jurisdictions, 66% of total spending on higher education institutions came from public sources in 2018. In absolute terms, Denmark spent the equivalent of USD 16 136 (PPP) of public funds per FTE student in 2018, well above the OECD average of USD 11 290, but below Finland, Belgium and Austria (where public spending per student was, respectively, 2%, 6% and 13% higher than in Denmark in 2018), Sweden and Norway (respectively 36% and 46% higher) and outlier Luxembourg (266% higher).

Figure 5. Public and private expenditure on higher education institutions (2018)

Expenditure per FTE student on public and private institutions, in equivalent USD converted using PPPs



Note: Countries are ranked in ascending order of the public expenditure on public and private tertiary institutions per full-time equivalent student. Data for Luxembourg are excluded to improve the readability of the chart. Luxembourg spent an average of over USD 47 694 per FTE student on higher education institutions in 2018.

Source: OECD (2021^[5]) *Education at a Glance 2021: OECD Indicators* <https://doi.org/10.1787/b35a14e5-en>.

Household expenditure on higher education institutions in Denmark is low compared to other OECD jurisdictions, reflecting the absence of tuition and other student fees. In 2018, household expenditure per FTE student in Denmark was estimated to be only USD 18 (PPP) – the second lowest level in the OECD, after Norway. In contrast, private spending from non-household sources, generated by activities such as

privately funded research or consultancy work, accounted for over 12% of total spending on higher education institutions in Denmark in 2018 (USD 2 361 (PPP)). This indicates that non-household private revenue is higher in Danish higher education institutions than in institutions in fellow Nordic states Finland and Norway, but lower, in absolute terms, than in Sweden and the Netherlands (where non-household private spending per student in 2018 was around USD 2 730 (PPP) per FTE student), Japan (USD 2930) and Canada, the United Kingdom and the United States (where non-household private spending exceeded USD 5 500 (PPP) per FTE student).

The private higher education sector is marginal in Denmark. In 2016, the only private institution with at least 30 full-time equivalent (FTE) academic staff and 200 students, recorded in the European Register of Tertiary Education, was the Independent Academy for Free School Teaching in the small central Danish town of Vester Skerninge, which received the majority of its funding from public sources (Lepori et al., 2019^[8]). In practice in OECD countries, the formal status of higher education institutions as “public” or “private” institutions says little about the origin of their funding. Universities of applied science in Finland and Austria and some universities and university colleges in the Flemish Community of Belgium are formally private, but receive the majority of their funds from public sources.

Even for some OECD jurisdictions where a high proportion of institutional funding comes from household sources (predominantly tuition fees), international data on public and private higher education expenditure must be interpreted with care. For example, while a high proportion of household spending on higher education institutions in the United Kingdom (particularly England) and Australia nominally comes from households, it is backed by public loan systems. High rates of non-repayment of loans, particularly in England, mean that a proportion of spending recorded as private in the short term will become delayed public spending in the longer term (Bolton, 2020^[9]).

Denmark allocates a relatively low proportion of expenditure on HEIs to teaching, although international data must be interpreted with caution

A range of factors can explain cross-country differences in per-student expenditure. The cost of instruction, for example, is influenced by student-to-staff ratios as well as the salaries, employment status and teaching load of staff. Expenditure levels also reflect the amount of research conducted by higher education institutions, as well as structural factors, such as the regional distribution of institutions and their ability to exploit economies of scale (Hemelt et al., 2021^[10]; Deloitte Access Economics, 2016^[11]). The UNESCO-OECD-Eurostat (UOE) joint data collection distinguishes between expenditure on three types of services (activities) in higher education institutions, which provides some insight into factors that may drive cross-country differences in higher education expenditure (OECD, 2020, p. 277^[1]):

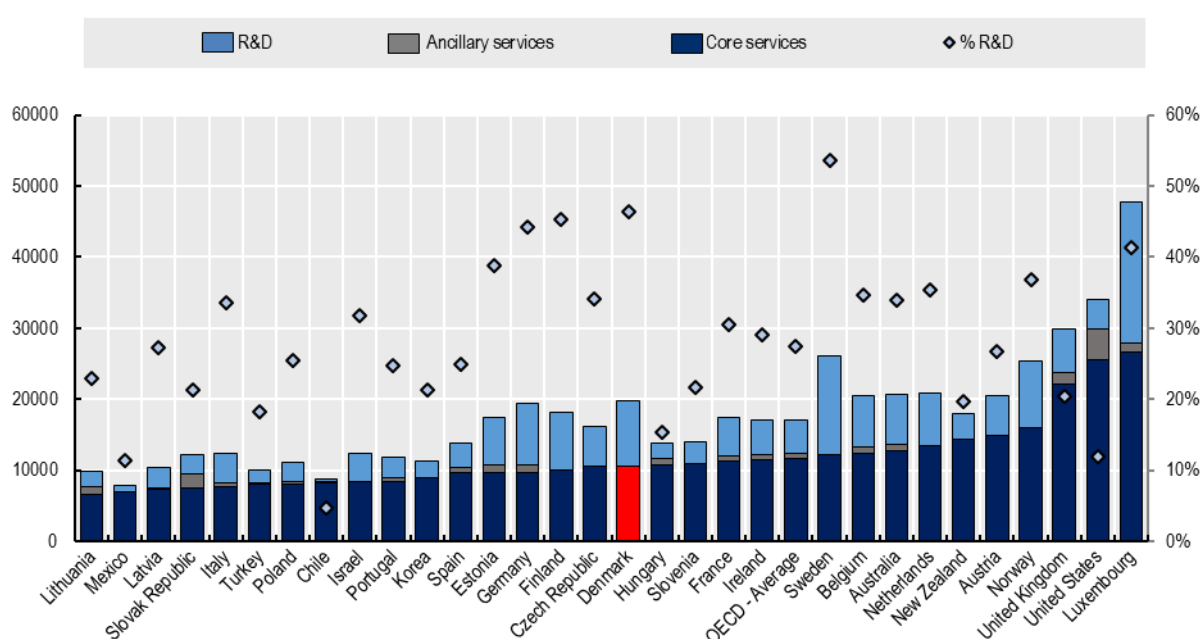
- **Core educational services**, which include all expenditure that is directly related to instruction in educational institutions, including the salaries of teaching staff, construction and maintenance of buildings, teaching materials, books and administration.
- **Research and development**, which includes research performed at universities and other tertiary educational institutions, regardless of whether the research is financed from general operational funds or through separate grants or contracts from public or private sponsors. Methods for allocating costs to research activities, particularly when staff also undertake teaching and other duties and infrastructure is shared, vary between OECD higher education systems.
- **Ancillary services**, which includes all services provided by HEIs that are peripheral to their main education and research mission, such as student welfare, residence halls (dormitories), dining halls and health care.

The methodologies used in practice to assign expenditure to these different categories are not uniform across OECD countries, which means international comparisons should be treated with some caution. Nevertheless, as shown in Figure 6, available data indicate that Denmark is, after Sweden, the OECD

country where the highest proportion of expenditure on higher education institutions is allocated to research and development. Spending on research accounts for 46% of all spending on higher education institutions, compared to just 27% on average across OECD member countries. This reflects the significant emphasis that Denmark places on investment in R&D in general. Measured as a proportion of GDP, Denmark's gross domestic expenditure on R&D – at 3.1% – is significantly above the OECD average of 1.7%. Only Israel, Korea, Switzerland, Sweden, Japan and Austria have higher rates of total R&D spending. Around one-third (32%) of Denmark's R&D investment goes to higher education institutions, rather than to other public institutions or industry, compared to the OECD average of 27% (OECD, 2020, pp. 39, Figure 2.8_[12]).

Figure 6. Total expenditure on tertiary institutions per FTE student, by type of service (2018)

In equivalent USD converted using PPPs



Note: Expenditure includes spending from public and private sources. Countries are ranked in ascending order of the expenditure on core services per FTE student. The diamonds indicate the proportion of overall spending dedicated to research and development. Korea, Mexico, New Zealand, Slovenia: no disaggregated data are provided on ancillary services – any such expenditure is included in "core services". Source: OECD (2021_[5]) Education at a Glance 2021: OECD Indicators, <https://doi.org/10.1787/b35a14e5-en>.

The corollary to the strong emphasis on R&D is that a relatively low proportion of overall resources in higher education institutions in Denmark is dedicated to other types of services. In 2018, spending on core educational services related to teaching and learning in higher education institutions accounted for 54% of overall expenditure (compared to the OECD average of 68%) and little was spent on ancillary services for students (0.02%, compared to the OECD average of 4.5%). In absolute terms, spending on core services in Denmark amounted to around USD 10 536 (PPP), compared to USD 11 628 (PPP) on average in OECD countries.

It is frequently challenging to distinguish accurately between spending on research and spending on other activities and differences in methodologies can affect international comparisons such as this (OECD, 2019_[13]). Many staff employed in research-intensive institutions engage in both teaching and research activities and may serve both education and research functions, through activities such as supervising

doctoral students or reading publications. The OECD's Frascati Manual Guidelines for Collecting and Reporting Data on Research and Experimental Development (OECD, 2015^[14]) acknowledges differences in national practices and recommends heuristics to guide the classification of R&D and education expenditure:

- Personnel expenditure should be categorised based on the proportion of time staff spend on education and research based on time use surveys or other administrative data sources;
- Other current expenditure and capital resources should be categorised based on their “intended use” whenever possible (or based on the same coefficients used for splitting staff time when the “intended use” criterion is not applicable or feasible).

In many systems, the lack of a common accounting standard makes it difficult to map and compare different types of expenditure in higher education, even within countries. In Denmark, as in a limited number of other OECD jurisdictions, a standardised activity-based costing system is being introduced to gain a more accurate picture of activities, costs and expenditure in the higher education sector.

Denmark is introducing a new standardised cost accounting system for HEIs

Following the recommendations of a Joint Chart of Accounts Committee in 2018, the Danish Ministry of Higher Education and Science (Ministry of Higher Education and Science, 2018^[15]) developed a new standardised cost accounting system, which all higher education institutions are expected to implement between 2019 and the end of 2021 (Ministry of Higher Education and Science, 2020^[16]). Previously, a standardised cost accounting model was only in place for non-university institutions. The goal is for the common accounting system to be used across the Danish higher education sector by 2022 to provide greater transparency on the costs incurred by different institutions and to offer opportunities for comparisons and peer learning across institutions.

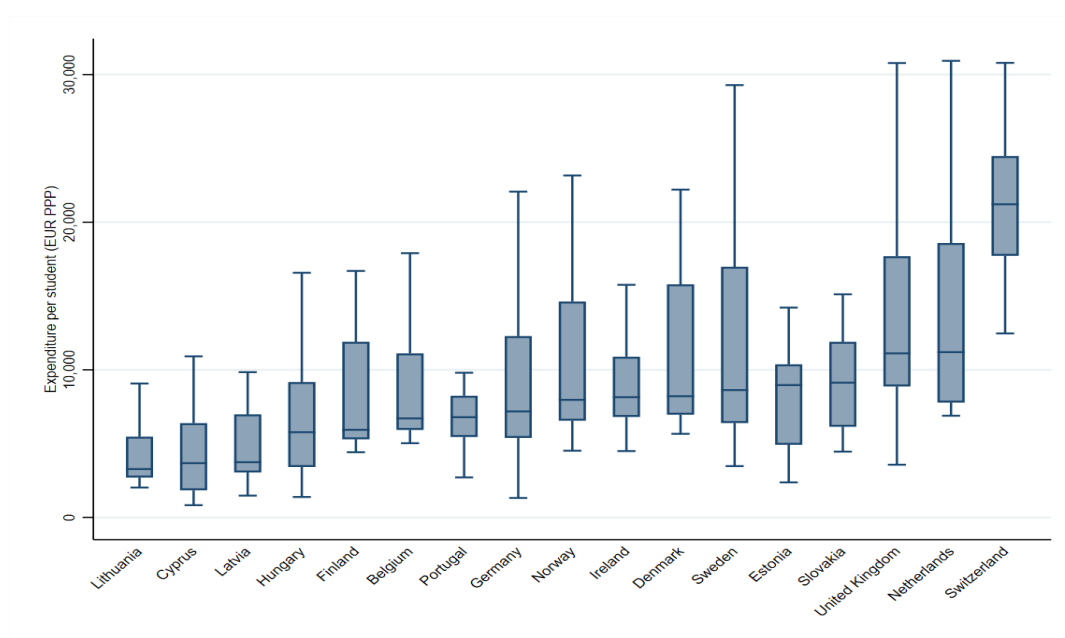
In a first step, the new Common Chart of Accounts (*fælles kontoplan*) requires institutions to report their expenditure in broad accounting categories (e.g. core activities, income-generating activities, grant-funded research activities, other grant-funded activities), which institutions may further subdivide. Expenditure in all categories is assigned to seven activity types, where applicable: (1) Education; (2) Research and development; (3) Dissemination and knowledge exchange; (4) Government services, advice and other services; (5) Dormitories; (6) General common costs; and (7) Buildings and building operations. The Ministry also provides guidance on how to deal with expenditure serving multiple purposes. Institutions are then required to further disaggregate their expenditure by fields of study as specified in the Common Chart of Accounts (Ministry of Higher Education and Science, 2020^[16]).

Over the last decade, an increasing number of OECD higher education systems have adopted system-wide protocols for activity-based costing (ABC). Such protocols make it possible to identify the direct costs of different types of activity in operational units – such as departments, faculties or research centres – and to attribute indirect (overhead) costs to these activities with some degree of accuracy. In European OECD jurisdictions, the adoption and development of ABC accounting systems has largely been driven by the financial reporting requirements of competitive research funding programmes that require beneficiaries to maintain detailed cost records. The United Kingdom was the first European country to introduce a system-wide cost accounting model for universities in 1999. Other countries that followed suit include Sweden (2009), as well as the university sectors in Finland (2009) and Norway (2015).

Per-student expenditure varies significantly between HEIs in Denmark, as in other OECD countries

As in other OECD countries, income and expenditure per student varies between institutions in Denmark. Drawing on institution-level data from the European Tertiary Education Register (ETER)¹, Figure 7 shows the median and variation in institutions' current expenditure per student enrolled at ISCED levels 5-8. This includes expenditure on personnel (salaries and social expenses, such as payroll tax, insurance, pensions etc.) and other recurring expenditures on goods and services (such as electricity, rent, small equipment, repairs and maintenance of infrastructure etc.), but excludes capital expenditure (e.g. on the construction or renovation of buildings and major expenditures on equipment) (Lepori et al., 2019^[8]). In Denmark, half of the institutions with available data in 2019 fell between a current expenditure of EUR 7 000 and 15 800 (adjusted for Purchasing Power Parity) per student (the values denoted by the lower and upper bounds of the box in Figure 7). This level of variation is one of the highest among OECD jurisdictions, with only Sweden and the Netherlands showing a greater dispersion in per-student expenditure.

Figure 7. Variation in expenditure per student in higher education institutions



Note: Total current expenditure per ISCED 5-8 student (FTE) in 2016. The adjustment for Purchasing Power Parity has been made by the dataset managers. Data for Denmark are from 2019 and data from Hungary are from 2014. The boundaries of the boxes represent values at the 25th and 75th percentiles of the distribution. Countries are sorted in ascending order of their median expenditure per student. The upper and lower whiskers show the largest/smallest observations that lie within 1.5 times the interquartile range from the third and first quartile respectively. Institutions outside of this range (outliers) are not shown. The average per-student expenditure shown in this graph is calculated based on institution-level data and may be slightly lower than the country-level per-student expenditure since students may be enrolled in more than one institution.

Source: Adapted from data from the European Tertiary Education Register (ETER) and the Danish Ministry of Higher Education and Science.

¹ The most recent expenditure data collected by ETER dates from 2016, although the most recent expenditure data for Denmark in ETER dates from 2013. The Danish Ministry of Higher Education and Science supplied equivalent data for 2019, allowing a comparison with more recent data. Twelve of the 37 countries covered by ETER did not provide any financial data. Others reported data only for some types of institutions. These countries were excluded from the analysis in this brief. For the countries included in the analysis, data on expenditure per student was available for 989 of 1 292 HEIs.

Variations in per-student expenditure across institutions can be explained by different factors, including the extent of research activities, institutional size and the type of facilities supported (e.g. hospitals or labs), fields of study offered, as well as strategic choices, such as whether institutions invest to achieve prestige or higher quality of education (Marconi and Ritzen, 2015^[17]). Depending on the funding system, some institutions may also be able to raise their expenditure by drawing revenue from additional sources, such as student fees. The variation in institutional expenditure thus need not indicate an over- or under-funding of particular institutions but primarily illustrates the diversity of missions within higher education systems. The Danish institutions with the highest expenditure per student include large, research-intensive universities in Copenhagen, Aarhus and Aalborg, as well as arts schools in Kolding and the capital. For the most part, the business academies occupy the lower end of the distribution.

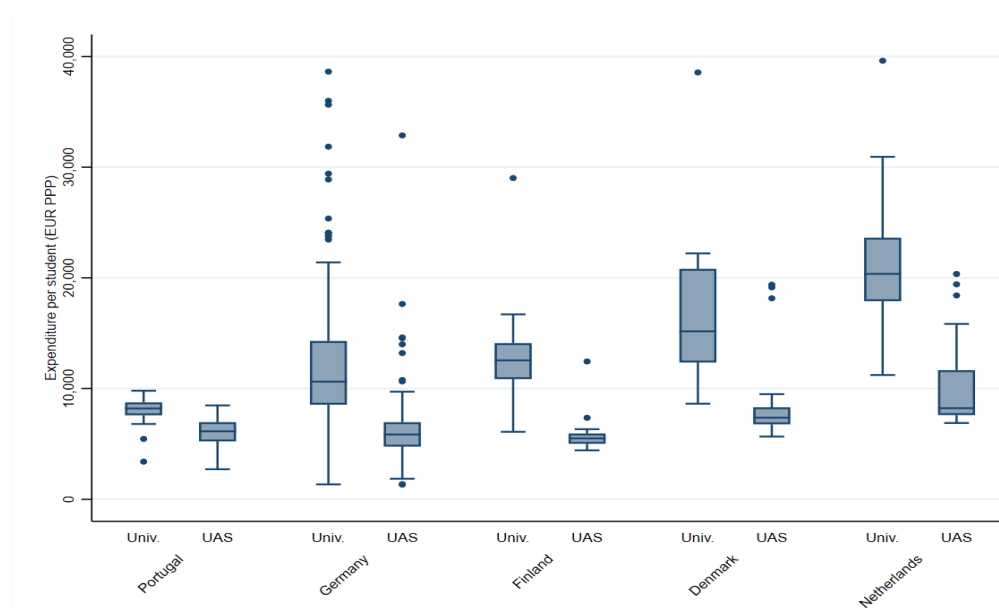
Variation in research intensity explains most expenditure differences between institutional sub-sectors

Higher education institutions vary in their activity profiles and the resources they require to fulfil their missions. Compared to universities, professional HEIs tend to offer programmes that are more occupationally specific and have a stronger work-based education component. Organising work-based learning and developing strong links with employers and the regional economy is resource-intensive. Nevertheless, as universities tend to spend considerably more on research and development activities than professional HEIs, their per-student expenditure is usually higher (OECD, 2019^[13]).

This pattern is illustrated in Figure 8, also based on ETER data, which shows that current expenditure per student is typically higher in universities than it is in Universities of Applied Sciences (UAS). In Denmark, UAS include a diverse set of institutions comprising university colleges, cultural and business academies. In 2019, the median total expenditure per student in the Danish universities was about twice as high as in UAS (EUR 15 200 PPP compared to EUR 7 400 PPP). A similar pattern could be observed in most European countries with available data, although there are some differences in the institutions that countries classify as UAS (Lepori et al., 2019^[8]).

There is some overlap between the ranges of expenditure among institutions of different types. In all systems shown in Figure 8, some UAS had higher expenditure per student than some universities. In Denmark, for example, per-student expenditure in university colleges and business academies ranged from EUR 5 700 PPP to EUR 9 500 PPP and was consistently lower than that of all but one university (the Copenhagen Business School). However, per-student expenditure in the cultural education institutions (the Aarhus School of Architecture, the Design School Kolding and the Royal Danish Academy of Fine Arts, Schools of Architecture, Design and Conservation) exceeded that of a number of universities.

Figure 8. Expenditure per student in universities and universities of applied science (UAS)



Note: Total current expenditure per ISCED 5-8 student (FTE) in 2016. The adjustment for purchasing power parity has been made by the dataset managers. Data for Denmark are from 2019. The boundaries of the boxes represent values at the 25th and 75th percentiles of the distribution. Countries are sorted in ascending order of their median expenditure per student. The upper and lower whiskers show the largest/smallest observations that lie within 1.5 times the interquartile range from the third and first quartile respectively. Seven outliers with expenditure above 40k per student were excluded.

Source: Adapted from data from the European Tertiary Education Register (ETER) and from the Danish Ministry of Higher Education and Science.

A key driver of spending differences between UAS and universities is their level of engagement in research and development. Research activities in universities generate additional revenues that lead to higher per-student expenditure (Lepori, 2019_[18]). Analyses conducted in selected jurisdictions for the OECD project on Benchmarking Higher Education System Performance showed that R&D expenditure accounted for much of the difference in per-student expenditure between sectors. In 2015, per-student expenditure was about twice as high at universities than at UAS in Estonia, the Flemish Community and the Netherlands, but when R&D expenditure was excluded, universities spent only about 40% more than professional HEIs in Estonia, and less than professional institutions in the Flemish Community and the Netherlands (OECD, 2019, p. 124_[13]).

The data in Figure 8 show that per-student expenditure is more homogeneous among UAS within a given jurisdiction than among universities (as indicated by the more compressed box plots). Particularly among universities, per-student expenditure tends to be highly skewed by certain institutions spending much more than the rest – often those with large research budgets and, sometimes, low student numbers. In Denmark, the Technical University of Denmark stands out, with per-student expenditure almost twice as high as the institution with the next highest level of spending. One exception to this international pattern is Portugal, where per-student spending is more homogeneous among public universities. This probably reflects the fact that a large proportion of research activity in Portuguese higher education occurs in legally separate research centres affiliated to universities, which have distinct budgets that are not counted in the Portuguese ETER data on finance. Another exception is the Netherlands, which shows a comparatively high heterogeneity in the expenditure of UAS, a pattern explained by a group of art schools that have significantly higher per-student expenditure than the other professional institutions and, possibly, a higher level of research activity in some Dutch UAS.

It is conceptually and empirically challenging to measure public spending by study field in higher education

Another driver of differences in expenditure between institutional sub-sectors is the mix of fields of study that they offer. Like most OECD jurisdictions that use formulas to allocate resources to institutions, Denmark uses subject-area weightings to ensure a broad alignment between the level of public funding and the relative costs of delivering higher education in different fields of study. In systems such as Denmark, where institutions receive their core funding as a lump sum and are free to reallocate it internally, the level of spending per field allocated by public authorities may not correspond to the per-student amounts that institutions distribute to their own faculties, departments and programmes. Public spending by field of study – measured by the weight assigned to different subject groups – only provides a notional indication of real spending per student in different fields. In some cases, governments make use of cost information in setting their budget envelope. However, empirically and conceptually, the distinction between institutions' expenditure, their available resources and the “real” cost of provision is complex and will be discussed in the following section.

Key points for Denmark

- Denmark's total level of spending per student on higher education institutions is above the OECD average, but lower than that in some advanced higher education systems in the OECD, including its two nearest Nordic neighbours. Public spending per student in Denmark is lower than in some other high-spending, largely publicly funded higher education systems, such as those in Austria, the Flemish Community of Belgium, Norway and Sweden. Non-household private spending per student is also lower in Denmark than in Sweden and substantially lower than in high-spending, predominantly English-speaking OECD countries, where tuition fees account for a substantial proportion of institutional income. Although there is a political consensus in Denmark around funding higher education through progressive taxation, rather than direct household contributions, there may be opportunities for institutions to generate additional income from non-household private sources in the fields of research, service provision or continuing education, as occurs in Sweden, the Netherlands or English-speaking systems. Such revenues could contribute to the pool resources available to fund overhead and investments in higher education institutions.
- International data suggest that per-student expenditure on teaching in higher education institutions is, on average, lower in Denmark than in comparable OECD jurisdictions. Expenditure per student in Denmark's teaching-oriented non-university institutions is on a par with levels observed in equivalent institutions other OECD jurisdictions, suggesting the country's lower overall rates of spending on teaching may originate in the Danish university sector. This issue warrants further investigation to clarify if the patterns of expenditure observed in Denmark result from real differences in spending on instruction compared to comparable jurisdictions or discrepancies in the methods used to account for spending on research.

2.2 Setting the resource envelope for public funding to HEIs

The available public funding envelope for HEIs always results from a political choice, but is influenced by the funding allocation mechanisms OECD countries use

Particularly in higher education systems that are primarily funded by public authorities, like Denmark's, the budget envelope for core public funding is a critical determinant of the resources institutions have at their

disposal. Core public funding refers to the resources provided to support the sustained operations of institutions. Usually allocated in the form of one or more recurrent grants, core public funding is nearly always intended to cover current expenditures for the provision of instructional (educational) activities, including the salaries of teaching staff, overhead, equipment and operational expenditures. Core public funding is usually complemented by other forms of public funding, such as institutional and competitive grants for research and non-recurrent targeted funding linked to policy priorities.

In most OECD jurisdictions, the overall level of funding available for higher education is determined through a political process that takes into account the available public resources and budget proposals developed by ministries or agencies responsible for higher education. Within the government's overall fiscal constraints, higher education budgets compete for resources with other areas of expenditure, such as health, welfare or debt servicing and, within the education portfolio, with other sectors, such as school education, early childhood education and vocational training (OECD, 2020^[12]). Political decisions beyond the realm of education policy can lead to decreases or increases in the higher education budget, as was the case in the context of recovery plans or the austerity measures seen in many countries following the 2008 economic crisis. Denmark, following a change of government in 2015, implemented annual cuts of 2% to its education budget. This so-called reprioritisation contribution (*omprioriteringsbidrag*) took effect in 2016 and required all higher education institutions to cut costs by 2% a year. The intention was for the savings to be reinvested into the system, but not necessarily for the same activities or institutions. The practice lasted until a new government took office in 2019 (Ministry of Children and Education, 2019^[19]).

Although most OECD jurisdictions use formulas to distribute at least part of the higher education budget to institutions based on inputs (e.g. students enrolled) or outputs (e.g. credits passed or degrees awarded), these formulas are not necessarily used to inform the overall budget envelope for institutions. In many cases, the formulas simply distribute the available budget envelope to institutions and do not use fixed units of funding for given inputs or outputs. Broadly, there are three models for setting the budget envelope and using formulas to allocate funding:

1. Systems can fix **guaranteed per-student unit costs** in advance and allow **open student recruitment** by institutions. This demand-driven approach requires careful projections of student enrolment and latitude in the total budget envelope since it may be forced to expand if enrolment rises. Demand-driven funding can also create perverse incentives for institutions to increase their revenue by lowering admission standards. Australia is one of the few notable systems that operated a fully demand-driven funding between 2012 and 2018. The budgetary uncertainty inherent in this model and increasing enrolment eventually lead to the introduction of institutional maximum grant levels. England also has also had a variant of this approach in place since 2015, although funding is provided to institutions through subsidised student loans to students.
2. Some systems fix **guaranteed per-student unit costs** in advance, but place **limits on enrolment** or specify the number of places that are funded in order to reduce the risk of unexpected rises in expenditure. This is the case for Scottish and Irish-domiciled undergraduate students in Scotland, for example, where the funding agency calculates the number of funded places they can provide in light of available funds and allocates these to institutions. In such cases, it is possible to work with closed budget envelopes and adjust student recruitment caps by institution depending on the level of resource available (this system is now in place in Australia).
3. Other systems combine a closed or nearly **closed budget envelope** with **open or near-open enrolment** of students. The risk of a closed budget envelope is that the average funding per student falls whenever enrolment rises, particularly where institutions are not able to raise tuition fees or limit their enrolment. Although institutions can exploit economies of scale as enrolments rise, there is a risk of eroding quality as institutions reach capacity and infrastructure limits. Some systems using this approach, such as the Flemish Community of Belgium, have mechanisms in place that trigger adjustments to the overall budget envelope if enrolment falls or rises by more than a specific threshold proportion.

In practice, many systems try to steer a middle ground between a fixed budget envelope and a fixed per-student funding rate. To ensure that the overall higher education budget makes it possible to maintain a given level of resources per activity or output, authorities use data on projected student numbers to ensure their budget takes into account demand over time. This helps to keep effective funding rates stable while avoiding a significant rationing of places that could carry equity risks. New Zealand provides an example of this approach, where the number of places in any given year is fixed taking into account enrolment projections. Table 2 summarises the main funding allocation and budget-setting configurations in selected OECD jurisdictions, including Denmark.

Table 2. Features of funding models that influence the calculation of the budget envelope

	Type of budget envelope	Open or capped recruitment of students	Formula allocation method		
			Fixed unit cost per student	Mixed (unit prices + distributive)	Distributive
Ireland	Closed	Open		✓	
Denmark	Closed	Capped in certain fields	✓		
Flemish Community (Belgium)	Semi-open	Capped in certain fields			✓
Finland	Closed	Open			✓
Australia	Closed	Effectively capped	✓		
Scotland	Closed	Capped	✓		
The Netherlands	Closed	Open			✓
New Zealand	Closed	Capped			✓

From this perspective, Denmark operates a mixed system with a closed budget envelope that is established annually with reference to projected student numbers, as well as fixed unit payments for each 60 credits passed by students for both universities and non-university institutions and student number caps in some fields. The Danish system thus lies between types 1 and 2 in the typology above. The numbers of bachelor's and master's students are forecast each year, taking into account previous enrolment patterns and projected progression rates to master's programmes estimated by universities. This, in combination with established unit payments for 60 passed credits in different fields of study, creates an estimate of financial need, which, in turn, forms the basis for the annual budgeting process. The unit payments per 60 passed credits are regularly adjusted by the Ministry of Higher Education and Science and established for the following three years in the annual finance law (Danish Government, 2020^[7]). Although the proportion of core funding for education linked to outputs (credits passed) was reduced to around two-thirds in the 2017 reform, the amount of funding each institution receives is still strongly determined by the number of credits passed by students, as it was historically (Schmidt, Langberg and Aagaard, 2006^[20]).

Three main types of method are used to allocate core public funding to individual HEIs in OECD countries

The method used to allocate the overall higher education budget within the system has important implications for higher education institutions. It affects the stability and predictability of their funding and sets incentives for their behaviour and strategic orientation. The results of the OECD Higher Education Policy Survey on resourcing show that nearly all participating jurisdictions determine at least part of their core funding allocations to institutions using funding formulas (whether purely distributive or based on fixed unit payments). However, many systems rely on more than one allocation method to determine different portions of funding for institutions (OECD, 2020^[12]). As shown in Table 3, OECD jurisdictions frequently use a combination of three main allocation methods in their overall model:

- **Historical or incremental funding** based on the amount of funding provided in previous years, typically adjusted for inflation or in line with overall increases in the higher education budget.
- **Negotiations between government and higher education institutions**, which may be formalised in performance contracts or funding agreements, through which institutions agree to deliver particular results for the funding granted.
- **Formula-based funding** calculates the budget based on a set of predefined parameters and indicators (related to inputs, outputs, outcomes or other performance measures). Formulas are most commonly distributive, i.e. they work with flexible rather than fixed unit payments.

Table 3. Methods used to allocate core public funding in selected countries

Country	Historical allocation or “fixed components”	Negotiated allocation linked to performance contracts	Formula funding
Denmark	✓	✓	✓
Flemish Community (Belgium)			✓
Finland		✓	✓
Ireland			✓
Portugal	✓	✓	✓
Australia			✓
Scotland			✓
The Netherlands	✓		✓

The results of the OECD Higher Education Policy Survey on resourcing suggest that countries typically distribute between a quarter and three quarters of core public funding to higher education institutions using formula allocation models, with the remaining allocations based on historical trends, funding negotiations or a combination of these. Some jurisdictions use formulas to allocate all or nearly all core funding to institutions. In the Flemish Community of Belgium, for example, all core operating funding to university colleges and universities is allocated using a formula. In Finland, from 2021 onwards, 95% of core funding to universities of applied science and 76% of core funding to universities is allocated using formulas, with the remaining resources negotiated and linked to institutional agreements on strategic development and “national duties” (OKM, 2021^[21]).

Fixed or historical allocations provide greater stability and predictability than formula models that closely follow changing enrolment patterns and make it easier to cover the cost of expenditures that are not directly proportional to the size of an institution’s activities and student population, such as the maintenance of facilities. This is a key reason why many OECD higher education funding systems allocate a proportion of institutional funding based on historical trends. The “basic grant” in the Danish system, which accounts for around 25% of institutional funding, is an example of this, as are the fixed “education increments” (*onderwijsopslagen*) in the Dutch model, which account for an average of 33% of core education funding for universities and 13% for universities of applied science (Jongbloed et al., 2018^[22]). The Flemish allocation model, while fully parameter-based, moderates sharp changes in funding arising from changes in enrolment or graduation by using historical five-year averages (Year-7 to Year-2) as a basis for calculations.

An important question for systems with fixed or historical funding components is how, and with which intervals, the values of these allocations should be recalibrated. In the Netherlands, for example, a number of universities have expressed their desire for the fixed funding base to be adjusted every five or seven years to take into account wider developments in the cost structure of education and research and to align funding more closely with the institutions’ evolving profiles. As with any distributional adjustment within a fixed resource envelope, however, such recalibrations would create winners and losers and it can be difficult to find broad support for any one approach (Jongbloed et al., 2018^[22]).

While the general trend in higher education funding has been to move away from negotiated budget allocations, partly due to their perceived lack of transparency, a number of OECD jurisdictions still determine part of their institutions' budgets through negotiation processes. Luxembourg, for example, relies exclusively on negotiations for its budget allocations and Mexico and Portugal use historical budget allocations as a base for subsequent negotiations (OECD, 2020_[12]).

As noted, Denmark's new model for core public funding combines elements of all three main allocation methods. The largest share of funding (67.5%) is allocated through the formula-based activity grant, where the number of students passing exams is the only parameter. The fixed "basic grant" (25% of funding), noted above, combines historical funding with a smaller performance-related component based on negotiated targets. The "results grant" adds additional funding based on fixed performance indicators. Estonia underwent a similar reform in 2017, moving away from a fully formula-based allocation method towards a greater emphasis on historical allocations, as well as performance indicators. Estonia went further than Denmark, however, since its new historical allocation method accounts for 80% of overall funding.

Many countries, including Denmark, use subject-area weightings in formula allocation systems to reflect cost differentials between fields

The cost of providing education differs across fields of study. Subjects such as medicine, engineering, certain natural sciences or artistic disciplines are more costly to provide than humanities or social sciences (Hemelt et al., 2021_[10]). Data from the National Study of Instructional Cost and Productivity from the University of Delaware in the United States, suggests, for example, that subjects such as electrical engineering cost more than twice as much to provide as others, such as mathematics. The main determinants of these cost differences (both between subjects and over time) are class sizes and faculty salaries, as well as non-personnel expenditures in a few subjects relying on expensive laboratory facilities (Hemelt et al., 2021_[10]).

Governments have an interest in ensuring there is broad alignment between the relative costs of delivering higher education in different fields of study and the levels of revenue higher education institutions are able to obtain to fund instruction in these fields. If revenue is too low to pay for well-qualified and able teaching staff, appropriate facilities and equipment, and adequate guidance and support to students, there are serious risks to learning quality and student outcomes. When per-student revenue for particular studies is excessive in relation to real costs, inefficiencies are generated and public authorities or fee-paying students end up paying too much. Mismatches in funding between fields of study can lead to undersupply in educational fields that are under-funded, but where demand for graduates is high, and, conversely, oversupply in well-funded, but potentially less relevant fields (OECD, 2020_[12]). In order to avoid these mismatches, most OECD jurisdictions that use funding formulas to allocate resources to institutions use weightings to account for the different costs of instruction across fields of study (see Table 4). Given the distributive nature of funding formula in many OECD jurisdictions, discussed above, subject-area weightings often determine relative rather than absolute levels of funding provided for each student.

Table 4. Subject-area weightings in selected OECD jurisdictions

Weighting factors for undergraduate students used in funding allocation formula in selected OECD jurisdictions

	Flemish Community		The Netherlands ²		Scotland	Ireland	Denmark (universities)	Finland ³
	Univ.	UC	Univ.	UAS				
Non-laboratory subjects (e.g. humanities and social sciences)	1	1	1	1	1	1	1	1
Subjects with fieldwork (e.g. computer science, education)	2	1.1 to 1.6	1.5	1.28	1.2 / 1.4	1.3	1.4	1
Laboratory subjects (e.g. engineering, physical sciences)	2	1.6	1.5	1.5	1.6 / 1.8	1.7	2.1	1.75
Clinical medicine	3.9	-	3	-	3.2	2.3	2.1	3
Veterinary studies / dentistry	3.9 ¹	-	3	-	3.2	4	2.1	3

Note: 1. Veterinary studies = 3; 2. The Dutch funding formula applies this weightings to enrolments and degrees awarded for the instruction component of funding and to degrees awarded to allocate 15% of basic funding to universities for research; 3. Finland introduced multipliers from 2021.

Sources: Flemish Government (2013^[23]) *Higher Education Code*, Article III.19; de Boer, H. and B. Jongbloed (2018^[24]), *Evaluatie interne allocatiemodellen Vlaamse universiteiten*; Scottish Funding Council (2019^[25]), *Outcome agreement funding for universities – 2019-20*.

Few systems have based their subject weightings on actual cost models, given the methodological challenges associated with this

Although, as noted, a number of OECD jurisdictions have introduced standardised activity-based costing methodologies in higher education to gain a better understanding of costs in the sector, the subject weights in allocation formulas are typically based on “notional” cost differences between fields of study. Such cost estimates are derived from methodologies that use a range of heuristics to approximate differences in cost, as is the case in Denmark. Empirically determining the cost of education in different fields of study is not trivial and identifying when the disparity between actual costs and funding rates is large enough to warrant adjustments is a challenge (OECD, 2020^[12]; Connew, Dickson and Smart, 2015^[26]).

Observed levels of expenditure on different subjects – when accounting systems allow them to be observed – do not necessarily reflect the “reasonable cost” of providing a given level of education, but are affected by the level of funding programmes receive. For example, if computer science programmes are under-funded by the government in comparison to their real costs and this under-funding is not compensated for through reallocation within higher education institutions or alternative revenue streams, the institutional unit that teaches computer science will be forced to lower its costs. Conversely, if computer science gets a higher rate of funding than is needed, the department is likely to adjust spending to the revenue received, thereby driving up the observed cost of its programmes (OECD, 2020^[12]; Connew, Dickson and Smart, 2015^[26]).

Despite these methodological challenges, there have been some efforts to estimate expenditure by field at the national or institutional level in Australia (Deloitte Access Economics, 2016^[11]), Ireland (Irish Higher Education Authority, 2017^[27]), England (KPMG LLP, 2019^[28]), and the United States (Hemelt et al., 2021^[10]; Altonji and Zimmerman, 2019^[29]). Recent analyses conducted in Australia, Ireland and England follow a similar approach. They first collect expenditure data at the HEI level (provided by national accounting systems or, in Australia, collected specifically for the study) and exclude research expenditure. They split the remaining expenditure between direct costs (directly attributable to educational programmes) and indirect (“overhead”) costs that are shared across all programmes within an institution, allocate the direct costs to the relevant fields of study and apportion the indirect costs across programmes.

Even at the level of individual institutions, estimating the expenditure by field of study poses significant challenges. The difficulty of distinguishing between education and research expenditure was highlighted

earlier. However, even identifying the direct costs associated with education in a given field can be difficult since, in many cases, they can only be attributed approximately to outputs. The Irish Higher Education Authority (2017^[27]), for example, identified costs by department, but noted that staff in a given department commonly provide instruction to students of a different field (e.g. law faculty teaching commercial law to business students). Further difficulties arise from shared resources or interdisciplinary programmes with courses from different fields of study.

Apportioning indirect costs poses further methodological challenges for the design of cost accounting systems. In the Australian example, Deloitte Access Economics (2016^[11]) left it to each higher education institution to determine which share of the indirect costs they assigned to each field of study, using a variety of criteria. In systems with standardised cost accounting systems, such as the United Kingdom, the United States and Ireland, common rules are in place, although institutions still need to make judgements about how to assign costs. Besides the difficulty this creates for inter-institutional comparability, no single indicator is likely to reflect the highly complex way in which indirect expenditures are related to individual fields of study. In theory, for example, it would make sense to split the cost of an institution's international relations office based on the number of international exchange students in each field of study, rather than their full-time equivalent enrolment or headcount.

For the reasons described above, estimating per-student expenditure by field of study requires data at a level of detail and quality that relatively few countries to date have been able to provide at national level and no robust, comparable international data on this exist. Higher education systems and their institutions use different cost accounting models and different systems for classifying fields of study, which complicates attempts to develop comparisons. As a result, neither the UNESCO-OECD-Eurostat (UOE) joint data collection, nor the European Tertiary Education Register (ETER) collect information on expenditure by field of study and there are currently no internationally comparable indicators. Denmark's new Common Chart of Accounts will require all institutions to report their annual expenditure by fields of study based on a methodology specified by the Ministry, which could improve the basis for estimating expenditure (and cost) across different fields of study in Denmark (Ministry of Higher Education and Science, 2020^[16]).

Denmark's allocation model uses relatively few subject-area weightings for university subjects and a highly differentiated system in universities of applied science

As set out above, Denmark uses subject-area weightings to determine the level of funding institutions receive from the activity grant. In 2021, for each 60 credits successfully passed by students, universities are allocated DKK 32 500 (tier 1), 46 300 (tier 2), or 67 700 (tier 3), depending on the field of study in which the credits are passed. Most social sciences and humanities are classified as tier 1, while most natural sciences and technical subjects fall under tier 3. Among the health-related subjects, some degrees, such as public health or occupational therapy are classified as tier 2 while others, such as medicine and dentistry, are classified as tier 3. Grants for part-time students are between 53% and 44% lower. Undergraduate students passing exams at university colleges and business academies are allocated activity grants based on a ten-tier system. Depending on the field of study, the tiers range from DKK 41 500 to 100 200, or DKK 8 800 for students engaging in internships (Ministry of Finance, 2020^[6]). Compared to the previous taximeter system for UAS, the number of tiers has been reduced.

Compared to other countries' subject-area weightings, Denmark's system is less granular for university subjects (classified into three groups) and more granular for professional HEIs (classified into ten groups). The Netherlands also uses a three-tier system for its universities, but most other countries (Australia, Germany, Finland, Ireland, Scotland) use a more differentiated system with four to ten different funding levels (Jongbloed et al., 2018^[22]). Like Denmark, the Flemish Community of Belgium also uses a more granular system of weightings for university colleges than for universities. Distinguishing between a greater number of subjects adds complexity but allows countries to match their funding allocations more closely to the assumed costs incurred by institutions. In Australia, for example, the greater number of tariff categories

allows them to assign a significantly higher weighting to students of subjects like medicine, for which the higher costs cannot be accurately reflected in a narrow set of categories.

The spread between Denmark's three funding tiers at the university level is comparatively wide, with science and technology programmes assigned about 110% more funding than humanities or social science programmes. This is comparable to the weighting used in the Flemish Community of Belgium and Australia, whereas the natural sciences are only provided 70% more funding in Scotland and 50% in the Netherlands. By contrast, both Scotland and the Netherlands allocate at least 200% more to medicine-related fields than to social sciences, compared with just 100% in Denmark (see Table 4).

In most cases, the weights that Denmark assigns to subject areas and different levels of education are reasonably close to the actual costs estimated by Ireland's Full Economic Cost (FEC) model (one of the OECD systems to have attempted such cost estimates). For example, undergraduate education in physics was estimated to cost about 60% more than instruction in the humanities and medicine cost 110% more. In other cases, however, Denmark's weights deviated from the costs estimated by the FEC. The real cost of postgraduate dentistry, for example, was estimated to exceed that of the social sciences by more than 600%, while Denmark only assigns it 110% of additional funding. Furthermore, whereas Denmark uniformly adds 30% to the tariff for master's students, the data from Ireland show significant heterogeneity in the way that costs in different fields change as students progress from undergraduate to taught or research-based postgraduate studies. While humanities cost about 60% more at the (taught) postgraduate level than at the undergraduate level, the cost of computer science rose by only 40% and that of chemistry by 320% (HEA, 2017^[30]). Some countries with funding ranges that are similarly narrow as Denmark's, such as the Netherlands, provide additional funding not linked to student activity or outputs to make up for the greater costs of programmes with laboratory components (Jongbloed et al., 2018^[22]).

In practice, in higher education systems that combine the allocation of core public funding as lump sums with substantial institutional autonomy, higher education institutions typically reallocate the funding they receive from the government through internal allocation models, which may use different weightings and parameters (see Section 4). Such approaches, seen in many systems, including the Netherlands, the Flemish Community of Belgium and many US states, as well as Denmark, allow institutions to align departmental and faculty budgets more closely with specific funding requirements.

Key points for Denmark

- Denmark's system for establishing the core annual budget envelope for higher education institutions, using forecast enrolment, pre-established unit payments for the activity grant and projected institutional budgets for three-year periods is transparent and comparatively simple. Although the level of payments to institutions per 60 credits passed by students can vary over time, the budgeting process and allocation method provide a higher degree of predictability over income for institutions than the purely distributive formulas used in some comparable OECD jurisdictions, where unit payments can fluctuate more significantly from year to year.
- The decision, in the 2017 reform of the allocation model, to inject greater stability into the funding system by increasing the proportion of funding allocated as a fixed, basic grant is consistent with practice in some other comparable higher education systems, including the Netherlands. Stability in funding can, in theory, support institutions in making long-term investments and reduce perverse incentives to focus primarily on the quantity of graduates, rather than the quality of education. As in other OECD jurisdictions that use fixed or historical funding, it will be important to review the basic grant periodically to ensure the level of historical funding to each institution remains appropriate in light of institutional requirements and real activity levels.
- Denmark's current system of subject-area weightings for universities is broadly in line with the multipliers used in comparable OECD higher education systems, but is unlikely to reflect fully the true range of costs associated with providing instruction in different fields, which have been revealed in national cost studies in other jurisdictions. In particular, the especially high costs of providing programmes in medicine, dentistry and veterinary studies appear not to be directly reflected in the current model, although it is understood that this is partially compensated through other funding streams.
- The system of subject-area weightings used to allocate funds to the university-of-applied-science sector in Denmark's funding model is more highly differentiated than the systems used in most comparable OECD jurisdictions. This adds complexity, but also allows clearer alignment between payments and differing costs of provision. Lessons from Denmark's experience with this model would be valuable for policy makers in other OECD jurisdictions.
- Denmark is one of the latest OECD jurisdictions to introduce a system-wide activity-based cost accounting model (the Common Chart of Accounts) for higher education institutions, joining the English-speaking jurisdictions and other Nordic countries that have already introduced such systems. Despite the potential for additional reporting burden within institutions, the Common Chart of Accounts promises to provide greater transparency over institutional expenditure, which will be valuable for informing institutional strategy and policy for higher education and research funding.

3. Using funding mechanisms to raise performance and achieve policy objectives

This section takes a closer look at the design of allocation mechanisms for public funding and the extent to which these can be used to influence institutional behaviour and support public policy goals. One of the key objectives motivating the reform of Denmark's higher education funding system was to enhance the quality of education and to strengthen the focus on good teaching and graduates' successful entry into the labour market. In reducing the relative weight of the output-based taximeter system and introducing a series of new performance-based funding mechanisms, the reform sought to shift the focus from quantity to quality and provide authorities with greater scope to allocate resources based on policy priorities (Danish Government, 2017^[2]). The analysis in this section is structured into two blocks:

1. The first block examines efforts in OECD jurisdictions to influence institutional behaviour and performance through output and outcome-related funding allocation models. It considers the use of different allocation mechanisms, the criteria used to allocate funds and whether experiences elsewhere in the OECD hold lessons for Denmark.
2. The second block examines how OECD governments direct funding to higher education institutions to support specific policy priorities, looking specifically at:
 - How institutional funding allocation mechanisms can be designed to promote social equity and how the Danish funding model compares in this respect.
 - How OECD jurisdictions have used institutional funding mechanisms to meet the needs of institutions outside core urban regions and support a balanced territorial distribution of higher education.

3.1 Using output- and outcome-based funding to influence institutional behaviour

An increasing number of OECD jurisdictions link funding for teaching activities of HEIs to output and outcome indicators

The design of funding allocation mechanisms for higher education institutions is one of the levers available to governments to ensure that scarce resources are used efficiently to deliver high-quality education and research in line with policy objectives for the higher education sector (OECD, 2020^[12]). Over recent decades, many OECD jurisdictions have introduced performance-related elements into their higher education funding systems as a means to incentivise improvement in outcomes, such as degree completion, teaching quality and research output or to foster greater transparency and accountability around public spending through monitoring and reporting procedures. This general trend could be observed in the funding of both teaching and research activities (Lepori, 2019^[18]).

Although there are varying estimates of the number of higher education systems using performance-related funding, responses to the OECD Higher Education Policy Survey on resourcing show that the majority of the 27 participating jurisdictions include at least some output criteria related to teaching or research activities in the formulas they use to allocate funding to higher education institutions. In the formulas for allocating funding for education, for example, 11 of the 27 responding jurisdictions use degrees awarded and eight, including Denmark, use the number of credits passed by students as parameters for determining payment levels. Publication numbers and doctoral degrees awarded are the most frequently used parameters in allocation formulas for research funding. Although the United States did not participate in the 2020 OECD Higher Education Policy Survey, recent analyses also show that 35 US states currently used performance-related funding models to allocate state appropriations for instruction to higher education institutions (Li, 2018^[31]).

Performance-related funding is an umbrella term used to describe any funding mechanisms that allocate resources based on some measure of output or outcome, rather than purely inputs. Outputs (also referred

to as “results”) are the quantifiable products of activity within higher education institutions and include the number of degrees awarded, course credits obtained or graduation rates. The term “outcomes” typically refers to the longer-term effects of higher education activities, such as students’ labour market outcomes, or performance measured against specific targets or policy objectives (e.g. internationalisation or innovation) (OECD, 2020_[12]; Claeys-Kulik and Estermann, 2015_[32]). Measures of the quality of educational and research-related processes, such as the results of student surveys, go beyond simple quantitative measures of output and are also generally viewed as “outcomes”.

As the proportion of funding related to performance varies between allocation systems, some authors distinguish between “performance-linked” models, where only part of institutions’ funding depends on performance, and “performance-based” models, where all or most of the funding is tied to performance (OECD, 2020_[12]). In addition, it is possible to distinguish between systems that allocate funding based on outputs or outcomes that have already been achieved (as is the case in output or outcome-based funding formulas) and those that seek to incentivise performance upfront (e.g. through performance agreements in which institutions commit to achieving certain outcomes in return for funding advanced).

As can be seen in Table 5, OECD jurisdictions that incorporated performance incentives into their institutional funding models have tended to use one or more of four main mechanisms:

1. **Core funding formulas** that integrate output or outcome indicators;
2. **System-wide performance indicators** that are used to allocate funding from a separate earmarked budget envelope outside the main formula to institutions based on their performance;
3. **Performance agreements with budgetary consequences**, where an explicit proportion of core funding or additional funding is made conditional on the attainment of objectives specified in the agreements;
4. **Performance agreements without budgetary consequences**, which are often a condition for funding (i.e. mandatory), but where payments are not conditional on the attainment of specific objectives or quantitative targets.

Table 5. Mechanisms used to allocate performance-based funding in selected OECD jurisdictions

	Output and outcome indicators in core funding formula		Separate budget envelope allocated based on output or outcome indicators		Institutional performance agreements with proportion of public funding conditional on observed performance		Institutional performance agreements as condition of funding, without financial penalties linked to observed performance
	Output	Outcome	Output	Outcome		%	
Denmark	✓	✓	✓	✓	✓	1.25%*	
Ireland					✓	10	
Finland	✓	✓					✓
Flemish Community	✓						
Scotland							✓
The Netherlands	✓				✓	3%**	

Note: Examples of output indicators: credits obtained, degrees awarded; Examples of outcome indicators: graduate employment rates or student feedback. *DNK: 5% of the fixed base funding (*grundtilskud*). **In The Netherlands, additional payments possible based on real performance in last year of operation of the quality agreements programme in 2024, amounting to around 3% of the value of total quality funds allocated over the six-year period 2019-2024.

Denmark has a strong tradition of performance-related funding and is unique among the first round of jurisdictions participating in the OECD Resourcing Higher Education Project for combining three different

types of performance funding mechanisms (types 1, 2 and 3 from the list above). Prior to the implementation of its new higher education funding model in 2019, Denmark's primary mechanism to allocate core funding for education was the “taximeter” system, which was based on the number of credits awarded, i.e. an output measure. While, as noted, study credits still play an important role in the new funding system, determining 67.5% of funding in the form of the activity grant, the latest reform has diversified the funding system. Notably, 5% of the newly introduced basic grant (the historical allocation making up 25% of total funding for education) is contingent on fulfilment of institutional performance agreements and another 5% on institutions' achievement of system-wide quality indicators measured through student surveys. In addition, Denmark added a separate budget envelope accounting for 7.5% of institutions' core education funding, which is contingent on system-wide indicators related to students' study duration and graduate employment rates.

The remainder of this section examines in more depth the four main performance-funding mechanisms used by OECD jurisdictions as well as the evidence of their respective strengths and weaknesses.

Many systems use output measures in their core funding formulas, but relatively few use outcome indicators

The most common way in which governments seek to incentivise particular behaviours and performance by higher education institutions is through the variables included in institutional funding formulas. Table 6 shows the types of indicators that selected OECD jurisdictions include in their funding formulas. In most cases, formulas primarily emphasise institutions' “inputs” and activities, such as the number of students enrolled or taking credits, as well as their fields of study (Jongbloed and Vossensteyn, 2016^[33]). However, the OECD Higher Education Policy Survey shows that nearly all participating systems also include “output” criteria related to teaching or research activities. Common output measures include the number of degrees awarded, credits completed or the amount of published research. Denmark's funding formula is notable in its parsimony since it uses only outputs as a parameter, although – as discussed below – the main funding formula is complemented by separate funding streams with additional performance criteria.

In addition to input and output criteria, there is also a growing interest in outcome indicators which aim to track the quality of institutions' educational provision by measuring factors such as graduates' labour market outcomes (OECD, 2020, p. 86^[12]). In the United States, at least seven of the 50 states use some form of labour market outcome metric in their funding formulas for instructional subsidies to public institutions (OECD, 2020, p. 86^[12]; Dalal, Stein and Thompson, 2018^[34]). The responses to the HEPS show that around half of the OECD systems that responded use at least one outcome-related indicator to distribute core funding to institutions for education and operations. Most frequently, countries reported including indicators on the number of graduates in employment and student feedback (e.g. in Italy and the Slovak Republic). Denmark's funding system does make use of both employment-related indicators and student feedback, but uses them in a separate funding mechanism outside the main funding formula (see below).

Table 6. Indicators used in core funding formulas of selected OECD jurisdictions

	Flemish Community of Belgium	Denmark	Finland	Ireland	The Netherlands	Norway
Indicators related to teaching activities						
Input and activity-oriented (e.g. student enrolment, study credits taken, private revenues raised)	✓		✓	✓	✓	✓
Output-oriented (e.g. degrees awarded, study credits obtained, time to completion)	✓	✓	✓		✓	✓
Outcome-oriented (e.g. graduates in employment, student feedback)			✓			
Indicators related to research activities						
Input and activity-oriented (e.g. research income or co-financed research)			✓	✓		✓
Output-oriented (e.g. doctoral degrees awarded, number of publications, patents)	✓		✓	✓	✓	✓
Outcome-oriented (e.g. citations, research evaluation results)						

Note: Results from the Higher Education Policy Survey on resourcing and additional OECD research

Norway's funding formula is an example that – like Denmark's – places significant emphasis on outputs (see Box 2). It is common for systems with relatively open and flexible study systems to use output indicators as a steering tool to incentivise progression and completion, whereas systems with selective entry and tightly structured study pathways and times, such as Ireland, have relied less on these indicators. In contrast to Denmark, Norway uses a formula to allocate only 32% of core education funding, compared to 67.5% in Denmark. The remaining 68% of funding in Norway is distributed as a fixed block grant, the level of which depends on the institution's academic profile, size and historical factors. Like Denmark, Norway combines the use of performance indicators in its higher education funding formula with institution-specific performance agreements (OECD, 2018^[35]).

Box 2. Performance indicators in Norway's funding formula

In Norway, 32% of the institutional block grant for higher education institutions is allocated using a funding formula using output-oriented indicators. The indicators are either linked to open-ended budgets (with no ceiling on the amount of extra funding that institutions can receive based on their performance) or a closed-ended budget (where institutions compete for a fixed pool of funds). In 2015, an expert panel reviewed the funding model for universities and university colleges. Due to its emphasis on enrolled credits, the formula provided strong incentives for institutions to increase enrolment – a key goal when the system was first introduced. The panel recommended shifting the formula's incentives from enrolment to quality, completion, internationalisation, and collaboration between higher education stakeholders. As a result of the review, the new formula includes graduate numbers and external revenue generated as parameters. The current model allocates the 32% of formula funding as follows:

- Study credits obtained by students (63%, open-ended budget)
- Number of graduates (15%, open-ended budget)
- Number of doctorate graduates (5%, open-ended budget)
- Funding from the European Union (5%, closed-ended budget)
- Research publication points (5%, closed-ended budget)
- Funding from Research Council of Norway (3%, closed-ended budget)
- Private and public revenue (3%, closed-ended budget)
- International students exchanges (1%, open-ended budget)

Sources: OECD (2018^[35]), Higher Education in Norway: Labour Market Relevance and Outcomes. <http://dx.doi.org/10.1787/9789264301757-en>; OECD (2020^[36]), Education Policy Outlook: Norway <https://doi.org/10.1787/8a042924-en>; Norwegian Ministry of Education and Research (2015^[37]) *Finansiering for kvalitet, mangfold og samspill: Nytt finansieringssystem for universiteter og høyskoler* (Funding for quality, diversity and cooperation: a new funding system for universities and university colleges) https://www.regjeringen.no/contentassets/95742f2460c74ee5aecf9dd0d2a8fc9f/finansieringuh_rapport.pdf (accessed on 3 July 2021).

Denmark is one of the few systems to link institutional funding to system-wide performance indicators outside the main allocation formula

Besides the use of performance indicators in core funding formulas, some higher education systems have established separate ring-fenced budgets that are distributed using a separate set of performance indicators. The Danish funding reform introduced three new system-wide indicators, linked to two distinct funding streams in the new allocation model. These measure study duration, graduate employment rates and students' attitudes to learning and their perception of the teaching and learning environment:

1. As part of the new funding model implemented in 2019, 7.5% of core public funding to higher education institutions is allocated through an explicitly performance-linked results grant (*Resultattilskud*). Half of the results grant (3.75% of total core funding) is awarded based on students' study duration in each institution. The average duration of study is calculated separately for bachelor's and master's students. If students graduate, on average, more than three months later than the expected course duration, the amount of institutional funding tied to the study duration indicator is gradually reduced, down to zero if the average time to graduation exceeds the expected completion time by more than one year. To avoid perverse incentives, institutions are provided with a time supplement based on the proportion of students with legitimate reasons to prolong their

studies, including students with special needs or illness, students taking maternity leave and – for medical institutions – students taking a research year (Danish Government, 2017^[2]).

2. The remaining half of the results grant (i.e. another 3.75% of total core funding) is linked to the employment rates of graduates from each institution, measured between 12 and 23 months after graduation. Employment rates are expected to be at least in line with the seasonally adjusted employment rate of the general working-age population (with a margin of 0.4 times the unemployment rate). If the employment rate is lower, the institutional funding tied to the employment rate indicator is gradually reduced, down to zero if the employment is 25 percentage points below the general employment (Danish Government, 2017^[2]).
3. Finally, payment of 5% of Denmark's basic grant (*Grundtilskud*) is tied to the institutions' performance with respect to a set of quality criteria that are measured using a biennial student survey – the Learning Barometer (see Box 3. for details). As the basic grant provides 25% of total core public funding to institutions, Learning Barometer results influence the allocation of 1.25% of total core funds.

Box 3. Student feedback in performance funding: using Denmark's Learning Barometer

Denmark's Learning Barometer survey was developed based on the Finnish "LEARN" survey and consists of 38 questions (scored on a 1-5 Likert scale) that are used to construct nine indicators: Compliance (or alignment), constructive feedback, interest and motivation, support from fellow students, teacher interaction, learning for understanding, organised learning, surface learning, and in-depth learning (Ministry of Higher Education and Science, 2019^[38]). The survey was administered for the first time in 2018, collecting responses from over 50 000 students (40% of those surveyed and roughly a third of all students). It was sent to a representative sample of students in each institution and institutions had the option to administer the Learning Barometer to all students, which many did. The results of the survey served to test, adjust and calibrate the survey instruments as well as to establish institutions' baseline performance.

From 2021, the Learning Barometer will be administered every two years and will inform whether institutions will continue receiving 5% of their basic grant. The assessment of institutions' survey results will emphasise their progress over time, rather than their performance relative to other institutions. Specifically, institutions will see the quality-related component of their basic grant reduced by 50% if their performance worsens in a statistically significant manner on more than three of the nine indicators between the baseline survey (2018) and the 2021 survey. If their performance worsens on more than six indicators, institutions will receive none of the quality-dependent 5% of the basic grant in the next funding period. Given that institutions' scope for progress depends to some extent on their baseline performance, specific provisions ensure that institutions are not disadvantaged by their strong performance in previous years and have strong incentives to address identified weaknesses. Negative developments on indicators that were previously scored above "4" are not counted for the purpose of the assessment and indicators that remain below "3" for the second time in a row will count as a negative development unless they showed a significant improvement.

As a final step in the assessment process, the Ministry of Higher Education and Science will engage in a dialogue with institutions that are at risk of losing some of their funding. This serves as an opportunity to identify extenuating circumstances, which may explain negative results. Following the dialogue, the Minister will decide whether to approve any reductions in the activity grant (Ministry of Higher Education and Science, 2019^[39]).

Source: Ministry of Higher Education and Science (2020^[40]) *Laeringsbarometer*, <https://ufm.dk/uddannelse/statistik-og-analyser/laeringsbarometer> (accessed on 3 July 2021).

Among OECD countries, few higher education systems have used uniform system-wide performance indicators to allocate resources outside of the main funding formula, as in the case of Denmark's results grant. Jurisdictions participating in the 2020 OECD Higher Education Policy Survey on resourcing that reported that they link funding to performance indicators mostly do so by integrating these indicators into core funding formulas or performance agreements, rather than – like Denmark – linking them to a separate funding stream. As in Denmark, the amount of funding linked to these generalised performance targets is usually less than 10% of overall core funding.

One example of a system that uses system-wide performance indicators similar to those of Denmark's results grant is Estonia. As described in Box 4, Estonia awards 17% of its closed-budget core funding for education using a set of six indicators. The two indicators accounting for the largest share of funding reward students' time to graduation and labour market outcomes – much like Denmark's results grant. While both systems measure the proportion of graduates in employment (or further study), Denmark awards funding

based on students' average completion time, while Estonia ties it to the share of students graduating within the nominal completion time.

Box 4. System-wide performance indicators in Estonia's funding model

In 2017, Estonia reformed its higher education funding model, which had previously awarded all funding based on a combination of input, output, outcome and quality indicators (Lees, 2016^[41]). The new system sought to provide higher education institutions with greater financial stability by awarding 80% of the core funding for education as a historical block grant based on the average funding received over the past three years. Of the remaining 20%, 3% is tied to the fulfilment of a performance agreement, and 17% is allocated based on six system-wide performance indicators. The indicators are aligned with the government's priorities and determine each institution's share of a closed-end budget (weightings in brackets):

- The share of students graduating within the nominal completion time (35%).
- The share of graduates in employment or further study (20%).
- The share of students enrolled in programmes identified as part of the university's mission or area of responsibility (15%).
- The share of foreign students (10%).
- The share of students studying abroad (10%).
- The ratio of public to private funding from education activities (including tuition fees and other revenues related to education provision) (10%).

Sources: OECD (2020^[42]), Education Policy Outlook in Estonia <https://doi.org/10.1787/9d472195-en>; OECD (2019^[13]), Benchmarking Higher Education System Performance, <https://doi.org/10.1787/be5514d7-en>; Lees (2016^[41]), Estonian Education System 1990-2016: Reforms and their impact http://4liberty.eu/wp-content/uploads/2016/08/Estonian-Education-System_1990-2016.pdf (accessed on 31 January 2021).

In a broad review, De Boer and Jongbloed (2015^[43]) identified five common motivations for establishing performance agreements:

1. To encourage institutions to position themselves strategically by establishing distinct profiles and goals;
2. To establish and/or improve the strategic dialogue between the government and HEIs, often with the aim to align national and institutional agendas;
3. To incentivise HEIs to improve their performance in core areas of activity (teaching, research, outreach), or to secure minimum quality standards;
4. To increase the efficiency of the institution's activities (e.g. their completion rates or students' time to complete degrees); and
5. To increase accountability and transparency by informing policy makers and the public at large about institutions' performance.

Higher education systems have emphasised these different goals to varying degrees when designing their performance agreements. This has given rise to significant heterogeneity in the process through which agreements are established and evaluated, the indicators included and their links to funding (OECD, 2020^[12]; Bennetot Pruvot, Claeys-Kulik and Estermann, 2015^[44]). Table 7 shows key features of performance agreements in selected OECD jurisdictions. Broadly speaking, three types of performance agreements used in OECD jurisdictions can be distinguished based on their financial consequences:

- Performance agreements with links to a share of core funding: Performance agreements linked to a specified share of funding, which can be reduced or entirely withdrawn if institutions fail to reach the targets they specified in the contracts.
- Performance agreements with links to the entire core funding allocation: Agreements applying to the entire core budget, although funding reductions in case of non-compliance or under-achievement are not necessarily larger than in systems with an explicit share of core funding linked to the agreements.
- Performance agreements with no direct links to funding: Some systems require HEIs to develop performance agreements without explicitly linking their attainment to financial consequences.

Table 7. Selected OECD systems using performance agreements and key characteristics

Country	% of public core funding subject to the agreement	Selection of indicators	Duration of the agreement	Notes
Performance Agreement (PA) applies to a share of core funding >				
Ontario (Canada)	60% (planned)	6 related to skills and job outcomes, 4 related to economic and community impact (some determined by the HEI)	5 years	The share of funding subject to the performance agreement will be gradually increased.
Ireland	10%	HEIs propose targets relevant to their mission and profile in line with an overall system performance framework	3 years	Performance compacts. Failure to achieve the specified goals can lead to withholding of up to 10% of the allocated block grant.
Netherlands	3%	2012-2017: 7 standard indicators alongside qualitative plan. 2019-2024: no standard indicators	6 years	An initial system of PAs ran from 2012-2017, with a new system of “quality agreements” introduced in 2019 following an in-depth evaluation.
Denmark	1.25%	3-8 main institution-specific goals related to their mission	4 years	1.25% of core budget conditional on PA achievement. Can be reduced to zero if the targets have been less than “partially fulfilled”.
PA applies to all core funding (with possible financial consequences)				
Austria (public universities)	All core funding		3 years	Performance compacts. Development is a condition to receive public funding, but not linked to the level of funding.
No direct link between PA and funding				
Australia	0%		3 years	Performance compacts. Development is a condition to receive public funding, but not linked to the level of funding.
Finland	15% for universities, 5% for UAS		4 years	PAs specify objectives for the strategic funding (15% of total funding for universities and 5% for universities of applied science). A majority of this funding is allocated through negotiations, the results of which are recorded in agreements. There are no direct financial consequences tied to non-achievement of goals in the agreements.
North-Rhine Westphalia (Germany)	0%		2 to 4 years	“Ziel- und Leistungsvereinbarungen”
Norway	0%	Qualitative and quantitative indicators suggested and measured by HEIs	4 years	Plans to establish links between PAs and funding in the future.

Note: Based on OECD research, drawing on de Boer, H., Jongbloed, B., et al. (2015^[45]), *Performance-based Funding and Performance Agreements in Fourteen Higher Education Systems* <https://research.utwente.nl/en/publications/performance-based-funding-and-performance-agreements-in-fourteen/> (accessed on 4 January 2021).

Denmark's strategic framework contracts provide significant room for institution-specific goals and are linked to a comparatively small part of the budget

As part of its 2017 funding reform, Denmark introduced strategic framework contracts (*strategiske rammekontrakter*), with which higher education institutions need to comply to continue receiving 5% of their basic grant (corresponding to 1.25% of their overall core public funding). The four-year performance agreements are negotiated between each institution and the government's Agency for Higher Education and Science (Ministry of Higher Education and Science, 2020^[46]). The contracts typically include three to eight main goals that are institution-specific and related to their mission. The first set of framework contracts for the period 2018-21, for example, include such targets as “strengthen students' learning outcomes”, “prepare students better for the job market” or “conduct research at the highest international level” (Ministry of Higher Education and Science, 2020^[47]). In the contracts, the institutions explain what motivates their choice of goals, outline specific indicators based on which their fulfilment can be assessed and propose actions they will take to achieve them. Although the goals are linked to measurable indicators, they tend to emphasise a direction of travel rather than establishing numerical targets or benchmarks.

The fulfilment of the framework contracts is assessed annually by the Ministry, based on reports prepared by the institutions. If, after four years, the contract is judged to have been largely fulfilled, the institution will continue receiving the full sum of the performance agreement-contingent portion of the basic grant (5%). If the contract has only been partially fulfilled, the institution will receive half of the contingent grant (2.5%) and if the contract has been fulfilled to a lesser extent, it will receive none (Danish Government, 2017^[2]). Funds not paid to institutions are allocated to the “quality pool” described in Section 2, which is re-distributed to institutions to support specific government priorities, such as digitalisation.

As shown in Table 7, many OECD jurisdictions use performance agreements, typically covering a period of two to five years. Where performance agreements are linked to budgetary consequences, the share of funding dependent on their fulfilment tends to be larger than in Denmark, although it rarely exceeds 10% of total core public funding. In Ireland, up to 10% of core public funding for higher education institutions was nominally linked to achievement of objectives in institutional compacts, although financial penalties have not been applied to date (O Shea and O Hara, 2020^[48]). In Austria, performance agreements establish the objectives that universities will aim to achieve in exchange for the public funding they receive. Quantitative targets are established for teaching and research for each university, with pro-rata financial penalties possible if universities fail to meet these by more than 2% (BMBWF, 2019^[49]).

Other systems require institutions to develop performance agreements, but do not include financial penalties for failure to meet institutional targets. In Finland, performance agreements are primarily designed to agree – through negotiation between the institution and the Ministry – on specific strategic priorities that institutions will pursue in return for the dedicated “strategic funding” they receive from the government. The Finnish funding models explicitly reserved 15% of core funding to universities and 5% of core funding to universities of applied science for strategic investment. Norway uses its performance agreements exclusively as a means to foster dialogue and support institutions' strategic profiling. Although there are plans to establish links between the agreements and funding in the future, they have initially served primarily as “letters of intent”, committing an institution to reflect and concentrate on its goals and to make a serious effort to accomplish them (OECD, 2018^[35]).

Even where performance agreements are linked to financial consequences, these consequences are rarely applied automatically. Typically, budgetary consequences are mediated by expert evaluations or through discussions between institutions and public authorities that give room to consider extenuating circumstances and the reasons for institutions' under-performance. In the Netherlands between 2012 and 2017, an independent review committee consisting of five independent higher education experts evaluated whether the indicator-related goals have been achieved after the contract period, based on evidence submitted by the institutions (Jongbloed et al., 2018^[22]). In contrast, in Ontario, higher education institutions that fail to hit their targets (beyond a band of tolerance) will have their funding reduced in proportion to the

scale of their under-achievement (Ontario Ministry of Colleges and Universities, 2020^[50]). In either case, international experience shows that systems often avoid imposing financial sanctions wherever possible, especially where they might inhibit institutions' ability to improve in the future. In practice, the failure to achieve targets therefore often results in a greater focus on developing a strategic plan for future improvement (de Boer and Jongbloed, 2015^[43]).

The goals defined in performance agreements are typically described as results to be achieved, leaving it up to the institution to decide how they meet them. Objectives are often described as qualitative measures (e.g. improve equal access of men and women to senior academic positions) and may be linked to quantitative indicators (e.g. the number or proportion of female professors) (OECD, 2020^[12]). In some systems, as is the case in Denmark, institutions have considerable freedom in their choice of indicators (and targets) to be included in the performance agreements. This allows institutions to reflect on their strategic positioning, select goals that are aligned with this strategy and thereby strengthen their individual profile (Claeys-Kulik and Estermann, 2015^[32]). In Norway, for example, institutions are entirely free to select indicators and targets that they deem appropriate to their mission. As in Denmark, however, Norway's institution-specific agreements are complemented with generalised performance indicators in the main funding formula (OECD, 2018^[35]).

In other cases, such as the Netherlands' first generation of performance agreements, a set of quantitative indicators was determined by the funding authority. A centrally defined list of performance indicators can be an effective approach if the goal is to align institutions' activities with system-wide policy priorities, rather than encouraging institutional diversity. However, following an evaluation of the Dutch funding system, the new generation of "quality agreements" in the Netherlands gives institutions greater scope in determining their use of indicators (Reviewcommissie Hoger Onderwijs en Onderzoek, 2017^[51]).

Some systems have sought to strike a balance between uniformity and individualisation in the selection of indicators. In Ontario (Canada), for example, institutions can choose an appropriate institution-specific indicator to measure their "economic impact", decide how much weight they assign to each indicator and set themselves annual "allowable" targets, against which they will be assessed (Ontario Ministry of Colleges and Universities, 2020^[52]). In international comparison, with ten indicators, Ontario's system of performance agreements uses a relatively large number of parameters. More generally, countries that have worked with performance agreements for some time have tended to reduce the number of objectives to make them simpler, more concrete, and easier for the institutions to focus on (de Boer and Jongbloed, 2015^[43]).

A growing body of research has started to identify the effects of performance-based funding and suggests conditions for successful implementation

Performance-related funding has the potential to influence the behaviour of higher education institutions, strengthen accountability and encourage improving priority outcomes. While funding based on historical trends ensures a degree of financial stability for institutions, it offers no rewards for improved performance and makes it more difficult for new institutions to grow (OECD, 2020^[12]). However, the potential benefits and dynamism induced by performance funding need to be weighed against the risks involved.

An extensive literature has established that the use of performance funding at both the school and higher education levels can lead to undesired and unintended consequences (Dougherty et al., 2014^[53]; OECD, 2017^[54]; Ortagus et al., 2020^[55]). It can induce risk-avoiding behaviour, exacerbate existing imbalances in the distribution of resources and set perverse incentives unless its distribution mechanisms are designed with great care (Dougherty and Natow, 2019^[56]). Independent of the mechanisms used to allocate performance funding, there are some general principles that experience has shown to matter for its successful implementation:

1. **Link an appropriate amount of funding to performance indicators:** Linking too much funding to specific performance indicators can encourage institutions to focus on narrow targets and measurable outputs, rather than the broader concept of institutional performance that they are intended to reflect (European Commission, 2017^[57]). It also makes it harder for institutions to plan ahead and risks inflicting a financial strain on institutions that fail to meet their performance objectives. This may further diminish these institutions' capacity to meet their objectives in the future, thus entrapping them in a vicious circle of diminishing performance. By contrast, if the amount of funding linked to performance indicators is too small, they are unlikely to incentivise institutional responses in line with policy objectives. Although convincing causal evidence on the effects of performance funding is rare, a modest amount of performance funding may suffice to draw attention to output measures and provide institutions with an incentive to improve educational quality (OECD, 2017^[54]). It has been suggested that the level of performance-related funding should be set at a level such that institutions do not depend on it to cover most of their cost of delivery (OECD, 2020^[12]).

Table 8 provides an overview of the amount of core education funding that selected OECD jurisdictions allocate to institutions based on different types of indicators. Compared to other countries, Denmark allocates a relatively large proportion of higher education funding based on performance indicators. Output criteria, in particular, account for nearly 70% of overall funding (67.5% of funding is allocated based on students credits completed and 1.25% based on students' completion time). By contrast, the historically determined proportion of funding is relatively low, accounting for only 22.5% in Denmark, compared to 80% in Estonia and 68% in Norway.

Table 8. Proportion of core public education funding allocated by indicator type (selected systems)

Country		Input / activity	Output	Outcome / other performance	Historical
Denmark		0%	67.5% (credits passed) + 3.75% (results grant – study duration)	3.75% (results grant – graduate employment rate) + 2.5% (performance component of basic grant)	22.5% (guaranteed basic grant)
Estonia		0%	~6% (output performance indicators)	11% (other performance indicators) + 3% (performance agreement)	80%
Norway		0%	~27% (performance indicators)	~5% (performance indicators)	68%
Flemish Community of Belgium	Universities	32% (enrolled credits)	68% (output – credits passed & diplomas)	0%	0%
	Professional programmes in university colleges*	47% (enrolled credits)	53% (output – credits passed & diplomas)	0%	0%
Ireland		100%	0%	10% of core grant linked to institutional compacts	0%
Finland	Universities	0%	83%	17%	0%
	Universities of applied science	0%	88%	12%	0%

2. **Allow for sufficient differentiation between institutions' different missions and goals:** Performance indicators should be adapted to the missions of different types of institutions. For example, targets using indicators that reward student progression and completion (such as credits passed or degrees awarded) need to take into account the level of selection on entry and the student profile in different types of institution. Systems that apply uniform measures risk unfairly penalising institutions that cater to large numbers of students from non-traditional backgrounds,

who face greater challenges in progressing swiftly in their studies and completing programmes (Frølich, 2011^[58]; Guthrie and Neumann, 2007^[59]).

3. **Ensure sufficient stability in funding and the selection of indicators:** Institutional responses to performance funding are likely to be most effective if performance indicators are stable and if the financial consequences of performance-related funding are clearly and transparently specified in advance (Dougherty et al., 2016^[60]). The level of performance-related funding should not be set at a level that would endanger the continued operation of institutions in the event of poor performance (OECD, 2020^[12]). Analysts also caution against using indicators over which institutions have little influence, such as unadjusted graduate employment rates, which are subject to wider economic trends (Claeys-Kulik and Estermann, 2015^[32]).
4. **Provide institutions with sufficient autonomy and capacity:** For performance-related funding to have the desired effect, higher education institutions need to have sufficient institutional autonomy to manage their resources effectively in line with their strategic priorities and objectives. This concerns their degree of autonomy over academic, organisational and staffing matters as well as autonomy over their use of financial resources. Among European higher education institutions, the majority of universities, including those in Denmark, are given significant discretion to use their block grant according to their own priorities and reallocate funding internally (Claeys-Kulik and Estermann, 2015^[32]). Another obstacle that may prevent institutions from responding effectively to performance incentives is their insufficient organisational capacity, including the lack of fine-grained student data or the ability to analyse it (Dougherty et al., 2014^[53]).
5. **Keep incentive structures parsimonious and well aligned:** Although tying a large proportion of funding to a few narrow indicators risks narrowing institutions' focus excessively, there is also a risk in using too many different performance indicators or performance-related allocation mechanisms. Adding complexity to a funding system can undermine the power of any one indicator to influence institutions' behaviour effectively. When funding is linked to multiple variables, it can be difficult for staff and institutions to identify a clear link between activities, outputs and the level of funding they receive. Experience has shown that incentives are more powerful if they allow institutions to focus on a few key areas of improvement, rather than to raise performance across the board of all desirable outcomes.

Evidence on the effect of output- and outcome-based funding formulas is mixed

The empirical evidence on the impact of performance-based funding formulas is decidedly mixed and much of it is limited to the United States. Evaluations of performance-funding systems in US states including Pennsylvania, Tennessee, and Ohio mostly suggest that they have failed to improve student completion and graduation rates at four-year institutions (Ortagus et al., 2020^[55]). Similar results were obtained for two-year institutions in Tennessee (Li, 2018^[31]; Li and Ortagus, 2019^[61]), although community colleges in Washington were shown to have issued more short-term certificates following a reform, pointing to potential unintended consequences of incentivising degree completion (Hillman, Tandberg and Fryar, 2015^[62]).

While the impact of performance funding on degree completion may be limited, some studies in the United States found more encouraging impacts on instructional practices and other policies and services aimed to improve their students' academic experience (Li, 2018^[31]). Some institutions undertook efforts to improve their course articulation, to intensify student counselling and orientation services, reduce the number of excess credit hours required for a credential (Dougherty et al., 2016^[60]; Jongbloed and Vossensteyn, 2016^[33]) or invest in their data analytics and academic advising services (OECD, 2020^[12]). Although these changing practices may not have been sufficient to improve degree completion, they do suggest that institutions respond to incentives in some cases (Li, 2018^[31]).

Fewer studies have investigated the impact of funding formulas in European systems, although the evidence that exists suggests a similarly limited impact. A study in Denmark found the completion-oriented taximeter system to have had a mixed impact completion rates. At the Copenhagen Business School, for example, implementation a supplementary government grant related to completion (*færdiggørelsestaxameter*) was followed by an increase in completion rates at the bachelor's level, but a reduction at the master's level (Claeys-Kulik and Estermann, 2015^[32]). Likewise, an evaluation of different performance-based funding formulas in German federal states between 2000 and 2008 found that their introduction was rarely followed by significant changes in the outcomes they were meant to incentivise, casting doubt on their efficacy, not least given the cost of their implementation. By contrast, mandating institutions to produce internal “objective agreements” (*Zielvereinbarungen*) was associated with increases in third party funding and, in the case of universities of applied science, improved graduation rates (Dohmen, 2016^[63]). As noted above, performance-related indicators in funding formulas may also have more indirect benefits, such as raising awareness of performance outcomes or improving data collection and monitoring efforts at the level of institutions, although such impacts are hard to measure.

System-wide performance indicators can focus institutions' attention on specific outcomes, but evidence on their impact is limited

Any choice of funding indicators carries the risk of producing perverse incentives. As noted, output-related indicators like completion rates, for example, may encourage institutions to focus on improving student retention. However, rewarding high graduation rates could also incentivise institutions to seek out students assumed to have higher academic ability (a practice known as “cream-skimming”), which may limit access for under-represented populations. In the United States, Ohio and Washington responded to this challenge by allocating additional funding to institutions that serve at-risk or underserved students. Similar, albeit less explicit, mechanisms are built into funding systems in some European jurisdictions that use output variables, such the additional weighting for students from non-traditional learner groups in the Irish and Flemish allocation models. Likewise, linking funding to employment outcomes may incentivise institutions to cut programmes that are socially important but do not lead to high earnings or to focus on the placement of graduates irrespective of their suitability for the available jobs. To mitigate these risks, it is important to look beyond employment rates and take into account the type of employment graduates obtain (OECD, 2020^[64]).

Besides these general risks associated with indicator-based funding, using uniform performance indicators for the whole system can promote homogenisation by incentivising all institutions to focus on the same goals (Codling and Meek, 2006^[65]). In Denmark, the risk of homogenisation arising from the uniform application of criteria in the results grant is attenuated by institutions' ability to negotiate individualised targets in their strategic framework contracts. The specific system-wide indicators that Denmark uses to allocate performance funding – completion time, employment outcomes and survey results on the student learning experience – are not widely used in other OECD jurisdictions and little evidence is available on their effects. A concern commonly raised around the use of graduate employment rates is whether institutions have sufficient control over the outcome, i.e. whether students' labour market outcomes are a fair reflection of individual institutions' performance (Jongbloed and Vossensteyn, 2016^[33]). This concern may be particularly pertinent where institutions have little autonomy over their course offer or where the application of indicators fails to account for economic circumstances beyond the institutions' control that may have an adverse impact on students' labour market outcomes.

Student surveys have been used as basis for performance funding in a number of US states, as well as in Finland, whose LEARN survey served as an inspiration for the Danish Learning Barometer (de Boer et al., 2015^[45]). In a context where the measurement of higher education learning outcomes is still under-developed (Van Damme, 2015^[66]), asking students about their learning experience and satisfaction may be a practical way to get closer to measuring the quality of education. A number of countries use student surveys to measure the student learning experience, including the National Survey of Student Engagement

(NSSE) in the United States and Canada, the National Student Survey (NSS) in the United Kingdom, the Student Experience Survey (SES) in Australia, and the Eurostudent survey, conducted by 25 to 30 participating European countries (OECD, 2019^[67]). However, the results of these surveys are primarily used to generate information about students' experience and draw institutions' attention to quality issues, rather than directly affecting the resources that they receive. To ensure that students' responses are representative, countries may analyse results for potential sources of non-response bias and take measures to encourage a high level of participation (e.g. the United Kingdom's NSS only publishes results for universities with at least ten respondents per course and an overall response rate of 50% or above).

Performance agreements can constitute an effective steering tool and provide a basis for strategic dialogue between institutions and authorities if certain conditions are met

The literature suggests that performance agreements can strengthen the relationship between the higher education sector and public authorities and can have a positive effect on strategic thinking and focus on results in institutions. Following the introduction of performance agreements in Finland, observers reported an increased attention to cost and performance among universities and in North-Rhine Westphalia (Germany), performance agreements were assessed to have improved internal university decision-making (de Boer et al., 2015^[45]). Nevertheless, experiences vary across countries and causal effects are hard to establish since the introduction of performance agreements has tended to go hand in hand with other policy changes and developments (Higher Education and Research Review Committee, 2017^[68]).

There is no consensus on the amount of funding that should be attached to performance agreements and the answer likely depends on the context in which the performance agreements are implemented. In general, the literature on higher education funding suggests that even relatively small financial incentives (in the magnitude of two to five per cent of public funding) can lead to changes in institutional behaviour. Conversely, systems may wish to avoid performance budgets of a magnitude that could threaten the financial position of underperforming institutions, cause significant year-on-year fluctuations, or lead to an excessively narrow focus on the incentivised objectives (de Boer and Jongbloed, 2015^[43]). Even large financial incentives may fail to bring about the desired behavioural changes if the indicators and their consequences are poorly understood or too complex.

The experience of some countries, such as Australia and Germany, suggests that performance agreements are taken more seriously by all parties involved if they are combined with some financial incentive (Higher Education and Research Review Committee, 2017^[68]). However, countries that primarily view the agreements as a means to establish a strategic dialogue and to align national and institutional agendas may be better served by agreements without a link to funding (de Boer and Jongbloed, 2015^[43]). Regardless of their design, an important factor for the success of any institutional agreement is that their establishment or negotiation involves a real dialogue between universities and their funding authority and that the two engage in the process as equal partners (Claeys-Kulik and Estermann, 2015^[32]).

The use and selection of indicators are other key aspects in the design of performance agreements. Some systems that previously emphasised standardised indicators have moved away from uniformity to give institutions more choice in selecting indicators that are aligned with their profiles. The Netherlands, for example, reformed their institutional agreements in 2017 to give institutions greater choice in the selection of objectives and related measures of success, after an evaluation pointed to the risk of homogenisation arising from the exclusive reliance on generic indicators (Leest et al., 2017^[69]). Another approach to balancing standardisation and individualisation was chosen in Ontario (Canada), where performance indicators are centrally defined, but institutions negotiate which weight to assign to them and which targets they will be measured against.

Analysis of existing systems of performance agreements note that systems can generate significant costs and reporting burdens (Jongbloed and Vossensteyn, 2016^[33]). Depending on the nature of the targets, the procedures for assessing their achievement may require institutions to strengthen their capacity to collect

and analyse data on specific indicators while for others, the evaluation may occur in the context of discussions between public authorities and the institution. Performance contracts typically require institutions to report regularly on their progress towards agreed goals through annual reporting and to devise remedial strategies in case they are not on track to meet their targets (OECD, 2020^[12]; Bennetot Pruvot, Claeys-Kulik and Estermann, 2015^[44]). If performance agreements are not directly linked to financial consequences, the reporting of results and structured dialogue with public authorities may take a more central role as a means to foster accountability and transparency in the performance agreement process.

Key points for Denmark

- In comparison to most other OECD jurisdictions, Denmark's model for funding higher education institutions allocates a relatively high proportion of total public funding based on output and outcome indicators. Among comparable European higher education systems that use funding formulas, most include enrolment (input) parameters and only Finland appears to allocate a higher proportion of education funding based on outputs than Denmark. The introduction of the larger fixed component (the basic grant) in the new Danish model reduces the emphasis placed on output (credit completion) and, in combination with other policy instruments such as the strategic framework agreements, arguably creates more space than the previous Danish system for strategic planning and a focus on other objectives of higher education.
- Denmark uses multiple mechanisms and indicators to incentivise performance and has introduced indicators designed to measure the quality and relevance of instruction that are used in very few comparable systems. This limits the scope for Denmark to learn directly from other systems in this respect. It will be important to monitor carefully the effects of these experiments with new indicators and results will be of interest to other OECD jurisdictions.
- The comparatively large number of performance-related parameters, attached to different components of the funding model, adds complexity to the system. This can theoretically make the system - and the different incentives it seeks to create - more difficult for institutions and their staff to interpret and may risk diluting the power of individual parameters to influence institutional and staff behaviour. Here again, careful monitoring of the effects of the different elements of the new system on institutional behaviour, outputs and outcomes will be important as a basis for future refinement of the funding model.
- The system of strategic framework contracts in Denmark is similar to those used in a number of other OECD jurisdictions in that it is primarily a tool to promote results orientation and accountability in higher education institutions, rather than a funding instrument as such. In common with other systems, such as Ireland, the Netherlands and Austria, payment of a small proportion of public funding for institutions in the Danish funding model is made dependent on the achievement of objectives in institutional performance agreements. International experience has shown that linking financial consequences to performance agreements is politically contentious and can be challenging for authorities to put into practice. Here again, other OECD jurisdictions will benefit from Denmark's experience as the new system beds in.

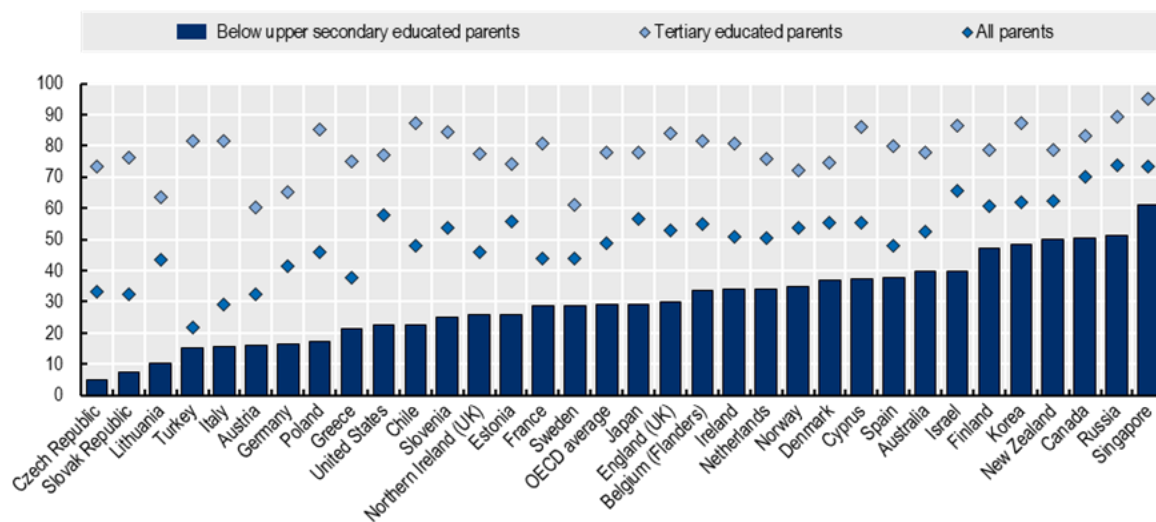
3.2 Promoting social equity through institutional funding

OECD countries use a variety of funding strategies to support access to higher education for under-represented groups

Across OECD member countries, access to higher education remains unequal. Despite the significant expansion of higher education, children of parents without a higher education qualification are, on average in OECD countries, still between 40% and 60% less likely to enter a bachelor's level programme than their peers with highly educated parents. Likewise, 18-24 year-olds whose parents are foreign-born are between 10% and 60% less likely to enter a bachelor's level programme than young people with parents born in their country of residence (OECD, 2019^[13]). Although intergenerational mobility in Denmark is above the OECD average according to some measures, access to higher education is still shaped by parental attainment. As shown in Figure 9, the OECD Survey of Adult Skills (PIAAC) found that only 37% of 25-44 year-olds in Denmark with parents who had not completed upper secondary education had entered higher education, compared to 75% of those with tertiary-educated parents (Borgonovi and Marconi, 2020^[70]). Socio-economically disadvantaged children in Denmark are also less likely to aspire to entering higher education, even if their performance in school would enable them to succeed. In the 2018 PISA survey, 26% of Denmark's top-performing 15-year-olds from a disadvantaged socio-economic background did not expect to complete higher education, compared to only 13% of students from better-off backgrounds with a similar performance. In contrast, immigrant students have, on average, higher educational aspirations than their peers (OECD, 2019, pp. 20, Table II.2^[71]).

Figure 9. Intergenerational educational mobility (2012 and 2015)

Proportion of 25-44 year-olds who have entered higher education at least once in their life (independent of completion) by parental education attainment



Note: Countries are ranked in ascending order of the share of the HE access rate of 25-44 year-olds without parents with HE attainment.

Source: Borgonovi & Marconi (2020^[70]) "Inequality in higher education: Why did expanding access not reduce skill inequality?", Open Education Studies, Vol. 2/1, pp. 312-343, <http://dx.doi.org/10.1515/edu-2020-0110>.

The mechanisms driving differences in students' access to higher education, whether related to socio-economic background or other factors, such as disability or childcare responsibilities, are complex. As a result, OECD countries have used a variety of strategies to support equity in higher education. Typically, these have included governments requiring or encouraging higher education institutions to address equity

issues through admissions policies, the recognition of prior learning, the provision of higher education in underserved and remote areas or by making special arrangements for students with specific needs (OECD, 2019^[13]). The funding of students and institution are also important levers for promoting equity in higher education. Broadly speaking, OECD countries have used funding mechanisms to pursue this goal in four main ways:

- **Financial support to students:** Financial support to families and students for whom the cost of higher education might constitute a barrier to entry is frequently provided through means-tested grants or, in some jurisdictions, including Australia, Hungary, the Netherlands or the United Kingdom, through publicly supported loan systems. In Denmark, Norway and Sweden, domestic students are typically eligible for grants and public loans.
- **Institutional funding through student weightings:** Some OECD jurisdictions complement student financial support with weightings in their institutional funding formulas to provide additional resources for students enrolled from disadvantaged population groups.
- **Institutional funding for specific equity initiatives:** Institutions can be provided with targeted funding in the form of earmarked grants that explicitly support initiatives benefiting under-represented student groups or increasing their enrolment.
- **Institutional performance agreements with financial consequences:** Equity targets can be included in performance agreements whose fulfilment may be linked to budgetary consequences.

Table 9 provides an overview of the use of these mechanisms in selected OECD jurisdictions.

Table 9. Main funding mechanisms to promote equity in selected OECD jurisdictions

Jurisdiction	Student funding (e.g. means-tested or universal grants)	Student weights in institutional funding formulas	Institutional funding for equity initiatives	Performance agreements with equity targets
Denmark	✓			
Norway	✓			
Sweden	✓			
Flemish Community of Belgium	✓	✓		
New Zealand	✓	✓		
Ireland	✓	✓	✓	✓
Virginia (US)	✓		✓	
Australia	✓			✓

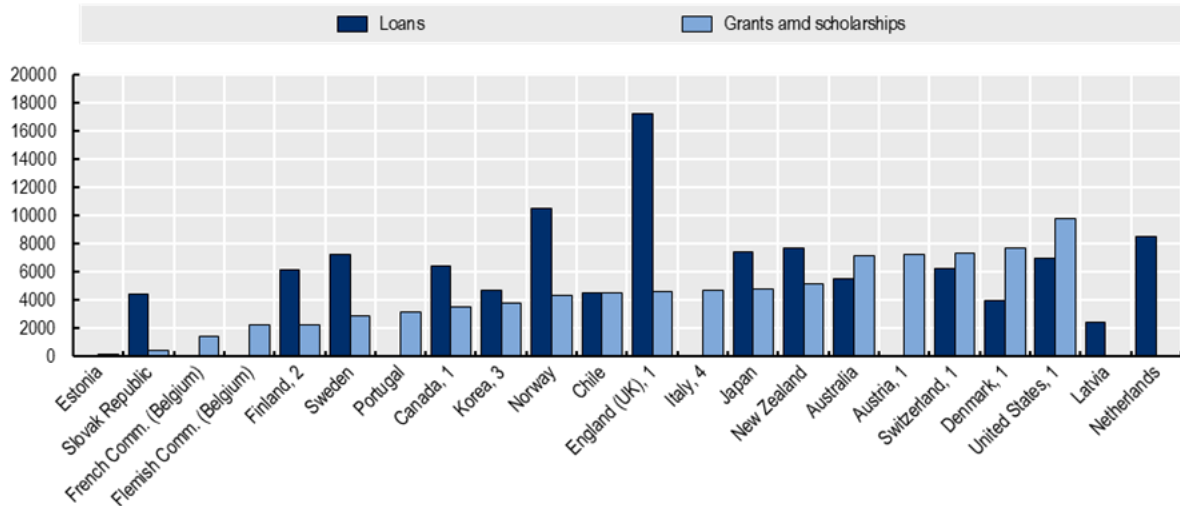
The Danish system relies primarily on student funding to promote social equity

As is typical in the Nordic countries, students in Denmark do not pay tuition fees for bachelor's degrees in public institutions (the same goes for EU/EEA and exchange students). This is the case in about a third of OECD jurisdictions (OECD, 2020^[11]). While free tuition alone does not guarantee universal and equitable access (OECD, 2019^[67]), students in Denmark also have access to financial aid, primarily in the form of grants, which help them cover their living costs. Like in Sweden and Norway, more than 80% of students in Denmark benefit from loans, grants or a combination of both (OECD, 2019, pp. 329, Table C5.2^[67]). In the academic year 2016/17, Danish tertiary students received on average USD 7 674 in grants, the highest average sum among OECD jurisdictions, after Austria and the United States. By contrast, the average amount of loans (USD 4 021) received by students in tertiary education was on the lower end of the scale among OECD jurisdictions that provide such support (see Figure 10). Unlike in most OECD countries, all full-time students in Denmark are entitled to a number of monthly grants that depends on the duration of their course, irrespective of their family income. Eligibility is subject to a threshold for students' private

earnings and adjusted for students living with their parents. In addition, as explain in **Error! Reference source not found.**, beneficiaries of grants are eligible for complementary loans (OECD, 2020, pp. 335, Table C5.3₍₁₎).

Figure 10. Average annual public grants/scholarships and loans received by tertiary students (2017/18)

In USD converted using PPPs



Notes: 1. Year of reference 2016/17 instead of 2017/18. 2. Government-guaranteed private loans instead of public loans. 3. Year of reference 2018 instead of 2017/18. 4. First- and second-cycle degrees only. Countries and economies are ranked in ascending order of the average annual amount of grants received by tertiary students.

Source: OECD (2020) *Education at a Glance 2020: OECD Indicators*, Figure C5.5, Table C5.3, <https://doi.org/10.1787/69096873-en>.

Box 5. Student financial support in Denmark

Eligible domestic students in Denmark benefit from a system of State Educational Grants (*Statens Uddannelsesstøtte*, SU) and Loans (*SU-lån*). Danish and foreign students meeting specific residency requirements who are enrolled in a full degree programme are entitled to monthly grants for the prescribed duration of their study programme. Students who enrol in higher education within two years of passing examinations qualifying them to access higher education are eligible to receive grants for an additional 12-month period. Students can switch degree programmes and continue receiving grants for up to a maximum of 70 months. The grant amount is reduced by 20% for students living with their parents. Students whose private earnings exceed a certain threshold in a given year have part of their grants transformed into loans. Loans can amount to just over half the value of grant support and are available for students who do not live at home with their parents. Loans must be repaid within 7-15 years at an interest rate determined by Parliament. Students must start paying back their loans no later than one year after the end of the year of their graduation or termination of their studies.

In 2016, over 493 000 students benefited from the SU system with an annual budget of DKR 24.4 billion (1 per cent of Gross National Product). In light of the high cost of the system, an independent expert committee was assembled in 2019 to identify recommendations for the reform of the SU, taking into account possible effects on students' educational choices, study time, drop-out, educational quality and social mobility. At the time of writing, the committee has not yet delivered specific reform proposals.

Sources: OECD (2020^[72]), "Education Policy Outlook in Denmark" <https://doi.org/10.1787/3288629c-en>; Danish Ministry of Higher Education and Science (2019^[73]), *State Educational Grant and Loan Scheme (SU and SU-lån)*, <https://www.su.dk/english/state-educational-grant-and-loan-scheme-su/> (accessed on 15 January 2021).

Some other OECD system use weightings in their funding formulas to promote equity

A number of OECD jurisdictions, including New Zealand, the Flemish Community of Belgium and Ireland, have sought to promote equity in the access to higher education by providing institutions with additional funding when they enrol students from designated target population groups. Targeted student weightings in funding formulas or separate indicators can, in theory, provide incentives for institutions to recruit students from non-traditional groups and compensate them for the additional costs often associated with educating such students (OECD, 2020^[12]; Dougherty et al., 2016^[60]). The OECD Higher Education Policy Survey on resourcing indicates that around a third of the 27 participating jurisdictions use either additional weightings or indicators in their funding formulas to provide additional resources to institutions that recruit students from specific target groups.

The funding system for higher education institutions in Ireland, for example, applies a multiplier of 1.33 for each enrolled student from one of four nationally determined "access groups". Three of these groups correspond to populations that have historically been under-represented in Irish higher education: those from low-income backgrounds, disabled people, and those from a traveller background. The fourth group are mature first-time adult learners, a group that the government wishes to support in accessing tertiary education. In 2020, approximately EUR 42 million of core funding was allocated to higher education institutions based on these access metrics.

Likewise, the Flemish Community of Belgium's funding formula applies an additional weighting of 0.5 to the funding points it assigns for students from three target groups. These are students who receive a means-tested grant, those who classify as disabled or special-needs students or those who combine work and study. The Flemish funding model uses both input and output indicators. The formula allocates funding points for the number of credits for which students are enrolled, the number of credits they actually pass

and the number of degrees awarded. Assigning weights to the credits and degrees obtained by students from target populations, rather than just their enrolment, can be a means to incentivise not only greater access among less prepared students, but also their continued support and successful progression.

Targeted institutional grants can also be used to support equity goals

Another means to incentivise the enrolment of specific student groups is through targeted institutional funding in the form grants earmarked for social inclusion goals. In the period of 2015-20, around half of OECD jurisdictions responding to the OECD Higher Education Policy Survey reported that they provide higher education institutions with targeted funding for equity initiatives. In Ireland, for example, institutions are required to spend part of their block grant on initiatives to widen access for disadvantaged socio-economic groups (OECD, 2019^[13]). Likewise, many US states, such as Virginia, provide institutions with earmarked funding to be used for student aid, mainly for eligible students to cover the cost of tuition and mandatory fees. From 2008 to 2014, the Flemish Community of Belgium provided higher education institutions with funding for initiatives that increased the entry, progression and completion rate of students from under-represented groups. However, the funding programme was terminated after an evaluation found that it imposed a high administrative burden on institutions. Since then, the programme's resources have been included in the general budget for the operating grants to institutions (OECD, 2019^[13]).

Inclusion and equity objectives are also embedded in performance agreements and non-binding targets in some systems

Some OECD systems include goals related to equity in their performance agreements with higher education institutions and some may, in theory at least, impose financial consequences if institutions fail to attain these goals. As noted earlier in this brief, such financial consequences are rarely applied in practice. In Ireland, institutions are required to include performance indicators and quantitative targets related to the system-wide objective of promoting access for disadvantaged groups in their performance compacts (de Boer et al., 2015^[45]). Other systems require institutions to commit to equity objectives as a steering tool, without linking them to financial consequences. The Australian performance compacts, for example, include mandatory indicators on the representation of those of aboriginal origin among enrolled and graduating students, as well as professional and academic staff. They also include targets concerning the proportion of undergraduates from a low-income backgrounds and other under-represented groups (de Boer et al., 2015^[45]). Similarly, higher education institutions in England are expected to develop access and participation plans that set out how they will improve equal opportunities for under-represented groups. Universities and colleges set their own targets working towards national targets set by the Office for Students (OfS) and addressing areas where there are specific gaps in equality of opportunity in their own organisation. The first plans will be in force from 2020-21.

Key points for Denmark

- Denmark's approach to promoting social inclusion in higher education, in common with that in other Nordic countries, reflects its Universalist welfare policies. The Danish welfare model seeks to ensure all citizens are able to access and succeed in education, without financial concerns becoming an impediment. In higher education, this approach is manifested in the universal grant and loan system and a generally lower emphasis on means-tested or targeted funding to support social inclusion than in many other OECD jurisdictions.
- Denmark does include some provisions in its institutional funding model that aim to mitigate the risk of perverse incentives that could harm equity. Notably, the design of the results grant - that is linked to study duration - allows supplementary time for students with legitimate reasons for prolonging their studies, including students with special needs or students taking maternity leave.
- Nevertheless, higher education institutions in Denmark, as in other OECD member countries, have an important role in supporting access and completion for students from non-traditional backgrounds, who typically face many non-financial barriers to study success. Although it is understood that specific initiatives to support students from non-traditional backgrounds are widespread at programme and faculty level, there may be scope to include more priorities related to enhancing social inclusion in future generations for the strategic framework agreements.

3.3 Using funding to steer the regional presence of higher education offerings

Funding mechanisms can influence the regional presence of higher education institutions, with implications for access and local economic development

There are multiple reasons why countries might wish to encourage the even distribution of higher education institutions across their territories. It provides students with access to higher education without having to move to a different region and might be a means to reduce the permanent out-migration of young talent from more remote areas (Hanssen and Mathisen, 2018^[74]). In addition, since the 1990s, higher education institutions have increasingly been recognised for their role in the knowledge economy and as part of regional innovation systems (Arbo and Benneworth, 2007^[75]). In many areas, institutions also act as major employers and attract considerable volumes of external productive investment. Higher education institutions can thus directly contribute to increasing productivity in the local economy (OECD, 2016^[76]) and have an indirect impact on the formation of human capital, the pool of knowledge and the attractiveness of a local area (OECD, 2019^[13]; OECD, 2007^[77]).

Ensuring the regional coverage of higher education institutions and giving students in all parts of the country access to higher education poses several challenges for policy makers. One of them is to assess the financial constraints inhibiting a geographically decentralised supply of higher education and devising strategies to surmount them. Higher education institutions in remote areas may face higher costs for procuring services or operating expenditures due to their small size and inability to benefit from economies of scale. They also do not benefit from the network effects generated in urban areas with a high density of institutions and may have greater difficulty attracting students and faculty.

Danish University Colleges have argued that smaller institutions face significantly higher expenses, suggesting that the annual cost of educating prospective teachers and nurses in a small town exceeds that in larger cities by 35 to 50% (Dansk Magisterforening, 2019^[78]). A 2016 study of cost drivers in Australian higher education found universities located outside major urban centres faced slightly higher unit costs,

which it attributed in part to the higher proportions on non-traditional students they served. The study also found costs to be slightly higher in smaller institutions, which suggests there may be some scale efficiencies in larger institutions, but the study noted this could also be due to the smaller classes found in many small institutions (Deloitte Access Economics, 2016_[11]).

To help higher education institutions in remote or underserved areas overcome these barriers and expand the regional provision of higher education, some governments have provided additional resources to institutions in remote areas, created incentives to set up new institutions, or supported existing institutions in expanding their offer to remote areas via local campuses. In OECD jurisdictions, this financial support has usually taken one of the following two forms:

- **One-off project-based or capital funding:** Targeted project-based funding has been a common way for OECD jurisdictions to support the establishment of decentralised education offers and promote the regionalisation of the higher education. This funding tends to be allocated outside the system's main funding mechanisms, usually covers a limited time and is sometimes tied to capital projects.
- **Regular core public funding for decentralised provision:** Some systems have integrated financial support for the decentralised provision of higher education into their main funding mechanisms, making it a structural feature of the system. This can take the form of indicators or weights in their core public funding formulas or separate funding streams. The funding may be allocated to specific regions or support institutions in underserved areas more indirectly, for example, based on their size.

Denmark places a strong emphasis on providing equal educational opportunities to students in all parts of the country and the new government's legislative programme for 2020/21 includes a commitment to "better education opportunities outside the big cities" (Danish Government, 2020_[79]). To promote the decentralisation of higher education, the Danish Government has used several funding levers both inside and outside of its main funding allocation mechanism in the recent past.

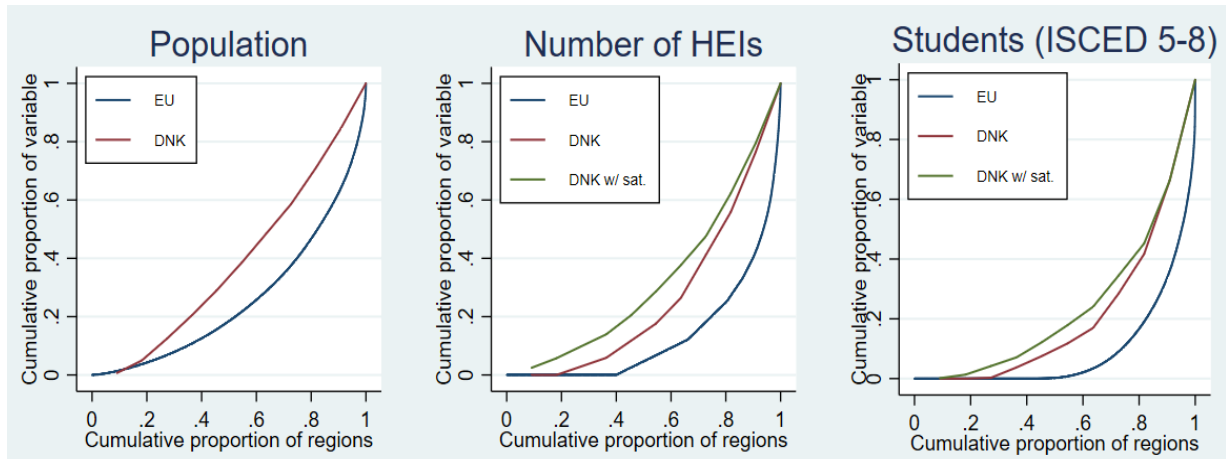
Denmark's diverse network of non-university institutions and satellite campuses contribute to a relatively even geographic distribution of higher education. In 2020, all but two of the 11 Danish provinces (*Landsdele*) were home to the main seat of at least one higher education institution under the authority of the Ministry of Higher Education and Science. The remaining two provinces – the remote island Bornholm and North Zealand – were served by satellite campuses. As in a number of European economies (including Finland, Ireland, the Flemish Community of Belgium and Portugal), the non-university sector plays an important role in extending the regional coverage of the higher education network in Denmark beyond the six provinces hosting a main university campus (Bonaccorsi and Lepori, 2019_[80]).

Figure 11 compares the distribution of higher education institutions and students across regions in Denmark and the EU as a whole. The curves show the cumulative distribution of the general population, the number of HEIs and students across NUTS 3 regions (corresponding to the provinces in Denmark). The straighter the curves (i.e. the less convex), the more even the distribution. Both higher education institutions' main campuses and students are more evenly distributed across Denmark's provinces than is the case across EU regions overall (indicated by the relative straightness of the red Danish curves in the centre and right panels of Figure 11). This might be expected, given that Denmark's population is more evenly distributed across its provinces than is the case for the EU as a whole (as indicated by the relatively straight line in the left panel of Figure 11). At the same time, the main campuses of many higher education institutions are located in Denmark's metropolitan areas and, in 2020, seven of 34 institutions' main campuses were situated in Copenhagen City.

Nevertheless, in Denmark, as in other European countries, the creation of satellite campuses and multi-site institutions has expanded the geographic coverage of higher education. The green line in the centre panel of Figure 11 shows that the regional distribution of HEIs becomes more even if all institutional sites (including both main campuses and satellites) are included in the count. The right panel also shows that

students are more evenly distributed if those studying in satellite campuses are assigned to the local and satellite campuses where they actually study, rather than to the locations of their institutions' main campuses.

Figure 11. Regional distribution of higher education institutions and students by NUTS 3 region



Note: Reference year for population data (EU and Denmark) is 2019. Reference year for HEIs and students is 2016 for EU and 2020 for Denmark. The green lines for Denmark (“DNK w/ sat.”) count both main campuses and satellite campuses as HEIs and assign all students to the campus in which they are enrolled. The data for the EU and the red lines for Denmark (“DNK”) only count main campuses as HEIs and assign all students enrolled in satellite campuses to their institutions’ main campus. The green line for Denmark is thus not directly comparable to the EU-wide values.

Source: Based on data from the European Tertiary Education Register (ETER), adapted from Bonaccorsi, A. and B. Lepori (2019^[80]), *ETER Analytical Report: The Regional Structure of European Higher Education*, https://www.eter-project.com/uploads/analytical-reports/ETER_AnalyticalReport_04_final.pdf (accessed on 6 October 2020); Additional data provided by the Danish Ministry of Higher Education and Science.

In 2016, 14 of the 33 Danish HEIs (42%) covered by the ETER database were multi-site institutions, which is the highest proportion observed among countries with available data. Across Europe, 22% of universities and 29% of universities of applied science have a satellite campus in another NUTS 3 region (Bonaccorsi and Lepori, 2019^[80]). Finland and Belgium are other examples of OECD jurisdictions with an extensive network of satellite campuses. In Finland, about half of the multi-site HEIs have their main campus in the capital city and satellites in other regions. In both Belgium and Denmark, the majority of multi-site institutions are based outside the capital region and while a few of them established satellites in the capital city, many of them have regional satellites in other parts of the country.²

Additional core public funding is provided in Denmark for decentralised provision

In recent years, Danish higher education policy has sought to increase opportunities for students to follow higher education programmes outside the four main university cities of Greater Copenhagen, Odense, Aarhus and Aalborg (Danish Government, 2017^[2]). Under the new funding model introduced in 2019, higher education institutions that – in addition to their main campus – offer “decentralised educational provision” at campuses outside the main cities received DKK 2.1 million (around EUR 310 000) annually for each decentralised campus, for up to six campuses (see Figure 1). Following a review of the system, a political agreement was reached in 2021 that increased the payment for each satellite campus to DKK 4 million (around EUR 540 000) and removed the limit on the number of satellite campuses for which each institution can receive funding. Campuses on Bornholm are excluded from the subsidy, since they

² Aarhus University has a campus in Copenhagen, the University of Southern Denmark has a campus Slagelse, Aalborg University has campuses in Esbjerg and Copenhagen, University College Copenhagen has a campus in Aarhus and Dania Academy has a campus in Hobro (ETER Database, 2016).

receive funding through a separate stream to cover the costs associated with educational provision on the island (Ministry of Finance, 2020^[6]). In addition, the same political agreement approved a progressive increase in the rate of the main activity grant (see Box 1) for all higher education institutions located outside the four core cities.

One-off project-based or capital funding is also used in OECD jurisdictions to support regional campuses

There are few examples of OECD jurisdictions explicitly taking into account institutions' location when determining the resources they receive through a funding formula. In the OECD Higher Education Policy Survey on resourcing, only Austria, Chile and Italy reported doing so. There are also other, more indirect, ways in which funding formulas can address the resource challenges that higher education institutions in remote or structurally disadvantaged areas experience. For example, funding formulas might take into account the institutions' size in order to offset the financial losses that small institutions might incur due to their lack of economies of scale. The base component of the funding model used in the Flemish Community of Belgium, for example, uses weightings linked to enrolment metrics (enrolled credits) that decrease with total enrolment, providing proportionally higher funding to smaller institutions.

There are several examples of OECD jurisdictions providing various forms of targeted funding to expand the higher education offer to underserved communities, often focusing on the provision of hybrid learning solutions or outreach to potential students:

- In **Sweden**, more than 200 “municipal learning centres” have been established since the 1990s. The learning centres offer teaching via video conference equipment, allowing students in remote areas and their mentors to meet physically in a learning centre and communicate synchronously with a teacher and other students in an accredited higher education institution. The learning centres were originally established using European Union Structural Funds. Now these funds are no longer available and the learning centres use a variety of funding models that vary from municipality to municipality (Gynther et al., 2019^[81]).
- In **Norway**, study centres (*studiesenter*) are small coordinating units whose main task is to facilitate education and skills development in their region. They have no permanent educational offer and mostly provide access to continuing and further education e-learning courses. They rely on collaboration between universities and university colleges, a national coordination department (*studiesenteret.no AS*), and municipally owned study centres. The study centres are financed by the municipalities, which pay for the premises and the coordinating and supervising staff employed by the municipality. Students can receive tuition from local, regional, as well as national colleges and universities (Gynther et al., 2019^[81]).
- In **France**, the government has supported the establishment of a network of “connected campuses” (*campus connectés*) – centres in predominantly rural municipalities where students can follow degree programmes through distance education with the support of dedicated tutoring staff. In May 2021, there were 89 campus connectés sites throughout France, which allow students access to a wide range of higher education programmes provided online by different universities. The initiative has been supported by an initial injection of public funds of EUR 25 million, used to provide subsidies to each site. Buildings and infrastructure on site are usually owned by the local municipalities (French Ministry of Higher Education, n.d.^[82]).
- The German federal state of **Brandenburg** provided support to establish local offices of higher education institutions (*Präsenzstellen*) in underserved areas identified as having potential for economic growth (*Regionale Wachstumskerne*, RWK). In contrast to the Norwegian or Danish models, these do not offer instruction but serve to build ties with local businesses and inform prospective students of the educational offer of the higher education institutions they represent (Government of Brandenburg, 2018^[83]).

Key points for Denmark

- A number of OECD jurisdictions, including France and neighbouring Nordic countries are experimenting with different models of decentralised provision of higher education in remote or rural regions. The Danish approach to supporting the regional accessibility of higher education through “education branches” is innovative and warrants attention from other OECD jurisdictions that aim to widen access to higher education opportunities across their territories.
- The Danish model is distinctive in that education branches are operated by specific higher education institutions, rather than municipalities, as in some other systems. There may be scope in the future to expand the range of programmes offered in the Danish education branches, including to programmes offered by other higher education institutions. In this respect, lessons from the recent French experience with rolling out the *campus connectés* could be instructive for Denmark’s policymakers.

4. Higher education institutions’ autonomy in the use of funding

The preceding sections of the policy brief described the process by which resources are distributed between higher education institutions. This section turns its focus on institutions’ autonomy over the use of the funding they receive. In particular, the section will address:

- The extent to which institutions in different OECD countries are permitted to reallocate public resources internally and the rationale for which some jurisdictions earmark funding for specific purposes.
- How public authorities regulate the provision of programmes and study places, the criteria used in the process and how the Danish approach compares to that of other OECD jurisdictions.

4.1 Institutional autonomy in the use of allocated resources

Allocation mechanisms may place more or less stringent conditions on institutions’ use and reallocation of public funding

Funding allocation mechanisms can link funding more or less closely to specific types of expenditure, ranging from highly restrictive line-item funding to more flexible block grant approaches, where institutions receive a lump sum (OECD, 2020^[12]). When designing funding allocation mechanisms, public authorities need to manage the tension between flexibility and accountability – between giving institutions autonomy to act on what they judge to be the most effective use of their funding and maintaining public confidence that the resources are spent for their intended purpose and contribute to the desired results (OECD, 2017^[54]). In recent decades, in parallel to introducing enhanced accountability requirements, governments in many OECD jurisdictions provided higher education institutions with greater autonomy over how they use their funds internally to achieve their goals (Lepori, 2019^[18]).

Most OECD higher education systems use one of three approaches to allocating public funds to higher education institutions, occasionally combining them with secondary mechanisms to allocate smaller portions of additional core funding:

- **Block grants without restrictions:** Although the funding allocated through block grants is usually intended to cover several categories of expenditure, including current expenditure on teaching,

ongoing operational costs and, in some cases, research activities, unrestricted block grants can be allocated freely across different types of activities, fields of study or expenditure types (OECD, 2020^[12]; Pruvot and Estermann, 2017^[84]).

- **Block grants assigned to broad expenditure categories:** In some cases, block grants are assigned to a broadly defined area of expenditure, such as teaching or research, but allow institutions to allocate the funding freely within this category.
- **Earmarked funding:** Earmarked (or ring-fenced) funding imposes stricter limitations on the use of resources, requiring HEIs to spend them on a specific purpose or project. Competitive research grants and third party contributions are frequently earmarked, but these restrictions have become less common for public core funding.

The results of the Higher Education Policy Survey on resourcing suggest that the dominant funding approach in OECD jurisdictions is to provide block grants without restrictions to higher education institutions for their core activities and to combine this with targeted earmarked grants for specific purposes. Many funding models, including the Danish system, provide separate core funding grants for education and research, in particular for the funding of universities. Where formula funding is used, these allocations are typically calculated using different sets of parameters. However, in most cases, including the Netherlands and the Flemish Community of Belgium, universities are free to use funding allocated for teaching or research for other purposes. Funding nominally allocated from the research “pot” can be used to pay for teaching activities and vice versa. The close relationship between teaching and research in higher education means that a strict division in the use of core funding is difficult to maintain. Nevertheless, there is likely to be an expectation on the part of governments and within institutions that a majority of funds allocated for education are used for education and the majority of funds allocated for research are used for research. Even where there is formally full freedom to reallocate resources, these expectations limit the real scale of reallocation.

In line with most OECD countries, Denmark provides higher education institutions with significant scope for the internal reallocation of funding

Most OECD systems allocate core public funding to higher education institutions in the form of block grants, often assigning funding nominally to broad expenditure categories, such as teaching and research. In the 2020 OECD Higher Education Policy Survey on resourcing, all but one of the participating jurisdictions reported that they use block grants as their primary mechanism to allocate core public funding to institutions. In this sense, Denmark’s funding model, which imposes few restrictions on the funding for both education and research, is in line with the wider trend towards providing institutions with significant freedom to reallocate resources internally.

Danish higher education institutions receive their core public funding for education (comprising the basic grant, the activity grant and the results grant) and research in the form of a block grant. Institutions can allocate this funding internally as they please, as long as it serves the institutions’ general mission, i.e. for most institutions, education and research (Ministry of Higher Education and Science, 2018^[4]). Denmark makes little use of targeted public funding programmes for higher education, whereby funds are allocated – often through competitive processes – for predefined objectives or tasks (such as widening access, skills development in specific fields or infrastructure). In the absence of a common accounting system, there is currently limited visibility over how institutions reallocate public funding internally (e.g. to cross-subsidise different activities or fields of study), but the new Common Chart of Accounts promises to increase transparency in this respect.

In addition to their core funding for education, Danish universities receive a basic research grant, which constitutes a large proportion of institutional research funding, in the form of a lump sum grant. Universities are free to determine how to allocate these resources to support research. The areas covered by the basic

research grant also include research-based education, PhD education, and the participation of Danish research institutions in international research programmes.

The majority of the basic research grant is allocated based on historical payments (Danish Government, 2020^[7]). However, new funds added to the overall budget envelope for the research grant since 2014, as well as a growing proportion of the historical grant (2% per year) are allocated to universities through a partially output-based formula. The “45-20-25-10-model” allocates 45% of the formula-related budget envelope for research based on the level of universities’ education funding, 20% based on their third party research funding, 25% based on bibliometric indicators related to research publications, and 10% based on the number of students completing their PhDs (Ministry of Higher Education and Science, 2020^[85]).

Like Denmark, just under half of all jurisdictions participating in the OECD Higher Education Policy Survey on resourcing, including Finland, Ireland and Portugal, reported that higher education institutions receive their core public funding in the form of a single block grant without restrictions on its internal reallocation. Australia and New Zealand also follow this approach, giving institutions significant freedom, for example, to use funds that are intended as subsidies for tuition to cover research or engagement costs instead. In practice, institutions that receive their funding in the form of an unrestricted block grant may allocate resources across departments using methods that broadly reflect how the national allocation system calculates the size of grants. For example, institutions may allocate funding to departments based on the subject-area weightings used in the central funding formula to reflect notional cost disparities between different fields of study, while giving the departments freedom to use these resources as they see fit, e.g. by deciding how to allocate staff time between teaching and research.

The use of more restrictive line-item budgets has become increasingly rare among OECD countries although some continue to rely on them to allocate core funding to higher education institutions. In contrast to block grants, line-item budgets tie funding to specific expenditure items and characteristically impose strict limits – or prohibitions – on the reallocation of funds across budget lines. Systems where line-itemised budgets remain in place include Greece, Korea and some sectors of Mexican public higher education (Estermann, Nokkala and Steinel, 2011^[86]; OECD, 2019^[87]). In some cases, the line between block grants and line-item budgets can be blurred if block grants are sub-divided into so many expenditure categories that the effective margin for redistribution is heavily circumscribed. In Hungary, for instance, higher education institutions may not shift resources across funding items, and any decision with financial implications must receive the approval of the University Chancellor – a central figure created in universities in 2014 and appointed directly by the Prime Minister (Pruvot and Estermann, 2017^[84]).

Internal allocation of funding requires financial management capacity and adequate accountability for results

Limiting the scope for the internal reallocation of funding provides central budgetary authorities with a higher level of financial control and transparency. At the same time, it significantly constrains the capacity of higher education institutions to make strategic decisions on the prioritisation of resources and to take responsibility for their management (OECD, 2020^[12]). As in any context in which public resources are spent, institutions’ degree of discretion over the use of funding needs to be matched with accountability mechanisms to ensure that the resources have been used for the purposes for which they were intended. In systems that place few restrictions on the internal reallocation of resources, monitoring and quality assurance systems therefore play an important role. Australia and New Zealand, for example, place significant emphasis on instruments like funding agreements to hold institutions to account (OECD, 2020^[12]) and Denmark, likewise, employs a range of performance-related funding mechanisms that serve to raise institutions’ accountability for student outcomes and other performance parameters.

Determining higher education institutions’ scope for the internal reallocation of resources also involves a trade-off between financial input control and institutional flexibility and administrative efficiency. Institutions’ compliance with spending rules is usually ensured through an audit of the accounts in accordance with

international accounting standards (conducted by a registered auditor) and an external assessment typically organised by the funding agency. Ideally, these assessments are conducted ex-post at the end of the financial year, which ensures that they do not interfere with the institutions' operational efficiency. In systems such as Greece, where most expenditures require an ex-ante authorisation, compliance procedures can make it difficult for institutions to operate efficiently or strategically. Even if compliance is assessed ex-post, systems that impose greater limitations on institutions' ability to reallocate funding across expenditure areas (e.g. Korea) require a more complex auditing process than systems that allocate funding in the form of block grants (OECD, 2020_[12]). In systems that afford institutions a high degree of flexibility to reallocate funding internally, financial accountability frameworks need to be oriented more towards a strategic assessment of financial performance and the ex-post assessment of performance commitments (OECD, 2020_[12]).

Analysing how higher education institutions internally reallocate their public funding can also provide public authorities with information concerning the adequacy of their funding formulas. Spending patterns that systematically deviate from the public authorities' resource allocation may indicate that the assumptions underlying its distribution model require adjustments to reflect the changing costs of education and research (Jongbloed et al., 2018_[22]).

Key points for Denmark

- Denmark provides higher education institutions with a high level of autonomy over the internal reallocation of core public funding. This high level of autonomy is consistent with funding models in comparable OECD jurisdictions, where institutions also have freedom to design and implement their own internal allocation models.
- As noted previously, robust internal accounting practices (and notably activity-based costing models) make internal cross-subsidisations more visible. The introduction of the Common Chart of Accounts in Denmark, with more granular and standardised accounting practices across the sector, should lead to a more nuanced understanding of the internal allocation of funds within higher education institutions. As well as improving the transparency of financial management in the higher education sector, this will benefit higher education institutions in their internal decision-making and policymakers as they monitor and assess the adequacy of national funding policies.

4.2 Regulating programme provision and student intake

Most OECD governments regulate programme provision and some control institutions' student intake

The ongoing digital transformation of economies and societies is changing the quantity and quality of jobs, the nature of work and the skills needed to succeed in the labour market (OECD, 2019_[13]). As new jobs are created and others disappear, the higher education sector faces the challenge of providing graduates with the skills they need to succeed in a labour market that is undergoing a profound transformation (OECD, 2020_[12]). Ensuring that the tertiary education offer remains relevant to labour market needs is a significant challenge and OECD jurisdictions have used a range of different approaches to steer the supply of higher education places to respond to skills demand and support students in making well-informed study choices (OECD, 2017_[88]).

Governments can intervene to influence the provision of higher education programmes and students' study choices in multiple ways. These interventions can take the form of financial or other incentives aimed at encouraging higher education institutions to offer specific types of programmes. As discussed earlier,

governments usually provide institutions with higher funding rates for programmes that are more costly to provide, but they may also reward institutions for positive labour market outcomes among their graduates or hold them accountable for mismatches between their graduates' skills and labour market needs. In addition to these supply-side incentives, public authorities may intervene on the demand side by seeking to influence students' study choices, for example by providing them with information about the career opportunities open to graduates from different fields or earnings in different professions.

Governments may also intervene more directly in the provision of courses and study places. Most frequently, this happens at the stage of programme approval and accreditation, where academic programmes may be assessed, among other factors, for their labour market relevance, including by asking industry stakeholders to provide feedback on the labour market relevance of programmes. Another means by which some countries steer the higher education provision is to control the number of students that higher education institutions are able to enrol in a given programme or field or the number of places for which institutions receive public funding. These restrictions may be applied at the institutional level or across the system and can serve to limit enrolment in fields of study for which there is low demand in the labour market. Denmark combines these two approaches, using labour market information both when accrediting new programmes and to impose caps on student intake.

Programme approval and accreditation are common means to regulate the educational offer

Many OECD systems require new higher education programmes to be approved or to undergo an accreditation process. This process serves to ensure the quality of the educational offer, but also allows authorities to regulate the offer based on other criteria, including their labour market relevance and graduate outcomes. In Denmark, new higher education programmes need to be approved by the Minister of Education and Research, who acts on the recommendation resulting from a “pre-authorisation” (*prækvalifikation*) process administered by the Advisory Committee for the Evaluation of the Offer of Higher Education (*Rådgivende udvalg for vurdering af udbud af videregående uddannelser*, RUVU). Since 2015, universities have been allowed to merge existing programmes without having to undergo the pre-qualification process, which has resulted in a reduction of the overall number of programmes (Ministry of Higher Education and Science, 2018_[4]). Between 2007 and 2014, 54 new programmes were authorised at the bachelor's level and 113 new programmes at the master's level. Between 2014 and 2016, only five bachelor's and eight master's programmes were newly authorised (Ministry of Higher Education and Science, 2018_[4]).

When assessing proposed programmes, the RUVU considers their labour market relevance (criterion 1), as well as their coherence with the overall educational offer (criterion 2) (Ministry of Higher Education and Science, 2018_[4]). Slightly different pre-authorisation criteria are used depending on whether a programme is newly created or a version of an existing programme (*uddannelsesudbud*). Universities, for example, tend to create their own new programmes, while professionally oriented institutions more often offer local versions of previously approved programmes (Ministry of Higher Education and Science, 2016_[89]; Ministry of Higher Education and Science, 2021_[90]). Higher education institutions must demonstrate that there will be sufficient demand for graduates of a new programme that is not sufficiently served by the existing educational offer. To this end, institutions are encouraged to submit supporting evidence, such as employer surveys or consultation results. When introducing a programme that already exists elsewhere, the pre-authorisation focuses on the assessment of local or regional needs. To fulfil the coherence criterion, institutions are expected to demonstrate that their proposed programme is aligned with the rest of the national or regional educational offer (for example, that graduates will have opportunities to pursue further studies building on the programme). Higher education institutions are also expected to show that the new programme would not significantly worsen the conditions of students in other programmes in areas such as access to internship or employment opportunities (Ministry of Higher Education and Science, 2016_[89]).

Like Denmark, many OECD countries have designed their programme approval and accreditation processes with a view to enhancing the labour market relevance of degree programmes. For instance, in the Slovak Republic, professionally oriented degree programmes must demonstrate their link to the labour market before they receive formal accreditation. In Poland, regulations introduced in 2016 require the Polish Accreditation Committee to account of employer involvement in curricular design and teaching when assessing programmes (OECD, 2017^[88]). The US states of Texas and Ohio have also developed standards guiding the approval of new academic programmes, which seek to ensure their labour market relevance (see Box 6).

Box 6. Labour market relevance and the approval of new programmes in the United States

Workforce relevance criteria in academic programme approval in Ohio (United States)

Ohio has developed a set of Detailed General Standards for Academic Programs, which are used to guide the approval of new programmes and majors in public institutions. Institutions submit proposals to the Ohio Department of Higher Education (ODHE) for a peer review by experts from Ohioan public universities and colleges. In addition to complying with general and programme-specific standards, institutions need to demonstrate evidence of their programmes' "workforce relevance, need and student interest". This includes collaboration with employers, students' potential for employment on graduation, and the competitive advantage of the submitting institution in providing the programme. In addition, public institutions must demonstrate that the proposed programme complements other programmes in the state and is aligned with state policy initiatives. Evidence may include local, state and national labour market research, demographic analysis, evidence of partnerships with business and industry (such as secured opportunities for co-ops and internships, or provision of adjunct faculty or mentors for students) or pilot courses or certificate programmes with a history of success, demonstrating the need and opportunity for a full degree.

Workforce need and the labour market relevance of new programmes in Texas (United States)

Public HEIs in Texas need to seek approval from the Texas Higher Education Coordinating Board (THECB) to offer new degree programmes or to make "substantive changes" to existing programmes. The criteria guiding the process include student demand, sufficient faculty resources, administrative capacity, sufficient equipment and different criteria related to labour-market relevance. For bachelor's and master's degree programmes, public four-year institutions must show:

- **Workforce need:** There should be a demonstrated or well-documented job market for graduates of the programme, or alternatively, it should produce students for master's or doctoral-level programmes in fields in which there is a demonstrated need for professionals.
- **Marketable Skills:** A list of the marketable skills associated with the proposed programme (aligned with the state's strategic plan 60x30TX) and a plan to inform students of these skills.

Criteria for **certificates and associate's degree programmes** (public two-year institutions) include evidence that the programme meets a job market need or leads to opportunities for further education and evidence that representatives from private sector business and industry have been involved in the creation of the programme through participation in an advisory committee.

Source: OECD (2020^[64]), *Labour Market Relevance and Outcomes of Higher Education in Four US States: Ohio, Texas, Virginia and Washington*, <https://doi.org/10.1787/38361454-en>.

Enrolment caps are used to control costs or promote alignment with labour market needs, or both

As well as controlling the accreditation of new programmes, some OECD systems seek to steer the educational offer and student enrolment by imposing limits on student enrolment. Higher education systems impose enrolment caps in order to exert budgetary control, to align the educational offer with labour market needs, or both:

- **Imposing enrolment caps to control costs:** Particularly in demand-driven systems with a fixed funding rate for students in higher education, overall enrolment caps are an important means to control the overall budget envelope. These enrolment ceilings may be adjusted to reflect changes

in overall demand and the education budget, as is the case in New Zealand and Scotland. Many central and eastern European countries provide funding to higher education institutions for a fixed number of state-funded (free) study places that are attributed on merit criteria, with other students required to pay fees. Rationing places for selected high-cost programmes with regulated labour markets, such as medicine, is more common and other European countries, such as Germany and Finland, use a numerus clausus system to allocate a limited number of places based on students' final high school grades. Here, however, the objective is typically to prevent oversupply of graduates, as well as to control costs.

- **Imposing enrolment caps to align the programme offer with labour market needs:** Another rationale for limiting the accreditation of new programmes and student places is to ensure that the educational offer remains broadly aligned with labour market needs. Particularly where higher education institutions are funded based on their number of enrolled students or graduates, higher education institutions may have an incentive to increase enrolment and offer as many study places as possible. Regulating institutions' educational offer based on labour market information or graduate outcomes can help to avoid an oversupply of study places without clear relevance in the labour market or to prevent a reduction in teaching quality.

Across the OECD, most governments impose some restrictions on the number of publicly funded students that higher education institutions can enrol, although these restrictions may not take the form of strict enrolment caps across the board. According to the European University Association's University Autonomy Scorecard, only seven out of the 29 European systems allow their universities to decide freely on student numbers, while the others use different types of restrictions. Six countries operate a free admission system, thus preventing universities from placing caps on enrolment (Claeys-Kulik and Estermann, 2015^[32]; Pruvot and Estermann, 2017^[84]). Table 10 provides an overview of selected OECD systems that have imposed enrolment caps and the main criteria they used to limit student numbers.

Table 10. Criteria used to cap student enrolment in selected OECD countries

	Recruitment caps fixed by public authorities	System used for admission to HEIs	Main objective of student caps		
			Maintain spending within available envelope	Avoid overcrowding / preserve quality	Promote good graduate labour market outcomes
Denmark	Capped in certain fields	Selection by HEIs			✓
Ireland	No centrally decided caps	Selection by HEIs			
Flemish Community	No centrally decided caps	Largely open access			
Finland	No centrally decided caps	Selection by HEIs			
Australia	Effectively capped	Selection by HEIs	✓		
Scotland	Capped	Selection by HEIs	✓	✓	
The Netherlands	No centrally decided caps	Largely open access			
Estonia	No centrally decided caps	Selection by HEIs			
Austria	Capped in certain fields	Largely open access	✓		

Note: Based on OECD research and OECD (2017^[88]), *In-Depth Analysis of the Labour Market Relevance and Outcomes of Higher Education Systems: Analytical Framework and Country Practices Report* <http://www.oecd.org/education/skills-beyond-school/LMRO%20Report.pdf> (accessed on 17 December 2020).

Austria centrally regulates the number of study places at individual universities as part of its funding regulation (*Hochschulraum-Strukturmittelverordnung*), while in Estonia, both ceilings and floors on the size of individual programmes can be agreed as part of higher education institutions' performance agreements

(OECD, 2017^[88]). In some systems, significant increases in student enrolment require political approval. In Poland, for example, increases of more than two per cent over the previous year need to be approved at the ministerial level – a process in which factors such as the labour market demand for graduates in particular fields of study are considered (OECD, 2017^[88]).

Even among systems with open enrolment policies, such as the Flemish Community of Belgium, many use a *numerus clausus* approach for specific fields of study, such as medicine, which are very costly to provide and have a highly regulated labour market that provides employment to a limited number of students. In fields that are also closely associated with a regulated profession but have a lower cost of delivery, such as accounting or law, governments are less likely to cap student numbers, also to mitigate the risk of professionals using occupational licencing to “bid up” the cost of their labour (Kleiner and Krueger, 2010^[91]).

Historically, higher education institutions in Denmark were free to determine how many study places to offer for each programme, with the exception of a few fields of study, such as medicine (Ministry of Higher Education and Science, 2018^[41]). Since 2014, however, Denmark has made an effort to create stronger links between the offer of tertiary education places and labour market demands by introducing admission ceilings for programmes whose graduates experience high unemployment rates, as described in Box 7.

Box 7. Unemployment-based enrolment caps in Denmark

In 2014, Denmark launched an initiative to reduce the student intake in programmes whose graduates show poor labour market outcomes and shift them to programmes with better employment prospects. Each year, programmes are identified for intake reductions if their graduates show “significant and systematic unemployment”. Significant unemployment is identified if the graduating cohort of a programme has a system-wide gross unemployment rate that is at least two percentage points above the average unemployment rate of higher education graduates 12 to 21 months after their graduation. Systematic unemployment is identified if at least 70 per cent of the last (up to) 10 graduate cohorts have such significant unemployment rates. Programmes are considered for intake reductions only if unemployment has been measured for at least three cohorts and if there are at least ten graduates.

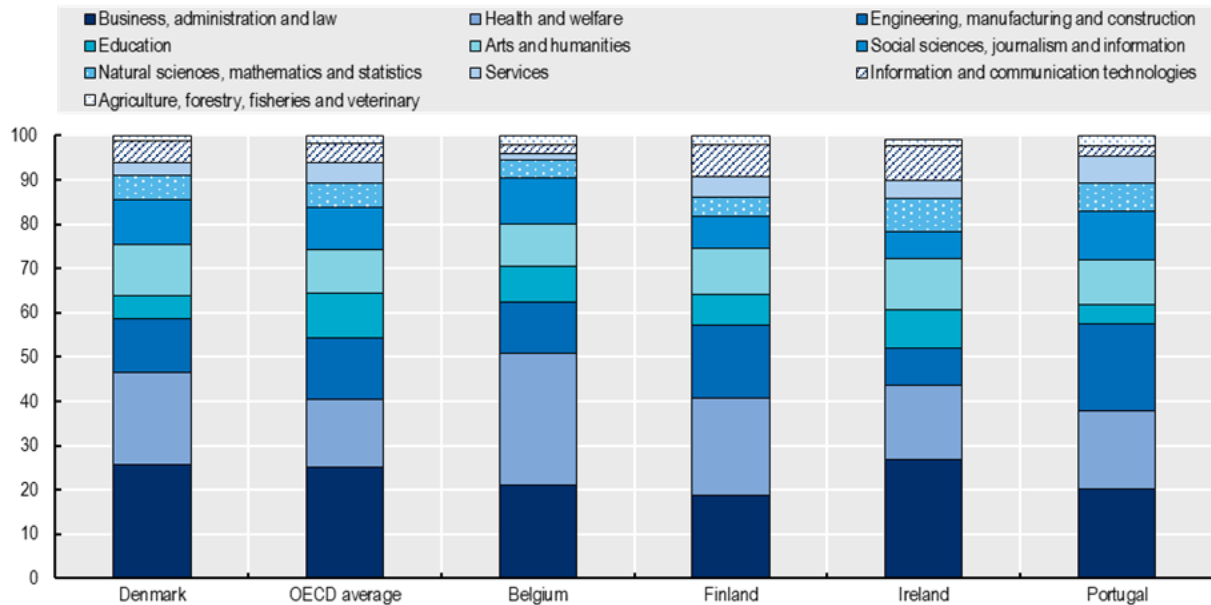
For programmes that show significant and systematic unemployment, a ceiling on the student intake is calculated based on their average enrolment at individual institutions over the past five years. Depending on the severity of the graduate unemployment rates, the student intake can be reduced by 10, 20 or 30 per cent of the previous five years’ average. This means reductions may exceed 30 per cent in programmes that have grown significantly in previous years. The intake restrictions were implemented in university colleges, business academies and for bachelor’s programmes at universities over a four-year period from 2015 to 2018. For master’s programmes at universities, the policy was implemented over a three-year period from 2018 to 2020. By 2016, 38 per cent of bachelor’s students and 28 per cent of master’s students were enrolled in programmes with unemployment-based enrolment caps, many of which were programmes in the humanities (Ministry of Higher Education and Science, 2018^[4]). Lists of programmes with admission ceilings are published online.

HEIs are given some leeway in how to implement the ceilings. In a dialogue with the Ministry, institutions can decide how to distribute the intake reductions across the selected programmes. With the Ministry’s permission, institutions can also transfer up to 15% of the mandated intake reductions to non-selected programmes if they can justify it on the basis of labour market needs. This effectively permits institutions to protect some programmes from the imposition of ceilings, for example if the local demand for its graduates exceeds that in the rest of the country. Furthermore, students who wish to follow up on a bachelor’s programme with a master’s programme in the same subject at the same institution are entitled to a place and funding, regardless of any ceilings.

Source: Ministry of Higher Education and Science (2020^[92]), *Gældende dimensionering fordelt på institutioner* (Current sizing by institution), <https://ufm.dk/uddannelse/videregaende-uddannelse/dimensionering/dimensionering-2014> (accessed on 7 July 2021); Ministry of Higher Education and Science (2020^[93]) *Modelbeskrivelse* (Description of the model) <https://ufm.dk/uddannelse/videregaende-uddannelse/dimensionering/ledighedsbaseret-dimensionering/modelbeskrivelse> (accessed on 7 July 2021).

The fields of study chosen by Danish graduates in 2018 closely resembled the OECD average (see Figure 12). The largest share of tertiary education graduates in Denmark had completed degrees in business, administration and law (26%), followed by health and welfare (21%), and engineering, manufacturing and construction (12%). However, there were more Danish graduates in health and welfare (21% compared to the OECD average of 15%), and fewer in education (5% compared to the OECD average of 10%). Some of these cross-country differences can be explained by the structure of higher education systems and the extent to which some fields of study, such as nursing, are offered as tertiary programmes or as non-tertiary vocational education (OECD, 2020^[11]). As in most countries, relatively few students in Denmark graduate with degrees in the natural sciences, mathematics and statistics (5%) or in information and communication technologies (5%).

Figure 12. Distribution of tertiary graduates by field of study (2018)



Source: OECD (2020) *Education at a Glance 2020: OECD Indicators*, Table B5.2, <https://doi.org/10.1787/69096873-en>.

Using multiple mechanisms to align programme provision and study choices with labour market needs, as is the case in Denmark, requires careful coordination

Some OECD countries, including Denmark, use more than one method to steer students' choices and the alignment between course provision and labour market needs. As noted, since 2014, Denmark has introduced enrolment caps on subjects with weak labour market outcomes and, in 2019, added labour-market-related incentives to its funding system through the results grant. In addition, the labour market relevance of programmes is analysed for programme accreditation and students are supported in their study choice through the "Education Zoom" online tool (*Uddannelseszoom*), which allows prospective students to compare educational programmes based on information including labour market opportunities (Hofer, Zhivkovikj and Smyth, 2020^[94]).

Particularly in systems where resources in higher education "follow the student", there may be concerns that higher education institutions provide courses that attract large numbers of students without providing rewarding employment opportunities. Including labour market outcomes in performance-related funding mechanisms can reduce the risk of such perverse incentives. Denmark's introduction of multiple means to steer programme provision must therefore be seen against the backdrop of a system that previously relied strongly on an output-based taximeter funding system, which may have provided incentives for institutions to increase their enrolment and create new programmes in competition for students (Ministry of Higher Education and Science, 2018^[4]).

In systems that use multiple tools to regulate and incentivise the behaviour of higher education institutions, it is important that the different tools are complementary and generate the intended effects. Combining regulatory, top-down approaches – such as Denmark's enrolment caps – with incentive mechanisms in the funding model – such as Denmark's results grant – can create tensions, as the first approach limits institutional autonomy, while the second relies on institutional agency to achieve the intended results. When multiple mechanisms are used to achieve the same basic objective (in this case, better graduate labour market outcomes), it is typically more challenging to identify the effects of each mechanism. Most

higher education systems combine top-down regulation and incentive-based steering, but it is important to consider the interaction between different mechanisms as policies are monitored and reviewed.

A 2017 evaluation of Denmark’s unemployment-based intake restrictions found that, over the first years of its implementation, from 2013 to 2016, both students’ enrolment and application patterns had shifted from the newly restricted to unrestricted programmes, i.e. from subjects with higher graduate unemployment to those with lower unemployment (Ministry of Higher Education and Science, 2018^[95]). The evaluation reported that universities asked for the ceilings to apply only to bachelor’s programmes, but the evaluation expressed doubts whether this would suffice to limit the number of graduates in high-unemployment fields. The report also suggested that there was scope to move towards the calculation of ceilings based on institution-specific rather than system-wide unemployment rates (Ministry of Higher Education and Science, 2018^[95]). The effects of the admission ceilings on graduate unemployment are expected to be seen by 2022 (Ministry of Higher Education and Science, 2018^[4]).

In general, limiting study places based on projected demand for graduates poses several challenges, particularly related to the uncertainty around future labour market needs. It is inherently difficult to predict how the demand for skills will evolve and how graduates will integrate into the labour market, not least given that decisions tend to be based on retrospective data on the outcomes of recent graduates (OECD, 2017^[88]). Public authorities need to decide whether to engage in these decisions themselves or leave it to higher education institutions to regulate their offer, potentially incentivising them by rewarding students’ outcomes. When rationing student places, countries also need to bear in mind the risk of inequities arising from student selection procedures. The selection of students based on their high school grades, for example, tends to favour advantaged students since performance in secondary school is highly correlated with their socio-economic status (OECD, 2019^[71]). Restricting the number of places in higher education will often affect those from lower socio-economic groups disproportionately.

Key points for Denmark

- OECD Higher education systems that use fixed payments per student – such as those in Scotland and Australia – tend to agree on enrolment limits for funded programmes to manage public spending and, implicitly or explicitly, to avoid quality concerns that may arise if enrolment exceeds teaching capacity. Denmark is the only OECD jurisdiction examined in the Resourcing Higher Education Project to have introduced enrolment caps explicitly linked to the employment outcomes of graduates.
- Denmark is also one of the few OECD jurisdictions that seeks to promote good employment outcomes for graduates through explicit graduate employment parameters in its core funding model (in the results grant). The effects of combining top-down regulation of study places and a funding model that seeks to incentivise institutional behaviour need to be carefully monitored to ensure institutions have adequate autonomy to respond effectively to the incentives in the funding model and regional labour market demand.
- Many countries have invested in guidance services to support students’ choices that use data on graduate labour market outcomes and Denmark’s “Educational Zoom” (*Uddannelseszoom*) is a leading example of this. Information services in the Netherlands (*Studiekeuze 123*) and the United Kingdom (prospects.ac.uk) are also among the most advanced in OECD jurisdictions. Research shows the limits of simple information provision on influencing study choice and the need for a comprehensive set of support services (Hofer, Zhivkovikj and Smyth, 2020^[94]). There is scope for Denmark to learn from other leading study guidance systems as it reviews and refines its policies in this area.

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Annex A. Research questions

In June 2020, the Danish Ministry of Higher Education and Science and the OECD Higher Education Policy Team agreed on the following list of key questions to be addressed in this Thematic Policy Brief for Denmark:

1. How do levels of spending on higher education per student (from public and private sources) vary between countries, and to what extent is it possible to disaggregate spending levels by type of institutions and field of study?
2. What methods are used to establish the overall level of core public funding assigned by governments for allocation to higher education institutions? To what extent do these methods make use of unit costs or cost models with differentiation between fields of study? In relevant cases, how are these unit costs and cost models derived?
3. What forms of result and outcome-related funding allocation models are used in OECD jurisdictions, what criteria/parameters are used in these allocation models and how do the models compare to that used in Denmark?
4. How do different institutional funding allocation models seek to promote social equity?
5. To what extent are public HEIs constrained in the internal reallocation of public resources allocated through different streams or for different purposes?
6. What controls exist on programme provision or student intake by programme and what are the principal criteria used to make decisions about programme authorisation and limits on student numbers? To what extent and how do other systems use information on graduate employment outcomes in establishing these controls?
7. Do funding models in other countries include specific mechanisms to support the provision of educational programmes in remote regions or encourage even territorial distribution of educational provision?

Resourcing Higher Education Project



This thematic policy brief has been prepared as part of the OECD Resourcing Higher Education Project (RHEP). Co-funded by the European Union, the RHEP is developing a shared knowledge base available to OECD member and partner countries on effective policies for higher education resourcing. It does so by exploring how OECD jurisdictions organise the funding of higher education institutions, provide financial support to students and regulate the employment of academic staff, taking into account evidence on the effects of different policy approaches. The findings of the project are shared in publications, including thematic policy briefs and country review reports, and through peer learning events organised to share practice and experiences.

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