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LABOR INCOME INEQUALITY TRENDS IN ISRAEL

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Labor Income Inequality Trends in Israel

Ayal Kimhi and Kyrill Shraberman*

Abstract

This study examines developments with regard to wage disparities in Israel during the period 1997 to 2011. This period witnessed a growing return, or yield, on education, a factor which could lead to a rise in labor income inequality. Israeli labor income gaps actually declined somewhat, though, due to the fact that low-wage earners improved their status relative to higher-wage earners. One possible factor in the narrowing of labor income disparities was the rise in the minimum wage. Workers in income Deciles 7 and 8 experienced a wage decline, relative to lower- and higher-wage workers, and this led to a more polarized labor income distribution. This polarization trend is also evident in the distribution of work-hours by occupation; occupations associated with both low and high wages witnessed an increase in work-hours relative to work-hours in occupations characterized by mid-range wages. A breakdown by occupation shows that the education wage premium for low-income occupations increased, while for high-wage occupations there was a decline in the return on education. This fact may also explain the relative wage increase experienced by low-wage earners. These trends indicate that higher education is now becoming economically advantageous to those in low-wage occupations.

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Introduction

Much has been said and written about the problem of income inequality in Israel. Ben-David and Bleikh (2013) showed that disposable income inequality in Israel[1] is among the highest in the OECD, while the Israeli taxation and social services system is among the least effective in the OECD in terms of reducing inequality. Rising income inequality is a global phenomenon; however, even in international comparisons, Israel lies in the upper part of the distribution. Market income inequality in Israel grew substantially until 2002, but since then, has shown a moderate downward trend. Still, this moderate decline in market income inequality is not reflected in the figures for disposable income inequality due mainly to the social benefit cutbacks of a decade ago, which primarily hurt weaker socioeconomic groups.

About 60 percent of the average Israeli household's per capita income comes from employment (Figure 1). A prior study (Kimhi, 2009) found that labor income contributes a large share to income inequality relative to its share in total income. It is therefore useful in the course of this discussion on income inequality to call special attention to the issue of income from employment.[2]

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[1] Disposable income refers to "net" income, that is, market income (income from labor, capital and pension) after taxes, with the addition of benefits and other transfer payments.

[2] This chapter focuses on hourly wage rather than total income from work, inasmuch as hourly wage more accurately reflects a worker's relative value and controls for workers' decisions regarding the number of hours that they work. However, Heathcote et al. (2010) found that wage distribution changes are the main factor behind changes in working hour distribution and, accordingly, in the distribution of labor income.

Figure 1

Gross per capita income distribution
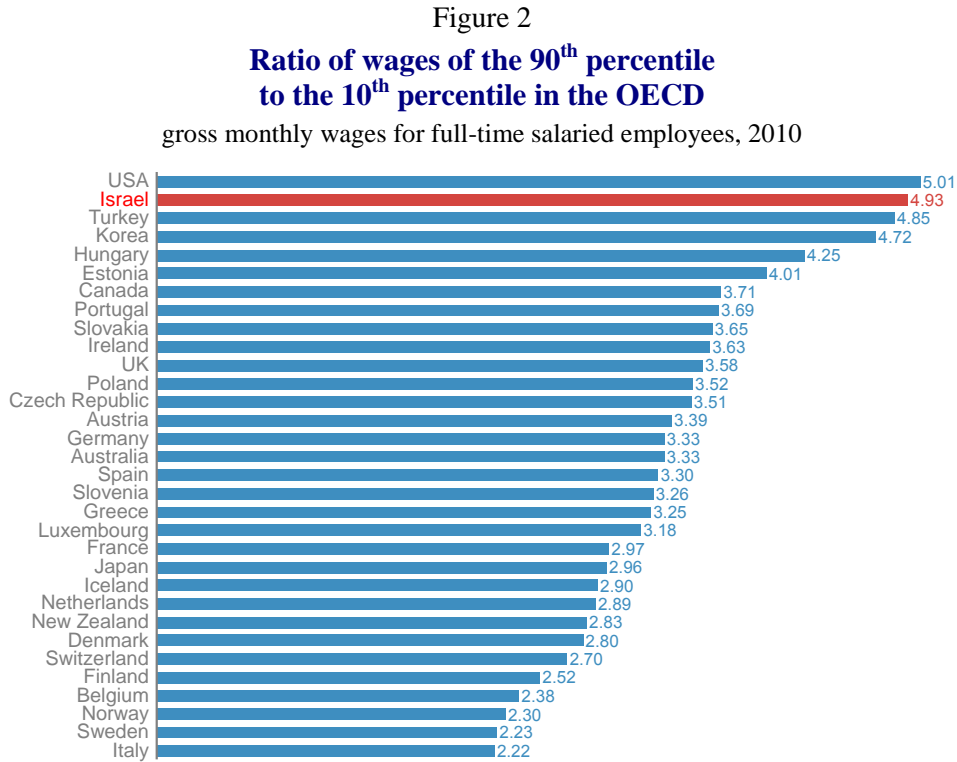
for average household, by sources of income, 2011
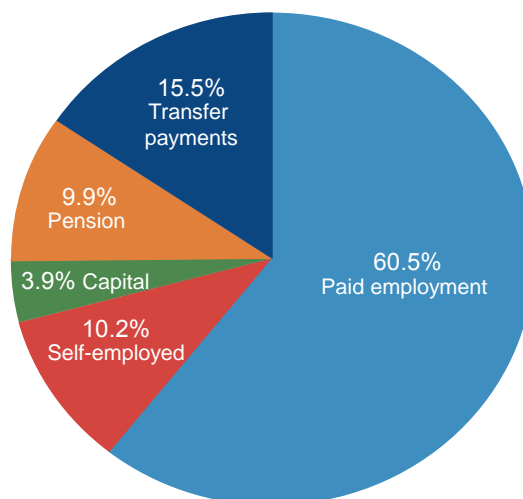
Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Income Survey*

1. *International Comparisons of Wage Differences*

Kimhi (2011) looked at wage inequality vis-à-vis income inequality and found that Israel leads the OECD countries in inequality, and that inequality within the upper portion of the wage distribution scale is substantially greater than in the lower portion, with the gap being much larger than that of other countries.[3] A review of more current figures

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[3]   Wage inequality is commonly measured in terms of the ratio between the wage of employees in the 90th percentile and that of employees in the 10th percentile (the 90/10 income inequality ratio). Similarly, inequality in the

paints a similar picture: according to 2010 data, Israel ranks second among the OECD countries in terms of wage disparities, after the United States (Figure 2).

Figure 2
**Ratio of wages of the 90th percentile
to the 10th percentile in the OECD**
gross monthly wages for full-time salaried employees, 2010

| Country	Ratio
USA	5.01
Israel	4.93
Turkey	4.85
Korea	4.72
Hungary	4.25
Estonia	4.01
Canada	3.71
Portugal	3.69
Slovakia	3.65
Ireland	3.63
UK	3.58
Poland	3.52
Czech Republic	3.51
Austria	3.39
Germany	3.33
Australia	3.33
Spain	3.30
Slovenia	3.26
Greece	3.25
Luxembourg	3.18
France	2.97
Japan	2.96
Iceland	2.90
Netherlands	2.89
New Zealand	2.83
Denmark	2.80
Switzerland	2.70
Finland	2.52
Belgium	2.38
Norway	2.30
Sweden	2.23
Italy	2.22

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Income Survey*; OECD

Nevertheless, examining wage gaps over time (Figure 3) shows a downward trend in Israel – from a six-fold disparity between the 10th and

upper part of the distribution is measured in terms of a 90/50 ratio, while inequality in the lower portion of the distribution is measured in terms of a 50/10 ratio.

the 90th percentiles in 1997 – a much higher ratio than in any the other OECD country – to a less than five-fold disparity in 2011, during a period characterized by growing wage gaps in most OECD countries. The United States, for example, experienced a widening gap between the 10th and the 90th percentiles – from 4.5-fold in 1997 to over 5-fold in 2011.

Figure 3

**Ratio of wages of the 90th percentile
to the 10th percentile in the OECD**

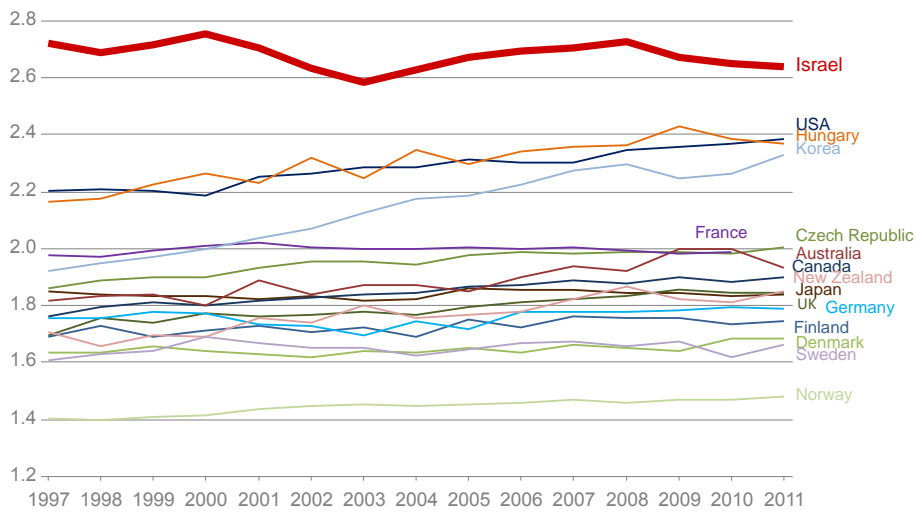gross monthly wages for full-time salaried employees, 1997-2011
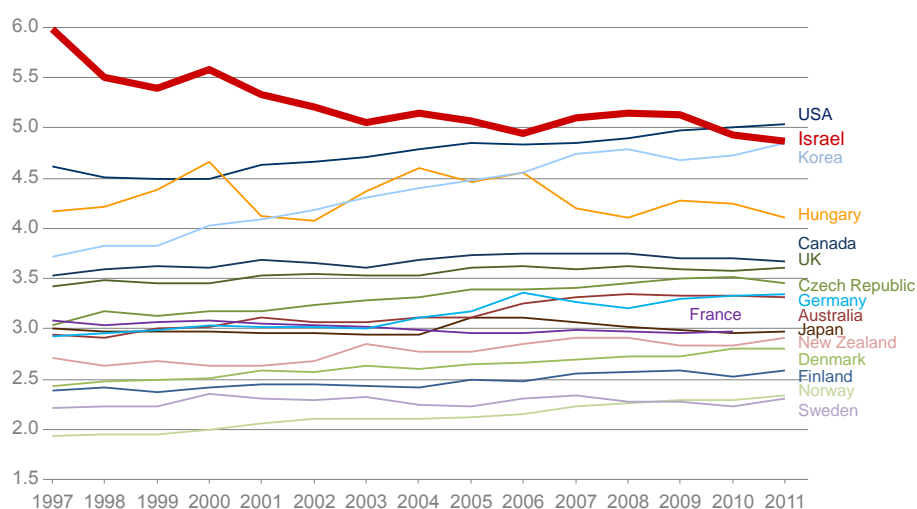
Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Income Survey*; OECD

Figure 4 shows that the wage disparities in the upper portion of Israel's wage distribution (90/50 ratio) are significantly higher than those of the other OECD countries. As with the 90/10 ratio, the 90/50 ratio has also been trending downward over the past decade and a half, in contrast to the upward trend observed for this ratio in other countries during the

same period. However, this decline is quite moderate compared with that of the 90/10 ratio – a finding that points toward a more meaningful wage-gap reduction within the lower portion of the wage distribution.

Figure 4

Ratio of wages of the 90th percentile to the 50th percentile in the OECD

gross monthly wages for full-time salaried employees, 1997-2011

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Income Survey*; OECD

Figure 5 shows that wage disparities within the lower part of the distribution scale declined sharply between 1997 and 2011. In 1997, Israel led the OECD in terms of its 50/10 ratio, while by 2011, five other countries had larger wage gaps than Israel in the lower part of the distribution.

Figure 5

Ratio of wages of the 50th percentile
to the 10th percentile in the OECD

gross monthly wages for full-time salaried employees, 1997-2011
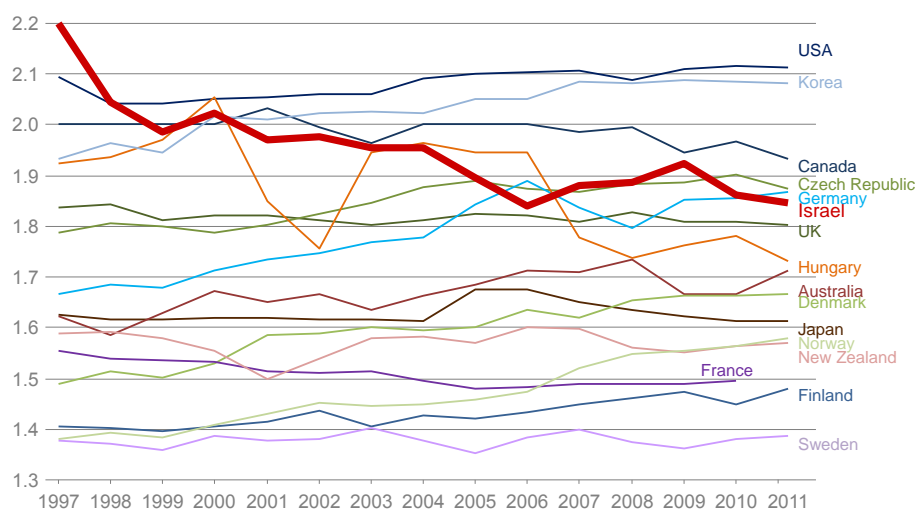
Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Income Survey*; OECD

It is interesting to note that the Scandinavian countries, despite their reputation as welfare states, also have relatively low gross wage disparities, in both the upper and lower parts of the wage distribution. This would seem to indicate that the Scandinavian countries' labor markets are equitable in and of themselves, even before state intervention through the taxation and social benefit system. Clearly, it is easier to maintain a generous welfare system when the labor market is relatively equitable to begin with.

In most OECD countries, the wage disparities in the upper part of the distribution are larger than those in the lower part. This is a well-known

feature of wage distributions, especially in the many countries where an effective minimum wage is in place. An exception is the United Kingdom, whose 50/10 wage gap is larger than its 90/50 gap. In Norway, the 90/50 disparity was greater than the 50/10 disparity in the late 1990s, but the country's positioning changed over the past decade as wage gaps in the lower portion of the distribution grew significantly, while disparities in the upper part of the distribution grew much more moderately.

To examine the various aspects of Israel's wage-gap decline from another angle, the cumulative change in real hourly wage since 1997 for three representative wage percentiles – the 10th percentile, the 50th percentile (the median wage), and the 90th percentile – is presented in Figure 6. The changes that have taken place in Israel are compared with changes in the United States, as reported by Acemoglu and Autor (2012). With regard to the American wage changes (Figure 6), wages in the 10th percentile increased by a little over 10 percent between 1997 and 2008. During the same period the median wage rose by over 15 percent, while wages in the 90th percentile increased by over 20 percent. These changes indicate a widening of wage gaps in the U.S., within both the upper and the lower parts of the wage distribution, as presented in Figures 4 and 5.

In Israel, the picture is entirely different; between 1997 and 2001, the median wage increased by 11 percent, while wages in the 90th percentile grew by 12 percent. By contrast, wages in the 10th percentile increased by 18 percent.[4] During the recession years of 2001-2003, the median wage fell by 6 percent, while the 90th percentile wage fell even more. By contrast, the 10th percentile wage continued to rise even during this period, although at a more moderate rate than in the preceding years. From 2003 to 2011, the wages of all three percentiles experienced no substantial changes, although there were fluctuations from year to year. Ultimately, during the period 1997-2011, the 50th percentile and 90th

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[4] Most of the rise in the 10th percentile wage relative to the median wage occurred between 1997-1998, while the period 1998-2001 witnessed similar rates of wage increases for all three percentiles.

percentile wages grew by 4 percent, while the 10th percentile wage
showed a cumulative increase of 18 percent.

Figure 6

Cumulative change in real hourly wage, by wage percentile

salaried employees aged 25-64, Israel (1997-2011) versus USA (1997-2008)
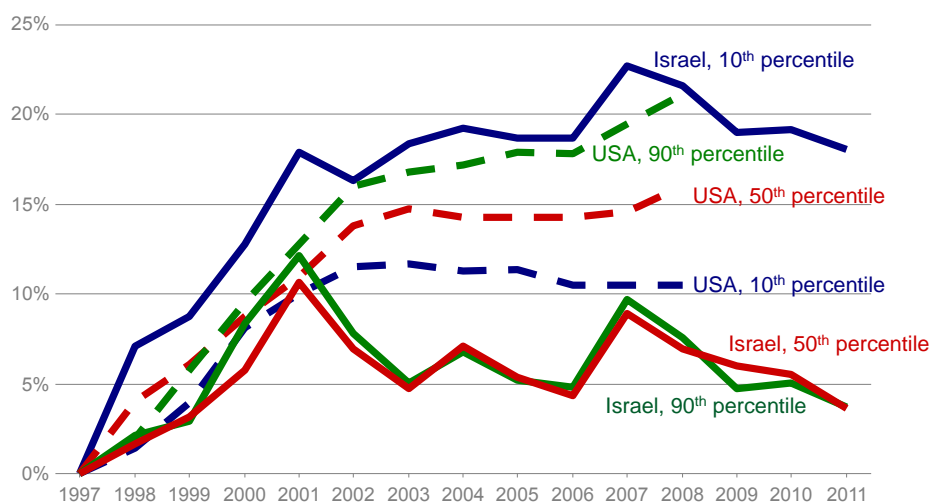
Source: Ayal Kimhi and Kyrill Shraberman, Taub Center (Israel);
   Acemoglu and Autor (2012) (USA)
Data: Central Bureau of Statistics, *Income Survey*

   These trends clearly support the conclusion that, in Israel, wage gaps
in the upper part of the distribution did not change during the period in
question, while they narrowed considerably in the lower portion of the
distribution.[5] Possible reasons for these changes in wage disparity will be
discussed, including changes in the minimum wage and in the return on

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5   The data used in Figure 6 differs slightly from that of Figures 3-5. Figure 6
    data are presented in terms of the hourly wage of all salaried employees, while
    Figures 3-5 present OECD data that refer to the monthly wage of full-time
    salaried employees only.

education, as well as phenomena related to wage behavior during periods of economic recession.

2. *Changes in the Wage Distribution*

In order to obtain a complete picture of the changes in wage distribution, the average annual change in real wage per hour for each wage percentile relative to the median is presented (Figure 7). A change of 1 percent, for example, means that the wage of the percentile in question increased by 1 percent beyond the change in the median wage. In the curve representing the United States, a relative wage increase in the upper part of the distribution is seen, that is, in the percentiles above the median, such that, from approximately the 57th percentile on, wages rise gradually moving up the scale.

Thus, the expansion of wage inequality in the United States within the upper part of the distribution extends across all wage levels, and is not merely the result of a rise in the wage of the uppermost 1 percentile, as is commonly thought. In the lower part of the U.S. wage distribution, no significant changes occurred, except for a relatively moderate wage increase relative to the median for the bottom 14 percentiles.

Figure 7
Average annual change in the real hourly
wage relative to the median wage

by wage percentiles, salaried employees aged 25-64, Israel versus USA

The changes in Israel's wage distribution are nearly the reverse of those in the United States. The distribution's lower portion actually witnessed a gradual wage increase relative to the median wage, a trend that reflects the significant decline in wage inequality within this portion of the distribution. In the upper part of the distribution, there is an interesting phenomenon. While no real change occurred in the wage of percentiles 85-95 compared with the median wage, the wage of percentiles 50-85 declined relative to the median. Essentially, it can be said that while the lower part of the wage distribution improved its relative status and approached the median from below, percentiles 50-85 approached the median from above – a trend that points to a relative wage

decline for this group. In general, it appears that income Deciles 7 and 8 of the wage distribution are the main losers from the labor market changes that took place between 1997 and 2011. If workers in Deciles 6-8 may be regarded as the middle or upper-middle class of salaried employees, the conclusion is that the disparity between the middle and lower classes has narrowed, while the gap between the middle and the upper classes has widened.

While Figure 6 showed that the relative changes in wage were not consistent across the period under study, Figure 8 looks at the relative changes in wage that occurred across the distribution (as in Figure 7) during three sub-periods: 1997-2001, 2001-2003 and 2003-2011.[6] It can be seen that the period 1997-2001 witnessed nearly a 1 percent average annual increase in the wage of the highest wage-earners relative to the median, and a nearly 2 percent increase in the wage of the lowest-paid workers. This is an indication of the relative weakening of the middle class. During the period 2001-2003, the wage of the lowest-paid workers showed a two-fold increase vis-à-vis the preceding period – nearly 4 percent – while the wage of the highest earners declined relative to the median wage. The most notable phenomenon of the period is thus the wage-gap reduction that occurred across the entire distribution. During these years, the Israeli economy experienced a deep recession, and it is clear that workers' wage decreases were in direct relation to their pre-recession wages. It could be that during the recession, employers cut back on flexible components of their employees' wages – overtime for workers at mid-range and high salaries and bonus payments for managerial personnel – so as to avoid dismissing these workers; whereas, if the need arose to reduce expenses associated with low-wage employees, there was almost no alternative but to dismiss them.

During the third sub-period, 2003-2011, changes in wage distribution were slight. This is rather surprising given that the employment rate was

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[6] These sub-periods were chosen following several different attempts to divide the time period as a whole. This was the division that yielded the most prominent differences.

trending upward during this period, and the trend was at least partly attributable to policy changes such as social benefit cutbacks and programs aimed at encouraging employment. It would be possible to assume that the workers who joined the labor market due to the policy changes were from the lower portion of the wage distribution, and this is perhaps the reason that the median wage remained more or less stable during this period (Figure 6). Nevertheless, wages of workers at both ends of the distribution remained stable.

Figure 8

**Average annual change in the real
hourly wage relative to the median wage**

by wage percentiles, salaried employees aged 25-64,
Israel, by sub-periods
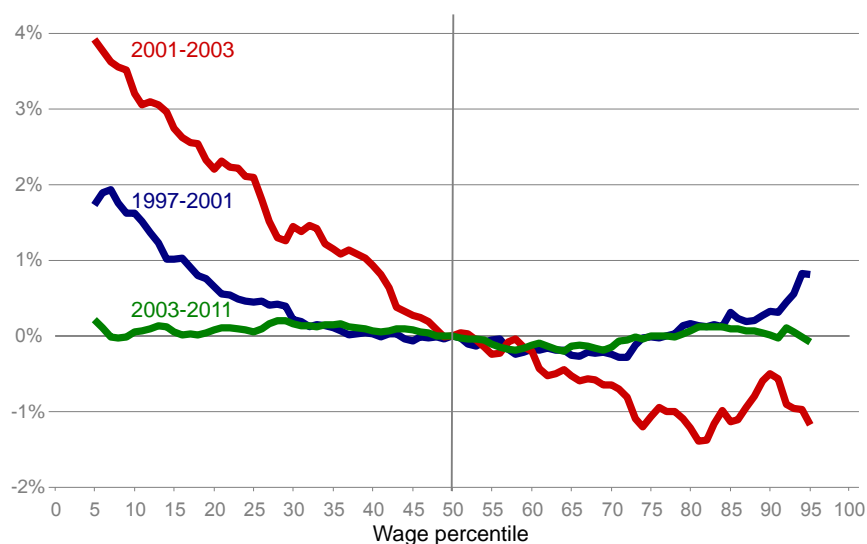
Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Income Survey*

3. *The Reasons for Wage Distribution Changes*

One possible reason for the wage-gap reduction in general, and for the wage increase experienced by the lowest wage-earners in particular, is the rise in the minimum wage. When changes in minimum wage are examined in real terms (Figure 9), it is found that the minimum wage rose substantially during the period 1997-2001, at an average annual rate of 6.3 percent. This fact explains, at least in part, the average annual wage increase of 4.4 percent enjoyed by the 10th percentile during that same period. By contrast, during the years 2001-2005, there was almost no increase in the minimum wage in real terms nor, as Figure 6 shows, did the wages of workers in the 10th percentile rise during this period. Another significant minimum wage increase took place in 2006-2007, and here, as well, impact on the wages of workers in the 10th percentile can be seen. However, the median wage also rose at the same time, as did the wage of workers in the 90th percentile, meaning that this minimum wage increase had no impact on wage disparities.

To conclude, the minimum wage increase likely explains the reduction in wage disparities during the 5-year period of 1997-2001; however, the more dramatic reduction that took place during 2001-2003 appears to have had other causes. As noted, one possible cause is the reaction of employers to the recession of that period.[7]

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[7]   There may, of course, be other reasons as well. For example, a comprehensive OECD study (2011) found changes in labor laws to have been a major cause of wage-gap changes in the organization member states.

Figure 9
Minimum hourly wage in shekels
2011 prices
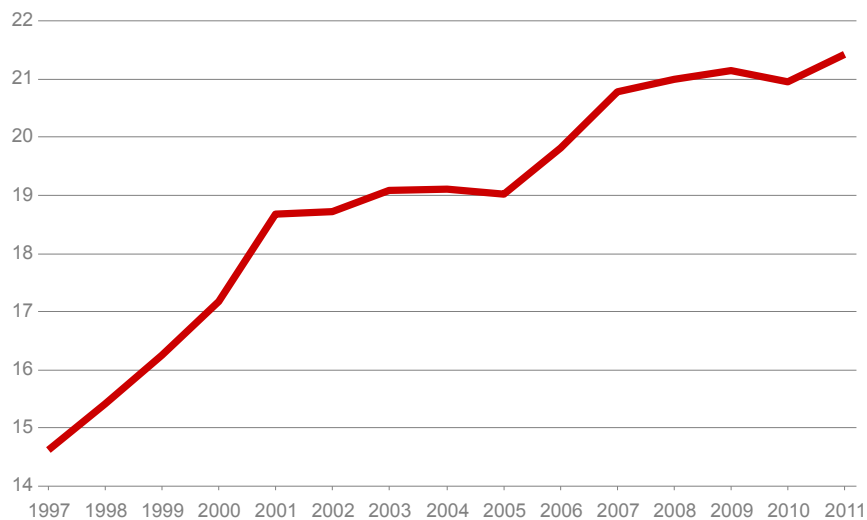
Previous studies have shown that wage gaps are largely determined by the education wage premium, which is the wage gap between more educated and less educated workers (Kimhi, 2011; 2012). This finding points to the likelihood that changes in the education wage premium contributed to the Israeli wage disparity changes that have been noted. Since education is correlated with higher pay, one would expect to find a decline in the education wage premium during the years when wage gaps narrowed.

Figure 10 presents the wage disparities that prevail between those with 16 or more years of schooling and those with no more than a secondary

education.[8] The figure shows the moderate rise that occurred in the education wage premium for all salaried employees, from 83 percent in 1997 to 88 percent in 2011. It also shows the higher education wage premium for men relative to women and that the rise in the education wage premium during this period was enjoyed almost exclusively by men. A closer look at short-term trends in the education wage premium reveals that it declined during the period 2002-2003, and there was a similar decline in wage disparities in those same years. Building on the earlier argument, the steep minimum-wage increase that occurred between 1997 and 2001 brought with it a narrowing of wage gaps despite the moderate rise in the education wage premium that characterized those years – while between 2001 and 2003, when the minimum wage remained virtually unchanged, the continued narrowing of wage gaps appears to have resulted from a decline in the education wage premium. The fact that wage gaps narrowed to a more moderate degree during the period 1997-2001 is explained by the conflicting impact of the minimum wage increase versus the education wage premium increase, while the wage disparity standstill that characterized the years 2003-2011 appears to have resulted from the fact that the period's relatively moderate minimum wage increase was counteracted by a rise in the education wage premium.[9]

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[8] The education wage premium was also examined by adjusting for the demographic changes that took place during the period in question. For this purpose the salaried-employee population at each level of educational attainment was divided into groups by gender and potential experience (age minus years of schooling minus 6), and for each group the average hourly wage was calculated, as well as the group's share in the population. The average wage for each educational level was calculated as the average of the average wage of each group, adjusted for the groups' average share over the years. In this way the changes in population composition over the period under investigation are controlled for. Measured in this way, the education wage premium was slightly lower than that in Figure 10, while the rate of increase in the premium was slightly higher.

[9] Moretti (2013) found that although better-educated workers tend to concentrate in metropolitan areas, the cost of living is also higher in those

Figure 10

Trends in the return on higher education, by gender

differences in hourly wage between salaried employees with
16+ years of schooling and those with 0-12 years of schooling
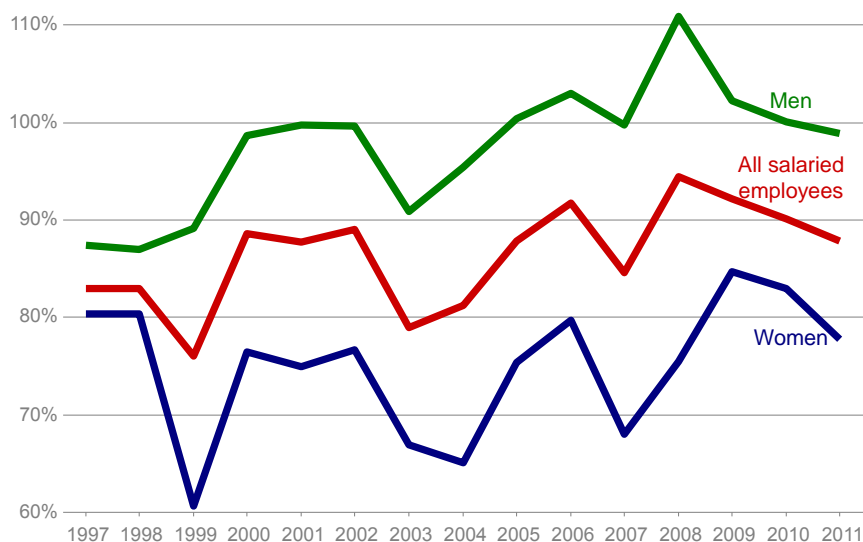
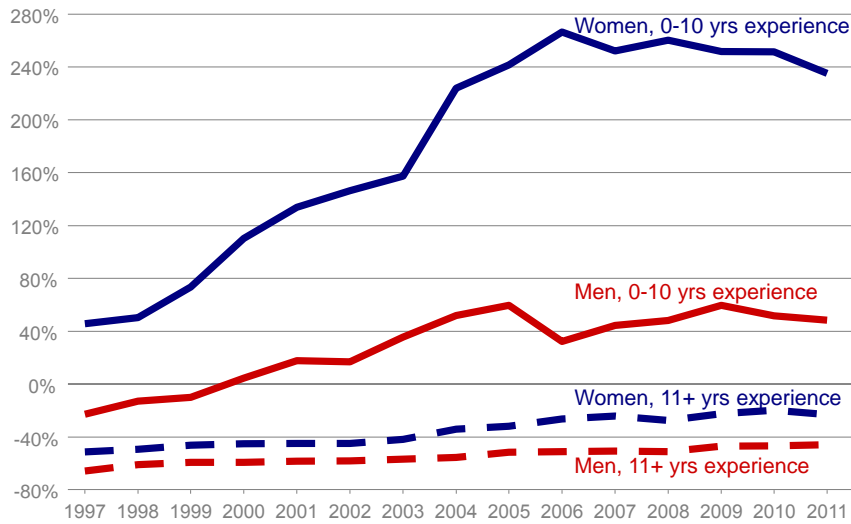Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Income Survey*

The rise in the education wage premium took place alongside a rise in the share of more educated workers in the Israeli labor market. Figure 11 presents the total number of work-hours of employed persons with 16 years of schooling or more compared with the total number of work-hours of employed persons with no more than 12 years of schooling. The ratio trend is presented by gender, for workers with no more than 10 years of potential experience and for workers with at least 11 years of potential experience. For example, in 1997, the total number of work-

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areas. Accordingly, when geographic differences are offset by price levels, more moderate changes in wage disparity are seen.

hours of males with a relatively high degree of seniority (11 or more years of experience) and a high degree of educational attainment was over 60 percent lower than the total number of work-hours of males with relatively high seniority and low educational attainment, but this gap had narrowed to 45 percent by 2011. For women with relatively high seniority, the gap is smaller than for men, although the trend is similar.

Figure 11

Difference in work-hours between individuals with 16+ years of schooling and individuals with up to 12 years of schooling*

ages 25-64, 1997-2011

*   Numbers on the vertical axis show in percentages the greater number of work hours of those with 16+ years of schooling versus those with 0-12 years of schooling

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Labor Force Survey*

The disparity trend for relatively young males (those with no more than 10 years of experience) reverses itself from 2000 on; starting in 2004 the total number of work-hours of more educated younger males is 40-60 percent higher than that of the less educated. As with older workers, in the case of relatively young workers, the gaps are larger and also widen at a faster rate for women. The total number of work-hours of relatively young and more educated women was over 40 percent higher than the total number of work-hours of relatively young, less educated women in 1997. This gap widened to 260 percent in 2006, then narrowed slightly in the following years. These figures reinforce earlier findings with regard to rising educational attainment levels within the population (Shavit and Bronstein, 2011) and declining employment rates among the less educated populations (Ben-David, 2011) over the years.[10]

However, education is not the sole factor, and may not even be the main factor, in wage disparities. Kimhi (2012) found, for example, significant wage gaps between workers in different occupations. An examination of the explanatory power of wages as a function of number of years of schooling (Figure 12)[11] indicates that differences in years of schooling explain 16 to 20 percent of salaried employees' wage differences during the period 1997-2005. From that time on, the explanatory power of wage as a function of years of schooling gradually increased, so that in 2011, years of schooling explained 23 percent of the wage differences among salaried employees. The rise in explanatory power of years of schooling underscores the growing importance of

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[10] No satisfactory explanation was found for the fact that the rise in the relative number of work hours of more educated workers within the younger population halted during the middle of the last decade.

[11] "Explanatory power" is R^2 divided by the variable under investigation (years of schooling, occupation, industry sector and their interactions) in log (wage) regression, which, in addition to that factor, also included a fourth-degree polynomial of potential experience (age minus years of schooling minus 6 or age minus 17, whichever is smaller). Years of schooling were divided into three groups: 0-12, 13-15, and 16 or more.

education in determining workers' earning power, in a manner similar to what was found regarding the education wage premium (Figure 10).

Figure 12
Explanatory variables for wage differences
employees aged 25-64, 1997-2011*
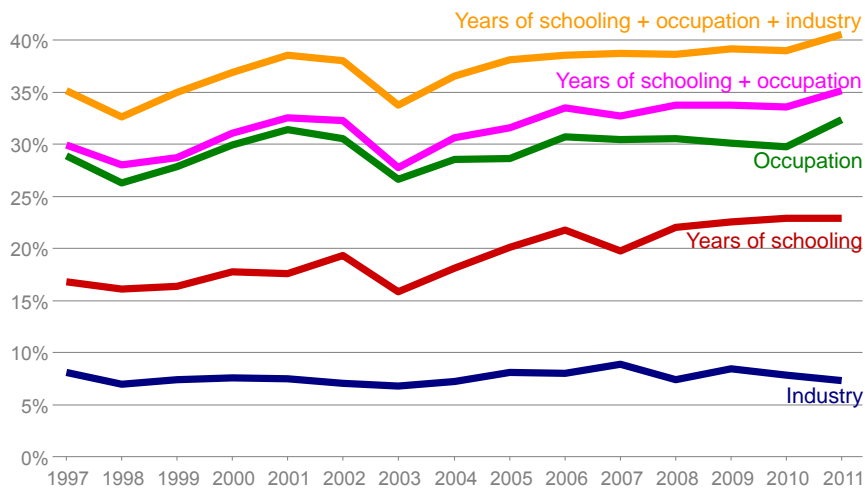
* Percentages reflect the extent to which explanatory variables explain wage differences, after accounting for the influence of differences in potential experience (age minus age at end of formal education). Adding together two or three variables reflects the cumulative explanatory value of the variables.

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Income Survey*

Despite education's growing importance, the explanatory power of occupation during the sample period is significantly greater, hovering at around 30 percent. In this context, however, the relatively high correlation between educational attainment level and occupation must be taken into account (Figure 13). Adding in years of schooling to occupation does not, therefore, significantly increase the explanatory power on wages. On the other hand, a worker's industry sector on its own

does not predict wage as much as schooling and occupation do, and its explanatory power ranges from 5 to 10 percent. The correlation between industry sector and occupation and years of schooling is lower, meaning that its addition to years of schooling and occupation significantly increases the explanatory power of wage.

Figure 13

**Relation between education and occupation,
employed persons aged 25-64**

distribution of work-hours by education in each occupational category*

| 1997 2011 | 1997 2011 | 1997 2011 | 1997 2011 | 1997 2011 | 1997 2011 | 1997 2011 |
| Unskilled workers | Agents, sales and service workers | Skilled workers in manufacturing, construction, and other sectors | Clerical workers | Associate professionals and technicians | Academic professionals | Managers |

■ 0-12 yrs of schooling   ■ 13-15 yrs of schooling   ■ 16+ yrs of schooling
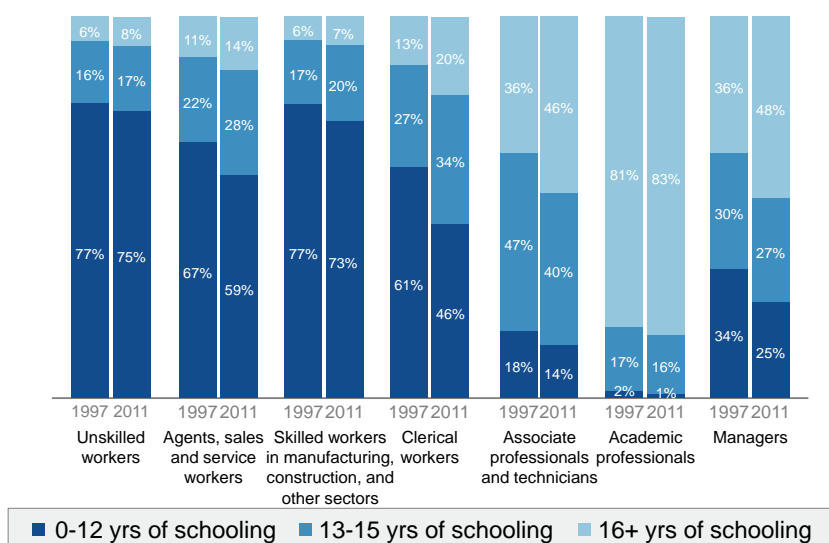
* Occupational categories are arranged from left to right by increasing order
   of average wages for the years 1997-2011

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Labor Force Survey*

In order to examine the correlation between a worker's level of educational attainment and occupation, Figure 13 presents the distribution of workers by years of schooling for each of seven occupational groups.

The occupations are listed from left to right by their average wage (from low to high wages). The figure clearly shows that, in the three relatively low-wage occupations, between half and three-quarters of work-hours come from those workers with no more than 12 years of schooling, while workers of this education level account for no more than a third of the work-hours in the three relatively high-wage occupations. In general, wage and educational attainment are consistently linked across occupations, except in two instances: agents and sales and service workers are, on average, more highly educated than skilled workers, but their wages are lower on average. On the other hand, managers are less educated than those in the academic professions although their wages are higher.

Each of the occupational groups shows a rise in the average level of educational attainment among its workers over the years. The most moderate increases were found in occupations associated with lower levels of educational attainment, among unskilled and skilled workers, and among those in occupations associated with the highest educational attainment level – those in academic occupations, nearly all of whom by definition have pursued higher education.

Figure 14 presents the changes in hourly wage that took place between 1997 and 2011 by educational attainment level, broken down by occupation and wage level.[12] One can see that the education wage premium, as reflected in the wage gap between highly educated workers and less educated workers, declined in the high-wage occupations, due primarily to a drop in the wages of those with 16 or more years of schooling. By contrast, the education wage premium rose in the low-wage occupations, due mainly to a rise in the wages of those with post-secondary education. The conclusion is that the rise in the education wage premium over the years, as reflected in Figure 10, is mainly the

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[12] A less aggregated occupational breakdown indicated similar though less precise trends, due to a scarcity of highly educated people in low-wage occupations and a lack of less educated people in high-wage occupations.

result of an increase in the education wage premium for those employed in low-wage occupations.

Figure 14

Changes in hourly wage between 1997 and 2011

by occupation and years of schooling, in fixed prices

Low wage occupations*	High wage occupations**
+6%	
+4%	+1%
-1%	-1%
	-9%

■ 0-12 yrs of schooling   ■ 13-15 yrs of schooling   ■ 16+ yrs of schooling
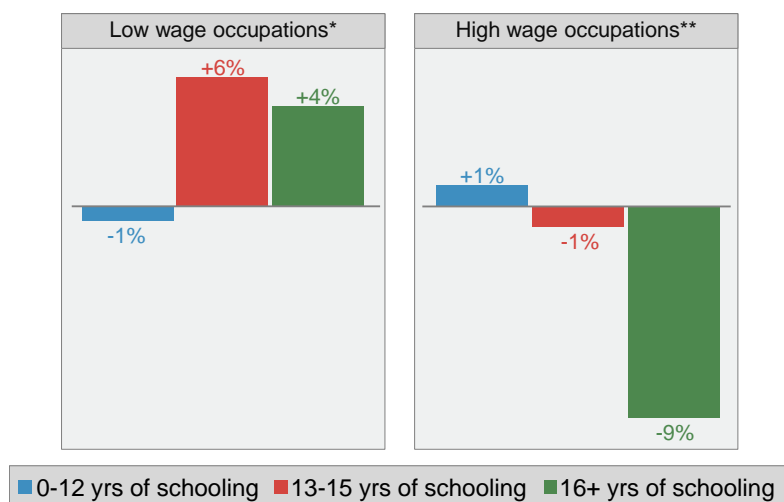
*   Skilled workers, agents, sales and service workers, unskilled workers

** Managers, academic professionals, associate professionals and technicians, and clerical workers

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Central Bureau of Statistics, *Income Survey*

At the same time, there is a downward trend in the percentage of skilled workers in manufacturing, construction, agriculture, and the like (Figure 15) – sectors that account for the majority of low-wage occupations. By contrast, an upturn was seen in the percentage of workers at the higher wage levels, a process that has also contributed to the education wage premium increase.

The trend toward rising education wage premiums in low-wage occupations is of great importance with regard to the continued

narrowing of wage gaps in the economy as a whole – especially given that worker educational levels continue to trend upward. Even when highly educated workers are not hired for work in high-wage occupations, their educational investment does not go to waste – not even when they are employed in low-wage occupations. The employment of highly educated workers in low-wage occupations likely increases labor productivity, meaning that the wages of those working in these occupations will continue to rise.

Figure 15 presents the total work-hour distribution in the economy by occupational group. The work-hours of skilled workers, the largest group of workers, declined significantly relative to the other occupations. A much more moderate decline was also found in the work-hours of clerical workers. It should be noted that these two occupations mainly employ workers who were situated in the middle of the 1997 wage distribution, between the bottom of the second quintile and the bottom of the fourth quintile. The 9 percentage points of work-hours that these two occupations lost were taken up, in part, by lower-wage occupations such as agents and sales and service workers (3 percentage points), with the majority going to higher-wage occupations. This hints at increasing polarization in the occupational distribution, and at a decline in the relative weight of those occupations situated in the middle of the wage distribution.

Figure 15
Distribution of work-hours by occupation
employees aged 25-64, as percent of total work hours*
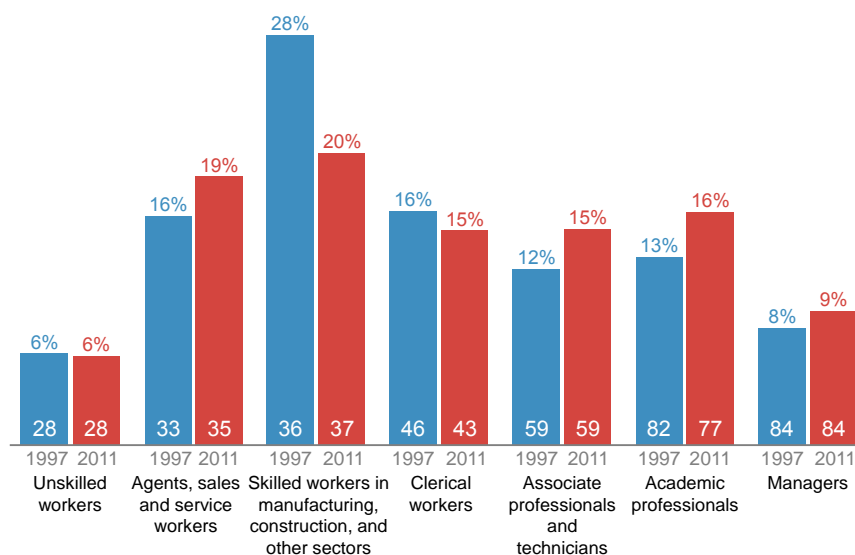
*   Occupational categories are arranged by average hourly wage in 2011
    shekels (the number at the bottom of the column)

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Labor Force Survey*

The decline in the relative weight of the middle class raises the question of how that decline is related to that observed in the wage distribution by percentile (Figure 7). Figure 16 presents the change in the relative share of each occupation with regard to total number of work-hours, alongside the change in real average hourly wage of workers employed in that occupation. Comparing these two changes facilitates an understanding of their causes. If each occupational group can be regarded as a separate labor market, the changes in work-hours and in hourly wage are the outcome of changes in labor supply on the part of workers in the given occupation, and of changes in the demand for these workers' labor.

On the assumption that each labor market of this kind starts out at equilibrium, then a rise in labor supply and demand at the same rate will produce an increase in the total number of work-hours, with no change in wage. Looking at Figure 16, it may be concluded that this is the situation in the labor market for associate professionals and technicians and for managers. In the case of agents and sales and service workers, there is a notable rise in both employment and wages. This situation is characteristic of a rise in demand for these workers, over and above a rise in supply. In the case of clerical workers, the situation is reversed; there is a simultaneous decline in employment and in wages due, apparently, to a clear decline in demand for these workers.

Opposite changes with regard to employment and wage attest to the dominant impact of changes in labor supply as compared to demand. In the case of those employed in academic occupations, the trend toward increased employment and a simultaneous decrease in wages points to a larger rise in the supply of labor relative to demand, while a trend toward declining employment and a simultaneous rise in wages among skilled workers indicates a larger decline in the labor supply relative to demand.

This analysis aligns with the overall rise in the share of more educated workers (Figure 13). Naturally, more educated people prefer to enter high-wage occupations, leading to a rise in labor supply in these occupations. When demand rises simultaneously, as in the case of managers and associate professionals and technicians, the surplus supply is readily absorbed and the change in wage is minimal. When demand does not rise at the same rate, as in the case of those in academic occupations, some of the increased supply is absorbed by the market, but this comes at the price of a significant decline in the labor wage. Obviously an increased supply of labor in certain occupations entails a relative decline in supply in other occupations. In the case of clerical workers, even though there was a decline in the supply of these workers, the drop in demand was even sharper, meaning that the level of employment declined and, at the same time, there was a drop in wage levels. The situation of agents and sales and service workers is the opposite; the demand for these workers grew and, accordingly, both

employment rates and wages rose. Regarding skilled workers, the decline in supply appears to have been the steepest and, in any case, more precipitous than any possible decline in the demand for workers. Following this, employment declined and wages rose. The decline in the supply of skilled workers is substantiated by employers' commonly-voiced claim that Israelis no longer want to work in "blue-collar" jobs.

Figure 16

Changes in share of work-hours and in real hourly wage in each occupation group between 1997 and 2011

salaried employees aged 25-64
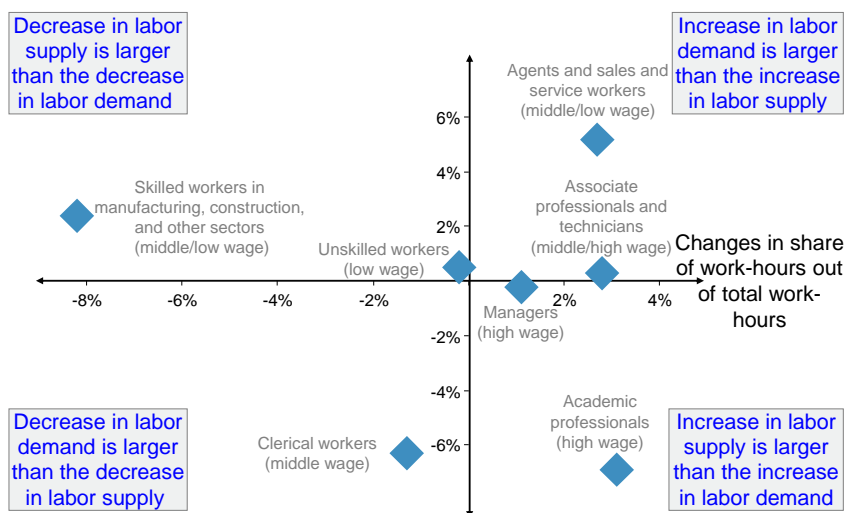
Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Labor Force Survey* and *Income Survey*

Figure 16 offers a possible explanation of the narrowed wage-gap phenomenon, as shown in Figure 3. Figure 16 demonstrates the wage decrease experienced by clerical workers and associate professionals and technicians as well as academic professionals situated within the upper part of the wage distribution, in contrast to the rise in wages enjoyed by agents and sales and service workers, and by skilled workers, situated in the lower portion of the distribution. The data in parentheses in the figure show that those occupations that lost workers (i.e., the skilled workers and to a lesser degree, clerical workers) are situated in the central part of the wage distribution, a fact that contributes to the deteriorating status of mid-level salaried employees.

In order to present this outcome in a more intuitive way, Figure 17 shows the changes in the relative share of work-hours for each work-hour decile between 1997 and 2011. Work-hour deciles were determined on the basis of each of the occupation groups that appear in Figure 16. A more detailed breakdown of occupations (according to Central Bureau of Statistics definitions) within each occupational group was examined and arranged in ascending order by average wage. Afterward, proceeding through the detailed occupational list as arranged by average wage, the total number of work-hours was divided into deciles so that each decile contains a tenth of the total number of work-hours (see the appendix for a more detailed explanation of the division into deciles). According to the figure, the reduction in number of work-hours was particularly notable in Deciles 3-5 and, to a lesser degree, in Decile 6.[13] If this is added to the fact that the deterioration in wages was especially profound in wage Deciles 6-8 (Figure 7), it is found that a particularly broad range of

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[13] A similar phenomenon was also documented in the United States, where the number of work-hours was found to have declined primarily in jobs of a routine nature (Jaimovich and Siu, 2012). A few studies have found that one of the main causes of this phenomenon is technological advancement in the high-tech industries (Autor and Dorn, 2013; Michaels et al., 2014). Another study points to changes in the composition of demand due to population aging as another possible cause (Moreno-Galbis and Sopraseuth, 2014), though not one that is relevant to Israel.

workers situated in the central portion of the wage distribution have potentially been hurt by the labor market changes due to a relative decline in their wage and number of work-hours. It is clear that, over the years, some of these workers switched to different occupations and that these other occupations therefore experienced a relative increase in number of work-hours and/or a wage increase. While in the absence of a database that traces workers' employment and wage data over time there is no way of identifying and characterizing the worker groups most adversely affected, one can nevertheless say, with a greater degree of certainty, that workers situated at the ends of the distribution scale were not hurt, and that their status actually improved.

Figure 17

Changes in share of work-hours by deciles of work-hours by occupation*, out of total work-hours

difference between 1997 and 2011, workers aged 25-64
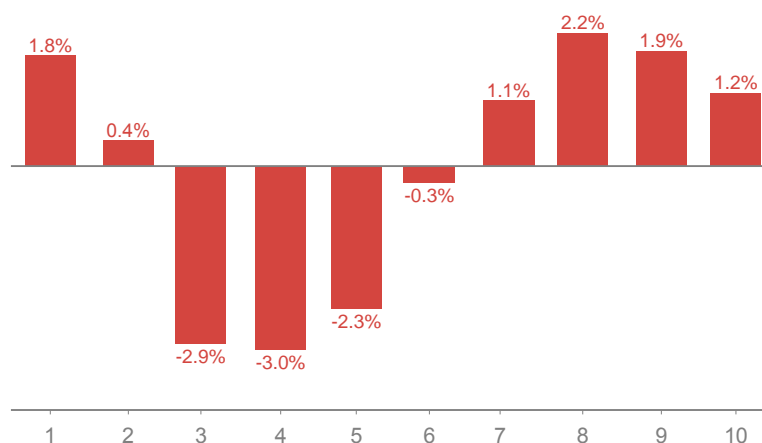
Decile of work-hours by occupation, in ascending order of average wage

* In each occupational group (Central Bureau of Statistics categorization), detailed occupations were ranked by average wage and then divided into deciles by number of work-hours. For a full explanation, see the appendix to this chapter.

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Labor Force Survey* and *Income Survey*

4. Summary and Conclusions

This chapter looked at the development of wage gaps in Israel during the period 1997-2011. One of the findings presented is that the education wage premium increased over this period. This fact, in and of itself, could potentially contribute to larger wage disparities between workers on a variety of characteristics. It turns out, however, that wage disparities narrowed somewhat, in light of the trend toward improved status of workers in the low-wage deciles relative to those in the higher-wage deciles. This trend runs counter to the prevailing trend in other developed countries during the period in question. At least some of the improvement in the status of low-wage workers may be attributed to a trend toward gradual increases in the minimum wage. At the same time, workers in Deciles 7-8 experienced a wage decline relative to lower- and higher-wage workers. The wage distribution thus became more polarized between the wealthiest and everyone else.

A breakdown by occupation showed that the education wage premium in low-wage occupations had increased, likely due to technological progress in those industries where such occupations are numerous. An opposite trend was seen in higher-wage occupations, where the return on education declined. An analysis of these opposing trends may explain the relative wage increase enjoyed by workers in low-wage occupations. Higher education is, in effect, becoming economically valuable even in occupations characterized by low wages.

The distribution of work-hours by occupation also reflects a polarization trend; work-hours in both low-wage and high-wage occupations increased relative to work-hours in middle-wage occupations which primarily employ skilled workers in manufacturing, construction and agriculture. An integrated analysis of the changes in wage and employment by occupation indicates that labor supply grew in education-intensive occupations which, naturally, are characterized by relatively high wages. But while demand for the labor of managers and associate professionals and technicians increased at the same time, demand for workers in the academic occupations did not keep up with the supply of

such workers, resulting in a relative real wage decline for academic professionals. Data in the lower part of the wage distribution attest to a drop in demand for clerical workers relative to the supply of such workers, which resulted in a downward trend in wages of clerical workers. By contrast, the wages of agents and sales and service workers rose thanks to rising demand for these workers; likewise, skilled workers' wages increased due to a significant decline in their supply. All of these findings indicate that the wage-gap reduction may be attributed both to changes in the supply of workers in certain occupations, due apparently to more widespread pursuit of post-secondary education, and to changes in demand for these or other occupations, stemming from changes in technology or in product demand.

The narrowing of wage gaps is, in and of itself, good news, but by no means justifies complacency. First, wage gaps, especially in the upper part of the distribution, are still very large by international standards. Second, the status deterioration suffered by workers in the middle part of the wage distribution – both in terms of employment possibilities available to these workers and in terms of the wage they receive for their labor – attests to growing polarization within the labor market, and that can hardly be regarded as good news. Finally, it should be remembered that the gaps have narrowed only with regard to labor income which constitutes, at most, 60 percent of average household income.

Thus, it is also important to know how income from other sources is distributed. Although this discussion deviates from the present study's objectives, it may be assumed with a high degree of certainty that income from capital is distributed much less equally than is income from labor; in other words, most capital income is in the hands of the higher income deciles (see Regev, 2014). From this perspective, it is interesting to examine what happened to capital income's share of the national income pie.

Figure 18 shows that, according to the national accounts of the late 1990s and the early 2000s, income from labor accounted for two-thirds of Israel's national income. Starting in 2001, labor's share of the national-income pie showed a downward trend, reaching 62 percent in 2011. A

similar trend could be observed in most of the G-7 countries; however, the decline in Israel was more substantial than in all other countries except Japan. What this means is that a smaller amount of national income is transferred to workers as income from labor, while a larger portion is transferred to the wealthy. The fact that capital income is concentrated in the hands of the upper deciles intensifies the labor market's already-existing polarization. The bottom line is that low-wage workers enjoyed a rise in the minimum wage, the affluent enjoyed a rise in capital income, and the middle class was left behind.

Figure 18
The share of labor earnings in national income
Israel and G-7 countries, 1995-2011
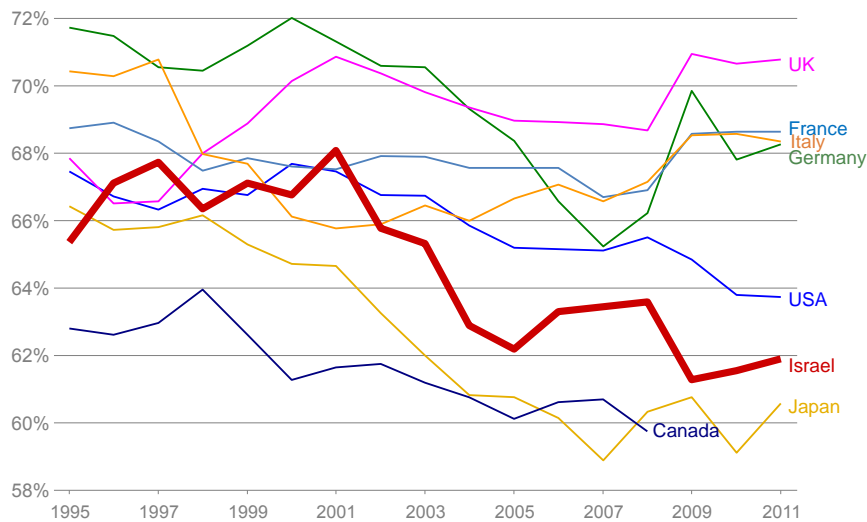
Source: Ayal Kimhi and Daniel Premisler, Taub Center
Data: OECD

In the past decade, much attention has been paid to the problem of the working poor (Stier, 2011). Policy measures such as raising the minimum wage and instituting a negative income tax aimed to address this problem, at least in part. The present study has shown that the increased minimum wage has served the purpose for which it was intended. By contrast, less attention has been paid to middle-class income levels, despite the fact that a relative decline in the income of young families, along with the cost of living, played an important role in the 2011 social protests (Shalev, 2012). As shown in this chapter, the middle class, by way of shifts in the demand for workers, has also been negatively affected by labor market changes that resulted from both technological developments in Israel and globally as well as from changing demand for different types of products and services.

The Israeli labor market is flexible in some ways and rigid in others. For example, the Bank of Israel (2014) found that workers tend to keep their jobs even during periods of structural change, while wages tend to rise or drop in accordance with the state of the market. There is nothing worrisome about this so long as the changes are cyclical; however, when they constitute trends, the question arises of whether institutional change is required in order to enhance occupational flexibility. Clearly, wage changes in specific occupations are partly due to the retirement or dismissal of workers at a certain wage level and the hiring of new workers at other wage levels; it may be, however, that wage change is also due to changes in the pay of existing workers. The question needs to be asked: why don't workers whose wage has eroded find other employment? In this context, it is worth examining the need for improved placement and vocational training services to help workers change their occupation in accordance with structural shifts in the labor market.

The chapter cannot come to an end without a discussion of the issue of education. The trend in recent years toward a higher share of academic degree holders in the labor force has led to a decline in the education wage premium. Highly educated workers are holding jobs that in the past were held by less educated workers – the reason being, apparently, that not all academic degree holders manage to find jobs commensurate with

their expectations, and as a result, some find themselves in lower-wage occupations. In this context, it should be noted that the education wage premium actually rose in occupations that employ less educated and lower-wage workers, meaning that the human capital investment represented by an academic degree is still worthwhile, not only from the state's perspective but from the individual's perspective, as well.

Nevertheless, it should be noted that academic degrees are not homogeneous. Degree-holders come from institutions that differ in quality and in the range of study disciplines that they offer; the labor market cannot be expected to compensate everyone in an identical manner. This may translate into erosion of the economic value of academic degrees whose supply has risen sharply in recent years – meaning that students need to be aware of the labor market value of the study programs that they choose. An academic degree in and of itself does not guarantee a high wage, although it does usually guarantee a wage higher than that of workers in the same occupation who do not hold an academic degree.

Appendix

An Example of How Work-Hours Were Divided into Deciles (Figure 17)

The market's total number of work-hours was divided into deciles as follows:

The occupation groups (see Figure 16) were ranked by average wage during the period 1997-2011, from lowest to highest.

Each occupational group was further divided into more detailed occupational categories, which are arranged in order of average wage, from lowest to highest.

For each detailed occupation category, the average annual total aggregate work-hours for the period 1997-2011 is given.

The total work-hours were divided into deciles, via proceeding through the list of detailed occupations as arranged by wage, such that each decile accounts for a tenth of the total work-hours.

The following example presents the allocation of occupations to work-hour deciles for two relatively low-wage occupation groups: (1) unskilled workers; (2) agents and sales and service workers.

The example in Appendix Table 1 shows that Decile 1 includes all unskilled workers, as well as caregivers, who are the lowest paid detailed occupation category within the agents and sales and service workers occupational group. The remaining detailed occupations that fall into the agents and sales and service workers group are in Decile 2, except for wholesale and commercial agents (the highest-paying detailed occupation category among the latter), who are in Decile 3.

Appendix Table 1.   **An example of dividing occupational deciles by hourly wage**

Occupation (Central Bureau of Statistics)	Hourly wage*	Decile
Unskilled workers		
Unskilled workers in agricultural picking, packaging, sorting, and stocking	25.3	1
Building cleaners, kitchen and laundry workers	26.3	1
Guards, messengers, ushers and others	27.9	1
Other unskilled workers	28.1	1
Unskilled workers in ground preparation and road work	29.7	1
Porters and longshoremen	34.1	1
Janitors, nightwatchmen, and other cleaning workers	38.3	1
Agents and sales and service workers		
Caregivers	25.4	1
Other service employees	29.6	2
Sales, shop assistants and models	31.1	2
Workers in hospitality	34.4	2
Tour guides and stewards	42.9	2
Financial and business agents	53.1	2
Wholesale and commercial agents	53.3	3

*   Hourly wage (in shekels) represents the average for 1997-2011, in 2011 prices

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

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