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Employment in Israeli High-Tech: Past, Present, and Future

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Abstract

Even before Israel's recent constitutional crisis, the main barrier to the development of the high-tech industry, Israel's major growth engine, was a shortage of skilled, professional, and creative labor supply. The share of advanced-degree graduates in the sciences and engineering in Israel is lower than in many developed countries, and is trending downward. In recent years, the share of students admitted to undergraduate programs in these disciplines has risen, as has the share of those completing their degrees. Yet it is uncertain if this trend will continue without an enlargement of the physical and human infrastructures necessary to absorb additional students.

The decline in psychometric scores (serving a similar screening purpose as the SAT in the US) of those admitted to academic studies in sciences and engineering suggests that the supply bottleneck for sufficiently skilled high-tech workers in Israel may due primarily to the quality of the country's education system, as evidenced by Israeli pupils' low achievements on international exams.

Uncertainty created by Israel's constitutional crisis in 2023 negatively affected high-tech investments. Both entrepreneurs and workers began to seek alternatives outside of Israel. It is still too early to accurately assess the impact of the Israel-Hamas war, but even if the situation in the sector will return to normal, the alternatives abroad for Israeli high-tech workers could nonetheless spark future worker shortages.

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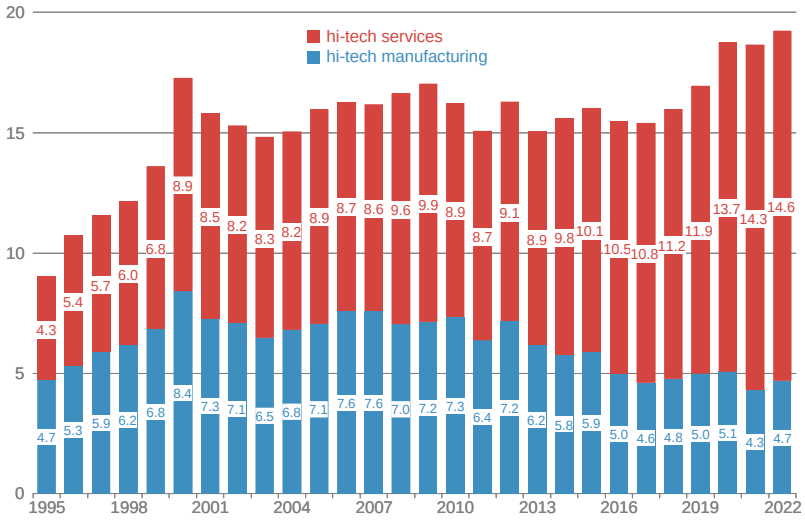
Introduction

Israel is often referred to as "Start-Up Nation," and for good reason. High-tech has been the country's main growth engine in recent decades. During the years 1995-2000, high-tech's share of GDP nearly doubled, from 9% to over 17% (Figure 1).[1] In the two subsequent decades, that share remained relatively stable, while beginning to rise again in 2018, reaching over 19% in 2022. High-tech exports also greatly increased over the past decade. Their share of total Israeli exports grew from 37% in 2012 to 48% in 2022 (Israel Innovation Authority, 2023). The Bank of Israel (2023) found that the high-tech industries account for a substantial share of Israeli productivity growth, while the Israel Innovation Authority (2023) reported that high-tech productivity is nearly double that of the economy as a whole. According to the Israeli Union of Advanced Technology Industries (2023), high-tech industry taxes amount to 65% of the government's total tax revenues. Thirty four percent of Israeli income tax revenues come from high-tech workers, despite the fact that this sector accounts for only 10% of total employment (Figure 2).

Figure 1

Hi-tech share of GDP

(in percent)



Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: Central Bureau of Statistics

In comparison to other countries, the share of employed persons in Israel's high-tech sector is greater than the sector's employment share in all of the European Union countries (Figure 2).

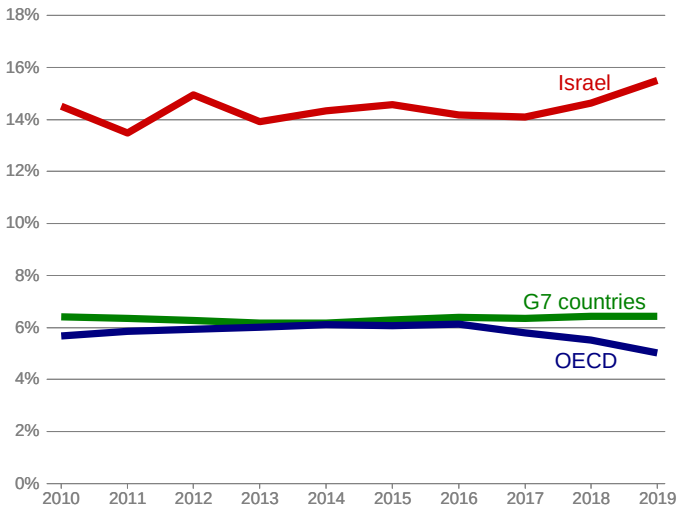
[1] High-tech industries include the manufacture of conventional and homeopathic medications, computers, electronic and optical equipment, aircraft, spacecraft, and related equipment. High-tech services include communication services, computer programming, consulting in the computer field, data processing, storage and other related services, websites, and research and development.

The share of high-tech in Israel's GDP is higher than in all of the other OECD countries, and is over double the OECD average (Figure 3). The share of high-tech in Israeli commodity exports has grown in recent years, and was nearly double the OECD average in 2021 (Figure 4).[2] Figure 5 shows that Israeli national R&D expenditure as a percentage of GDP is also double the OECD average, and has been trending upward since 2010. As a result of massive development of Israeli high-tech, the sector's quality and its relative attractiveness vis-à-vis other countries, foreign investments are responsible for more than half of Israeli R&D investment, in complete contrast to all other developed countries (Figure 6). High-tech also plays an important role in the diplomatic arena. The uniqueness of the Israeli high-tech sector incentivizes agreements with other countries and

Figure 3

Hi-tech share of GDP

Israel, G7 countries and OECD countries, 2010-2019*



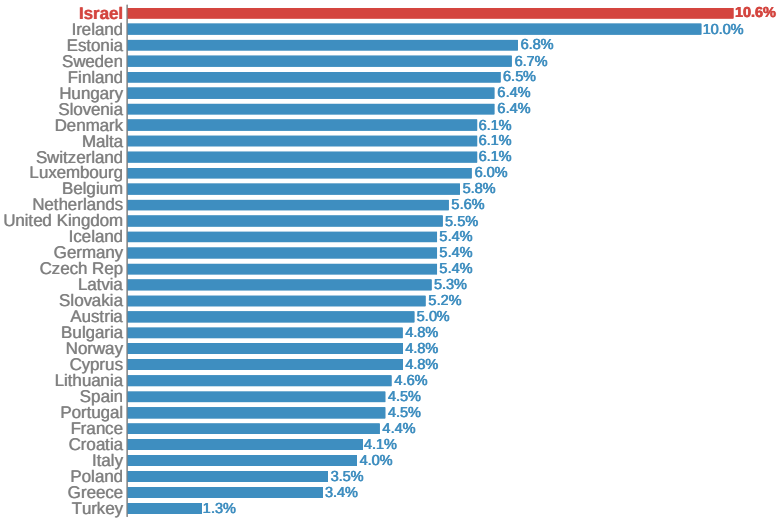
* Data for the OECD and G7 for all years and Israel for 2011-2016 come from the OECD's STAN Industrial Analysis 2020 ed. Israeli data for 2010 and beginning in 2017 calculated on the basis of changes in hi-tech's share of GDP in Central Bureau of Statistics data.

Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: OECD and Central Bureau of Statistics

Figure 2

Hi-tech share of employment

Israel and European Union countries, 2022*



* Employed persons ages 15-74. Data for UK and Turkey from 2020.

Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: Central Bureau of Statistics

[2] No similar data were found on high-tech's share of service exports.

helps strengthen diplomatic ties with Israel (Israeli Union of Advanced Technology Industries, 2023).

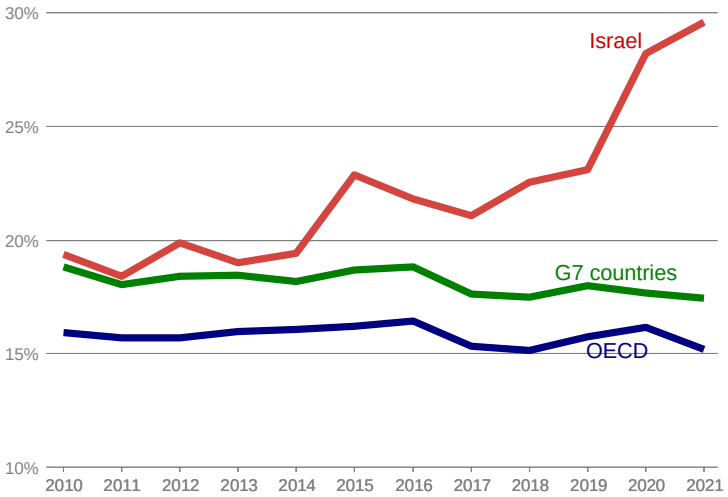
Israeli government decisions (Prime Minister's Office, 2012; 2017; 2022) reflect the great importance attached to the high-tech sector and to increasing the employment in it.[3] The shortage of skilled labor is considered the main barrier to the sector's development. In light of this, there is a question of whether Israel still has unrealized potential in terms of workers with skills suited to high-tech employment, and if so, what must be done in order to optimally realize that potential.

As early as 2012, an inter-ministerial team (Kandel et al., 2012) found that Israel has a dearth of highly-skilled workers, especially in the computing fields (computer science and computer and electronics engineering). Bental and Peled (2016)

Figure 4

Hi-tech share of merchandise exports

Israel, G7 countries and OECD countries, 2010-2021

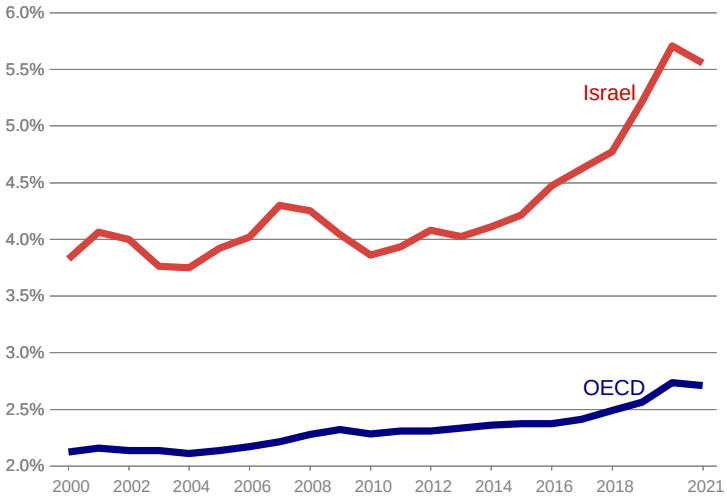


Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: World Bank

Figure 5

Gross national expenditure on R&D

as percent of GDP, Israel and OECD countries, 2000-2021



Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: OECD

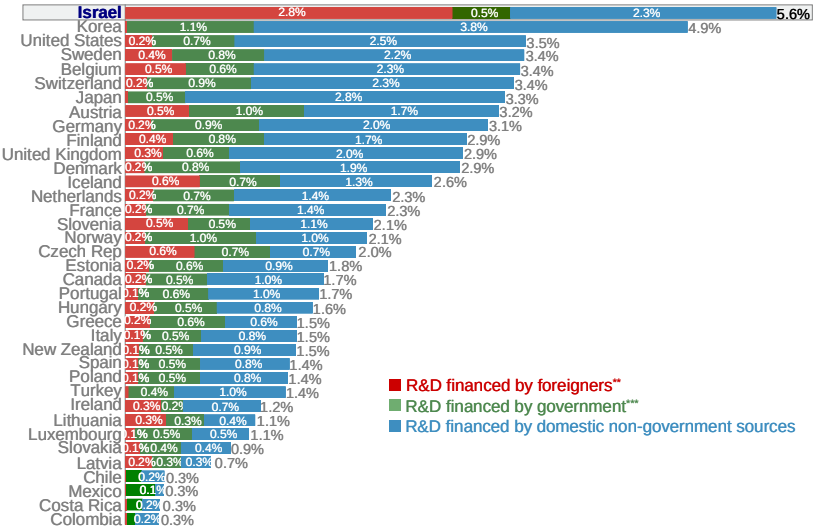
[3] The current government has other priorities. The Parlmutter commission's recommendations in 2022 to address the human capital problem in the high-tech sector have not been implemented, given the social and political chaos that existed since then (Ehrlich, Biran and Patir, 2024).

argued that Israeli academia is producing a sufficient number of degree-holders in science and technology to meet the demand for suitable workers in the future. The seeming contradiction between these two conclusions indicates a need to distinguish between quantity and quality with regard to academic degrees. The number of degree-holders in appropriate fields who are entering the labor market may meet the needs of the high-tech sector, but it is possible that not all of these degree-holders have the requisite skills and capabilities demanded by the sector's employers. In any event, the fact that other sectors also need engineers and programmers further limits the available supply.

Figure 6

Domestic R&D expenditure in OECD

as a percent of GDP, average for 2020-2022*



* Average for all countries except Denmark (2019) and Mexico (2017).

Source: Yael Melzer and Ayal Kimhi, Shoresh Institution

Data: OECD

Brand (2018) argued that the low skills of Israeli workers (in international comparison) cast doubt on the ability to retrain workers for high-tech employment. Bental, Peled and Sumkin (2020) found that measures such as increasing the number of those tested at the 5-unit level on the mathematics matriculation exams, as well as raising the number of graduates with academic degrees in mathematics, statistics, computer science, engineering and the physical and biological sciences, could potentially enlarge the high-tech labor supply. In particular, Mazuz-Harpaz and Krill (2017) emphasized the importance of computer science studies, at both the high-school and the academic levels.

The Israel Innovation Authority (2022) found that there was growth in high-tech employment in 2021, but also found an increase in the number of job vacancies in the sector,

indicating a shortage of suitable workers. The conclusion was that "governmental policy should focus on building human capital in the long term, whether by increasing the number of university graduates in the high-tech disciplines, or by encouraging high-level nonacademic training." Friedmann (2017) also found that the supply of appropriate workers for high-tech can self-adjust to growing demand only 5-8 years after the rise in demand, making long-term planning of worker training a necessity.

This study looks at the composition of workers in high-tech industries, the worker shortage that emerged mainly after the coronavirus crisis ended, and the reasons behind this shortage. Since the beginning of 2023, the judicial changes initiated by Israel's new government led to a severe crisis in the high-tech sector and was accompanied by major declines in investments to the sector. The stagnation that followed in the wake of the government's legislative initiatives also negatively impacted high tech employment. As of this writing, demand for high-tech labor has dropped and there is no evident shortage of workers. Once the judicial and security crises have passed and the country returns to a more normal state of affairs, it is likely that there will be a re-awakening in the demand for high-tech workers. However, the relative mobility of these workers and the options available to them worldwide make it unclear how many of them will still be available when this occurs. As such, the current situation should not divert the country's attention from the need to train more high-tech workers in Israel, and for policymakers to address the matter without delay.

Labor composition in the Israeli high-tech sector

The composition of the high-tech sector has changed substantially over the years, with its center of gravity shifting from manufacturing to services. High-tech manufacturing was responsible for half of the sector's product in the late 1990s (Figure 1). However, this share gradually declined, with high-tech services accounting for over 75% of the sector's product by 2022. Figure 7 shows that this development is also reflected in the composition of high-tech employment. Between 2013 and 2021, the number of persons employed in the three high-tech

manufacturing sub-sectors grew only slightly, while the number of employees in computer programming and R&D (service sectors) increased by considerably more.

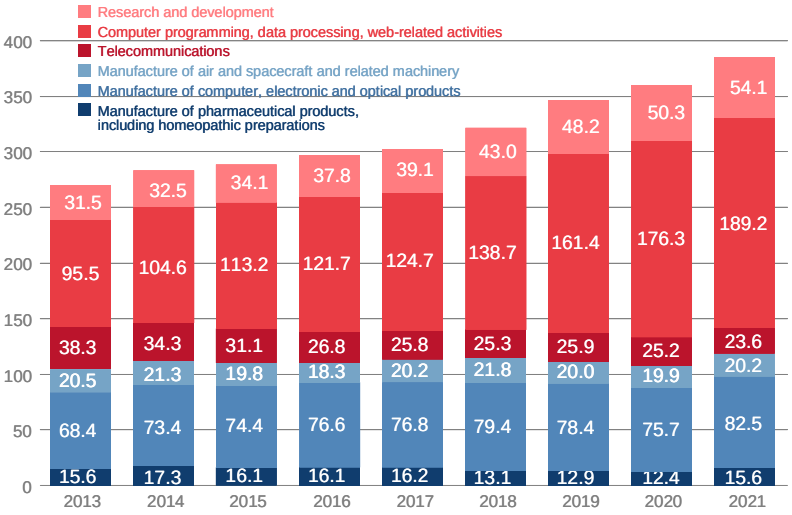
Specifically, the number of employed persons in the programming sector, the largest employer among the high-tech sub-sectors, nearly doubled during this period, while employment in R&D grew by more than 70%. In the communication services sector, by contrast, employment dropped by 38%, apparently due to automation of these services, with the sector currently accounting for only a small share of high-tech employment.

In Israel, the share of employed persons in R&D companies was relatively stable at 2% between 2002 and 2014 (Figure 8), and then surged to 3.6% in 2020. By comparison, the European Union share of employed persons in R&D rose consistently throughout the entire period, but reached only 1.5% in 2021 – less than half of the share in Israel that year.

Figure 7

Hi-tech employees in Israel

thousands, 2014-2021

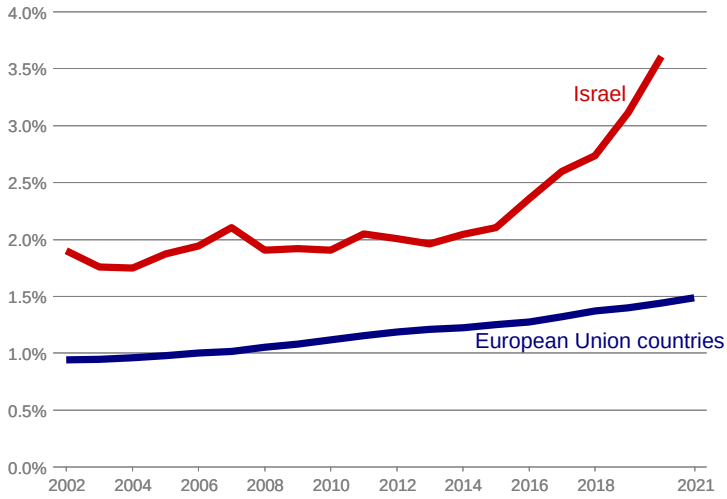


Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: Central Bureau of Statistics

Figure 8

Employment in R&D

as percent of total employment, Israel and European Union countries, 2002-2021



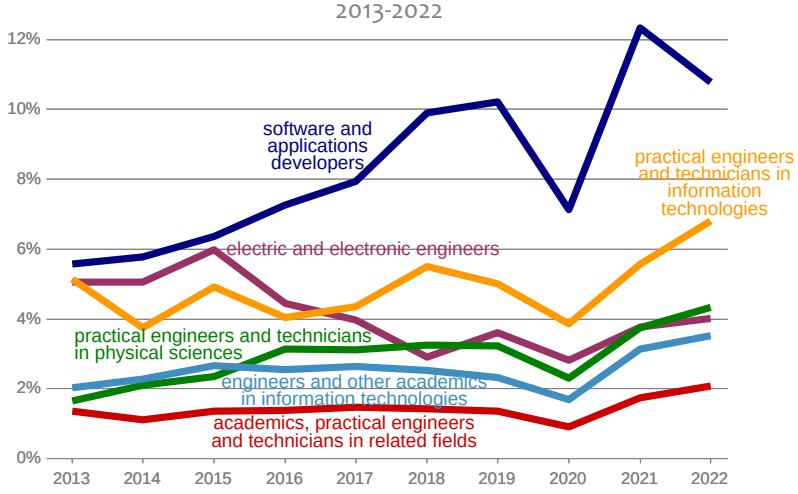
Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: OECD and Central Bureau of Statistics

The relatively rapid employment changes in part of the high-tech sub-sectors raise questions regarding the labor market's ability, in the short term, to meet rapidly-growing demand for workers in specific occupations. In occupations relevant to high-tech, the ratio between the number of job vacancies and the number of persons employed in each occupation provides an indication of this capability (Figure 9).

Figure 9

Vacant positions as percent of total employed persons in same occupation

2013-2022



Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: Central Bureau of Statistics

While demand for workers varied across the various high-tech sub-sectors, all experienced a dip in 2020 as a result of the coronavirus pandemic. Demand in each of the high-tech sub-sectors rose in 2021, eclipsing pre-pandemic levels in all but one. The demand for system analysts and software developers is much greater than the demand for workers in the other occupations. Similarly, an examination of a number of developed countries (OECD, 2022) also points to a substantial rise in demand for software developers, programmers, engineers, data scientists, and data engineers. In Israel, demand for engineers and technicians in the information technology industries as well as in the fields of physics and engineering is also on the upswing (Figure 9).

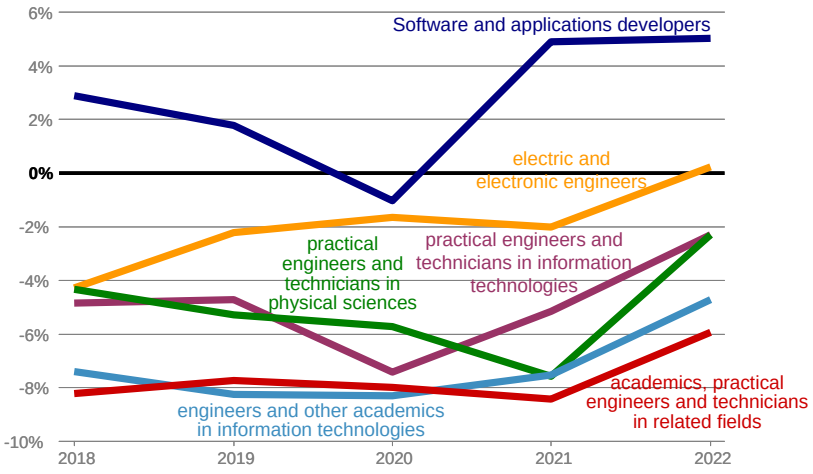
Figure 10 focuses on the excess demand for high-tech workers – the gap between demand for workers and their supply. This gap reflects the difference between the number of job vacancies and the number of jobseekers as a percentage of the total number of those employed in a given

occupation.[4] Here too, the relatively high demand for system analysts and software developers is notable. In 2021, the excess demand for these workers greatly exceeded its pre-COVID level. By contrast, the other relevant occupations show an excess supply of jobseekers, although the excess supply decreased once the coronavirus crisis ended – and in the case of electrical and electronics engineers the gap closed entirely in 2022.

Figure 10

Excess demand for workers

Difference between number of vacant positions to number of job seekers as percent of total employed persons in same occupation, 2018-2022



Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: Central Bureau of Statistics

Is Israel training enough workers with necessary high-tech skills?

Hashai, Sumkin and Nir (2022) note that the source of the rise in the number of persons employed in the high-tech sector is a substantial increase in the number of workers in high-tech occupations who possess high-level professional-technological skills that make it possible to engage in knowledge-intensive activity. Thus, the supply of workers is not dependent solely on the desire to work in specific occupations, but also, and perhaps primarily, on the skills and abilities of those interested in high-tech employment.

[4] The demand for workers is taken from the job vacancies survey of Israel's Central Bureau of Statistics. The demand for workers is defined as the number of non-employed persons and non-participants in the labor force who sought work during the past 12 months, as well as the number of employed persons who sought other work or jobs with a greater number of hours over the past four weeks, based on labor force survey data. Beginning in the first quarter of 2018, labor supply (jobseekers) includes all those who sought work over the past year, and not only those who worked during the past year (as was the case up until the first quarter of 2018).

Israel's higher education system is the country's primary channel for training workers for high-tech occupations. In the long term, and in light of the sector's dynamic nature and frequent changes, the education system needs to be able to provide workers with broad learning capabilities and the ability to adapt to the sector's rapidly-changing demands.

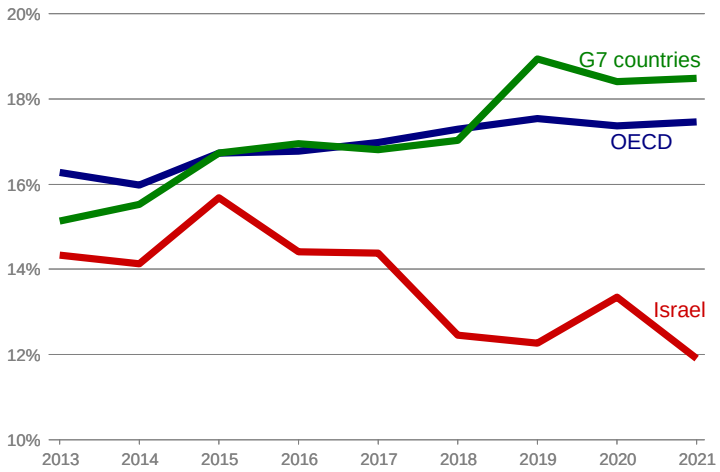
The majority of Israel's higher education institutions are public institutions subject to close regulation on the part of the Council for Higher Education in Israel. For each field of study, the Council determines a student quota that the institutions are required to adhere to, even if the number of suitable candidates exceeds it. Moreover, the academic institutions are limited in their ability to recruit outstanding faculty in the more prestigious disciplines, or to expand their physical infrastructures as needed (Regev and Gordon, 2020). What this means is that the number of academic degree holders with training in high-demand fields is determined largely by public policy.

Consequently, the annual share of Master's and Ph.D. graduates in Israel in fields relevant to high-tech has been declining steadily in recent years (Figure 11). This stands in sharp contrast to the average share of advanced-degree recipients in these fields in the OECD and the G-7 countries, which is not only higher in each group, but rising as well.

Figure 11

MA and PhD graduates with science, technology and engineering degrees

as percent of total MA and PhD graduates, 2013-2021



Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: OECD

Given Israel's high percentage of employed persons in high-tech (Figure 2), and especially in R&D (Figure 8), continued growth in the high-tech sectors could be limited by a shortage of sufficiently skilled workers specializing in research and development, as has already emerged from the data on demand for workers (Figures 9-10). A

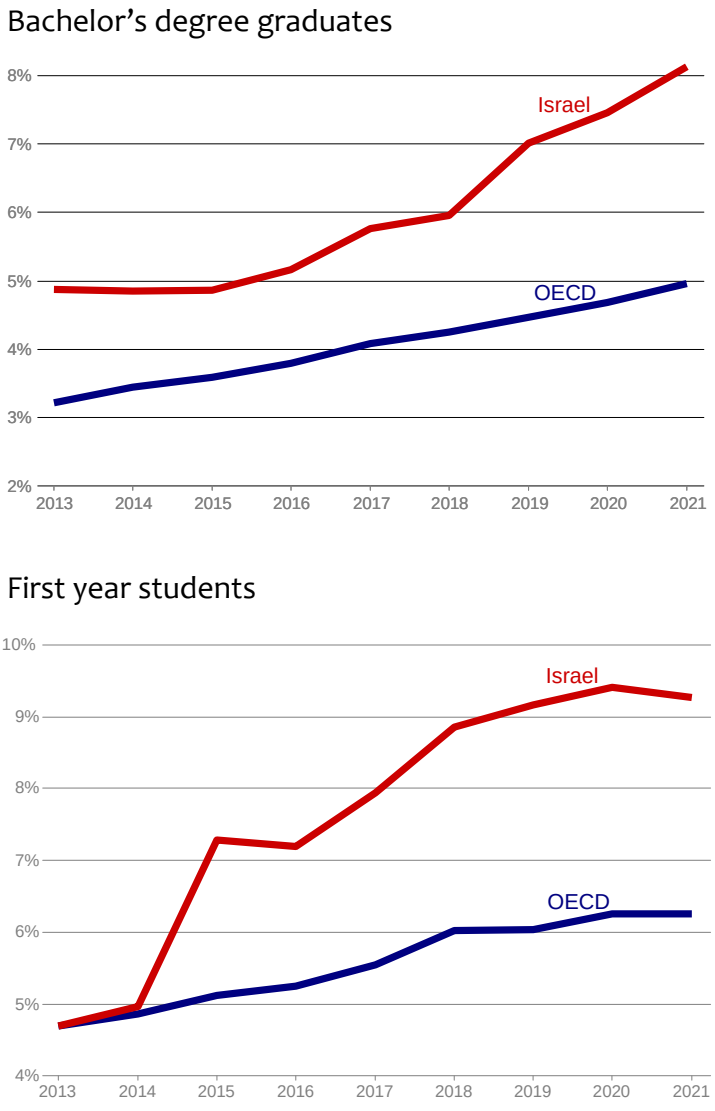
decline in the percentage of advanced-degree recipients in the relevant fields could also lead to a shortage of instructors and teaching assistants, which in turn, would limit the institutions' ability to increase their student enrollment.[5]

The question is whether the higher education system is preparing to train larger numbers of persons for the occupations that high-tech needs. It appears that despite the bureaucratic limitations detailed above, changes in undergraduate student enrolment and graduation rates, at least in some of the relevant fields, are encouraging. Figure 12 shows that the share of information and communication technology graduates out of all Bachelor's degree graduates has been trending upward since 2015. It is not only higher than the corresponding share in the OECD countries, the gap between them has widened steadily over the years. The percentage of first-year Israeli students in these disciplines is also higher than the OECD

Figure 12

Students and bachelor's degree graduates in information and communication technologies

as percent of total, 2013-2021



Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: OECD

[5] The Israel Academy of Sciences and Humanities (2022) also notes the difficulty of recruiting faculty and advanced-degree students, especially in engineering and computer science. This difficulty stems from competition for the existing supply – which apparently is not large enough to begin with – with industry and universities abroad. Furthermore, the shortage of funds for purchasing advanced scientific equipment also undermines the universities' ability to support activity on the forefront of global scientific research, and to recruit new academic faculty of the highest caliber.

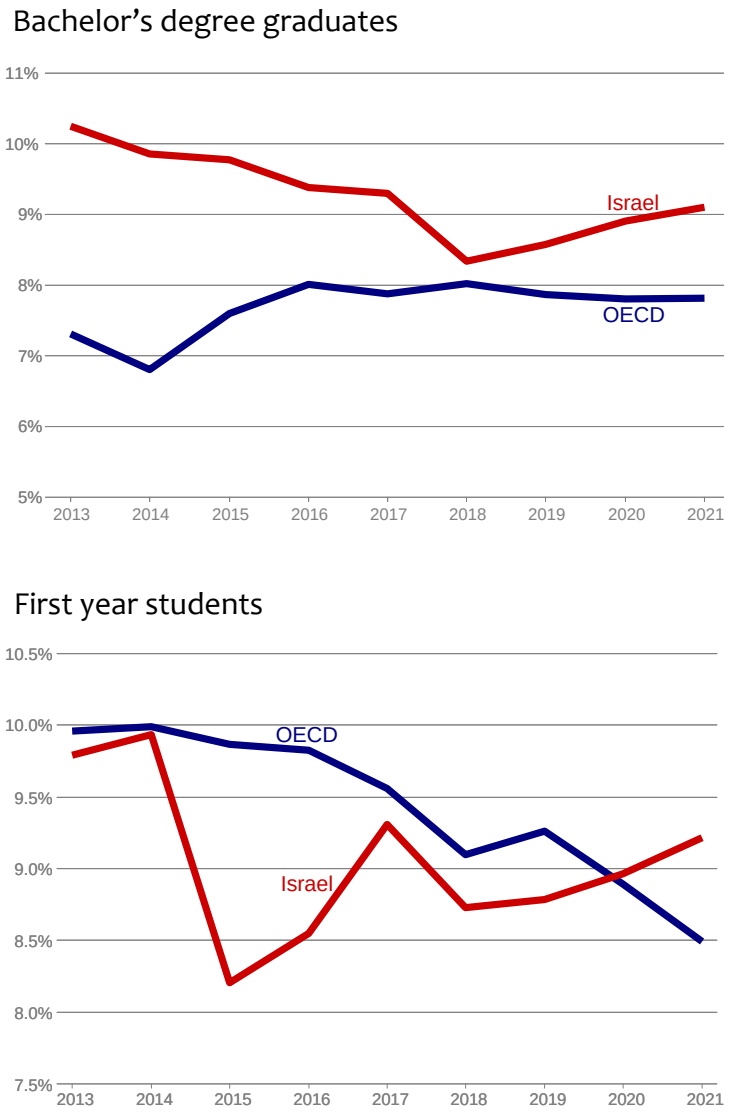
average, rising over time, until it leveled off in 2020-2021. This recent stabilization may indicate that the potential for continued growth in the share of students in these fields has been exhausted.

On the other hand, figure 13 shows that Israel's percentage of undergraduate-degree recipients in engineering, while being higher than the OECD average, was trending downward until recent years, when it began rising. This recent increase in the share of engineering graduates in Israel is consistent with the increase that began a few years earlier in the share of those admitted to engineering programs. By contrast, the share of undergraduate-degree recipients in the exact sciences is both low, relative to the developed country averages, and in a slight decline (figure 14), despite a rise in the percentage of first-year students in these subject areas.[6]

Figure 13

Students and bachelor's degree graduates in Engineering

as percent of total, 2013-2021



Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: OECD

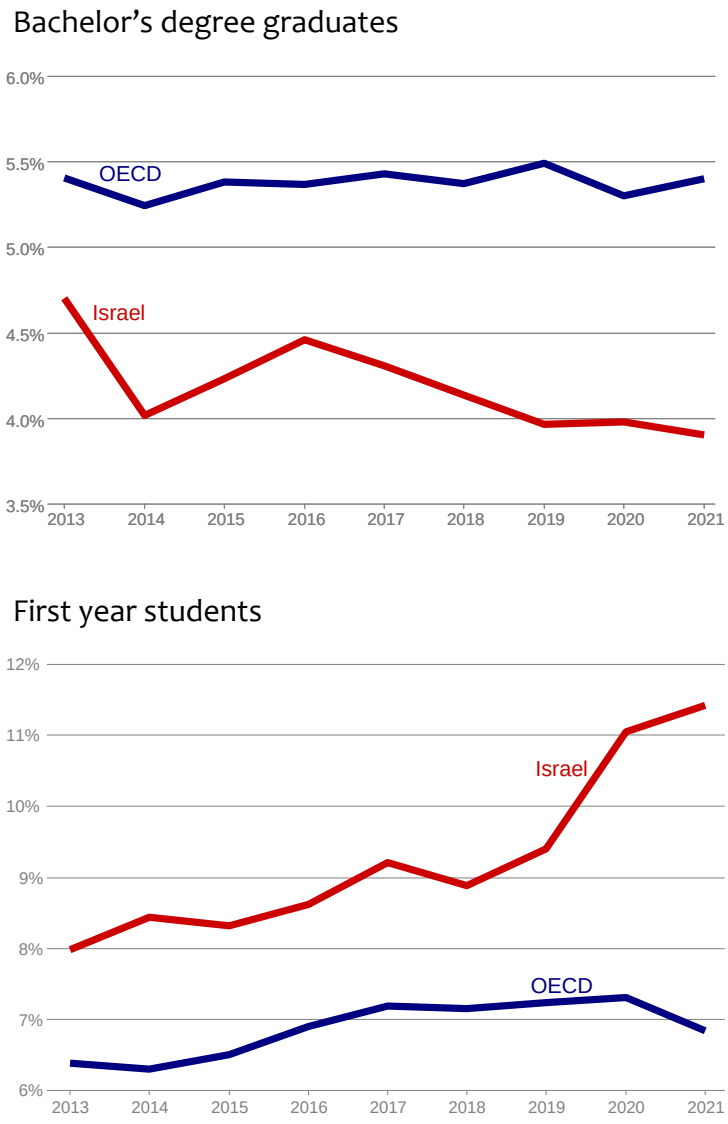
[6] The gap between the share of first-year students and the number of bachelor's degree recipients in the exact sciences is relatively large. In 2018, for example, 8.9% of all new students were enrolled in exact-science departments, but in 2021, three years later, the percentage of bachelor's degree recipients in these fields out of all degree recipients was only 3.9%. This disparity may point to a high attrition rate and, perhaps, to excessively low admissions requirements

Figure 15 shows that the share of applicants accepted to science and technology disciplines[7], and especially to engineering and architecture, has been falling since the 2013-2014 academic year. On the one hand, this may be due to the academic institutions' limited ability to recruit faculty in these subjects and to expand the necessary physical infrastructures (Regev and Gordon, 2020) – this despite a government resolution and an initiative of the Council for Higher Education on this matter (Admon, Schwartz, and Speyer, 2022). On the other hand, Figure 15 also shows a decline in the average psychometric score of those rejected by engineering and architecture departments, which indicates that the rise in applicant numbers stems at least partly from less-suitable applicants who do not meet the admission criteria for these studies.

Figure 14

Students and bachelor's degree graduates in natural sciences, mathematics and statistics

as percent of total, 2013-2021



Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: OECD

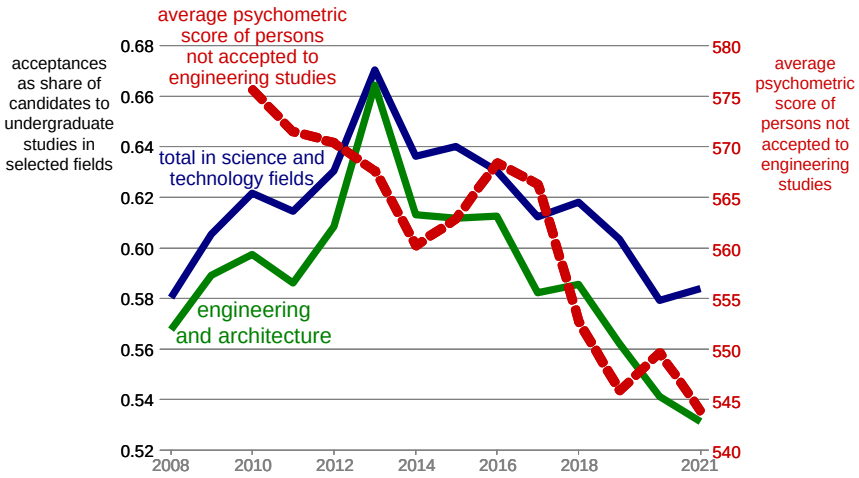
in the exact sciences, as reflected in the average psychometric score of those accepted for study in the biological and physical sciences (Figure 17). By contrast, the OECD gap between the percentages of bachelor's degree recipients and first-year students in the exact sciences is much smaller.

[7] It is important to note the distinction between individuals accepted to academic studies – who do not necessarily enroll afterwards – and first year students who are actually embarking on academic studies.

Figure 15

Acceptances as share of candidates to undergraduate studies in selected fields, and average score in psychometric exam of persons not accepted to engineering

2008-2021

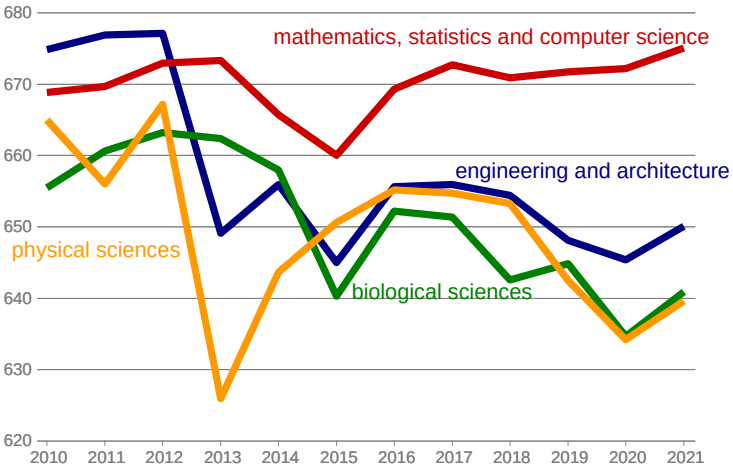


Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: Central Bureau of Statistics

Figure 16 displays the average psychometric scores of those admitted to the research universities in the fields relevant to high-tech. While the average scores of persons accepted to mathematics, statistics and computer science was relatively steady over the span of the past decade, there has been a downward trend in the psychometric scores of those admitted to undergraduate programs in engineering and architecture, as well as in the biological and physical sciences.

Figure 16

Average psychometric score of persons accepted to undergraduate studies in the sciences at the research universities*



* Through 2013, data from Ariel University are included among the non-research colleges. In 2014 it was reclassified as a research university and included here.

Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: Central Bureau of Statistics

At the non-research colleges (Figure 17), the average psychometric score of those admitted has been trending downward for all STEM disciplines.[8] These findings may hint at a lower level of academic degree holders in these fields who are entering the labor market, and raise the question, again, of the degree to which the Israeli primary and secondary education system is preparing its students for academic study in the sought-after fields crucial to the national economy.

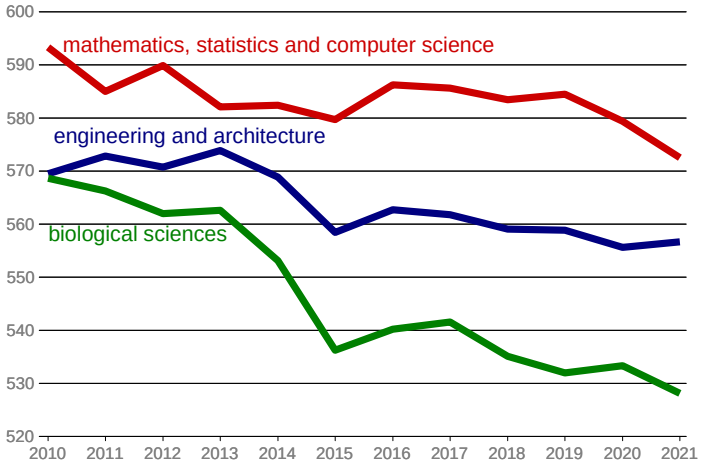
[8] The physical sciences are not displayed in Figure 17 due to the small number of those admitted to Israeli colleges in these fields (a few dozen per year).

The share of Israeli 18-year-olds tested at the five-unit level (the highest possible) on their mathematics matriculation exams rose between 2000 and 2006 (Figure 18), peaking at 11%. A decline between 2006 and 2012 brought the percentage to a low of 7%. The education ministry then mounted a massive national campaign to explain the importance of mathematics study, encouraging students to study the field at the highest level possible. This was followed by a strong and uninterrupted (except during the COVID crisis years) rise in the share of those tested at the five-unit level in mathematics, reaching 14% by 2021.

The percentage of those tested in physics, chemistry, and computer science has also been trending upward since the middle of the last decade. Many of those testing at the five-unit level in mathematics also tested in physics and computer science at the five-unit level. As noted, the rise in the share of those testing at the five-unit level in mathematics and in other STEM fields may be due, at least in part, to the Education Ministry's Five Times Two (Kimhi, 2022) and Scientific-

Figure 17

Average psychometric score of persons accepted to undergraduate studies in the sciences at the non-research colleges*



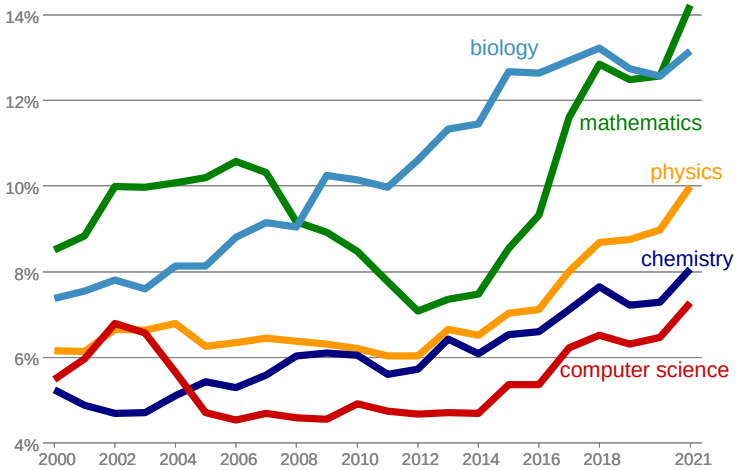
* There were very few acceptances to the physical sciences at the non-research colleges.

Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: Central Bureau of Statistics

Figure 18

Pupils taking matriculation exams at 5 unit level in the sciences

as percent of all 18 year-olds, 2000-2021



Source: Yael Melzer and Ayal Kimhi, Shoresh Institution
Data: Education Ministry

Technological Reserves programs (Zussman and Maagan, 2019), but it may also reflect growing awareness of the study and employment options open to graduates in these fields (Ben-David and Kimhi, 2020; Kimhi, 2022). Interestingly, the share of those tested in biology at the five-unit level has consistently risen, from 7% in 2000 to 13% in 2021, despite the relatively limited earning potential in this field.

The above findings indicate that both students and the education system are responding to the growing demand for professional and skilled workers in the high-tech sectors, and that the supply of potential workers is on the upswing. It is hard to say whether this increase is sufficient, or whether the bottleneck of skilled-worker training for high-tech lies in the primary and secondary education system or in the higher education system.

The past year

In 2022, Israel's high-tech sector experienced a downturn, as part of a global shift in trend. The downturn in Israel intensified substantially in 2023, in the wake of the government's announcement of a legislative initiative intended to undermine the independence of the country's judicial system. Ehrlich, Biran and Patir (2024) found that the 58% decline in high-tech investments in Israel from 2022 to 2023 was almost twice as large as in the U.S. (30%) and considerably larger than in Europe (44%). Israel fell from 5th place in high-tech investment volume to 10th place (Viola, 2023).

In contrast with other countries, funding for Israel's high-tech sector is based largely on private, rather than public, investments, with the majority of these being foreign investors (Figure 6). The flow of such investments has almost completely ceased since January 2023, immediately following the government's announcement (Dovrat, 2023). Of the non-Israeli funds that invested in Israel during 2022, 42% stopped doing so in 2023, compared to just 14%-19% during 2018-2021 (Ehrlich, Biran and Patir, 2024). Even if some investors may be personally motivated to support Israel, and even if they have great confidence in Israel's high-tech entrepreneurs, their

main consideration is the profit potential of their investments and their accompanying risk. Investments in a country where the judiciary's independence is in danger instantly become riskier.

In conjunction with the pivot in investments, nearly all new startups founded by Israelis since early 2023 have been registered in the US or other countries rather than in Israel. The share of new Israeli startups registered abroad reached 50-80%, compared with 20% previously (Israel Innovation Authority, 2023). In the future, those startups that become successful will contribute to the economic growth of other countries and not Israel's – which also means that they will pay taxes to other governments, not to Israel's. Even those who have invested in more mature high-tech companies have stopped investing in Israel. Many of these companies have branches abroad and it is relatively easy for them to transfer their local businesses to those branches and, later, to transfer workers from Israel to foreign locations.

High-tech workers enjoy high international mobility. Scientists go abroad for continuing education and come back to work in Israeli high-tech industries. Others are sent by their employers to work at their companies' branches abroad for specified periods. The uncertainty that presently characterizes this sector, both in Israel specifically and at the global level, is necessarily causing many of Israeli workers located abroad to consider their actions and, at the least, to "sit on the fence." High-tech companies are making staff reductions due to the investment freeze and the general uncertainty. According to the Israel Innovation Authority (2023), there was a steep decline in the number of job vacancies in the high-tech services sector – the sector that had been leading high-tech growth in recent years – during the first four months of 2023. Similarly, the number of persons employed in the sector began to decline, after a continuous increase since the end of the COVID crisis. It may turn out that a substantial portion of these trends is irreversible. Workers with families who left the country may not necessarily return, even if the business climate improves.

The damage suffered by Israel's high-tech sector is also reflected in the stock market. In the first three quarters of 2023, the TA-Tech Index rose by 12% – and after adjusting for the

devaluation of the shekel, amounts to only a 3.5% rise in dollar terms – while the NASDAQ-100 Technology Sector Index rose by 38%. The two indexes had formerly fluctuated more or less in unison. In addition, according to the Israel Innovation Authority (2023), the index of Israeli tech companies traded on NASDAQ rose in Q1 2023 by only 10.8%, while during 2019-2022 this index displayed a higher yield than the NASDAQ-100 index. There is no question that those who invest in Israeli high-tech companies through the capital market expect that the country's anti-democratic legislation will harm the performance of these companies.

These trends, in both the capital and labor markets, raise serious concerns with regard to the high-tech sector's further contribution to the Israeli economy. Continued legislative efforts aimed at weakening the judicial system, combined with the overall security situation – and the current war in particular - are exacerbating uncertainty, deterring investors, and encouraging entrepreneurs, companies, and workers to seek alternatives elsewhere.

Thus, the damage to the high-tech sector may turn out to be irreversible. To a great extent, the damage will only increase as long as the anti-democratic legislative proposals remain on the agenda of the government and the Knesset. Even if the situation returns to normal, and the demand for high-tech workers reawakens, it is unclear how many potential workers will still be available. Therefore, Israel must not allow the sector's current stagnation to divert the country's attention from the need to train more Israeli high-tech workers.

Summary and conclusion

The high-tech sector is a dynamic and innovative sector that requires a highly-educated, skilled, professional, and creative labor force. The rapid development of Israel's high-tech sector sometimes results in an excess demand for suitable workers, whose training does not keep pace with changes in demand. The main pipeline channeling professional workers into the high-tech sector is the higher education system. Compared with other developed countries, Israel produces few academically-trained workers in the science and technology fields (except for information and

communication technologies). This situation has been improving, and the demand for undergraduate studies in the relevant disciplines has grown. However, this trend may not be sufficient, due both to the intrinsic rigidity of the public higher education system, and to the quality of applicants to STEM-based academic programs, as evidenced by the average psychometric scores of those who are accepted.

Higher education in the sciences requires effective preparation at the high-school level. While the share of pupils testing at the five-unit level in math and science on the matriculation exams is rising, this may not be sufficient. There are problems in the Israeli education system, such as a teacher shortage, especially in the sciences (Weissblai, 2022) and in the periphery (Bar-Zohar and Josefsberg Ben-Yehushua, 2020), an infrastructure that does not keep up with population growth (The State Comptroller, 2022) and the Education Ministry's near-total control of content and teaching methods. These severely challenge the ability of the Israeli education system to enable pupils to realize their full potential.

But the problems do not start with preparation for the matriculation exams. An analysis of the results of the international PISA exams, which test the scholastic competency of 15-year-olds, indicates that the Israeli education is much less successful than the education systems of other countries at closing the gaps that pupils bring with them from home (Savin, Kimhi and Ben-David, 2023). Furthermore, Israel's fastest-growing population group, the Haredim (ultra-Orthodox Jews), does not allow most of its children to receive the kind of modern general education that is key to future integration in the higher education world and, later, in high-tech employment.

Since the second half of 2022, there has been a perceptible slowdown in Israel's high-tech sector, accompanied by job losses and reduced demand for workers. The initial slowdown in Israel was due to a global slowdown. However, the Israeli slowdown intensified substantially after announcement of the new government's legislative initiative designed to weaken the judiciary's independence. Assuming that the political situation will return to normal, the present downturn

must not be allowed to divert Israel's attention from the need to train more workers for the country's high-tech sector.

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