



COST, COMMITMENT, AND ATTAINMENT IN HIGHER EDUCATION
An International Comparison

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Making Opportunity Affordable is a multiyear initiative focused on increasing productivity within U.S. higher education, particularly at two- and four-year public colleges and universities. The aim is to use dollars invested by students, parents, and taxpayers to graduate more students. The initiative relies on partner organizations working within various states to develop, promote, and implement policies and practices that will help achieve this goal.

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Executive Summary

Public policy debates regarding postsecondary education in the United States increasingly use international comparisons to set goals and measure performance. To help clarify and inform these debates, this report compares and analyzes data on three key indicators of tertiary education in countries belonging to the Organization for Economic Cooperation and Development (OECD):

- *Cost*: The amount that countries spend on tertiary education per student;
- *Commitment*: The share of GDP a country spends on tertiary education; and
- *Attainment*: The share of working-age adults holding a tertiary education degree.

One objective of this report is to examine the extent to which a country's attainment rates correlate with high cost levels and/or financial commitment to higher education. It also identifies the strategies that various OECD countries have been adopting to increase their attainment rates sustainably with respect to both cost and commitment.

This report, following the lead of a number of recent reports, moves away from the more traditional approach of comparing countries on the basis of higher education participation (entry) rates—typically measured as the percentage of an age group that enrolls in a postsecondary program—and focuses instead on attainment rates. The greater emphasis on attainment shifts the focus of higher education debates from access *or* success to access *and* success. In recent years, a growing number of policymakers have taken on the issue of student success, even as they maintain their traditional concerns about increasing access and improving equity. It is also important that they consider what will be necessary to achieve higher attainment levels given the constraints of both cost and financial commitment.

Industrialized countries can be categorized on a number of dimensions regarding their higher education systems, based on a series of data that are regularly collected and published by the OECD from its thirty member nations. This analysis, based on OECD's *Education at a Glance 2008*, confirms that there is considerable variation as to which OECD countries rank highest on these three parameters.

Where the United States Ranks

An examination of the most recent OECD data shows that the U.S. ranking on the variables of cost, commitment, and attainment varies.

For education and total spending per student in 2005, the United States ranks highest among OECD countries. The United States also has the greatest financial commitment to higher education as reported by OECD, with a much heavier reliance on private sources of revenue than any other country. It also has the second highest level of Bachelor's degree attainment for all adult workers (aged 25-64) of any OECD country, and is sixth among the youngest group of workers (aged 25-34).

WHERE THE UNITED STATES RANKS ON COST, COMMITMENT, AND ATTAINMENT AMONG OECD COUNTRIES			
COST	EDUCATION	RESEARCH	TOTAL
Higher Education Spending per Student, 2005	1st	15th	1st
COMMITMENT	PUBLIC	PRIVATE	TOTAL
Higher Education Resources as a Percentage of GDP, 2005	15th	1st	1st
DEGREE ATTAINMENT	BACHELOR'S	SUB-BACHELOR'S	TOTAL
Attainment Rates, Workers Aged 25-64, 2006*	2nd	9th	3rd
Attainment Rates, Workers Aged 25-34, 2006*	6th	11th	10th
Attainment Rates, Workers Aged 55-64, 2006*	1st	5th	1st
Difference in Attainment Rates Between Workers Aged 25-34 and 55-64, 2006*	30th	18th	29th

Source: Education at a Glance 2008, OECD (2008) * U.S. attainment rates are revised to correct error in Education at a Glance 2008

However, the United States ranks average to below average on a number of other key dimensions. For example, on research-related activities it spends much less per student than the OECD average: 15th out of 25 countries reporting on this measure. And although its overall financial commitment remains the highest in the world, its share of GDP devoted to higher education coming from public resources (15th) is slightly below the OECD average. The U.S. attainment rate for sub-Bachelor's degrees also is average for the OECD (9th) and the U.S. rank has declined over time, which is a principal reason why the overall U.S. attainment rate is no longer in the top rank and thus a subject for concern. The United States is also among the lowest ranking of OECD countries in the difference in attainment rates between the youngest and oldest workers, reflecting the fact that it has a mature universal system of higher education.

Strategies for Increasing Attainment

Recent U.S. history and trends among OECD countries suggest three approaches that the United States should consider to achieve higher attainment at sustainable levels of costs and commitment.

Focus more resources and attention on community colleges. One effective way for the United States to economize in higher education, while at the same time becoming more productive, is to shift public resources toward less costly sub-Bachelor's programs in community colleges, while ensuring that these programs lead more students to successful outcomes, including credentials and degrees of value in the labor market.

Pay more attention to developing and implementing strategies to improve completion rates at both two-year and four-year institutions. Degree-completion rates—the proportion of entering students who finish their education programs—have traditionally been low in the United States, relative to many other OECD countries. While U.S. degree-completion rates at community colleges are especially low, the rates at four-year institutions also are below average among OECD countries. A sustained U.S. effort at improving degree-completion rates at all postsecondary institutions and levels would bring cost, commitment, and attainment more in line with one another.

Consider increases in enrollments as a means for moderating costs per student and improving productivity. Discussions of costs per student in many countries and states tend to be static, virtually ignoring the effects that enrollment changes can have on revenues and costs per student. Thinking about how enrollment levels are managed—both at the system level and by individual institutions—may help raise productivity by driving down spending per student while maintaining attainment at high and increasing levels.

SUMMARY OF STRATEGIES OECD COUNTRIES USE TO INCREASE THEIR ATTAINMENT RATES*

In drawing lessons for U.S. policymakers, this review of OECD-reported statistics and a consideration of the experience in countries with high levels of growth in attainment provide clues regarding how and why their attainment rates may have grown more rapidly than others. These comparisons also suggest which strategies may have been most effective in achieving increases in attainment in sustainable ways.

STRATEGIES	COUNTRIES
Increasing graduation rates	Australia, Denmark, Iceland, Israel
Reducing time to degree	Australia, Iceland, Japan, New Zealand, Sweden, United Kingdom
Expanding sub-Bachelor's programs	Belgium, Canada, Finland, Japan, Spain
Maintaining a high level of public commitment	Denmark, Finland, Norway, Sweden, Switzerland
Relying on the private sector to foster growth	Japan, South Korea, Spain, United States
Increasing enrollments in universities	Denmark, Iceland, Netherlands, Norway
Increasing tuition fees in the public sector	Australia, Canada, Israel, New Zealand, United States
Recruiting more students abroad	Australia, Austria, Ireland, New Zealand, Switzerland, United Kingdom

* Including Israel, an associate member of the OECD

Introduction

Public-policy debates regarding postsecondary education in the United States increasingly use international comparisons to set goals and measure performance. As one prominent example, the final report of the U.S. Secretary of Education's Commission on the Future of American Higher Education (often referred to as the Spellings Commission) relied on data collected and distributed by the Organization for Economic Cooperation and Development on degree completion and attainment to help make its case that significant reforms are needed in American higher education (OECD 2008)¹. A number of other recent reports also have focused on OECD-reported data to call for changes in U.S. policies at both the federal and state levels.²

To help clarify and inform future debates on these important topics, this report compares and analyzes data on three key indicators of tertiary education in OECD countries:³

- *Cost*: The amount that countries spend on tertiary education per student;
- *Commitment*: The share of GDP a country spends on tertiary education; and
- *Attainment*: The share of working-age adults holding a tertiary education degree.

This report clarifies how cost, commitment, and attainment are measured and examines the extent to which a country's attainment rates correlate with its cost levels and its financial commitment to higher education. We also identify strategies that various countries have adopted to increase their attainment rates in sustainable ways with respect to both cost and commitment.

To do this, we examine OECD-reported statistics on the three key variables (*see box, "Key Components of Cost, Commitment, and Attainment"*). We then look at the experience of ten OECD member or associate countries that have achieved either high levels of attainment or high rates of attainment growth, as indicated by the difference in the attainment rates of their youngest and oldest workers.

Key Components of Cost, Commitment, and Attainment

Cost: Spending per Student

- Education-related: Spending for instruction and general operations of the institution
- Research-related: Funding for research and development activities conducted on campus
- Total: Spending for instruction and research, plus ancillary services such as transportation, meals, and housing provided by institutions

Commitment: Resources Devoted to Higher Education

- Public resources: Revenues to institutions and students from governments at all levels, as a percentage of GDP
- Private resources: Revenues from tuition fees, ancillary services, commercial ventures, charitable donations, and other nongovernmental sources of revenue, as a percentage of GDP
- Total resources: Revenues drawn from both public and private sources devoted to higher education, as a percentage of GDP

Attainment: Proportion of Working Adults with a Tertiary Degree

- Bachelor's degree: Proportion of adults of a certain age holding at least a Bachelor's degree
- Sub-Bachelor's degree: Proportion of adults of a certain age holding a sub-Bachelor's degree, such as an Associate's degree
- Combined degree: Proportion of adults of a certain age holding at least an Associate's degree

One of the more useful aspects of this report is that we move away from the more traditional approach of comparing countries primarily on the basis of their higher education participation (entry) rates and focus instead on attainment rates. This shift in focus toward attainment, which follows the lead of several other recent comparative reports, reflects the fact that policymakers around the world are engaging more with the issue of student success, even as they seek to maintain their traditional concerns about increasing access and improving equity. But to maximize the relevance of these discussions, it is important that policymakers also consider what will be necessary to achieve high attainment levels in terms of both cost and financial commitment (the proportion of GDP devoted to higher education).

This greater emphasis on attainment shifts the focus of higher education debates from access *or* success to access *and* success. It also brings greater statistical integrity to international comparisons. The more traditional ways of measuring the size and accomplishments of higher education systems have been participation rates (the proportion of traditional-age college students who enroll—also called entry rates) and persistence rates (the proportion of enrolling students who complete their program of study—also referred to as graduation, completion, or survival rates). As disseminated by the OECD, these more traditional rates often are reported inconsistently across member countries and have other statistical flaws that limit their utility.⁴ By contrast, attainment data tend to be collected more consistently across countries through the use of a census or survey of those in the labor force. In addition, attainment rates, although they are collected as a data snapshot in a particular year, allow for a longitudinal consideration of trends by comparing the attainment rates of older workers to those of younger workers.

In terms of examining attainment, wherever it is appropriate, data for what the OECD refers to as Tertiary 5A (academic or Bachelor's) degrees and Tertiary 5B (sub-Bachelor's or Associate's) degrees are reported separately here for several reasons, including:

- Countries vary considerably in the relative size of their academic and vocational systems. The analysis in this report indicates that few countries are attainment leaders for both types of degrees.
- The mix of academic and vocational degree attainment varies widely among countries and could be critical in explaining why some countries achieve high overall attainment rates while having average or even relatively low levels of financial cost or commitment.

Growth in attainment rates for both Bachelor's or sub-Bachelor's degrees (e.g., Associate's degrees), as measured by differences in rates between older and younger workers, varies considerably within countries and among countries.⁵

The Highest-Ranking Countries on Cost, Commitment, and Attainment

Industrialized countries can be categorized on a number of dimensions regarding their higher education systems, based on a series of data that the Organization for Economic Cooperation and Development regularly collects from its thirty member nations. Our analysis from OECD's *Education at a Glance 2008*, issued in September 2008, confirms that there is considerable variation in which countries rank highest on the three key parameters of cost, commitment, and attainment.

Cost Measured as Spending per Student

What countries spend per student is the most frequently used measure of the financial resources applied to higher education. Spending per student is also the most traditional measure of public and private resource consumption by institutions as well as by countries. The presumption is that institutions and countries that spend more per student are of higher quality than those that spend less. This statistic provides a reasonably accurate sense of the relative level of financial resources devoted to higher education, whether at the national or the institutional level. However, several factors limit its effectiveness for comparing the relative level of financial resources that countries provide for higher education:

Different countries have different conventions regarding what their calculation of costs includes.

Accounting differences among countries may account for some or much of the difference in the costs

per student they report on a regular basis. For example, some but not all countries include the costs of campus-based research, health care, pensions, student aid, or ancillary services. The OECD tries to account for this by collecting and reporting spending data separately for education, research, and ancillary activities, but some inconsistencies still exist. It is difficult to know how much these reporting differences account for variation in the cost figures, but a reasonable estimate would be that at least one quarter of differences in spending per student among OECD countries could be a function of variation in how cost figures are collected and reported.⁶

The amount a country spends per student will be affected by trends in enrollments that in turn are influenced by a number of factors, including the state of the economy. For example, during a recession, enrollments, especially in community colleges and graduate and professional school programs, tend to rise because more people are out of work and decide to go to school. If the number of students shoots up for whatever reason, this depresses costs per student. Conversely, slower-than-expected growth in enrollments during good economic times could lead to an increase in average costs even when public funding does not increase rapidly. Discussions of cost trends often fail to explore the effects of these enrollment trends fully.

Costs per student are influenced by what type of education system is in place. When total spending is divided by the total number of students in elite higher education systems where participation rates are relatively low, the costs per student may be high for those students who enroll but the overall national financial commitment to higher education may be lower because resources are focused on relatively few students. By the same token, per-student costs are likely to be lower in mass or universal systems of higher education, all else being equal.

Key Observations about Costs (Table 1 and Figure 1)

- Only three countries spent \$20,000 or more per student in 2005: the United States, Switzerland, and Canada. The United States spent more than double the OECD average of \$11,500, while Switzerland and Canada spent nearly double that amount.
- In terms of education spending per student, the U.S. figure of \$18,600 is more than \$5,000 higher than that of the next-largest spender—Canada—and well more than twice as much as the OECD average of \$8,000 per student.⁷
- Switzerland spent more than \$8,700 on research per student in 2005, more than double the OECD average of \$3,400. No other OECD country spends more than \$8,000 on research per student.⁸
- With some exceptions, the founding countries of the OECD tend to spend more per student on education than newer members. Central and Western European and English-speaking countries tend to spend more (at least \$10,000 per student) than Eastern European and Mediterranean countries.

Level of Financial Commitment

While spending per student is the most frequently used measure of cost, as the discussion above suggests it may not be the best indicator of the relative size of a country's financial commitment. High levels of spending per student can also indicate elite systems spending a lot on relatively few students rather than high levels of total spending. Thus, resources devoted to higher education as a share of GDP is often a better measure of a country's financial commitment than spending per student. Comparing percentages of GDP also removes the question of how best to adjust for currency differences among countries: the figure for each country is measured internally, using its own currency.

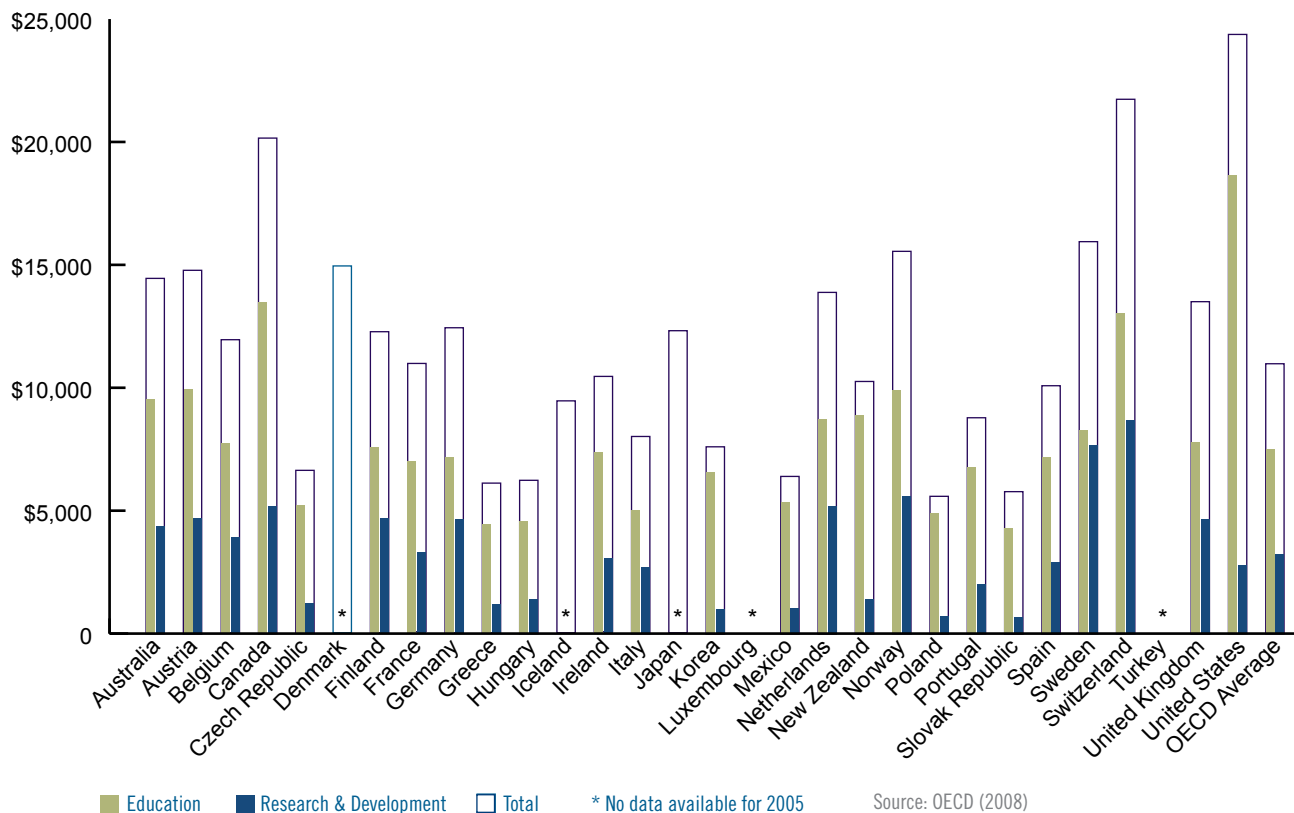
When examining the level of financial commitment, it is also important to examine the mix of public and private resources used to pay for higher education. Is government the dominant source of funding? Or is the private sector relied upon in a major way? Public resources include funds from governments at all levels for support of instruction, research, operations, and other purposes. The term private resources refers to fees paid by students and their families; corporate funding for research, employer benefits, and other purposes; and charitable support through gifts, endowment income, and other private efforts.

TABLE 1. HIGHEST-RANKING COUNTRIES ON COST (Spending per Student, 2005)

	1st	2nd	3rd	4th	5th
Total Spending	United States \$24,370	Switzerland \$21,734	Canada \$20,156	Sweden \$15,946	Norway \$15,552
Education	United States \$18,656	Canada \$13,463	Switzerland \$13,041	Austria \$9,952	Norway \$9,897
Research	Switzerland \$8,694	Sweden \$7,666	Norway \$5,571	Canada \$5,166	Netherlands \$5,164

Source: OECD (2008) Note: Figures are converted to U.S. dollars using the Purchasing Parity Price Index

FIGURE 1. COST AMONG OECD COUNTRIES: SPENDING PER STUDENT, 2005



Political and economic structures strongly influence the degree of public and private commitment to higher education in many countries. For instance, industrialized countries that adhere to a strong socialist model generally treat higher education as one of the public services largely or solely financed by taxpayers. Because higher education is maintained mostly through the tax system in these countries, paying for college is normally not a private concern. In many emerging economies, higher education also is maintained largely by public means; as a result, higher education in these countries, as well as most public functions, tends to be underfunded relative to the underlying need or demand for these services. Conversely, in developed countries with liberal economies, higher education often is financed more through a combination of public and private means. This mixed funding often occurs in countries with lower marginal tax rates and where the prevailing political consensus treats students more as consumers than as taxpayers.⁹

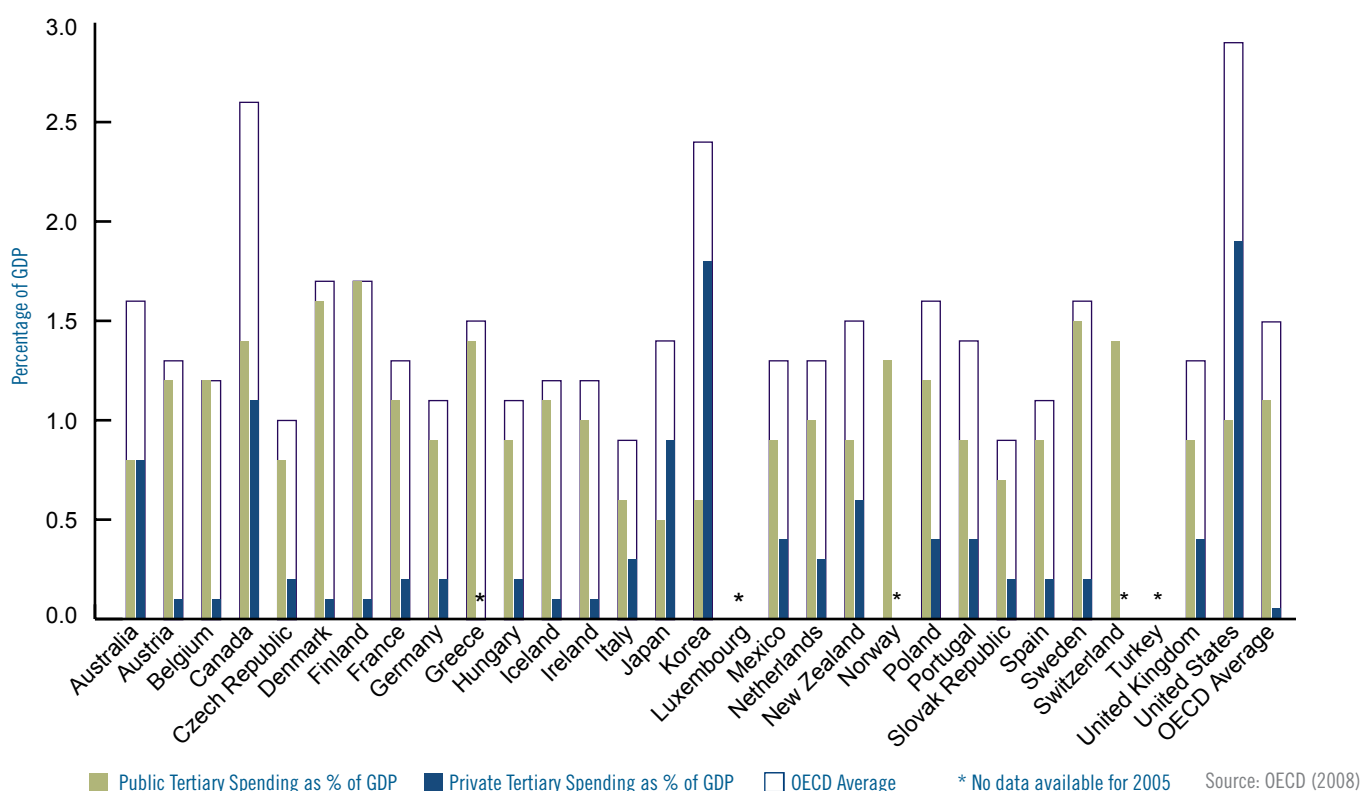
Key Observations on Commitment (Table 2 and Figure 2)

- The United States, Canada, and South Korea have the highest overall commitment to higher education; all devote at least 2 percent or more of GDP to higher education.¹⁰
- Nordic and Scandinavian countries tend to have the strongest commitment of public resources to higher education. In Finland, Denmark, Sweden, and Norway, public resources devoted to higher education represented at least 1.3 percent of GDP in 2005. This relatively high level of public commitment to higher education in part reflects traditions of universality and large-scale commitment to social welfare in this region of the world.
- Only Canada ranked among the highest five countries in both public and private commitment. Its public and private commitment to higher education was relatively even (1.4 percent public and 1.1 percent private resources) as a percent of GDP. In most countries, private resources account for less than 20 percent of resources devoted to tertiary education; the OECD average is roughly 30 percent.
- Only South Korea and the United States commit private resources in excess of 1.5 percent of GDP for tertiary education activities. And only four countries rely as much or more on private resources than on public resources to support their tertiary education systems. The United States is the most reliant on private resources, followed closely by South Korea. Japan also depends principally on private resources,

TABLE 2. HIGHEST-RANKING COUNTRIES ON COMMITMENT (Percent of GDP Devoted to Higher Education, 2005)					
	1st	2nd	3rd	4th	5th
All Resources	United States 2.9%	Canada 2.6%	South Korea 2.4%	Finland 1.7%	Denmark 1.7%
Public Resources	Finland 1.7%	Denmark 1.6%	Sweden 1.5%	Canada 1.4%	Norway 1.3%
Private Resources	United States 1.9%	South Korea 1.8%	Canada 1.1%	Japan 0.9%	Australia 0.8%

Source: OECD (2008)

FIGURE 2. FINANCIAL COMMITMENT AMONG OECD COUNTRIES: TERTIARY RESOURCES AS A PERCENTAGE OF GDP, 2005



* No data available for 2005 Source: OECD (2008)

while Australia has roughly an even split between public and private sources. This greater private-sector reliance suggests that these countries treat higher education more as a private investment, whereas most OECD countries regard higher education primarily as a public good, drawing less than one fifth of total support for higher education from private resources.

Attainment Patterns

Traditionally, international comparisons of the size of higher education systems have been based on entry or participation rates, usually measured as the proportion of students of traditional college-going age who enroll in some form of higher education.¹¹

Comparisons based on participation rates, though, are often difficult to make because of differences in data across countries and a series of data-collection problems. Definitions of what constitutes postsecondary enrollments differ from country to country, as do measures of the traditional college-going age and the degree to which students are enrolled on a full-time basis. In addition, many governments, especially in developing countries, do not regularly collect data on enrollments, whether through surveys or census reporting. In many countries, industrialized or developing, institutions cannot be relied upon to report enrollments regularly or reliably. This has led the OECD to rely instead on what might be called proxy measures (e.g., the gross enrollment ratio, which divides the number of students enrolled by the traditional college-age population) in which the numerator of the statistic counts people who are not included in the denominator.¹² This reliance on proxy measures sorely undercuts the validity of these figures: they do not reflect underlying participation rates in any meaningful way.

Graduation rates are another traditional measure used to compare higher education systems. Although the terms “graduation rate” and “attainment rate” are often used interchangeably, they differ: the former measures the proportion of entering students who receive a degree within a reasonable period of time; the latter looks at the proportion of adults who hold a degree. Graduation rates suffer from similar statistical problems that plague participation rates: countries do not collect the data on a comparable basis, and the OECD is forced to use proxy measures in its reports. As in the case of participation rates, graduation or survival rates are a much less useful basis for comparing OECD countries in their capacity to have students complete their programs of study.

To avoid these difficulties, this report relies on education attainment as the primary basis for comparing the size of higher education systems. This focus on attainment has several advantages over using the more traditional participation or persistence measures. For example, attainment rates:

- Are collected on a more comparable and consistent basis across countries than are participation or gross enrollment rates;
- Are regularly collected for both Bachelor’s and Associate’s degrees, so that a country’s mix of academic and vocational programs can be accurately examined;
- Provide a longitudinal perspective from a snapshot data set by virtue of being able to compare the attainment rates for different adult age groups; and
- Combine aspects of access and success because they reflect both the proportion of the population that enrolls (access) and the proportion that receives degrees (success).

Even with attainment, though, data limitations need to be recognized. Of particular concern is whether in calculating what the OECD refers to as “Tertiary 5B” rates—the proportion of the population earning degrees below the baccalaureate level—some countries may include recipients of some degrees or certificates that might more typically be considered high school graduation in other countries. Canada, which has the highest overall attainment rates as reported by OECD, is a good example of this possible kind of overreporting.

Also, OECD officials, in deciding what data to include in comparisons, make judgments that officials in some OECD countries may dispute. Australia is a good example of this: its postsecondary vocational system enrolls more students than its higher education system, with roughly 1.6 million students in vocational programs and roughly 1 million students enrolled in universities. However, OECD attainment statistics do not include the certificates or degrees earned by these vocational students; thus, the OECD figures tend to understate Australian attainment for sub-Bachelor’s vocational programs.

In contrast, in Norway, vocational courses that might be offered for two-year degrees in many countries are instead part of the curriculum in programs that offer Bachelor's degrees or their equivalent. This situation may help to explain the very high proportion of Bachelor's degree attainment in Norway. These anomalies may also distort the balance in reporting activity between vocational (i.e., Associate's) and academic (i.e., Bachelor's) degree attainment patterns in some cases.

Key Observations on Attainment (Figure 3 and Tables 3,4,5)

Examination of the OECD reports and data confirms that the patterns of attainment among OECD countries vary considerably depending on the type of the degree and the age of workers that are being examined.

- Canada and Japan are the leaders in overall degree attainment (*see Table 3*), as well as for the youngest group of workers (*see Table 4*). This leadership position for both countries is largely a function of their sub-Bachelor's degree attainment, where they report the highest rates of attainment among OECD countries.

TABLE 3. HIGHEST-RANKING COUNTRIES ON ATTAINMENT Percent of Adult Workers (Ages 25-64) with a Higher Education Degree, 2006					
	1st	2nd	3rd	4th	5th
All Degrees	Canada 47%	Japan 40%	United States 39%	New Zealand 38%	Finland 35%
Bachelor's Degree	Norway 31%	United States 30%	Netherlands 28%	Denmark 27%	Iceland 26%
Sub-Bachelor's Degrees	Canada 23%	Belgium 18%	Japan 18%	Finland 16%	New Zealand 15%

Source: OECD (2008) * U.S. attainment rates are revised to correct error in Education at a Glance 2008

FIGURE 3. TERTIARY DEGREE ATTAINMENT AMONG OECD COUNTRIES, 2006

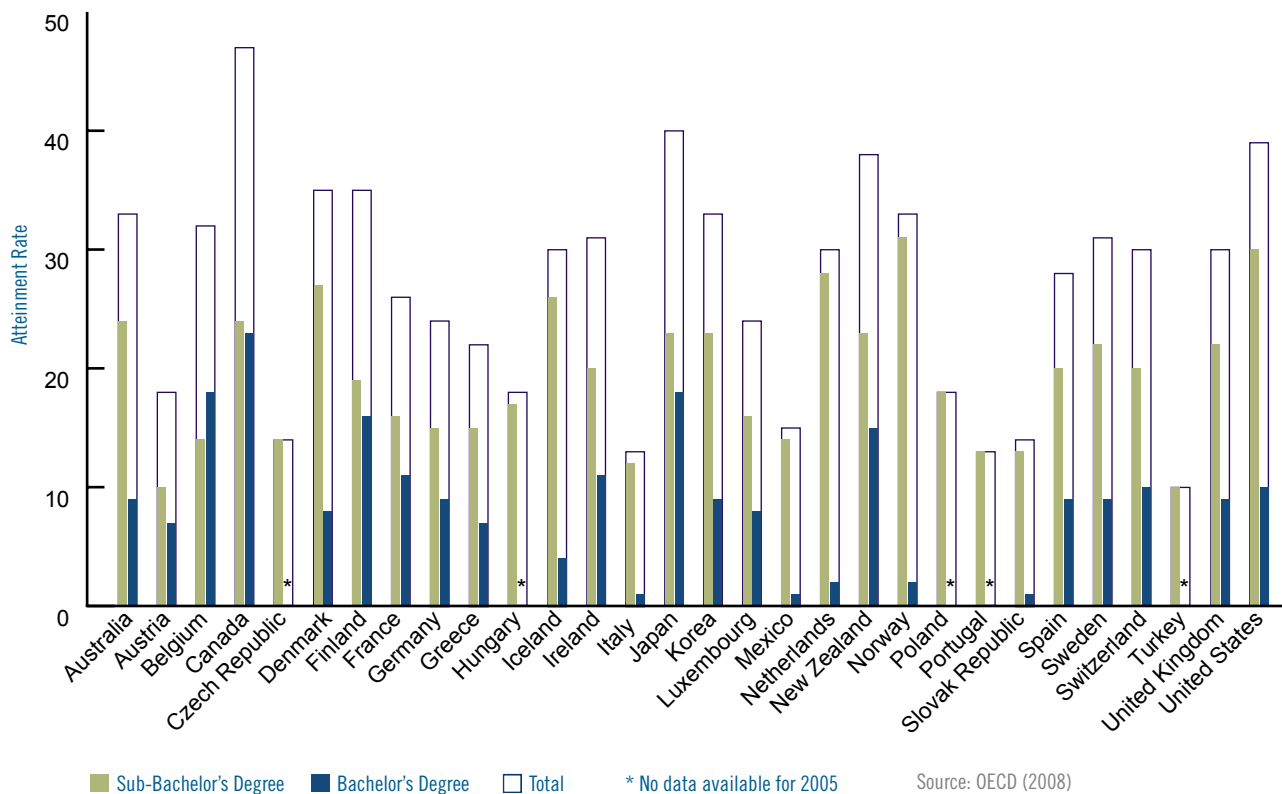


TABLE 4. HIGHEST-RANKING COUNTRIES ON ATTAINMENT
Percent of Youngest Workers (Ages 25-34) with a Higher Education Degree, 2006

	1st	2nd	3rd	4th	5th
All Degrees	Canada 55%	Japan 54%	South Korea 53%	New Zealand 44%	Norway 42%
Bachelor's Degree	Norway 40%	Netherlands 34%	South Korea 33%	Denmark 32%	Sweden 31%
Sub-Bachelor's Degrees	Canada 26%	Japan 24%	Belgium 22%	South Korea 20%	France 18%

Source: OECD (2008) * U.S. attainment rates are revised to correct error in Education at a Glance 2008

TABLE 5. HIGHEST-RANKING COUNTRIES ON ATTAINMENT GROWTH, 2006
Difference in Attainment Rates Between Adult Workers Aged 25-34 and 55-64

	1st	2nd	3rd	4th	5th
All Degrees	South Korea 42 percentage points	Japan 31 percentage points	France 25 percentage points	Ireland 25 percentage points	Spain 24 percentage points
Bachelor's Degree	South Korea 23 percentage points	Ireland 17 percentage points	Norway 17 percentage points	Finland 17 percentage points	Japan 16 percentage points
Sub-Bachelor's Degrees	South Korea 19 percentage points	Japan 16 percentage points	France 13 percentage points	Belgium 10 percentage points	Spain 10 percentage points

Source: OECD (2008) * U.S. attainment rates are revised to correct error in Education at a Glance 2008

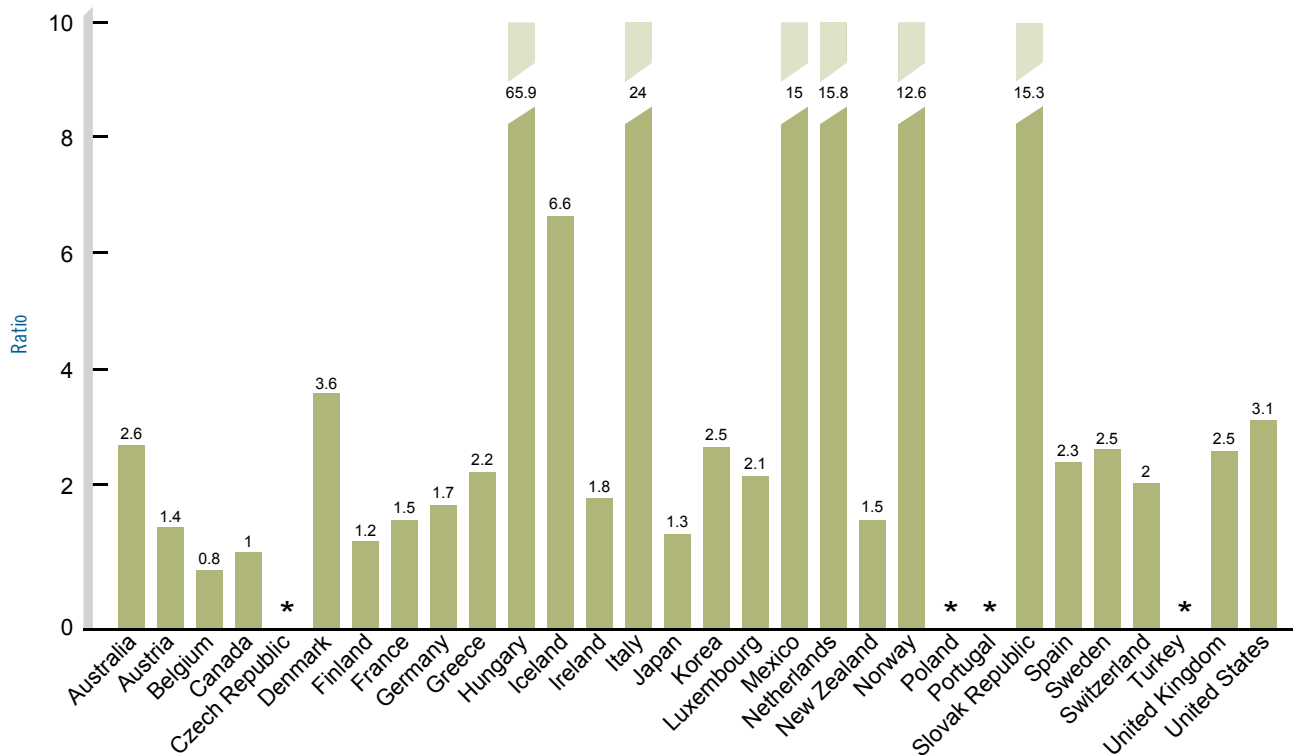
- Norway and the United States rank at the top of OECD countries with respect to Bachelor's degree attainment for all adult workers. Norway also ranks at the top for the youngest group of workers, followed by the Netherlands and South Korea.
- In terms of growth in attainment over time, as measured by the difference in rates between the youngest adult workers (ages 25-34) and the oldest workers (ages 55-64), South Korea is the fastest-growing country for both Bachelor's and sub-Bachelor's degrees (*see Table 5*). For Bachelor's degrees, Ireland and Norway have the next-largest differences between their younger and older workers, while for sub-Bachelor's degrees, Japan has the next-largest difference after South Korea.

There is also tremendous variation in the ratio of attainment for Bachelor's degrees to sub-Bachelor's degrees (*see Figure 4*). This ratio ranges from that in Hungary, which reports virtually no sub-Bachelor's degrees; to those in a group of countries, including Norway, Italy, the Netherlands, and Iceland, with ratios in excess of 12:1; to that in the United States, where it is 3:1. There are also a number of countries where the ratio is less than 3:1; this latter category includes Canada and Japan, which have the highest overall rates of attainment, where the ratio is 1:1. That is, the attainment rate for sub-Bachelor's degrees equals that for Bachelor's degrees.

This ratio of Bachelor's to sub-Bachelor's degrees may be a key determinant of whether countries can increase their overall attainment at sustainable levels of cost and commitment. A lower ratio means that it is more feasible to increase attainment without unduly increasing cost per student or financial commitment. However, if there is a high attrition rate, as in the United States, even changing the ratios of attainment between Bachelor's and sub-Bachelor's degrees may not result in increased attainment rates at reasonable costs.

Despite large differences in societal organization from market-based economies to welfare-state nations, a broad set of patterns emerges from comparing OECD countries on the components of cost, commitment, and attainment. Those countries that have reached the highest levels of overall degree attainment have tended to rely on sub-Bachelor's degree programs to achieve much of this growth. The more balanced utilization of both Bachelor's and sub-Bachelor's programs also appears to have allowed these countries to achieve higher levels of degree output at relatively lower cost than countries that rely more on the Bachelor's degree programs. In part, this is because programs leading to sub-Bachelor's degrees are inherently less costly to run: their average time to degree is shorter, and the higher costs

FIGURE 4. RATIO OF BACHELOR'S DEGREE ATTAINMENT TO SUB-BACHELOR'S DEGREE ATTAINMENT AMONG OECD COUNTRIES



required at most research-focused institutions have little effect on cost per degree. By contrast, Norway, Denmark, and the United States are prime examples of countries that have achieved high overall levels of degree output but through greater reliance on more costly Bachelor's degree programs.

Where the United States Ranks

Where does the United States rank on the variables of cost, commitment, and attainment? An examination of the most recent OECD data shows that the U.S. ranking on these variables is mixed (see Table 6).

The United States has the highest levels of cost, commitment, and attainment among OECD countries on several key components of each. For education and total spending per student in 2005, the United States ranked highest among OECD countries. The United States also has greatest financial commitment to higher education, with a much heavier reliance on private resources than any other country. It also has the second-highest level of Bachelor's degree attainment for all adult workers and is sixth among the youngest group of workers.

TABLE 6. WHERE THE UNITED STATES RANKS ON COST, COMMITMENT, AND ATTAINMENT AMONG OECD COUNTRIES

COST	EDUCATION	RESEARCH	TOTAL
Higher Education Spending per Student, 2005	1st	15th	1st
COMMITMENT	PUBLIC	PRIVATE	TOTAL
Higher Education Resources as a Percentage of GDP, 2005	15th	1st	1st
DEGREE ATTAINMENT	BACHELOR'S	SUB-BACHELOR'S	TOTAL
Attainment Rates, Workers Aged 25-64, 2006*	2nd	9th	3rd
Attainment Rates, Workers Aged 25-34, 2006*	6th	11th	10th
Attainment Rates, Workers Aged 55-64, 2006*	1st	5th	1st
Difference in Attainment Rates Between Workers Aged 25-34 and 55-64, 2006*	30th	18th	29th

Source: OECD (2008) * U.S. attainment rates are revised to correct error in Education at a Glance 2008

However, the OECD-reported statistics also indicate that the United States ranks average to below average on a number of dimensions. It spends less per student on research-related activities than the OECD average: 15th out of 27 countries measured. Although its overall financial commitment remains the highest in the world, its share of GDP devoted to higher education coming from public resources (15th) is slightly below average. The U.S. attainment rate for sub-Bachelor's degrees also is about average for the OECD (11th), which is one key reason that the overall U.S. attainment rate is no longer in the top rank. The U.S. also ranks very low among OECD countries in the difference in attainment rates between the youngest and oldest workers, reflecting the fact that it has a mature universal system of higher education.

Changes over Time in U.S. Figures for Cost, Commitment, and Attainment

The annual publication of OECD's *Education at a Glance* report always brings some revision in figures and rankings among countries; sometimes these revisions are enough to change the storylines. The 2008 report contains changes in the characterization of the U.S. position on cost, commitment, and attainment that bear further analysis and discussion.

Cost per student. Between 2004 and 2005, the U.S. total spending for higher education per FTE student and cost per student associated specifically with instruction and other education-related activities each increased by about 3 percent, slightly slower than the average increase among all OECD countries of almost 4 percent. By contrast, between 2003 and 2004, among all OECD countries, total spending per student declined modestly, from an average \$11,300 to \$11,100. Education and research spending per student also both declined slightly between 2003 and 2004. This reflects the fact that in a half-dozen countries, including the United States and the United Kingdom, total spending per student declined between 2003 and 2004. The United States had the biggest decline of any OECD country, with total spending per student falling roughly 5 percent. Big surges in enrollments that drove down spending per student were a primary cause for this decline in both countries. Even with this reduction, though, U.S. spending per student remained the highest in the world by a large margin (in part because of how the cost figures are computed).

Commitment. The United States has made the largest commitment to higher education among OECD countries for a sustained period of time. It ranked first among OECD countries in 1995, 2000, and 2005. Moreover its levels of commitment increased much more rapidly than the OECD average. In 1995, the United States committed 2.3 percent of GDP to higher education while the OECD average was 1.3 percent. In 2000, the U.S. figure had grown to 2.7 percent while the OECD average remained at 1.3 percent. In 2005, the pattern persisted: the U.S. figure had grown to 2.9 percent, more than double the OECD average commitment of 1.4 percent for countries reporting in each of these three years.¹³

Attainment. Large-scale changes in the U.S. attainment rates were one of the most striking items in the OECD's 2008 report. After a number of years in which the U.S. attainment rate for Bachelor's degrees for all age groups was reported at roughly 30 percent, the U.S. rate jumped to 35 percent for all age groups. At the same time, the U.S. rate for sub-Bachelor's degrees was halved, from the traditional 10 percent to 5 percent, again for all groups, while the overall attainment rate was virtually unchanged. But it turns out these changes were a mistake: they reflected an incorrect recategorizing of academic Associate's degrees awarded by community colleges as Bachelor's degrees in the 2008 OECD report rather than as sub-Bachelor's degrees, as was the case in previous OECD reports. Thus, the change in the attainment rates for the United States in *Education at a Glance 2008* as initially reported should be ignored; in this report, we have used U.S. attainment rates as revised on the OECD Web site to show where the United States ranks among OECD countries.¹⁴

This underscores that the OECD figures must be reviewed with care. But as with previous OECD reports, the attainment rankings of the United States relative to other OECD countries raise concerns that without substantial changes in policy, this nation will become less competitive in the global marketplace because many other countries are now producing more graduates at the sub-Bachelor's degree level or higher.¹⁵

Are these concerns justified? To answer this question, it is important to divide the issue of attainment into two parts: one relates to Bachelor's degrees and the other to sub-Bachelor's degrees. In Bachelor's degrees, the United States has ranked at the top of OECD countries since it developed a mass system of higher education in the 1960s. This continues to be the case. The United States has the second highest attainment rate among all adult workers, at 30 percent. When comparing attainment rates for Bachelor's degrees among the youngest adult workers, however, the United States now ranks sixth.

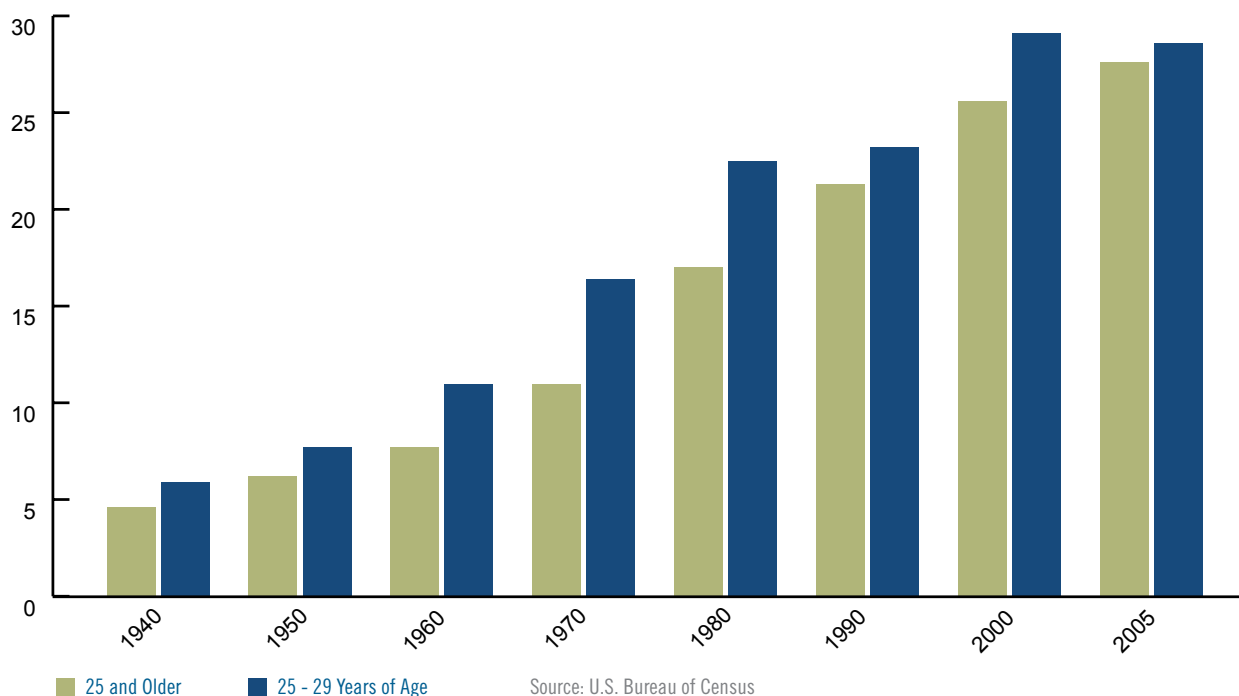
Much also is made in some recent reports that the United States and Germany are the only two OECD countries where the attainment rate for younger workers is the same or lower as the rate for older workers, suggesting that their overall attainment rates are declining. A recent letter initiated by Carnegie Corporation of New York and signed by officials of a number of state higher education agencies and national associations went further and argued that for the first time in our history younger workers have a lower attainment rate than older workers.

However, comparing the attainment rates of younger and older workers can be tricky. The fact is that the U.S. Bachelor's degree attainment rate has climbed throughout the past half century (*see Figure 5*). How can this be so if younger and older workers now have the same rate of attainment? The answer is that if the attainment rate is the same for younger and older workers, that means attainment rates are rising because as the younger adult workers age, additional members of the cohort will receive a degree, thus leading to higher attainment rates. In fact, in a mature mass higher education system, one would expect the attainment rate of younger workers to be slightly lower than that for older workers.¹⁶

Even though U.S. Bachelor's degree attainment rates have continued to rise over the past half century, the slower growth in Bachelor's degree attainment in recent decades relative to many other countries should be a source of concern if there are not enough qualified college graduates to fill the jobs that require the set of skills and abilities provided through higher education. But on this question the jury is still out, or at least opinion is sharply divided. Many argue that having more college graduates is always a good idea if we as a nation are to remain globally competitive, while others wonder how many future jobs will require Bachelor's degree recipients to fill them.

The more immediate and pressing concern regarding attainment, though, comes at the sub-Bachelor's degree level, where the United States traditionally has lagged behind many other OECD countries. Given that community colleges account for nearly half of the total enrollments in American higher education, one can reasonably conclude that low rates of graduation help to account for the very low levels of sub-Bachelor's attainment. Thus, a focus on improving the performance of community colleges seems well merited.

Figure 5. U.S. BACHELOR'S DEGREE ATTAINMENT RATES, 1940 TO 2005



Examining the Experience of Other OECD Countries

A primary purpose of sorting through the OECD data should be to identify countries with high or rapidly rising attainment rates, and then to assess whether these levels or growth seem to have been achieved in a sustainable way. Using a variety of strategies, ten OECD member or associate countries have achieved high levels or growth in attainment (*see Table 7*). Several aspects of the experience of these countries should be noted:

- *High levels of Bachelor's degree attainment typically do not accompany modest levels of cost and commitment.* Countries with high levels of Bachelor's degree attainment (e.g., the United States, Norway, and Denmark) tend to have higher costs and higher levels of financial commitment than countries that have invested more in the sub-Bachelor's degree programs.
- *A focus on increasing sub-Bachelor's attainment does not ensure lower costs and greater sustainability.* Canada and Japan represent a good contrast in this regard. Canada has high levels of sub-Bachelor's attainment, cost, and commitment, while Japan, which relies primarily on private resources, has equally high levels of sub-Bachelor's attainment but at much lower levels of per-student cost and overall commitment.
- *Some countries have achieved high levels or growth of attainment with relatively low levels of cost and commitment.* In Ireland, rapid economic growth allowed for the investment of more resources without significantly higher cost or commitment. Spain similarly relied on economic growth, and it also stimulated expansion through a greater reliance on private-sector institutions and minimizing the facilities used to educate students. However, these approaches often lead to increased concerns about quality.
- *In a number of countries, increases in participation have led to higher levels of attainment, but the reasons vary.* In Australia, with its innovative financing strategies, higher education has grown at relatively modest levels of cost and commitment, while in Israel, an associate member of the OECD, increased enrollments through immigration from post-Soviet countries have translated into high attainment rates. South Korea used private-sector expansion, while the United States in the 1950s and 1960s and Canada more recently relied on growth in their public sectors to develop universal postsecondary systems.

Strategies for Increasing Attainment

In drawing lessons for U.S. policymakers, our review of OECD-reported statistics and the consideration of the European experience provide clues regarding how and why attainment may have grown more rapidly in some countries than in others. These comparisons also suggest which strategies may have been most effective in achieving increases in attainment in sustainable ways (*see Table 8 for a summary of countries and strategies*).

Increasing Degree-Completion Rates

One obvious way to raise attainment rates is to introduce regulations or provide incentives to institutions or students that increase degree-completion rates. A number of countries have made strides in this regard. For example, Denmark now uses graduation measures in its funding formulas. At least a handful of OECD countries have increased graduation rates significantly since 1995, including Australia, Iceland, and Italy.¹⁷ Increasing degree-completion rates would seem to be a more sustainable way to improve attainment than encouraging large increases in enrollments, which could strain system capacities.

Reducing Time to Degree

Through what is known as the Bologna process, European countries are seeking to improve the efficiency and effectiveness of their higher education systems in a number of ways.¹⁸ One key focus of this effort is to reduce the normal time to degree for Bachelor's degree programs, to three or four years from what has been five or more years in many European countries. Examples of European and non-European countries that have taken this approach include Australia, Iceland, Japan, New Zealand, Sweden, and the United Kingdom.

TABLE 7. COUNTRIES ACHIEVING HIGH ATTAINMENT RATES OR GROWTH

Country	Chief Attainment Accomplishments	Ranking, Cost per Student	Ranking, Commitment	Strategies for Improving Attainment
Australia	High levels and growth of Bachelor's degree attainment	8th	7th	Used publicly financed fees to increase resources and access Relied heavily on overseas students to generate resources and spur growth
Canada	Highest sub-Bachelor's degree and combined attainment rates among OECD countries	3rd	2nd	Focused on expanding sub-Bachelor's sector to increase attainment rates. Increased fees, aid, and student loans helped university sector expand as well.
Denmark	Sustained high levels of Bachelor's degree attainment	6th	5th	Government pays institutions for number of graduates not enrollees Emphasized commitment to universities
Ireland	High growth in Bachelor's degree and sub-Bachelor's degree attainment	16th	20th	High economic growth spurred high growth in Bachelor's degree and sub-Bachelor's programs despite low public commitment and low fees Private philanthropic support stimulated increased public investment in university-based research
Israel	Sustained high levels of Bachelor's and sub-Bachelor's degree attainment	16th*	4th*	Used graduation rates in funding formula Raised fees in 1990s to produce more resources to increase completion rates High immigration from former Soviet Union helped to increase participation and attainment levels
Japan	High levels and growth in attainment of sub-Bachelor's programs	12th	11th	Relied heavily on private sector for growth in participation and attainment, especially in sub-Bachelor's degree programs
Norway	Highest levels of Bachelor's degree attainment	5th	Data not available in 2005	Used a high level of public commitment in university sector to produce high levels of Bachelor's degree attainment
South Korea	Highest rates of growth in Bachelor's degree and sub-Bachelor's attainment	22nd	3rd	Relied on private sector for growth in participation and attainment in both Bachelor's and sub-Bachelor's degree programs
Spain	High growth in Bachelor's and sub-Bachelor's degree attainment	18th	21st	Expansion of private religious sector was a principal source of overall enrollment growth Use of public-sector facilities has been minimized relative to enrollments
United States	Sustained high levels of Bachelor's degree attainment	1st	1st	Recent growth achieved through higher fees linked with more aid, and more distance learning Earlier growth (1950s-1970s) based principally on public-sector expansion

Source: Column 1-4; OECD (2008) *If Israel were an OECD member

TABLE 8. STRATEGIES OECD COUNTRIES USE TO INCREASE ATTAINMENT RATES*

STRATEGIES	COUNTRIES
Increasing graduation rates	Australia, Denmark, Iceland, Israel
Reducing time to degree	Australia, Iceland, Japan, New Zealand, Sweden, United Kingdom
Expanding sub-Bachelor's programs	Belgium, Canada, Finland, Japan, Spain
Maintaining a high level of public commitment	Denmark, Finland, Norway, Sweden, Switzerland
Relying on the private sector to foster growth	Japan, South Korea, Spain, United States
Enrolling more students in universities	Denmark, Iceland, Netherlands, Norway
Increasing tuition fees in the public sector	Australia, Canada, Israel, New Zealand, United States
Recruiting abroad	Australia, Austria, Ireland, New Zealand, Switzerland, United Kingdom

The Bologna process has also stimulated some countries to institute reforms that help to lessen the time to degree. For example, the Czech Republic is seeking to shift students from its traditional five-year program leading simultaneously to both a Bachelor's and a Master's degree to a three-year Bachelor's degree, followed by a two-year Master's degree.¹⁹ If successful, these strategies should result in higher attainment rates at lower, or at least similar, cost levels, as countries move more students through the system more efficiently.

Expanding Sub-Bachelor's Programs

One of the principal ways in which countries stimulate growth in attainment at relatively modest levels of cost and commitment is to invest more heavily in sub-Bachelor's degree programs, which tend to cost less per student than Bachelor's degree programs. Canada and Japan have both used this strategy to achieve very high levels of overall degree attainment. However, neither nation ranks in the top five countries in terms of Bachelor's degree attainment rates.

Making a High Level of Public Commitment

The investment of more resources in higher education often leads to greater participation, which then may translate into higher rates of attainment. A number of countries, especially from Nordic regions, have made a significant public commitment to increasing the size of their higher education systems and raising attainment rates. Ireland, too, has significantly increased the investment of public resources in higher education, but this increase came more from rapid national economic growth than from a high level of public commitment.

Relying on the Private Sector to Foster Growth

South Korea and Japan are the prime examples of industrialized countries that have relied on expansion in private-sector institutions to fuel growth in participation and attainment. Both have become worldwide leaders in attainment without a high cost per student or commitment. Outside the OECD, a number of developing countries also have pursued such a strategy for increasing the size of their higher education systems with reasonable success.

Enrolling More Students in Universities

A number of Scandinavian countries have Bachelor's degree attainment rates similar to or exceeding those in the United States, especially for their youngest workers. Norway, with the highest rate of Bachelor's degree attainment, has focused on developing Bachelor's degree programs, with a very small sector of sub-Bachelor's programs. As a result, the Nordic countries tend to have relatively high levels of both education cost per student and public commitment. These countries with high Bachelor's degree attainment also tend to spend more on research per student than do countries with smaller Bachelor's degree sectors.

Increasing Tuition in the Public Sector

Several OECD countries have achieved high levels or rates of growth in participation by relying relatively heavily on raising the fees for students attending public-sector institutions. Canada has followed this strategy, and it has the highest overall rates of attainment among OECD countries, although, as noted, much of this growth has been in sub-Bachelor's degrees. In the United States and New Zealand, higher public fees also have expanded resources, which in turn allow for higher enrollments. Australia is the prime example, through its Higher Education Contribution Scheme, of a country that now publicly funds higher fees initially, with students repaying these fees based on their income once they graduate. England and Thailand recently have adopted similar publicly funded fee approaches.²⁰

Recruiting Abroad

Another means for countries to increase resources and enrollments is to recruit more students from other countries. The fees these students pay, which often approach market rates, can generate significant resources for a higher education system. Australia and New Zealand are particularly aggressive in this regard: overseas students represent one-fifth or more of total higher education enrollments. In Austria, Switzerland, and the United Kingdom, overseas students represent at least one-tenth of enrollments. However, to the extent that few overseas students typically become citizens of the countries in which they study, large influxes of international students may not affect attainment rates significantly.

Future Directions for the United States?

We can all agree that the knowledge-based economy, which has replaced the labor-intensive enterprises of yesterday, demands a well-educated workforce with the technical skills to grapple with twenty-first-century problems. Yet improving and expanding higher education is a challenge for many countries. For one thing, it can be costly to expand the size of the sector. For countries that are catching up and those that are moving away from elite systems, doing more with less is critical as public support for higher education systems typically does not match the booming demand for college and university

Three Essentials for Sustainable Progress on Attainment Rates

Around the world, countries recognize the importance of expanding higher education in order to lead national economies. For some, such as South Korea and Ireland, building educational capital has meant catching up to countries that already had strong tertiary education systems. For others, especially those with strong records on degree attainment, increasing output typically means expanding the number of new students or those who have not historically participated in tertiary education at high rates.

What is clear is that fiscal constraints often deter policymakers from investing in increasing enrollment and degree attainment indiscriminately. Indeed, as demand for higher education continues to increase rapidly in most countries, financial support must follow the most cost-effective approaches to improving degree attainment if the system is to remain sustainable. In this process, realizing sustainable growth in attainment cannot be decoupled from some essential requirements of the enterprise:

- Preserving high academic standards;
- Increasing enrollment; and
- Having enough physical resources to serve all those who wish to be students.

These caveats are essential, yet some OECD countries seem to have struggled to maintain academic quality while expanding access to higher education. For instance, some French universities have deferred maintenance for years. In Italy, some courses are so overcrowded that students must call ahead to reserve seats. In Spain and Portugal, university officials expect far fewer than half of enrolled students to attend classes on a regular basis; this sharply reduces the need for expansion in academic facilities.

access. In the United States and in other countries with mature higher education systems, the challenge today is to improve degree productivity in financially sustainable ways.

As higher education systems evolve, all countries will face increased fiscal and demographic pressure to adjust and adapt. Recognizing these limits brings us to two sets of questions that underlie this report:

- How can the variables of cost, commitment, and attainment be used to tell the story of why U.S. growth in attainment rates lags in relation to other countries, while cost and commitment levels in the United States remain among the highest in the world?
- Short of massive new investments, what can be done to lift U.S. attainment rates at both the Bachelor's and sub-Bachelor's degree levels? In other words, how can the United States efficiently and effectively improve its overall attainment level to ensure its continued global economic competitiveness?

It seems apparent in hindsight that the United States remained at the top of the international Bachelor's degree attainment rankings for many years because large numbers of people were able to enter into the university system. Even with average to below average degree-completion rates for university students, the United States continued to maintain the world's highest Bachelor's degree-attainment rates. On the other hand, the United States has never had a high attainment rate for degrees below the Bachelor's level, despite the remarkable expansion of its community college system over the past half century. This testifies to extraordinarily low degree-completion rates in community colleges and perhaps to an underlying inefficiency of the U.S. system.

By the same token, it is remarkable that degree-attainment rates in the United States are so similar among various age groups. The rate of attainment for 55 to 64 year olds is roughly the same as the attainment rate for 25 to 34 year olds for both Bachelor's and sub-Bachelor's degrees. That fact reflects the consistent U.S. financial commitment to higher education over a sustained period of time, one that few if any countries have matched in the past. One of the most intriguing questions going forward is whether the countries that have increased their attainment rates rapidly will be able to sustain those improvements in the future.

It also seems clear that a primary reason for the recent modest growth in attainment despite continued high levels of cost and commitment is the high degree to which the United States has focused on baccalaureate education and beyond. In contrast, Canada, Japan, and several OECD countries have jumped ahead of the United States in overall attainment rates mostly by focusing on increasing the number of sub-Bachelor's degrees they produce.

Recent U.S. history and trends among OECD countries suggest three approaches the United States should consider to achieve higher attainment levels at sustainable levels of costs and commitment.

I. Focus more resources and attention on community colleges.

As in most countries, four-year institutions receive the lion's share of public and private funding for higher education in the United States and tend to be more costly to run than two-year institutions, but U.S. Bachelor's degree attainment is high compared with most other OECD countries. Community colleges, by contrast, tend to have lower costs per student, but U.S. attainment rates are average to below average among OECD countries. One effective way for the United States to economize, while at the same time becoming more productive, is to shift more public resources toward less costly sub-Bachelor's programs, while ensuring that these programs lead more students to successful outcomes, including credentials and degrees of value in the labor market.

II. Pay more attention to developing and implementing strategies to improve completion rates at both two-year and four-year institutions.

The U.S. persistence and degree-completion rates have been average to below average among OECD countries for many years. This pattern is a function of many factors, but an important one is the tendency for U.S. public policies and institutional practices to focus on access more than success. While the completion rates at community colleges are especially low, degree completion at four-year institutions

also is below average among OECD countries. Therefore, a sustained effort at improving completion rates at all postsecondary levels should bring cost, commitment, and attainment more in line with one another. One means for doing this is to provide institutions with incentives to produce more graduates, such as basing state funding formulas on the number of students who complete a year of study or graduate rather than adhering to the traditional practice of funding institutions on the basis of the number of students they enroll. This approach seems to have worked well in countries such as the United Kingdom, Denmark, and Israel. It could lead to increased degree-completion rates in the United States as well.

III. Employ strategies that increase enrollments as a means for moderating costs per student and improving productivity.

Much has been made of the fact that U.S. public funding for higher education has sunk in recent years to thirty-year lows. Less attention has been paid to the fact that this decline is not so much because states have cut their higher education appropriations (they have not, in the aggregate), but more because a big enrollment surge in the first half of the 2000s drove down resources per student. This confluence of events helps to explain why the United States had the biggest decrease in spending per student of any OECD country between 2003 and 2004. It also suggests that thinking about how enrollment levels are managed—both at the system level and by individual institutions—may lead to raising productivity by driving down spending per student while maintaining attainment at high and increasing levels.

ENDNOTES

1. U. S. Dept. of Education (2006).
2. See, for example, National Center for Public Policy and Higher Education (2008), College Board (2008), and Reindl (2007).
3. *Tertiary education* is the term used for the full range of postsecondary education in the OECD documents and statistics. Increasingly, it is used in international discussions to denote higher education and postsecondary education. However, the OECD statistics on cost, commitment, and attainment that are examined in this report apply principally to the higher education sector more than the broader definition of tertiary education.
4. See Hauptman (2008) and Wellman (2007) for more detailed discussions of these statistical issues with regard to participation and persistence.
5. In the United States, Dennis Jones and his colleagues at NCHEMS deserve a lot of credit for the increased attention to the differences in attainment rates for older and younger workers. Their comparisons of countries based on OECD data on attainment and their state-by-state analysis of attainment rates were among the first to recognize the intellectual and practical value of comparing the attainment rates of older and younger workers to determine the growth in attainment over time.
6. For example, in the United States, the Delta Project (2008) reports education spending of roughly \$14,000 per student in 2005 when including the spending of both public and private institutions. This compares to the \$18,000 in education costs per student in the United States in 2005 as reported in the OECD's *Education at a Glance 2008*.
7. As noted above, U.S. average education costs per student as reported by OECD may substantially exceed actual education spending per student, measured as state funding of institutions plus net tuition fees divided by number of FTE students.
8. But research spending per student is not a good indicator of national research effort, because per-student amounts are influenced by whether the system is an elite one or not, which bears no relationship to the level of effort. A more appropriate measure of research effort would be spending as a share of GDP, a figure that OECD calculates for all national research and development but not for research only conducted at universities. See Hauptman (2009) for more on the weakness of some OECD indicators.
9. For a further discussion, see Jongbloed (2004) or Johnstone (2004).
10. In the case of the United States, however, activities such as university hospitals and athletic programs are included in this calculation of commitment; in many other countries, they are not included as part of higher education activities. Thus, the figures in different countries are not fully comparable. For these and other reasons, levels of financial commitment should be examined broadly and relatively small differences among countries should not be emphasized.
11. Martin Trow (1973, 2006) used participation rates as the basis for his now well-known categorization in the 1970s of countries as having elite, mass, or universal higher education systems—with participation rates of less than 15 percent constituting an elite system; 15 to 50 percent would be a mass system under Trow's typology; over 50 percent would be a universal system. In the more than three decades since Trow first wrote on the topic, many countries have moved from elite status to what now would be regarded as mass or universal systems. As a result, the borders used by Trow to define the three categories of systems may have changed in common usage and the definition of both mass and universal higher education would be higher than the figures used by Trow in his seminal article published in 1973.
12. In the case of the gross enrollment ratio, for example, international students and more mature students are included in the numerator and not the denominator, leading New Zealand and some other countries to have gross enrollment rates near or over 100 percent.
13. Source: OECD(2008), Table B2. These figures must be compared with care because the U.S.-reported totals include funds for hospitals and other activities that many other countries do not report as higher education spending.
14. New Zealand was the only other country for which attainment rates changed as dramatically in the 2008 report. New Zealand's rates for both Bachelor's and sub-Bachelor's attainment increased dramatically, thus lifting it into the upper ranks of OECD countries in terms of attainment. When asked about why this change occurred, New Zealanders respond by saying that the figures reported in *Education at a Glance 2007* were incorrect and that the 2006 figures reported in the 2008 edition are correct.
15. See, for example, Wagner (2006).
16. See letter published as an advertisement in *The New York Times*, *Washington Post*, and *Boston Globe* on December 16, 2008. In it, a number of higher education leaders in the United States argued that higher education should be included in the economic stimulus package, particularly in the area of facilities construction and renovation. The letter is available at: www.carnegie.org/sub/news/obama_open_letter.html.

17. The graduation rates reported by OECD are proxy measures: they present the number of graduates in one year as a percentage of the population at the typical age of graduation. As such, they are unlikely to provide accurate comparisons among countries. However, time series for a given country as presented in *Education at a Glance 2007* (Table A3.2) should provide a reasonably accurate sense of changes over time.
18. The Bologna process, named for the Italian city in which officials first met, encourages greater cooperation among European nations to improve their higher education systems through a variety of mechanisms, including greater standardization of degree programs and easier transfer of credits.
19. While a number of countries are adopting this shorter-degree practice, labor-market forces still often demand graduates to obtain both split degrees that in the past were longer cycle degrees.
20. Other fee-related strategies may have contributed to Australia's growth in attainment to the extent that more students lead to more degrees completed. For example, Australia does not subsidize certain fields of study within its public universities.

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