



Can the High-Tech Sector Grow to Reach 12% of Workforce?

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This is a short summary, for the full paper (in Hebrew) see
<https://www.idc.ac.il/he/research/aiep/pages/policy-papers.aspx>.

* Dr. Sergei Sumkin is a senior researcher at the Aaron Institute for Economic Policy. This policy paper is based on a study conducted in collaboration with Start-Up Nation Central. We would like to thank participants of the roundtable discussion held by the Aaron Institute on December 17, 2019, titled "How Can High-Tech Employment Be Expanded?" for their useful comments (Hebrew: <https://www.idc.ac.il/he/research/aiep/pages/17-2-19.aspx>). We thank the professional staff at the Central Bureau of Statistics: Ms. Anat Katz, Ms. Yifat Klopschtock, Ms. Leah Polachik and Mr. David Gordon for preparing the data file, and for their fruitful cooperation and willingness to help.

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Can the High-Tech Sector Grow to Reach 12% of Workforce?

This study, conducted by the Aaron Institute in collaboration with Start-Up Nation Central, examines the following question: is it possible to expand the rate of workers employed in the Israeli high-tech sector, which currently stands at 9% of the entire Israeli workforce, up to 12% by the year 2030? This is not a rhetorical question. In fact, if the high-tech sector fails to expand, it runs the risk of shrinking due to the strong competition arising from the hubs of innovation which are rapidly evolving around the world, particularly in the USA. To achieve this goal, a coordinated strategy must be developed and enacted by the government with the support of the high-tech industry as well as academic institutions and civic organizations. This study does not discuss such a strategy; it examines whether Israel has the human capital required to support such an expansion. And the answer to that is yes, but only if the positive trends which we have seen over the last few years regarding human capital development are sustained and enhanced.

This policy paper begins with an overview of the two economies which coexist in Israel: the traditional economy, which employs relatively few people in development positions – for each worker in a development position there are 15 workers in other positions – alongside the technological sector, where the majority of employees hold development positions, with a ratio of 0.7 workers in other positions for each developer.

Since the Israeli high-tech sector is the global leader in terms of its share of the local economy, it could have been assumed that the rate of students in the Israeli education system who major in STEM-related and "high-tech relevant" fields would be among the highest worldwide.¹ This paper shows that this is not the case. Furthermore, only 19% of Israeli graduate students in 2016 were majoring in STEM subjects, compared to an average rate of 24% in the benchmark countries, reaching as high as 31% in South Korea and 30% in Finland.² Similarly, only 6% of Israeli students in 2016 were studying "core high-tech" subjects, which are in very high demand in the job market, compared to 7% in the benchmark countries, and nearly 10% of students in Ireland and in the UK. Thus, according to our paper, for the high-tech sector to reach a rate of 12% of the Israeli workforce, the number of students majoring in "high-tech relevant" subjects need to grow by 7% annually between 2017 and 2030. A

¹ STEM: Science, Technology, Engineering and Mathematics. STEM-related academic fields include mathematics, statistics, computer science, engineering, and architecture, as well as physical and biological sciences.

² The "benchmark countries" consist of Austria, Denmark, Finland, Ireland, The Netherlands, and Sweden.

substantial part of this increase has already occurred, thanks to government schemes which have raised the number of students who study "high-tech relevant" subjects by over 40% compared to 2016. This trend must continue over the next decade, along with efforts to maintain the ratio between non-technological and technological workers in the higher income levels of the high-tech sector. We estimate that that the high-tech sector will struggle to reach 12% of the workforce if the majority of workers in development positions are confined to development hubs.

Given that a significant part of STEM graduates will not join the high-tech sector, and as long as the rest of the Israeli economy fails to offer them sufficient availability of high-paying positions, Israel might face a surplus of highly skilled workers. These graduates will be forced to take on positions which require lower skill levels, to undergo additional training towards high-tech employment, or to leave the country, as is the case with many skilled professionals (in the life sciences, for example) who cannot find suitable positions in Israel. None of these outcomes is desired, hence the pressing need to create incentives for prospective students to study fields which are in high demand, and to offer them guidance before they decide which subject to major in.

Job training and retraining is a preferred option: our paper shows that workers who switch from high-tech industries to other sectors are mostly at middle-income levels, and they maintain their income level after the transition. Conversely, workers who switch to the high-tech sector from other industries are mostly at low-income levels (apparently when they realize that their career choice was mistaken), and their income is more than doubled following the transition. It would have been preferable, of course, if they had studied the preferred vocation in the first place.