

Report card on Israel's higher education system

by Prof. Dan Ben-David

selected pages from forthcoming

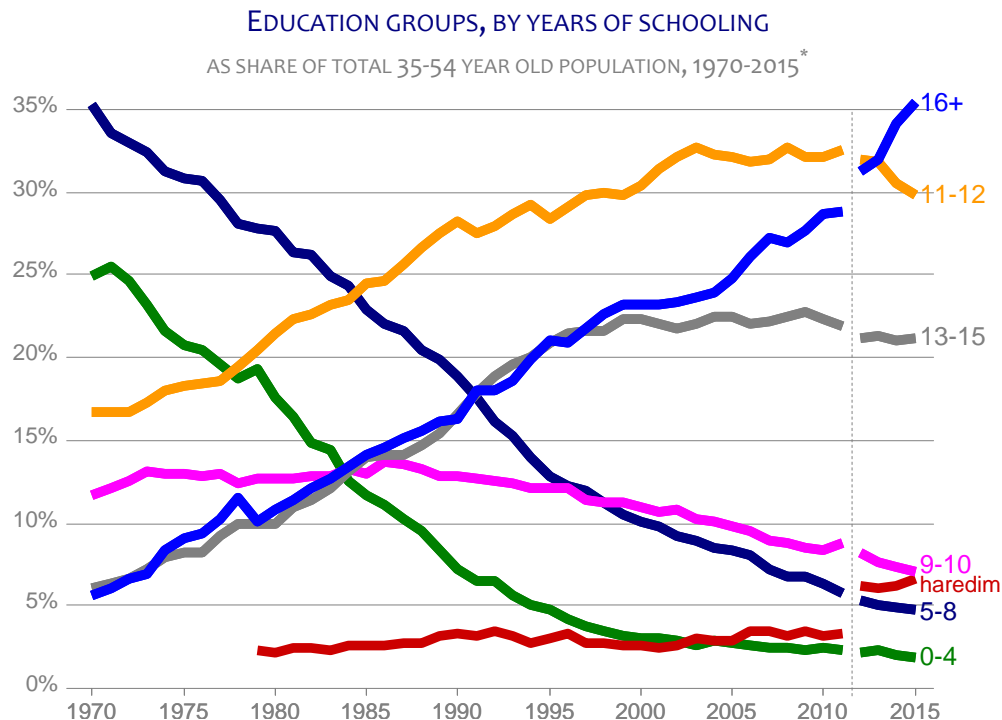
Shoresh Handbook 2017

Israel's population has become more educated

The past four and a half decades have seen a marked change in the educational composition of Israeli society. In 1970, over half of Israel's prime working age adults did not have more than eight years of education. Today, such adults account for less than 10% of this population.

At the opposite end of the education spectrum, the group with 16 or more years of education has exhibited the fastest and most steady growth in its relative share of the prime working age population. Today, the group with 16+ years of education has become the largest, representing over a third of the prime working age population.

The years of schooling metric is not relevant for Haredi (ultra-Orthodox Jewish) men. Nearly all of them do not study a core curriculum (and even this is only a partial core) beyond 8th grade. Instead, they study Torah, sometimes for dozens of years – which results in their being listed in the 16+ group despite not having studied anything approaching an academic education. For this reason, the Haredim are listed separately here.



* As of 2012, the Central Bureau of Statistics changed the estimation methodology in labor force surveys. Since 2012, Haredim are self-identified in the data. Data by school years before 1979 includes Haredim.

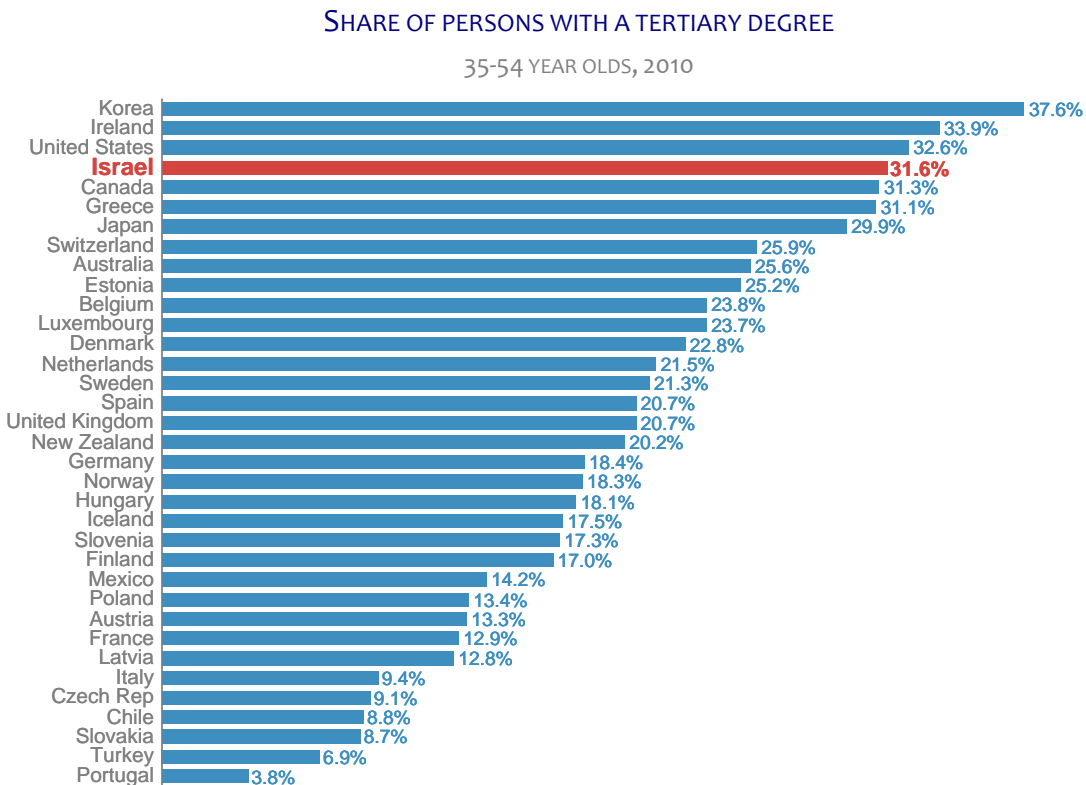
Source: Dan Ben-David and Oren Tirosh, Shoresh Institution
Data: Israel's Central Bureau of Statistics

The share of Israelis with academic degrees is one of the highest in the world

Almost one in three prime working age Israelis have an academic degree. Only three countries in the world have a higher population share with an academic degree.

But this national achievement has not yielded average national incomes at the levels of countries ranked far below Israel in educational attainment.

Not all segments of Israel's population reach academia at such rates – and not all degrees are created equal. Reaching a higher education institution is important, reaching the best ones even more so. More on all of this, below.



Source: Dan Ben-David, Shores Institution and Tel-Aviv University

Data: Barro and Lee (2016)

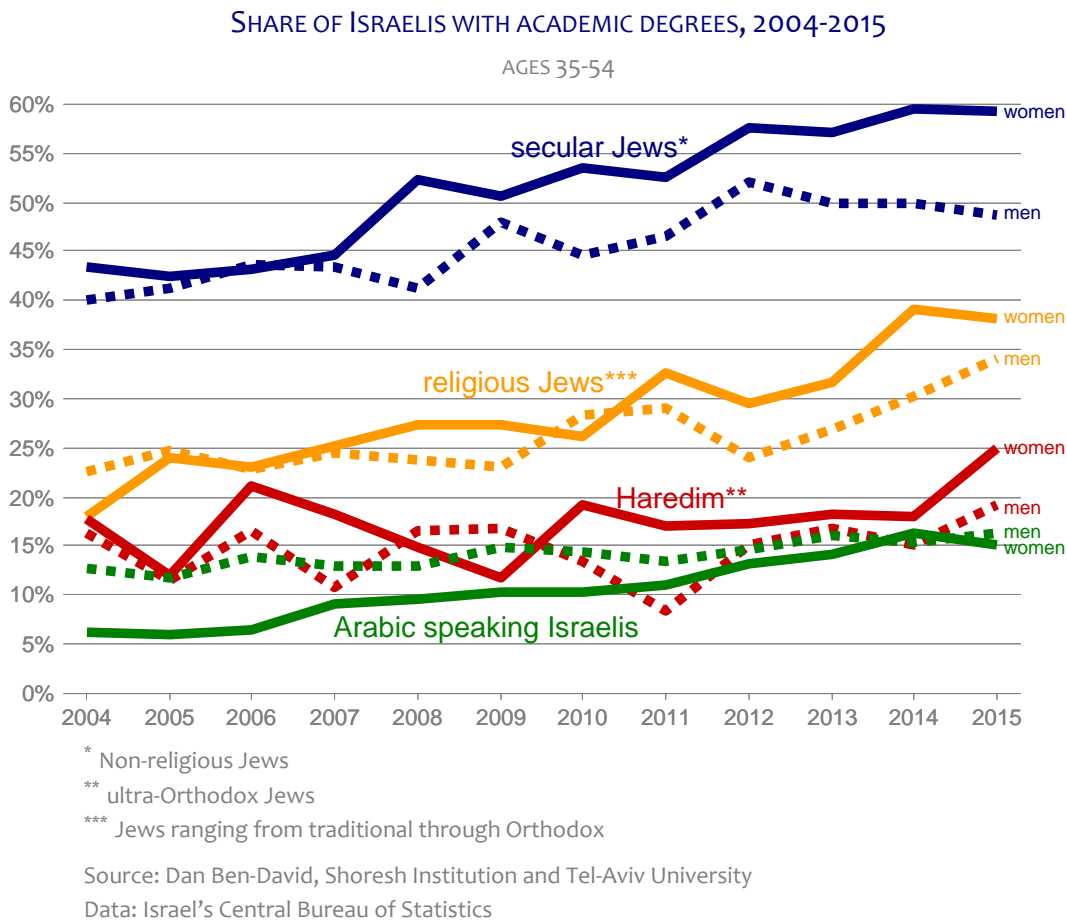
Large gaps between population groups in attainment of academic degrees

The most educated group in Israel are the secular Jews. Roughly half of the prime working age men and almost 60% of the prime working age women have an academic degree.

The fact that there are thousands more Haredim registering for an academic education than in the past has led to a prevailing sentiment that this matter is well on the way to being resolved. However, in light of the rapid increase in the overall Haredi population, the issue is not whether there has been an increase in absolute numbers. More relevant is whether the population share has increased – and not in terms of how many register, but in terms of how many actually graduate.

When individuals do not study any core subjects beyond 8th grade, there are no shortcuts in life to academic degrees. Therefore, it should not be surprising that, in contrast to conventional wisdom, the share of Haredim who actually graduated with an academic degree is very low, and steady – and it has not been very different between Haredi women and men.

Given the small sample size, there is considerable volatility in the outcomes – though these have been relatively stable over the past decade. That said, the 2015 results for the Haredim may, or may not, signal a possible change for the future.



Significant increases in the academic attainment of Arabic speakers in Israel

While the share of Arabic speakers in Israel with academic degrees was below that of the Haredim in the middle of the past decade, it has been rising steadily and approaching Haredi levels.

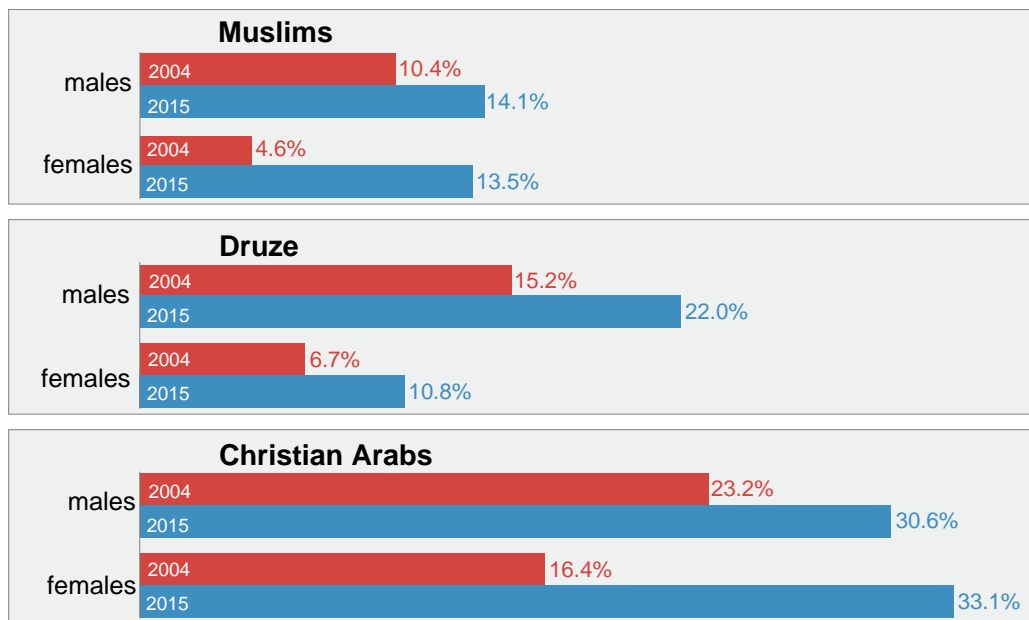
Within Israel's Arabic-speaking population, there are considerable differences between the various religious groups – and within them, between women and men. Muslims make up roughly 80% of the Arab speaking population. While their men have the lowest academic attainment rate among all men, this rate has nonetheless increased by four-fifths, from 10% to 14%. Muslim women exhibited the largest relative increase by far, from 4.6% to 13.5%.

The Druze, like the Muslims, differ from Israel's other population groups in that their women have lower rates of academic attainment than do their men.

The Christian Arabs' school system is much better, enabling them to attain considerably higher academic graduation rates than both of the other groups. The share of Christian Arab woman with academic degrees doubled over the past decade. As a result, these women have overtaken the Christian Arab men, who also experienced a marked increase in their academic attainment.

SHARE OF ARABIC-SPEAKING ISRAELIS WITH ACADEMIC DEGREES IN 2004 AND 2015

AGES 35-54



Source: Dan Ben-David, Shoresh Institution and Tel-Aviv University

Data: Israel's Central Bureau of Statistics

Not all academic institutions are created equal – students beware

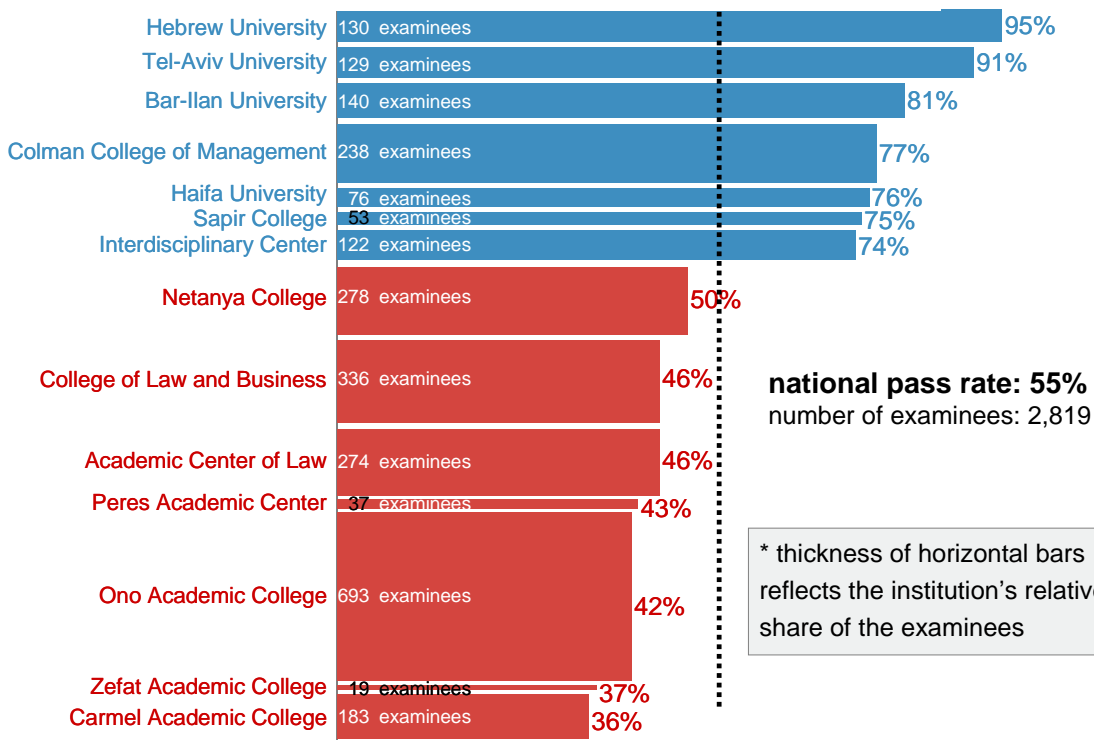
In Israel, as in other countries, the prevailing wisdom is that college degrees open the door to the labor market. What too few in Israel realize is that what one studies and where matters. While getting any academic degree makes it possible to at least find a job, the level of studies greatly influences the graduate’s actual knowledge level – and this is what ultimately determines an individual’s success in the labor market.

It is not easy to distinguish between academic levels within fields across the many institutions of higher learning. Rare are the measurement tools that allow comparison.

One discipline in which such comparisons are possible is Law. Only 55% of those taking the national bar exam passed it in May 2016, a seemingly low percentage. But nearly all of the Hebrew University and Tel-Aviv University students passed the exam, as did relatively high rates in a number of other institutions. However, the majority of students studied law in institutions that were under the bar – both figuratively and literally. This reflects both the low level of primary and secondary education that many of these students received, as well as the low level in which they were taught in college. It is insufficient to simply check off the higher education slot on the resume and assume that equal opportunities will ensue. They don’t.

PERCENTAGE OF EXAMINEES PASSING THE BAR EXAM

BY ACADEMIC INSTITUTION*, MAY 2016



Source: Dan Ben-David, Shores Institution and Tel-Aviv University
Data: Israel Bar Association

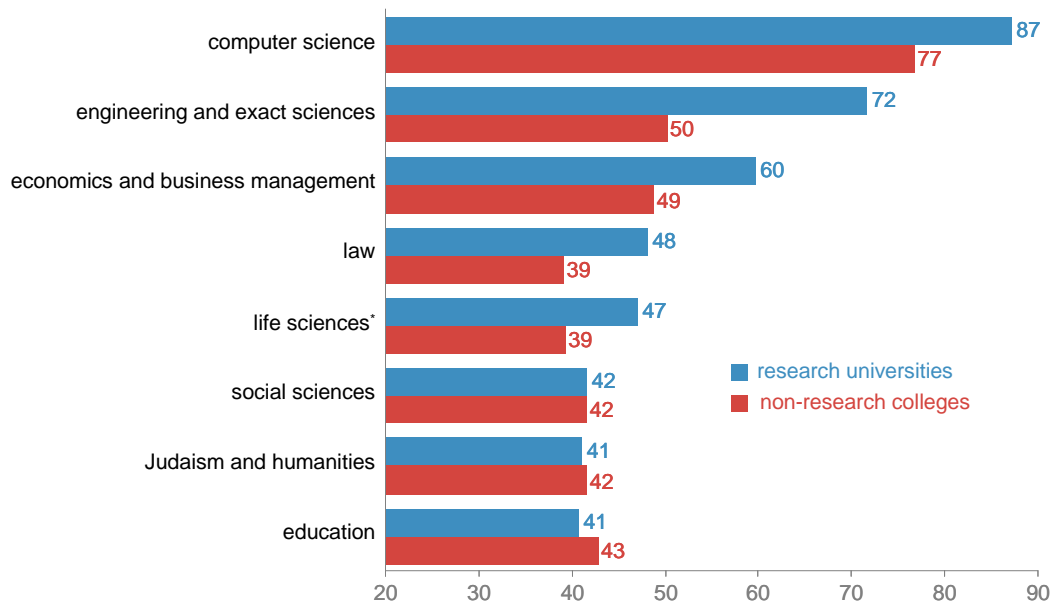
Quality of higher education and academic field of study have major effect on wages

The choice of what to study in higher education, and where, plays a critical role in subsequent earnings. According to the Ministry of Economy and Industry, there is only one person available for every three open positions in the field of computers. With such excess demand, it is no wonder that graduates with degrees in computer science make so much more than graduates in other fields with lower – or no – excess demand.

The quality of academic studies also has a major impact on wages, since not all academic institutions were created equal. The highest quality of academic studies is provided in Israel's research universities. This fact is recognized by the business sector and rewarded accordingly.

Accounting students at universities receive offers for internships following graduation while still in their first year of studies. Many students in non-research colleges have difficulty finding internships even after graduation. Evidence of the large discrepancy between law students in the various institutions is provided in another section below, dealing with issues of quality versus quantity of education. Bental and Peled (2016) find that the quantity of graduates with science and technology degrees actually equals the demand for these in Israel. The fact that the business sector does not consider many such graduates as relevant candidates for open positions is indicative of the relatively low quality of education provided by a large number of Israel's academic institutions.

AVERAGE HOURLY WAGES BY ACADEMIC DISCIPLINE
FOR SALARIED EMPLOYEES, COMPARISON OF UNIVERSITY AND COLLEGE GRADUATES, 2008



* excluding medicine

Source: Dan Ben-David, Ayal Kimhi and Moty Citrin, Shores Institution

Data: Israel's Central Bureau of Statistics

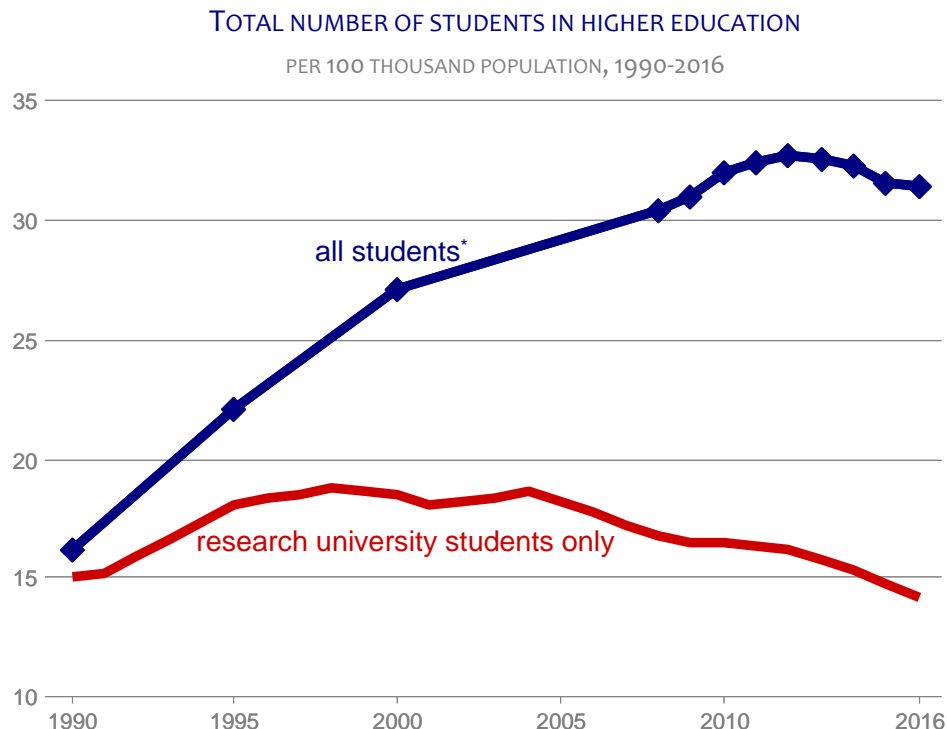
Adding another layer of higher education between high school and research universities

Israel opened up higher education in the 1990s. Following the lead of other countries, an intermediate layer between the top tier research universities and high schools was created. This resulted in over a doubling of the number of students per capita.

The initial emphasis was on creating new institutions of higher education that provided only undergraduate degrees, with the research universities concentrating on graduate degrees that are more expensive to produce.

Over the years, non-research colleges began to include graduate degrees, as well. This created new opportunities that had not existed before for many Israelis, offering alternatives to some that had been considering universities.

Declining birth rates in Israel may be bringing the number of individuals seeking academic degrees to a saturation point, with the total number of students per capita beginning to fall in recent years.



* Total number of students in research universities and non-research colleges.

Source: Dan Ben-David, Shoresh Institution and Tel-Aviv University

Data: Israel's Central Bureau of Statistics and the Council for Higher Education

National priorities have shifted away from Israel's research universities

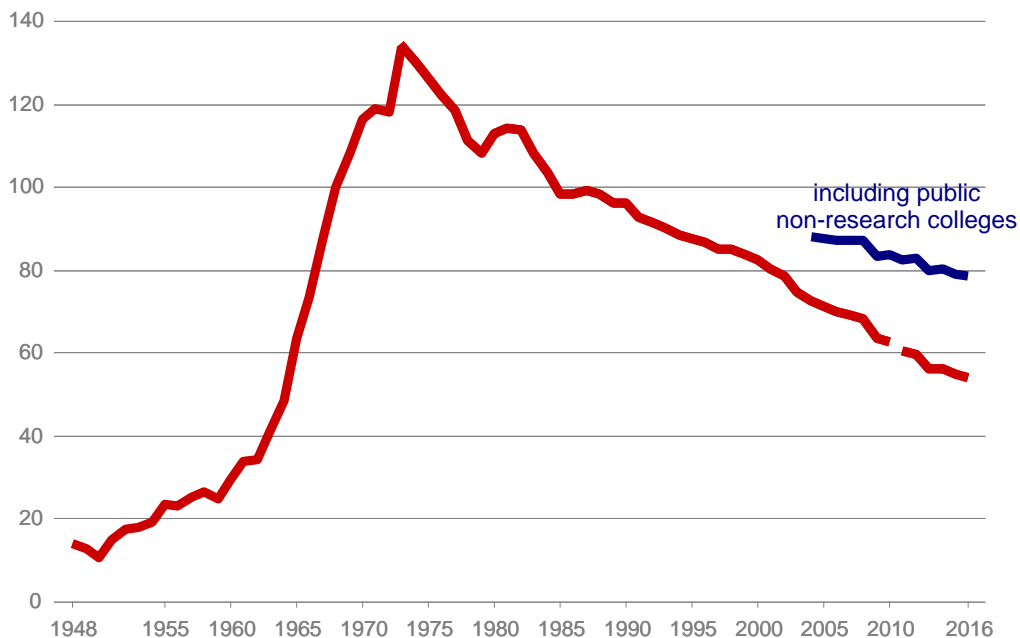
Following its War of Independence in 1948, Israel was flooded with new immigrants. Within just two and a half decades, by 1973, the country's population had increased four-fold. Despite the tremendous internal and external existential pressures, Israel built research universities. By 1973, there were seven.

Over four decades have elapsed since 1973, and the population is now 2.6 times its size then. The country is considerably wealthier, with GDP per capita more than doubling. And yet, not one additional research university has been created since the 1970s.² The number of senior research faculty per capita has fallen steadily for over four decades, and is now just 40% of the 1973 peak. Even with the addition of non-research colleges, the number of faculty per capita is much lower, and falling.

To reach the world's highest living standards, and to remain there, requires that a nation shift from imitation to innovation – and research universities are the key to the latter. This is something that the country's founders understood, but it appears to be unknown or unimportant to many of Israel's recent leaders.

SENIOR RESEARCH FACULTY IN UNIVERSITIES*

PER 100 THOUSAND POPULATION, 1948-2016



* Senior research faculty includes full professors, associate professors, senior lecturers and lecturers. Basis of data changed in 2011.

Source: Dan Ben-David, Shoresh Institution and Tel-Aviv University

Data: Israel's Central Bureau of Statistics and the Council for Higher Education

² The decision, a few years ago, to label the West Bank college of Ariel as a university emanated more from political considerations than any strategic decision to increase the country's research universities.

More graduate students are guided by fewer faculty members

Graduate school represents the top echelon of a country's education system. This is where the country's future researchers are trained. It is the home to the basic research platforms underlying the business sector's hi-tech and bio-tech locomotives. The higher the degree, the greater the need for more personal guidance by senior academic faculty members.

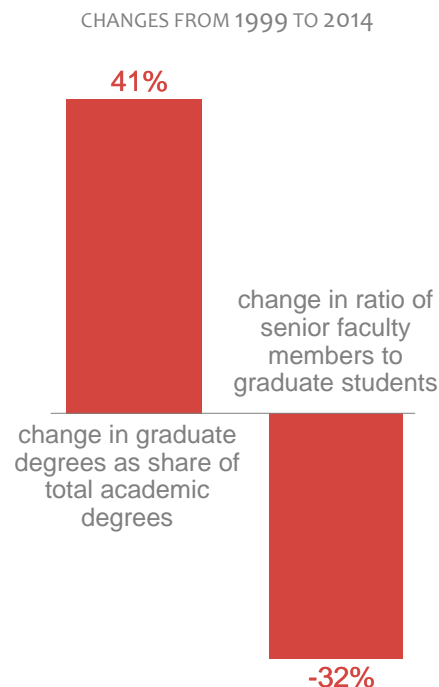
As Israel's economy has grown and matured, the resultant increase in demand for more educated and skilled workers has also translated into a greater need for workers with more advanced degrees. As a result, there has been a 41% increase in the share of graduate degrees out of the total number of degrees granted by the research universities since 1999.

However, the shift in national priorities away from the research universities led to a decline from one senior faculty member per 7.2 graduate students in 1999 to one in 10.6 in 2014, a decrease of 32%.

This result is not conducive to the quality of graduate research. It means less time available for mentors to guide the work and advise their students. In addition, the rapid increase in the number of graduate students may indicate a fall in the average quality of these students – especially in light of the low quality of education at the primary and secondary levels, which are often succeeded by lower quality undergraduate educations provided in some of the colleges.

Whatever the reason, a decline in the quality of graduate student research will not bode well for Israel's future.

THE EVOLUTION OF GRADUATE TRAINING AT UNIVERSITIES*



Source: Dan Ben-David, Shores Institution and Tel-Aviv University
Data: Israel's Central Bureau of Statistics and the Council for Higher Education

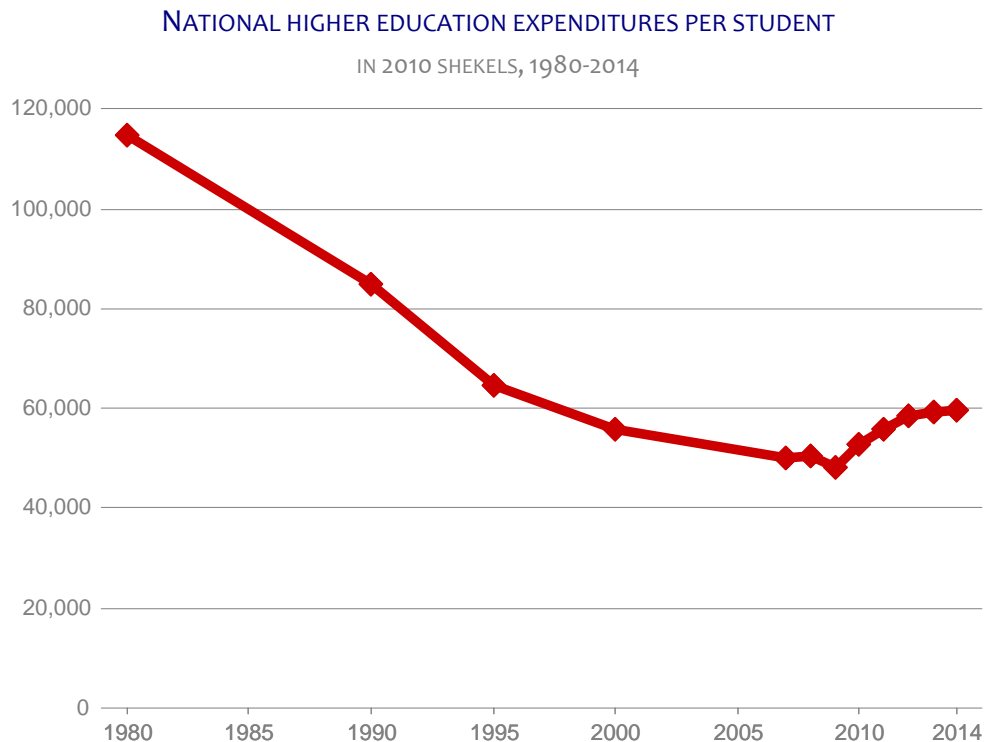
Multi-decade decline in higher education spending per student – until recently

The reduction in Israel's national expenditure per student began in the 1970s, before the introduction of the non-research colleges in the 1990s. To a certain extent, what has transpired after the advent of the colleges makes sense.

Since these colleges focus on undergraduate studies (less so in recent years), they not only provide an opportunity for many who could not get into higher education in the past, they also represent a cheaper way to provide an academic education.

On the other hand, Israel's population has more than doubled since the 1970s. Provision of the highest level of academic education to the same share of Israel's top students who had received this in the past means providing considerably more resources to the research universities today than in earlier years (the number of students in these institutions alone has more than doubled since 1980).

Public pressure in the last decade has led to a turnaround in the funding pictures, with some major increases in recent years.



Source: Dan Ben-David, Shores Institution and Tel-Aviv University
Data: Israel's Central Bureau of Statistics

Public spending on Israel's higher education is one of the lowest in the OECD

The relatively low place that Israel ascribes to higher education in its national priorities can be seen in the ranking OECD countries according to their public expenditures per student in higher education. Israel is below the large majority of the OECD countries.

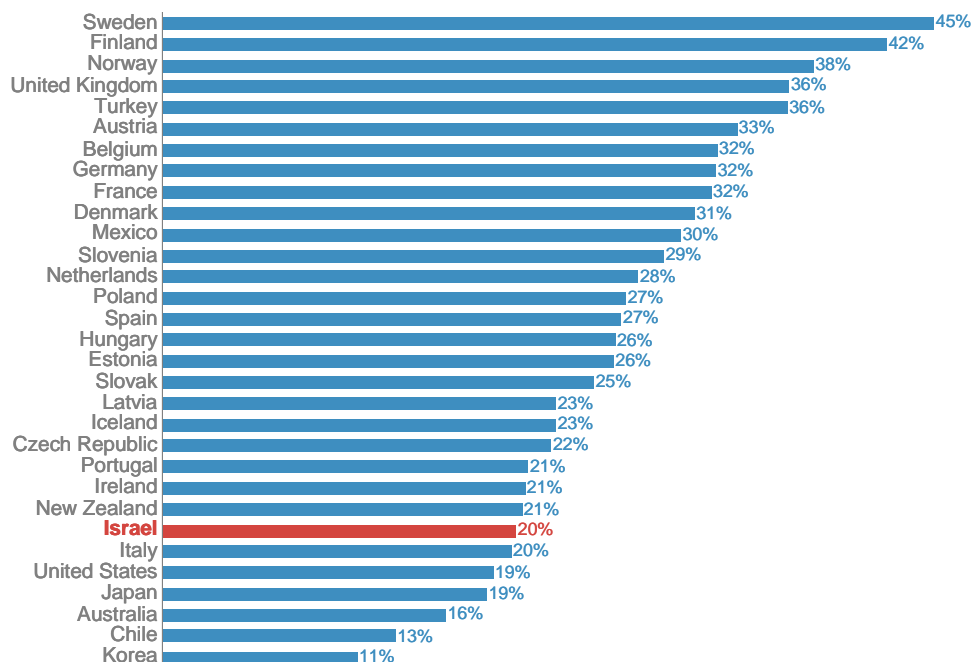
It is possible to go in the way of some other countries, privatizing and charging students much higher tuition. There is some justification in the approach that a person whose future income stream will be higher because of the higher education should also pay for this investment and not ask others to finance it on his or her behalf.

Such an approach omits two major considerations, one general and the other specific to Israel. Human capital is a fundamental ingredient in determining productivity, which in turn, determines country's living standards and their rates of growth. We all benefit if the human capital of others rises, even if it helps them personally. Given how much greater the social rate of return of higher education is than the private rate of return, a strong case can and should be made for subsidizing higher education.

In Israel, there is another reason for doing so. The country asks its young people to serve in the army for several years to protect it. Not only is the army pay meager, these individuals are asked to forgo up to three years of a business career to serve their country – three lost years that are worth a considerable amount of money in the years prior to retirement. A country that knows how to ask should also know how to give back to those who enable its existence.

PUBLIC EXPENDITURE PER STUDENT IN TERTIARY EDUCATION

RELATIVE TO GDP PER CAPITA, 2013



Source: Dan Ben-David, Shores Institution and Tel-Aviv University

Data: OECD

The quality of academic research is converging in the developed world

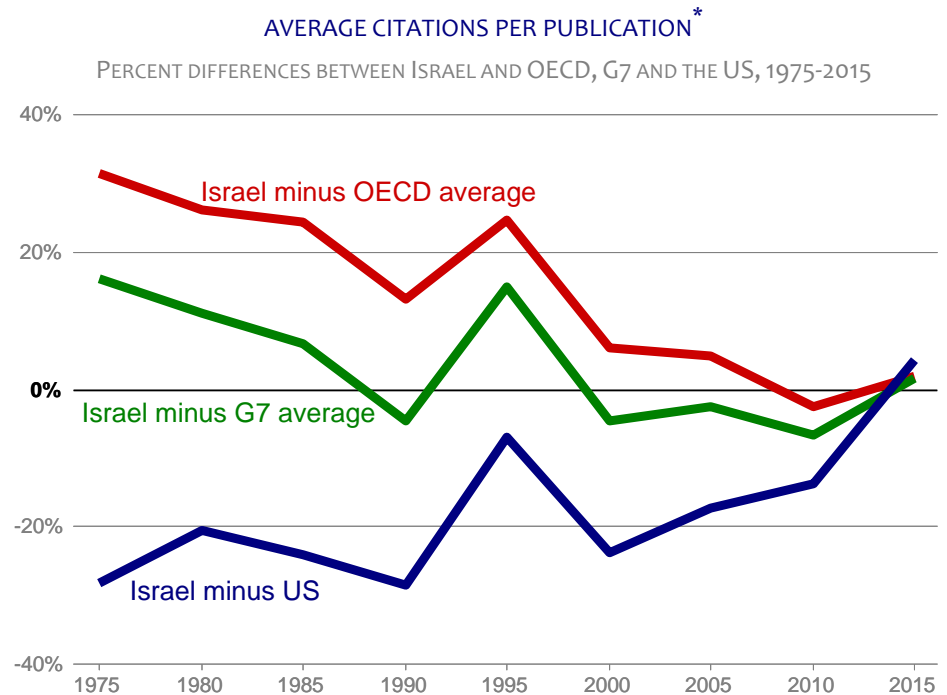
A major gauge for the quality of academic research is the contribution that it has as a stepping stone for subsequent research by others. This contribution can be measured by the number of times a study is cited in later studies.

Since the number of researchers and journals has grown considerably over time, it is not possible to assess qualitative changes over time using the cites per article measure. However, it is possible to measure relative quality at any point in time in comparison with other countries.

Four decades ago, the average number of times that academic papers from Israeli institutions were cited was substantially higher than the average from institutions in countries now belonging to the OECD. It was also higher than the G7 average, but below the American average.

Since the 1970s' there has been a general convergence trend in the developed world. The gaps between Israel and the averages for the OECD and G7 countries, as well as with the US, have been all but eliminated – which also indicates a similar reduction in the gaps between each of these groups.

Two provisos are in order here. First, recent articles have not yet had their complete moment in the sun, so cites of them may yet rise. Second, the average number of citations per article differs from discipline to discipline. The underlying assumption here – which may or may not be correct – is that the law of large numbers applies with regard to the distribution and relative weight of disciplines within countries, making possible a comparison such as the one conducted here.



* Observations at five year intervals. Citations exclude self-citations.

Source: Dan Ben-David, Shores Institution and Tel-Aviv University

Data: Web of Science

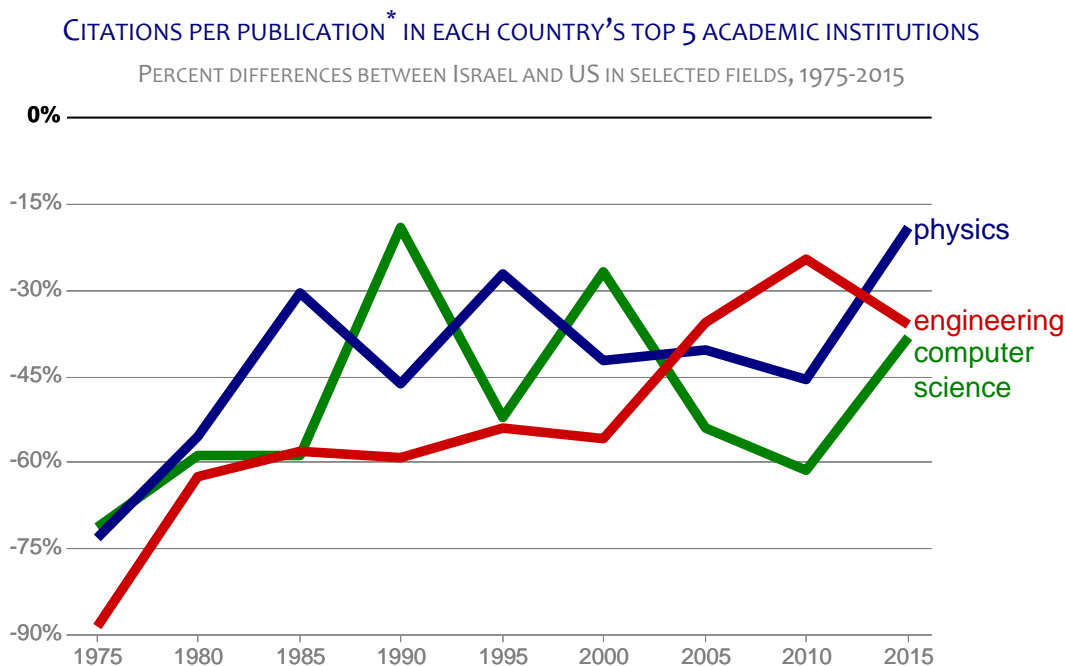
The quality of academic research in Israel's top five universities is converging to that of the top five American universities

A country's technological level can only be as high as its best academic institutions. Thus, a comparison of all universities and colleges produces national averages that do not provide a true indication of how good the country's highest levels are vis-à-vis other countries.

To deal with the great amount of noise that exists in national comparisons of citations per article, the great variance between academic institutions within countries and across disciplines, it is useful to narrow the focus to the top of the top in each country – and to conduct such comparisons within specific disciplines.

America's top universities, which generally have their pick of the world's top scholars, tend to reflect the highest international academic standards. All other academic institutions strive to get as close to these standards as possible.

Three academic fields – physics, engineering and computer science – are among the most important for raising a country's technological level. In each of these fields, the top five Israeli universities are compared to the top five American universities. The gap between the top US and Israeli universities declined in all fields between the mid-seventies and the eighties. Since then, the computer science field in Israel has remained at a fairly constant – albeit highly fluctuating – gap from the top American universities. In physics, the gap has declined further in recent years, while in engineering, the gap has been steadily falling for decades.



* Observations at five year intervals. Citations exclude self-citations.

Source: Dan Ben-David, Shoresh Institution and Tel-Aviv University

Data: Web of Science

coming soon, the complete

The Shoresh Handbook

Education and its impact in Israel

2017

Dan Ben-David

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