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Integration of Haredi Men in the High-Tech Sector

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For the full paper (in Hebrew) see

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1. Summary of Main Findings and Conclusions

There are around 1.2 million Haredi (ultra-Orthodox) people living in Israel today, representing around 12% of the Israeli population. According to the forecast issued by the Israel Central Bureau of Statistics (CBS) regarding the population growth rate, by 2035 the Haredi population is projected to constitute around 18% of Israeli population.[1]

Haredi society has unique features, which stem mainly from religious observation and a set of religious and communal values it wishes to preserve. Therefore, Haredi community maintains clear boundaries, and is characterized by socioeconomic separatism. At the same time, the increasing demographic presence of Haredi population in Israel necessitates suitable government policies with regard to economy and employment. Given the size and significance of Haredi population in Israeli society, and the fact that Haredi population already accounts for around 10% of the primary working age (25-64) population, there is a need for government policy which is adapted to Haredi population with regard to vocational training which matches the needs of the labor market, in order to address the current developmental needs of Israeli economy. In recent years, the Israeli government has allocated extensive resources to prepare and equip Haredi population for the labor market, and for the high-tech sector in particular.[2] As a result, by the end of 2020 the employment rate of Haredi women aged 25-64 had increased significantly and reached around 78%, compared to around 83% among non-Haredi Jewish women. However, the employment rate of Haredi men aged 25-64 was around 52%, compared to 87% among non-Haredi Jewish men.[3]

[1] Haredi Institute for Public Affairs tabulations of 2019 CBS data.

[2] The annual budget of the KEMACH Foundation, which was less than NIS 1 million in 2008, has since reached around NIS 50 million; see https://keren-kemach.org. See also publications by The Knesset Research and Information Center: "Schemes for Integration of Former Haredim in the Employment Market" (2019, HEB), https://fs.knesset.gov.il/globaldocs/MMM/61fc5da4-42d1-e811-80e1-00155d0a98a9/2_61fc5da4-42d1-e811-80e1-00155d0a98a9_11_13682.pdf; "Government Aid Schemes for People with Haredi Background in Higher Education, Employment, and Military Service" (2014, HEB), https://fs.knesset.gov.il/globaldocs/MMM/4b506b58-e9f7-e411-80c8-00155d010977/2_4b506b58-e9f7-e411-80c8-00155d010977_11_7756.pdf.

Haredi people identified according to self-definition between 2014 and 2019. In 2012-2013, the number of Haredi people was calculated on the basis of the rate of change in the number of Haredi people as identified according to the most recent educational institute they have attended.

The high-tech sector is a primary growth engine of the Israeli economy. The product per worker and the average monthly wage in this sector are more than twice as high as the per-worker product and wages in the rest of the economy. However, despite the significant differences in labor productivity and wages between the high-tech sector and all other industries, for nearly two decades there has been a relative stability in the share of the high-tech sector in the total business product, which has stood at around 15%, as well as relative stability in the employment share of the high-tech sector, which has hovered around 8%-10%. This means that some 90% of Israeli salaried workers are not employed in this sector, hence their labor productivity and wages are lower. Which begs the question: how can the share of high-tech employees be increased, and particularly that of underrepresented population groups? It should be noted, in this context, that Haredi women are already being integrated into the high-tech sector, and from the outset the barriers and challenges facing Haredi women are altogether different than those facing men – both because they study core subjects more extensively, and because their social role as primary wage earners means there is more acceptance and approval of their integration into the labor market.

Study Objectives

The present study examines the extent to which it would be possible to expand the scope of integration into the high-tech sector of Haredi men who are already employed, and how it may be achieved, with reference to the following questions:

1. What are the characteristics of Haredi men employed in high-tech, and what are their educational resources?
2. Which training courses currently exist to prepare Haredi men for high-tech employment, and what are the characteristics of their students?
3. What is the required scope of employment of Haredi men in high-tech, in order to generate a significant change in this regard?

This information forms a basis for policy recommendations aiming to increase the rate of Haredi people employed in high-tech and technological occupations, in order to enhance labor productivity among this population group and in the economy as a whole, and to boost economic growth.

Government intervention in the development of training schemes for high-tech employment targeting Haredi men in working age is necessary, due to a market failure which exists in regard to this population group: a substantial proportion of Haredi men in working age lack suitable skills and proficiencies, and some of them already have families by the time they reach working age. These characteristics constitute a considerable barrier for such Haredi men, hindering their integration into highly productive positions in the labor market.

This study made use of quantitative research methods. Information was gathered from CBS data – workforce surveys conducted between 2012 and 2019,[4] as well as individual data from the CBS Research Room[5] – along with information regarding workers with academic degrees in tech-related subjects which was received from The Council for Higher Education;[6] data from the Labor Branch in the Ministry of Labor, Social Affairs and Social Services regarding graduates of the Practical Engineering courses in the Government Institute for Technological Training (MAHAT); and data regarding 27 vocational training schemes for high-tech employment, which were received from private training providers.

Our findings reveal that the number of Haredi men in high-tech employment is low. From 2013 to 2019, only around 1,084 Haredi men had been integrated into employment in the high-tech sector, and in 2019 the number of Haredi men employed in this sector was 3,088. Thus, the average increase in the number of Haredi high-tech employees is around 155 men per year. Haredi men represented only around 1% of all salaried employees in the high-tech sector, and around 3.4% of all employed Haredi men. **These rates remained stable throughout those years, despite the public investment in this area.** The share of Haredi men in the growth in the number of high-tech employees was around 1%.[7] Most of the increase was concentrated in the high-tech services sectors.

[4] Between 212,000 and 311,000 observations.

[5] 119,389 observations of Haredi men (see Table 6).

[6] Between 9,200 and 13,300 observations.

[7] Extremely low integration of Haredi population in high-tech employment is also evident in high-income development roles: only 0.7% of high-tech employees in high-income development positions hail from Haredi society, and most of them are women (Ministry of Finance, 2019).

Examination of the human capital characteristics of Haredi men in high-tech employment (matriculation studies, particularly science matriculation, as well as academic and extra-academic studies) is based on tabulation of data from two sources: (1) administrative data from the CBS regarding around 119,000 Haredi men who were born between 1978 and 1995; (2) data received from existing training schemes for integration of Haredi men in high-tech employment, regarding 2,727 Haredi men who had participated in **high-tech oriented** training courses between 2007 and 2020. In this framework, we examined the impact of the education level of Haredi men, including education which is relevant to high-tech employment, on their chances of integration in the high-tech sector and in technological occupations.

Table 1 indicates that the vast majority (81%) of Haredi men employed in high-tech do not have academic degrees. **Among Haredi men who do not have matriculation or an academic degree (as is the case with most Haredi men), the share of those successfully integrated in high-tech employment, out of all Haredi employees, is very low and stands at only around 2.5%.** The data suggest that the chances of Haredi men to integrate in high-tech employment depend on their track of studies. **The share of high-tech employees among those with STEM-related degrees[8] is very high**, and stands at around 42% among those with non-science matriculation and around 64% among those with science matriculation.

Table 1 also indicates that as the education level of the Haredi employee increases, so does the return on education level generated by employment in the high-tech sector. A multivariable regression analysis regarding the contribution of high-tech employment on income level shows that the wage gap between high-tech employees and employees in other sectors, among Haredi men with similar education level, is very high and reaches nearly 60% (while controlling for explanatory variables such as work experience, number of children, district of residence, parents' education).

[8] 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.

Table 1: Characteristics of Haredi Men Employed in the High-Tech Sector – Employment and Wages by Track of Studies

Matriculation Type	Academic Degree Type	Observations	Distribution of High-Tech Employees by Track of Studies	Percentage of High-Tech Employees by Track of Studies	Average Net Salary	Salary in Relation to No-Matriculation No-Degree Track	Ratio Between High-Tech Salary and Salary in Other Sectors
No Matriculation	**No Degree**	1,239	66%	2.5%	9,430	1.00	1.7
	Non-STEM Degree	165	9%	12.7%	14,826	1.57	1.4
	STEM Degree						
Non-Science Matriculation	**No Degree**	207	11%	4.2%	9,898	1.05	1.7
	Non-STEM Degree	19	1%	6.3%	11,523	1.22	1.1
	STEM Degree	47	3%	42.0%	14,730	1.56	1.3
Science Matriculation	**No Degree**	75	4%	16.4%	10,736	1.14	2.3
	Non-STEM Degree	17	1%	12.1%	14,004	1.49	1.3
	STEM Degree	104	6%	63.8%	16,225	1.72	1.5
Total		**1,873**	**100%**	**3.2%**	**10,581**	**1.12**	**1.9**

Source: CBS, individuals born between 1970 and 1995, aged 21-46 in 2016. Identified as Haredi by school supervision.

The dedicated training in high-tech occupations available to Haredi men consists of four main tracks: (1) academic studies in colleges and universities ("academic training track"); (2) vocational training for technicians and practical engineers in the frameworks of the Labor Branch and MAHAT; (3) vocational training through dedicated technological courses within the Israel Defense Forces (Haredi Integration Track, dubbed SHAHAR in Hebrew); (4) Studies in the framework of various agencies and projects for vocational training in high-tech occupations ("vocational training tracks"), some of which are financed or supported by the Israeli government while others are funded by business and philanthropic organizations.

Information was collected regarding around 2,000 graduates of high-tech vocational training schemes from **around 70 training programs**, who had studied between 2012 and 2019. During this period, the number of learners in each training track had ranged between 100 and 200 in each year (Table 2).

Table 2: Training Tracks in Which Haredi Men Studied High-tech Occupations, Divided Between Academic and Vocational Tracks

Program Commencement Year	Vocational Training	Academic Training	Total High-Tech Trainees
2012	104	29	133
2013	150	62	212
2014	202	97	299
2015	95	155	250
2016	92	146	238
2017	207	146	353
2018	97	148	245
2019	165	139	304
Total 2012-2019	**1,112**	**922**	**2,034**

Source: Tabulations by The Haredi Institute for Public Affairs and Aaron Institute of data from training programs on which data were collected for this study.

Studies in academic and vocational tracks differ in the duration and cost of training. Training in the academic track takes around 40 months, as opposed to around 12 months in the vocational training track, although there is great variation in the duration of various vocational training courses. According to data provided by the training programs, the average cost of studying for a student in the academic track is around NIS 30,440, compared to around NIS 9,696 in vocational training tracks.[9] A significant portion of students in the various training tracks are supported in the funding of their tuition fees. Thus, in vocational training the average support amount is around 55% of the cost of tuition fees, while in the academic track the support amount may reach around 70% of the cost of tuition fees.

[9] These figures refer only to the student's tuition fees.

The data regarding tuition fees in high-tech training programs, and the increase in wages as a result of these studies (return on training), enable us to estimate the return on investment in studying **from the perspective of the student**.[10] If we assume that the return on high-tech vocational training among Haredi men is similar to the return among **all** certified MAHAT graduates, which is around 30% (and their net salary following MAHAT training is around NIS 7,800), and the return on an academic degree is similar to that of **all** academic degree holders in tech-related subjects, which is around 75% (and their net salary after graduation is around NIS 10,500), we can assess that it takes **around 4 years** to get the return on the investment in training.[11]

In order to assess the scope of integration of Haredi men in high-tech employment which would be conducive to reducing the disparity in the rates of men in high-tech employment compared to the rest of the population, we devised a scenario based on different assumptions. As of today, the percentage of salaried workers aged 25-64 who are employed in the high-tech sector is around 10% of all employees. These rates are particularly low (3.4%) among the Haredi men population. According to the findings of Bental, Peled and Sumkin (2020), as well as Sumkin (2020), the relative share of the high-tech sector in the overall employment of the 25-64 age group can be raised, from around 10% in 2017 to around 12%-15% by 2030.

Reducing the gap in high-tech employment rates between Haredi men and the Israeli society as a whole, and raising the employment rate of Haredi men to around 12%, require an extensive effort to train and integrate a large number of Haredi men every year, with yearly cohorts of Haredi men ranging from around 600 (in 2021) to around 3,800 (in 2030) over the next ten years. To achieve a more ambitious goal of 15% in high-tech employment by 2030, the effort to increase the number of Haredi men should encompass yearly cohorts of Haredi men ranging from around 700 (in 2021) to around 5,200 (in 2030) over the next ten years.

[10] The overall cost of academic studies extends beyond tuition fees.

[11] The return on MAHAT studies in core-subjects track, compared to an individual without matriculation, is around 32%, and the return on a tech-related academic degree, in comparison to an individual without matriculation, is around 75%; see: https://www.funder.co.il/article/91801 (HEB). Table 10 suggests that the return on training among Haredi men may even be higher than that of the general population: the net salary of a Haredi man without matriculation who is employed in the high-tech sector is around NIS 9,500, whereas the net salary of a Haredi man without matriculation who is employed in any other economic sector is around NIS 6,000. If a Haredi man without matriculation who is employed in the high-tech sector has undergone vocational training towards high-tech employment, these data may suggest a high return on training, of around 60%. The net salary of a Haredi man with an academic degree who is employed in the high-tech sector is around NIS 15,000, which is around 150% higher than the net salary of a Haredi man without matriculation who is employed in any other economic sector.

This is a highly challenging task, due to: a. the insubstantial increase in the number of Haredi high-tech employees in recent years (around 155 per year in average); b. relatively low integration rates in the high-tech sector among graduates of vocational training courses, both private and governmental; c. the high cost of vocational training.

It is noteworthy that currently, despite the intensive efforts of various public and private actors to train Haredi men for high-tech employment and to integrate them into the labor market, the annual increase rate in the number of Haredi men in high-tech employment has been relatively low in recent years. Between 2012 and 2019, the number of Haredi men employed in the high-tech sector had increased at an average annual rate of around 6.4%, compared to 13.7% among Haredi women. The training of skilled, high-quality workforce among Haredi men, which would meet the requirements of high-tech employment, remains a significant economic challenge for the state of Israel.

General Principles for a Strategic Plan to Advance the Integration of Haredi men in High-Tech Employment

The current policy paper examines the extent to which it is possible to expand the scope of integration of Haredi men in high-tech employment. Inasmuch as the goal is to reach a state where 12% of all Haredi men in employment are employed in the high-tech sector, its realization requires the implementation of an extensive action plan which would achieve the integration of 600 to 3,800 Haredi men each year. It should be noted that in 2020, around 7,500 Haredi men joined the primary working age group (the cohort aged 25-26), and until 2030 around 8,000 to 12,000 Haredi men are expected to join this group every year (estimation based on CBS data from 2020).

Findings from the various information sources, taken as a whole, point to several important elements for the success of the training and placement process of Haredi men in high-tech employment:

1. **Multi-year, intensive process** – imparting the necessary knowledge and professional skills for integration in the high-tech sector, and meeting the requirements of employers for high-quality workers with high professional level, necessitates a long-term process which includes several stages: locating and screening candidates, filling in gaps in education and life skills, intensive vocational training, and initial on-the-job internship (which may assist in the competition against candidates with academic and military background).

2. **Professional locating and screening processes** – identifying candidates who have a potential to succeed in high-tech occupations requires professional, in-depth processes for locating and screening, which would help guiding suitable candidates to the training tracks which are appropriate for them. Some will be integrated into various training tracks for high-tech occupations, while others will be directed to vocations outside the high-tech sector.
3. **Filling in educational gaps** – a substantial part of the work in the high-tech sector requires medium to high levels of English language skills and mathematical proficiency. Since the majority of Haredi men reach training without preliminary knowledge in these subjects, an initial preparatory stage should be designed, prior to the vocational technological studies per se, which would enable the Haredi learner to fill in the gaps in his knowledge of these subjects. This preparatory stage would enable him to make the most of his studies during the vocational technological training.
4. **Imparting personal and interpersonal skills** – which are necessary for integration in employment and for advancement in high-tech occupations. The acquisition and experience of these skills constitute an essential element of the training processes of Haredi men for high-tech employment.
5. **Intensive vocational training program** – daily studies for around a year, covering the main contents identified by employers as necessary for optimal integration in technological occupations within the high-tech sector. Since the recommended vocational training program should be focused and concise, the curriculum should be adapted and updated regularly according to the professional needs of prospective employers.
6. **On-the-job internship component as part of the training process** – Due to the level of experience and professional knowledge required in the high-tech employment market, it would be beneficial if the vocational training year is followed by placement in internship positions within firms, through HR companies or in the public sector, which would be characterized by low wages, a predetermined internship period (of around 2 years), and continued learning, in order to add another rung to the ladder of the candidate's professional progression and his preparation for integration in the labor market.

7. **Subsistence grants for trainees** – since the majority of Haredi men enter training at a relatively older age, when most of them already have their own families, it would be necessary to explore how they may be provided with basic subsistence grants, or alternatively conditional loans, which will enable them to complete their training and internship courses prior to entering the labor market.
8. **Lifelong learning** – work in the high-tech sector requires ongoing learning and updating of knowledge, particularly in light of the many gaps in technological knowledge which Haredi men have upon entering the labor market. Therefore, it is necessary to build a complementary study program during the working years, even after the completion of internship.
9. **Designing a structured training track** – unlike graduates of the Israeli state education system, a Haredi man who completes his course of religious studies and wishes to enter the labor market, and the high-tech sector in particular, finds himself in a state of uncertainty regarding the training tracks available to him. Even after choosing one or another component in the process of training/screening/preliminary studies, there is today no structured process with clearly defined stages for the process of integrating into employment. Thus, some Haredi men embark on their training stage without any preparatory course or preliminary screening, which would have enabled them to match their training track to their individual skills.
10. **Changing awareness and perception in the Haredi public** – A common perception in the Haredi public is that general studies (core subjects) and technological vocational studies can be completed within a few months. The duration of the proposed training course is around three years of intensive engagement with low pay (around one year of training and two years of internship). Mobilizing large numbers of candidates to this program requires alignment of expectations, through a process of changing the perceptions and awareness of this public regarding the scope of investment required to acquire the requisite knowledge for successful integration in high-tech occupations.

An effort such as that requires a reliable, centralized agency which would coordinate and lead the process, conduct year-by-year tracking of the outcomes and results of this scheme on both the individual and system-wide levels, and also measure and evaluate the various programs in terms of curriculum, quality of teaching staff, and the learning experience. In addition, further investment should be made toward integrating Haredi men in STEM subjects, while providing a supporting envelope which would enable more students to complete their training courses and to avoid dropping out.

A number of important issues received less emphasis in this study, and warrant further research and in-depth examination: (a) cost-benefit analysis should be conducted to assess the future return on investment. Such an analysis can reveal how worthwhile the investment is, and what is the capacity for further expansion of the intake of Haredi men into the training tracks; (b) Mapping of the barriers to successful integration in employment of around half of the graduates of STEM-related studies, and the ways to help them make the most of the training they have acquired upon entering the labor market; (c) this study did not look into the selection problem. The set of vocational training students, as well as Haredi men who seek high-tech employment, do not constitute a representative sample. In a follow-up study, we could investigate the characteristics of this population group and compare it to a group with similar characteristics who has not sought employment in the high-tech sector, in order to perform a better comparison in terms of wages and integration in the labor market. At present, the comparison to the average salary is not the accurate metric for successful integration in high-tech employment; (d) the data does not enable us to differentiate between those who are employed in the high-tech sector according to their occupation. Therefore, a cleaner, a secretary or a Kosher supervisor who work in a high-tech company would also be included in our data as high-tech employees.

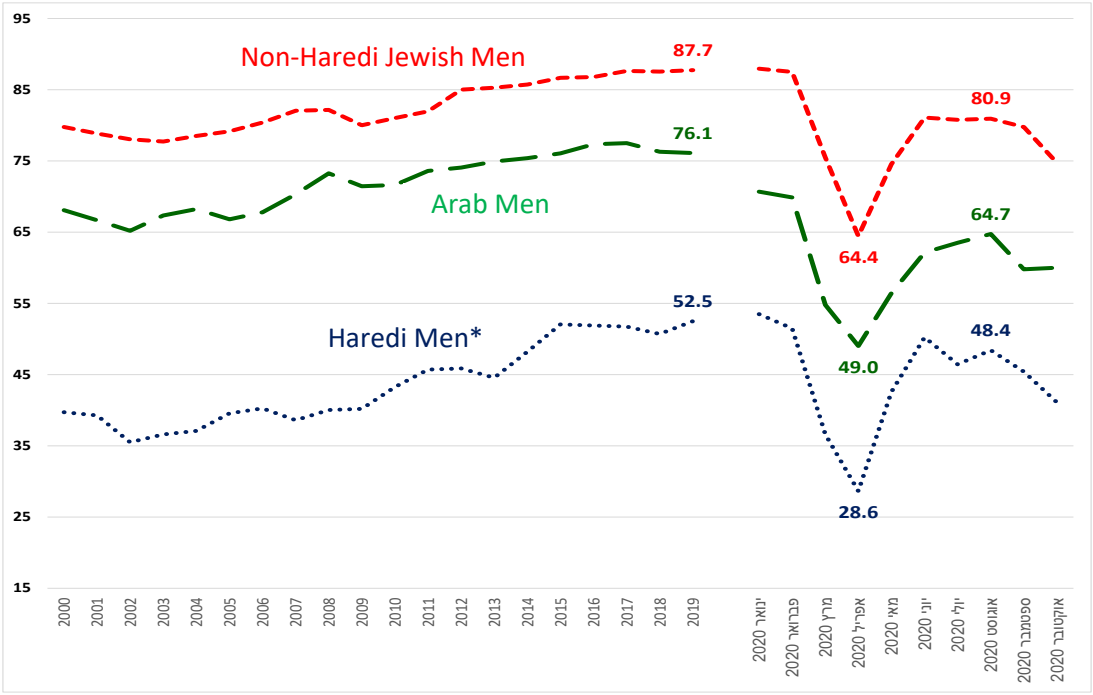
Considering these issues, the present study is an intermediate stage, paving the way for a follow-up study which would delve deeper into the aforementioned issues, and would enable us to indicate the training programs for tech-related occupations (as well as other fields) which are worthy of government support in order to promote high-quality employment of Haredi men in the high-tech sector and other industries.

2. Integration of Haredi Men in the High-Tech Sector: A Current Overview

2.1 Employment of Haredi Men in the Wider Economy and the High-Tech Sector

In 2019, the employment rate of Haredi men stood at around 52.5%, and was significantly lower in comparison to non-Haredi Jewish men (87.7%), as well as Arab men (76.1%) – see Figure 1. Between 2002 and 2019, the employment rate of Haredi men had increased by around 17 percentage points, thanks to an effective employment policy which aimed to achieve an employment target of 63% by 2020 (Eckstein, Larom and Lifshitz, 2018).[12]

Figure 1: Employment Rate of Men, by Population Group



Ages 25-64. Identification of Haredi people according to self-definition.

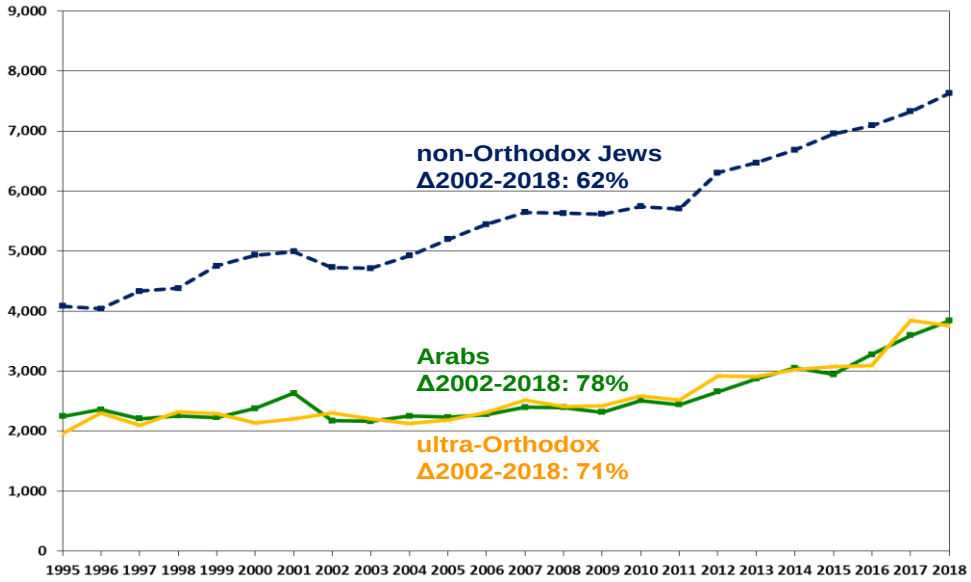
Source: Aaron Institute tabulations of labor force surveys.

The employment level of Haredi men decreased during 2020, at the time of the COVID-19 pandemic, down to 2009 level. This decrease makes it very difficult to achieve the employment target of Haredi men for 2030, which is set around 65%-70% (Ministry of Labor, Social Affairs and Social Services, 2020).

[12] Since 2015, the pace of increase in the employment rate of Haredi men has slowed down significantly.

The income level among the Haredi population is also low (Figure 2), however it is evident that concurrently with the increase in the employment rate of Haredi men, from 2002 to 2017, there had been a real increase of 78% in the gross labor income of households, and an increase of 71% in the net (disposable) income of Haredi households. According to the report of The Committee for Employment Advancement (Ministry of Labor, Social Affairs and Social Services, 2020), the national target for 2030 is an annual increase of 2%-3% in the nominal monthly wage.

Figure 2: Disposable (Net) Income of Households, by Population Group

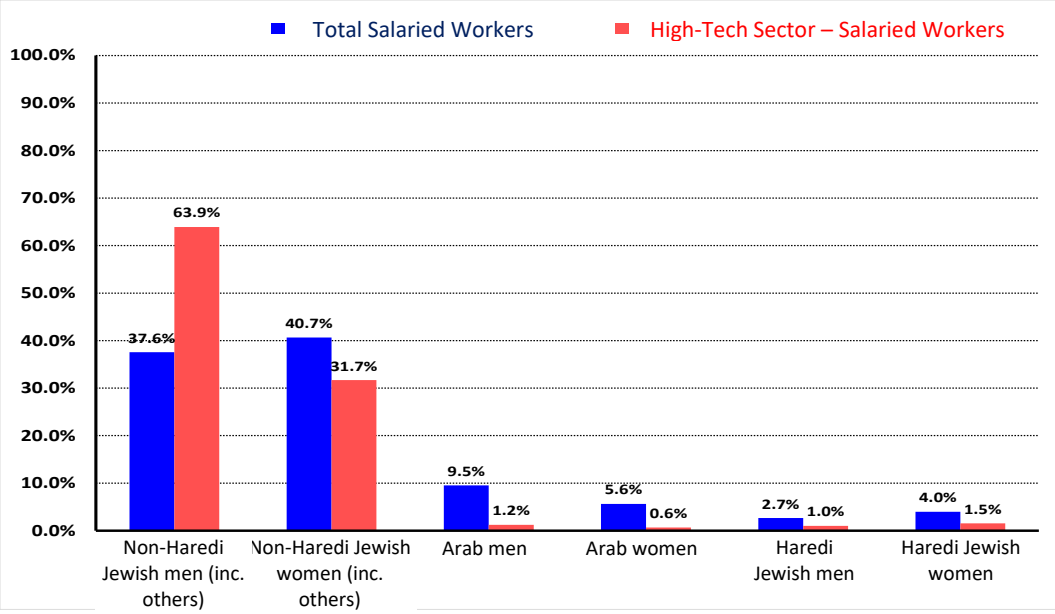


Ages 25-64 (household head). Standardized per-capita income, in 2018 prices.

Source: Aaron Institute tabulations of income and expenses surveys conducted by the CBS.

Although the Haredi population represents around 8% of the primary working age population (ages 25-64), and around 7% of salaried workers, the percentage of Haredi people employed in the high-tech sector is very low, and stands at only around 2.5% (around 1.0% Haredi men, around 1.5% Haredi women; Figure 3).

Figure 3: Distribution of Salaried Workers by Population Groups, in Total and in the High-Tech Sector, 2019



Ages 25-64. Identification of Haredi people according to self-definition. "Others" population group includes non-Arab Christians, members of other religions, and individuals not classified by religion in the Ministry of Interior.

Source: Aaron Institute tabulations of labor force surveys.

In 2019, there were 3,088 Haredi men employed in the high-tech sector, an increase of 14% compared to the previous year. While this is a significant increase, the number of Haredi men in the high-tech sector is still relatively low. Between 2012 and 2019, the number of Haredi men employed in the high-tech sector had increased at an average annual rate of around 6.4% – lower than the rate of increase among the Arab population and among Haredi women.

Upon examination of the share of salaried workers in the high-tech sector out of the total number of the salaried workers in each population group, we can see that the share of Haredi men employed in the high-tech sector remains stable, at around 3.0%-4.0% (Table 3).

Table 3: Share of Salaried Workers in High-Tech out of the Total Number of Salaried Workers, by Population Group

Population Group	2012	2013	2014	2015	2016	2017	2018	2019
Non-Haredi Jewish Men	14.1%	14.5%	15.2%	15.1%	16.0%	16.0%	16.8%	17.8%
Non-Haredi Jewish Women	6.3%	6.6%	6.8%	7.2%	7.6%	7.3%	7.3%	8.2%
Arab Men	0.7%	1.1%	1.4%	1.2%	1.4%	1.3%	1.7%	1.3%
Arab Women	0.3%	0.4%	0.5%	0.2%	0.7%	0.7%	1.0%	1.2%
Haredi Jewish Men	4.0%	3.4%	4.0%	3.0%	3.3%	3.7%	3.5%	3.9%
Haredi Jewish Women	2.8%	2.5%	2.6%	2.8%	3.4%	3.3%	4.2%	4.0%
Total Salaried Workers	**8.6%**	**8.8%**	**9.2%**	**9.2%**	**9.7%**	**9.5%**	**9.8%**	**10.5%**

Salaried workers aged 25-64.

Source: CBS workforce surveys.

In 2019, the number of Haredi men employed in high-tech manufacturing sectors was around 680 (Table 4), and in high-tech services sectors their number was around 2,408 (Table 5). Between 2012 and 2019, the pace of annual increase in the number of the Haredi men employed in high-tech services sectors had been rapid, at around 12.3%. In high-tech manufacturing sectors, on the other hand, the number of Haredi men had decreased.

Table 4: Salaried Workers in High-Tech by Population Group – High-Tech Manufacturing Sectors

Population Group	2012	2013	2014	2015	2016	2017	2018	2019	Annual Change Rate 2012-2019*
Non-Haredi Jewish Men	66,406	62,884	68,951	67,596	67,990	68,135	70,654	68,499	0.4%
Non-Haredi Jewish Women	33,405	35,274	34,882	34,997	35,940	34,272	34,564	34,063	0.3%
Arab Men	824	1,224	1,921	1,517	2,145	1,380	2,074	1,568	9.6%
Arab Women	259	282	244	120	539	697	885	925	19.9%
Haredi Jewish Men	**932**	**921**	**1,145**	**1,016**	**746**	**1,365**	**735**	**680**	**-4.4%**
Haredi Jewish Women	208	206	192	99	100	297	534	643	17.5%
Total Salaried Workers	**102,034**	**100,791**	**107,335**	**105,345**	**107,460**	**106,146**	**109,446**	**106,378**	**0.6%**

Salaried workers aged 25-64.

Source: CBS workforce surveys.

Table 5: Salaried Workers in High-Tech by Population Group – High-Tech Services Sectors

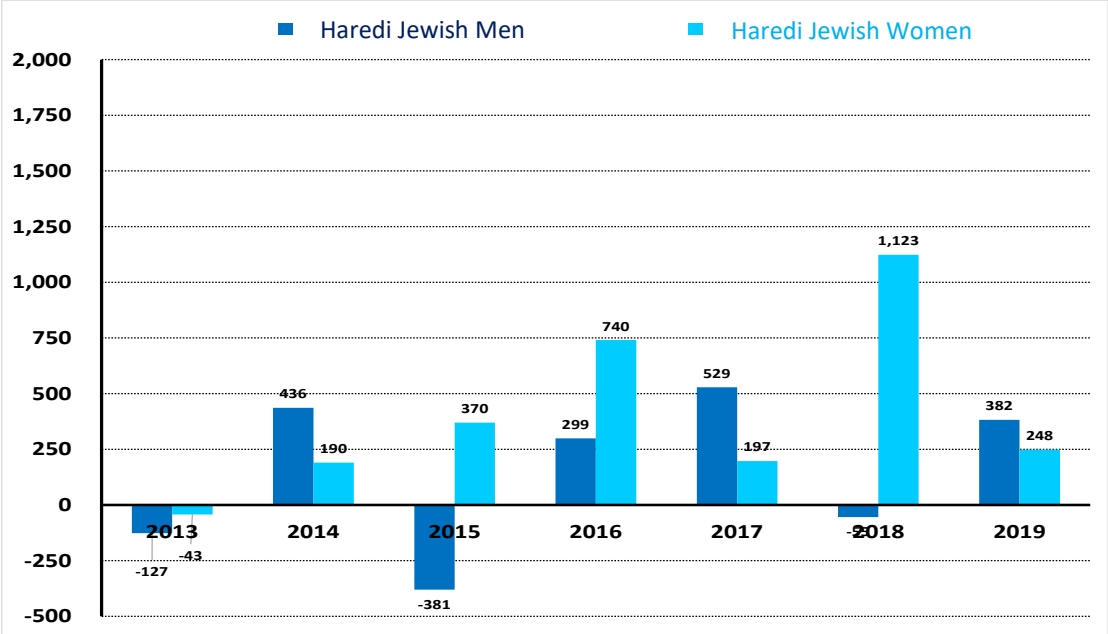
Population Group	2012	2013	2014	2015	2016	2017	2018	2019	Annual Change Rate 2012-2019*
Non-Haredi Jewish Men	72,717	83,767	88,839	90,411	99,829	104,063	114,334	130,567	8.7%
Non-Haredi Jewish Women	34,050	37,043	42,014	47,635	51,482	50,086	53,540	64,586	9.6%
Arab Men	702	1,166	1,282	1,370	1,357	1,844	2,442	2,253	18.1%
Arab Women	0	115	345	147	272	302	747	1,084	
Haredi Jewish Men	**1,072**	**956**	**1,168**	**917**	**1,486**	**1,396**	**1,971**	**2,408**	**12.3%**
Haredi Jewish Women	1,742	1,701	1,905	2,368	3,108	3,107	3,994	4,133	13.1%
Total Salaried Workers	**110,283**	**124,748**	**135,553**	**142,848**	**157,534**	**160,798**	**177,028**	**205,032**	**9.3%**

Salaried workers aged 25-64.

Source: CBS workforce surveys.

Between 2013 and 2019, the total number of high-tech employees had increased by around 99,000. The number of Haredi men employed in the high-tech sector had increased by only around 1,083 (figure 4). The relative share of Haredi men in the increase in high-tech employees was around 1.1%.

Figure 4: Additional Haredi Employees in the High-Tech Sector, by Gender



Salaried workers aged 25-64.

Source: CBS labor force surveys.

2.2 Characteristics of Haredi Men by Track of Studies

In order to analyze the characteristics of Haredi men employed in the high-tech sector, we used administrative data accessed in the CBS Research Room. We had access to data of 3,269,401 Israelis, born between 1970 and 1995.[13] The file includes data on the type of school supervision (i.e., educational stream), matriculation characteristics of individuals (number of study units and grade for each subject), psychometric exam score (for those who have taken it), tertiary education characteristics (educational institute – university, government subsidized college, or non-subsidized college – and academic major), PIAAC scores (for those who have taken it), wage data, economic sector, size of employing firm, ownership of employing firm (local or foreign ownership),[14] and demographic data (city of residence, number of siblings, and parents' education). These data facilitate analysis according to economic sector (high-tech sectors and other economic sectors), firm ownership (local ownership and foreign ownership), and size of firm (0-19 employees, 20-249 employees, and 250 employees or more). Identification of Haredi men was done through data regarding school supervision and city of residence (Modi'in Illit and Beitar Illit were identified as Haredi cities).

Analysis of the employment and wages of Haredi men will be based on the individual's decision tree regarding track of studies:[15] matriculation studies (science matriculation [BM], non-science matriculation [BNM], no matriculation [NB]), academic studies (A), academic STEM studies (S), with each track of studies being divided into employment in the high-tech sector (H) and in other economic sectors (NH). Each branch of the decision tree represents the probability for its realization. Thus, the probability that an individual who had studied for science matriculation and studied an academic STEM major would be integrated into high-

[13] The last data year we accessed in this study, with regard to individual employment variables, was 2017. In that year, people born between 1970 and 1995 were aged 22-47, and constituted around 80% of the workforce in the high-tech sector. Full matriculation data is available for people born between 1978 and 1995 (aged 22-39 in 2017), therefore most of our analyses refer to the characteristics of these age cohorts.

[14] The approach taken by the CBS to classify firms according to local/foreign ownership is based on the identity of the firm's owner: if the owner is foreign, the firm would be defined as foreign-owned; if the owner is local, the firm would be defined as locally owned. Determining the ownership of the firm is based on several sources of information. One source is the Israeli Company Register, based on files of the VAT Authority and the National Insurance Institute, which include information on the firm's Business Number (BN). Foreign-owned firms can be identified by the first two digits of their BN. However, (a) a locally owned firm can be purchased by foreign owners and thus shift to foreign ownership without changing its BN; (b) a firm may be registered abroad and receive a BN which identifies it as foreign-owned, even though the firm's owner is actually local. In order to resolve these issues, the CBS utilizes data from R&D surveys, business surveys and financial reports of firms, and updates the ownership classification continuously and systematically.

[15] For further details, see Bental, Peled and Sumkin (2020).

tech employment is $P_{BM\_A\_S\_H}$, while the probability that an individual with non-science matriculation and non-STEM academic studies would be integrated into high-tech employment is $P_{BNM\_A\_NS\_H}$. For an individual who had not studied for matriculation and had not opted for academic studies (NA), the probability of integration into the high-tech sector is $P_{NB\_NA\_H}$.

The wages resulting from each track of studies are marked by $W_{i\_j\_k\_l}$, where the first index (i) designates studies for science matriculation (i=BM), for non-science matriculation (BNM), or no matriculation studies (i=NB); the second index (j) designates a course of academic studies (j=A) or no academic studies (j=NA); the third index (k) designates academic STEM studies, that is, if j=A then the index k will receive the value S or NS according to the choice of STEM or non-STEM studies; finally, the index l will get the value H for an individual employed in the high-tech sector, or NH for employment in other sectors.

Our sample contains data regarding 119,389 Haredi men, who were born between 1970 and 1995. For 9,914 (8.3%) out of those 119,389 Haredi men, we have data regarding the matriculation subjects they had studied.[16] Out of those 119,389 Haredi men, 2,470 (2.1%) are academics (Table 6). The average age of those with an academic degree (33) is around 4 years higher than the average age of Haredi men without an academic degree (29). The share of Haredi men with children is around 77% among those with an academic degree (with no significant difference between academics with STEM degrees and those with non-STEM degrees), and around 57% among those without an academic degree. The average number of siblings among Haredi men without matriculation and without an academic degree is 6.5, while among Haredi men who have matriculation and an academic degree it ranges from around 2.8 (science matriculation and a STEM degree) to 3.9 (non-science matriculation and a STEM degree). The average number of children among Haredi men without matriculation and without an academic degree is 2.7, while among Haredi men who have matriculation and an academic degree it is around 2.5. The share of Haredi men who reside in the Jerusalem District is around 28% among those without matriculation, and around 10% among those with matriculation. The share of Haredi men who reside in the Tel Aviv and Central District is around 39% among those without matriculation, around 50% among those with matriculation, and around 56% among academics who had studied for

[16] The finding that around 90% of Haredi men do not have a matriculation certificate is not new; See, e.g., "Employment in the Haredi Sector: Characteristics, Barriers, and Proposed Solutions" by the Research and Economy Administration in the Ministry of Industry, Trade, and Labor, https://employment.molsa.gov.il/Research/Documents/X10035.pdf (HEB).

science matriculation. The matriculation eligibility rate is around 90% among those who had studied in science matriculation track.

Table 6a: Characteristics of Haredi Men, by Track of Studies

Matriculation Type	Academic Degree Type	Observations	Distribution by Track of Studies	Age	No. of Siblings	% with Children	No. of Children	Age of Children
No	**No Degree**	107,865	90.3%	29.7	6.5	70%	2.7	5.1
Matriculation	**Non-STEM Degree**	1,610	1.3%	35.0	5.4	83%	3.4	6.9
	STEM Degree	-	-	-	-	-	-	-
Non-Science	**No Degree**	8,206	6.9%	27.2	4.9	48%	1.4	3.5
Matriculation	**Non-STEM Degree**	363	0.3%	33.3	3.7	77%	2.7	4.8
	STEM Degree	133	0.1%	32.6	3.9	76%	2.3	4.5
Science	**No Degree**	848	0.7%	29.0	3.4	50%	2.0	4.7
Matriculation	**Non-STEM Degree**	168	0.1%	32.8	3.4	74%	2.6	4.6
	STEM Degree	196	0.2%	33.0	2.8	67%	2.5	5.0
Total		**119,389**	**100%**	**29.6**	**6.4**	**69%**	**2.7**	**5.1**

Table 6b: Characteristics of Haredi Men, by Track of Studies (contd.)

Matriculation Type	Academic Degree Type	% in Jerusalem District	% in Tel Aviv and Central District	Mother's Years of Study	Father's Years of Study	Matriculation Eligibility
No	**No Degree**	31%	33%	12.3	15.4	0%
Matriculation	**Non-STEM Degree**	30%	42%	12.4	15.5	0%
	STEM Degree	-	-	-	-	-
Non-Science	**No Degree**	15%	44%	12.3	12.5	19%
Matriculation	**Non-STEM Degree**	9%	49%	12.9	13.3	65%
	STEM Degree	11%	46%	12.7	13.3	57%
Science	**No Degree**	12%	45%	12.9	13.1	84%
Matriculation	**Non-STEM Degree**	10%	54%	13.4	14.1	89%
	STEM Degree	11%	55%	13.2	13.6	93%
Total		**30%**	**34%**	**12.3**	**15.1**	**27%**

Source: CBS, cohort born between 1970 and 1995, aged 21-46 in 2016.

2.3 Characteristics of Employed Haredi Men by Track of Studies

Out of 119,389 Haredi men, 57,838 (48%) are in employment. The characteristics of the employed Haredi men (Table 7) resemble the characteristics of the overall sample of Haredi men. The average age of those with an academic degree (33) is around 4 years higher than the average age of Haredi man without an academic degree (29). The share of Haredi men with children is around 75% among those with an academic degree, and around 56% among those without an academic degree. The share of Haredi men who reside in the Jerusalem District is around 30% among those without matriculation, and around 10% among those with matriculation. The share of Haredi men who reside in the Tel Aviv and Central District is around 38% among those without matriculation, around 50% among those with matriculation, and around 55% among academics who had studied for science matriculation. The matriculation eligibility rate is around 90% among those who had studied in science matriculation track.

Table 7a: Characteristics of Employed Haredi Men, by Track of Studies

Matriculation Type	Academic Degree Type	Observations	Distribution by Track of Studies	Age	No. of Siblings	% with Children	No. of Children	Age of Children
No	**No Degree**	50,428	87.2%	30.5	**6.4**	74%	2.98	5.6
Matriculation	**Non-STEM Degree**	1,300	2.2%	34.9	**5.4**	84%	3.42	6.8
	STEM Degree	0						
Non-Science	**No Degree**	4,933	8.5%	27.5	4.8	49%	1.40	3.5
Matriculation	**Non-STEM Degree**	303	0.5%	33.2	3.7	78%	2.75	4.8
	STEM Degree	**112**	0.2%	**32.7**	**3.9**	**79%**	**2.43**	**4.5**
Science	**No Degree**	458	0.8%	29.0	3.3	47%	1.77	4.6
Matriculation	**Non-STEM Degree**	141	0.2%	32.8	3.5	74%	2.60	4.7
	STEM Degree	**163**	0.3%	**33.3**	**2.9**	**71%**	**2.55**	**5.0**
Total		**57,838**	**100.0%**	**30.4**	**6.2**	**72%**	**2.84**	**5.5**

Table 7b: Characteristics of Employed Haredi Men, by Track of Studies (contd.)

Matriculation Type	Academic Degree Type	% in Jerusalem District	% in Tel Aviv and Central District	Mother's Years of Study	Father's Years of Study	Matriculation Eligibility
No Matriculation	**No Degree**	26%	35%	12.1	14.8	0%
	Non-STEM Degree	29%	42%	12.4	15.5	0%
	STEM Degree					
Non-Science Matriculation	**No Degree**	14%	45%	12.2	12.4	19%
	Non-STEM Degree	8%	51%	12.9	13.5	67%
	STEM Degree	**13%**	**45%**	12.7	13.5	58%
Science Matriculation	**No Degree**	12%	51%	12.9	13.1	82%
	Non-STEM Degree	9%	57%	13.7	14.5	89%
	STEM Degree	**12%**	**55%**	13.3	13.5	93%
Total		**24%**	**36%**	**12.1**	**14.6**	**28%**

Source: CBS, cohort born between 1970 and 1995, aged 21-46 in 2016.

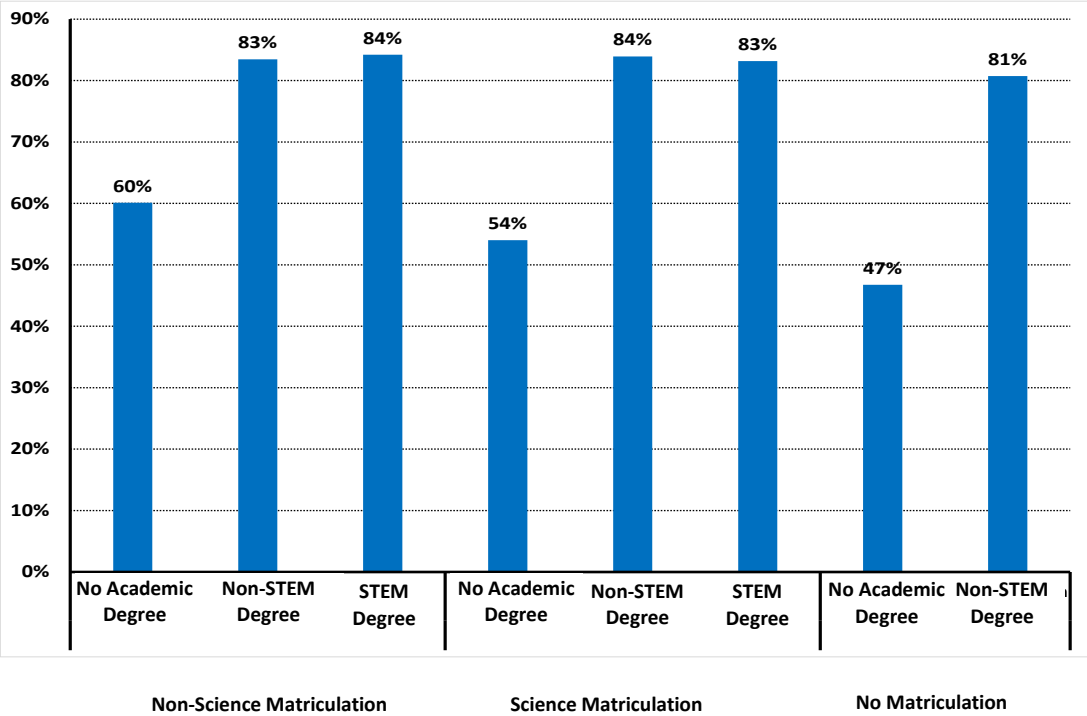
In the context of the current study, the first decision juncture is whether or not to study in a matriculation track. For 6,110 (11%) out of 57,838 Haredi men in employment, we have data regarding the matriculation subjects they had studied. The next decision is whether to study for, and take, science or non-science matriculation. Out of 6,110 employed Haredi men for whom we have matriculation data, only 762 (12% of those with matriculation certificate of any kind, and around 1% of all Haredi men in employment) have science matriculation (with 5 study units in Mathematics, Physics, or Computer Science). 88% have non-science matriculation. The rate of Haredi people who complete science matriculation studies, with 5 study units in at least one scientific subject (Mathematics, Physics, Computer Science) is half of that of the non-Haredi Jewish population (Sumkin, 2020).

In the next juncture, Haredi men can decide regarding an academic degree, which may be a STEM or non-STEM major. Out of the Haredi men with science matriculation, 21% (163 out of 762) pursued studies for a STEM degree, and only 2% (112 out of 5,348) of those with non-science matriculation pursued studies for a STEM degree. Hence, science matriculation increases the probability of studying for a STEM degree. Without a science matriculation, there is hardly any chance of studying for a STEM degree or a non-STEM degree. We would also note that there is a high rate of Haredi people with science matriculation who do not have an academic degree (more than twice as high compared to the non-Haredi Jewish population).

2.4 Employment and Wages of Haredi Men by Track of Studies

The employment rate and wages of Haredi men depend on their track of studies. The employment rate among Haredi men without matriculation or academic degree (who constitute 90% of the Haredi men in our sample) is very low, and stands at around 47%. The employment rate among those with matriculation who do not have an academic degree is 54%-60%, and among academics it is 81%-84% (Figure 5).

Figure 5: Employment Rate of Haredi Men, by Track of Studies



Source: CBS, cohort born between 1970 and 1995, aged 21-46 in 2016.

The average salary of Haredi men without matriculation or an academic degree is the lowest, and stands at around NIS 5,579. In relation to this salary, the salary of those with matriculation who do not have an academic degree is 2%-5% higher, the salary of those with matriculation and a non-STEM degree is 88%-96% higher, and the salary of those with matriculation and a STEM degree is 129%-153% higher (Table 8).

It should be noted that the selection problem was not examined. The set of vocational training students, as well as Haredi men who seek high-tech employment, do not constitute a representative sample. In a follow-up study, we could investigate the characteristics of this population group and compare it to a group with similar characteristics who has not sought employment in the high-tech sector, in order to perform a better comparison in terms of wages.

Table 8: Characteristics of Haredi Men – Wages of Employees

Matriculation Type	Academic Degree Type	Observations	% Without Income Tax	Average Net Salary (NIS)	Salary Compared to No-Matriculation, No-Degree Track
No	**No Degree**	**50,140**	**67%**	**5,579**	**1.00**
Matriculation	**Non-STEM Degree**	1,291	30%	10,957	1.96
	STEM Degree	0			
Non-Science	**No Degree**	**4,904**	**61%**	**5,884**	**1.05**
Matriculation	**Non-STEM Degree**	301	35%	10,494	1.88
	STEM Degree	111	14%	12,750	2.29
Science	**No Degree**	**455**	**65%**	**5,685**	**1.02**
Matriculation	**Non-STEM Degree**	141	26%	10,822	1.94
	STEM Degree	162	13%	14,136	2,53
Total		**57,505**	**65%**	**5,803**	**1.04**

Source: CBS, cohort born between 1970 and 1995, aged 21-46 in 2016.

2.5 Characteristics of Haredi Men Employed in the High-Tech Sector[17]

Another important decision juncture for the Haredi man is the choice of employment sector. In 2016, among the 21-46 age group, 1,873 (3.2%) out of 57,838 Haredi men were employed in the high-tech sector. Matriculation data exist for 469 out of 1,873 (25%) Haredi men in high tech employment (Table 9). Haredi men in high-tech employment who have matriculation data (469) constitute 7.7% of the employed Haredi men who have matriculation data (6,110). Haredi men in high-tech employment who do not have matriculation data (1,404) constitute only 2.7% of employed Haredi men who do not have matriculation data (51,728).

The average age of high-tech employees (31.8) is slightly higher compared to those employed in the other sectors (30.4). Their average number of children is lower (2.5 compared to 2.9 in the other sectors). They hail from smaller nuclear families (average number of siblings 4.9, compared to 6.2 in the other sectors) and their parents are slightly more educated. A quarter of the high-tech employees have matriculation data (compared to around 10% in the other sectors), around 19% of them have an academic degree (compared to 3% of employees in the other sectors).

[17] Characteristics of Haredi men employed in other sectors are available on demand.

Table 9a: Characteristics of Haredi Men Employed in the High-Tech Sector, by Track of Studies

Matriculation Type	Academic Degree Type	Observations	Distribution by Track of Studies	% in High-Tech out of Employees	Age	No. of Siblings	% with Children	No. of Children	Age of Children
No Matriculation	**No Degree**	1,239	66.2%	2.5%	31.5	5.5	75%	2.6	5.6
	Non-STEM Degree	165	8.8%	12.7%	34.1	4.7	76%	2.6	6.1
	STEM Degree								
Non-Science Matriculation	**No Degree**	207	11.1	4.2%	30.6	3.9	64%	1.9	4.2
	Non-STEM Degree	19	1.0%	6.3%	32.8	3.6	79%	2.8	5.0
	STEM Degree	47	2.5%	42.0%	32.5	3.6	72%	2.2	4.9
Science Matriculation	**No Degree**	75	4.0%	16.4%	29.7	3.3	47%	1.6	4.3
	Non-STEM Degree	17	0.9%	12.1%	33.1	3.0	59%	2.1	4.5
	STEM Degree	104	5.6%	63.8%	33.7	3.0	70%	2.5	5.4
Total		**1,873**	**100.0%**	**3.2%**	**31.8**	**4.9**	**72%**	**2.5**	**5.4**

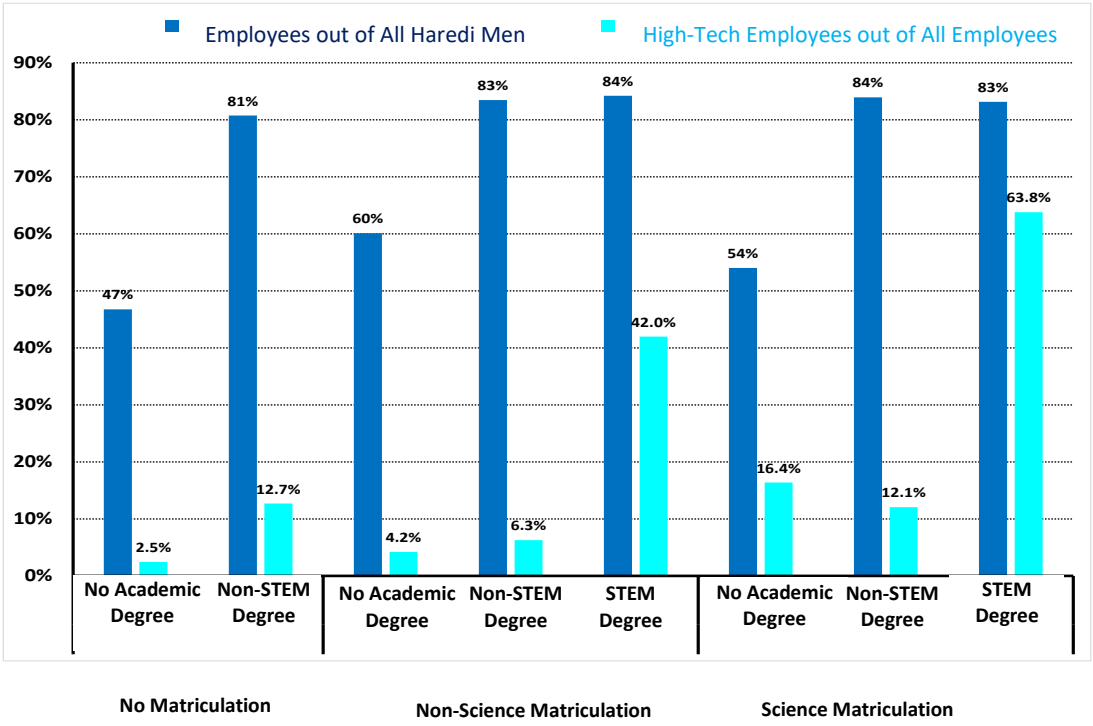
Table 9b: Characteristics of Haredi Men Employed in the High-Tech Sector, by Track of Studies (contd.)

Matriculation Type	Academic Degree Type	% in Jerusalem District	% in Tel Aviv and Central District	Mother's Years of Study	Father's Years of Study	Matriculation Eligibility
No Matriculation	**No Degree**		46%	12.6	15.5	0%
	Non-STEM Degree		45%	13.7	16.5	0%
	STEM Degree					
Non-Science Matriculation	**No Degree**		52%	11.9	12.3	27%
	Non-STEM Degree		68%	12.9	13.8	53%
	STEM Degree		43%	12.5	13.1	53%
Science Matriculation	**No Degree**		61%	12.9	13.8	83%
	Non-STEM Degree		71%	14.4	15.3	88%
	STEM Degree		57%	12.9	13.2	91%
Total		**20%**	**48%**	**12.6**	**15.0**	**53%**

Source: CBS, cohort born between 1970 and 1995, aged 21-46 in 2016.

Two thirds (around 66%) of the men in high-tech employment had studied in a track without matriculation and without an academic degree. Studies for science matriculation and an academic degree (particularly in STEM fields) increase the chances for high-tech employment and the salary in the high-tech sector. The wages of Haredi men in high-tech employment are about twice as high compared to the wages of those employed in all other sectors (Figure 6).

Figure 6: Share of Employees out of All Haredi Men, Share of High-Tech Employees out of All Employees, by Track of Studies



Source: CBS, cohort born between 1970 and 1995, aged 21-46 in 2016.

Examining employment and wages in the high-tech sector by track of studies (Table 10) reveals that:

- Around 66% (2.1% out of 3.2%) of the Haredi men in high-tech employment do not have matriculation or an academic degree. The probability of high-tech employment for Haredi men without matriculation and without an academic degree is extremely low, and stands at around 2.5%. The average salary of Haredi men without matriculation and without an academic degree who are employed in the high-tech sector is lower in comparison to other tracks of studies, and stands at around NIS 9,430. This group is the largest in terms of educational background among the entire set of Haredi men, and constitutes over 90% when divided into groups according to educational background.

- Around 11% of Haredi men in high-tech employment have non-science matriculation and do not have an academic degree (4% of Haredi men in high-tech employment had studied for science matriculation). The probability of high-tech employment for Haredi men with non-science (science) matriculation and no academic degree is 4.2% (16.4% for those who had studied for science matriculation). The average salary of Haredi men with non-science (science) matriculation and no academic degree, who are employed in the high-tech sector, is around NIS 9,898 (NIS 10,736 for those who had studied for science matriculation).
- Around 1% of Haredi men in high-tech employment have non-science matriculation and a non-STEM academic degree (1% have science matriculation). The probability of high-tech employment for Haredi men with non-science matriculation and a non-STEM academic degree is 6.3% (The probability of high-tech employment for Haredi men with science matriculation and a non-STEM academic degree is 12.1%). The average salary of Haredi men with non-science (science) matriculation and a non-STEM academic degree, who are employed in the high-tech sector, is around NIS 11,523 (NIS 14,004).
- Around 3% (6%) of Haredi men in high-tech employment have non-science (science) matriculation and a STEM academic degree (6% of Haredi men in high-tech employment have science matriculation and a STEM academic degree). The probability of high-tech employment for Haredi men with non-science matriculation and a STEM academic degree is high, and stands at 42% (for those with science matriculation, the probability increases to 64%). The average salary of Haredi men with non-science matriculation and a STEM academic degree, who are employed in the high-tech sector, is around NIS 14,730 (the salary of those with science matriculation is NIS 16,225).
- The percentage of high-tech employees by track of studies indicates that Haredi men with science matriculation and an academic degree in STEM subjects are those with the highest probability to be employed in the high-tech sector, however this group is tiny, and includes around 0.16% of Haredi men when divided according to educational background.

Table 10: Characteristics of Haredi Men – Employment and Wages in the High-Tech Sector, by Track of Studies

Matriculation Type	Academic Degree Type	Distribution by Track of Studies	Percentage out of All Employees*	Percentage of High-Tech Employees by Track of Studies	Average Net Salary	Salary in Relation to No-Matriculation No-Degree Track	Ratio Between High-Tech Salary and Salary in Other Sectors
No Matriculation	**No Degree**	**66%**	**2.1%**	**2.5%**	**9,430**	**1.00**	**1.7**
	Non-STEM Degree	9%	0.3%	12.7%	14,826	1.57	1.4
	STEM Degree						
Non-Science Matriculation	**No Degree**	**11%**	**0.4%**	**4.2%**	**9,898**	**1.05**	**1.7**
	Non-STEM Degree	1%	0.0%	6.3%	11,523	1.22	1.1
	STEM Degree	3%	0.1%	42.0%	14,730	1.56	1.3
Science Matriculation	**No Degree**	**4%**	**0.1%**	**16.4%**	**10,736**	**1.14**	**2.3**
	Non-STEM Degree	1%	0.0%	12.1%	14,004	1.49	1.3
	STEM Degree	6%	0.2%	63.8%	16,225	1.72	1.5
Total		**100%**	**3.2%**	**3.2%**	**10,581**	**1.12**	**1.9**

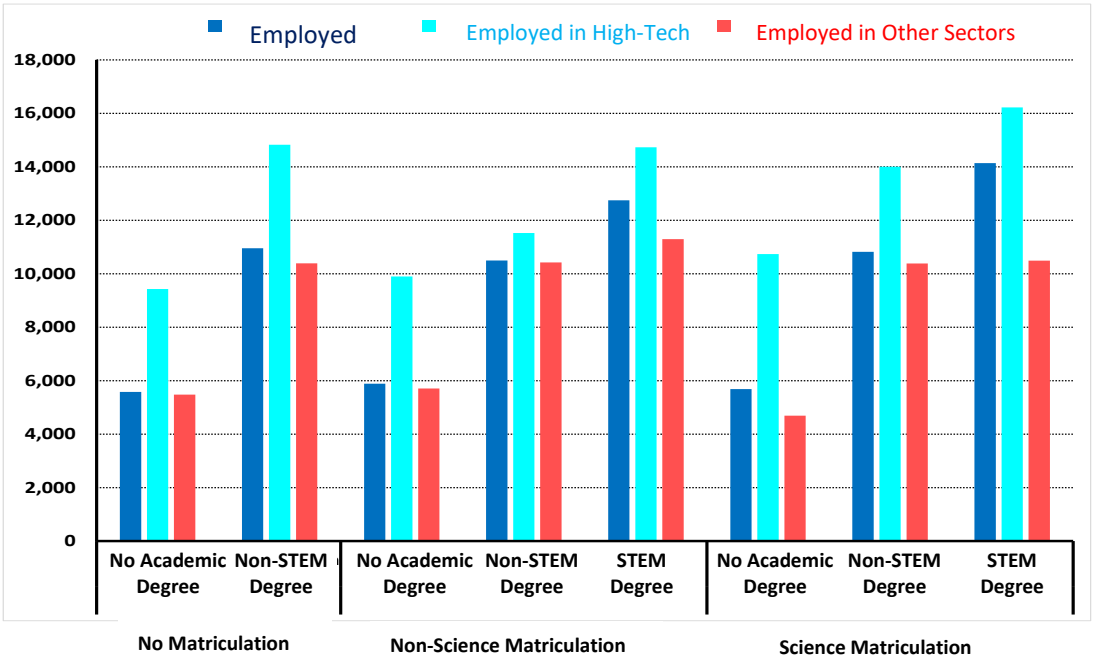
* Out of 57,838.

Source: CBS, cohort born between 1970 and 1995, aged 21-46 in 2016.

The salary of those with matriculation who do not have an academic degree is around 5%-14% higher than the salary of Haredi men in high-tech employment who have neither matriculation nor an academic degree. The salary of those with matriculation who have a non-STEM degree is 22%-57% higher, and the salary of those with matriculation and a STEM degree is 56%-72% higher (Figure 7).

The salary of Haredi men in high-tech employment is twice as high as the salary of those employed in other sectors. Wage gaps are particularly high between Haredi men with no academic degree who are employed in the high-tech sector, and those employed in other sectors. Wage gaps between high-tech employees and those employed in other sectors, among Haredi men with a non-STEM degree, range between 10% and 40%. Wage gaps between high-tech employees and those employed in other sectors, among Haredi men with a STEM degree, range between 30% and 50%.

Figure 7: Haredi Men Wages – Employed, Employed in High-Tech, and Employed in Other Sectors



Source: CBS, cohort born between 1970 and 1995, aged 21-46 in 2016.

We would note that some of the Haredi men who do not have an academic degree have undergone dedicated training courses for Haredi men. Therefore, some of the wage gaps between Haredi men without an academic degree who are employed in the high-tech sector, and those who are employed in other sectors, may be accounted for by this training. Furthermore, it should be noted that these wage gaps do not take into account important factors such as the individual's experience in the labor market, and the individual's socioeconomic background. To account for these factors, we present below the results of estimated wage regressions, which incorporate the individual's work experience and socioeconomic background.

2.6 Results of Wage Regressions

To assess the impact of the track of studies in school and academia on the individual's wages, we estimated wage regressions with explanatory variables for tracks of studies, and control variables such as experience in the labor market (and experience squared), number of children, district of residence, number of siblings, employment sector (high-tech/other). The results of the wage regressions reveal that:[18]

- The wage gap between high-tech employees and those employed in other sectors, with all other explanatory variables held constant, is around 53%.
- When controlling for experience characteristics, number of children, and other control variables, the salary of Haredi men who have neither matriculation nor an academic degree is around 6% lower than the salary of Haredi men with matriculation who do not have an academic degree. In other words, the return on matriculation among non-academics is around 6%. In the high-tech sector, the return on matriculation among non-academics is not statistically significant. It is possible that the dedicated training undertaken by Haredi men without matriculation or an academic degree reduces the wage gap in relation to those with matriculation who had not undergone dedicated training.
- There is very significant return of around 37% on a STEM-related academic degree, particularly in the high-tech sector – around 44%, and around 38% in the other sectors. The return on a non-STEM degree is also high, and stands at around 19% in the high-tech sector and around 33% in the other sectors.
- Work experience yields very significant return (around 12% in the high-tech sector, around 19% in the other sectors).
- The starting salary in the high-tech sector is around 13% higher than the starting salary in the other economic sectors.

[18] For full results, see appendix.

3. Estimated Projection of the Number of Haredi Men in High-Tech Employment for 2021-2030

Table 11 presents the distribution of the population, of those in employment, and of those in high-tech employment, by population group. As previously stated, the share of Haredi men in high-tech employment out of all high-tech employees is around 1%, which is significantly lower than the share of Haredi men in the population (around 4.2%), as well as the share of Haredi men in employment (2.8%).

Table 11: Distribution of Population, Employees, and High-Tech Employees, by Population Group, 2019

Population Group	Population	Employees	High-Tech Employees	High-Tech Employees out of All Employees
Non-Haredi Jewish Men	35.7%	40.1%	63.9%	15.6%
Non-Haredi Jewish Women	35.7%	38.3%	31.7%	8.1%
Arab Men	10.1%	9.8%	1.2%	1.2%
Arab Women	10.1%	4.8%	0.6%	1.3%
Haredi Jewish Men	4.2%	2.8%	1.0%	3.4%
Haredi Jewish Women	4.2%	4.1%	1.5%	3.6%

Source: CBS.

In this section we produce six scenarios to assess the addition of Haredi men to the high-tech sector from 2021 to 2030. Our assessment is based on the following assumptions:

1. Population group: primary working ages, 25-64.
2. The annual increase rate of the non-Haredi Jewish, Arab, and Jewish Haredi population groups, between the ages of 25 and 64, will match CBS forecasts.[19]
3. Employment rates by population group and gender, for the years 2021-2030, are derived from the targets outlined by the Employment 2030 Committee, and by 2030 will stand at: non-Haredi Jewish men – 87.7%; non-Haredi Jewish women – 84%; Arab men – 83%; Arab women – 53%; Haredi Jewish men – 70%; Haredi Jewish women – 81%.[20]

[19] Data is available on demand.

[20] The target set by the Employment 2030 Committee for Haredi men, in case the barriers which hinder their full integration in the labor market from the age of 22 are not removed, is 65%.

The CBS forecast for the size of Israeli population between the ages of 25 and 64 is around 4,799,000 people in 2030. Therefore, assuming that the employment rate between 2021 and 2030 will match the targets outlined by the Employment 2030 Committee, the number of employees in this age group will be around 3,868,000 in 2030.

We examined three scenarios for the development of the high-tech employment rate between 2021 and 2030:

- Scenario 1: The share of the high-tech sector in overall employment between 2021 and 2030 will remain stable at 10%.
- Scenario 2: The share of the high-tech sector in overall employment between 2021 and 2030 will increase moderately, and reach 12% in 2030.
- Scenario 3: The share of the high-tech sector in overall employment between 2021 and 2030 will increase substantially, and reach 15% in 2030.[21]

In the year 2030, 10% in high-tech employment out of around 3,868,000 employees would be around 386,000 people, 12% in high-tech employment would be around 464,000 people, and 15% in high-tech employment would be around 580,000 people.

In addition, we considered two scenarios for the development of the relative share of Haredi men in high-tech employment, out of all employees, between 2021 and 2030:

- Scenario A: continuing underrepresentation of Haredi men in high-tech employment – the share of Haredi men and Haredi women in high-tech employment between 2021 and 2030 will remain equal to their share out of all employees aged 25-64 today (1% among Haredi men, 1.5% among Haredi women).
- Scenario B: Matching the representation of Haredi men in high-tech employment to their share in overall employment – by 2030, the share of Haredi men and Haredi women in high-tech employment will match their share out of all employees aged 25-64 (in 2030, the share of Haredi men in employment is expected to stand at around 5%, and the share of Haredi women in employment is expected to stand at 5.7%).

Table 12 presents the estimated increase in the number of Haredi men in high-tech employment according to each scenario.

[21] Government Decision no. 212 from August 1, 2021, regarding a plan for advancing innovation, encouraging the growth of the high-tech sector, and enhancing technological and scientific mobility, set an ambitious national target of increasing the relative share of high-tech employees to 15% of all employees, within 5 years of 2021.

Table 12: Estimated Increase in the Number of Haredi Men in High-tech Employment, by Scenario

Scenario of Haredi Representation in High-Tech Employment	% of Haredi Men out of All High-Tech Employees in 2030	% of High-Tech Employees in 2030	Number of High-Tech Employees in 2030	Addition of Haredi Men in High-Tech Employment from 2021 to 2030
A. Underrepresentation – Share in High-Tech Same as in 2020	1%	10%	386,839	50-80
	1%	12%	464,206	100-170
	1%	15%	580,258	170-330
B. Share in High-Tech Matches Share out of All Salaried Workers by 2030	5%	10%	386,839	540-2,900
	5%	12%	464,206	600-3,800
	5%	15%	580,258	700-5,200

In a scenario in which the share of the high-tech sector in overall employment remains stable between 2021 and 2030, and stands at 10%, meeting the targets of the Employment 2030 Committee and maintaining the current representation of Haredi men in high-tech employment (1%) requires increasing the number of Haredi men employed in the high-tech sector between 2021 and 2030 by around 50 (in 2021) to 80 (in 2030).

In a scenario in which the share of the high-tech sector in overall employment rises significantly between 2021 and 2030, and reaches 15% in 2030, meeting the targets of the Employment 2030 Committee and maintaining the current representation of Haredi men in high-tech employment requires increasing the number of Haredi men employed in the high-tech sector between 2021 and 2030 by around 170 (in 2021) to 330 (in 2030).

In a scenario in which the share of the high-tech sector in overall employment rises significantly between 2021 and 2030, and reaches 15% in 2030, meeting the targets of the Employment 2030 Committee while generating a change in the employment of Haredi men in the high-tech sector, in order to match their representation in high-tech employment to their share in overall employment, requires increasing the number of Haredi men employed in the high-tech sector between 2021 and 2030 by around 700 (in 2021) to 5,200 (in 2030) – far beyond the current annual increase, which stands at 155 additional men per year.[22]

[22] This move involves substantial investment, which includes among other things the diagnostic and screening stage, the cost of filling in educational gaps which is estimated at around NIS 10,000 per student, the cost of the training itself which stands at around NIS 50,000 for a practical engineer and around NIS 70,000 for an academic, the cost of a personal and educational envelope, and the cost of subsistence grant for participants.

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Appendix: Wage Regressions

$$lnW = \beta_0 + \beta_1 BANS + \beta_2 BAS + \beta_3 NBNA + \beta_4 NBANS + \beta_5 exper + \beta_6 expersq + \beta_7 nyeladim + \beta_8 Jer + \beta_9 nsib + \beta_{10} HighTech + \varepsilon$$

BANS - dummy variable, takes the value 1 if the individual had studied for matriculation and has an academic degree in a non-STEM subject.

BAS - dummy variable, takes the value 1 if the individual had studied for matriculation and has an academic degree in a STEM subject.

NBNA - dummy variable, takes the value 1 if the individual had not studied for matriculation and has no academic degree.

NBANS - dummy variable, takes the value 1 if the individual had not studied for matriculation and has an academic degree in a non-STEM subject.

exper - labor market experience.

expersq - labor market experience squared.

nyeladim - number of children.

Jer - residence in the Jerusalem District.

nsib - number of siblings.

HighTech - dummy variable, takes the value 1 if the individual is employed in the high-tech sector.

_cons - equation intercept.

N - number of observations.

R^2 - goodness-of-fit index.

Table 13: Results of Estimated Wage Regressions Among Haredi Men

	(1)	(2)	(3)	(4)	(5)
Studied for Matriculation, non-STEM academic	0.744***	0.338***	0.331***	0.317***	0.317***
Studied for Matriculation, STEM academic	1.043***	0.670***	0.665***	0.379***	0.377***
Not Studied for Matriculation, Not Academic	-0.103***	-0.051***	-0.072***	-0.058***	-0.062***
Not Studied for Matriculation, non-STEM academic	0.784***	0.481***	0.464***	0.421***	0.413***
Experience		0.192***	0.190***	0.190***	0.190***
Experience Squared		-0.006***	-0.006***	-0.006***	-0.006***
Number of Children			0.012***	0.014***	0.014***
Jerusalem District					0.047***
Number of Siblings					-0.001
High-Tech				0.583***	0.583***
_cons	8.319***	7.314***	7.311***	7.285***	7.279***
N	57505	57505	57505	57505	57505
R^2	3%	20%	20%	21%	21%

The base group includes Haredi men who had studied for matriculation, do not have an academic degree, and work in sectors other than high-tech.

*** Significance level 1% or less. ** Significance level 1%-5%. * Significance level 5%-10%.

Table 14: Results of Estimated Wage Regressions Among Haredi Men Employed in the High-Tech Sector

	(1)	(2)	(3)	(4)
Studied for Matriculation, non-STEM academic	0.345*	0.219	0.195	0.186
Studied for Matriculation, STEM academic	0.586***	0.470***	0.447***	0.442***
Not Studied for Matriculation, Not Academic	**-0.123***	**-0.021**	**-0.075**	**-0.025**
Not Studied for Matriculation, non-STEM academic	0.480***	0.452***	0.417***	0.466***
Experience		0.115***	0.117***	0.118***
Experience Squared		-0.003***	-0.003***	-0.004***
Number of Children			0.050***	0.050***
Jerusalem District				-0.111**
Number of Siblings				-0.026***
_cons	9.014***	8.248***	8.196***	8.322***
N	1869	1869	1869	1869
R^2	9%	22%	24%	25%

The base group includes Haredi men who had studied for matriculation and do not have an academic degree.

*** Significance level 1% or less. ** Significance level 1%-5%. * Significance level 5%-10%.

Table 15: Results of Estimated Wage Regressions Among Haredi Men Employed in Other Sectors

	(1)	(2)	(3)	(4)
Studied for Matriculation, non-STEM academic	0.756***	0.337***	0.330***	0.330***
Studied for Matriculation, STEM academic	0.792***	0.394***	0.389***	0.388***
Not Studied for Matriculation, Not Academic	**-0.081*** **	**-0.038** **	**-0.059*** **	**-0.065*** **
Not Studied for Matriculation, non-STEM academic	0.765***	0.441***	0.422***	0.412***
Experience		0.193***	0.191***	0.192***
Experience Squared		-0.006***	-0.006***	-0.006***
Number of Children			0.013***	0.013***
Jerusalem District				0.052***
Number of Siblings				0.000
_cons	8,280***	7.282***	7.280***	7.268***
N	55636	55636	55636	55636
R^2	2%	20%	20%	20%

The base group includes Haredi men who had studied for matriculation and do not have an academic degree.

*** Significance level 1% or less. ** Significance level 1%-5%. * Significance level 5%-10%.