

The Labor Market in Israel: An Overview

Michael Debowy, Gil S. Epstein, and Avi Weiss

Introduction

The COVID-19 pandemic and the economic crisis that accompanied it had a dramatic effect on the labor market in Israel and led to extreme and rapid changes in the levels of employment and unemployment and in wages. Following the major shocks in 2020 — the year of unpaid leave and lockdowns — the process of recovery gained momentum in the second half of 2021 and essentially was completed during 2022. During the first half of 2022, the level of employment returned to its 2019 level and the narrow rate of unemployment dropped to below its pre-pandemic level. Towards the end of the summer, there was somewhat of an increase in both the broad and narrow rates of unemployment, and since then the former has been within a range of less than one percentage point above its end-of-2019 level and the latter has been within a range of less than one-half of a percentage point.

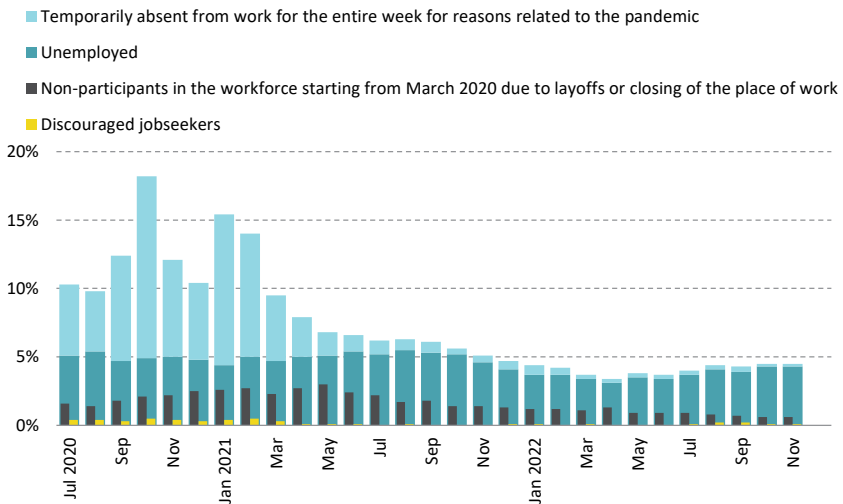
In this paper, we will survey the developments in the labor market and discuss them in the context of past and future forecasts. We will examine the level of employment and work hours in the various industries, as well as wages. We will describe the variation in employment according to gender, sector, age, and region and the changes that have occurred in higher education and vocational training in recent years. Finally, we will discuss the forecasts of the Israeli labor market's future.

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Unemployment, employment, and wages

Figure 1 presents unemployment and its composition during the past two years. The definition of unemployment was expanded during the pandemic so as to include workers on unpaid leave (or those who were absent from work for some other reason related to the pandemic) and individuals who left the workforce as a result of the pandemic. The unemployment that was incurred by these two groups in 2020 and the first half of 2021 was in addition to the already significant increase in the rate of unemployment according to its narrow definition (jobseekers out of all workers and jobseekers) during this period; however, during all of 2022 the contribution of these two groups was less than 2% (1.2% in July 2022).

Figure 1. Rate of unemployment



Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

The rate of unemployment according to its narrow definition also fell significantly between 2021 and 2022, reaching less than 3.5% in the spring of 2022 before rising again in the summer and autumn (4.3% in October 2022). Even if we include workers who were absent from work because of the pandemic, the rate of unemployment during the first half of 2022 was lower than its historically low point in 2019, and during the second half of the

year it did not exceed its end-of-2019 level by more than half a percentage point. According to this simple measure, Israeli employment reached one of its historically best levels in 2022, and it remained there at the end of the year.

Figure 2a. The average wage
NIS, current prices

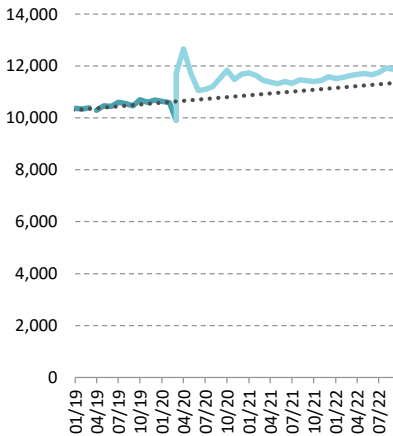
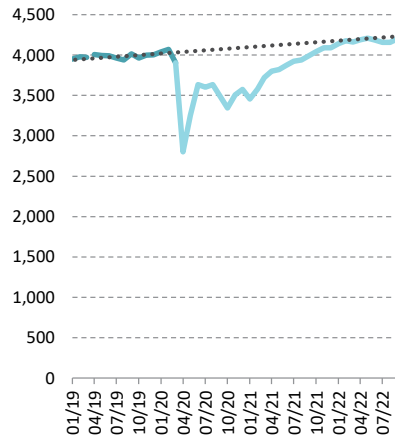


Figure 2b. Total jobs
Thousands



Notes: The dark blue line continues until March 2020 and is the basis for the calculation of the trend line presented for the entire period (based on monthly seasonally adjusted data starting from January 2017).
Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

The ups and downs in employment during the past two years were paralleled by movements in wages. Figures 2a and 2b present the average monthly wage and the number of jobs in the economy from the beginning of 2019 through September 2022. The dotted lines represent the long-term trend, which is based on pre-pandemic data. The drop in the rate of employment with the onset of the pandemic was accompanied by a rise in the average wage, since the jobs that remained paid higher wages, on average, than the jobs that were lost. During the second half of 2021, the number of jobs began to return to their pre-pandemic level and the average wage fell in parallel. Although the rate of increase in number of jobs returned to the pre-pandemic level by the beginning of 2022, the average wage remained higher (in real terms) than its expected value and remained higher by about 1% as of September 2022.

It can be assumed that this situation reflects the difficulty in hiring workers during the recovery period and the wage increase that employers had to pay in order to persuade workers to return to work, an issue that has been widely discussed in public discourse (Arlosoroff, 2022; Lavi, 2021; Tash, 2021).

Employment and wages by industry

As described in our previous survey, the effect of the pandemic varied across industries (Debowy et al., 2021a). In addition to the variation in the intensity of demand shocks by industry and in the restrictions on production activities in different industries, other background factors, such as technological innovation and volatility in international trade, continued to have an effect. Table 1 presents the change in the number of jobs by industry up to September 2022 relative to the annual average or the same quarter in 2019 (the data include workers on unpaid leave). In 2020–2021, the number of jobs was significantly less than in 2019 in almost all industries (although in 2021 there was an improvement in all industries relative to 2020) and in 2022 the number of jobs recovered to its previous level in most of them. However, employment in several industries remained at a lower level than in 2019.

The industries in which the number of jobs was at a lower level than prior to the pandemic include: agriculture (where the monthly number of jobs during the first nine months of 2022 was lower by 1,200 on average than during the same period in 2019); mining and quarrying (400 fewer jobs); transportation and warehousing (1,400); hospitality and food services (12,100); art and entertainment (4,600); and management and support services, which lost more than 33,000 jobs during the two-year period.

The number of jobs increased in the rest of the industries and some of them experienced a particularly large increase. Jobs in the health and welfare industry grew by about 26% and during the three first quarters of 2019 it accounted for 112,000 of the 190,000 new jobs in the economy. About 44,700 new jobs were added in the information and communication industry and 60,000 in the *high tech* industry (a substitute definition that partially overlaps with some of the other industries). Almost 19,000 new jobs were added in the education industry and a similar number in the professional, scientific and technical service industry. The construction industry also recovered from the severe effect the pandemic had on it, and it saw an addition of about 17,800 jobs. It is possible that this last figure is directly related to the recovery in employment among Arab men, as will be described.

Table 1. Rate of change in number of jobs (including workers on unpaid leave) in 2020–2022 relative to the same period in 2019, by industry

	Average 2020	Average 2021	Q1 2022	Q2 2022	Q3 2022
Overall economy	-10%	-3%	5%	5%	4%
Agriculture, forestry, fishing	-5%	-4%	-1%	-2%	-4%
Mining, quarrying	-10%	-11%	-8%	-7%	-9%
Manufacturing	-6%	-3%	1%	1%	1%
Electricity, water supply, waste management	1%	3%	3%	4%	4%
Construction	-9%	-4%	8%	8%	7%
Wholesale trade, vehicle repair	-13%	-6%	2%	2%	2%
Transportation, warehousing, postal, courier services	-15%	-8%	-1%	-1%	-2%
Accommodation, restaurant services	-40%	-23%	-2%	-6%	-8%
Information, communication services	-1%	9%	23%	23%	22%
Financial, insurance services	-6%	-5%	0%	1%	1%
Real estate activities	-10%	-3%	7%	8%	6%
Professional, science, technical services	-8%	-1%	8%	8%	7%
Management, support services	-22%	-17%	-11%	-10%	-11%
Local, public, security administration	-1%	1%	2%	1%	1%
Education	-4%	-1%	4%	4%	3%
Health, welfare, social services	6%	17%	26%	26%	25%
Arts, recreation, entertainment	-36%	-24%	-6%	-7%	-9%
Other services	-17%	-10%	2%	3%	4%
High tech	0.2%	8%	18%	19%	19%

Notes: High tech includes a number of subindustries that belong to several different industries: manufacturing, information and communication, and professional, scientific and technical services. Therefore, these jobs partially overlap those presented in the aforementioned industries.

Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

Due to the reduction in work hours among workers who remained employed, which was observed in almost every industry, the drop in employment during the pandemic was even larger than the drop in the number of jobs. Table 2 presents the change in the number of weekly work hours per worker during the past three years by industry relative to 2019. In 2022, the comparison is to the parallel quarter in 2019. It can be seen that the decline was across the board, affecting almost every industry. It moderated in 2021 but lingered in several industries, particularly in the transportation, warehousing, postal and courier

services industry. However, in 2022 the number of work hours grew in most industries, including in the aforementioned industry, such that average work hours per worker remained within a few percentage points of its level during the first half of 2019 and was even higher than in the third quarter of 2019.

Table 2. The rate of change in average weekly work hours per worker in 2020–2022 relative to the same period in 2019, by industry

	Average 2020	Average 2021	Q1 2022	Q2 2022	Q3 2022
Overall economy	3%	1%	-1%	3%	-1%
Agriculture, forestry, fishing	-2%	-1%	0%	3%	-1%
Mining, quarrying	-1%	5%	3%	-2%	1%
Manufacturing	0%	-1%	-7%	6%	-2%
Electricity, water supply, waste management	-6%	-1%	1%	1%	-2%
Construction	-10%	-3%	-1%	-1%	-2%
Wholesale trade, vehicle repair	-13%	-3%	-2%	-3%	-1%
Transportation, warehousing, postal, courier services	-30%	-13%	0%	-4%	-3%
Accommodation, restaurant services	1%	2%	1%	3%	2%
Information, communication services	0%	2%	1%	5%	4%
Financial, insurance services	-12%	-3%	2%	-5%	3%
Real estate activities	-6%	-1%	-1%	3%	1%
Professional, science, technical services	-14%	-6%	-6%	-3%	2%
Management, support services	0%	0%	0%	1%	1%
Local, public, security administration	-6%	0%	-1%	-1%	2%
Education	-5%	1%	-3%	3%	3%
Health, welfare, social services	-28%	-7%	2%	-1%	3%
Arts, recreation, entertainment	-19%	-7%	-3%	-6%	5%
Other services	4%	12%	14%	5%	9%

Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

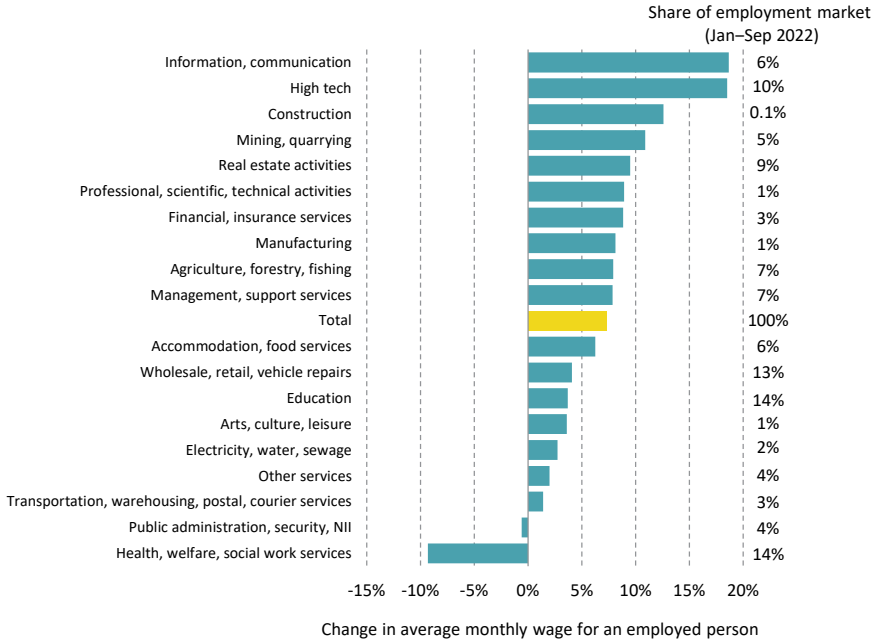
In parallel with the change in employment in the various industries, there were also far-reaching changes in wages during the pandemic and the recovery period. Figure 3 presents the change in the monthly average wage between the first three quarters of 2019 and the same quarters in 2022 by industry.¹ At the end of each bar, is the share of each industry out of total employment during the first three quarters of 2022. Particularly noticeable is the drop of about 9% in the average wage in the health and welfare industry. As mentioned above, there was a meteoric rise in the number of jobs in this industry during the pandemic and many of those workers were low-paid (such as workers administering the COVID-19 testing). It appears that the growth in the number of workers led to a drop in the industry's average wage. There was also a particularly large increase in the average wage (9%–11%) in the manufacturing and construction industries; in the information and communication industry and in the high tech industry (18%–19%); in agriculture (9%); in finance and insurance (9%); and in mining and quarrying (13%).

It is worth focusing on the high tech industry (i.e., the information and communication industry, which largely overlaps with high tech) in view of its large share of employment (about 10%), the large increase in the industry's average wage (which was already high before the pandemic), and the entry of workers from a variety of sectors of the population during the past decade (Cohen Kovatch, 2022). The aforementioned factors had a major impact on the trend of wages in the economy as a whole. According to the industry classification of the CBS, high tech is comprised of a number of subindustries that belong to several different industries and therefore it overlaps them to some extent.²

1 The CBS does not publish data on work hours in the high tech industry.

2 The high tech industry is composed of the following subindustries: pharmaceuticals production, production of computers and electronic and optical equipment and production of transportation and transport vehicles (which are part of manufacturing); communication services, information and software services and computer consulting (which are part of information and communication); and research and development (which is part of professional, scientific and technical activity).

Figure 3. The rate of change in the average monthly wage between 2019 and 2022, by industry



Notes: High tech includes a number of subindustries that belong to several different industries — manufacturing, information and communication and professional, scientific and technical services. Therefore, these jobs partially overlap those presented in the aforementioned industries. The length of the bar represents the change in wages (in percent) between the first three quarters of 2019 and the same quarters in 2022. The value presented at the end of the bar represents the share of the industry in total employment during the first three quarters of 2022.

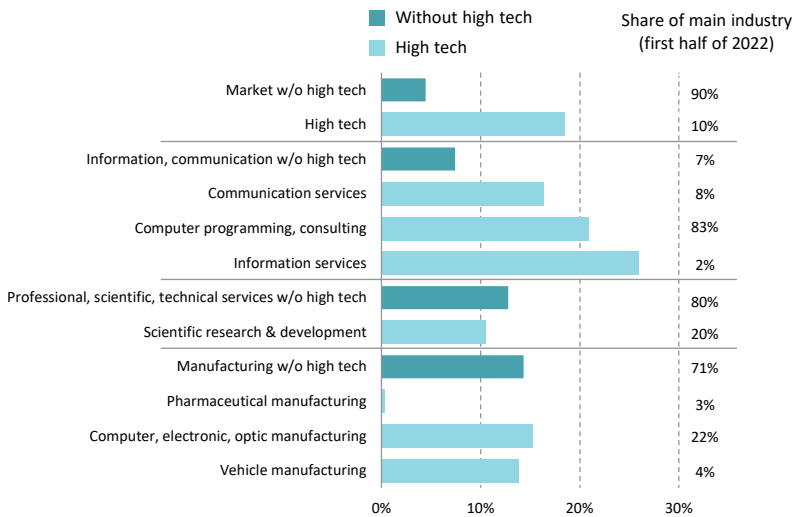
Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

In a comparison of high tech and non-high tech subindustries within a particular industry, an interesting picture emerges. Figure 4 presents the rate of change in the average monthly wage per worker in selected industries between 2019 and 2022. For each industry, the graph presents the rate of change in the various high tech and non-high tech subindustries in that industry, alongside the relative weight of each group in that industry.

First, an overview of the economy as a whole shows that after subtracting out the increase in wages in high tech — which totaled about 18% during the period — the increase in the average wage in the economy was much more

moderate. The average wage outside of high tech grew by 4% (as opposed to about 7% in all of the industries including high tech). Second, in the information and communication industry, the majority of which is high tech (93%) and primarily software and computer consulting (83%), wages in the high tech subindustries grew by two- to three-fold more than in the non-high tech subindustries. Also, in professional and scientific activity, wages grew faster in the high tech subindustries than in the rest of the industry (13% vs 10%). The situation was different in manufacturing: the rise in wages in the three high tech subindustries was only about 13.6% on average in contrast to 14.3% in the rest of the industry. This industry is the only one in which the rate of increase in wages in some of its high tech subindustries was more moderate than in the non-high tech subindustries.

Figure 4. The rate of change in wages in the high tech subindustries in contrast to the non-high tech subindustries, 2019–2022, selected industries



Notes: The length of the bars represents the change in wages (in percent) between the first three quarters of 2019 and the same quarters in 2022. The percentage appearing at the end of the bar represents the share of the industry within total employment during the first three quarters of 2022.

Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

SPOTLIGHT

The Relationship Between Wages in High Tech and Wages in Other Industries

Since the high tech industries are directly responsible for a significant part of the increase in aggregate wages and since in some cases the increase in high tech wages was greater than in the rest of the industries, the question arises as to whether an increase in high tech wages contributes indirectly to increasing wages in other industries since it leads to increased competition among employers for workers outside their industry. Indeed, the claim is sometimes made in public discourse that non-high tech employers are forced to raise wages in order to prevent the *flight to high tech* (Fisher, 2022; Greenzweig, 2021). Economic theory predicts that in the short term the initiative will be that of the industry with the highest marginal productivity of labor, although in the long term the competition over workers will be mutual between businesses or industries (on the assumption that the workers have skills that are suited to the different industries or that there is sufficient time to acquire them). This claim is therefore expected to have validity only in the short term (and perhaps not even in the short term) while in the longer term both the high tech industry and its competitors will react to each other's wage increases.

Although the wage data we possess does not make it possible to confirm or refute the claim, they do make it possible to gather *circumstantial evidence* regarding the connection between wages in high tech and wages in other industries. Our empirical investigation made use of the Granger test (Granger, 1969)

to examine the hypothesis that the behavior of high tech wages in the past does not improve the accuracy of wage forecasts in other industries after taking into account the past behavior of wages in those industries. In other words, we checked whether wages in high tech or its trend contain information on future wages in other industries. This test, which we carried out on the basis of monthly wage data from January 2017 to July 2022, used a multivariate model to estimate the mutual relations between time series data for wages and additional factors such as long-term trend, seasonality and lockdowns.³ The statistical significance of the results, along with other statistics for the model, are presented in Appendix Table 1a.

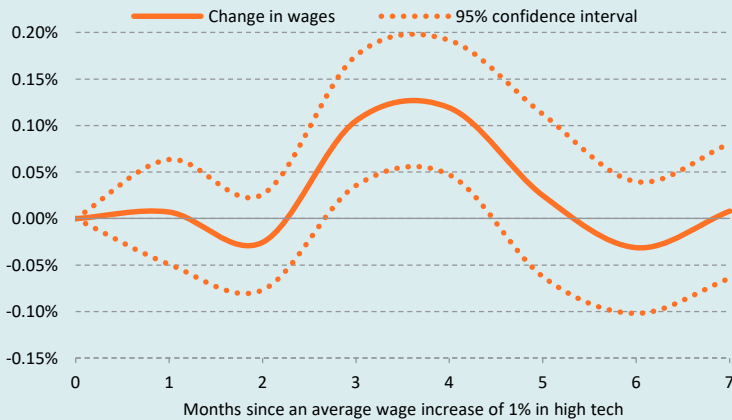
We found that in the short term (up to three months), the wage level in high tech or its monthly rate of change predicts the level of wages and their monthly rates of change in the rest of the economy, while wages in the rest of the economy do not predict wages in high tech. In the intermediate term (six months), the effect is for the most part mutual, although the effect of high tech on the rest of the economy is more statistically significant, while in the long term (nine months), the effect is totally mutual. These findings are consistent with the claim that wage increases in high tech lead to increases in other industries and also with the theoretical prediction that in the long term it is also expected that other industries will have an effect on high tech.

With respect to the duration of the effect and its intensity, most of the estimations predicted that an increase of 1% in the average wage in high tech will lead to an increase of 0.11%–0.12% in the average wage in other industries after three to four months. Figure 5 presents the impulse response function. The vertical axis represents the response of the

3 The results of the Augmented Dicky-Fuller tests for stationarity of the wage time series are presented in Appendix Table 1b.

average wage in the rest of the economy to an increase of 1% in the average wage in high tech while the horizontal axis represents the number of months since that increase. The graph shows that the confidence interval includes zero at every point except for the third and fourth months. In other words, the possibility that there is no response before 3–4 months have passed and that subsequently the response dies out completely cannot be ruled out. In contrast, in the range of 3–4 months the response is estimated to be at least 0.05% and no more than 0.19% (0.11%–0.12%, on average, as mentioned above).

Figure 5. The response of the average wage in non-high tech subindustries to an increase of 1% in the average wage in the high tech subindustries



Note: The graph presents the impulse response of the average wage in the rest of the economy to the average wage in high tech, based on the model that explains the connection between the two with nine lags (presented in Appendix Table 1a).

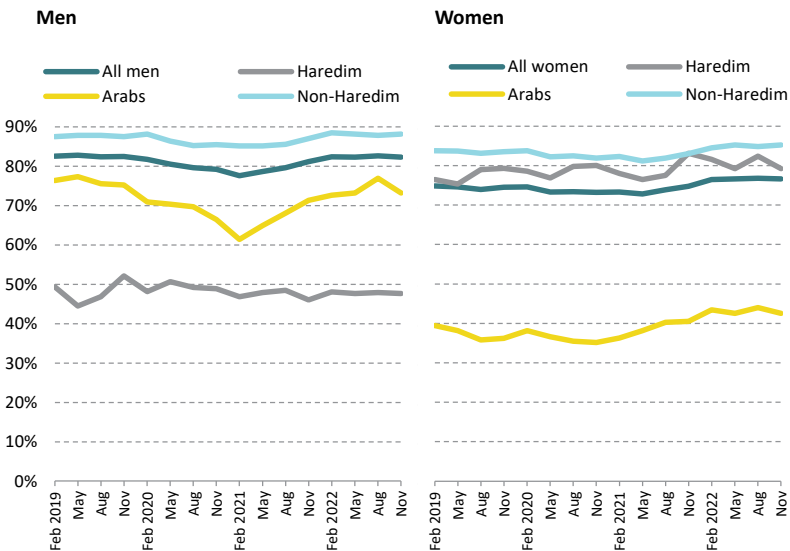
Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

This oversimplified analysis has several drawbacks. First, the average wage data conceal a much more complex picture of the variation in wage levels among workers with differing skill levels and different positions in the hierarchy. Second, the omission of the self-employed is liable to bias the actual average wage estimator. And third, it may be that the official definition of the *high tech industry* is overly narrow, such that it does not include firms that everyone would agree should be classified as *high tech*, or overly wide, including firms that many would not classify as *high tech*. Nonetheless, our investigation uncovered an interesting pattern that is in line with the conventional wisdom expressed in public discourse and with economic theory. Furthermore, the results seem to imply that the growing high tech industry — the Israeli economy's *growth engine* — is indeed pushing wages up in other industries as well.

Employment and wages by sector

Figure 6 presents recent rates of employment for men and women aged 25–64 in various sectors of the population. The rate of employment among Jewish non-Haredi (non-ultra-Orthodox) men, which fell by about 3–4 percentage points during the pandemic, returned to pre-pandemic levels already at the beginning of 2022. The fall in the rate of employment among Arab men, which began already in 2019 and intensified during the pandemic, was halted in the summer of 2021 and has shown a consistent recovery since then. The employment of Haredi men remained somewhat lower than prior to the crisis (by about 4 percentage points).

Figure 6. Rates of employment among the 25–64 age group, by sector



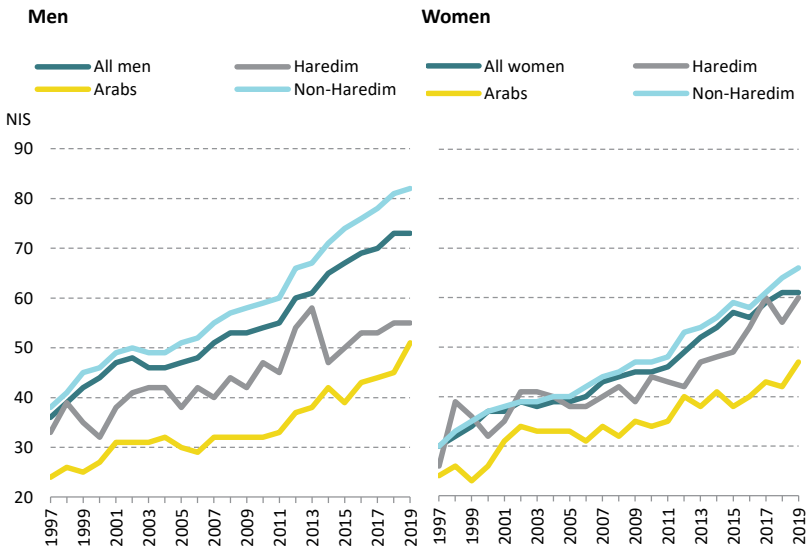
Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

The rate of employment among Jewish non-Haredi women, whose decline in employment during the pandemic was similar to that among men in the same sector, also returned to its pre-pandemic level by the beginning of 2022 and even surpassed it during the year. At the same time, the rate of employment

among Haredi women continued to rise and temporarily caught up to that of Jewish non-Haredi women in the third quarter of 2021. Among Arab women also, the employment situation returned to its previous level by the beginning of 2022 and since then has even surpassed it by several percentage points.

In general, while the rate of employment among men during the summer of 2022 was equal to its level in the summer of 2019 (82%), among women there was an increase of about 2 percentage points (77% vs 75%). Moreover, among women in all sectors of the population, the rate of employment returned to its previous level and even surpassed it relative to the end of the previous decade, and among Arab men the rate of employment returned to its previous level. In contrast, among Haredi men the rate of employment has still not returned to its previous level.

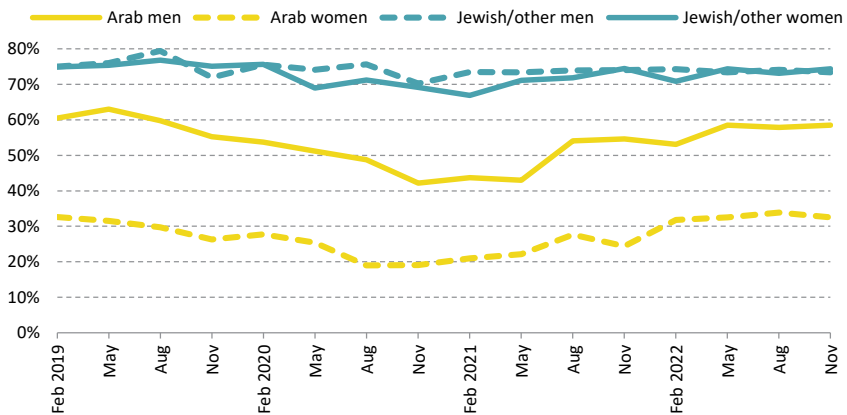
Figure 7. The hourly wage in the 25–64 age group, by sector



Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

The growth in the employment of women appears to be a natural continuation of the trend in recent decades. It was also accompanied by a significant increase in women's wages, with the increase being close to or equal to that of men (in relative terms) in every sector of the population. For example, between 1999 and 2019 the average hourly wage of Arab men rose by 103% while that of Arab women rose by 100%, in contrast to 83% among non-Haredi men and 90% among non-Haredi women and 65% among Haredi women and 57% among Haredi men (Figure 7). It is worth mentioning that this impressive increase in wages was accompanied by somewhat of a narrowing in the hourly wage gap between Jewish and Arab women (the hourly wage gap between Jewish non-Haredi women and Haredi women was never large or consistent); however, the monthly wage gap in fact widened (Appendix Figure 1). The wage gaps grew between non-Haredi Jewish men on the one hand and Arab and Haredi men on the other.

Figure 8. Rates of employment among the 20–24 age group, by gender and sector

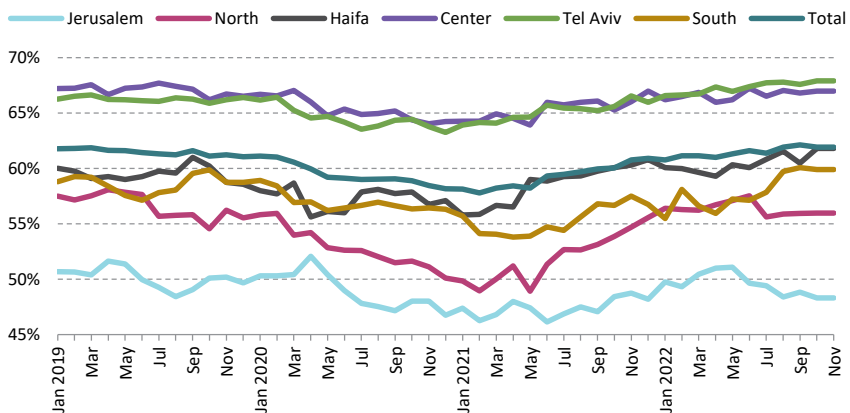


Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

The effect of the pandemic and the recovery was even more evident in employment among the young. Figure 8 presents the rate of employment among men and women in the 20–24 age group by sector and gender. It can be seen that employment in this age group, which tends to be several percentage points lower than among older adults, suffered most from the

pandemic. This is a reasonable finding given the demographic profile of workers in the industries most disrupted by the pandemic. Among young Arab men and women, for example, the rate of employment dropped by 24% and 27%, respectively, between the first quarter of 2019 and the last quarter of 2020, in contrast to declines of 12% and 3% among Arab men and Arab women, respectively, in the 25–64 age group. Nonetheless, even among this population there was a significant recovery during 2021–2022. Since the spring of 2022 the employment of young Jewish men and women has been at its pre-pandemic level and among young Arab men and women it even surpassed its pre-pandemic level. Young Arab women have even returned to their rate of employment at the beginning of 2019, prior to the trend of non-employment among the young in this sector of the population, while young Arab men have approached this level but have not yet fully returned to it.

Figure 9. The rate of employment among the 15+ age group, by region



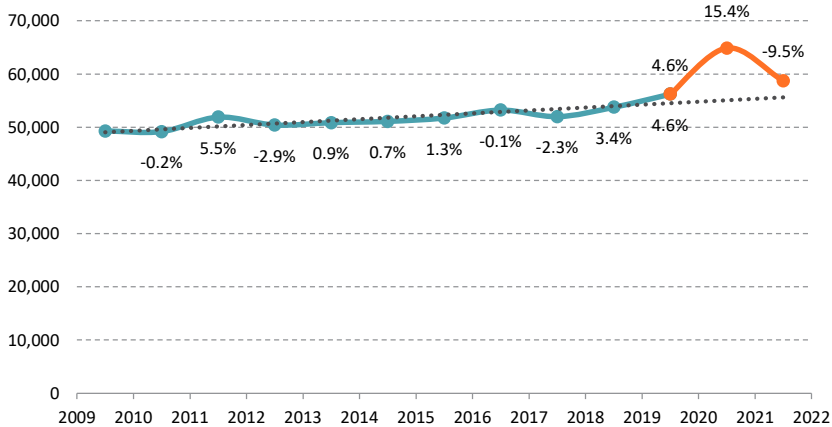
Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

The recovery of employment since mid-2021 has been consistent also by region. Figure 9 presents the rate of employment among the 15 and over age group by region. In all regions, there was a return to the average rate of employment in 2019 by the beginning of 2022. In the regions of Jerusalem, the South and the North, in which there were declines of 10% or more in rates of employment during the pandemic, employment has recovered to the

greatest extent. However, employment in those regions remains lower than in the Center and Tel Aviv regions, as it was prior to the crisis.

Higher education

The pandemic and the lockdowns led to a sharp increase in new students during the 2020/2021 academic year, primarily among the age groups whose employment and leisure possibilities were particularly limited by the pandemic, such as younger individuals who were unable to travel abroad or work in various service sectors. An important question in this context is what percentage of those new students had intended to study in any case and simply started earlier and what percentage would not have acquired an academic education if not for the pandemic and the unique circumstances it created. The larger the former group, the greater will be the expected decline in the number of new students in the years following the pandemic, since individuals who intended to study in any case will have already entered the system. In the 2021/2022 academic year, the number of new undergraduate students dropped by 9.5% compared to 2020/2021. Though a significant decline, it is modest relative to the increase in 2020/2021 (Figure 10), so the number of new students in this year was still above the expectations given the long-term trends. It seems likely, therefore, that many of the new students in 2020/2021 would not have acquired a higher education had it not been for the pandemic and they entered the system only because of the restrictions imposed in response to the pandemic. It would be interesting to more closely examine this one-time shock and its implications for the individuals involved and for the economy as a whole in coming years.

Figure 10. Number of new undergraduate students and the rate of change

Notes: The height of the line represents the number of undergraduate students in Israel and the number above or under it is the rate of increase (in percent) relative to the previous academic year. The straight dotted line represents the long-term trend and is based on the period from the 2009/2010 academic year to the 2019/2020 academic year alone.

Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS

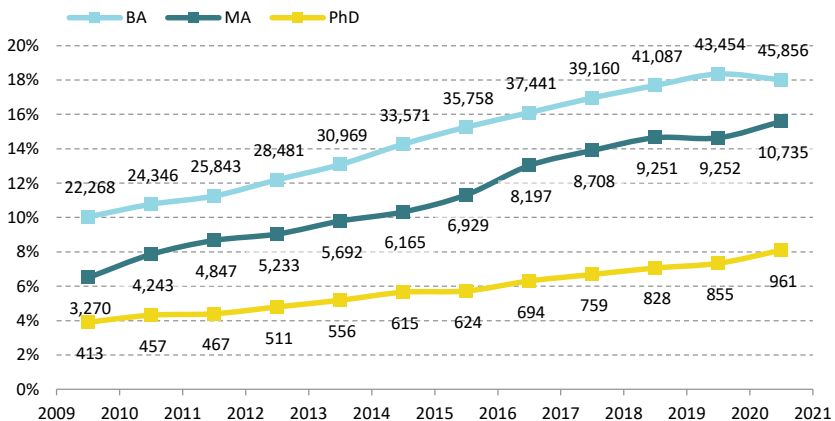
The number of degrees awarded continued to grow, particularly bachelor's and master's degrees. Table 3 presents the number of degree recipients in Israel during the past three decades. During the 1990s and the 2000s, there was a significant increase, thanks to, among other things, the *college revolution*. During the past decade, the rate of growth has slowed, though there remains an upward trend in the number of degree recipients for each type of degree. From 1999/2000 until 2020/2021, the number of bachelor's degree recipients grew by about 21%, the number of master's degree recipients grew by about 68%, and the number of doctoral degree recipients grew by 7%. However, it should be recalled that the population also grew by approximately 50% during this period.

Table 3. Number of degree recipients

Academic year	BA	MA	PhD
1989/1990	11,528	2,790	450
1999/2000	29,322	7,528	800
2009/2010	42,934	15,649	1,534
2019/2020	50,395	24,022	1,811
2020/2021	52,157	26,289	1,640

Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS, 2022

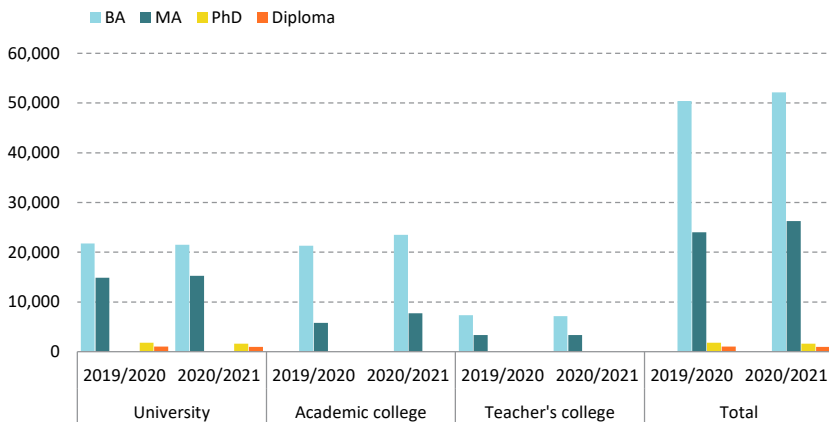
The expansion of higher education was even more evident in the growing proportions of Arab students. Figure 11 presents the proportion of Arab students studying for the various degrees (and their absolute number) during the past decade. From 2009/2010 until 2020/2021, the number of Arab undergraduate students more than doubled and their proportion from all undergraduate students grew from 10% to 18%, a few percentage points less the share of the Arab sector within the total population. The share of students studying toward advanced degrees grew even more (relatively): the proportion of Arab graduate students among all graduate students rose during the decade from less than 7% to about 16% and the share of Arab doctoral students doubled from 4% to 8%.

Figure 11. The proportion of Arab students in higher education, by type of degree

Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: The Council for Higher Education

An interesting picture is revealed if we focus on the institutions granting these degrees, especially recently. Figure 12 presents the number of degrees awarded during the 2019/2020 and 2020/2021 academic years. The largest increase occurred among the academic colleges, which, for the first time, awarded more bachelor's degrees than the universities in 2020/2021. In that year, the academic colleges awarded almost 2,000 more master's degrees than in 2019/2020, an increase of more than 33%. While in 2019, the academic colleges awarded less than 40% of the number of master's degrees awarded by the universities, in 2020 they awarded more than 50%.

Figure 12. Number of degree recipients in the 2019/2020 and 2020/2021 academic years, by degree



Note: PhD's and academic certificates (such as a certificate in teaching, translation, musicology, or editing, which are contingent on completion of undergraduate studies) were awarded only by the universities, not including the Open University.

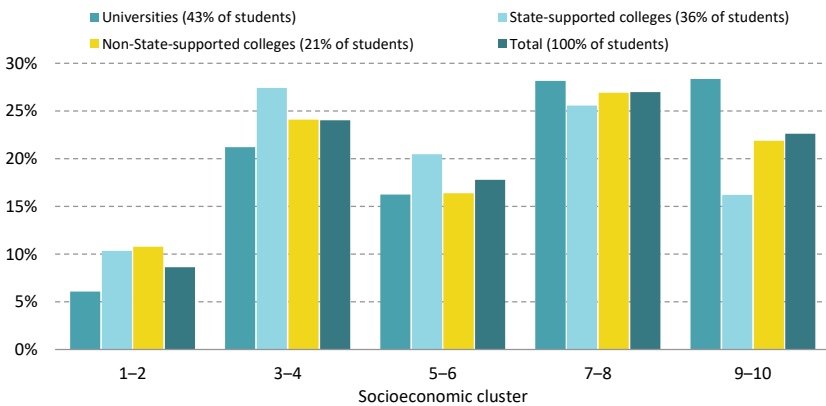
Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: CBS, 2022

The spectacular growth in the number of master's degree recipients is also in line with the long-term growth mentioned above (68% in 21 years). Figure 12 shows that this trend is maintained also in the short term and that only master's degrees were awarded in larger numbers by universities in 2020/2021 than in 2019/2020. It is worth mentioning that a master's degree involves the shortest period of studies, usually two years and sometimes even one, and therefore it may be that among those who earned a master's degree in 2020/2021 were

those who started their studies in that year as part of the surge in registration as a result of the pandemic and lockdowns.

The lead taken by colleges in awarding degrees is particularly encouraging when one considers the population of students that they serve. In the past five years of growth in the activity of the colleges the number of students from cities with a low socioeconomic ranking (1–4) grew by about 14,000. This represents a majority of the increase in undergraduate students, which stood at about 21,000 (Council for Higher Education, 2022). Figure 13 presents the breakdown of undergraduate students during the 2020/2021 academic year by socioeconomic status and type of institution. The colleges, and in particular the budgeted colleges, recorded a higher proportion of students from the lower half of the distribution. Furthermore, the proportion of students from cities with a socioeconomic ranking of 1–4 in the budgeted colleges stood at 35%, which is similar to the proportion of the total population living in those cities. On the other hand, the proportion of students with a high socioeconomic status (ranking of 7–10) in the universities is larger than in the colleges. However, it is worth mentioning that the differences between the colleges and the universities in the proportion of students from the various socioeconomic strata are usually not more than a few percentage points.

Figure 13. The distribution of undergraduate students in the institutions of higher education by socioeconomic status, 2020/2021 academic year



Note: The data do not include the Open University and the teachers' colleges, which are not budgeted by the Planning and Budgeting Committee. The percentage of students in each institution (appearing in the legend) includes students without a socioeconomic ranking (the percentages represented by the columns are in relation to total students with a socioeconomic ranking who account for about 90% of the students in all the types of institutions).

Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: The Council for Higher Education

Vocational training

Despite the surge in demand for assistance by the unemployed in placement and vocational training during the pandemic and the lockdowns, the Employment Service found it difficult to provide the assistance and tools in real time due to the social distancing restrictions. The number of participants in vocational training and skill-building programs run by the Employment Service in 2020 was 35% less than in 2019.

On the other hand, during the recovery from the pandemic in 2021, the number of participants grew in almost all of the Employment Service programs relative to 2019 (Table 4). There was a sharp increase of 91% (about 50,000 additional participants) in guidance, workshops and infrastructure programs relative to 2019. The largest increases were in the IAM diagnostic programs and in employment counseling (69% and 50%, respectively) and they were described by the Employment Service as a *paradigmatic change* (Israeli Employment Service, 2022). There was also a significant increase (32% or about 6,200 additional participants) in vocational training programs and skill-building programs (whose activity contracted in 2020) relative to 2019. Within this group of programs, there was a particularly large increase in use of vouchers for vocational training with employers (86%) and in the number of participants in vocational Hebrew courses (68%) and *The Right Training* program (61%), alongside a high level of interest in new programs, such as vocational English.

It appears, therefore, that during 2021 the placement and vocational training programs returned to their previous level of activity and new programs that are suited to the challenges of the current labor market were opened. The impressive growth in the number of participants in the various programs is evidence that Israelis are taking advantage of the options to improve their human capital also when the labor market is in a period of recovery. It is possible that these programs contributed to the increase in employment and in wages during 2021 and 2022.

Table 4. Rate of change in number of participants in Employment Service vocational training programs between 2019 and 2021

Program/year	2019	2020	2021	Change 2019/2021
Employment Plus (rehabilitation)	712	0	450	-58%
Employment training in the department			437	
Career Incubator 40+	7,158	3,591	7,147	-0.2%
Employment Circles	15,881	32,312	27,427	42%
Employment consultation	25,400	53	50,453	50%
IAM - Diagnostic tool	5,933	4,914	19,368	69%
Total: aid, consultation, workshops, programs	55,084	40,870	105,282	48%
<hr/>				
Joint programs with outside agencies			2,163	
Personalized training	55	9	142	61%
Hebrew for on-the-job	516	197	1,600	68%
UP- joint initiative		2,000	2,394	
English for on-the-job			2,397	
Vouchers to employers	419	0	2,981	86%
Professional training vouchers	2,540	2,597	3,055	17%
Courses in professional training division	3,680	2,418	4,443	17%
Other programs	5,737	1,249		
Total: professional training and programs for skills strengthening	12,947	8,470	19,175	32%
<hr/>				
Grand total	68,031	49,340	124,457	45%

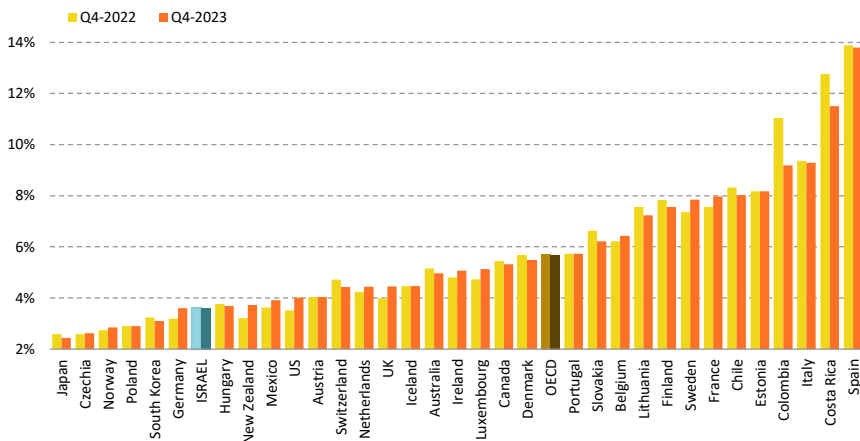
Source: Michael Debowy, Gil Epstein, and Avi Weiss | Data: Employment Service

Forecasts

In 2019, the rate of unemployment in Israel stood at about 3.8%. In April 2020, it reached a peak of 36% according to its broad definition, and in August 2021 it reached a peak of 5.5% according to its traditional definition. By July 2022, a decline had begun in unemployment according to both definitions: the broad rate of unemployment dropped to 4.6% while according to its traditional definition it dropped to 3.4%. In view of these figures, two important questions arise: the first is whether the economy has recovered from the pandemic and has reached full employment and the second and more important question is whether the labor market will tighten even further in the future or will the rate of unemployment perhaps rise again.

Various organizations in Israel and worldwide have issued forecasts for the economy as a whole and for the labor market in particular. According to the Bank of Israel forecast released in October 2022, the rate of unemployment in the 25–64 age group is expected to be about 3.1% on average in 2022 and about 3.5% in 2023 (Bank of Israel, 2022). A similar though somewhat less optimistic forecast was made by the OECD (Figure 12): 3.6% at the end of 2022 and also at the end of 2023. This is in contrast to the OECD’s forecast one year earlier, which expected the rate of unemployment at the end of 2022 to be higher than in 2019 by about 1 percentage point and that the Israeli economy would not return to full employment before 2025.

Figure 14. The forecasted rate of unemployment in the OECD countries during the fourth quarters of 2022 and 2023



Source: Michael Debowy, Gil Epstein and Avi Weiss | Data: OECD

Although the OECD forecast is somewhat less optimistic than those of the Bank of Israel, they are both positive about the Israeli economy relative to other countries. Figure 14 compares the OECD forecasts for various countries. The forecasted rate of unemployment in Israel is about two-thirds of the average forecast for the OECD countries, and only in a few countries is there expected to be a lower rate of unemployment. The previous OECD forecasts, which, as mentioned, were less optimistic, rested on, among other things, the assumption that it would be very difficult to again achieve the historical

low of 3.8% recorded in 2019. However, the data show that Israel has indeed achieved that low and even dipped below it at the beginning of the summer of 2022 (with the reservation that since then the rate has risen somewhat and we need to wait and see at which level it will stabilize).

Conclusion

The pace of recovery in Israel's labor market in 2022 exceeded most forecasts and the rate of jobseekers fell to below its historic low achieved in 2019. The return to the 2019 level of employment was recorded in all regions already at the beginning of 2022 and the increase in the rates of employment is visible among all sectors of the population. Among Jewish non-Haredi men of all ages there was a full recovery in employment and a return to pre-pandemic levels. There was an impressive recovery also among Arab men of all ages. Among Haredi men, the rate of employment remained low. Among women in all sectors of the population not only did employment return to its pre-pandemic level but there were new records for employment achieved in all of them: 85% among non-Haredi Jewish women, 83% among Haredi women and 43% among Arab women. The impressive recovery in rates of employment and the supply of jobs was accompanied by an aggregate increase in average wages, which is about 7% above that in 2019 in real terms.

The recovery was not uniform in all parts of the economy, and in particular it varied by industry. The majority of jobs added in the economy since 2019 were in the health, welfare, and nursing care industries (about 59% of the added jobs in the economy), and in high tech (32%), alongside not insignificant additions in education (10%) and construction (9%). The largest increases in jobs relative to the past were also in the high tech and health industries (26% and 19%, respectively). A more modest increase, though important in its own right, was recorded in construction (9%) and real estate (8%). Wage changes were not uniform across industries, and in particular not in industries where employment has expanded significantly. Thus, for example, the average monthly wage in high tech rose by about 18% and in construction by about 11%, while in education it rose by only 4%,⁴ and in the health and

4 The wages of workers in education are, for the most part, determined by collective bargaining agreements with the teachers, and therefore wages remained fixed until the signing of a new wage agreement between the State and the Teachers Union in the autumn of 2022. The new framework, which includes significant wage increases (primarily for new teachers), will go into effect in January 2023 and will include retroactive compensation for September–December 2022.

welfare industry it dropped by about 9%. Wages rose by a surprising extent in traditional manufacturing and in agriculture (9%) and in the knowledge-intensive industries, such as finance and insurance (9%), real estate (8%), and professional, scientific and technical services (13% without high tech). It can be assumed that these recent wage increases are related indirectly to the high tech industry, which competes with other industries for workers and forces them to increase the wages they pay. This effect goes beyond high tech's direct contribution to the growth in wages in the relevant years — about one-third of the total growth (as mentioned, outside of the high tech industries wages rose by only 4%, as opposed to 7% in all industries including high tech).

If the continuing wage increases in high tech indeed represent an increase in the labor productivity of high tech workers, then this is a welcome phenomenon, since competition over workers with other industries will force businesses in those industries to improve efficiency and the productivity of their workers. In contrast, if the wage increase in high tech is partly the result of distortions in the capital market and investments in start-up companies, or if they represent a high tech bubble, then the transition to a sustainable equilibrium will be accompanied by wage decreases and even a contraction in employment in all of the industries affected by high tech, to the detriment of workers.⁵ The consistency of the wage increases in high tech over the years makes it possible to adopt some degree of optimism and to cautiously assume that they are to a large extent the result of increases in labor productivity.

In parallel with the expansion of employment and the increase in wages, there was an increase in the number of academic degrees awarded last year, particularly master's degrees, and in the number of degrees awarded by academic colleges. The sharp increase in the number of master's degrees awarded is particularly interesting given the return on advanced degrees in recent years (Debowy et al., 2021b). It appears that many in the labor market have internalized the fact that this is a highly accessible way to improve earning power. On the other hand, since this is an academic degree that requires a relatively short period of studies, it may be that we are observing the first

5 When wages reach a non-sustainable level and employers must lower wages in order to survive, they sometimes choose instead to reduce their scope of activity and lay off workers in order to maintain the level of wages among the remaining workers. The rationale is that morale will be damaged by a cut in wages and will lead to a decline in the output of the workers, such that it would be preferable to fire them. This theory, which is well-known in economics, is known as *downward nominal wage rigidity* (Tobin, 1972).

graduates of the *class of corona*. In other words, it is a direct result of the surge in the number of students enrolled for a bachelor's or master's degree program with the onset of the pandemic. One way or another, the large increase in the number of workers with a master's degree is a good sign, and the fact that the academic colleges are primarily responsible for the increase is evidence that they are fulfilling their function, namely to provide an academic education to anyone who wants one.

In conclusion, the labor market has recovered surprisingly well from the pandemic. This was manifested in the expansion of employment and a rise in wages to beyond their pre-pandemic level. This aggregate recovery involved a high degree of variation in employment and wage trends across the various industries. However, the expansion of employment cuts across regions and sectors of the population, and the accumulation of human capital in the workforce through the acquisition of an academic education is grounds for an optimistic view of the future, as seen in the forecasts of the Bank of Israel and the OECD. In the short term, it can be assumed that the labor market will continue to move forward. However, in order to ensure long-term growth, investment must continue in higher education and vocational training, in infrastructure, in macroeconomic total factor productivity, and in high-quality employment opportunities for Israeli workers.

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Appendix

Appendix Table 1. Results of Granger test (1969)

Dependent variable	Average industry wage in month t			Change in average industry wage between month t-1 and month t			
	3	6	9	3	6	9	
Statistical test for the <i>influence</i> of wages in the high tech sector on wages in the overall economy without high tech	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	
Statistical test for the <i>influence</i> without high tech on wages in the high tech sector	0.330	0.002***	0.000***	0.307	0.020**	0.000***	
Information criterion of the model	AIC	2.51	2.20	1.66	2.64	2.17	1.83
	SBIC	3.05	3.03	2.78	3.19	3.01	2.96
Number of observations	124	121	118	123	120	117	

Note: The table presents p-values for a Granger test to examine the *impact* of wages of the average employee in a given sector on wages in another sector, based on monthly data from January 2012 until September 2022. The tests are based on the VAR model with a series of average wages in high tech and a series of average wages in the overall economy, with trends, seasonality, and dummy variables for lockdowns in 2021–2020. Information criterion of Akaike and Schwarz are also presented for each model, alongside the p-value of the Granger test for each direction of *influence*.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Appendix Table 2. Results of Augmented Dicky-Fuller test for stationarity

Industry branch	Augmented Dicky-Fuller	p-value
Economy without high tech	-8.068	0.0000***
High tech	-6.539	0.0000***

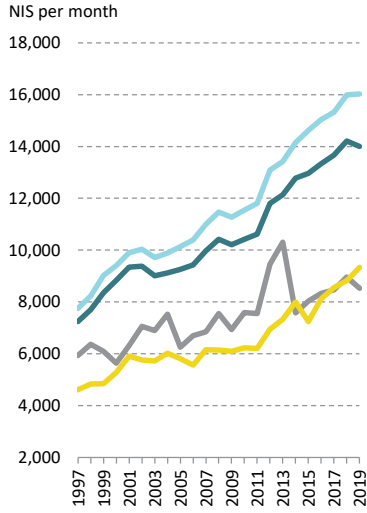
Note: The table presents the results of an Augmented Dicky-Fuller test to examine stationarity in the wages series used in Appendix Table 1a. All of the tests were included in the trend.

Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

Appendix Figure 1. Average monthly salary for workers ages 25–64, by sector

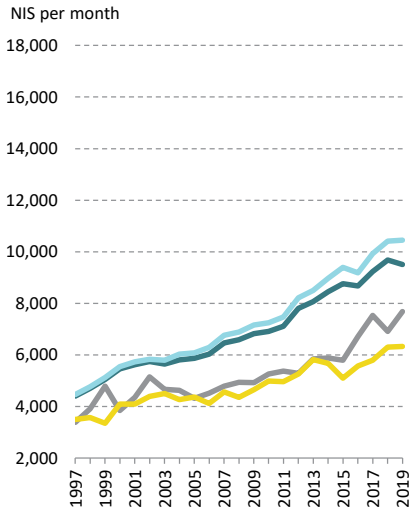
Men

- All men
- Arabs
- Haredim
- Non-Haredi Jews



Women

- All women ages
- Arabs
- Haredim
- Non-Haredi Jews



Source: Michael Debowy, Gil Epstein, and Avi Weiss, Taub Center | Data: CBS

