

THE ORIGINS OF INCOME INEQUALITY IN ISRAEL—
TRENDS AND POLICY¹

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This paper analyzes the trends in the level and the composition of income inequality in Israel between the years 1987 and 2011. The main trends found in income inequality among individuals are: a decline in the wage share of the middle wages, an increase in the prevalence of part-time jobs at the lower end of the labor market, and an increase in the concentration of income at the high end of the labor market. We analyze the relative contribution of income inequality between genders, between Jews and Arabs, and by years of education to the total level of inequality. We show that individuals with secondary education or less did not benefit from the contemporary growth in GDP. In addition, we analyze the trends in levels of inequality of equivalized household income from 1997 onward. We prove that the level of inequality before redistribution has declined due to an increase in labor force participation. However, the level of inequality after taxes and transfers has increased. We show that this increase is the result of a significant reduction in direct taxes and transfers.

1. INTRODUCTION

Income inequality is one of the main problems in Israel's economy and perhaps the most significant one. The level of inequality in Israel is substantially higher than in most other developed countries (Dahan 1998). Although this situation has existed for more than a decade, the trend of inequality is still increasing, rather than decreasing.

The term "inequality" is used to describe the general level of income gaps in society. The advantage of using this general term is that it summarizes the broad spectrum of income gaps, and enables us to conduct a comparison among different countries and different time periods. However, the generality of this term obscures its many component details. The term "income inequality" comprises the gender gap, ethnic gaps such as between Jews and Arabs, gaps in labor income and other income sources, as well as the results of taxation, redistribution policies, etc.

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This study explores those details, thoroughly reviewing the various component factors of inequality and the changes that have occurred in the study period, in order to provide an updated and comprehensive survey of inequality in Israel, and its comparison to the rest of the world. We see that aside from the general story of high and rising inequality, there are many changes in the various trends in the last few years.

The analysis of wage inequality focuses on the years 1987–2011, for which we have a uniform dataset from the Income Survey of the Central Bureau of Statistics (ISCBS). In contrast, the analysis of household income inequality is restricted to the period starting in 1997, since this is the first year following a major redesign of the Income Survey.

The Gini index is used through most of this work in order to measure the level of inequality, as it is the most common measure used for this purpose. In some cases, other indices are used for methodological purposes. Income ratios between percentiles are used in order to better assess inequality in different areas of the wage distribution. The Theil index is also used in order to decompose total inequality to the inequality within and between the various groups. A detailed description of the methodology and datasets used can be found in the Appendix.

Chapter B provides a comparison of inequality in Israel vs. other developed countries. By all common measures of inequality, Israel is among the countries with the highest level of inequality, and these gaps are only widening. We also show that most of the gaps are located in the high end of the wage distribution, in the gaps between the top and middle wages. This finding contradicts the common misconception that inequality in Israel originates from the gaps between Arabs or Ultra-Orthodox Jews and the rest of the population.

In the following chapters we further analyze the gaps in Israel and their origins. Each chapter contains a separate discussion of a different factor influencing the income of individuals and households, and its effect on inequality: hourly wages, wages per salaried worker, and finally, household income and equivalized disposable income, in which the gaps have the most significant impact on welfare.

The analysis of the hourly wage rate in Chapter C shows that the most dominant trend in the last generation is the decline of the middle wages. This decline is exhibited by an increase of the gap between high and middle wages, along with a decrease of the gap between the middle and low wages. We show that this trend can be attributed to changes in the level of inequality in different occupations: an increase in inequality within the high-wage occupations, and a decrease in inequality within the low-wage occupations.

In Chapters D-F we analyze wages per salaried worker. We show that although there is a wage compression in the hourly rate, the gap in monthly wages between middle-wage workers and low-wage workers is retained. This can be attributed to the rise in the number of workers working in part-time jobs, which are characterized by a low number of working hours.

The upper tail of the distribution is analyzed in Chapter E. The study of this subject has developed considerably lately (Pikety and Saez, 2004). We provide evidence for the widening of the upper tail of the wage distribution, namely an increase in the income share of the highest earners.

Chapter F provides a discussion of the gaps between various groups in the population. We show that the gap between males and females is diminishing, while the gap between Jews and Arabs is widening. Nevertheless, we show that only a small fraction of general inequality can be attributed to such gaps.

Chapter G provides a discussion of household incomes and redistribution policies. As was found in a previous study (Achdut et al, 2013), we show that the last decade is characterized by a decrease in equivalized market income inequality, and prove that this decrease can be attributed to the increase in the share of households with market income from work and savings.

Nevertheless, we show that there is an increase in inequality in equivalized disposable income. This increase can be attributed to the reform in the redistribution policy starting in 2003. This policy shift explains half of the gap between Israel and the OECD average.

This research provides a concise and clear basis for the further study of inequality in Israel.

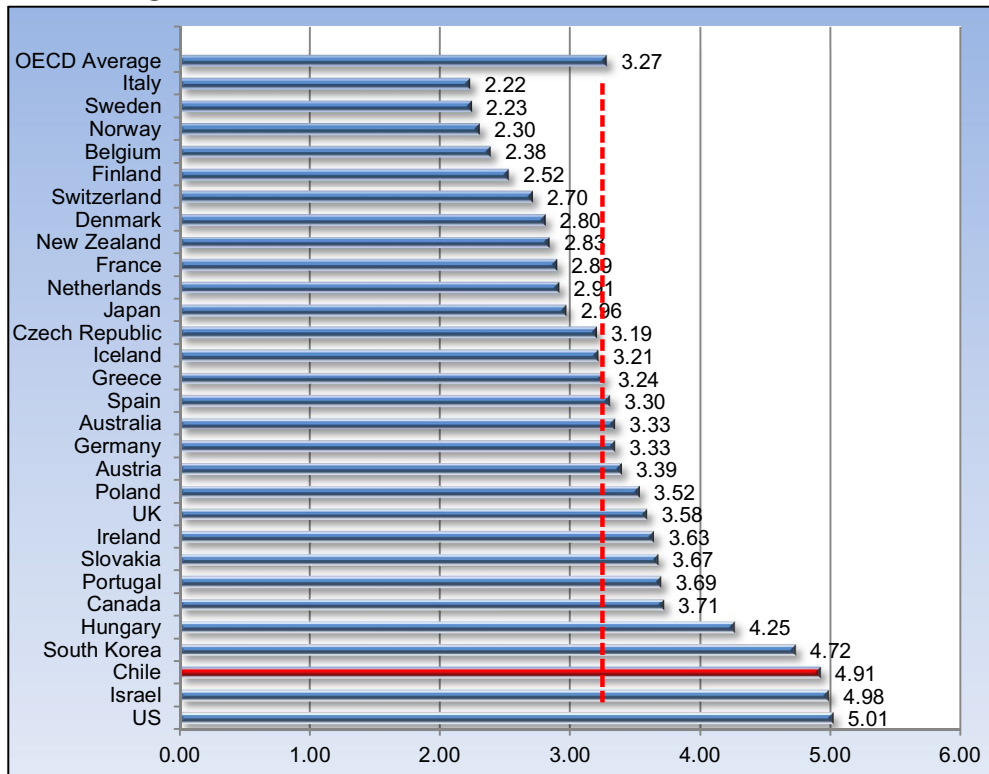
2. INEQUALITY IN ISRAEL—AN INTERNATIONAL COMPARISON

The admission of Israel to the OECD enables the comparison of its economy with the rest of the developed world. This chapter provides a comparison between inequality levels in Israel and the rest of the OECD countries, using some of the most common inequality measures. An analysis of the differences in wage inequality appears in part B.1, while an analysis of both households' gross and disposable equivalized income is provided in the rest of the chapter.

a. Wage inequality—the gaps are in the high end of the labor market

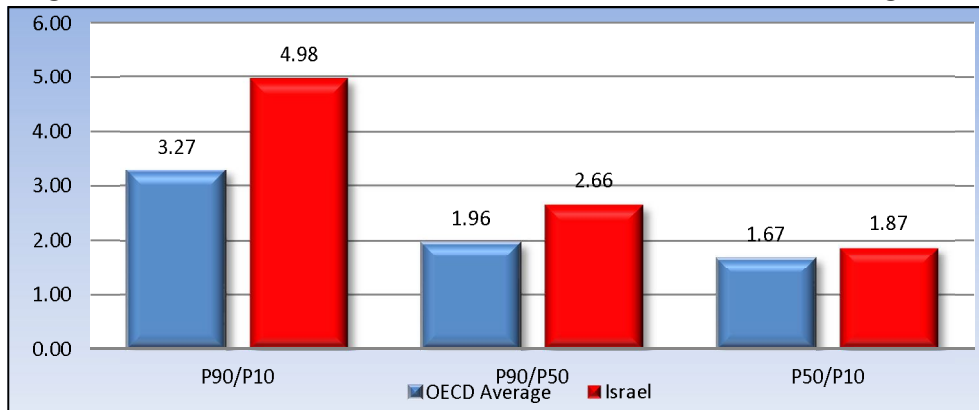
The main source of households' income is wages. In an OECD comparison of countries based on the wages of full-time salaried workers (Figure 1), Israel is located at the bottom of the developed countries in the P90/P10 measure, which measures the wage ratio between entry to the top decile and exit from the lowest decile.

Figure 1
P90/P10 Wage decile ratio, full-time salaried workers, 2010



SOURCE: Based on OECD data.

Figure 2
Wage decile ratio for full-time salaried workers, 2010, Israel vs. OECD average



SOURCE: Based OECD data.

Figure 2 shows that the P90/P10 ratio in Israel exceeds the average² ratio of the OECD countries by 52 percent. The percentile ratio can be decomposed into two complementary ratios: The ratio of the 90th wage percentile to the median wage (P90/P50) and the ratio of the median wage to the 10th wage percentile (P50/P10). The P50/P10 ratio in Israel is close to the OECD average. In contrast, there is a considerable gap between the P90/P50 ratio in Israel and the OECD average. This finding is in contrast with the common misconception that inequality in Israel can be attributed to the gap between specific population groups, such as Arabs or Ultra-Orthodox Jews, and the rest of the population, since this gap between population groups should influence mostly the lower part of the wage distribution.

b. Inequality in Households' equivalized disposable income—Israel is at the bottom of the OECD

Figure 3 shows a contemporary comparison, suggesting that Israel is located at the bottom of the developed countries in the Gini measure for inequality of households' equivalized disposable income.

The OECD provides an accounting system and definitions that can be used to compare the various countries and to define "Disposable income" and "Equivalized income", the definitions of which are presented herein.

Definition—Disposable income

The OECD definition of household income follows the definitions of the Canberra Group (Franz et al. 1998, Expert Group 2001) and of LIS (Smeeding et al. 1990). Table 1 shows the standard framework. In this framework, income from wages and salaries, self-employment and property are summed to be the "factor income"; factor income plus occupational pensions gives "market income"; market income plus public and private transfers, as well as other types of cash income, provide the "gross income"; finally, gross income minus personal income taxes and employees' social security contributions gives "cash disposable income". This last concept is used as the main measure of household well-being.

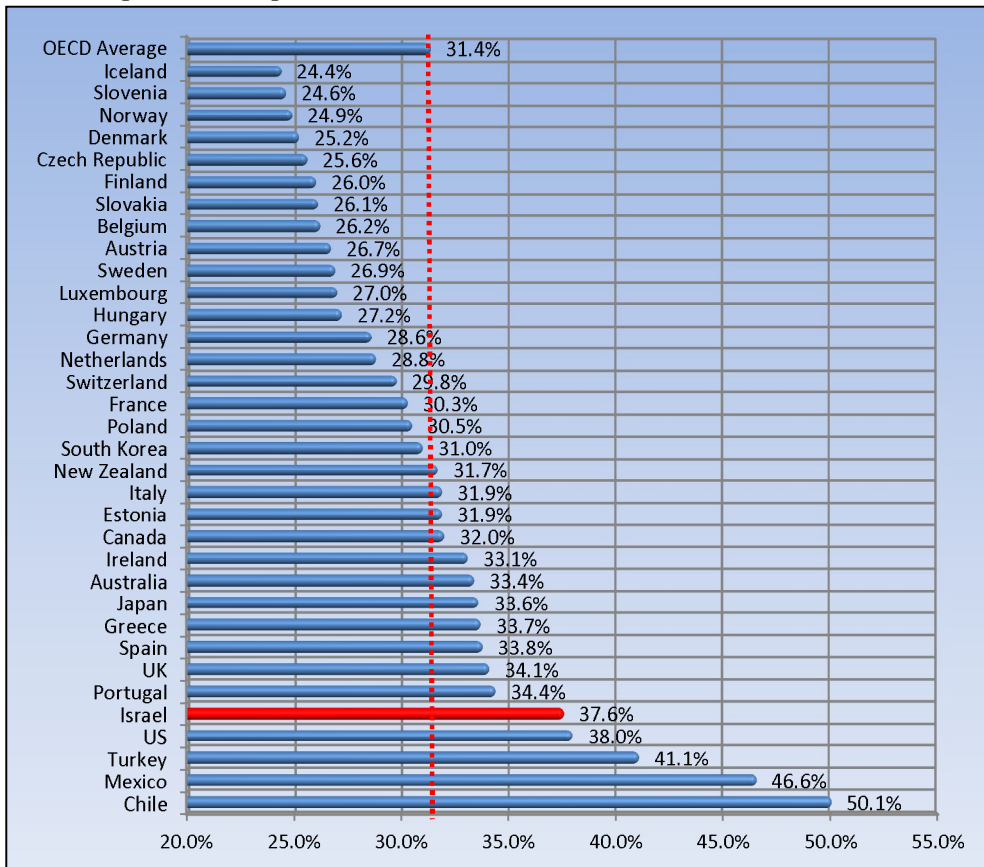
Equivalized scale

Household income is computed by summing the incomes of all the individuals. This sum is then attributed to each of its members, irrespective of who in the household earns that income³. The OECD adjusts incomes to reflect differences in needs of households of different sizes by dividing the income by the square root of household size. This implies that, for instance, a household of four persons has income needs twice as large as a household composed of a single person.

² A geometric mean is used for averaging ratios.

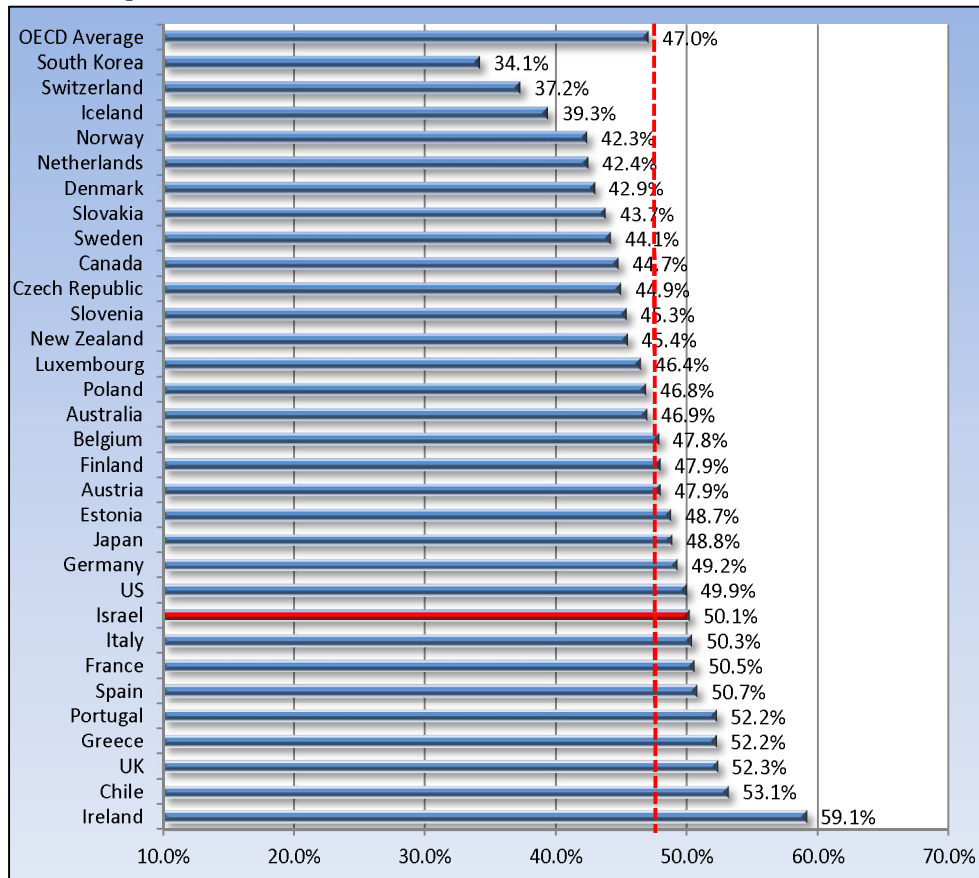
³ It also assumes equal sharing of resources within a household. This may conceal an unequal distribution of income between men and women and between different generations within a household.

Figure 3
Gini for equalized disposable income, 2010



SOURCE: Based on OECD data.

Figure 4
Gini for equivalized market income, 2010



SOURCE: Based on OECD data.

Table 1
Income component classification in the OECD

Income Component
Gross wages and salaries from dependent employment
+
Self-employment income
+
Capital and property income
=
1. Factor income
+
Occupational and private pensions
=
2. Market income
+
Social security cash benefits (universal, income-related, contributory)
+
Private transfers
+
Other cash income
=
3. Gross income
-
Income tax (and employee social security contributions)
=
4. Cash disposable income

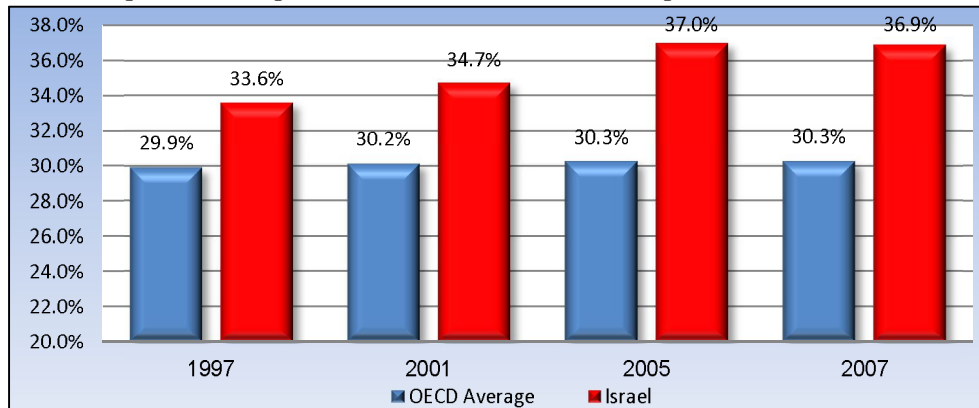
c. Market income inequality—above average; below Italy, Spain and France

When measuring inequality in market income (equivalized scale), Israel is above the OECD average, but is now much closer to it (Figure 4). It should be noted that the calculation of inequality includes households that have no market income and rely solely on allowances, benefits and transfers (which constitute about one-fifth of households in Israel).

d. Gap from OECD is increasing

Israel was not always placed so high in inequality comparisons. Data from the LIS database (Figure 5) shows that since 1997, the Gini measure for inequality in disposable income in Israel has risen 3.3 percent. In the rest of the OECD countries it remained at the same level with an average rise of 0.4 percent. The economic processes and economic policy that led to this situation are the subject of the following chapters.

Figure 5
Gini for equalized disposable income, international comparison, 1997–2007

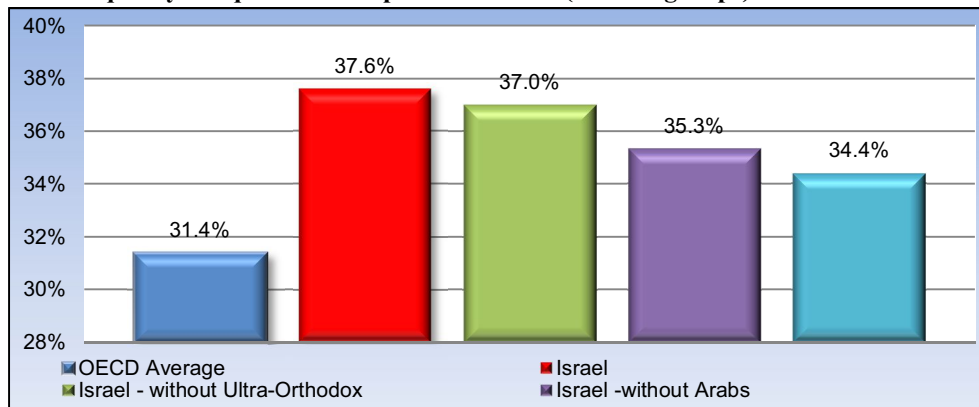


SOURCE: Based on LIS data.

e. Arabs and Ultra-Orthodox Jews: The smoke screen

A common opinion in Israel is that the high level of inequality is mostly a consequence of the low incomes of Arabs and Ultra-Orthodox Jews. The low participation of Ultra-Orthodox males and Arab females in the labor market, and the relatively high fertility rates in these population groups contribute to their high poverty rates. Focusing the discussion on these issues hides the true extent of the inequality problem in Israel.

Figure 6
Gini inequality in equalized disposable income (various groups)



SOURCE: Based on the ISCBS and OECD data.

Figure 6 presents Israel vs. the average of OECD countries. This shows the data for Israel (which is identical to the data in Figure 2), as well as the data of a counterfactual simulation deducting these populations from the general public.

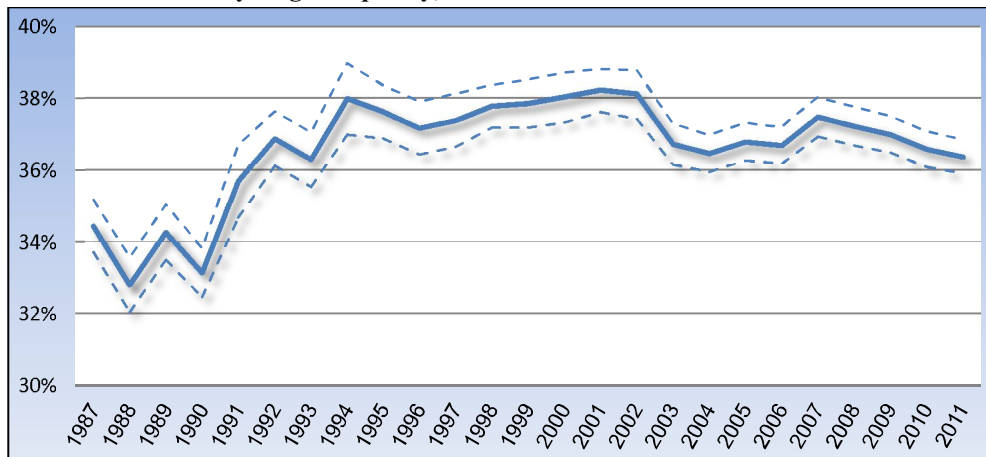
Although we compare Israel, without its most disadvantaged demographic groups, to the OECD average (which includes the entire population in each country), we can still learn a few things from the figure. The influence of Ultra-Orthodox Jews on inequality is minor (0.6 percent). In contrast, removing the Arab population from the equation reduces inequality by 2.3 percent. It can also be seen that even after these weak population sectors are removed, Israel's low ranking (4th from the bottom) remains unchanged.

It is therefore clear, that although there are specific attributes to these demographic groups, they are not the reason for the long trend of increasing inequality, or for Israel's low rank by international comparison.

3. THE LABOR MARKET—A DECLINE IN MIDDLE WAGES

In recent years there was no significant change in the Gini index of the hourly rate in Israel, and since 1993 it retains a relatively stable level (Figure 7). Kristal & Cohen (2005) show that since the early 70s, inequality in hourly wages has continuously increased until reaching its current level⁴. While the Gini measures for inequality remained fairly constant, the hourly wage distribution has changed significantly. One such major change is the decline in the middle wages vis-a-vis both the lower wages and the upper wages. In fact, it can be said, that although the measure of total inequality in the hourly wage has not changed much, the nature of the inequality has changed considerably.

Figure 7
Gini index for hourly wage inequality, 1987–2011



SOURCE: Based on the ISCBS.

⁴ Kristal and Cohen studied the inequality in hourly wages for workers aged 25–64. This measure is naturally lower (as the population is more homogenous, wage inequality is lower), but it kept rising after 1993.

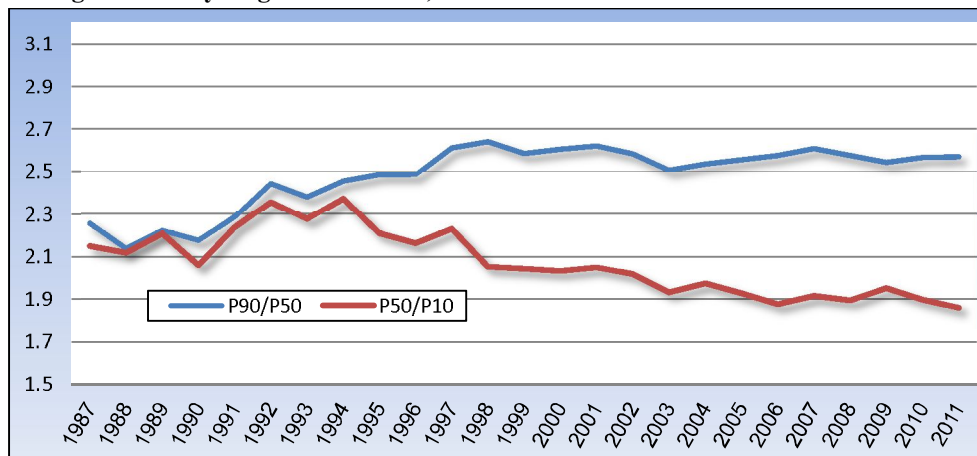
The reason for the change of the wage distribution stems from the changes in the levels of inequality within occupations. During these years, the correlation between the wage level of an occupation and that occupation's wage inequality has increased. That is, occupations that are characterized by higher wages experienced an increase in wage dispersion, while in occupations that are characterized by lower wages, the wage distribution became more compressed. As a result, there is an increase in the gaps at the high end of the wage distribution, combined with a decrease in the wage gaps at the low end, which together create a decline in the middle wages vis-a-vis both the high and low wages.

a. Trends in the hourly wage

Shows the P90/P50 ratio and the P50/P10 ratio. It can be seen that in the decade from 1988 to 1998, the gap between the top decile and the median grew significantly, and that it remained high in the following years. In addition, that the gap between the median and the bottom decile grew between the years 1987 and 1994, but in the years 1994–2006 it shows a steep decline, which results in a significant reduction of the P50/P10 gap over the period as a whole. Similar trends for US hourly wage inequality are described by Autor et al. (2008) for the same period.

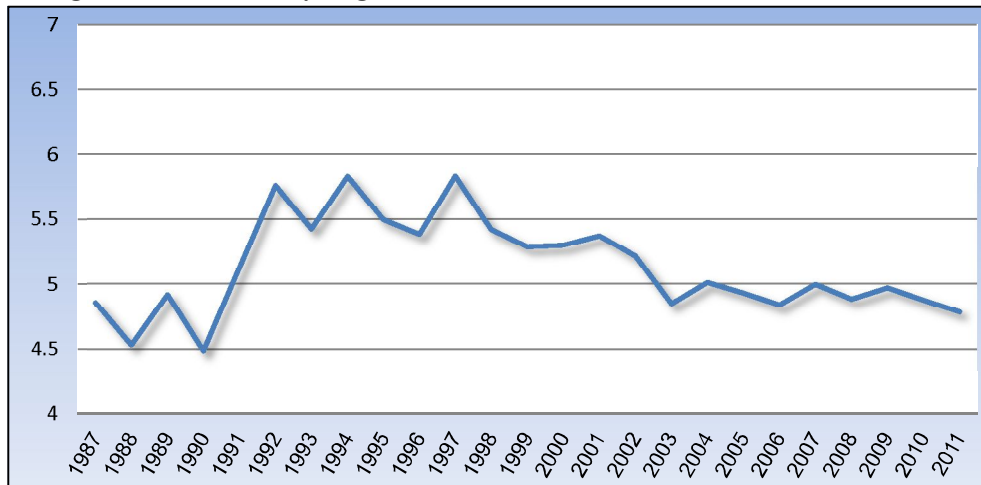
Multiplication of the P90/P50 ratio by the P50/P10 ratio provides the P90/P10 ratio. As Figure 9 shows, the P90/P10 ratio did not change much during that period. However, as we have seen, its composition has changed, and now most of the gap is concentrated in the upper half of the distribution. A similar trend can be demonstrated for either male or female hourly wage distribution.

Figure 8
Changes in hourly wage decile ratios, 1987–2011



SOURCE: Based on the ISCBS.

Figure 9
Changes in P90/P10 hourly wage decile ratio, 1987–2011



SOURCE: Based on the ISCBS.

b. Percentile changes (U Shape)

Figure 10 shows in a more detailed manner the change in each hourly wage percentile between the years 1987 and 2011. For each percentile, the relative hourly wage change is

compared to the median hourly wage, and presented by the formula $\frac{w_p^{2011}}{w_p^{1987}} / \frac{w_{50}^{2011}}{w_{50}^{1987}}$. It can be

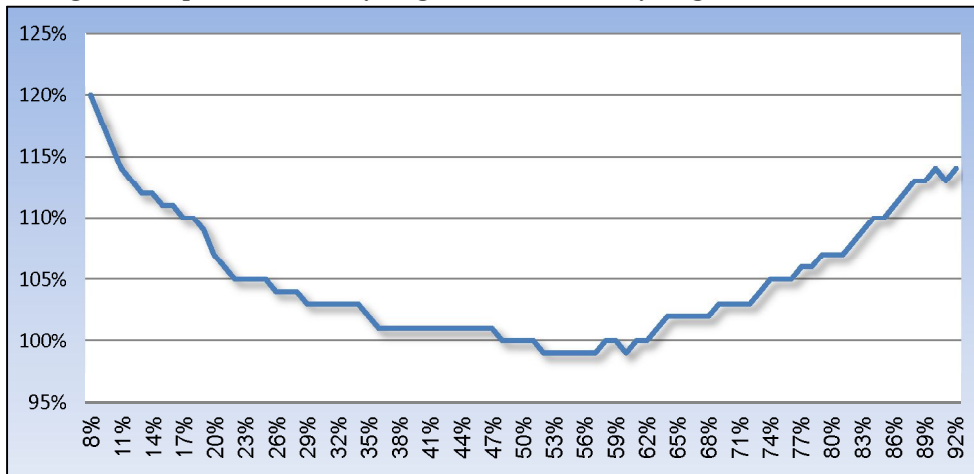
easily noticed that this is equivalent to $\frac{w_p^{2011}}{w_{50}^{2011}} / \frac{w_p^{1987}}{w_{50}^{1987}}$ i.e. the change in the hourly wage ratio

between each percentile p and the median between the years 1987 and 2011. It can be seen that the middle percentiles have witnessed a decline in their income compared to both the high and the low percentiles.

c. Is the middle class disappearing?

A popular claim argues that the middle class in Israel is disappearing. The data we have shown suggest that there is a decline in the middle wage. This does not lead to the conclusion that the number of people defined as middle class is decreasing.

Figure 10
Changes in the percentile hourly wage vs. median hourly wage, 1987–2011

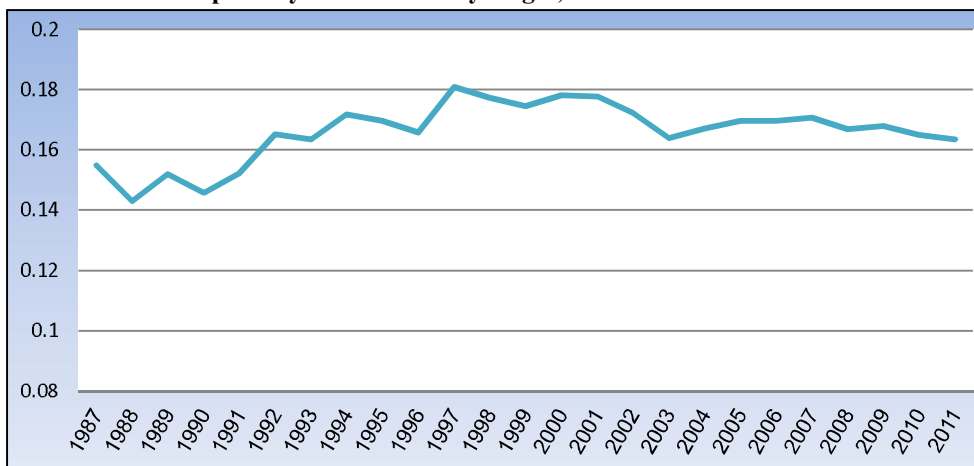


SOURCE: Based on the ISCBS.

In order to assess the size of the middle class we use the Foster-Wolfson bipolarity index (Foster and Wolfson, 2010). This index distinguishes between polarized wage distributions, in which workers concentrate at the high and low ends of the distribution, and distributions that exhibit a wide middle.

Figure 11 presents this index for the years 1987–2011. It can be seen that there was no significant increase in this measure, and therefore, although the relative income of the middle class has decreased, its size has not decreased.

Figure 11
Foster-Wolfson bipolarity index of hourly wages, 1987–2011

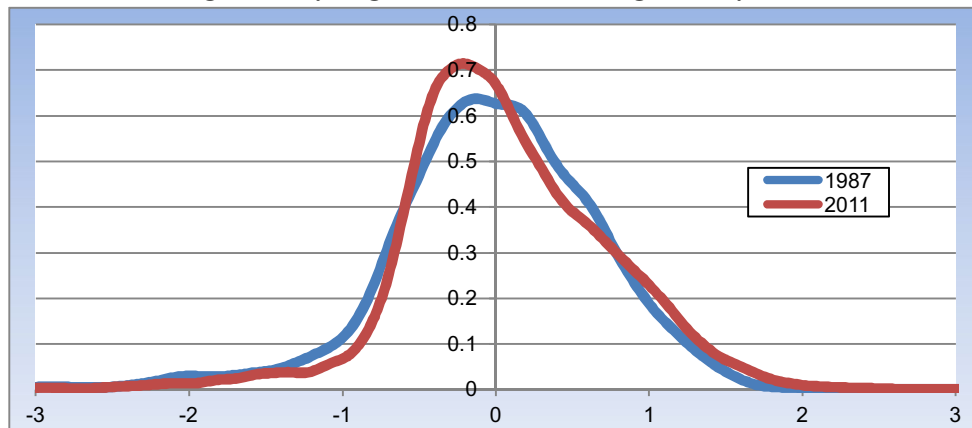


SOURCE: Based on the ISCBS.

d. Sources of the decline in middle wages

What has led to this change in middle wages? Until now we have used measures that describe the decline of the middle wages, which are simple but, unfortunately, can't be decomposed. Using these measures alone, it is impossible to observe the sources of the changes in wage distribution.

Figure 12
Distribution of log of hourly wage around the mean wage in the years 1987 and 2011



SOURCE: Based on the ISCBS.

Therefore, we utilize a different index that describe these changes but is also decomposable. Such index is the skewness of the distribution, which can be computed using the 3rd moment of the log wage distribution.⁵

This index, as its name suggests, measures the skewness—or lack of symmetry—of the distribution. When there is an increase of the gaps at the high end, and a decrease at the low end, the distribution has a longer right tail but more of the distribution mass is concentrated on the left side, thus becoming skewed to the left (positively skewed). This phenomenon is exhibited in the log wage distribution in the years 1987–2011, as can be seen in Figure 12.

As could have been anticipated, when looking at the skewness over the years in Figure 13, it gradually increases.

The advantage of using this measure is its decomposability. The division is done as follows: We divide the population into groups. These groups could be education levels, age, occupation, etc.

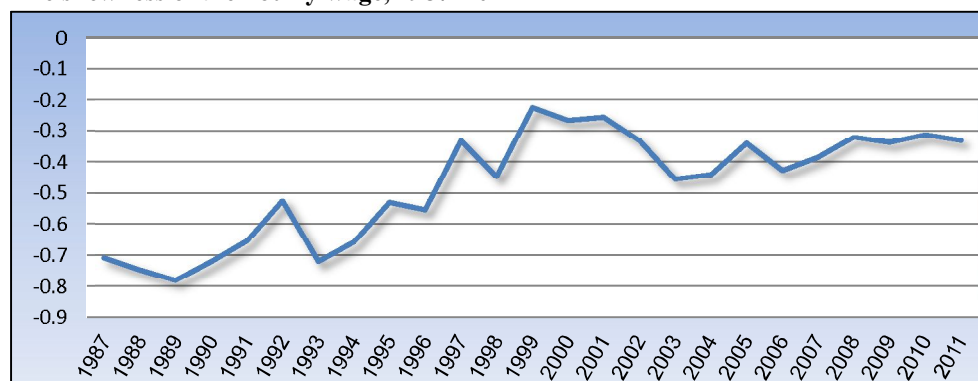
The skewness is decomposed according to the following formula:

$$S(\log(w)) = E(S(\log(w) | X)) + S(E(\log(w)) | X) + 3\text{COV}(E(\log(w) | X), V(\log(w) | X))$$

⁵ Skewness is defined as $(\log(w)) = \frac{E[\log(w) - E[\log(w)]]^3}{V[\log(w)]^{0.5}}$

The first component in this decomposition is the skewness within the groups, the second component is the skewness between the groups, and the third component represents the covariance between the wage level and its variance at each group. This component becomes significant when groups with higher wage levels also exhibit higher inequality⁶, and similarly when groups with lower wages also exhibit lower inequality.

Figure 13
The skewness of the hourly wage, 1987–2011



SOURCE: Based on ISCBS data.

Table 2 presents this decomposition for various group divisions, and shows the relative contribution of each of the components to the general trend. 70 percent of the skewness increase is explained by the 3COV component of the occupations. This means that most of the skewness can be explained by an increase in the correlation between the wage level in an occupation and its corresponding inequality.

Table 2
Decompositions of the change in skewness measure by various groups

Grouping	Skewness Between groups	Skewness Between groups	3COV
Occupation	0.18 [0.173,0.188]	0.11 [0.109,0.112]	0.709 [0.702,0.716]
Age	0.377 [0.370,0.385]	0.289 [0.286,0.291]	0.334 [0.330,0.338]
Education	0.698 [0.668,0.707]	-0.032 [-0.032,-0.031]	0.338 [0.334,0.342]
Age and Education	0.109 [0.102,0.115]	0.314 [0.311,0.317]	0.577 [0.571,0.583]
Gender	1.021 [1.008,1.033]	0.007 [0.007,0.007]	-0.027 [-0.028,-0.026]

⁶ The wage level is measured by the expectancy of the log wage, and the inequality by the variance of the log wage.

In other words, the expansion of the gaps in the upper half is caused mainly by the expansion of the gaps within occupations with higher wages, while the decrease of the gaps in the lower half is caused by the compression of wages in low paying occupations. “General Manager” is a good example for an occupation with both high wage levels and high inequality, while “unskilled worker” is a good example of an occupation in which the wages are low and also compressed, i.e. lower variance.⁷

Both age and education can also explain some part of the trend. However, this finding is much less significant, since compared with occupation, both age and education groups have a higher correlation with wages. It seems that the changes within the various occupation groups are linked with changes to the education and experience premium.

It is worth noting that the increase in the minimum wage relative to the average wage compresses the wage distribution at the lower end, and may explain some of the decrease in inequality in the lower part of the distribution. Specifically, it might have compressed the wage in low-pay occupations, (Mazar and Peled, 2012).

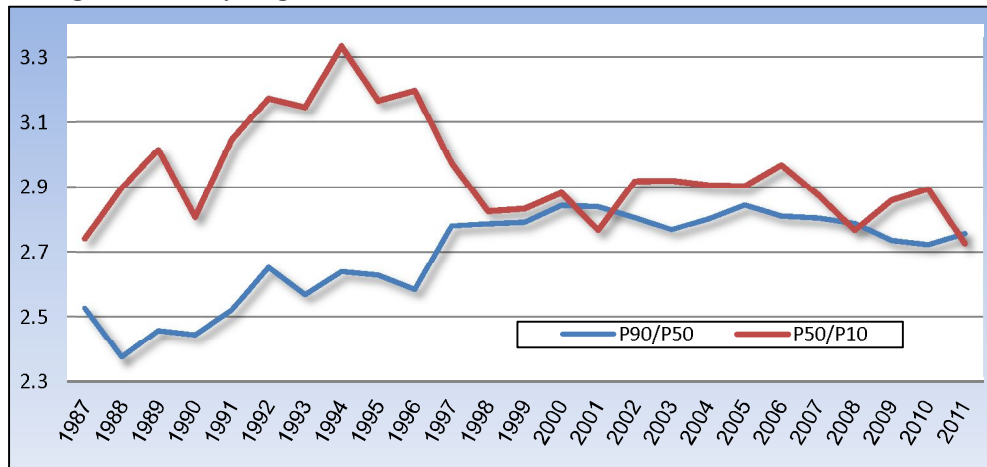
4. INDIVIDUAL WAGES—THE POOR WORKERS

In the previous chapter we examined hourly wages to discover a relative decline in the middle wages relative to both the high and the low wages. In fact, we have seen a decrease in inequality at the lower half of the distribution.

In this chapter we examine individuals’ wages (total wage per worker). We show that at the upper half of the distribution, the wage per worker follows a similar increase to the hourly wage. But at the lower end of the wage distribution, gaps are not compressed, unlike the hourly wage. The reason for that is the decline in the number of hours worked by the workers with lower wages, and a rise in the number of part-time or very part-time jobs.

⁷ The change in the coding of occupations over the years does not allow for a precise analysis of which exact occupations caused this increase.

Figure 14
Changes in monthly wage decile ratios, 1987–2011



SOURCE: Based on the ISCBS.

Figure 15
Changes in the percentile monthly wage vs. median monthly wage, 1987–2011

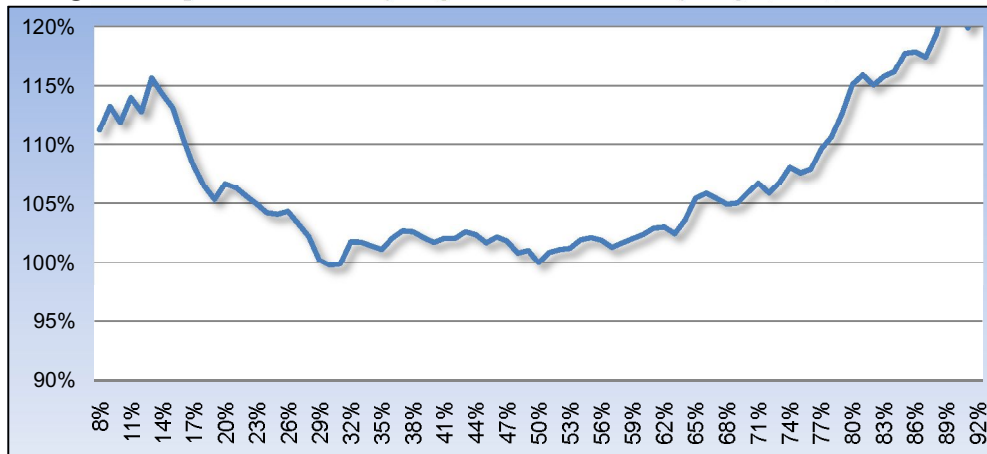


SOURCE: Based on the ISCBS.

a. Trends in workers' wages

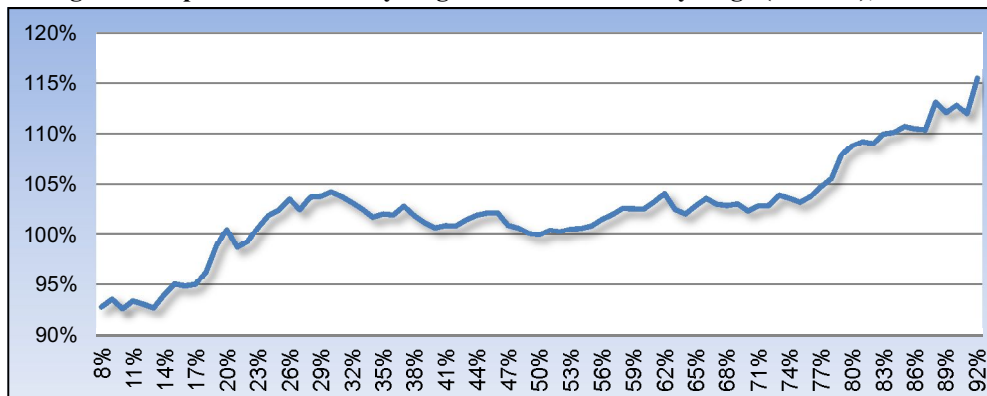
Figure 14 shows that in the years 1987–2011 there was an increase in gaps at the upper half of the distribution, while no change is registered in the gaps at the lower half of the distribution within the study period. That is, the trend in workers' wages is similar to the trend in hourly wage at the upper half, while the trend at the lower half is different.

Figure 16
Changes in the percentile monthly wage vs. median monthly wage (Men), 1987–2011



SOURCE: Based on the ISCBS.

Figure 17
Changes in the percentile monthly wage vs. median monthly wage (Women), 1987–2011

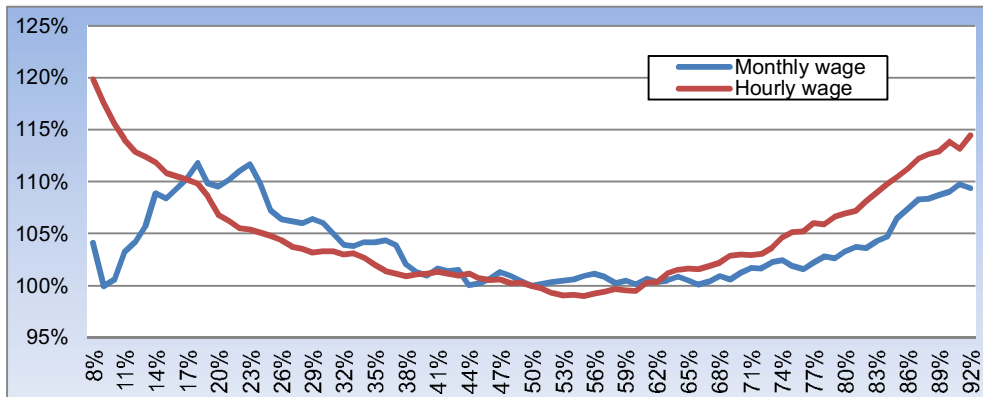


SOURCE: Based on the ISCBS.

Figures 15, 16, and 17 show the relative change in the wages in each percentile. (See explanation for Figure 10.) There is a similar U shape in the chart, but this U is shifted to the right. There is some increase of workers in the 20th percentile relative to the median. In contrast, in lower wages, in the vicinity of the lower decile, there is no relative improvement. That is, there is a significant increase in the gap between the 10th and 20th percentile.

Figure 18 compares the changes in both the hourly wage and the individual wage, and shows that the gap is concentrated at the lower percentiles.

Figure 18
Changes in percentile wage vs. median wage, 1987-2011



SOURCE: Based on the ISCBS.

There is also a noticeable difference between the genders. For females, there is no U shape and there is a relative decline in the lower percentiles. We can therefore infer that the low income workers who have not improved their wages are mostly women.

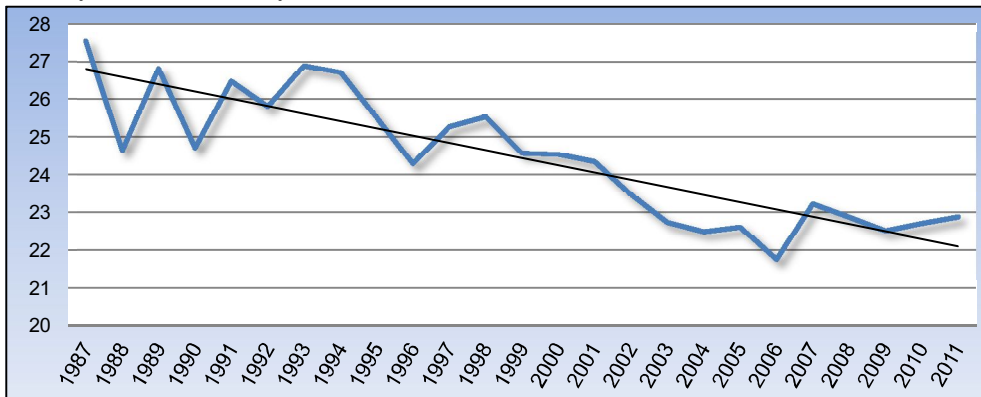
b. Distribution of working hours

The reason there is no decrease in wage gaps in the lower half of the individual wage distribution stems from the change in the number of hours worked. Obviously, that if all workers worked the same number of hours, there would be no difference between the hourly rate and the individual wages.

Figure 19 shows the average number of hours worked by workers in the lower decile during the study period. The weekly number of hours per worker declined from 27 to 22. This considerable decline of approximately 20 percent offsets the relative increase in the hourly wage.

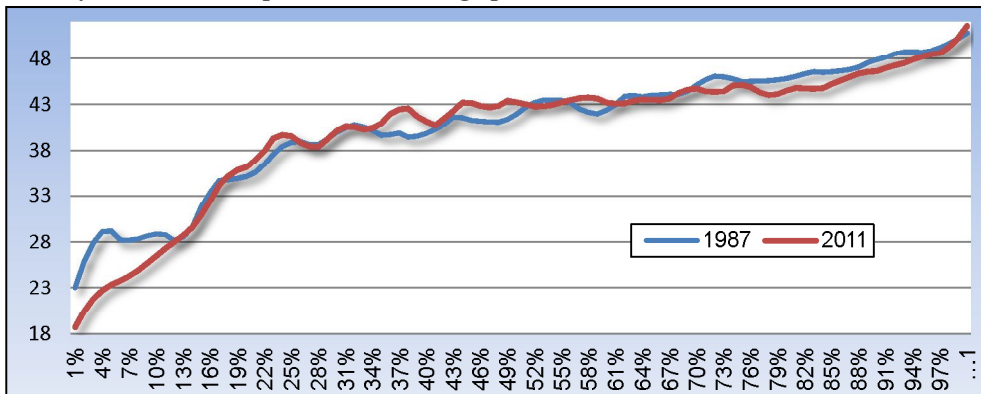
Figure 20 shows the average number of hours worked in each income percentile in the years 1987 and 2011. It can be clearly observed that the most significant change in the numbers of hours worked occurs at the low end of the income distribution. Furthermore, the number of working hours is much smaller for low-income percentiles. From this we deduce that a considerable part of the gap in wages can be attributed to the gap in number of hours worked.

Figure 19
Weekly hours worked by workers in the lowest decile, 1987–2011



SOURCE: Based on the ISCBS.

Figure 20
Weekly hours worked per worker in wage percentile, 1987 and 2011



SOURCE: Based on the ISCBS.

In summary, we describe two processes working in opposite directions: the number of hours worked by workers in the lower percentiles decreased, while the hourly wage rate has increased in relative terms. These two processes effectively canceled each other out and left the gap at the same level at the lower half of the distribution.

5. THE UPPER END OF THE WAGE DISTRIBUTION

Wage distributions in different countries share some common attributes: they are asymmetric, with positive skewness and a heavy “fat” tail (Neal and Rosen, 2000). The asymmetry and the positive skewness mean that many workers get low wages, while a few

earn a lot. The “fat” tail means that the small part of the population enjoying high wages also gets a disproportionate share of the total wage. The ISCBS reveals that the top decile earned 30 percent of the total wage, and the top percentile earned 6 percent of the total wage.

The estimation of the tail of the distribution from surveys like the ISCBS is problematic. Researchers such as Burkhauser et al. (2012) suggest using a parametric estimation of the distribution in order to analyze the tail, using distributions such as the Generalized Beta of the second kind, which was found to be compatible with the empirical wage distribution (Bandourian et al., 2002).

The parameters of the GB2 distribution for the study period were estimated and are presented in

For the sake of comparison the distribution was normalized such that the average wage is 1.⁸

Table 3
GB2 distribution parameters

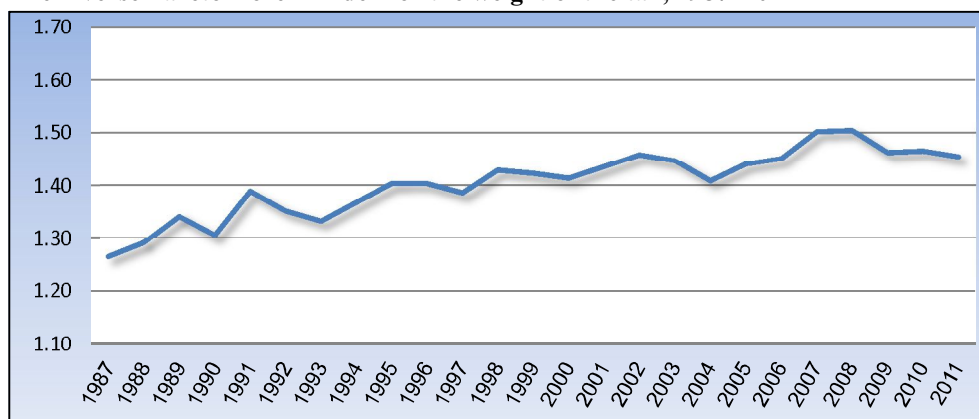
Year	α	β	P	Q
1987	1.99	1.31	0.90	1.90
1988	2.53	1.23	0.66	1.36
1989	2.93	1.11	0.54	1.00
1990	2.59	1.18	0.65	1.26
1991	3.33	1.02	0.47	0.77
1992	2.37	1.09	0.69	1.20
1993	2.53	1.16	0.62	1.19
1994	2.71	1.10	0.54	1.00
1995	3.06	1.01	0.49	0.81
1996	3.35	1.02	0.44	0.74
1997	2.38	0.98	0.70	1.09
1998	2.99	0.90	0.56	0.78
1999	2.66	0.89	0.66	0.89
2000	2.50	0.91	0.70	0.97
2001	2.72	0.87	0.64	0.84
2002	3.27	0.87	0.50	0.67
2003	3.40	0.89	0.48	0.66
2004	2.84	0.95	0.58	0.86
2005	3.09	0.89	0.53	0.73
2006	3.39	0.90	0.47	0.65
2007	4.24	0.83	0.38	0.47
2008	4.30	0.81	0.39	0.46
2009	3.38	0.86	0.49	0.64
2010	3.63	0.85	0.47	0.59
2011	3.46	0.86	0.50	0.64

SOURCE: Based on the ISCBS.

⁸ In order to get the actual wage distribution, you need to multiply by the average wage for that year. The normalization affects only the β parameter.

From the GB2 distribution we can deduce the attributes of the right tail. The higher the weight of the right tail, the higher the wage share of the top percentiles. A good measure of the tail weight is the inverse Pareto-Lorentz index. This index expresses the level of inequality at the high end of the wage distribution. It is defined as the ratio between the average wages of all workers exceeding some threshold value, and the threshold itself.⁹ For example, in a wage distribution with an inverse Pareto-Lorenz index of 1.4, the average wage of all the workers with wages exceeding NIS 20,000 is NIS 28,000. Figure 21 depicts this index in the study period and shows a gradual increase in the weight of the tail. Therefore, inequality at the top end of the income distribution increased.

Figure 21
The inverse Pareto-Lorenz index for the weight of the tail, 1987–2011



SOURCE: Based on the ISCBS.

6. SOCIO-DEMOGRAPHIC INEQUALITIES AND THEIR TRENDS

This chapter covers the contribution of the wage gaps between various socio-demographic groups to the general inequality of the entire population. For this purpose we shall use the Theil index. This index enables us to decompose inequality into two components: inequality between groups and inequality within groups.¹⁰

The Theil inequality index expresses the degree of difference between the population division and the corresponding income division. When the wage distribution between groups overlaps with their relative size (each group has the same share of income as its share in the population), the Theil index represents full equality. If one of the groups has the same share in income and in population, its contribution to the Theil index is zero.

⁹ A characteristic of the GB2 distribution is that for any threshold above a certain level, the inverse Pareto-Lorenz index yields the same value.

¹⁰ The other indices we have used thus far to measure inequality (Gini or percentile ratios) do not enable such a decomposition. The trend in the general inequality measured by this index is identical to the other indices.

Groups with income share greater than their share in the population have a positive contribution, while groups with smaller share have a negative contribution. Each group can be further subdivided up to the level of individuals, where the Theil index expresses the gap between the individual's share of the total income, and his or her share in the population. (Every individual has the same share of the population, but a different share of the income.)

We decompose inequality according to gender, ethnicity (i.e. Jews vs. Arabs) sector, and years of education.¹¹ In all cases we show that most of the inequality is attributed to the inequality within the groups and not between them. Nevertheless, a small change of few percent in the level of inequality can be significant in an international comparison. We focus on the relative changes over time, rather than on the absolute value of group division.

a. Gender inequality – an ongoing reduction

In the Israeli labor market there are various forces acting to increase the participation of women in the labor force and reduce the gender gap.

Table 4
Characteristics of the labor market in the prime working ages (25-54)

	Entire population	Labor force		Unemployed		Partial workers	
	(1000)	(1000)	Percent out of the population	(1000)	Percent out of the labor force	(1000)	Percent out of the labor force
Entire population	2,899.7	2,286.2	78.8%	116.4	5.1%	547.6	24.0%
Females	1,461.8	1,081.6	74.0%	54.8	5.1%	359.4	33.2%
Males	1,437.9	1,204.6	83.8%	61.6	5.1%	188.3	15.6%
Jewish females	1,146.1	960.9	83.8%	47.9	5.0%	320.0	33.3%
Jewish males	1,119.6	946.0	84.5%	49.9	5.3%	163.4	17.3%
Arab females	276.7	86.8	31.4%	4.7	5.4%	28.8	33.2%
Arab males	279.2	222.1	79.5%	10.0	4.5%	20.3	9.1%

SOURCE: Central Bureau of Statistics, Statistical abstract 2012.

The entry of women into the labor market is a long-term trend that started in the 1960s. Table 4 shows that the participation rate of Jewish women is nearly identical to the participation rate of Jewish men. The participation of Arab women is particularly low—less than one-third.

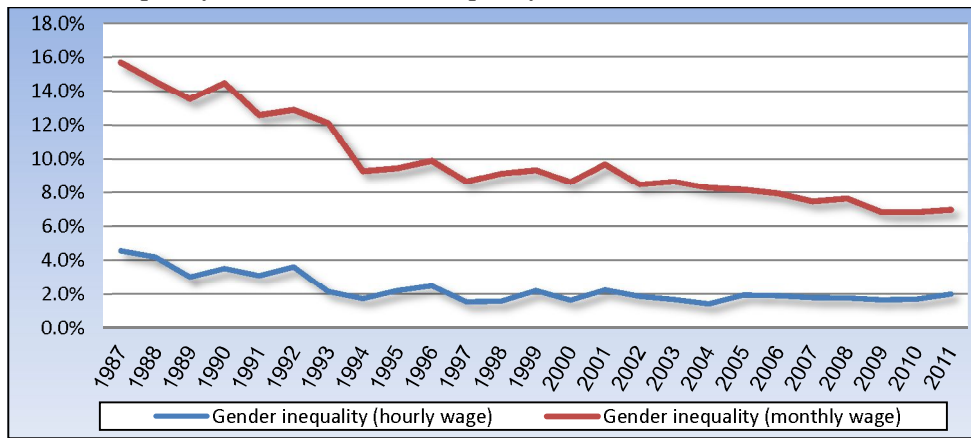
¹¹ Haberfeld and Cohen (2007), studied the influence of the Ashkenzi/Mizrachi division on inequality. We examined the Theil index decomposition according to continent of birth, and found that this division contributes 5 percent of total inequality, while most of the inequality is within the groups.

Table 5
Wages of men and women in 2010

Hired workers (2010)	Gross wage	Gross hourly wage	Work hours per week	Gini (Monthly wage)	Gini (Hourly wage)	Percentage in the below the median (Monthly wage)
Entire population	8,100	47.9	40.4	41.5%	36.8%	
Females	6,386	43.0	35.6	39.6%	34.8%	60.8%
Males	9,720	51.4	44.9	40.6%	37.9%	39.6%

SOURCE: Central Bureau of Statistics, Israel abstract for 2010; Median and Gini by the authors.

Figure 22
Gender inequality as a share of total inequality, 1987–2011



SOURCE: Based on the ISCBS.

Table 5 shows that the average monthly wage for men is 52 percent higher than the average monthly wage for women. The average hourly wage rate is 19.5 percent higher for men. The fact that many women are working in part-time jobs increases inequality. About 60 percent of working women earn less than the median wage, while this is true for only 40 percent of working men. The fact that more women can be found in the lower end of the wage distribution is reflected by the relatively low inequality among women. Inequality among women is lower than among men in both monthly and hourly wages. Nevertheless, the small difference between the inequality within the groups and the total inequality in the general population shows that most of the inequality is caused by the inequality within the genders rather than the inequality between them.

Theil inequality can be decomposed as follows: Theil inequality between the mean wage of men and the mean wage of women (inter-gender inequality), plus the weighted sum of the Theil inequality among men and the Theil inequality among women (intra-gender inequality).

Figure 22 shows that the inter-gender inequality is low, and out of the total inequality in monthly wages in 2011 only 7 percent can be attributed to intra-gender inequality (2 percent while measuring hourly wages). Moreover, it shows that the inter-gender gap is narrowing over the study period.

b. Ethnic inequality – wages in the Arab population are half the wages in the Jewish population

The wage gaps between the Jewish and Arab populations in Israel are large. In order to neutralize the impact of the low participation rate among Arab women, we tested the inequality between Arab and Jewish men.

Table 6 shows that both Jewish and Arab men work the same number of monthly hours, but the monthly wage of Arabs is only 54 percent of the wage of Jewish salaried workers. Inequality among Arab men is much lower than inequality among Jewish men, as a result of the concentration of the former in the lower end of the wage distribution where there is higher similarity in wages. More than 80 percent of the Arab workers earn below the median wage.¹²

Table 6
Monthly wage of Arab and Jewish men in 2011

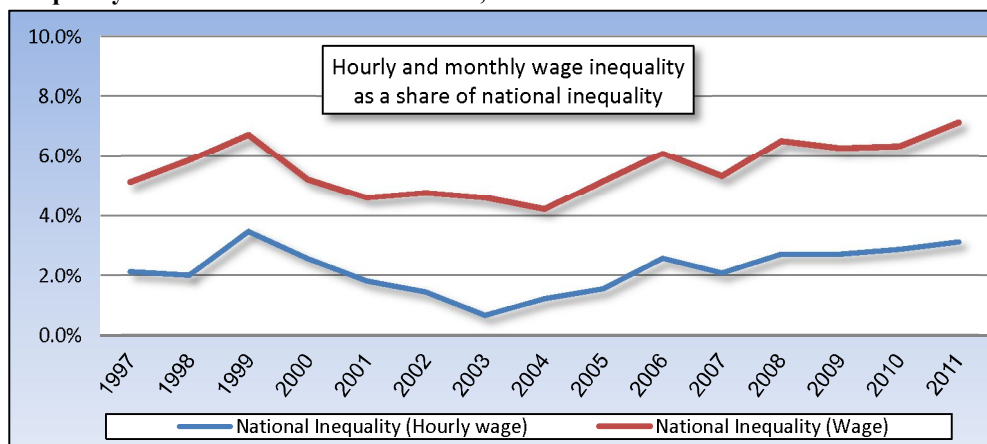
2011 (Salaried workers)	Gross monthly wage	Gross hourly wage	Hours worked per week	Gini (Monthly wage)	Gini (Hourly wage)	Percent below the median
Men	9,949	52.2	44.5	40.9%	38.7%	
Jews	10,813	56.5	44.6	40.7%	38.4%	46.5%
Arabs	5,893	32.4	44.1	26.7%	28.4%	81.0%

SOURCE: Based on the ISCBS.

A Theil decomposition of inequality among male salaried workers suggests that the share of inequality that can be attributed to the ethnic gap increased in the last several years. Nevertheless, even at its peak, the ethnic gap consists of only a small fraction of total inequality, especially regarding the hourly wage.

¹² A thorough discussion on the wage differences between Jewish and Arab populations can be found in Miaary et al. (2011).

Figure 23
Inequality between Jewish and Arab men, 1987–2011



SOURCE: Based on the ISCBS.

c. Inequality by education – the less educated are left behind

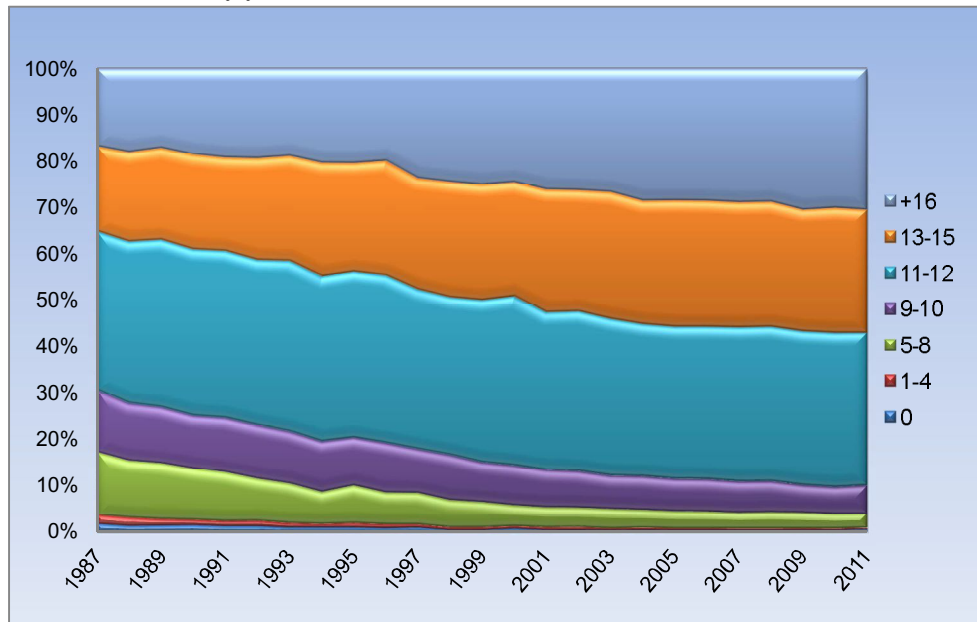
Table 7
Salaried workers' wages by years of education, 2011

2011	Gross monthly wage	Gross hourly wage	Hours worked per week	Gini (Monthly wage)	Gini (Hourly wage)	Percent below the median
Entire population	8,306	47.6	40.3	41.1%	36.9%	
Up to 10 years of education	4,995	29.0	40.5	30.0%	31.8%	77.3%
11–12 years of education	6,294	35.2	41.1	35.4%	36.5%	63.2%
13–15 years of education	8,142	47.3	39.3	40.2%	38.2%	49.2%
16+ years of education	11,728	67.6	40.1	39.4%	37.1%	29.4%

SOURCE: Based on the ISCBS.

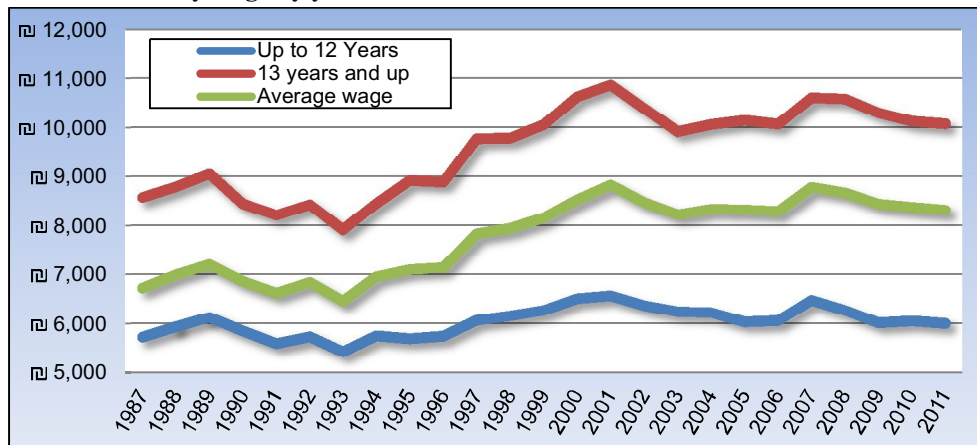
Years of schooling are an important factor in the determination of wages. Workers with lower education levels are found in the lower end of the wage distribution, while workers with higher education levels are found in the higher end. The lower level of education does not greatly reduce the number of hours worked, but it affects the hourly wage. The wage of workers with the lowest education level (less than 10 years), is 60 percent of the average wage. The wage of workers with 12 years of schooling is 75 percent of the average wage, and workers with higher education (16 years of education or more) earn 141 percent of the average wage.

Figure 24
Salaried workers by years of education



SOURCE: Based on the ISCBS.

Figure 25
The real monthly wage by years of education

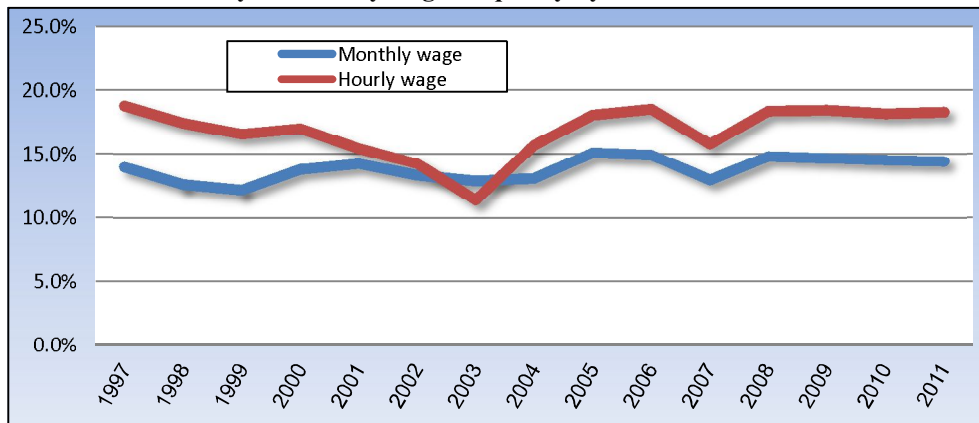


SOURCE: Based on the ISCBS.

The Israeli population became more educated over the course of the study period. The share of workers with (less than 10 years of education) has grown smaller. The share of workers with secondary school education remained roughly the same. There was a small increase in the share of workers with 13–15 years of education, and the group that increased the most is workers with more than 16 years of education.

The group of workers with secondary education or less shrank, but it still consists of 50 percent of salaried workers. Their real wage (inflation adjusted) stayed roughly the same throughout the last 25 years. Such a segmented labor market structure suggests that the share of the population that has not increased their education level above secondary education has not benefited from overall growth.

Figure 26
The share of monthly and hourly wage inequality by level of education



SOURCE: Based on the ISCBS.

A Theil decomposition of monthly wage inequality by years of schooling shows that the inequality between education groups makes up 14 percent of total wage inequality. This share is stationary throughout the years of the study. The share of the hourly wage inequality that can be attributed to differences between the education groups is approximately 18 percent, but is somewhat more volatile.

The hourly wage decomposition suggests that the gender gap accounts for only 2 percent of inequality, and the ethnic gap accounts for 3 percent, but the education gap accounts for 18 percent. Moreover, in the demographic analysis the hourly wage share is lower than the monthly wage share, but when considering the level of education, the hourly wage inequality's share is higher than that of the monthly wage inequality.

7. INEQUALITY IN EQUIVALIZED DISPOSABLE INCOME – A GAP EXPANDING POLICY

In this chapter we analyze the inequality in equivalized disposable income as it was defined in section B.2.

In the last decade there has been an increase in the level of inequality for equivalized disposable income (after redistribution). This increase occurred, even though the level of inequality in equivalized market income before redistribution fell during the same period. The main reason for these two trends is a dramatic change in the government's redistribution policy of taxes and allowances. Starting from 2003, there has been a decline in both the amount of direct taxes collected and the amount of transfers made. Since direct taxes and transfers reduce inequality, their decrease directly increases inequality.

This policy might also have an indirect effect that may reduce inequality. It seems that the reduction in taxes and allowances, together with the exit from the crisis of the second Intifada, led to an increase in the labor force participation rate. This led to a decrease in inequality in equivalized market income. Because the direct effect of the reduction in taxes and allowances was stronger, the inequality in equivalized disposable income has increased. Moreover, we can determine that compared to beginning of the period, the high level of inequality (in a global perspective) is more a result of less effective government intervention, and is less driven by market inequality.

a. Trends in inequality of equivalized income – before and after redistribution

In all developed countries, state intervention in household income reduces inequality. All developed countries collect higher taxes from higher income households, and transfer more generous allowances to lower income households. In chapter B, we saw that the OECD average Gini index for equivalized market income is 47 percent while the Gini index for equivalized disposable income is significantly lower, at 31 percent.

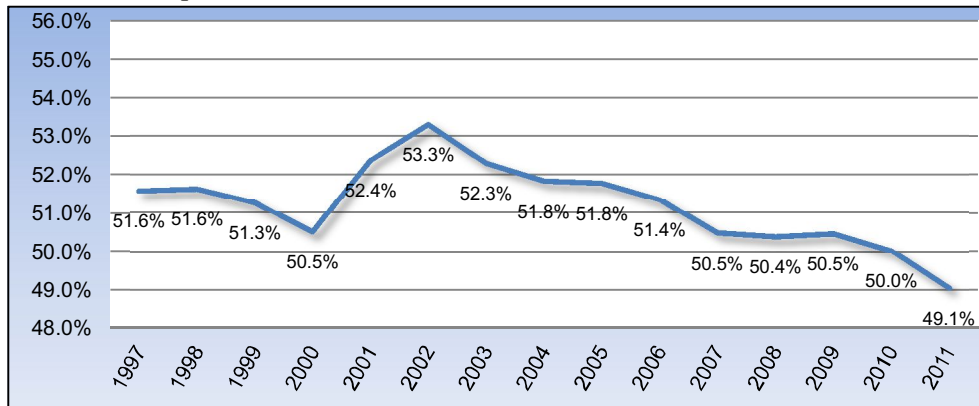
We also showed in chapter B that, while Israel has one of the highest levels of inequality in equivalized disposable income (see Figure 3), its level of inequality in equivalized market income is only slightly higher than the average (see Figure 4). We can infer that the redistribution system in Israel is less effective in reducing inequality compared to other OECD countries.

This was not always the case.

Figure 27 shows the Gini index for equivalized market income before state intervention starting from 1997.¹³ We can see that the inequality level (before redistribution) peaked in 2002. Since 2003 it has declined, and the Gini index has dropped by 4 percent. Without this drop, Israel would have been in next-to-last in the OECD comparison of the Gini index for equivalized market income.

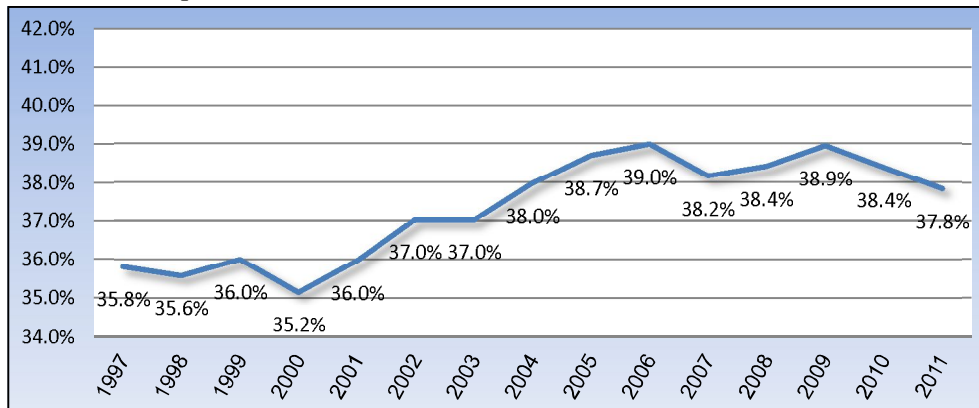
¹³ This year was chosen since this was the first year after a major redesign of the Survey of Households. See methodology appendix.

Figure 27
Gini index of equivalized market income, 1997–2011



SOURCE: Based on the ISCBS.

Figure 28
Gini index of equivalized market income, 1997–2011



SOURCE: Based on the ISCBS.

Although there is a reduction in inequality before government intervention, when looking at the Gini index after taxes and transfers, we can observe that it has actually risen during the same period.

Figure 28 shows that starting from 2000, this index has risen from 35.8 percent to 37.8 percent. Even if we focus only on the period from 2002 onward, in which inequality before government intervention dropped, we can still see that inequality after state intervention has increased.

We will now analyze the causes for the decrease in inequality before redistribution and for the increase in inequality after redistribution.

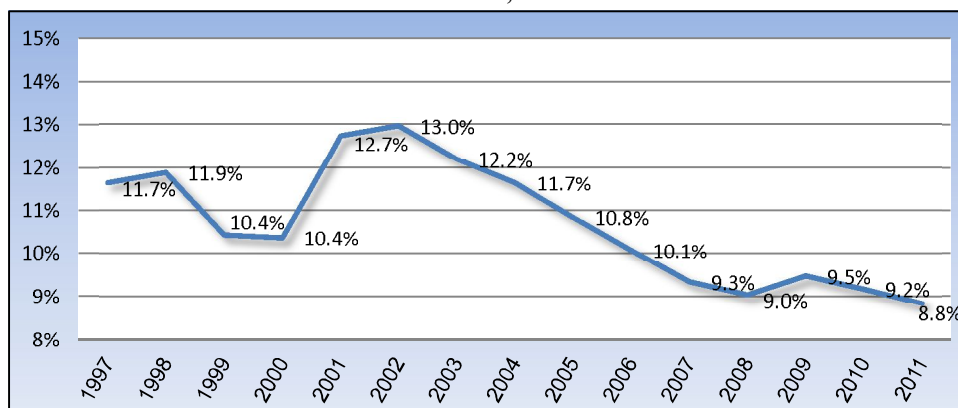
b. Increase in the share of households with market income

We start with the analysis of the decline of inequality prior to redistribution. We show that the main reason for this drop is an increase of the share of households with market income greater than zero.

There is a common misconception that the labor force participation rate in Israel is low. The source for this misconception is an incomplete measurement of the civilian labor force. (Bank of Israel, Annual Report, 2012, page 174). After making the necessary methodological adjustments, the updated data for 2012 shows that the participation rate in the prime working ages (25–64) is 78.7 percent while the OECD average is 76.1 percent. This high rate is the result of the increase in both women's participation rate and the average years of schooling.

Figure 29 shows the share of households with no market income during the years 1997–2011. That is, the share of households whose income would be zero without transfers and allowances. This share peaked at 13 percent during the years of the second Intifada and its associated recession. Since 2002, though, this share has declined and reached levels even lower than those before the recession.

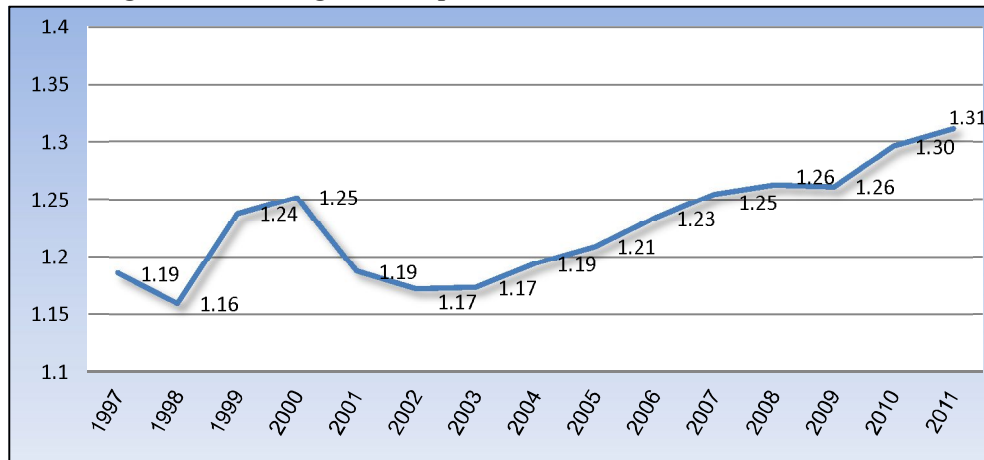
Figure 29
Share of households with no market income, 1997–2011



SOURCE: Based on the ISCBS.

Figure 30 shows the average number of wage earners (salaried and self-employed) in a household. It shows that the decline in households without market income is part of a broader trend of an increase in labor force participation. This is related to both the end of second Intifada recession and new government policy.

Figure 30
The average number of wage earners per household, 1997–2011



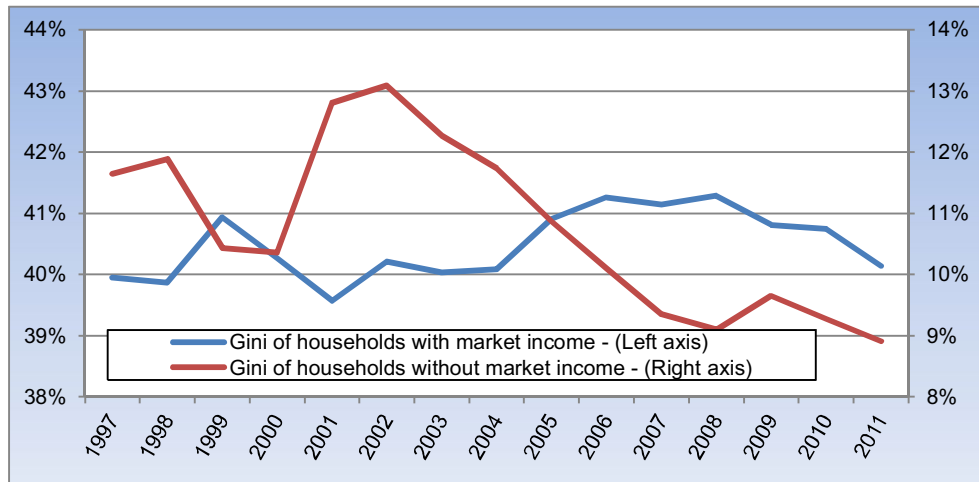
SOURCE: Based on the ISCBS.

In fact, we can definitively determine that the decline in the Gini index of equivalized market income stems from the decline in the share of households without market income. The Gini index can be decomposed into the sum of (a) the inequality level among households with income, and (b) the inequality level between households with market income and households without it.¹⁴

Figure 31 plots these two series. Although the Gini index among households with market income is much higher, it is rather stable, while the inequality between the groups sharply declined in the years 2002–2011 from 13 percent in 2002 to 8.9 percent in 2011. That is, the entire decline in inequality in equivalized market income stems from the decline in inequality between households with and without market income. Moreover, we can determine that this decline stems from the decrease in the share of the households without market income.

¹⁴ In this case we are able to decompose the Gini index, since the groups do not overlap (any household with market income has more income than a household without).

Figure 31
Gini decomposition between households with no market income and households with market income



SOURCE: Based on the ISCBS.

c. Redistribution policy reform

The fact that inequality in equivalized disposable income increased while inequality in equivalized market income decreased suggests that the redistribution policy became less effective in reducing of inequality.

It can clearly be seen that in this period there was a broad decline in direct taxation. We can look at the effective tax rate, which we define as:

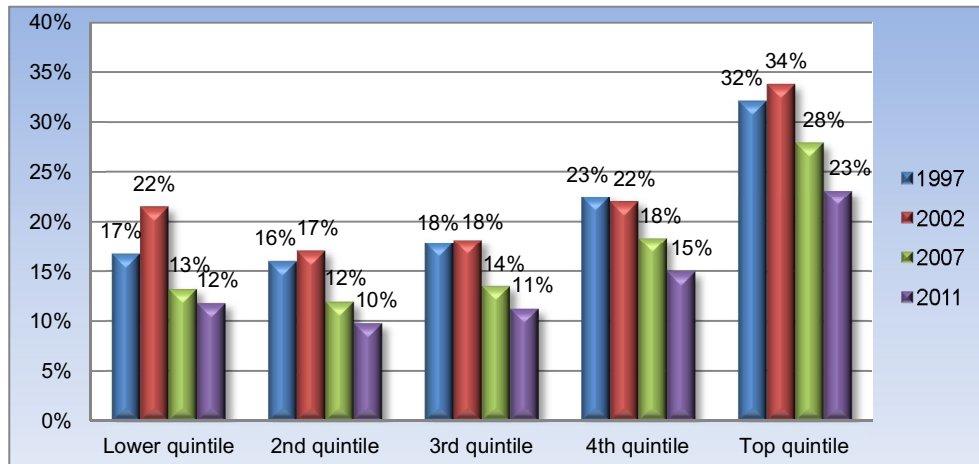
$$\frac{\text{Gross income} - \text{Disposable income}}{\text{Market income}}$$

That is, the share of income that the government retains out of the total market income. We compute this value for each quintile.¹⁵ The results are displayed in Figure 32. In each quintile there is a decline of 7.10 percent in the effective tax rate, which starts in 2002 and gradually continues to 2011.¹⁶

¹⁵ The division into quintiles is done according to equivalized disposable income.

¹⁶ The lowest quintile pays a rate higher than the rate paid by the quintile above it. The collected sum is nominally lower, but it is higher relative to market income.

Figure 32
The effective tax rate on households according to quintiles of equivalized disposable income, 1997–2011



SOURCE: Based on the ISCBS.

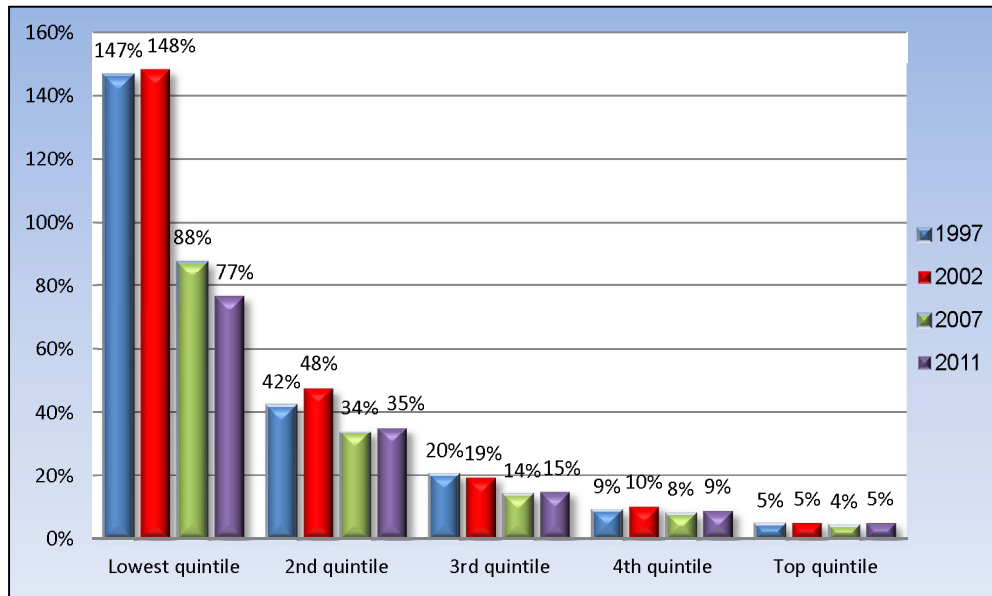
Figure 33 shows the changes in the allowances (transfers from state to individuals) by quintiles.

We define the allowances share as the ratio of the total amount of transfers to market income.

$$\frac{\text{Gross Income} - \text{Market income}}{\text{Market Income}}$$

Similar to what we showed for direct taxes, there is also a decline in the allowance share, but it varies between different quintiles. The most drastic change appears in the lowest quintile which has dropped from 158 percent of its market income in 2001 to 76 percent in 2011. In higher quintiles, this drop is substantially smaller. There is even some increase in the allowances share starting in 2008, so the allowances in the top quintile are actually higher in 2011 than in 2002.

Figure 33
Transfers out of the market income of households by quintiles of equivalized disposable income, 1997–2011



SOURCE: Based on the ISCBS.

Table 8 shows the changes in the redistribution policy. It shows, for various income sources, the share of the population for which this income source is its main income source in the years 2002 and 2011. For example, the share of households for which the main source of income is from salaried work has risen from 57.4 percent to 61.3 percent. At the same time, the share of households for which the main income source is subsistence allowance has dropped from 3 percent to 1.7 percent.

Table 8
The changes in the main income sources for households between 2002 and 2011 (present)

Main income source for household	2002	2011	Relative change
Wage compensation	57.45	61.34	6.76
Self-employed income	7.55	8.83	16.90
Capital income	0.82	1.44	74.25
Pension	7.84	7.44	-5.02
Pensions from abroad	0.93	0.55	-41.29
Other support	2.00	1.86	-7.04
Children allowances	1.41	0.56	-60.10
Old age allowance	9.74	9.08	-6.81
Survivors allowance	1.45	0.54	-62.57
Work injury allowance	0.23	0.13	-43.02
Disability allowance	2.72	3.26	20.12
Unemployment benefits	1.41	0.65	-54.12
Subsistence allowance	3.49	1.68	-51.99
Other allowances	0.63	0.51	-18.93
Transfers from other households	1.90	1.67	-11.88
No income	0.42	0.46	9.28

SOURCE: Based on the ISCBS.

There is a significant decline in the share of households for which the main income source is child allowance, survivors allowance, unemployment benefits and subsistence allowances.

These findings can explain at least part of the rise in the participation rate we have detected, and especially in households in the lower quintiles, which have suffered a significant decrease in transfers.

d. Quantifying influences on inequality

We have so far discussed 3 trends that influence inequality in equivalized disposable income: the rise in the share of households with some market income, which reduces inequality, and the reduction in direct taxes and allowances, both of which increase inequality. We will now quantify the relative contribution of each of these factors to the Gini index.

As we have noted, since 1997, there was a gradual increase in the inequality level for equivalized disposable income. This increase continued even after 2002, even though the inequality level before redistribution declined starting in that year. We now show precisely how the changes in the redistribution policy have caused the increase in inequality. We also show that the changes in redistribution policy were so sharp, they have eliminated any impact of the rise in the participation rate.

We divide disposable income into 3 factors:

$$\text{Disposable income} = \text{Market income} - \text{Direct taxes} + \text{Allowances}$$

In order to check the influence of each of these factors on inequality we use the method suggested by Lerman and Yitzhaki (1985) for the decomposition of the Gini index by income sources. This decomposition divides the contribution of each factor to the total inequality into three components: its share, the inequality within it and its correlation with the total income.

For example, the relative share of allowances measures their share out of disposable income. The inequality within allowances measures the differences in the allocation of allowances between households. Finally, the correlation factor measures the correlation between the level of allowance and the level of disposable income for each household. For allowances we expect this correlation to be negative, since households with higher income are entitled to a smaller allowance.

The relative share of allowances and taxes mechanically determines the share of market income. Therefore we attribute all changes in this component to the changes in both taxes and allowances. This is further elaborated in the appendix, while the results are presented in the next section.

Before showing the results, it is important to emphasize that this decomposition assumes these sources are independent. We measure their direct impact on inequality, without taking into account their indirect impact on each other. It is, nevertheless, plausible to assume that the declines in allowances and direct taxes are also driving the high participation rate. We will discuss this further in the summary of this chapter.

e. Results

Table 9 shows the effect of each of the factors on the Gini index in units between 0 and 100 (where 100 is the maximum Gini).

Table 9

	Market income (<i>I</i>)	Allowances (<i>A</i>)	Taxes (<i>T</i>)	Total
Relative size changes (Δ_{S_x})		1.95	1.66	3.61
Inequality changes (Δ_{G_x})	-4.27	-0.02	0.34	-3.95
Correlation changes (Δ_{R_x})	0.52	0.79	-0.17	1.14
Total	-3.75	2.72	1.83	0.8

As we can see, between the years 2002 and 2011 the Gini index declined by 3.75 percent due to changes in the market income distribution (prior to redistribution). On the other hand, the changes in redistribution policy, both allowances and taxes, increased the Gini index by $2.72+1.83=4.55$ percent. For comparison, as we saw in chapter B, the total difference in the Gini index between Israel and the OECD average is 6.2 percent.

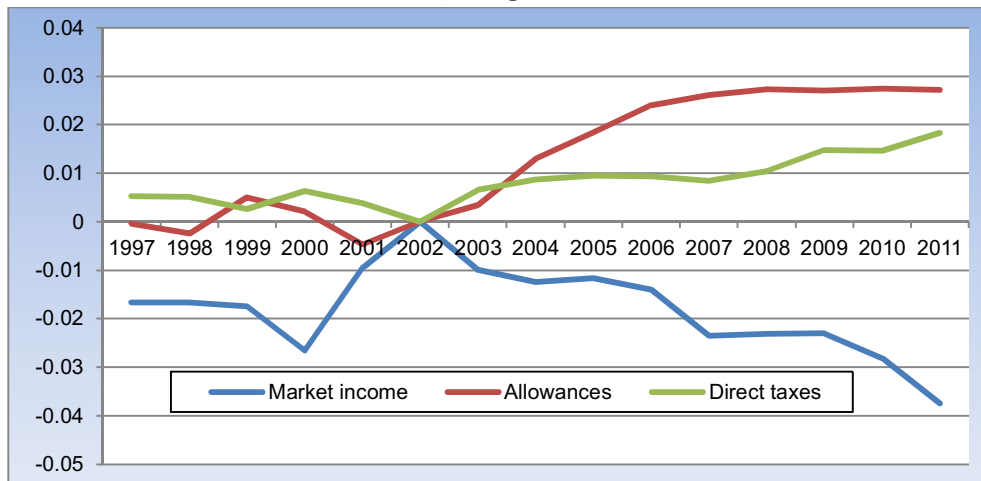
That is, if there was a way to change taxes and allowances back to their level in 2002, without shifting the market income distribution (a rather strong assumption), Israel's inequality would be much closer to the OECD average.

Most of the impact on inequality is due to the reduction in the amount of taxes collected and allowances provided, and not due to the way they are distributed. That is, this change was not caused because the redistribution system became less progressive, but rather due to its reduced size.

The correlation of allowances with disposable income has raised inequality by another 0.79 percent, probably due to the reduction in the allowances that are targeted for low income households. There is an increase of 0.5 percent in the Gini index due to the increase in correlation of market income with disposable income. This happens mainly due to the decreased influence of taxes and allowances, but it is hard to determine whether it is the former or the latter. If we attribute this component to the change in redistribution policy instead of the change in market income, then the change in market income reduces Gini inequality by 4.27 percent and the change in redistribution policy increases Gini inequality by 5.07 percent.

In summary, the change in inequality between 2002 and 2011 is not significant (a change of 0.8 percent), but the reasons for inequality have changed. The high inequality level at the end of the period is caused more by state intervention via direct taxes and allowances, and less by market income distribution.

Figure 34
The factors of change in the Gini index of equivalized disposable income
(Taxes, allowances and market income) compared to 2002



SOURCE: Based on the ISCBS.

We show that 2002 was a turning point in redistribution policy. Figure 34 shows the impact of market income and redistribution policy on inequality for each year in our period compared with 2002. In practice, we repeat the same calculation we have conducted for 2011 for each year between 1997 and 2011. For each year, we decompose the change and attribute it to taxes, allowances or market income factors.

We can see that in 2002 there is a change in the trend. Before 2002, the trend in the direct tax system was towards reducing inequality, while the allowances system had a stable influence. After 2002, they both started increasing inequality further every year. Market income inequality was increasing before 2002 and started its decline at 2002.

f. Chapter Summary

In this chapter, we have seen that while inequality in disposable income was rather stable in the recent period, there were significant changes in its composition. Policy changes have led to a reduction in both direct taxes and allowances, which directly led to an increase in inequality. However, the share of households with market income has increased simultaneously, which has offset the increase in inequality.

The coincidence of the decline in households without market income with the policy change may suggest these phenomena are related. A reasonable conjecture is that the policy changes have incentivized more people to participate in the labor market, thus leading to a decrease in market income inequality.

On the other hand, it is hard to believe that all the reduction we observed in the share of households without market income is the result of the policy change. We have seen that the second intifada and its associated recession led to an increase of 3 percent in the share of households without market income. Since the total decrease in the share of households without market income is only 4 percent, it is obvious that a significant portion of the decrease should be attributed to the end of the recession. Therefore, even if the policy shift did somewhat reduce inequality, this contribution is probably fairly small, and in total the policy change has significantly raised the level of inequality.

In addition, it is clear that different aspects of the policy shift had different implications on the share of households without market income. It seems likely that households that opted for the labor market following the policy change had a rather low income potential. Therefore, they are expected to be mostly influenced by the policy actions related to the decrease in allowances. Furthermore, the reduction of the direct tax level on high-income households is unlikely to have any impact on these households' participation. Therefore we surmise that the change in the participation rate of households is a consequence of the reduction of allowances rather than the reduction of direct taxes. Hence, our assessment is that without the direct tax cuts, the Gini index would have dropped by 1 percent instead of the 0.8 percent increase that we actually observed.

8. SUMMARY

Israel is at the bottom of the OECD countries in inequality of equivalized disposable income. This work deals with the sources of this inequality as a result of both the labor market and the redistribution policy.

We have found that there were some parallel processes in the labor market during the study period that affected inequality. The first is the narrowing of the gap between the median hourly wage and lower wages, and the widening of the gap between high hourly

wages and the median. We have found no evidence for the disappearance of the middle class, but it is clear that the share of total income from wages that goes to workers at the middle of the distribution has shrunk considerably. We therefore conclude that inequality is decreasing in the bottom half of the hourly wage distribution and increasing in the top half. At the high end of the income distribution we have found that the income share of the top percentiles is disproportionately high, and the wage concentration is increasing.

A big change that affects the lower end of the labor market in particular is the collapse of the structured labor market, i.e. the emergence of temporary and part-time jobs. This phenomenon is especially prominent in the lower decile of wage earners, for which the average number of hours worked at a job has shrunk by 20 percent.

We find that the gender gap diminished throughout the examined period, but the ethnic gap between Jews and Arabs is, nevertheless, widening. These two gaps comprise only a small share of total inequality, which is mostly driven by inequality within the various groups and not between them.

The labor market in Israel is becoming more educated. We have found evidence of a stratified labor market, in which the wages of a significant group of workers with secondary education or below, have not grown (in real terms) in the last 25 years. The entire growth in real wages during this period has concentrated on the more educated part of society.

In contrast to a common misconception, and regardless of very low participation rates in some populations, the participation rate in the civilian labor force is high when compared globally, and especially the participation of Jewish women. As a result of the recent rise in the participation rate, the inequality in equivalized market income is reduced, and is now just slightly higher than the OECD average.

Naturally there are other factors that might influence inequality, which we have not covered in this study, like the immigration from former Soviet countries or the increase in labor migrants. We have not found any evidence in the data that these were important factors. There is no correlation between the years of massive immigration and the changes in the inequality trends. Moreover, the increase in labor migrants should mostly affect the workers in the lower end of the wage distribution, and expand the gaps there, but the data suggests the opposite.

Finally, our analysis of inequality in equivalized disposable income suggests that the main reason for the increase in inequality is the government policy change starting in 2003. This policy reduced the effective direct tax, and at the same time, reduced the size and extent of transfers and allowances. These two actions are the main reason for the poor ranking of Israel in an international comparison of inequality levels. There is room for further study on how precisely these actions have affected the market income of households and their contribution to the decline in inequality before redistribution. Our assessment is that some of the rise in the participation rate is a result of the cut in allowances (and not the tax cuts), but that the main reason for the reduction in inequality prior to redistribution is the end of the recession.

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Dataset and methodology appendix

The main dataset we used is the income surveys conducted by the Central Bureau of Statistics in the years 1987–2011. During this period, there were changes in the technique and extent of the survey. Therefore, not all the data are displayed for the entire study period.

The dataset includes information on individuals aged 15 and above and on households. (A household is defined as a group of people living together most of the week, who share a budget for that purpose.)

The survey changed in 1985, when it started asking people about their quarterly income. Since no survey was conducted in 1986, we focused our research on the period starting in 1987.

Until 1996, the survey focused on households, where the head of household was either a salaried worker or unemployed (and not self-employed). The dataset of households includes its income from various sources such as wages, support payments, pensions and social security allowances. The individual details include demographics, labor force and income characteristics, and others. The data on compensation are limited to direct nominal compensation. All wages are adjusted to the average CPI for the year of the survey. The survey includes households in communities with 2,000 inhabitants or more, as well as urban areas in the Arab sector (excluding eastern Jerusalem).

The survey was extended in 1997, to include 95% of the households. In addition to the salaried workers and unemployed in urban areas, it now also covers self-employed households and people living in smaller communities and Moshavim. The populations still excluded are the people living in the Kibbutzim and nomad Bedouins, as well as households located in eastern Jerusalem. (In the years 2000–2001, eastern Jerusalem was excluded due to the 2nd Intifada).

Since 2001, National Insurance allowances are detailed, and since 2004 there is also individual information on self-employment and capital income. Since 2005, top-coding is used for the top 10 households. In a theoretical examination, the top-coding has a negligible impact on inequality and average computations.

As the names of the fields have changed over the years, we list the names of the fields in the 2011 file. In other years we have used compatible fields (with different names).

Table 10
The individuals file

Field	Field in the file
Survey year	year
Weight	weight
Monthly wage	incsal
Status at work	workstat
Number of hours worked	weekhrs
Gender	sex
Religion	religion
Education years group	schoolyg

Table 11
The households file

Field	Field name in file
Survey year	year
Weight	weight
Income from work	incsal
Income from self-employment	incself
Income from capital	inccap
Income from pension	incpen
Income from pension abroad	incabr
Income from other people	incprhh
Gross income (after allowances)	totghinc
Net income	totnhinc
Number of persons in HH	hhprsns
Child allowance	childalo
Old age allowance	oldalo
Survivors allowance	servipen
Work injury allowance	winjualo
Disability allowance	disabalo
Unemployment benefits	unempben
Subsistence allowance	incsupp
Other allowances	otheralo

We look at individuals whose working status is either “salaried” or “salaried and unemployed”. Missing wage fields are completed to be 0. The hourly rate is computed by the monthly wage divided by the hours worked per month. (The hours worked per month equal the hours worked per week multiplied by 4.3).

The household’s market income was computed as the income from the following sources: wages, self-employment, capital gains, pension, pension abroad and private transfers. The difference between this income and the gross income is the total allowances, and the difference between the market income and the disposable income is the tax collected.

The equalization of income is conducted according to the CBS table:

Table 12
Equivalence scale in Israel

Number of members	1	2	3	4	5	6	7	8	Next member
Number of equivalized members	1.25	2	2.65	3.2	3.75	4.25	4.75	5.2	0.4

We conducted our international comparison using the OECD and LIS standard of square root of the members of the household.

The OECD data were downloaded from stats.oecd.org. Averages were computed using the most current year available. We have used the following OECD datasets:

Income Distribution and poverty: Gini index (of disposable income, post taxes and transfers) for the Total population.

Income Distribution and poverty: Gini index before taxes and transfers for the Total population.

Labour: Earnings: Decile ratio of gross earnings: Decile 9/Decile 1

Labour: Earnings: Decile ratio of gross earnings: Decile 9/Decile 5

Labour: Earnings: Decile ratio of gross earnings: Decile 5/Decile 1

LIS data were taken from www.lisdatacenter.org Inequality and Poverty Key Figures.

The CPI information used to calculate the real wages was a table from the Bank of Israel.

Lerman Yitzhaki decomposition

A Lerman Yitzhaki decomposition is used to quantify the impact of various income factors on the Gini index. In our context we want to understand the impact of taxes (T), allowances (A) and market income (I) on disposable income (N), which is expressed as $N = I + A - T$.

The impact of each factor depends on its share (S_x), its inequality G_x and its correlation with disposable income (R_x). S_x is defined by the ratio of the size of x to the size of N . G_x is defined as the Gini index for this factor and R_x is computed according to $R_x = \frac{cov(x,F(N))}{cov(x,F(x))}$.

Were cov is the common covariance and F is the cumulative distribution function (cdf). The denominator is always positive so the correlation sign is determined solely by the nominator, and it will be positive only when the factor is positively correlated with the disposable income.

The total Gini index G_N is

$$G_N = \sum_{\text{for } x \text{ in } \{I,A,T\}} S_x G_x R_x$$

In order to measure the change since 2002, we denote the change in m by Δ_m and get

$$G_N + \Delta_{G_N} = \sum_{\text{for } x \text{ in } \{I,A,T\}} (S_x + \Delta_{S_x})(G_x + \Delta_{G_x})(R_x + \Delta_{R_x})$$

Rearrange

$$\Delta_{G_N} = \sum_{\text{for } x \text{ in } \{I,A,T\}} (S_x + \Delta_{S_x})(G_x + \Delta_{G_x})(R_x + \Delta_{R_x}) - \sum_{\text{for } x \text{ in } \{I,A,T\}} S_x G_x R_x$$

and simplify

$$\Delta_{G_N} = \sum_{\text{for } x \text{ in } \{I,A,T\}} \Delta_{S_x} G_x R_x + S_x \Delta_{G_x} R_x + S_x G_x \Delta_{R_x} + O(\Delta^2).$$

Also,

$$\Delta_{S_I} + \Delta_{S_A} + \Delta_{S_T} = 0.$$

Thus the change due to taxes is $\Delta_{S_T} * (G_T R_T - G_I R_I)$ while the change due to allowances is

$$\Delta_{S_A} * (G_A R_A - G_I R_I).$$