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STATE OF THE NATION REPORT

SOCIETY, ECONOMY AND POLICY IN ISRAEL

2015



EDITORS: DOV CHERNICHOVSKY AND AVI WEISS

STATE OF THE
NATION REPORT

*Society, Economy and Policy
in Israel*

2015

The Herbert M. Singer Annual Report Series

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Dov Chernichovsky and Avi Weiss
Editors



Taub Center for Social Policy Studies in Israel

Jerusalem, December 2015

Taub Center for Social Policy Studies in Israel

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STATE OF THE NATION REPORT
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Foreword

We are honored to present the *State of the Nation Report 2015*, a publication in the *Herbert M. Singer Annual Report Series*. The volume's 13 chapters address a wide range of topics and are based on original research touching on many different aspects of Israel's current socioeconomic situation. The issues covered in the *Report* reveal a great deal about Israeli social policy and shed light on how the welfare of Israelis might be improved.

As 2015 has drawn to a close, Israel's population stands at 8.5 million people – 2 percent higher than it was a year ago. OECD data put Israel's GDP per capita for 2014 at \$33,000, or NIS 126,000. Israel's gross domestic product at the start of the year had risen by 2.5 percent (Central Bureau of Statistics), and the country's per capita income was higher as well. At the same time, the income distribution gaps have widened and poverty rates have worsened (according to the National Insurance Institute's calculations).

The Taub Center's annual report, divided into five main sections, provides a detailed look at what these statistics mean for the lives of Israeli citizens, particularly from the perspective of the population's welfare and the government's policies.

The *Report* opens with a discussion of the Israeli labor market in terms of education and wages. The first chapter in this section shows that, although Israel's economy has been growing for at least a decade, real wages have not increased during this period. The rise in household income from wages that was seen during the same period was due to an increase in the number of additional marginal wage earners – many of them young adults living with their parents – who joined the labor market. The authors, Prof. Ayal Kimhi and Kyrill Shraberman, propose studying this phenomenon in greater depth since the increase in the

number of wage earners cannot continue to serve indefinitely as a method for households to deal with the stagnation in real wages.

This section of the *Report* also focuses attention on several different worker groups that are the subject of public debate in Israel and around the world. The first of these is workers in occupations at high risk of being computerized. Identifying the traits of these workers, who are liable to be made redundant by today's rapid pace of technological development, shows that many of them are low wage earners who lack an academic education; a high percentage of them are non-Jewish males and young adults. Researcher Shavit Madhala-Brik stresses the need to prepare in advance for anticipated labor market changes resulting from computerization, to ensure that workers entering the labor market possess the skills and abilities that the changing market place will demand.

The chapter written by Dr. Noam Gruber deals with contract workers in Israel. These workers are employed by third parties, generally on terms and with rights inferior to those of direct-hire workers. Gruber shows that the scope of contract work in Israel, compared with that of other countries, has been overestimated, due to terminological confusion. He also points out the fundamental differences between two types of contract workers in Israel, and proposes that the rights of the most vulnerable contract workers be protected. This should be done without hampering employers' ability to hire and fire workers in accordance with specific economic circumstances – since constraints in that area could potentially raise the unemployment rate, specifically among the contract worker population.

Young Israelis (ages 18-34) led the social justice protests at the beginning of the present decade, and have naturally continued to play a dominant role in public discourse. Researcher Hadas Fuchs looks at the lifestyle changes that have affected Israeli young adults since 1995, and finds that the percentage of students and academic degree holders within this population grew significantly as a large number of academic colleges opened their doors. At the same time, the employment rate of this group's youngest segment declined, while the share of those employed in part-

time and temporary jobs increased sharply. Additionally, there was a rise in the share of young adults living with their parents, both because young Israelis are entering the work force and marrying at older ages and due to steadily climbing housing prices, which affect this population in particular.

The second section of the *Report* deals with Israeli labor productivity, an issue that has broad ramifications in all areas of economic life: wages, prices and growth. The first chapter in this section points out that there are export industries characterized by high and rapidly rising labor productivity, while in the rest of the business sector productivity and growth are exceedingly low. The authors, Gilad Brand and Eitan Regev, show that over the years two business sectors have emerged that differ greatly from each other in terms of worker traits, education wage premiums, and labor productivity, and that mobility between these two sectors is low. The researchers posit that diversifying Israel's export mix and investing in human and material capital in low productivity industries would enhance efficiency and raise wages in those industries.

Alongside the discussion of productivity in Israel, and in particular as it relates to exports, is the topic of Israeli labor productivity in relation to other countries. An additional study by Eitan Regev and Gilad Brand shows that productivity in most industries in Israel is lower than in the OECD countries, and productivity gaps widened even more between 1995 and 2009. Five large industries in the commercial and service sectors are responsible for 81 percent of the increase and, in particular, non-tradable industries contribute to the worsening productivity gaps in Israel. As was found in the previous study, high productivity is related to the degree to which the economy is exposed to imports as well as to exports.

The third part of the *Report* looks at major macroeconomic developments in Israel: price levels and tax rates. The first of these issues has become highly important for the welfare of Israeli households, especially given the stagnation in real wages noted above. By addressing the methodological issues that arise when making comparisons as a result

of exchange-rate fluctuations, Taub Center researcher Gilad Brand shows that, when taking into consideration the different income levels, Israeli consumer prices have for many years been higher than those of other developed countries. The food sector, where imports and competition are relatively low, exhibited a particularly notable rise in prices during the past decade, alongside the sector's increased profitability.

In order to cope with Israel's economic challenges, the government has introduced changes in taxation since 2003. Researcher Dr. Moshe Hazan demonstrates that, although there has been an increase since 2003 in the progressivity of the direct tax, defined as the percent of income tax out of gross income, income disparities between households in the different deciles did not decline; in fact, they widened. The main beneficiaries of the reduced tax burden are households at either end of the income distribution: the lowest decile and the top two income deciles.

The *Report's* fourth section takes up the issues of poverty, disparities and social welfare that lie at the heart of Israeli socioeconomic debate. In an international comparison of the development of poverty rates and income gaps in Israel from 2002 to 2011, the Taub Center research shows that until 2006, there was a rise in disposable income disparities, after which they stabilized, although at a high level relative to other developed countries. At the same time, poverty rates increased steadily over the entire period, especially among Arab Israelis and Haredim (ultra-Orthodox Jews). With regard to the elderly, researcher Haim Bleikh finds that, although the total pension allocation per senior citizen puts Israel at a relatively high ranking among developed countries, the resources are not equitably distributed, leading to income gaps and comparatively high poverty rates within the group of those aged 66 and over. The chapter notes that the tax burden in Israel is among the lowest in Western countries, and this is directly linked to public expenditure which is also relatively low.

Researchers Prof. John Gal and Shavit Madhala-Brik examine Israel's social security and social welfare budgets from 2000 to 2014, with an emphasis on 2014, when housing and the cost of living were once again

at the center of public debate. Even though the War on Poverty Committee, established by the previous government, recommended augmenting Israel's social welfare expenditure, the study shows that there has been no change in the policy direction. A significant number of the institutions involved in social security and social welfare are showing continued expenditure reductions, or stable but low levels of spending compared with past years. This is especially true in the expenditure area of income supports and the budget of the Ministry of Construction and Housing. On the other hand, there has been a steady rise in social security spending for the elderly and people with disabilities, as well as for Holocaust survivors.

An interesting issue in the sphere of poverty and welfare is that of health in the Haredi sector, which is one of Israel's poorest population groups. Despite the sector's low socioeconomic status, which should translate into poor health, the data indicate that Haredim enjoy a higher life expectancy and better self-reported health than do other population groups. The researchers, Prof. Dov Chernichovsky and Chen Sharony, attribute these findings to the Haredi sector's high levels of social capital – good relationships with family and friends, deep involvement with a supportive community, and a religious lifestyle. These findings underscore the importance of social cohesion for health.

The *Report's* final section is devoted to Israel's education system. The first chapter in this section examines the relationship between socioeconomic variables, as well prior scholastic achievements, and educational tracking into vocational versus academic education. The researchers, Carmel Blank, Prof. Yossi Shavit and Prof. Meir Yaish, show that, despite changes in Israeli vocational/technological education, socioeconomic factors still have an impact on tracking, even when controlling for the effect of a pupil's prior attainments. It was also found that matriculation certificate eligibility rates in the academic track and the engineering track (the most prestigious technological track) are higher than in the other two vocational tracks, and the drop-out rates in the prestigious tracks are almost half the rate of the other tracks. Another

finding was that while most Arab Israeli upper secondary school pupils once studied in the academic tracks, half of them now study in technological tracks – with a substantial share in the engineering track, whose matriculation certificate eligibility rates are, again, relatively high.

The second chapter in this section, and the *Report's* final chapter, discusses equality in education. Senior researcher Nachum Blass notes that, although in recent years the Ministry of Education has sought to address educational inequality, it has not taken adequate measures to reduce the gaps between pupils from different socioeconomic backgrounds. Through an analysis of timely issues – a return to budgeting per pupil in primary and lower secondary schools, implementation of the Compulsory Education Law for Ages 3-4 and the addition of a second teaching assistant in preschools, reducing crowding in classes, and tougher budgetary policy for those schools that are recognized but unofficial – Blass demonstrates that, in his opinion, the more well-established populations are able to dictate the direction of budgetary expenditures, and in this way they hamper significant steps in the direction of affirmative action.

A number of major changes have taken place at the Taub Center over the past year. The Center welcomed a new Executive Director (its fourth in 33 years), Prof. Avi Weiss, as well as Prof. Claude Berrebi, its new Director of Research, and Prof. Johnny Gal, Senior Researcher and Social Welfare Policy Program Chair (who returned to the Taub Center after serving as Dean of the Paul Baerwald School of Social Work and Social Welfare at the Hebrew University of Jerusalem). Itay Matityahu joined this year as Director of Marketing, Communications and Government Relations. The Center's dissemination team expanded significantly thanks to the addition of Project Manager Tova Cohen (who assumed her duties after completing a year-long marketing internship at the Center), Online Media Associate Lior Morag (whose position is generously funded by the Rosenzweig Coopersmith Foundation), and Marketing Coordinator Tamar Friedman (in the framework of an internship generously funded by the Israel Institute). These new staff members are

welcome additions to the Center's veteran team, which includes many of the researchers who wrote chapters for this book, Managing Director Suzanne Patt Benvenisti, Strategic Partnerships Director Michal Rubin, and a host of others.

We feel confident that this expanded high caliber staff at the Taub Center will continue to produce quality research studies such as those in this *Report*, and exert an ever greater influence on Israel's policy makers.

The Taub Center welcomes questions, responses and requests for printed copies of the *Report*; these queries may be addressed to the Center's office:

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Sincerely,

Prof. Dov Chernichovsky, Senior Researcher and Chair, Taub Center Health Policy Program

Prof. Avi Weiss, Executive Director, Taub Center for Social Policy Studies in Israel

I. EMPLOYMENT AND EDUCATION

The Increase in the Number of Income Earners and Its Impact on Household Income

Ayal Kimhi and Kyrill Shraberman*

Abstract

The Israeli economy is growing but real wages have not risen since the early 2000s. Reductions in the income tax burden during that time helped some households improve their situation, but many earners remain beneath the tax threshold and so their households are not affected by changes in tax rates. In parallel with the stagnation of wages, the average number of earners per household has risen, so that the overall income of the average household has grown in real terms, even though the additional earners earn much less than the main earners. Working-age young adults living in their parents' households constitute the largest part of the increase in the number of marginal earners; this may also be a result of the cost of housing, which prevents those young adults from establishing their own households. The increase in the number of earners, whether it is the reason for the wage stagnation or a result of it, cannot continue indefinitely; therefore in-depth analyses into the reasons for the stagnation of real wages must be undertaken to better understand the consequences for households which rely on the labor market for their livelihood.

* Prof. Ayal Kimhi, Department of Environmental Economics and Management, Hebrew University; Vice President, Shores Institution for Socioeconomic Research. Kyrill Shraberman, researcher, Taub Center for Social Policy Studies in Israel. The authors wish to thank Prof. Avi Weiss, Prof. Dov Chernichovsky, Haim Bleikh, Hadas Fuchs, and Eitan Regev for their helpful comments.

Introduction

At the beginning of the previous decade, the Israeli economy experienced a deep recession, reflected by two consecutive years (2001-2002) of negative economic growth (Yashiv, 2013). Reasons for the recession included the second intifada and the global high-tech crisis. As a result of the recession and the budgetary deficit, the Israeli government had to implement a policy of fiscal restraint, which manifested itself in deep cuts in welfare allowances and in other ways. The end of the recession, beginning in 2003, was reflected by the renewal of growth and a sharp decline in unemployment, which dropped from a peak of more than 13 percent in 2003 to below 8 percent by 2008 (Yashiv, 2013).

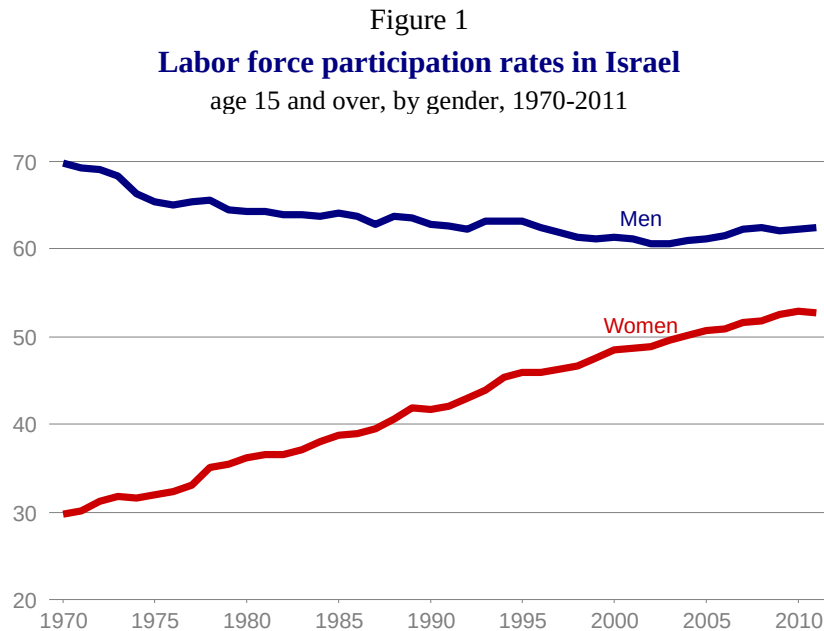
Upon the resumption of growth, the labor market began to recover. The significance of the rise in labor market participation rates, and the simultaneous drop in unemployment, is that new positions were created in the economy, so that the labor market managed to absorb both a large share of the unemployed and new entrants into the labor market. In terms of supply and demand, there is no doubt that coming out of the recession brought about an increase in demand for labor.

However, Kimhi and Shraberman (2014, Figure 17), have shown that the labor market in Israel is undergoing a process of polarization. The relative share of high-wage occupations rose, as did the relative share of low-wage occupations, while the relative share of mid-range wage occupations declined. Changes in the relative share of occupations, and the unequal rise in real wages at the various wage levels, led to a decline in the inequality of labor wages (Kimhi and Shraberman, 2014, see Figures 3 and 7).

This chapter will focus on the increase in the supply of labor in Israel following the recession of the previous decade and its implications for the standard of living of households, referring mainly to income from work. First, the changes in the number of earners in the average household will be presented; including an examination of the role that the rise of the retirement age played in these changes, and then the implications for household incomes will be examined.

1. Changes in Labor Force Participation and in Real Wages

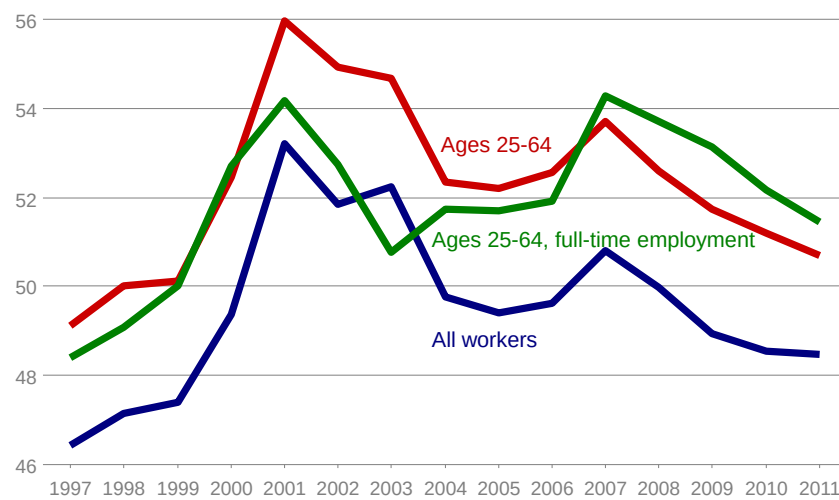
Upon resumption of economic growth after the recession, the downward trend seen in the participation rate of men in the labor force reversed. Figure 1 shows that while women's participation rose consistently over the years, men's participation rate was on a downward trend until 2003, and then changed to a rising trend. The exit from recession is usually characterized by a rise in demand for labor by employers, which should lead to a rise in wages if the labor supply (the number of workers) does not rise at a similar rate.



Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: Bank of Israel

As can be seen in Figure 2, however, real wages from labor rose between 2004 and 2007, and then returned to a downward trend. The conclusion is that the rise in demand for workers was higher than the rise in supply until 2007, after which the supply of labor grew faster than the demand. It must be noted that the reference is to average wages. The rise in labor force participation was most likely among low-wage workers, so that it is possible that the wages of those who worked continuously continued to rise, even though the average wage dropped.

Figure 2
Average real hourly wage for employees
 in shekels, 2011 prices, 1997-2011



Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

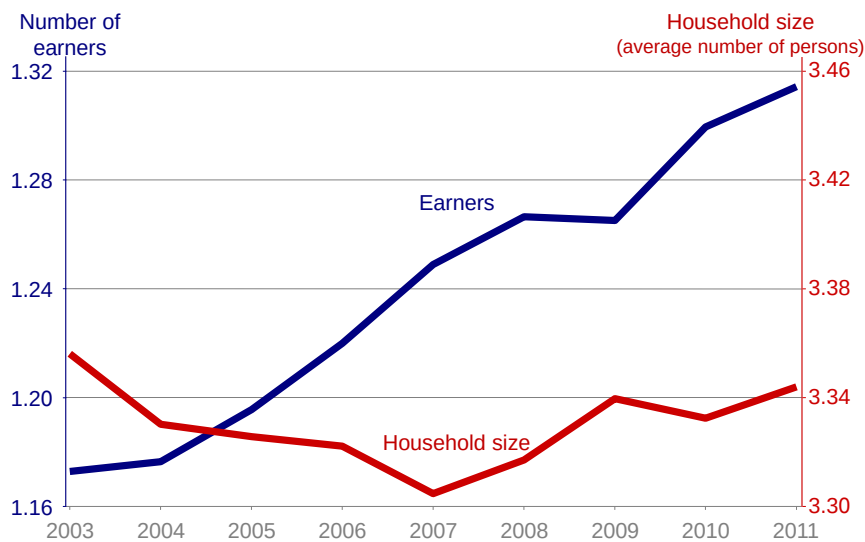
Data: Central Bureau of Statistics, *Income Surveys*

2. Changes in the Number of Income Earners

One of the manifestations of the rise in labor supply is the rise in the average number of earners per household. Figure 3 shows that the number rose from 1.18 to 1.32 between 2003 and 2011, while the size of the average household did not change substantially. The increase in the number of earners undoubtedly helped households increase their total income and minimally improve their standard of living.

Figure 3

Number of earners and household size for the average Israeli household, 2003-2011



Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

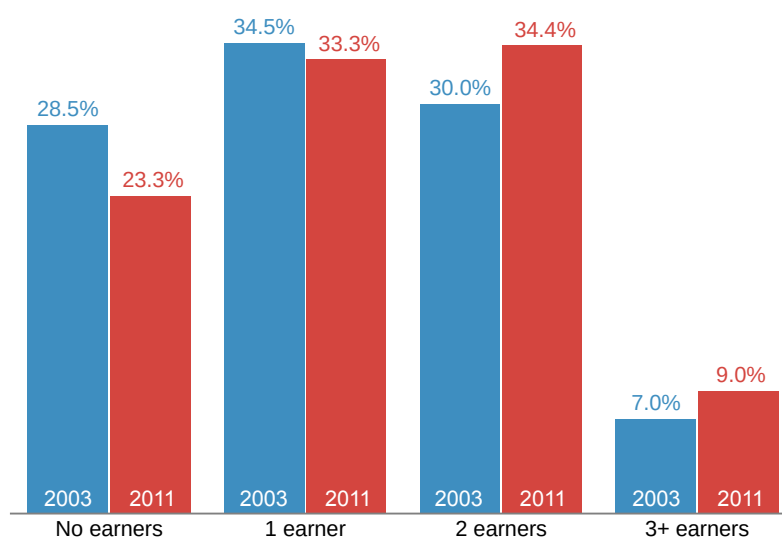
Figure 4 shows the distribution of households by number of earners in 2011 compared to 2003. The most substantial change is the drop in the number of households without earners. One possible reason that these

households joined the labor force is the cut in allowances, which was part of the policy that brought Israel out of the recession. As part of the overall reduction in government spending, child allowances and supplementary income benefits were cut, the regular adjustments of other benefits were canceled, and terms of entitlement for unemployment allowances were tightened (Bank of Israel, 2004). It can be assumed that at least some of the households that did not have earners in 2003 moved in the following years to the group of households with a single earner. However, the rate of households with a single earner also dropped from 2003 to 2011, so that apparently there was a parallel, and no less significant, trend of households with a single earner in 2003 to increase their number of earners by 2011.

As the figure shows, most households that increased their number of earners moved to the category of two earners. The rate of households with more than two earners also grew during that period.

Figure 4

Household distribution by number of earners, 2003 and 2011



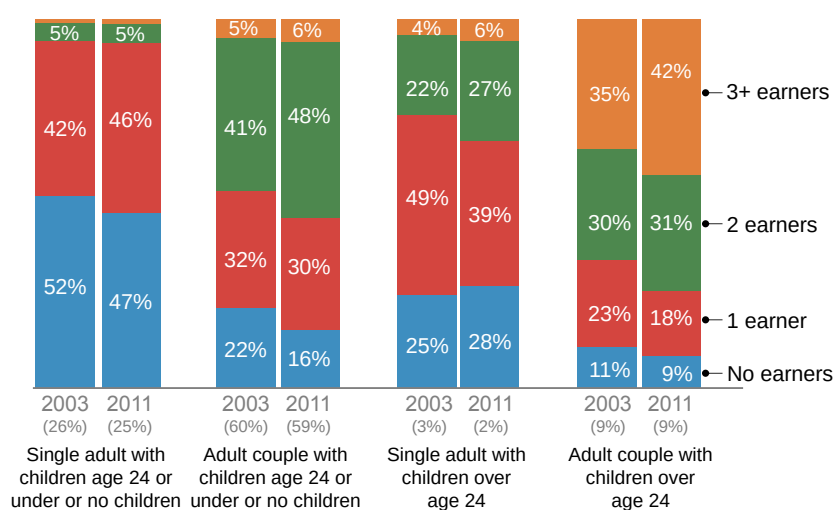
Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

Figure 5 looks at the increase in the number of earners by household demographic composition. As a first step, households were divided by the family status of the head of household: single adult (without partner) or coupled adults. In the second step, each group was divided into two subgroups: (1) households without children over age 24; (2) households with children over age 24.¹ Households with parents of the head of household or the partner's parents were not included.

Figure 5

Distribution of Israeli households by number of earners and household demographic characteristics,* 2003 and 2011



* Percentages in parentheses are the share of each group out of all households. The percentages do not sum to 100 percent; households that include the parents of the head of household were not included. Children under the age of 24 may be included in any of the categories and are not counted as adults.

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

¹ Dividing by the presence of children over the age of 24 is arbitrary, and based on the fact that most children under this age who are living with their parents do not contribute substantial financial support to the household.

Among single adult households without adult children there was a rise in the rate of single earners and a drop in the rate of households with no earners.² Among coupled households with children age 24 or under or no children, there was a drop both in the rate of households without earners and in the rate of households with a single earner. The main increase among this population was in the rate of households with two earners (from 41 to 48 percent), although there was also a small rise in the rate of households with three earners or more. Among single adult households with adult children, there was actually a rise in the rate of households with no earners. Conversely, there was a significant drop in the rate of households with a single earner among that population – from 49 to 39 percent – while there was an increase in the rate of households with two earners or more. Among coupled households with adult children, there was a drop in the share of households with no earners and a single earner, a mild rise in the rate of households with two earners, and a more substantial rise (from 35 to 42 percent) in the rate of households with three earners or more.

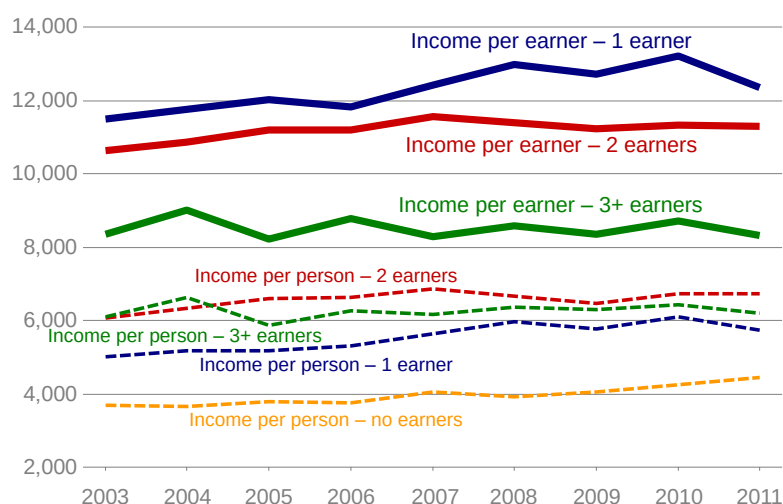
The conclusion is that the growth in the number of earners extends across all types of households. In some cases, it is the head of household and/or partner who join the labor force, and in other cases it might be adult children living with their parents who share in the support of the household.

Besides looking at the changes in the distribution of households by number of earners, the changes in the income of those households must also be examined. Figure 6 presents the changes in gross real income per earner (alongside the gross per capita income) in households divided by the number of earners. Particularly in households with a single earner, there was a rise in income per earner between 2003 and 2011, while this figure grew only slightly in households with two earners, and did not grow at all in households with three earners or more. The very small

² In the case of more than one earner in a single adult household, this figure apparently refers to household members aged 15-24, who are not considered adults.

increase in income per earner reflects the stagnation in labor wages (Figure 2 above). The increase in the income of households with a single earner, along with the previous finding that the share of such households in the population has declined over the years, may be due to the fact that single wage-earner households with particularly low incomes were the ones who chose to increase their number of earners. This may also be the reason for the observation that households that remained with a single earner had relatively high incomes.

Figure 6
Gross monthly income per person and per earner, 2003-2011
 by number of earners per household, in shekels, 2012 prices



Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

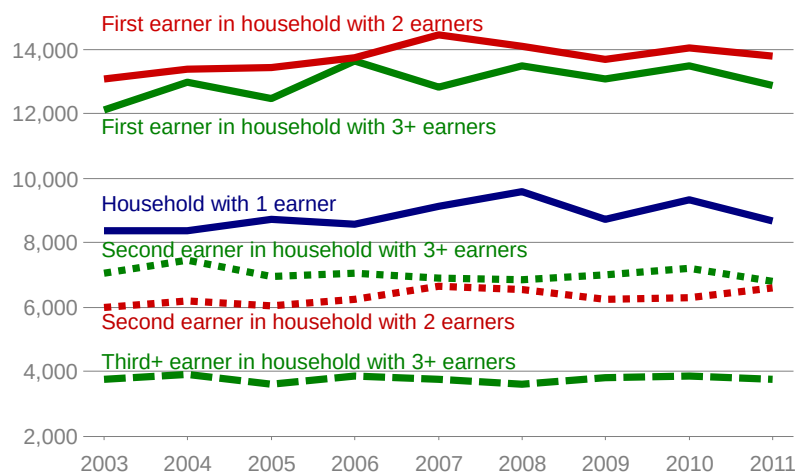
Data: Central Bureau of Statistics, *Household Expenditure Surveys*

The income per earner in households with two earners was lower than that of households with a single earner, and the gap grew between 2006 and 2010, and then shrunk somewhat in 2011. Even if the first earner (that is, the one with the higher income) in households with two earners

earned the same as in households with only a single earner, the second earner contributed less towards household income than the first earner (also by virtue of the definition of the ranking of earners within the household). This phenomenon was even more evident in households with three earners or more. Since the income per earner in these households is considerably lower than in households with two earners, the marginal earners contribute considerably less towards the household income.

Figure 7 shows that in households with two earners or more, the monthly income of the main earner ranged from an average of NIS 12,000-14,000 (for the years 2003 and 2011, in 2012 prices), whereas the monthly income of the second earner ranged from NIS 6,000-7,000 during the same period, while the income of the third and more earner was below NIS 4,000. A comparable comparison of hourly wages leads to a similar conclusion. These findings are in keeping with the basic economic theory of working: when households seek additional sources of income, the members of the household whose earning power is lower than the value of their alternative occupation (such as housework, caring for children, grandchildren or elderly parents) – and apparently lower than that of the current earners – join the labor force.

Figure 7
Gross monthly income per earner by rank, 2003-2011
 by number of earners per household, in shekels, 2012 prices



Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

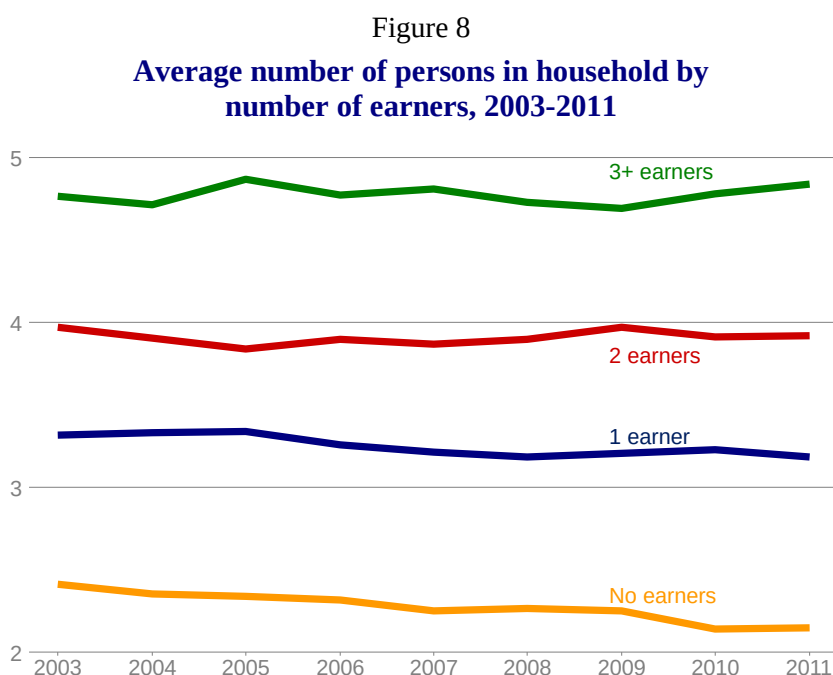
Data: Central Bureau of Statistics, *Household Expenditure Surveys*

Figure 6 shows that the per capita income in households with two earners is a little higher than in households with a single earner, even though the number of persons in these households is larger (Figure 8). This is also true of households with more than two earners, and in general it can be stated that the per capita income in households with earners does not change much depending on the number of earners. This leads to the conclusion that the bigger households are those forced to rely on the income of more earners in order to maintain an adequate standard of living, even if the income of the marginal earner is relatively low.³

³ It should be noted that the causality might be the other way around: it is possible that marginal earners with low incomes cannot afford to live in separate households.

The exceptions are households without earners, whose per capita income is substantially lower than that of households with earners.

Figure 8 also shows that in households with one earner or no earners, the average number of persons dropped between 2003 and 2011. The drop reflects the fact that households that moved from the category of a single earner to the category of two earners or more were apparently bigger than the ones that stayed in the category of a single earner. In any case, the decline in average family size among households with a single earner helped these households raise their standard of living over the designated period.

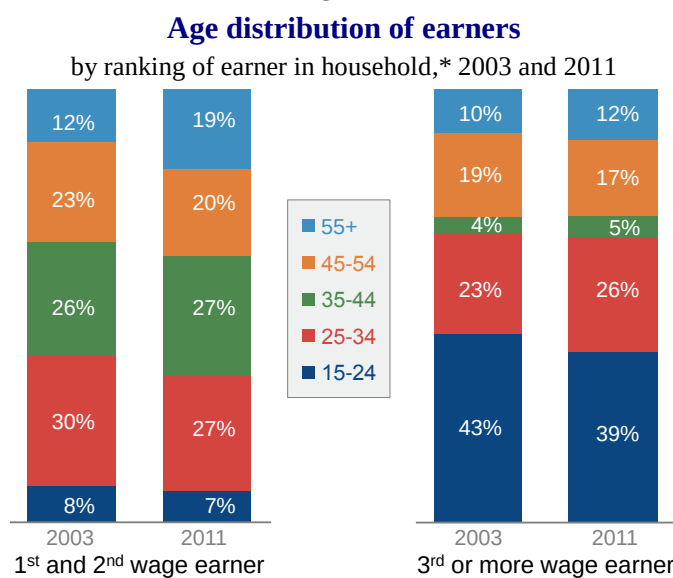


Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

A review of the age distribution of earners (Figure 9) shows that the marginal earners (third and upwards) in the household are relatively younger than the main (first and second) earners. About 40 percent of marginal earners are under the age of 25, whereas less than 10 percent of the main earners are in that age group. Conversely, few marginal earners belong to the 35-44 age group: 5 percent or less, compared to more than 25 percent of the main earners. Apparently, the relatively young marginal earners are the adult children of the household heads, whereas relatively older marginal earners are presumably their parents. A look at the relationship of the marginal earners to the head of household shows that about 60 percent of the marginal earners are children of the head of household, and about 5 percent are parents of the head of household and the remaining 35 percent is mostly partners of the head of household.⁴

Figure 9



* Households with 3 or more earners

Source: Ayal Kimhi and Kyrrill Shraberman, Taub Center

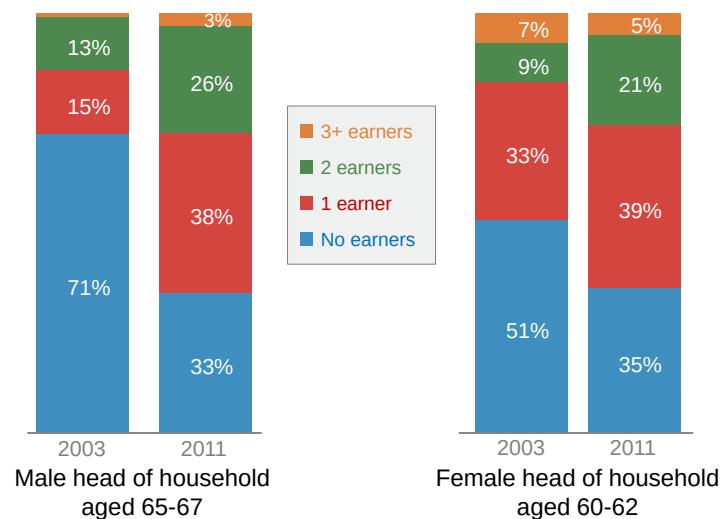
Data: Central Bureau of Statistics, *Household Expenditure Surveys*

⁴ Note that Figure 9 includes all households, whereas Figure 5 omits those including the parents or partners of the head of household.

The change in the retirement age in 2009 raised men's retirement to 67 and women's age of retirement to 62. As such, Figure 10 presents the share of earners per household for those households affected by the change: men ages 65-67 and women ages 60-62. The figure shows that, of households headed by men aged 65-67, the rate of households with no earners dropped by more than half. Among households headed by women aged 60-62, there was also a substantial drop in the rate of households with no earners. Meanwhile, there was an increase in the rate of households in all of the other categories except for the category of three earners or more in the case of women. The conclusion is that the rise in the retirement age contributed to the increase in the number of earners, although this conclusion is relevant only for a limited cohort.

Figure 10

Distribution of households where the head of household was affected by the change in retirement age, by number of earners, 2003 and 2011



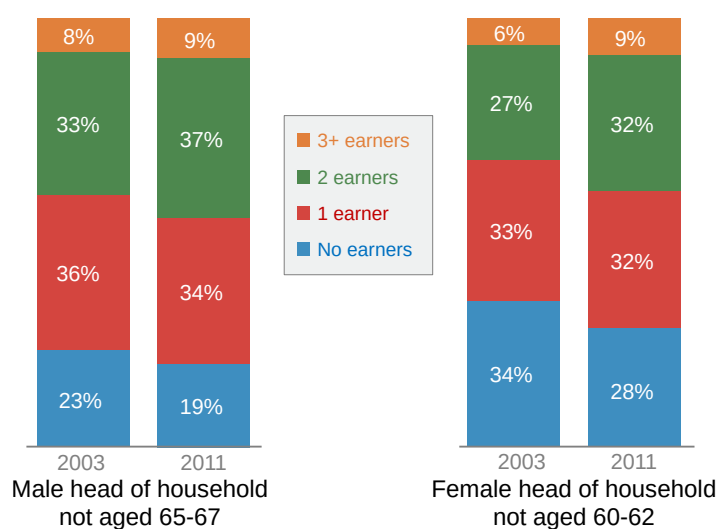
Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

Figure 11 shows that the increase in the share of households with two earners or more is also evident in households headed by individuals who were not affected by the rise in the retirement age, meaning that the explanation based on the rise of the retirement age does not preclude the explanation based on the economic need to increase the household's total income. This finding is not surprising since the share of households whose heads were affected by the retirement age represent no more than a small percent of the total number of households.

Figure 11

Distribution of households where the head of household was not affected by the change in retirement age, by number of earners, 2003 and 2011



Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

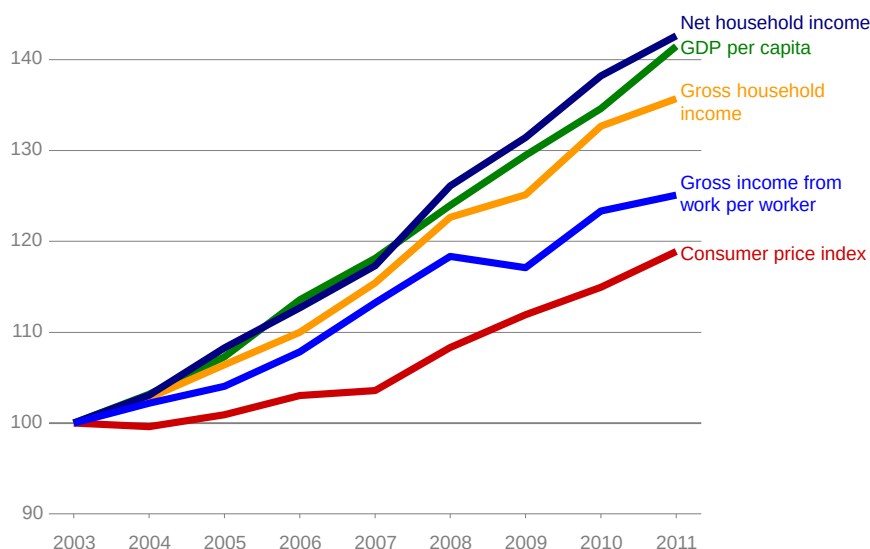
Data: Central Bureau of Statistics, *Household Expenditure Surveys*

3. Changes in Household Income

Figure 12 shows that average income from work (including salaried work and self-employment) in Israel increased by 25 percent between 2003 and 2011, a little more than the rise in the consumer price index during that period, which was just below 19 percent.⁵ Average real income from work grew only a little more than 5 percent during that period, but the cumulative growth of the economy (the growth of the per capita GDP) reached more than 40 percent (19 percent in real terms), meaning that income from work eroded relative to the average standard of living.

⁵ Figure 2 shows the average hourly wage of salaried workers only, whereas Figure 11 presents the average monthly income from work per earner for all employed household members, including the income of the self-employed. Therefore, there is no contradiction between the slight decrease in wages presented in Figure 2 and the slight increase in household income from work presented in Figure 11.

Figure 12
Consumer price index, GDP per capita and income, 2003-2011
 Index: 2003=100

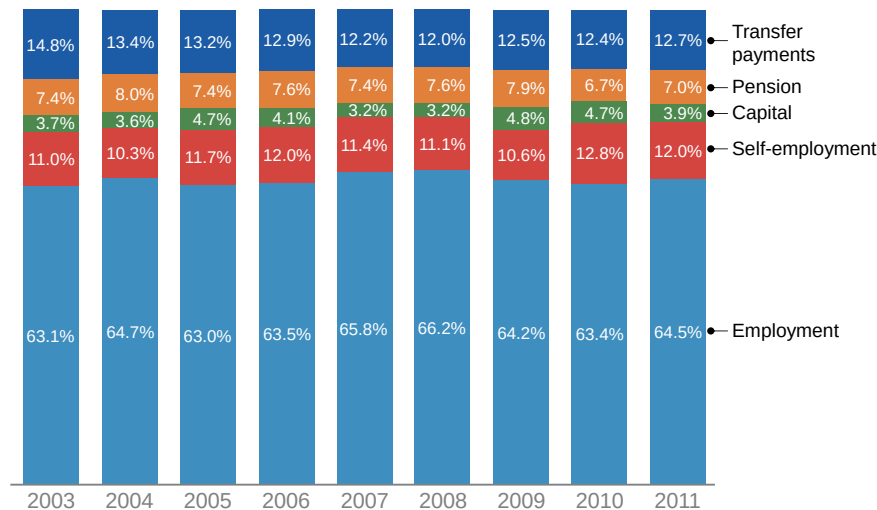


Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

The gross income per household grew at a higher rate than that of income from work per worker; a fact that arises at least partly from the increase in the average number of earners per household. Another possible explanation is that there was a bigger rise in income from sources other than work, but Figure 13 shows that this explanation is not valid. The distribution of sources of income for households did not change dramatically between 2003 and 2011: the portion of income from work (salaried or self-employed) grew from 74.1 percent to 76.5 percent throughout that period, mainly at the expense of the portion of income from transfer payments, which shrank.

Figure 13
Distribution of gross income for Israeli households, by source, 2003-2011



Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

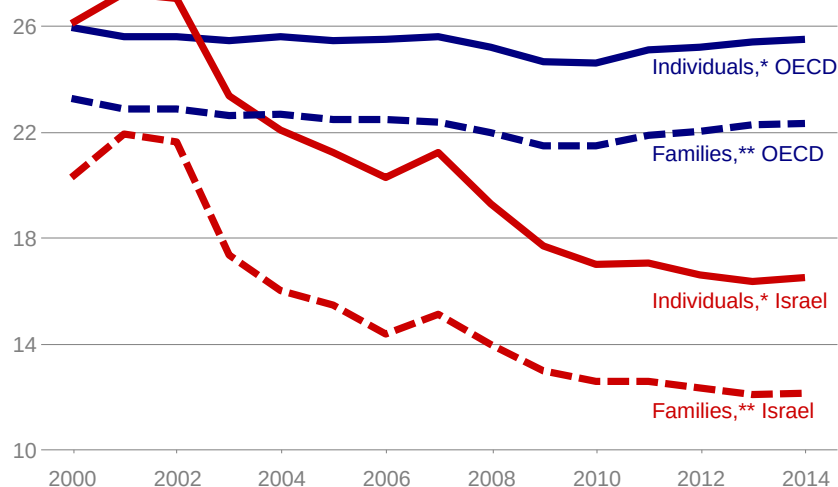
Despite the increase in the number of earners, the increase in gross income per household is still lower than the increase in per capita GDP. The net income per household grew at a higher rate, though, identical to the growth rate of the per capita GDP during those years (Figure 12). The conclusion that may be drawn from the fact that the net income of households grew at a faster rate than the gross income is primarily rooted in taxation policy.

Figure 14 shows that the rates of income tax and National Insurance Institute payments imposed on the income of individuals and families in Israel have been in a downward trend since 2001. The average tax rate imposed on individuals without children earning average wages dropped from 27 percent in 2001 to 16 percent in 2013, whereas the average tax rate imposed on a couple with two children, one of whom earns the

average wage and the other who earns 67 percent of the average wage, dropped from 22 percent in 2001 to 12 percent in 2013. During this same period, the average tax rates in OECD countries changed very little. This drop in tax rates benefited households and helped them increase their net income beyond the increase in their gross income.⁶

Figure 14

Average rates of income tax and social security contributions in Israel and the OECD, 2000-2014



* Individual without children earning average wage

** Couple with two children, one earning average wage and the other earning 2/3 of average wage

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

⁶ Since tax rates in Israel are progressive, it can be assumed that changes in the taxation policy have different impacts on workers with different income levels. Such an analysis is beyond the goals of the present study, but there is no doubt that the changes in income tax rates have no impact on workers whose wages do not reach the minimum tax threshold, which is about half of salaried employees in Israel.

Theoretically, an increase in income at a similar rate to the rise of prices would allow households to maintain their normal standard of living. Therefore, the question is what made households increase their supply of labor by increasing the number of earners, so that their income grew beyond the increase in the consumer price index. The immediate reason is the continued growth in the rate of women's participation in the labor force, as illustrated by Figure 1. Nonetheless, the figure also shows that men's participation rate also grew since 2003, contrary to the previous trend, making this explanation insufficient. Two possible reasons can be cited. One is that the perception of the cost of living is largely influenced by prices that are not represented in the consumer price index, and particularly housing prices. The sharp rise in housing prices (Gruber, 2014) lowered households' sense of their economic power, even if they did not intend to buy an apartment in the immediate future, and this may have also created an additional motive to increase income.⁷

Another possible reason is the differential changes in labor wages and cost of living. Kimhi and Shraberman (2014, Figure 7) show that, among other things, the wages among middle-wage salaried workers eroded relative to workers with lower or higher wages. It may be that the majority of the increase in the number of earners came from households with middle-wage workers. Furthermore, Kimhi and Shraberman (2014, Figure 18) show that the share of labor in national income in Israel has been on a downward trend since 2001 (see the Spotlight in this chapter). The significance of this finding is that a growing share of national income is being transferred into the hands of the wealthy. The wealthy are naturally the people with high wages, causing further erosion of the income of the middle class (which has income from capital to a more limited extent) relative to the wealthy.

⁷ However, the rise in housing prices should actually increase the sense of economic security of households owning one apartment or more.

Spotlight: An International Perspective

In recent years, the issue of the erosion of wages relative to the growth of product appeared on the global agenda. Karabarbounis and Neiman (2014) reported a drop in the share of labor in national income in most of the developed countries in the last decade, reaching an average of five percentage points between 1975 and 2010. They also showed that about half of that decline was derived from the relative cheapening of capital assets. Figure 15 shows a comparison of the share of labor in the income of the business sector⁸ (that is without the public sector) in Israel and other countries. In Japan and the Eurozone, the share of labor has been on the decline since 1995.⁹ In Israel, as in the US and in the UK, the share of labor in the revenues of the business sector was on the rise until 2001 and then began to drop. The decline in Israel and in the US came to a halt in 2005, whereas in the UK it continued until 2008. That year, following the global crisis that mainly hurt income from capital, there was a rise in the share of labor in most countries except Israel.

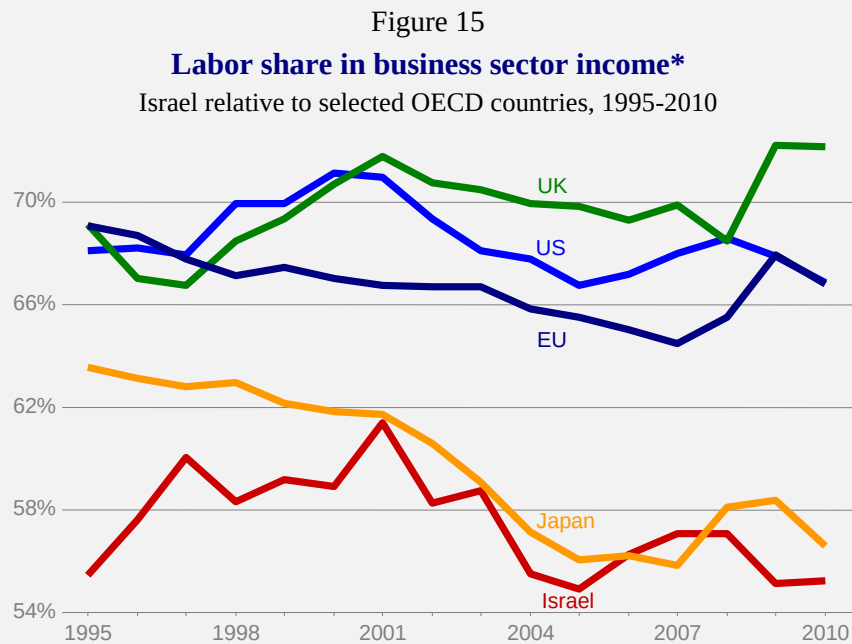
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⁸ Labor share in income is measured as Unit Labor Costs (ULC). ULC measure the average cost of labor per unit of output. They are calculated as the ratio of total labor costs to real output, or equivalently, as the ratio of average labor costs per hour to labor productivity (output per hour). As such, a unit labor cost represents a link between productivity and the cost of labor in producing output (OECD-Stat).

⁹ In Japan, the downward trend has been present since the 1970s. Similar data for the Eurozone is unavailable.

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The turning point came in 2001, the year Israel was hit by the deepest recession it experienced in the last decades. The share of labor in the income of the business sector continued to drop even after the recession ended in 2003.



* Labor share in income is measured as ULC (unit labor costs) that represent the relation between labor productivity and labor wage costs.

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: OECD

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Summers and Balls (2015) claim that the slowdown in the increase of wages and income in some of the developed countries, led by the US, began even before the 2008 financial crisis, but got worse as a result of it, at a time when the cost of living continued to rise. They explain the slowdown in the increase of wages in terms of four factors:

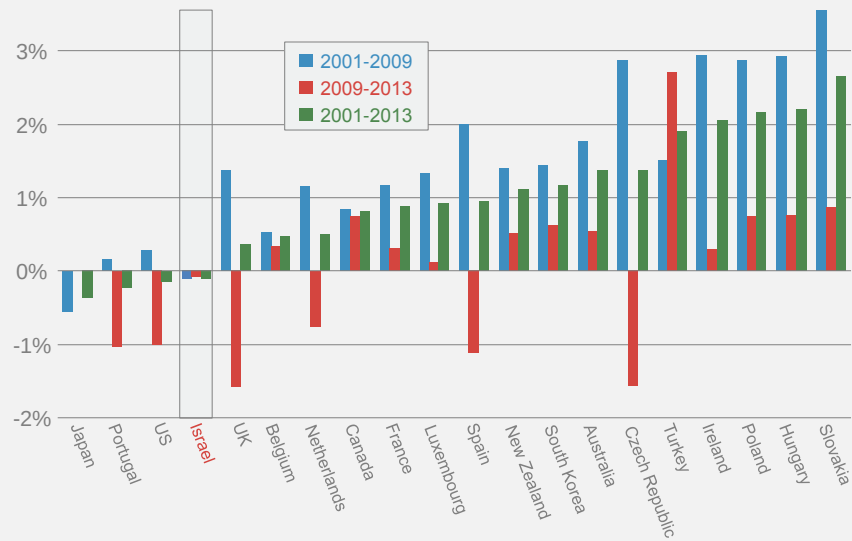
- A. Globalization allowing for the offshore transfer of production processes, reducing the bargaining power of employees relative to employers;
- B. The technological advancement that led to the replacement of workers by machines, especially at low and medium wage levels;
- C. The drop in the power of professional unions;
- D. The drop in the commitment of business owners to their employees, especially those not in senior management positions.

Figure 16 presents the average annual change of median real wages of full-time salaried employees in the years 2001-2013 in 20 OECD countries. Only half of the countries recorded a wage rise of more than an annual average of 1 percent. Divided into two sub-periods, this shows that in most countries the wage increase in the years 2009-2013 was much lower than in the years 2001-2009, apparently as a result of the global economic crisis. In Israel, which was less affected by the crisis than other countries, no meaningful difference was found between the two sub-periods, and median real wages showed an insignificant drop during that period. Although the drop was not quantitatively significant, the very fact that the median real income did not rise for nearly a decade and a half is extremely significant.

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Figure 16
**Annual average change in the real median annual wage
 for full-time employees***



* For OECD countries with data except for Estonia and Greece where there were unusual changes

Source: Ayal Kimhi and Kyrill Shraberman, Taub Center

Data: OECD

4. Summary and Conclusions

Real wages in Israel are at a standstill and have even been on the decline since the beginning of the new millennium. In contrast, the economy continues to grow. Households manage to increase their income so that it keeps pace with the growth rate in a number of ways. First, reductions in income tax levels during this period increased the share of income that remains in the hands of the workers, at the expense of the share that is transferred to the state. It should be noted, however, that the main beneficiaries of these reductions are relatively high income workers, whereas employees beneath the tax threshold do not benefit from them at all. Second, there was an increase in the number of earners per household, so that the share of households with fewer than two earners declined whereas the share of households with two earners or more increased. The increase in the number of earners extended over all types of households. The additional earners earned substantially less than the main earners, particularly in households with more than two earners, which supports the hypothesis that the increase in the number of earners is the result of economic necessity. Most of the marginal earners are working-age young adults who belong to their parents' households. The question is whether this is a mixture of a number of phenomena. On the one hand, young adults living with their parents join the labor force, and on the other hand, young people who were already employed continue living with their parents because of the rise in housing prices. The postponement of the age of marriage and the rise in divorce rates may have also had an impact on the housing patterns of young adults. The data used for this study do not make it possible to separate out these phenomena, and therefore this question will have to await further study.

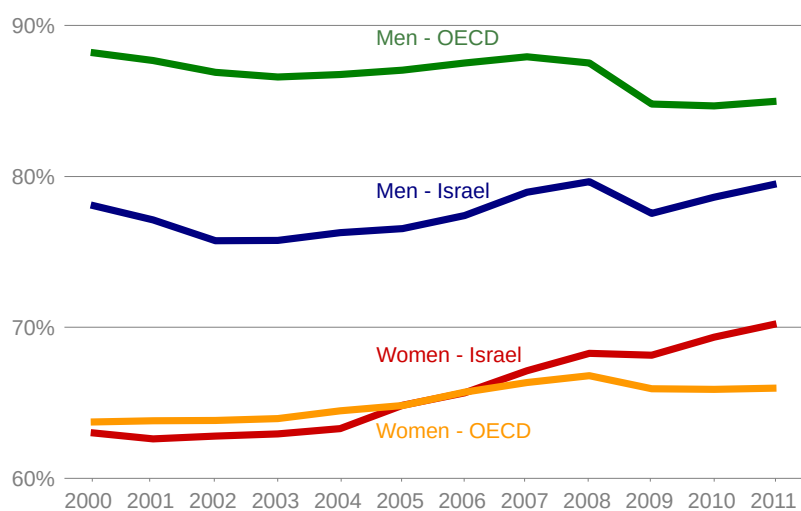
The research also found a rise in the number of older adults who joined the circle of earners. Part of this increase was a result of raising the retirement age, which caused older adults to remain in the labor force. Even among households headed by adults who are not at retirement age, though, there was an increase in the number of earners.

In conclusion, the increase in labor force participation is a welcome phenomenon, even if the reason for it is economic need. As Horowitz (1951) wrote in the context of the mass immigration to Israel after the country was founded, “full employment, even though it may not be the sole and final criterion, is a very important factor. A large percentage of these earners [...] may not be fully integrated into a productive economy yet, **but the very fact that they have become productive and working is extremely valuable**” (p. 6, emphasis in the original).

The stagnation of average real wages may be the result of the increase in participation in the labor force, mainly by workers with low potential wages such as women and young adults. However, that is not to say that this phenomenon should not be cause for concern, for two reasons. First, as Kimhi and Shraberman (2013) show, the increase in the employment rate of elderly men in Israel is significant, and it is higher today than the average in OECD countries; however, the employment rate of men in Israel lags behind the OECD average among those in prime employment ages (Appendix Figure 1). Second, employment rates in Israel have nearly exhausted their growth potential, except in specific population groups, such as ultra-Orthodox men and Muslim women. Therefore, the increase in the number of earners cannot serve forever as a means for households to contend with the stagnation of real wages. Although the stagnation of real wages might stop when the economy reaches full employment, there is no guarantee of that, and thus, the reasons for the stagnation of average real wages must be re-examined in depth.

Appendix

Appendix Figure 1
Employment rates, ages 25-54
Israel relative to OECD, by gender, 2000-2011



Source: Ayal Kimhi and Kyrill Shraberman, Taub Center
Data: OECD

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Occupations at Risk: Computerization Trends in the Israeli Labor Market

Shavit Madhala-Brik*

Abstract

In the past few years, there has been a rapid process of technological developments that is changing the face of the world of work. These changes raise several questions: what will the labor market look like in the future? Which occupations will disappear and which remain essential? What are the skills and aptitudes that will be required to succeed in the new labor market? This chapter maps out the risks faced by occupations in Israel from a process in which computerization will replace manpower; it is based on a similar mapping of the US labor market. Results indicate that workers who supply about 40 percent of the work hours in the Israeli market place are likely to be replaced by computers or machines in the coming two decades. Since the mid-1990s, there has been a decline in the relative share of work hours in such "high risk" occupations. A look at those occupations at high risk shows that they are characterized by requiring low levels of education and low wages and many of them employ non-Jewish men or young workers. These findings emphasize the need to prepare in advance for the expected changes in order to prevent a situation where willing labor market participants are forced out due to a lack of the required skills or aptitude. This preparation may require several steps, including widening the use of vocational training and targeting it to match the relevant characteristics of the workers in high-risk occupations while monitoring the needs of the future labor market.

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Introduction

The labor market is a dynamic market, one exposed to an array of influences, including technological developments, globalization and changing consumer preferences. Trends and changes in the labor force have been extensively discussed in the research literature. Goos, Manning and Salomons (2010) studied the employment structure of 16 European countries between 1993 and 2006, and determined that the employment share of prestigious occupations such as management and skilled work, as well as of low-wage personal care occupations, increased at the expense of production line and clerical jobs characterized by repetitive tasks performed according to a fixed routine. The authors conclude that declining employment in routine task jobs performed by workers of mid-range skill level is the main driver of polarization in the distribution of employment.

Kimhi and Shraberman (2014) found a similar phenomenon in the Israeli labor market. Between 1997 and 2011, workers in the central portion of the wage distribution were potentially adversely affected by changes in the labor market, due to decreases in both wages and work hours relative to workers at either end of the distribution.

Autor and Dorn (2013), who surveyed the American labor market from 1980 to 2005, determined that local labor markets characterized by routine task occupations had gradually adopted technologies to replace workers for these tasks.¹ Their study also finds polarizations within these markets in wages and employment rates of workers at different wage levels, as well as an increase in the employment of both high-skilled and low-skilled workers. Moreover, the authors find that increased employment rates and wages of low-skilled workers are mainly concentrated in a single broad occupational category – the service industry – and that this sphere expanded when wages declined in the

¹ For purposes of this chapter, routine tasks are defined as tasks for which automation has become possible and feasible in recent decades.

routine task occupations, causing low-skilled workers to move into the service sector.

Computerization has been prevalent in the Israeli labor market for a long time: Israel Railways has replaced cashiers with an automated ticketing system; bank tellers are being increasingly supplanted by automated banking services, etc. (Varon, 2015; Frenkel, 2015). The labor market's dynamism and the changes taking place within it have given rise to uncertainty about its future: Which occupations will be replaced by technology, and which will continue to require human presence? What will be the labor market's leading occupations and what skills and capabilities will the market require?

This chapter aims to identify the trends and changes that can be expected for the future labor market vis-à-vis today's labor market and, in so doing, to offer a means of preparing in advance for these changes.

1. Likelihood of an Occupation's Computerization

Frey and Osborne (2013) developed a broad-based methodology for classifying occupations by the likelihood of their becoming computerized. The methodology was devised so that the computerization probability of occupations over the coming decade or two could be estimated, and along with it the likelihood of workers being replaced by automated technologies. The methodology is based on research in the field of labor economics, and especially findings on the historical impact of computerization on the labor market's occupational composition (Autor, Levy and Murnane, 2003; Goos et al., 2007; Autor and Dorn, 2013). The methodology was implemented using the O*NET occupational database for 2010.² This database contains detailed

² O*NET was developed for the U.S. Department of Labor, and is a major source of American employment information. At the heart of the system is a database containing extensive information on hundreds of occupations and their attributes. The information is continually updated through surveys of

information on all occupations and on the abilities, skills, knowledge, and tasks they entail. Using the Frey and Osborne (2013) model, the probability of an occupation becoming computerized is a function of the kinds of tasks it is comprised of, which are assessed using measures of creative and social intelligence, perception complexity and manipulation, e.g., persuasion or negotiation. Using a model based on these parameters, the probability of a given occupation becoming computerized over the next two decades is rated using on a scale of 0 to 1: an occupation rated 1 is certain to be computerized within the next decade or two, and an occupation rated 0 will certainly not be computerized in the near future.

The model's analysis results, which relate to data for 2010 in the US labor market, show that 47 percent of those currently employed fall into the category of high computerization risk (probability greater than 0.7), 19 percent into the medium risk category (probability of 0.3-0.7), and 33 percent into the low risk category (probability lower than 0.3).

In this chapter a similar assessment was performed for the Israeli labor market based on the Frey and Osborne (2013) model. Israeli occupations were mapped in a comparable manner, and each individual occupation's risk of computerization was calculated in terms of the aforementioned criteria. Accordingly, Israeli workers were divided into 3 groups: high risk – occupations with a computerization probability of over 0.7; medium risk – occupations with a computerization probability of 0.3 to 0.7; and low risk – occupations with a computerization risk below 0.3.

This model is based on an assumption that occupations rated as at-risk according to Frey and Osborne's (2013) model will actually become automated within a decade or two at the level posited by the model. It is also important to consider that computer and machine capabilities are continually improving, making it safe to assume that even non-routine tasks, those that require creativity and emotional-social intelligence, may one day be easily performed by computers and machines. As an example,

workers in the various occupations and of relevant experts, so that the occupations' growth over time can be tracked.

ten years ago, Autor et al. (2003) classified car navigation systems as a non-automatic task, while today computerized and automated navigation systems exist.

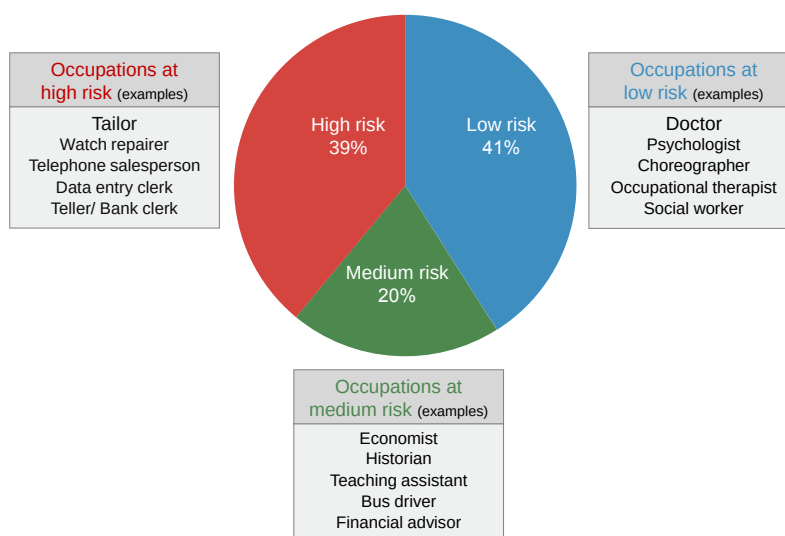
Another reservation worth noting is that the model's adaptation to the Israeli market conditions and the analysis that follows do not make allowances for unforeseeable changes, such as the removal of import barriers or changes to quotas or the production mix. These types of changes could affect the demand for certain occupations, or cause changes in certain sectors – and thereby affect the need for employees in those sectors. The Israeli textile industry underwent a change of this kind: the easing of import restrictions on textile products dealt it a fatal blow. Due to these kinds of occurrences, occupations that are expected to disappear from the labor market may not actually disappear but could potentially grow.

2. Mapping Israel's Labor Market

Figure 1 presents the work hours distribution of employees ages 25-64 in 2011 in Israel, according to the computerization probability definitions and risk group classifications noted above.³ The figure shows that 39 percent of work hours are in occupations characterized by a high degree of computerization risk, 20 percent in medium risk occupations, and 41 percent in low risk occupations. Similar results are obtained when the distribution of employees are examined. This translates into a million Israeli workers in this age group who fall into the high-computerization-risk category. A similar number of workers are in the low risk category, while half a million are in the medium risk category. Figure 1 offers several examples of occupations in each of the risk categories.

³ 2011 is the last year for which relevant data are available.

Figure 1
**Distribution of work hours by occupation risk of
 computerization***
 workers aged 25-64, 2011



* Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

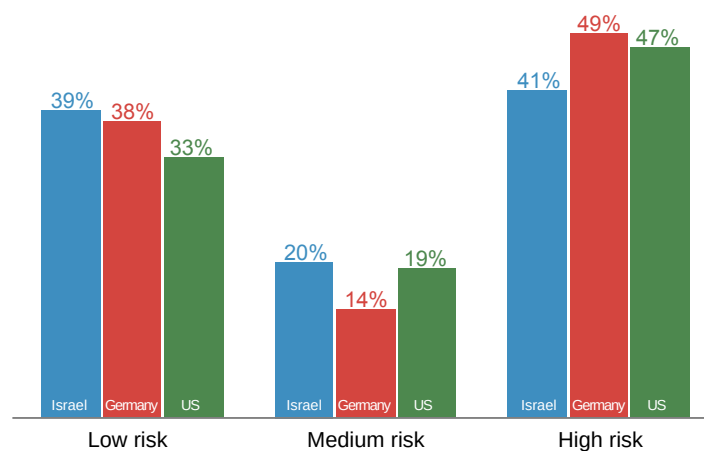
Data: Central Bureau of Statistics, *Labor Force Survey*

Figure 2 compares the distribution of employees in the labor market according to the three risk levels in Israel, Germany and the United States (the countries for which information is available in sufficient detail to conduct such a comparison). Overall, the 2010 data (the last year for which relevant data were available) show that the Israeli labor market distribution is similar to those in Germany and the US. This supports the assumption that a global or even a natural process is at play, one that may be expected to take place in all countries where new technologies are adopted. Alongside the similarity, there are a number of differences between Israel and the other two countries. In particular, a relatively large

share of employees in the Israeli labor market are engaged in occupations rated low risk for computerization, with a relatively small share, compared with the other countries, falling into the high risk category. This difference stems from structural differences in the markets and in the relevant industries.

Figure 2
**Distribution of workers by occupation risk of
computerization***

Israel, Germany and US, 2010



* Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

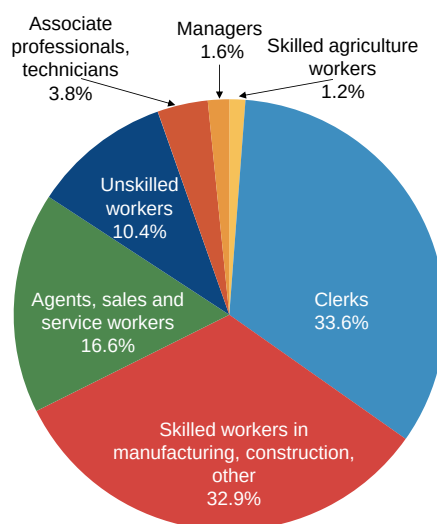
Data: Central Bureau of Statistics; Luxembourg Income Study

A picture of the characteristics of occupations at high risk of computerization may be found in Figure 3, which presents the distribution of work hours for workers in these occupations, according to the Central Bureau of Statistics' occupational classification.⁴ The occupation that stands out in this group is that of clerical work – 34 percent of all work hours in the high risk occupation group – despite the fact that the share of all forms of clerical work in the economy's total work hours is 15 percent. This occupation has a high percentage of female employees – 73 percent of all work hours – and few employees with academic degrees. The share of male academic degree holders in the occupation's total work hours is only 8 percent.

By contrast, the share of at-risk workers in the manager and associate professional/technician groups, which account for 9 percent and 15 percent respectively of the economy's total work hours, is very low – 1 percent and 4 percent out of the total work hours for workers in at risk jobs, respectively. The main reason for this is that these occupational groups encompass jobs that require a high degree of emotional intelligence and creativity. At the medium risk level as well, the relative share of the managerial occupations is 1 percent, and most managerial jobs are classified as “safe” with just a few managerial jobs, such as those in the supply sphere, at higher risk of computerization. Among academic professionals, no workers were found in occupations denoted as high risk.

⁴ See the Central Bureau of Statistics occupational classification system in the Appendix.

Figure 3
**Distribution of work hours for workers in
 occupations at high risk of computerization***
 by occupation group, workers aged 25-64, 2011



* Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

3. The Effect of Worker Characteristics on Computerization Risk

In order to characterize employees in the various risk groups, four areas were examined: education, hourly wages, gender, and sector. The relationship between these characteristics and occupational computerization probability was examined as well.

Education

Kimhi (2012) found a link between education level and exclusion from the labor market for Israeli males: the older they are, the more the less-educated among them tend to drop out of the labor market. Frey and Osborne (2013) found a close relationship between worker education in a given occupation and the probability of that occupation becoming computerized: occupations in which employees are less educated were found to be at higher risk. Figure 4 presents the correlation between percentage of academic degree holders in an occupation and the probability of that occupation becoming computerized.⁵ As with the findings of Frey and Osborne (2013), an inverse relation was found between education and computerization probability: the higher the probability of an occupation being automated, the lower the share of academic degree holders among those employed in it. Nevertheless, in contrast to this trend, which is consistent through most of the distribution, there are two anomalies in the figure. The first is an increase in the share of academic employees in occupations classified as being at the highest risk for computerization (0.96-1). This jump occurred because the occupation group includes such jobs as insurance agent, secretary, bookkeeper, bank teller, and credit clerk – many of which are manned by academic degree holders. The second deviation is a decline in the rate of academics employed in occupations with a low risk rating. This decrease is due to the fact that there are some low risk occupations with only a few workers with higher education working in them (see details that follow).

Except for these occupations, the conclusion is that jobs whose computerization risk is great are ones that require less higher education. These findings are consistent with a 2013 occupational forecast of the US Bureau of Labor Statistics (Bureau of Labor Statistics, 2013), which states that occupations requiring higher education are expected, on

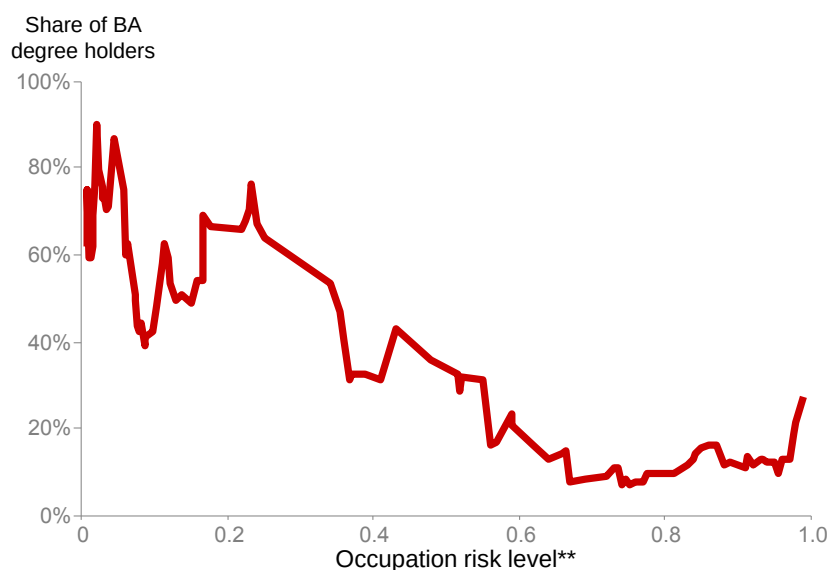
⁵ Academic degree holders, for purposes of this chapter, are defined as people with at least 15 years of schooling, for whom the last institution at which they studied was an academic one.

average, to grow more rapidly than those that do not demand post-secondary education.

Figure 4

Share of BA degree holders in occupations at high risk of computerization*

out of all workers in occupations at all risk levels, workers aged 25-64, 2011



* Moving average

** Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

Figure 5 also shows the inverse relationship between education level and computerization probability, by breaking down occupations by the average number of years of schooling of those employed in them (each dot on the figure represents an occupation). As may be seen, occupations at high risk are located in the two groups with the smallest number of

years of schooling. In the 15-16 years of schooling group, most of the occupations are low risk, while in the 17 years and over group, all of the occupations are low risk. Even in this figure, there are exceptions: jobs such as hairdresser, athlete, cosmetician, and police officer are held by people with relatively few years of schooling, yet are at low risk of computerization. There are also occupations, such as economist, computer engineer and computer technician, that are at medium risk of computerization, even though they require many years of schooling.

Figure 5
**Occupation by risk of computerization* and
 number of years of schooling****
 workers ages 25-64, 2011



* Occupation risk level is based on Frey and Osborne (2013)

** Average number of years of schooling for all employed people in the occupation group

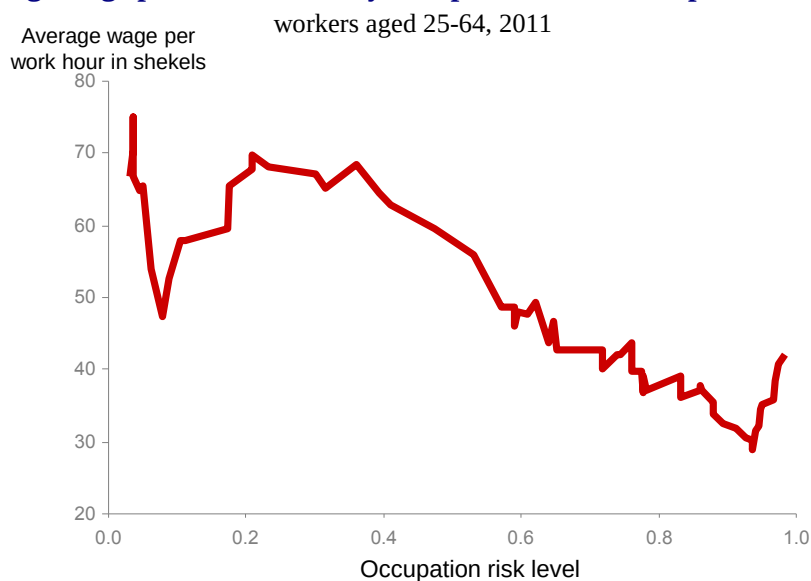
Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics, *Labor Force Survey*; Frey and Osborne (2013)

Wages

Another interesting link is between wage and computerization probability. Frey and Osborne (2013) found an inverse relationship between an occupations' wages and its likelihood of being computerized. Figure 6 presents the same correlation by average hourly wage of salaried employees in the Israeli economy. As with the education variable, hourly wage is also negatively correlated with computerization probability in Israel. The figure shows that the link is most evident in the higher computerization probabilities – from 0.4 on. The positive relationship between education and wage is clear and well-known, making the emergence of an indirect relationship between hourly wage and probability of computerization unsurprising. However, there are deviations from this trend at both ends of the wage distribution: on the one hand there are occupations at low risk of computerization whose average hourly wage is low, e.g., clergy, teachers (primary and pre-primary) and security workers (police officers and firefighters). On the other hand, there are occupations at high risk of computerization with high average wages relative to the other high risk jobs – auditors, bookkeepers and postal clerks.

Figure 6

Average wage per work hour* by occupation risk of computerization**

* Moving average

** Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics, *Income Surveys*

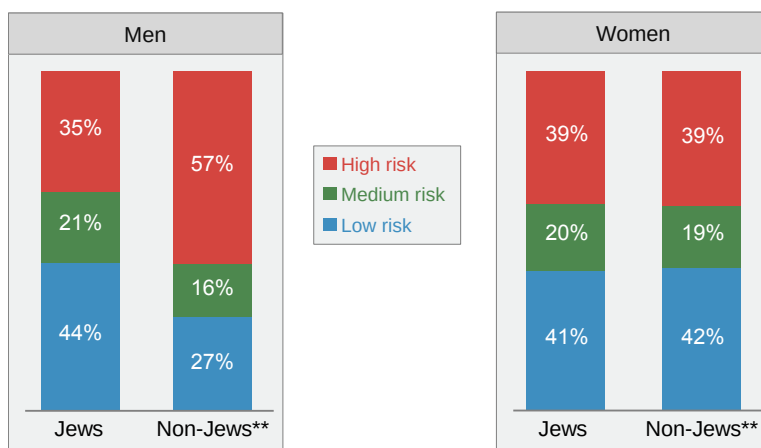
Gender and Sector

The distribution of work hours in the economy by computerization risk level broken down by gender and sector is presented in Figure 7. Non-Jewish males stand out for their high representation in high risk occupations. They are followed by women – both Jewish and non-Jewish – with similar distributions, with Jewish men at the lower end of the scale, demonstrating a relatively low rate of employment in occupations with high computerization risk. The sector variable does not seem to be meaningful in the work hours distribution by risk level for women. For men, though, the difference between Jews and non-Jews is clearly visible

in the distribution, and is due to the differing occupations in which the members of each sector are employed.

Figure 7
Distribution of work hours by occupation risk of computerization*

by gender and ethnic group, workers aged 25-64, 2011



* Occupation risk level is based on Frey and Osborne (2013)

** Muslims, Christians, Druze, and others

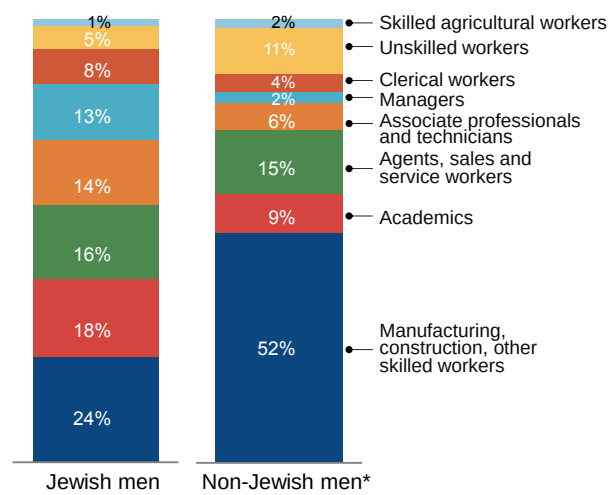
Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

This is demonstrated in Figure 8 which focuses on the distribution of work hours among non-Jewish men by occupation. Over 50 percent of this group's work hours are in skilled jobs in industry, construction and other sectors – a particularly high percentage compared with the work hours of Jewish men in those same occupations. These professions are characterized by a proliferation of occupations that are considered at high risk of computerization. A review of the occupations with high employment of non-Jewish men shows that many of these jobs are as construction workers, drivers, tinsmiths, welders, metalworkers, and

mechanics. Fuchs (2015) shows that there is a decline in the employment rate of young Arab Israeli men (ages 18-34) between 1995 and 2011. This decline is at least partly explained as the first signs of the effect of technological changes on the main employment areas for this population.

Figure 8
Distribution of work hours of men by occupation group
 by ethnic group, aged 25-64, 2011



* Muslims, Christians, Druze, and others

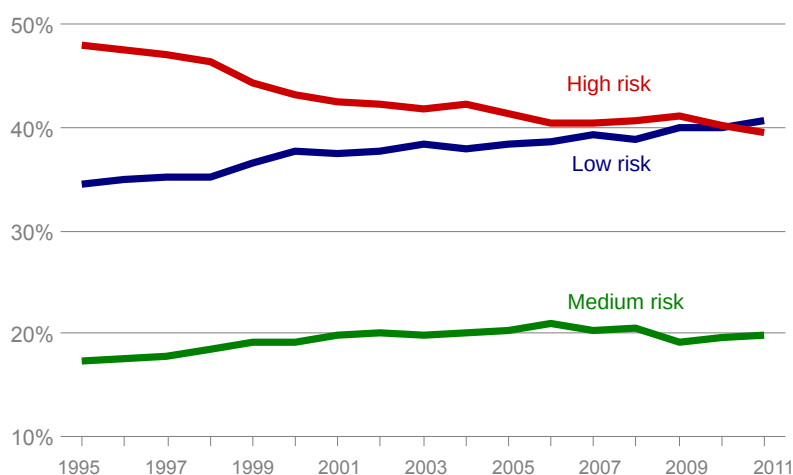
Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

4. Employment Trends by Computerization Risk Level: 1995-2011

After examining current computerization risk levels, this section looks at developments in this area over time. A review of Israeli labor market trends from 1995 to 2011, presented in Figure 9, reveals that the relative share of occupations rated high risk for computerization in the work hour total has declined over the years, along with a rise in the relative share of occupations rated low risk. This trend indicates that a drop in the relative share of occupations considered to be at high risk of computerization is an ongoing process that has been underway for the past two decades.

Figure 9
Distribution of work hours by occupation risk of computerization,* 1995-2011
workers ages 25-64



* Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

Table 1 presents the employment characteristics of the main occupations rated as high risk for computerization.⁶ The picture obtained is one in which the total employment share of most of these occupations declined between 1995 and 2011. These data also reflect the negative correlation observed between education and occupation computerization risk (Figure 3). Apart from insurance agents, bank tellers and credit clerks, 46 percent of whom hold academic degrees, the percentage of academic degree holders among all those employed in the major high risk of computerization fields is low.

⁶ Occupations characterized by a relatively high rate of labor market participation and ranked as high risk for computerization.

Table 1. **Main occupations at high risk of computerization***

Occupation	Relative share of labor force, 2011 (%)	Relative share of labor force, 1995 (%)	Rate of change, 1995-2011 (%)	Share of workers in the occupation with an academic degree (%)	Weekly work hours (average)
Salespeople/shop assistants	4.80	5.62	-15	12	38
Drivers (private, taxi, commercial, truck)	3.16	3.54	-11	4	45
Secretaries	2.55	2.82	-9	20	34
Metal workers (welders, blacksmiths, tinsmiths)	2.22	3.61	-38	10	45
Bookkeepers	2.09	2.03	3	24	37
Stock keepers**	1.29	1.23	5	16	42
Bank clerks and credit agents	0.82	1.01	-19	47	39
Woodworkers/carpenters	0.70	1.30	-43	7	43
Cashiers	0.67	0.63	6	14	34
Insurance agents	0.37	0.38	-3	46	41

* Occupation risk level is based on Frey and Osborne (2013)

** Although stock keepers are ranked at a risk level of 0.64, which is on the borderline of high risk, they appear here because of their relative high share in the labor force.

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

Table 2 presents the main occupations rated as low risk for computerization and their attributes.⁷ In contrast to the list of major high computerization risk jobs, the list in Table 2 is characterized by high rates of workers with higher education. The change rate in employment for most of these occupations is positive, and even in those where a decline in the employment rate is seen, the decline is relatively small except for medicine, which showed a 24 percent drop in relative employment share, though this appears to be unrelated to computerization).

⁷ Jobs characterized by a relatively high rate of labor market participation that are rated low for computerization risk.

Table 2. **Main occupations at low risk of computerization***

Occupation	Relative share of labor force, 2011 (%)	Relative share of labor force, 1995 (%)	Rate of change, 1995-2011 (%)	Share of workers in the occupation with an academic degree (%)	Weekly work hours (average)
Architects/engineers**	3.41	2.62	30	96	44
Primary school, special education teachers and others	2.87	2.34	23	66	30
Security workers (police, detectives, firefighters)	2.22	1.65	34	24	41
Company directors and private sector CEOs	1.82	1.71	6	56	47
Systems analysts and academic professionals in computer sciences	1.77	0.69	158	91	44
Secondary school teachers	1.46	1.51	-3	90	30
Certified nurses	1.13	1.01	11	67	37
Physicians	0.95	1.24	-24	100	45
Preschool teachers	0.84	0.57	48	48	32
Lecturers in higher education institutions	0.60	0.47	27	97	31

* Occupation risk level is based on Frey and Osborne (2013)

** Engineers are not included in the computer science group

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

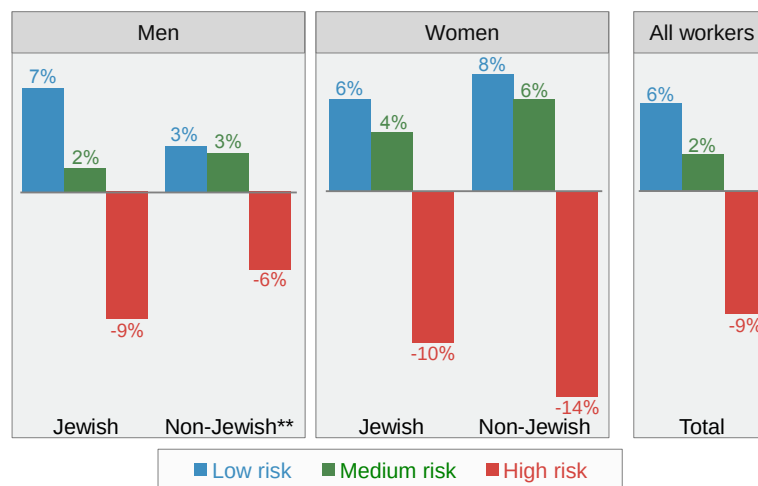
Developments in the Labor Market by Level of Computerization Risk and Worker Characteristics

Figure 10 presents the changes in the relative share of work hours of different types of worker between 1995 and 2011 by level of computerization risk and broken down by gender and sector. The figure shows a trend toward switching from employment in high risk occupations to employment in low and medium risk occupations, for both women and men. However, women – especially non-Jewish women – showed a steeper decline in the relative share of work hours in high computerization risk occupations. For Jewish men, most of the increase was found in jobs at low risk of being computerized.

Figure 10

Changes in the relative portion in work hours, 2011 compared to 1995

by ethnic group, gender and occupation risk of computerization,*
workers ages 25-64



* Occupation risk level is based on Frey and Osborne (2013)

** Muslims, Christians, Druze, and others

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

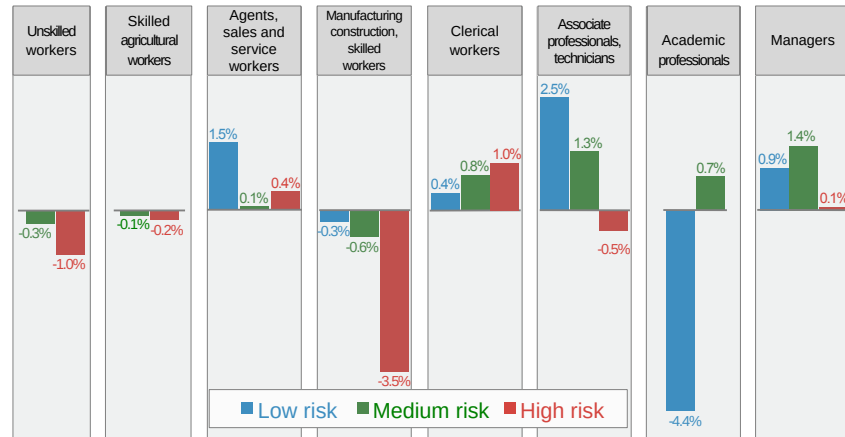
Data: Central Bureau of Statistics, *Labor Force Surveys*

Figures 11A and 11B present the change in relative share of work hours among employed persons with and without academic degrees, respectively, from 1995 to 2011. Academic degree holders appear to have transitioned from employment in jobs belonging to skilled and unskilled occupations, especially those rated as high risk, to employment in the associate professional/technician, management, and clerical occupations – particularly those fields rated as low and medium risk for computerization. The rise in work hours among academic degree holders occurred mainly in the fields of primary and pre-primary school teaching, laboratory technician/nursing, senior management, computer engineering, engineering and architecture. In the figure, the declining relative share of low risk of computerization jobs among academic occupations stands out. An examination of changes in work hours for jobs in this occupational group found that most of the decline can be explained by a drop in the relative share of physicians.

Figure 11A

Change in the relative portion of work hours of employed academic degree holders,* 2011 versus 1995

as percent of all work hours of academic degree holders, by occupation and occupation risk of computerization,** workers ages 25-64



* Occupations are arranged from left to right in order of ascending wage per work hour in 2011 prices

** Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

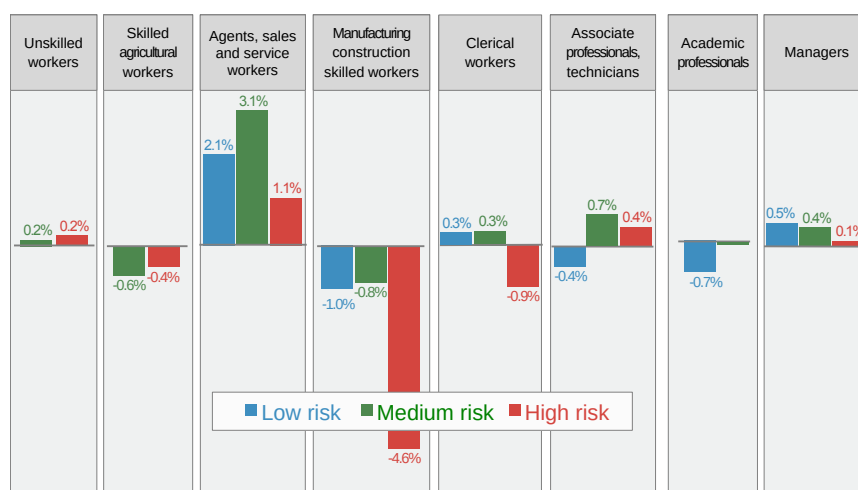
Data: Central Bureau of Statistics, *Labor Force Surveys*

Figure 11B shows that, as with the trends found in the American labor market (Autor and Dorn, 2013), the rise of service occupations in the Israeli labor market has been especially great among non-academic degree holders, and particularly for service jobs rated at medium risk for computerization.

Figure 11B

Change in the relative portion of work hours of employed workers without academic degrees,* 2011 versus 1995

as percent of all work hours of workers without academic degrees,
by occupation and occupation risk of computerization,**
workers ages 25-64



* Occupations are arranged from left to right in order of ascending wage per work hour in 2011 prices

** Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

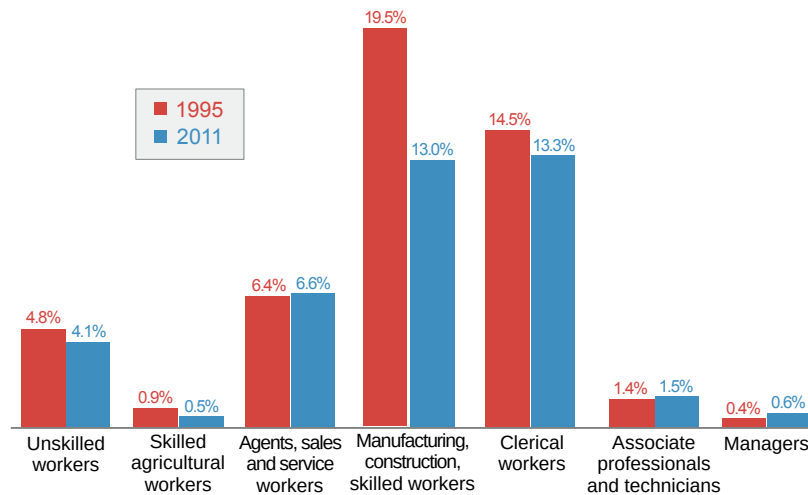
The two figures highlight the decline in the relative share of jobs belonging to the skilled workers in industry, construction and other skilled workers group. This decline is also seen in jobs not considered to be at high risk of computerization, such as foremen in the machinery and mechanic field.

Figure 12 presents the distribution of work hours in jobs at high risk of computerization as a share of all work hours in the economy. It can be seen that many work hours are concentrated in the category of skilled workers in industry, construction and other skilled workers, and in clerical jobs. By contrast, in the associate professional/technician occupations and among managers and skilled agricultural workers, the figures are low to nonexistent. It should be noted that skilled agricultural workers' share in the economy's total work hours, at all computerization risk levels, is low, amounting to about 1 percent.

Figure 12

Distribution of work hours in occupations at high risk of computerization*

by occupation group,** as percent of all work hours, workers aged 25-64



* Occupation risk level is based on Frey and Osborne (2013)

** Occupations are arranged from left to right in order of ascending wage per work hour in 2011 prices

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

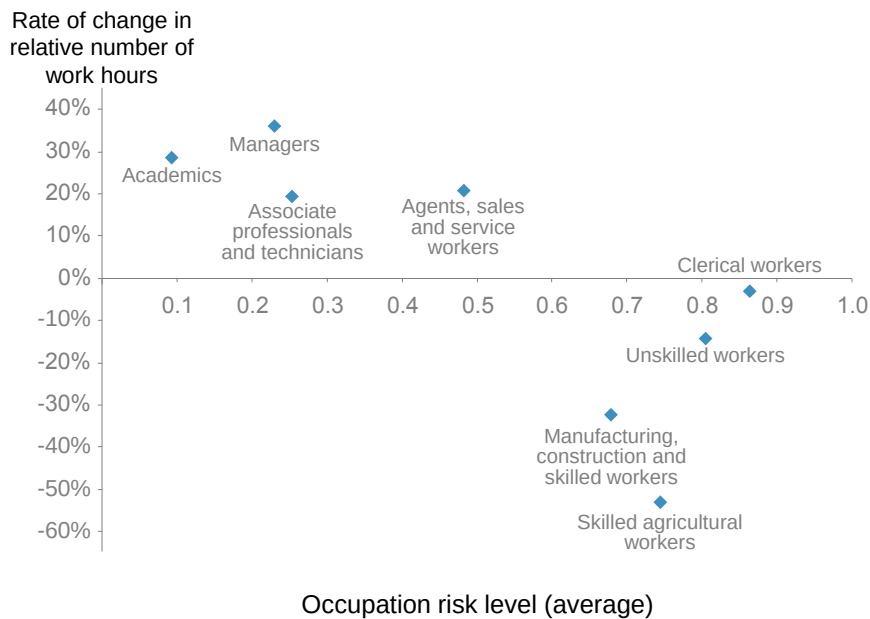
Data: Central Bureau of Statistics, *Labor Force Surveys*

Regarding the changes in work hour distribution that took place between 1995 and 2011, most of the decline occurred in the category of skilled workers in industry, construction and other skilled workers. An in-depth look at work hour rates in high computerization risk in this category shows an especially sharp decline among tinsmiths, welders and metalworkers, as well as floorers, painters/whitewashers and tailors. A small decline was also seen in clerical jobs. In occupations characterized by a low concentration of work hours on the part of workers at high risk, like managers, the changes are very small.

Figure 13 shows the relationship between the change in employment by occupation over the past few years and the average probability of computerization. The figure shows the change in each occupation's relative share of the total work hours, by the average computerization probability for each occupation (from 0 to 1). Academic degree holders, managers and associate professionals/technicians – fields characterized by few workers in high computerization risk jobs – appear to exhibit the largest employment increase from 1995 to 2011. Clerical work, an occupation characterized by high computerization risk, shows a relatively small decline in its share of total work hours in the labor market. It is interesting that occupations characterized by an average (medium to high) degree of risk show a decline in their relative employment share, while occupations with a high degree of risk actually exhibit quite small changes in their relative share of work hours. It should be remembered that each occupation carries a different weight in the labor market, meaning that the trends described here do not contradict the change trends by computerization risk level in the labor market as a whole (Figure 9). For agents and sales/service workers, a rise in the relative share of work hours is found. Regarding the occupation's internal distribution, a decline in the relative share of jobs belonging to the sales area is found and, by contrast, there is a rise in the relative share of jobs in the service sphere.

Figure 13 combined with the findings of Figures 11A and 11B leads to a conclusion similar to that indicated by Figure: the period 1995 to 2011 saw a transition to occupations whose computerization risk is medium or low – service jobs, associate professional/technician occupations, management and academic professions.

Figure 13
**Change in relative share of occupations out of all work hours,
 2011 compared to 1995**
 by occupation risk of computerization,* workers aged 25-64



* Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

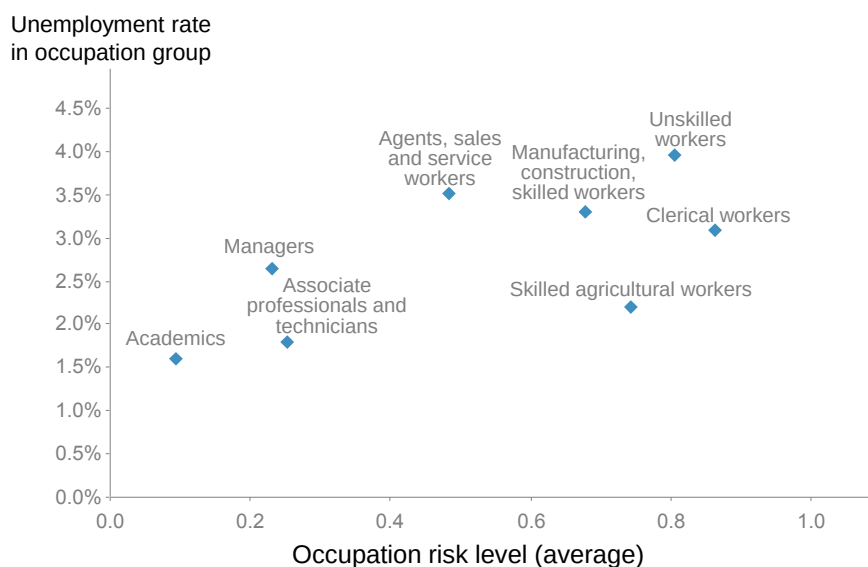
Data: Central Bureau of Statistics, *Labor Force Surveys*

Unemployed Individuals

The data for unemployed individuals supplements the picture of the status of employed persons in the labor market.⁸ Figure 14 shows the share of unemployed individuals in the various occupations by average probability of computerization. Like the trends observed for employed persons, the percent of unemployed individuals is relatively high in occupations with a high average computerization probability, especially among unskilled workers and skilled workers in the industry, construction and other skilled workers category. The opposite is also seen: few unemployed people belong to occupations whose average probability of computerization is low.

Figure 14

Unemployment rate by average occupation risk of computerization* in occupation groups, workers aged 25-64, 2010-2011



* Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

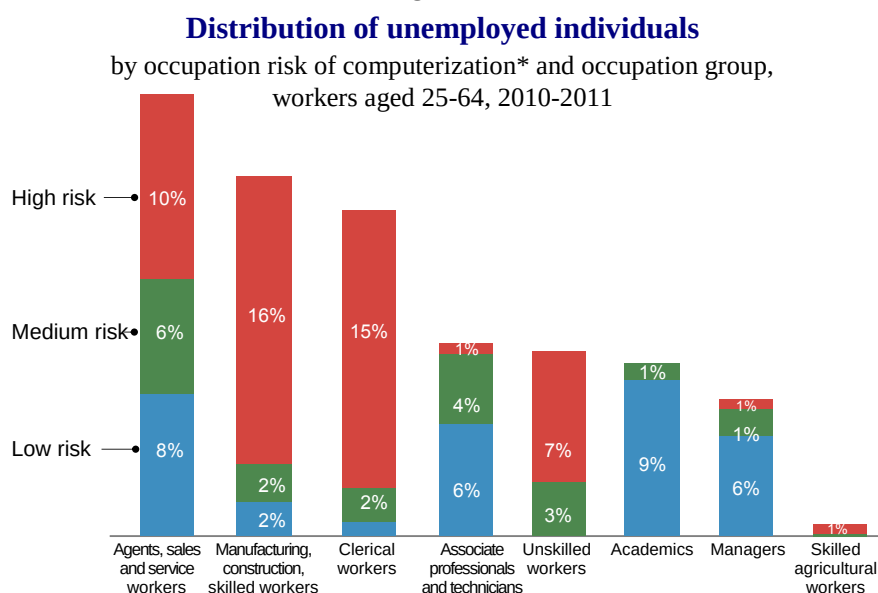
Data: Central Bureau of Statistics, *Labor Force Surveys*

⁸ “Unemployed” is defined as people actively seeking work who have worked during the past 12 months.

A look at the kinds of work in which unemployed individuals are engaged in shows that 50 percent belong to occupations at high risk for computerization. To obtain an in-depth picture of this group's occupational composition, Figure 15 presents the distribution of unemployed individuals across the various occupations by computerization risk level. It can be seen that among those who were in unskilled work, as well as clerical workers and skilled workers in industry, a large proportion of the unemployed belong to occupations rated as at high risk for computerization.

Regarding unemployed persons who have given up looking for work from 2010 to 2011 31 percent stated that the reason they abandoned their job search was that no work existed in their occupation. A look at these individuals' occupations indicates that, during this period, 60 percent of these individuals belonged to occupations rated as at high risk for computerization. This finding constitutes a warning sign for people engaged in high risk occupations: they could ultimately find themselves unemployed despite their wish to remain in the labor force.

Figure 15



* Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

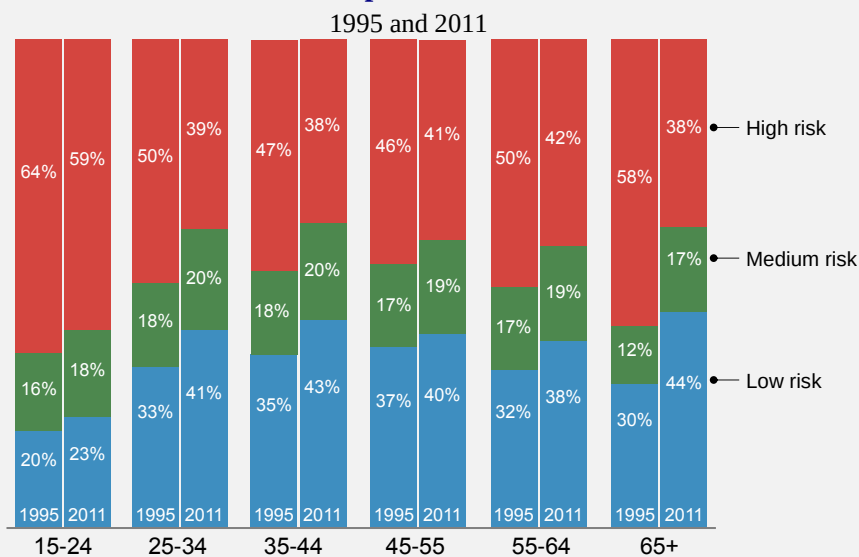
Data: Central Bureau of Statistics, *Labor Force Surveys*

Spotlight: *Employment Characteristics by Age Groups*

A look at the distribution of work hours by computerization risk and by age group (Figure 16) reveals that in the youngest age group (15-24) a substantial proportion of work hours is supplied by workers in high computerization risk occupations. This is not surprising, given that employed persons in this age range have generally not yet embarked on their career path and for the most part may work at temporary jobs that do not require education or training.

Figure 16

Distribution of work hours by age group and occupation risk of computerization*



* Occupation risk level is based on Frey and Osborne (2013)

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

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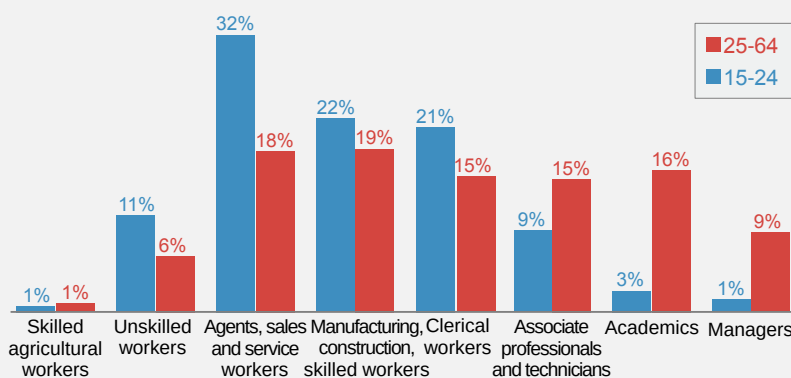
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Moreover, compared with employed persons in the other age groups, those in the 15-24-year-old age group exhibit the smallest decline (5 percent) in the share of work hours in occupations at high risk of computerization. By contrast, the largest decline in share of work hours in high computerization risk occupations was found among those aged 65 and over – 19 percent, compared with more moderate declines of 5-10 percent in the other age groups. The decline among those aged 65 and over is reflected primarily in sales, tailoring, accounting, and cashier jobs. A similar distribution is found when employee numbers are looked at.

According to 2011 data, employed persons aged 15-24 account for 8 percent of work hours in the Israeli economy. About 30 percent of work hours in this age group are in agent, sales and service occupations – a relatively high percent compared with that of the prime working age range (Figure 17).

Figure 17

Distribution of work hours by occupation* and age group, 2011



* Occupation are arranged from left to right in ascending order of wage per work hour in 2011 prices

Source: Shavit Madhala-Brik, Taub Center for Social Policy Studies in Israel

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

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Overall, it appears that occupations considered to be high wage have a low proportion of young employees, as these occupations require education, skills and experience. By contrast, occupations in the skilled workers in industry, construction and other skilled workers category exhibit a relatively high proportion of young employees – despite the fact that these jobs generally require training and job-specific skills. A closer look at the young people working in skilled industry jobs shows that most are employed in positions at high risk for computerization, especially metalworkers, electrician/electronics workers, auto mechanics, and truck drivers.

The high computerization risk jobs in which workers aged 15-24 are employed are mainly sales and office jobs, wait staff jobs, and shop assistant/department store jobs. The main areas that employ people in this age group and that are not at high risk of computerization are childcare, computer technician and technical agent jobs, and security.⁹

5. Implications and Recommendations

The data presented here point to a feasible scenario in which, within the span of two decades, employed persons who currently supply 40 percent of work hours in the Israeli economy will be replaced by computers and automated devices. The current trend, which is expected to continue, indicates a transition from routine-task occupations at high risk of computerization to occupations whose computerization risk is moderate or low. Additionally, there are jobs which, though their definitions may remain the same, will nevertheless change radically in terms of the nature

⁹ For a more detailed discussion of young adult employment in Israel, see Fuchs (2015).

of the work and the skills that those doing the work will be expected to have.

Beyond the obvious impact of anticipated changes in the labor market – the likelihood that many of those employed today will find themselves in occupations destined to disappear or due to change drastically – it must be acknowledged that the unemployment risk will affect those belonging to the most vulnerable groups in Israeli society. As shown in this study, worker attributes such as lack of academic education and low wage, as well as non-Jewish status (for males) and young age (15-24), are strongly correlated with occupations at high risk of computerization. The needs of these worker populations should therefore be addressed in advance, so that a lack of skills and abilities required by the new labor market will not doom them to unemployment.

Vocational Training Tailored to Existing Needs

A policy tool that can be used to address and prepare for anticipated labor market changes is vocational training. This measure should be tailored to the needs of those who are forced out of the labor market due to technological development, taking into account their occupational background and skills and oriented toward the future labor market – the careers of the future, as well as the attributes and the skills that will be required. Accordingly, the current training programs funded by the state must be examined and assessed as to how well they serve their population, as well as their suitability for the future labor market.

At present the government operates, through the Israeli Employment Service framework, two vocational training tracks: (1) government courses offered by the Ministry of Economy's Manpower Training and Development Bureau; and (2) a voucher system for subsidizing vocational training, in which an unemployed person can choose a desired

course and educational/vocational institution.^{10,11} Upon successful completion of the course, the government provides partial funding for participation (Ministry of Economy, 2015). Although these tools could help many unemployed people, Israeli Employment Service data (2014) show that of the half-million jobless citizens who visit the country's employment bureaus each year, fewer than 1 percent are referred to these training frameworks – only 1,649 to the voucher program, and 2,276 to government courses operated through the Manpower Training and Development Bureau (personal communication from the Israeli Employment Service, 2015). This being the case, it would be both appropriate and worthwhile to increase the enrollment of unemployed people in vocational training courses by tens of percentage points.

A comprehensive Israeli Employment Service survey of voucher recipients during the years 2008 to 2013 attempted to identify the main voucher-recipient populations, and to determine whether the courses they took had been useful to them.¹² The survey found that the voucher recipients' median wage was just NIS 4,500, and that most of them were unable to pay for the training on their own.

Survey data regarding the main vocational training courses offered in the voucher framework (Table 3) indicate that the most prevalent jobs for which training is provided include ones rated high risk for computerization, such as bookkeeper, payroll controller and payroll clerk. However, graduates of these courses do appear to be finding work in these fields, as are most of those who complete courses in occupations rated medium risk for computerization. By contrast, most graduates of

¹⁰ There are other agencies that refer clients to existing training courses. In the present study the focus is on the Israeli Employment Service, as it is the largest service for unemployed Israelis.

¹¹ Courses that meet specific criteria, and educational institutions from a list of recognized institutions.

¹² The survey encompassed 53 percent of the voucher recipients for the period 2008-2013. A survey response bias was found in favor of stronger populations.

courses offered in areas classified as low risk for computerization, such as academic occupations, hairdressing, and management, are not finding work in their fields of study. The fact that graduates of courses in high computerization risk occupations are managing to find their way into the labor market is not surprising, since – it should be recalled – the scenario foreseeing the demise of these occupations is forward looking, referring to a period of ten or twenty years from now. In addition, as noted, structural changes in certain sectors may affect the demand for workers and actually lead to increased employment in these sectors, even if the nature of the work is changing. The real question is why graduates of courses in low-computerization-risk fields are failing to find work. There are several plausible explanations for this: voucher recipients might be unsuited to the occupations for which they are trained; there could be a glut of workers in some of the occupations; and the training provided by the educational institutions offering the courses might be inadequate, which in turn would hurt the course graduates' placement chances.

Another tool that could prove useful in addressing the anticipated changes is that of continuously updating the continuing education programs offered by schools and academic institutions, to ensure that the training provided is in line with technological development in the relevant fields and in the labor market.

In order to facilitate coordination between all of the relevant entities, a government unit should be established to manage this area in an ongoing way. The unit could work together with the training and academic institutions, the schools, the employment authority, and the Israeli army training units, as well as with the National Labor Federation, other labor unions, and employers. The unit would see to coordination and continuous updating of all involved agencies regarding anticipated changes in the labor market.

6. Conclusion

This chapter aims to identify technology driven trends and changes likely to affect Israel's labor market. The importance of these developments lies in their potentially broad and far-reaching consequences for the Israeli economy as a whole.

The chapter provided a glimpse of the current distribution of employment in Israel's labor market in terms of three levels of computerization risk: low (less than 0.3), medium (0.3-0.7), and high (over 0.7). The expected scenario is that employed persons now accounting for 40 percent of work hours in Israel's labor market will be at high risk for replacement by computers and machines over the next two decades. An international comparison shows that the trend discernible in Israel is prevalent in other countries as well, and the share of workers in high computerization risk occupations in the Israeli labor market is even relatively small.

Alongside this finding, it may be expected that some occupations will remain unaffected by technological development. According to Autor and Dorn (2013), though technological development lowers the cost of executing routine, codifiable tasks of the kind that can be performed by computers, it has a marginal impact on the cost of service tasks that require human presence.

It is important to note that, although technological development causes some occupations to disappear from the labor market, it can also be expected to produce new ones. A British-Welsh study found that new technologies had created more jobs over the years than it had eliminated, and that, on the whole, it had led to an increased proportion of workers in caregiver and nursing jobs, at the expense of physical labor jobs (Stewart, Debapratim and Cole, 2015).

It has also been shown in this chapter that the main occupations at high risk of computerization are those that involve routine tasks and manual labor in a fixed procedural framework, such as secretarial work, accounting and insurance agent jobs. By contrast, occupations found to be at low risk of computerization require creativity, persuasiveness and

emotional-social intelligence – e.g., teachers, engineers, security workers, and physicians. Higher education is another widely shared attribute of people employed in low computerization risk occupations, and the reverse is true as well: low education levels are correlated with high computerization risk. High computerization risk also characterizes areas in which young people, non-Jewish men and low wage workers are disproportionately employed. The trends observed for the period 1995 to 2011 are aligned with predictions for declining employment in jobs categorized as high risk for computerization. A decline in the relative share of work hours was found for these occupations, alongside a rise in the relative share of occupations rated medium and low risk for computerization. This increase is due mainly to a shift on the part of employed persons who are not academic degree holders to these occupations – especially to service jobs, which fall into the medium risk category.

The status report and forecast presented in this chapter were supplemented by policy options for addressing the anticipated changes: creating appropriate vocational training frameworks and expanding the use of such frameworks, continually updating study programs in the schools and in academic institutions, and establishing an agency to coordinate activity in this area.

Appendix

Classification of Jobs by Occupation by the Central Bureau of Statistics

The Central Bureau of Statistics developed its *Standard Classification of Occupations, 1994* based on the recommendations of the International Labor Organization, as set forth in the International Standard Classification of Occupations, ISCO-88, and adapted to reflect local Israeli conditions.

“Occupation” as defined in the *Standard Classification of Occupations*: “Occupation includes all the activities the worker actually does at his workplace. However, the level of education required for filling a specific occupation became the main principle for classification. This principle is already expressed in the division of occupations into ‘major groups’ by descending ranking of educational level. The major group ‘Managers’ (Major Group 2) is an exception which does not follow the principle of education.”

Description of the Contents of the Major Groups

Major Group 0 - Academic Professionals: Academic Professionals who work in life sciences and natural sciences, engineering, computers, medicine, law, humanities and social sciences and education in academic and secondary education institutions. Professionals in this major group deal mainly with conducting research and applying scientific methods to find solutions to various problems in fields listed above. These workers require a high level of education which is usually acquired at universities or at other recognized academic institutions.

Major Group 1 - Associate Professionals and Technicians includes workers who perform tasks of technical assistance in research, in scientific development and in applying scientific knowledge, as assistants to academics in the fields specified in Major Group 0. Also included are associate professionals such as: athletes, designers and religious associate

professionals, and those whose occupations are in teaching, medicine and other fields, which require a post-secondary school education but not an academic one.

Major Group 2 - Managers includes workers who participate in determining policy, laws, regulations, decision making on a governmental or non-governmental plane, in managing and organizing factories and institutions and in carrying out policies that have been decided upon. This order is not related to level of education [...] In this major group a distinction has been made between a manager whose position is mainly administrative, who is classified in this major group, and a manager whose work is mainly in the field of his specialization and is classified in the appropriate major group (for example - a manager of a medical division in a hospital will be classified among doctors).

Major Group 3 - Clerical Workers includes occupations whose main tasks are filing, storing material, calculations and supplying information. The workers perform secretarial work, type, operate office machinery and perform clerical tasks connected to mail services, handling money and managing meeting schedules. This major group also includes clerks who supervise these workers. These are supervisory clerks equal in authority to department managers, according to the accepted terminology of the Civil Service Authority.

Major Group 4 - Agents, Sales Workers and Service Workers includes workers who deal in wholesale and retail trade. They purchase and sell various goods and services or serve as agents between buyers and sellers. Also included are workers who provide services related to the daily needs of the community and the family such as accommodation and food, personal care and other services.

Major Group 5 - Skilled Agricultural Workers includes workers who perform skilled work in agriculture: field and vegetable crops, plantations, animals and mixed farming; forestry and maintenance, fishing and fish raising.

Major Group 6-8 - Skilled Workers in Industry, Construction and Other Skilled Workers includes workers having professional knowledge and training who deal in production processes in industry and workshops using sophisticated equipment and industrial machinery or using manual equipment or hand tools. Also included are sailors, drivers, construction workers and mining and quarry workers.

Major Group 9 - Unskilled Workers includes workers who have occupations requiring primary school education or not requiring any education at all. They usually perform work that requires more physical strength than training and knowledge.

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Contract Workers in Israel

Noam Gruber*

Abstract

The public discourse in Israel has dealt extensively with the phenomenon of contract workers: workers employed via a third party, whose rights and terms of employment are usually inferior to those of direct employees. This chapter will focus both on the extent of this phenomenon and on the essential difference between two groups of contract workers: agency contract workers and service contract workers. Agency contract workers are young relative to the Israeli workforce, and the extent of this form of employment is in decline. In contrast, service contract workers are older and have lower socio-demographic profiles, and the extent of such employment is on the rise. The failure to distinguish between these two groups leads to the common misconception that the extent of this phenomenon in Israel is extraordinary in international comparison; this chapter will demonstrate the differences between the two groups. In its final section, this chapter will address solutions to the problems involved in contract employment. The gap between the rights of permanent workers and those of temporary workers must be reduced as such gaps are the primary impetus for temporary or indirect employment. However, measures that would harm employers' ability to hire and fire workers according to the prevailing economic circumstances must be avoided, as this could serve to increase unemployment, particularly among contract workers.

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Introduction

The issue of contract workers in Israel stirs up strong public emotions. Some see the phenomenon as a form of exploitation, with employers – and especially the State – shirking their responsibility towards workers and bypassing labor protection laws as part of an ongoing trend of privatization and a shrinking of the welfare state (Weisberg and Bior, 2011; Barkan, 2014). On the other hand, there are those who argue that it is precisely social legislation, which gives workers rights and benefits they consider excessive, that causes employers, especially in the public sector, to turn to indirect employment that does not obligate them to provide workers with such benefits (Moav and Cohen, 2008). There are some who maintain that contract employment is a poverty trap, denying workers social benefits, seniority, and job security, and also that the contracting companies keep an unjustified share of the workers' salaries. In contrast, others feel that contract employment fills an important role in the economy, as it provides businesses with flexibility, enables young workers to gain experience that will lead them to permanent employment, and helps older and less skilled workers, who do not find other work, to break out of the cycle of unemployment.

Ideological disputes aside, there is a serious problem in Israel when it comes to defining and collecting data about this. The term “contract workers” has become an umbrella term for temporary workers (employed directly and indirectly), workers in employment agencies providing services, and various outsourced service providers, blurring the distinction between work via employment agencies and outsourcing. This lack of clarity, exacerbated by a lack of systematic data, makes it difficult to estimate the extent of the phenomenon in Israel and compare it internationally, coloring the discussion with inaccuracies and exaggerating the extent of the problem.

The purpose of this chapter is to provide an overview of the state of contract workers in Israel based on a systematic analysis of existing data on the subject. An international comparison indicates there is no basis for the claim that the extent of contract work in Israel is far greater than is

common worldwide. It also shows that contract workers are divided into two groups – agency contract workers and service contract workers – which have very different demographic profiles. The first group is characterized by a high percent of young people and inexperienced workers, and has been on the decline in recent years. The group of service contract workers, on the other hand, is characterized by employees with relatively weak socio-demographic profiles. This form of employment is part of a broader phenomenon of the increased use of outsourcing and subcontracting for the employment of temporary workers and is due, among other things, to the disparities in social rights between permanent and temporary workers. At the end of this chapter, a recommendation is presented for contending with the challenge facing policy makers in Israel: equalizing conditions of employment between permanent and temporary workers while not infringing too much on the flexibility of this type of employment. This tactic may lead to an increase in unemployment, especially among service contract workers. Another possible solution to the problem is to adopt the “flexicurity” (flexibility and security) model as practiced in Northern Europe, which provides employers with flexibility alongside a wide safety net for workers who lose their jobs.

1. Defining Contract Workers

There are large differences between the international definition of contract workers and the definition in Israel. Globally, it is common to differentiate between agency contract work, which takes place on the client’s premises and under its supervision, and outsourcing (or subcontracting), in which the client purchases services, but does not directly oversee the work.¹ Outsourcing can take place either on or off the

¹ See Article 1 of the International Labour Organization’s Private Employment Agencies Convention (C181) of 1997. The definition in this convention also serves the European Union (EC Expert Group, 2011) and Ciett, the

client's premises. The policy discussion on contract workers and this chapter focus on the issue of outsourced work that takes place on the client's premises. For example, if a company hires a programmer through an employment agency and the hiring company is directly in charge of guiding and overseeing the programmer's work, this programmer is an agency contract worker. On the other hand, if the company pays a service provider for programming services, and as part of those services a programmer comes to the company, working under the guidance and supervision of the service provider, this would be outsourcing. This distinction is highly important, because in the case of outsourcing there is essentially no employment relationship between the worker and the company that buys the service, and the regulations that apply to employment agencies are not applicable (International Labour Organization, 2006).

Similarly, in Israel, the 1996 Employment of Employees by Manpower Contractors Law (hereinafter the "Contractors Law") distinguishes between an employment agency, which mediates between "agency contract workers" and clients ("engaged in the provision of manpower services by his employees for the purpose of work for another person"), on the one hand, and a service contractor employing workers ("engaged in the provision of a service [...] by means of his workers, for another person"), on the other hand. According to the definitions of this law (second addendum), only workers in guarding, security, and cleaning jobs are considered "service contract workers."² All other outsourced workers are not covered by the Contractors Law while Section 12(a) of the law stipulates that a body employing an agency contract worker through an employment agency must hire the employee directly after nine

International Confederation of Private Employment Agencies, which is the source of a large part of the global data on contract employment (Cielt, 2014).

² The 1951 Hours of Work and Rest Law includes a broader definition, according to which a service contractor is one who "engages in provision of a service, by his workers, at a client's premises."

months (nursing and computer service employees are excluded from this requirement), no such requirement applies to service contract workers.

According to the definitions of the Contractors Law, it can be said that Israel's agency contract workers are nearly equivalent to the internationally accepted term "agency workers." The main difference is with regard to nursing care workers – who are generally considered agency workers in the international arena but are not considered either agency or service contract workers according to Israel's Contractors Law. In practice, however, and according to the Central Bureau of Statistics, nursing workers in Israel are generally considered to be service contract workers. Furthermore, the Israeli definition of service contract workers can be defined as a type of outsourcing by international terms. As such, for example, cleaning workers employed by a contracting company and working under its supervision would be considered service contract workers in Israel, while in the European Union they would be considered outsourced or subcontracted company employees (EC Expert Group, 2011). However, it is important to clarify that globally, in contrast to the situation in Israel, work in cleaning or guarding could also be considered agency work, so long as the direct guidance and supervision of the worker are the client's responsibility (Tal-Spiro, 2014). An additional difference is that in the European Union, an association or public body acting as an employment agency would be subject to the same laws as a private employment agency (EC Expert Group, 2011) while in Israel, various municipal associations, non-profit institutions, and municipal corporations essentially act as employment agencies without being subject to the Contractors Law (Moshe, 2014).

It is clear that the overall definition of contract work in Israel, which also includes service contractors, is not identical to the international definition of agency work, which does not include outsourcing. However, despite this fundamental difference, it has become customary in Israel to compare the extent of the country's total contract work with the extent of agency work worldwide. The result is that the relative extent of this phenomenon in Israel is significantly overestimated in international comparisons, and there is a misconception that the percent of contract

workers in Israel is the highest in the world by a wide margin (for example, Yashiv, 2011; Weisberg and Bior, 2011; Barkan, 2014). On the other hand, the aforementioned difference in the regulation of municipal/nonprofit activity leads at the same time to an underestimation of the phenomenon in Israel. In order to make a valid comparison, worldwide agency work rates must be compared to data on agency contract workers alone, excluding service contract workers – as will be detailed in Section 2.

Figure 1 shows the overlap and difference between the definitions of various contract workers in Israel and worldwide. This comparison raises a few main points:

- A. In Israel, domestic care service (nursing care) is exempted by law from the category of agency workers, so as not to obligate individuals employing caretakers through employment agencies to hire them directly after nine months. However, it can be argued that nursing workers belong to the “agency workers” category in terms of employment characteristics, since the caretakers work under the direct supervision of the clients. At the same time, the client often pays the caretaker directly in addition to the payment through the nursing care employment agency. Some of those eligible for nursing care benefits from the National Insurance Institute receive money specifically for the purpose of direct payment to the caretaker – meaning that some workers are simply employed directly rather than through an employment agency.³ Therefore, it does not seem justified to add all workers in the domestic care branch to the category of agency contract workers for the purpose of international comparison.
- B. Employees of municipal associations that operate as employment agencies (such as municipal corporations that allow indirect employment of teachers) are not considered by law to be agency contract workers, but do belong to the agency worker category in

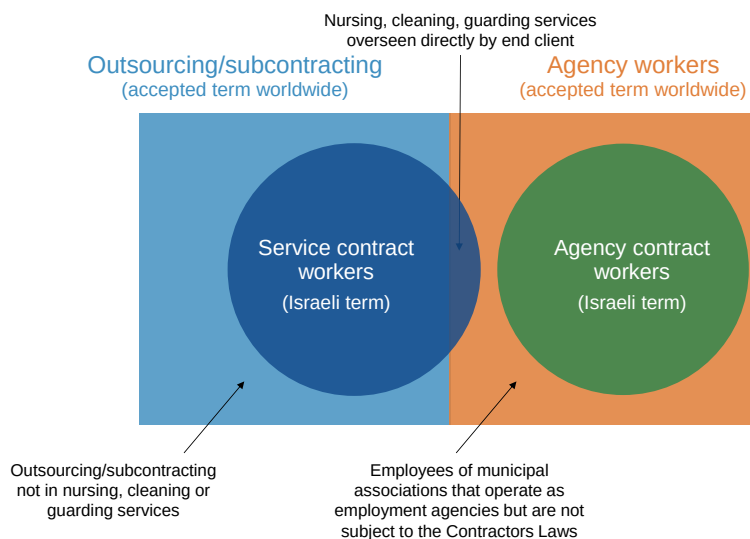
³ It appears that the option for direct hire is only used in about 10 percent of cases (Brodsky, Resnizki and Cohen, 2013).

terms of their employment characteristics. This category also includes workers in cleaning and security (and nursing), working under the guidance and supervision of the end client, but considered service contract workers according to Israeli regulations (or in practice).

- C. As noted, the law in Israel defines service contract workers as workers in guarding, security, and cleaning only. This paper adds nursing care workers to this group, as they are considered such in practice by the Central Bureau of Statistics as well. However, the international definition of outsourced (subcontracted) employees is broader than the Israeli definition of service contract workers, since it includes outsourced employees in other fields, such as catering, or workers providing services to the end client without being physically present at the workplace (customer service workers or accountants). In Israel, these outsourced employees are not covered by the Contractors Law.

Figure 1

Alternative employment types in Israel and worldwide



Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

Spotlight: *Contract Workers in the Education System*

The public sector in Israel features a phenomenon of employment through municipal associations which function to a large extent as employment companies. This phenomenon is especially prevalent in the education system. From 2001 to 2009, 85 percent of teaching hours in elementary education were funded directly by the Ministry of Education and 15 percent by other sources (Blass, Tsur and Zussman, 2010). At least part of this 15 percent probably includes teaching hours by “contract teachers,” that is, teachers who are not employed directly by the Ministry of Education. According to Vurgan (2014), the Central Bureau of Statistics (CBS) identified some 18,000 teachers (14 percent of all teachers) who were not reported in Ministry of Education accounts, and some were apparently employed through mediating agencies. However, according to the CBS *Labor Force Survey* (2013), only about 3,400 employees in the field of education declared that their wages were paid by employment companies. There are possible explanations for the discrepancy between the numbers. It may be that the teachers do not consider the company employing them an employment agency because it specializes in education. Another possibility is that some of the teachers are employed through municipal associations, which are not considered employment companies for the purpose of the survey.

Contract teachers in Israel are employed primarily in nationwide enrichment programs, reviewed by Bar Giora, Sagi and Metuki (2011), and by associations which are often connected with municipalities.⁴

⁴ Vurgan (2014) found that in Jerusalem, Tel Aviv-Yafo, Rishon LeZion, Ramat Gan, Herzliya, and Be’er Tuvia, there were a total of 1,500-2,000 contract teachers employed by local government, through municipal associations or

(continued from previous page)

Table 1 reviews the employment of contract teachers through nationwide enrichment programs.

Table 1. **National programs that employ contract teachers**

Program	Funding	Type of employment	Number of teachers
Karev Educational Program	Ministry of Education, local authority, parents, and Karev Foundation	Hourly pay or individual contracts	3,807
Hila Program	Ministry of Education	Hourly pay; advisors have a unified contract	1,600
Homesh	Designated budget from the State	Hourly pay including benefits	3,500
Milat Program	65% Ministry of Education, 25% local authority, 10% parents	Hourly wages including benefits	4,000

For more information on the Karev educational program, see the Ministry of Education website:

<http://cms.education.gov.il/EducationCMS/Applications/Manka/EtsMedorim/3/3-7/HoraotKeva/K-2012-10-1-3-7-71.htm>

It should be noted that in many cases, these are relatively small part-time positions, and a great many contract teachers are also officially employed in the education system, working on an hourly basis in these programs in order to supplement their income. However, because these teachers work under the direct guidance and supervision of the schools, and not the agencies or municipal associations that employ them, for the purpose of international comparison their work should be classified as agency contract work.

employment companies that specialize in education. The difficulty collecting comprehensive data on this phenomenon is reviewed by Moshe (2014).

2. *Extent of Employment Through Employment Agencies in Israel and Worldwide*

Agency work is common in many countries. There are two ways to measure its extent. The percent of agency workers out of all employees, or the penetration rate – an index representing the percent in total Full Time Equivalents (FTEs) in agency work out of all employees in the country. For example, two agency workers each employed in a half-time position would be equivalent to one full-time worker; if the economy had 100 half-time agency workers and 50 regular full-time workers, the penetration rate for agency workers would be **one-third** (50 FTEs from agency workers divided by 150 – the number of employees in the economy). In contrast, the index of relative percent among all employees does not take into account the number of hours in the job position; therefore the percent of agency workers out of all employees in this example would be **two-thirds** (100 agency workers out of 150 employees). This example highlights the bias resulting from comparing the employee percent rate in Israel with worldwide penetration rates, as has been done in several articles. It also indicates the value in comparing penetration rates to obtain a broader picture of the situation.⁵

Data on worldwide agency work penetration rates is available through Ciett, the International Confederation of Private Employment Services (this is also the data used by the International Labour Organization, the ILO). In Israel, the primary source of data on various types of contract work is the Central Bureau of Statistics' *Labor Force Survey*. With the help of the survey data, it is possible to assess the number of people employed through employment agencies (defined by law as agency contract workers), the number of employees in guarding, security and

⁵ Since a relatively large portion of contract workers are employed on a part-time basis, the penetration rate is usually lower than the percentage of contract workers among all employees. See, for example, Yashiv (2011), Weisberg and Bior (2011).

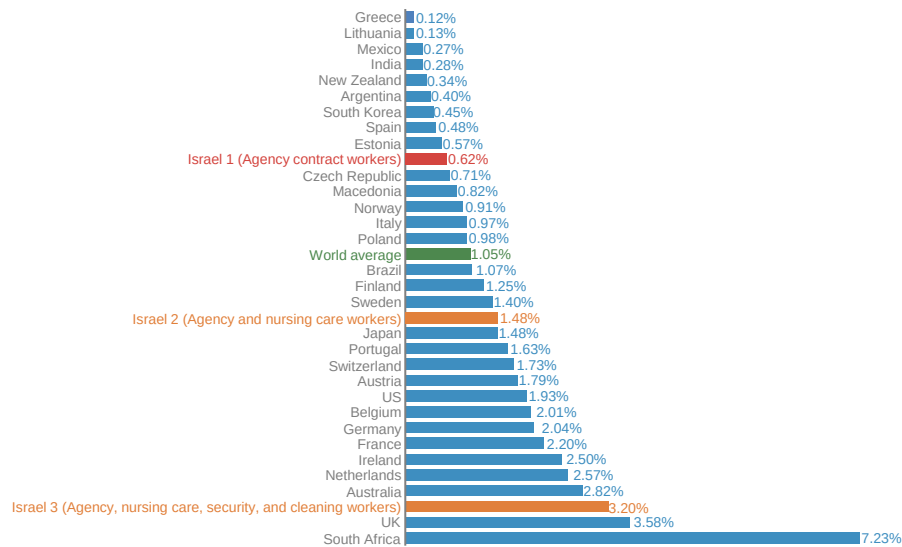
cleaning services (defined by the law as service contract workers), and the number of employees in the domestic care branch (nursing services).

Figure 2 presents an international comparison of the penetration rate of contract work. The data for contract workers in Israel (grouped by employment type) was calculated to match the data from other countries (the FTE estimate is calculated as the sum of all part-time positions divided by the total number of employees).⁶ As can be seen in Figure 2, when considering only agency contract workers – which, as noted, have similar characteristics to the international category of agency workers – the penetration rate in Israel of 0.62 percent is not particularly high relative to other countries. It compares to 1.93 percent in the United States, 1.54 percent in Japan, and a world average of 1.05 percent, for example. Even if all nursing care workers are added, a penetration rate of only 1.48 percent is attained (the “Israel 2” estimate), which is not very high by international standards. Since, as noted, not all of the workers in nursing care meet the definition of agency workers (as some are paid wages directly by the client), only some of these workers should be added to this comparison. Therefore, it stands to reason that the actual agency work penetration rate in Israel lies between 0.62 percent (“Israel 1” estimate) and 1.48 percent (“Israel 2” estimate) and is not exceptional in international comparison.⁷

⁶ According to the data from the CBS *Labor Force Survey*, in 2011, the average number of weekly working hours for a full-time worker was nearly 45 hours. A tally of the hours worked per week by the various contract workers divided by the average number of hours for a full-time position shows that the employment agency contract jobs equaled 18,654 FTEs, nursing care work equaled 26,208 FTEs, and cleaning and security work equaled 51,887 FTEs. Dividing these numbers by the number of employees in 2011 (about three million), leads to the numbers shown in Figure 2.

⁷ Adding employees of municipal associations that provide employment services (not including municipal associations that provide outsourcing/subcontracting services) would only add a few thousand FTEs. Since 1 percent of penetration equals some 30,000 FTEs (author’s calculation

Figure 2
Penetration rate of agency workers*
 international comparison, 2011



* Full-time equivalents (FTEs), computed by summing up all part-time job shares divided by total labor force

Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics, *Labor Force Surveys* (Israel); Cieltt (2013) (other countries)

In contrast, when comparing the penetration rate of all contract workers in Israel, including both employment agency and service contract workers (the “Israel 3” estimate in Figure 2) to the penetration rate of agency work in various countries, the result suggests that the phenomenon of contract work in Israel is more widespread than it is in most countries, except for South Africa and the United Kingdom. As

based on 2011 CBS *Labor Force Survey* data), it seems that this category is not enough to change the estimate in any meaningful way.

noted though, this comparison is flawed, because data on agency work in other countries does not include outsourced and subcontracted workers, which are more or less equivalent to service contract workers in Israel. In fact, the Ciett organization explicitly differentiates between employment services and such services as accounting, security and cleaning jobs (Ciett, 2014).

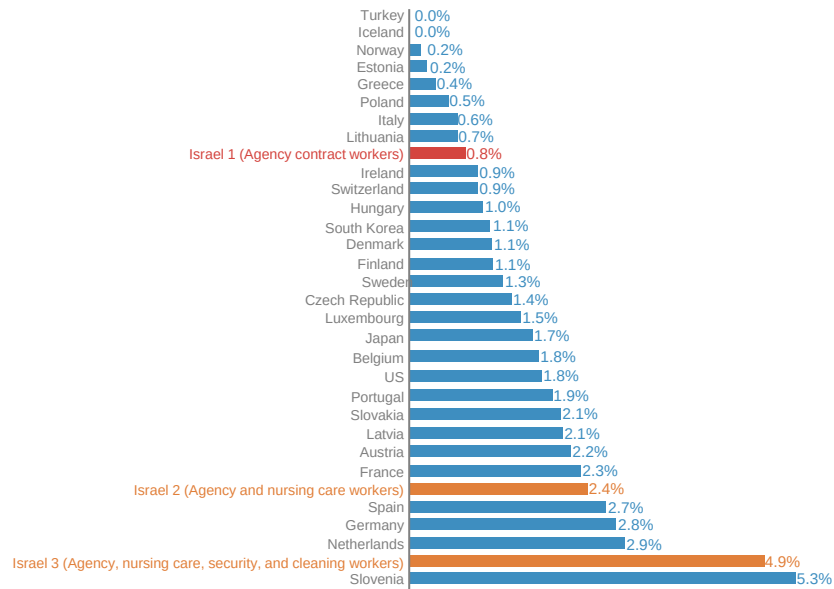
The second way to estimate the extent of contract employment in various countries is to examine the ratio of agency contract workers to all employed persons. These data, used by the OECD, are presented in Figure 3. When examining only those workers employed through employment agencies in Israel, their share out of all employed individuals is relatively low: about 0.8 percent (the “Israel 1” estimate in Figure 3). The high share of nursing care workers (about 1.7 percent) brings Israel up to a relatively high total of 2.4 percent (the “Israel 2” estimate), which places Israel between France and Spain – although, as noted, it would not be justified to define all nursing care workers as agency contract workers. Including service contract workers in security and cleaning services further increases the estimate to the even more inflated 4.9 percent (the “Israel 3” estimate).

Based on this analysis, the extent of employment through employment companies is not extraordinary in comparison with other countries. It is only the erroneous inclusion of service contract workers in such a comparison that leads to this misconception.⁸ One caveat worthy of mention is that it appears that the CBS survey data’s coverage of migrant workers is very limited.⁹

⁸ Since this is a unique Israeli definition, there is no data on “service contract workers” in other countries. On the assumption that these are workers in temporary employment, they are included in the temporary worker data presented in the appendix (there is no data on temporary workers in Israel).

⁹ According to the Population and Immigration Authority (2012), in 2011 there were over 52,000 migrant workers, mostly from the Philippines, in nursing care jobs in Israel. The CBS *Labor Force Survey* only shows about 3,700 employees in nursing care jobs whose origin is in Asia (not including the former USSR, Arab states or Iran). While various studies indicate a high rate

Figure 3
Share of workers employed through agencies
 out of all workers*



* 2011 for Israel; average of 2011-2012 for all other countries

Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics, *Labor Force Surveys* (Israel); OECD (other countries)

of immigrants among agency workers in Europe, these countries do not have data on foreign laborers who are not immigrants (people without citizenship or residency status, who are supposed to return to their countries of origin at the end of the term of employment). It appears that the extent of migrant laborers in most Western countries – unlike in Israel – is relatively limited. Since the policy discussion in Israel primarily focuses on Israeli contract workers, this study does not attempt to account for the underestimate of migrant workers in the data on nursing.

3. *The Number of Contract Workers in Israel*

According to the CBS *Labor Force Survey*, in 2000 there were an estimated 57,000 agency contract workers in Israel (workers receiving their wages through employment agencies) and about 75,000 service contract workers (workers in guarding, security, cleaning, and nursing care). When calculating these data, some of the survey's limitations must be taken into account. First, as noted, the Contractors Law classifies as service contractors only those engaged in providing services in guarding, security and cleaning, but, methodologically, all workers in companies whose services are provided on the client's premises (such as computing services, catering and nursing) must be included as service contract workers. Second, the Central Bureau of Statistics generally categorizes workers in guarding, security, cleaning, and nursing care as contract service workers¹⁰ but, unfortunately, the data do not provide a clear picture regarding other branches.¹¹ Similarly, it is not known which of the workers in these branches work under the guidance and supervision of the client (and should therefore, methodologically, be included under agency work) or which nursing care service employees actually receive most of their salary through employment agencies.

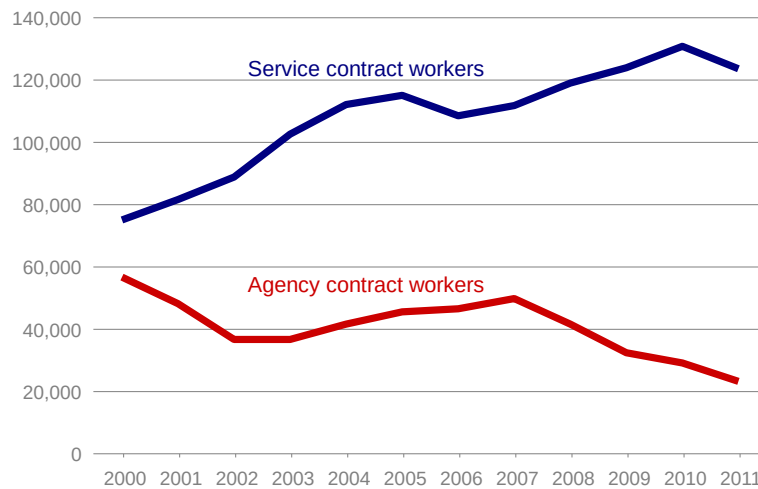
As can be seen in Figure 4, until 2007 the number of agency contract workers remained relatively static (about 50,000 in 2007) alongside an increase in service contractor employment (about 112,000 in 2007). Starting in 2008 – when Section 12(a) of the Contractors Law came into effect, barring agency contract workers from being employed for periods longer than nine months – there is a steep and continuous decline in the number of agency contract workers, down to 23,000 in 2011 (less than half of their number in 2007). The same period witnessed a marked

¹⁰ Since 2013, workers in “combined support services for facilities” are also categorized as subcontractors (CBS, 2013).

¹¹ See Feldman (2014) on the problems involved in using existing data to attain an estimate of the extent of contract work in the Israeli economy.

increase in the number of service contract workers, up to 124,000 workers in 2011.

Figure 4
Number of contract workers by employment type, 2000-2011



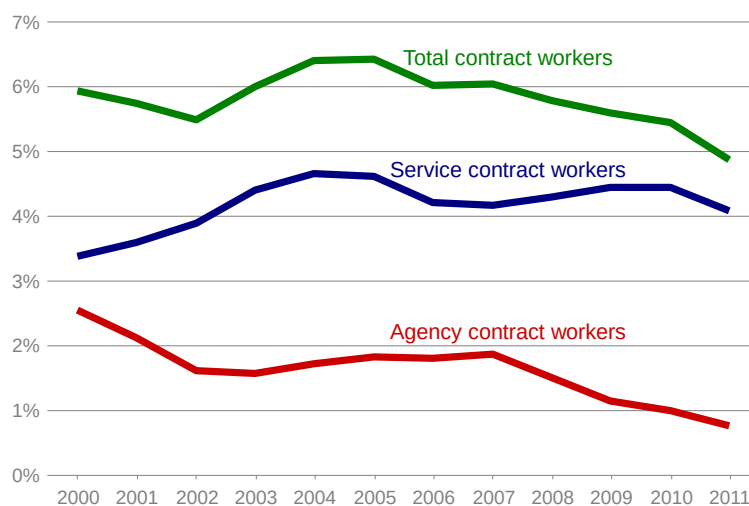
Source: Noam Gruber, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics, *Labor Force Surveys*

Mizrahi (2007) identifies a downward trend in the number of agency contract workers in government offices and a parallel increase in the number of service contract workers. She attributes this to limitations on the employment of agency contract workers in public offices, which are similar to those set in the 2008 law, but preceded them.

As can be seen in Figure 5, these limitations led to a slight decrease in the total percent of contract workers out of all employed persons, from about 6 percent in 2000 down to less than 5 percent in 2011. This decrease resulted from the steep decline in the percent of agency contract workers, from about 2.6 percent in 2000 to less than 0.8 percent in 2011,

as the percent of service contract workers actually grew by half a percentage point during the same period.

Figure 5
Contract workers in Israel
as percent of all employed people, 2000-2011



Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

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

It is clear that the laws and regulations affected the employment relations of agency contract workers and service contract workers in fundamentally different ways. The percent of agency contract workers declined significantly in the past decade, whether due to their employment becoming less worthwhile or due to their increased direct employment by their actual employers. In contrast, the rate of service contract workers has actually increased somewhat. The result is a highly substantial change in the relation between these two groups: in 2000, service contract workers represented 57 percent of all contract workers, a rate which rose to 84 percent by 2011.

4. The Characteristics of Agency Contract Workers and Service Contract Workers

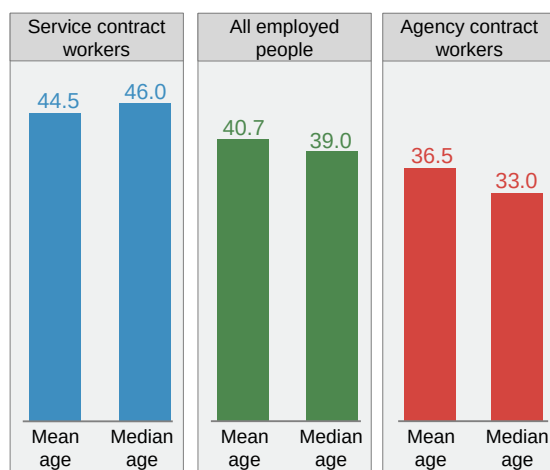
Beyond the methodological differentiation between agency contract workers and service contract workers, there are essential differences in the socioeconomic profiles of workers in the two groups.

Age

In general, agency contract workers worldwide are relatively young, as employment through an agency allows them to gain experience in the workforce and serves as a stage on the path to finding long-term employment. Globally, 61 percent of the workers in this group are under the age of 30; 68 percent were unemployed before they came to be employed through an employment agency, but only 32 percent remained unemployed after completing their temporary employment (Ciett, 2014). Globally, most agency workers are employed in manufacturing (33 percent) and services (38 percent).¹² In Israel too, agency contract workers are younger, on average, than service contract workers. As can be seen in Figure 6, in 2011 the median age of all employed persons was 39 (the average age was 40.7). The median age of agency contract workers was 33 (an average age of 36.5), that is, six years younger than employed persons in general. In contrast, the age of service contract workers was seven years higher than all employed persons: a median of 46 years of age in 2011 (with an average age of 44.5).

¹² The other branches are construction (9 percent), public administration (7 percent), agriculture (3 percent), and others (10 percent) (Ciett, 2014).

Figure 6
Mean and median age by employment type, 2011

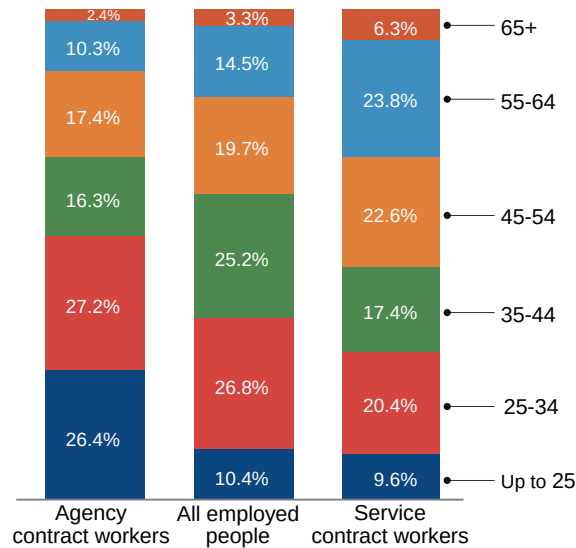


Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

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

When examining the various employment types by age group (Figure 7), it is clear that agency contract workers are concentrated among the younger age groups: 26.4 percent are 25-years-old or younger, compared to 9.6 percent of service contract workers and 10.4 percent of all employed persons. In contrast, service contract workers are concentrated in the older age groups: 23.8 percent are 55-64-years-old (compared with 10.3 percent of agency contract workers and 14.5 percent of all employed persons), and 6.3 percent are 65 or older (compared with 2.4 percent of agency contract workers and 3.3 percent of all employed persons).

Figure 7
Distribution of employed people by age and employment type, 2011



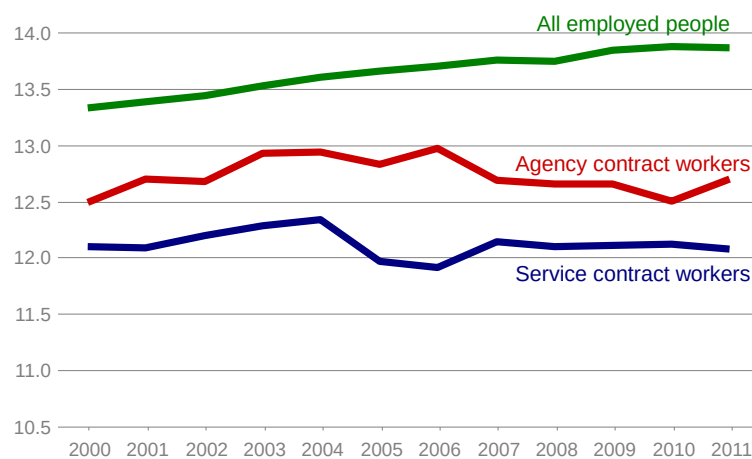
Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

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

Education Level

There are also clear differences between agency and service contract workers in terms of education level. Figure 8 shows that while the average number of years of education among all employed persons has gradually increased in recent years, this is not the case among contract workers. Agency contract workers are more educated, on average, than service contract workers (by a statistically significant margin), but they, too, are less educated than employed people in general, and it appears that the education gap between contract workers and the rest of the workforce is increasing over time.

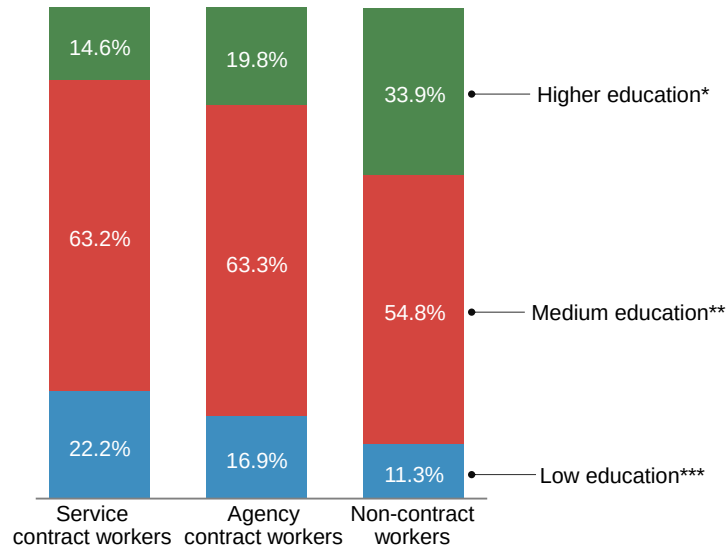
Figure 8
**Average years of schooling by employment type,
2000-2011**



Source: Noam Gruber, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics, *Labor Force Surveys*

When the data is broken down by education levels (low, medium or high), a similar pattern holds. It can be seen that service contract workers are less educated on average than agency contract workers, and that they, in turn, are less educated than employed people who are not contract workers (Figure 9).

Figure 9
**Distribution of employed people by education level
 and employment type, 2011**



* BA and higher

** Completed upper secondary school (with or without matriculation)/ some higher education/ other

*** Completed primary school/ no diploma/ unknown

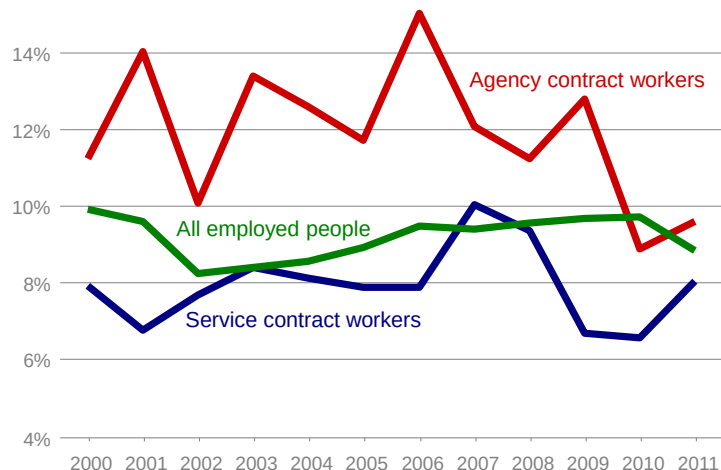
Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

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

However, the gaps in average education between agency contract workers and the general employee population and service contract workers and the general employee population should not be interpreted in the same way: agency contract workers are younger on average and better able to close the gap – which cannot be said for service contract workers. As Figure 10 shows, the share of service contract workers who are also higher education students (7.9 percent on average in 2000-2011) is lower than the share of employed people in general who are also higher

education students (9.2 percent on average), whereas the share among agency contract workers was, on the whole, substantially higher (11.9 percent on average in the same years).

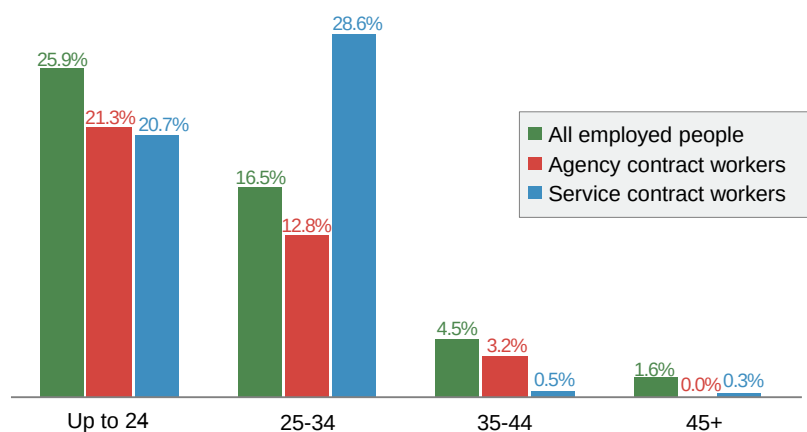
Figure 10
Share of higher education students in labor force, 2000-2011
 by employment type



Source: Noam Gruber, Taub Center for Social Policy Studies in Israel
 Data: Central Bureau of Statistics, *Labor Force Surveys*

The differences in the share of students within each employment type derive directly from the share of young people in each group: a relatively high share among agency contract workers and relatively low share among service contract workers (Figure 6 above). This finding is highlighted by further dividing the share of higher education students in each employment type by age group. Figure 11 shows that the share of students among agency contract workers is not particularly high, when considering age. In contrast, it is interesting to note the notably high rate of students among service contract workers aged 25-34 (Figure 11). The vast majority of these students are employed in guarding and security services, as shown in Table 2.

Figure 11
Share of higher education students in labor force, 2011
 by age and employment type



Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

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

Table 2. **Primary occupation among service contract workers, 2011**
 ages 25-34, by educational status

Occupation	Student	Non-student
Nursing care	8.1%	24.0%
Guarding and security	77.2%	38.9%
Cleaning	1.9%	19.2%
Other	12.8%	17.9%
Total number	7,203	18,046

Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

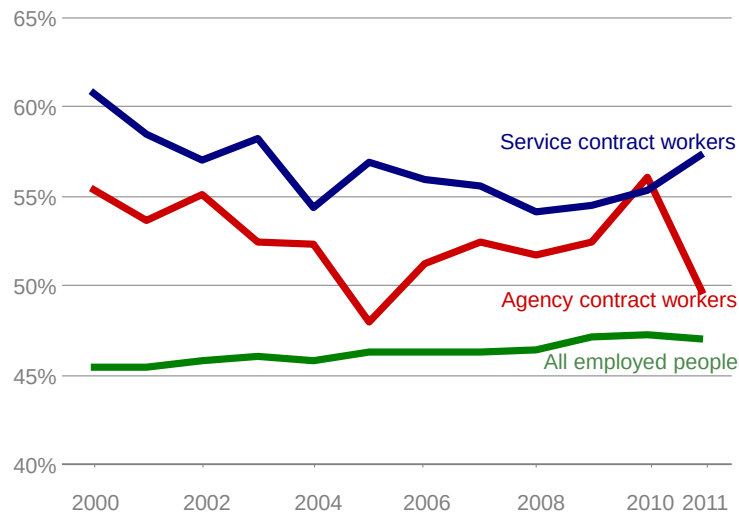
Data: Central Bureau of Statistics, *Labor Force Surveys*

Demographic Characteristics

The group of contract workers is characterized by a high share of immigrants and women – two population groups considered relatively weak in employment terms. Figure 12 shows that the percent of women among all employed persons is on the rise in Israel, similar to the trend across the developed world (Kimhi, 2012). Among contract workers, the percent of women has actually decreased relative to the beginning of the previous decade, but it is still higher than among employed persons in general; this is especially so in the case of service contract workers in Israel, 57.4 percent of whom were women in 2011. Men actually represent a majority of agency workers worldwide (54 percent), but this figure varies significantly between countries. For the most part, in countries where agency work is concentrated in the service sector, like in Israel,¹³ women are the majority while, in countries where most agency work is in manufacturing, men are the majority.

¹³ According to the Central Bureau of Statistics Labor Force Survey data, in 2011, about 8,000 out of about 23,000 agency contract workers worked in industry, agriculture, and construction, while the rest worked in the various service branches (both private and public).

Figure 12
Share of women in the labor force, 2000-2011
 by employment type



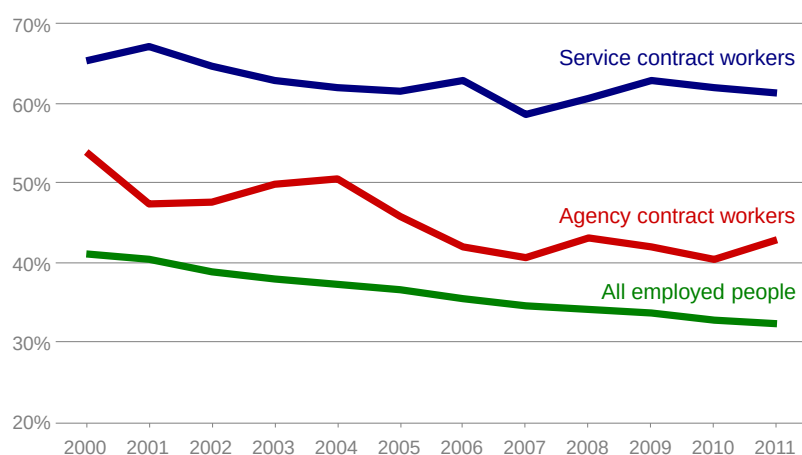
Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

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

In contrast to the share of women among all employed persons, the share of immigrants (i.e., workers who were not born in Israel) was actually found to be in steady decline, as the immigrants who arrived from the former Soviet Union in the 1990s are gradually leaving the workforce. Between 2000 and 2011, the share of immigrants among all employed persons fell from 41 percent to 32.3 percent, a decrease of some 21 percent (Figure 13). In keeping with the general trend, the share of immigrants among contract workers is also on the decline, but remains relatively high. Among agency contract workers, the percent of immigrants went down from 53.8 percent in 2000 to 42.8 percent in 2011. The share of immigrants among service contract workers is higher, and the rate of decline far more moderate: in 2000, the share was 65.4

percent, dropping to 61.4 percent in 2011. This is almost double the share of immigrants among all employed persons in general in 2011.

Figure 13
Share of immigrants in the labor force, 2000-2011
by employment type



Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

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

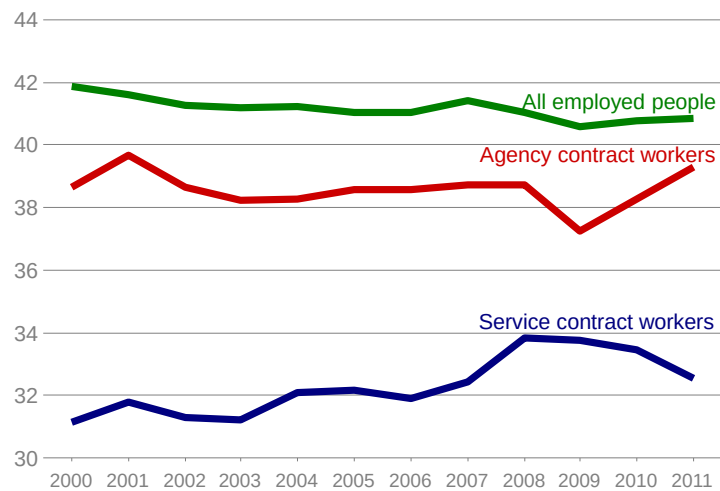
Full-time or Part-time Employment

Another characteristic of contract workers in Israel is the prevalence of part-time work.¹⁴ While employed persons in general worked an average of nearly 41 hours per week in 2011, agency contract workers worked 39 hours and service contract workers worked 32.5 hours per week (Figure 14). It is interesting to see that the trends in this regard are different in each group: among all employed persons, there is a downward trend in

¹⁴ Similarly, in the vast majority of developed countries, agency workers work fewer hours than regular employees (Ciett, 2013).

hours worked, among agency contract workers there is no clear trend, and among service contract workers there is a general upward trend (although that trend has reversed, beginning in 2008). Therefore, the gap in work hours between employed people in general and service contract workers decreased somewhat, from almost 11 hours per week in 2000 down to approximately 8 hours in 2011.

Figure 14
**Average weekly work hours by employment type,
2000-2011**



Source: Noam Gruber, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics, *Labor Force Surveys*

Another way to examine this phenomenon is to look at the difference in the rate of full-time employment. In 2011, the percent of agency contract workers working in full-time positions (77.4 percent) was relatively close to the rate among employed persons who were not

contract workers (83.9 percent). In contrast, the rate of service contract workers in full-time positions was much lower, at 53.7 percent.¹⁵

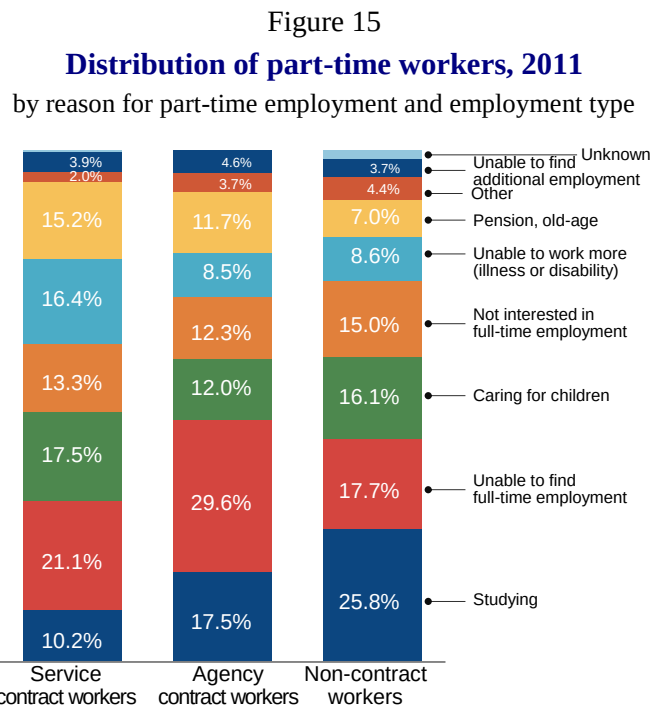
Reasons for Partial Employment

Figure 15 presents the various reasons for working part-time among workers in the different employment types. The leading reason for part-time employment among non-contract workers is education (25.8 percent). The percent of agency contract workers listing education as the reason for working part-time (17.5 percent) is lower than among non-contract employees and this figure is even lower among service contract workers (10.2 percent); this was expected based on the breakdown of each group by age (Figure 6 previously).

The leading reason for part-time work among agency contract workers is the fact they could not find full employment (29.6 percent). This is also the leading reason among service contract workers (21.1 percent) and the second most common reason for non-contract workers (17.7 percent). This means that these workers are ready and willing to work more, but do not have the opportunity. The result is labor underutilization, and its macro-economic repercussions are similar to those of unemployment.¹⁶ Combining part-time workers who could not find full employment with those workers who looked for an additional job and could not find one gives the share of all workers who were clearly interested in working more hours but did not manage to do so. This figure is 35.2 percent among agency contract workers, 25 percent among service contract workers, and 21.4 percent among non-contract employees. While some of those working part-time chose to do so due to their life circumstances, this is less likely to be the case for contract workers, especially agency contract employees.

¹⁵ In the years 2000-2011, there were no substantial changes in the share of full-time positions across the different employment types.

¹⁶ In the United States, people working part-time due to economic reasons (i.e., interested in working more, but there is no demand for their labor) are considered part of the expanded unemployment index U-6.



Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

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

The third most important reason for working part-time among non-contract workers is caring for children (16.1 percent). This reason is less common for agency contract workers (12.0 percent), perhaps due to their lower average age. It is more common among service contract workers (17.5 percent) – for the older members of this category the children they are caring for are likely to be grandchildren.

The rates of service contract workers who work part-time for reasons of “cannot work more (illness, handicap)” and “pension, old age” (16.4 and 15.2 percent respectively) are substantially higher than among other types of workers (and double the rate among workers who are not contract workers). This figure reflects the fact that the service contract

worker population is also weaker with regards to personal health. There is a possibility that without flexible employment options through service contractors, this population might have been forced to either work longer hours – which could represent a real burden for them – or have been forced out of the workforce altogether.

Reasons for Temporary Employment

Despite the significant differences in the characteristics of the two groups of contract workers, they can both be categorized as part of a broader phenomenon – the development of a dual labor market, characterized by a major gap between the employment conditions of permanent employees and those of temporary employees.¹⁷ Temporary employment has expanded in many OECD countries over the past quarter century (OECD, 2014).¹⁸ The rate of temporary employment ranges from 2.7 percent (Lithuania) to 30.5 percent (Chile), and exceeds 10 percent in most OECD countries where data exists (Appendix Figure 1). In Israel, data is not collected regarding temporary employment; therefore this phenomenon cannot be compared with the rest of the OECD.

The extent of temporary employment in OECD countries is especially prominent among the newly employed, defined as those with three months or less of job seniority (Appendix Figure 2). It appears that employing new workers on limited contracts has become a widespread norm; the rate of temporary employment among new employees ranges from 25 percent in Britain to 88 percent in Spain and, in many countries, more than half of new workers start work on a temporary contract. In addition, in most countries, the share of new workers employed on a

¹⁷ The OECD defines temporary employment as employment limited in time, and/or employment through employment agencies (OECD, 2002, A.3). For outsourcing workers, there is no clear-cut distinction between temporary or permanent workers, and the definition depends on the conditions of employment.

¹⁸ The International Labour Organization (2011) and Cielt (2014) show an increase in penetration of agency work in particular.

temporary basis was higher in 2011-2012 than in 2006-2007. This finding indicates that in many countries, temporary employment has become an important stage for new workers joining the workforce and is often a stepping stone to long-term employment (OECD, 2014).

This phenomenon has the positive feature of increasing the flexibility of employment relations for employers, whose employment needs change and for workers, some of whom are not interested in full-time positions, some of whom want flexibility in working hours, and some of whom still lack the necessary experience and skills required for permanent employment. However, it cannot be ignored that a primary motivator for this phenomenon is the disparity in rights and wages between permanent and temporary workers, leading employers to prefer temporary or indirect employment. The result is a dual labor market with substantial rights for permanent workers, who are organized and enjoy protections such as tenure (especially in the public sector). In contrast, temporary workers do not enjoy such rights, whether because of discriminatory agreements and laws or due to flawed enforcement of existing agreements and lack of protection from professional unions. In such a labor market, a conflict of interest arises, well-known in economic literature, between the powerful and protected permanent workers (who are interested in maintaining their employment terms) and the temporary workers (who seek permanent employment even on much worse terms, as it would still provide them with significant benefits).¹⁹

In the case of South Africa, a country with a very high rate of agency work, the large number of temporary workers is due to market structure. On the one hand, there is a lack of flexibility in permanent employment, with high wages and aggressive unions that tend to strike frequently; on the other hand, protections for temporary workers are lax (Budlender, 2013). The situation in Israel is probably not as severe, but there are

¹⁹ In economic literature, this is known as the “insider-outsider problem.” See a general review of the topic in Boeri (2011); an analysis of the problem in Spain, where it is especially severe, can be seen in Bentolila, Dolado and Jimeno (2011).

similarities between the structure of Israel's labor market and that of South Africa. In the public sector (and also in select companies in the private sector, such as the major banks), there are strong unions and a system of tenure,²⁰ as well as arrangements that favor union members over other workers. Although Israel has seen significant achievements in protections for service contract workers,²¹ it is clear that, with a form of employment that is provisional by nature, it is very easy to prevent workers from organizing and protecting their rights. In general, the population of service contract workers has little education and is relatively older. Furthermore, due to the high share of immigrants, many of these workers likely face difficulty communicating in Hebrew. In light of this, service contract workers may find it difficult to protect their rights and may be exploited by employers. For example, Viller (2014) details the distribution of contract workers' inquiries with the Worker's Hotline association, showing a high prevalence of social rights abuses, particularly the denial of seniority (in cases where the same worker stays with the same end client, but the contracting company changes) and incomplete pension contributions by the employing party.

The conditions that lead employers to prefer contract work – substantial differences between the rights of permanent workers and those of contract workers, as well as problems in enforcing the rights afforded to the latter – certainly exist in Israel, creating a hierarchy within the labor market that discriminates against temporary workers, including contract workers. At the same time, caution must be exercised when attempting to minimize these disparities, as measures which decrease the flexibility of employment are likely to increase unemployment at the

²⁰ In Israel, about a quarter of all employees are unionized, and many of them receive tenure (Bank of Israel, 2013).

²¹ See, for example, government offices hiring workers as direct employees (Histadrut website, http://www.histadrut.org.il/index.php?page_id=2134); the 2013 Act Concerning Workers Employed by Cleaning and Security Services Contractors in Public Entities; as well as the extension orders in the cleaning and security branches according to the Collective Agreements Law.

expense of weaker workers.²² The challenge, therefore, is to attempt to bring the working conditions of the two groups into alignment while maintaining flexibility in the labor market. It appears that the common social protections for workers in northern Europe, generally called “flexicurity,” manage to meet this challenge by ensuring a social safety net for the worker that is separate from the employing company – i.e., ensuring general employment security, rather than tenure at a particular work place (Ben-David and Bowers, 2014).

5. Summary and Recommendations

Contract workers in Israel can be divided into two categories: agency contract workers, employed under the supervision and guidance of the service-commissioning client; and service contract workers, subject to the supervision and guidance of the external contracting company. Besides the fact that these two groups are viewed differently by the law, the data presented in this chapter suggests that they are fundamentally different in terms of their characteristics and composition, and therefore require separate policy measures.

Agency contract workers are, on average, a young population – a relatively high share of whom study while employed. In comparison with service contract workers, agency contract workers are far more similar to the general employed population in terms of education levels, percent of women and immigrants, and the share of those employed in full-time work. In recent years, there has been a noticeable and substantial decrease in the absolute number of agency contract workers and in their relative share among all employed persons, from about 57,000 (2.6 percent of employed persons in 2000), down to 23,000 (0.8 percent) in 2011. In international terms, this is a low share. As indicated by the share of young

²² There is ample evidence suggesting that flexibility in the labor market decreases the unemployment rate and increases the participation rate, for example, Di Tella and MacCulloch (2005).

people and students in this group, agency contract work is an important channel of employment, allowing employers flexibility in manpower management and affording young workers the opportunity to gain experience in the labor market and make a livelihood on flexible terms during their studies. Taking this into account, one measure that should be considered is extending the permitted period of employment for agency contract workers to more than nine months, in order to allow workers, especially students, to gain employment continuity and job experience.

Despite this positive picture, there are also problems related to the employment of agency contract workers in Israel. One is that Israeli law, unlike common practice in the European Union, for example, does not recognize employees of municipal associations providing employment services (such as contract teachers) as agency contract workers, and does not limit their term of employment. This loophole has to be regulated, and it must be proposed that municipal associations that operate similarly to employment companies give their workers the same rights. The second problem concerns workers in nursing care services who, at least in some cases, should be considered agency contract workers. The National Insurance Institute allows eligible recipients to collect domestic care allowances in cash for the purpose of directly employing (usually foreign) nursing care workers (rather than paying the nursing care company). However, the cash stipends are 20 percent less than allowances transferred to the nursing care companies (this reflects the difference in VAT transferred to the company, which is 15.25 percent of the payment, and the amount paid to the company itself for administration and profit, which is 4.75 percent). The administration and profit differential between individual and nursing care companies should be cancelled, so that eligible individuals receive the full value of the benefit (without VAT). In this way, individuals can choose to only purchase placement services from the nursing care companies, while directly hiring a caretaker. A transition to this system is expected to both increase nursing care workers' wages (Levy, 2013) and save the patients a great deal of money (Brodsky et al., 2013).

Service contract workers, in contrast, are a fundamentally different case. Unlike agency contract workers, their numbers and share among all employed persons have increased, from about 75,000 in 2000 (3.4 percent of all employed persons), up to approximately 124,000 in 2011 (4.1 percent of all employed persons). This population of workers is older and socioeconomically weaker, and in many cases unable to organize and demand its rights. Current conditions, which raise serious concerns about the exploitation of weak workers, must be improved, populist actions that could primarily harm the service contract workers themselves must be avoided. If the law were to force employers to hire service contract workers as permanent employees, many of them would likely become unemployed, as hiring them would not be economically worthwhile.

Enhanced transparency can protect the legal rights of service contract workers. Under such a proposal, every service contractor would be required to send both the worker and the client a monthly report detailing wage payments to the contract worker (including payments in social benefits) alongside the sum charged to the client for the employee's work. The client would be legally required to share the responsibility for paying the contract workers (no longer using the contracting company as a buffer) and all sides would understand exactly how much the service contractor profits from the mediation between them and whether they might be better off transitioning to direct employment.

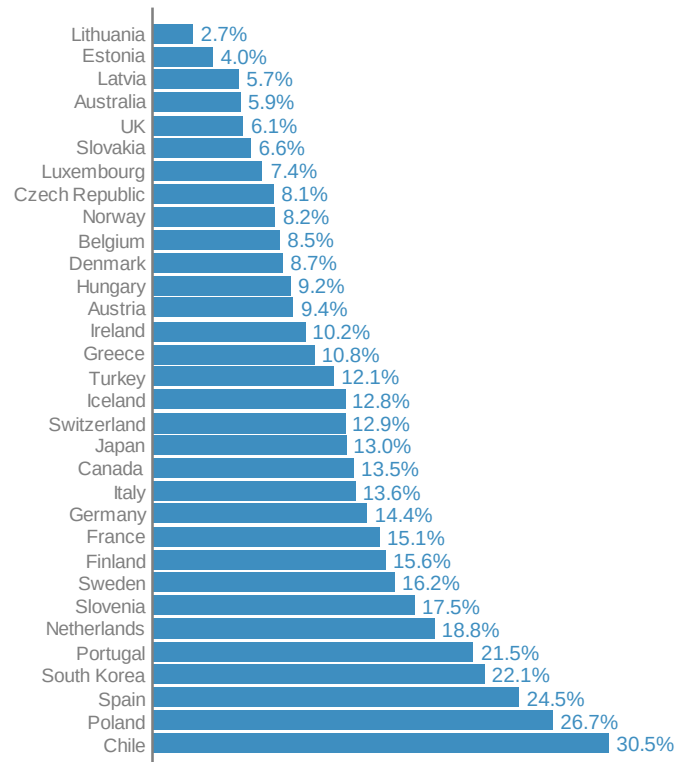
Alongside these measures – which are recommended for immediate implementation – legislation regarding contract work must be improved and data on this phenomenon must be collected in a comprehensive and systematic manner. As noted, the law must treat municipal associations and companies providing employment services equally. Likewise, the law that currently defines a service contractor only as a person engaged in providing guarding, security, and cleaning services must be changed. It appears that the legislator's purpose in detailing these specific fields was to clarify that workers in these fields do not have protections similar to those of agency contract workers. However, it is not reasonable to limit the definition of the service contractor to specific sectors, and the definition must be expanded to include all those who engage in providing

services, by means of their employees, on their customers' premises. Accordingly, the relevant fields must be added to the Central Bureau of Statistics' surveys to assess the extent and characteristics of this phenomenon more precisely: indirect employment through companies and municipal associations, work providing services to a primary customer, wages and social benefits, and long-term or limited contracts.

Work through both employment agencies and service contractors, which is a form of outsourcing, plays an important role in modern economies. The former enables young people to gain experience while allowing flexibility in their work schedule during their studies; the latter provides employment and income to workers who have difficulty holding a full-time permanent position for reasons of health and family. Both provide companies with flexibility in hiring workers and buying services. However, it is important to note that in many cases, especially in the public sector, these are positions in which direct employment would benefit the both employer and employee if it did not involve tenure. In such cases, two classes of workers are created, with permanent organized workers on the one hand and temporary workers with few rights on the other. The stronger the unions in a given area, the more rigid the employment therein, and the more employers prefer to rely on temporary workers. To reduce the abuse of weak workers and limit the phenomenon of outsourcing to those cases where it makes economic sense, flexibility of employment in the labor market, especially in the public sector, must be increased, while the rights of contract workers, especially those of service contract workers, must be thoroughly enforced.

Appendix

Appendix Figure 1
**Share of workers in temporary employment* in
 OECD countries****
 average 2011-2012



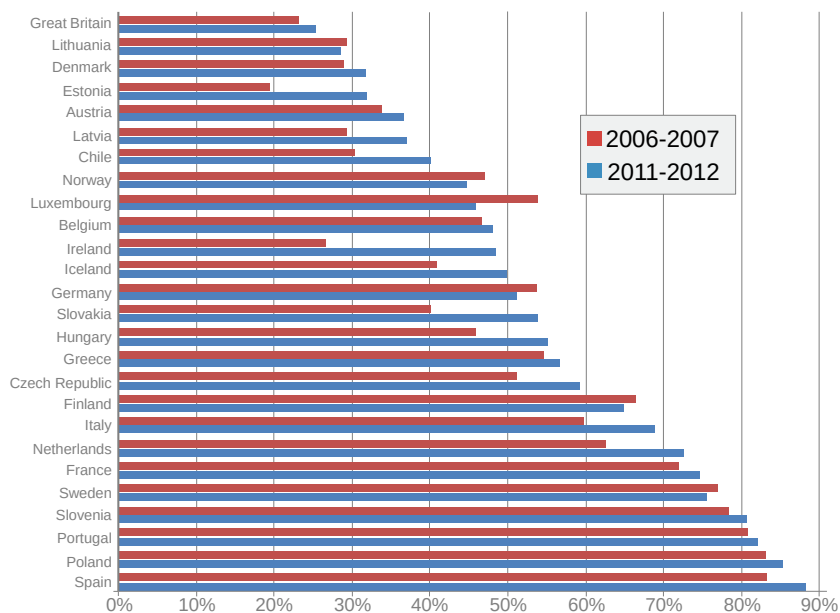
* The OECD defines temporary employment as employment limited in time and/or employment through employment agencies.

** This figure includes data for Lithuania and Latvia along with data for OECD countries. Data for Israel are not available.

Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

Data: OECD (2014)

Appendix Figure 2
**Share of newly employed* people in temporary
 employment** in OECD countries*****



* Three months or less on the job

** The OECD defines temporary employment as employment limited in time and/or employment through employment agencies.

*** This figure includes data for Lithuania and Latvia along with data for OECD countries. Data for Israel are not available.

Source: Noam Gruber, Taub Center for Social Policy Studies in Israel

Data: OECD (2014)

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The Socioeconomic Situation of Young Adults in Israel

Hadas Fuchs*

Abstract

This chapter examines the developments in the socioeconomic characteristics of young adults ages 18-34 in Israel since 1995, with breakdowns by age groups and personal attributes. In the areas of higher education and employment, the share of students and academic degree holders has grown considerably since the 1990s, commensurate with the opening of many colleges. The age at which individuals begin their academic studies has been delayed, and the majority of students are concentrated in the 23-26 age group. The employment rates of the youngest age group have declined, while there has been a sharp increase in the rate of those employed in part-time jobs among individuals of this age group. In contrast, the rate of Jewish student employment has risen, with students mainly employed in clerical, sales and service jobs. There has also been an increase in the relatively low-paid service jobs among individuals in the 31-34-year-old age group who do not have an academic education. Among those with an academic education of the same age, there has been a decline in wages relative to older academics, even though younger academics are employed in the same professions and working the same number of hours. In the area of housing, a rise was found in the share of young adults living with their parents, particularly since the beginning of the housing crisis. Home ownership rates among young adults have dropped, due in part to older ages at marriage. For those ages 25-30, the decline has likely occurred because of changing social preferences, while among ages 31-34, the rising cost of housing was no doubt also a factor.

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Introduction

In recent years, young adults have taken their place as leaders of the social protest movements both in Israel and around the world. One of the striking examples in Israel is the protests that began in the summer of 2011 which were initiated and led by young adults, including student union members, who were protesting against their economic situation. They claimed, among other things, that it is harder today than in the past for young adults to support themselves, combine work with academic studies, and find housing at a reasonable price.

The aim of this chapter is to examine the social and economic situation of young adults ages 18-34 in Israel with regard to higher education, employment and housing and to examine the trends in these areas since 1995.

The situation of young adults may be influenced by two main factors. The first, which is frequently cited in protests and by the various media (for example, Frenkel and Somfalvi, 2015), is the external factor. That is, the reason that young adults in Israel experience difficulty in finding work that suits their skills and pays appropriate wages stems from the changes in the Israeli and world economy. According to this argument, the rise in housing prices might indeed make it more difficult for young adults to leave their parents' homes and move to rented accommodation or to buy a home. The second possible factor is internal, i.e., relating to the character of young adults in current times. Criticism is often levelled at members of Generation Y (those born in the 1980s and early 1990s) suggesting that they are more spoiled than previous generations. For example, it has been argued that young adults of Generation Y are incapable of working and that "a spirit of pampering, lack of industriousness, and self-absorption exists in this generation, and it influences their moral code, including their moral code in the realm of work" (Almog and Almog, 2015).

This study examines whether these perceptions are supported by the data, with the intent of offering a broad picture of the social and economic situation of young adults in Israel. It also examines different

age groups within the “young adult” category to identify various characteristics among them.

Current studies examining the condition of young adults (ages 18-29) in the OECD countries, such as the research on young adults in the European Union by Eurofund (Sandor and Ludwinek, 2014) and the research on young adults in the United States on behalf of PEW (Taylor and Keeter, 2010), found that there has been a rise in the share of young adults living with their parents, an increase in their unemployment rate, and a drop in the share of young adults in full-time employment. One of the explanations for this is that young adults are more impacted by economic crises, and therefore the situation of young adults in Europe and the United States has worsened in the wake of the world economic crisis that began in 2008.

Due to the military and national service that many Israelis perform between the ages of 18 and 21, this group tends to have low employment rates and leave their parents' homes at a later age. As such, comparisons with young adults in the OECD in these areas are more difficult. It is also important to note that Israel has been less impacted by the recent economic crisis relative to other OECD countries, and, in turn, the harm experienced by young adults was also relatively less.

This research consists of several parts. The first part surveys the situation of young adults in higher education and in employment, from age 18 – the conclusion of secondary school studies – through the years of academic studies and into the initial stages in the labor market. The chapter then examines changes in living arrangements of young adults.

Data

In this chapter, young adults are classified into four groups with different characteristics:

Ages 18-22. Most of the Jewish population in this group performs military or national service; in the Arab Israeli sector, most of the young adults interested in pursuing academic education begin their studies during this time.

Ages 23-26. Most of the Jewish population in this age group has concluded military or national service, and the share of students among the Jewish population peaks.

Ages 27-30. The share of students is still relatively high in this group, although less than half that of the younger age group. Relative to 1995, there is an increase in the share of Jewish students in this group, with about half of them pursuing advanced degrees.

Ages 31-34. Most of the students in this group have concluded their studies, and are beginning their path in the labor market.

The chapter is based on data from the Central Bureau of Statistics (CBS) – *Labor Force Surveys* for the years 1995-2011, *Income Surveys* for the years 1997-2011, *Expenditure Surveys* for the years 2003-2014, and the *Population Census* from 2008.

Definitions¹

Academic degree holders. Those with 15 years of study or more whose last educational setting is university or college. This definition predicts with a high level of accuracy the rate of actual first degree holders for individuals above age 30, but is insufficiently accurate for individuals below that age (because many of them are still students even after 15 years of study). Therefore, the calculations for first degree holders on the basis of years of study were performed for ages 31 and above.

Students. Those studying where the last educational setting is academic, including studies towards advanced degrees.

Years of academic study. The overall number of years of study minus 12, for those studying whose last educational setting is academic.

¹ Categories relating to students include ages 18-34 only.

Living with parents. A child of the head of household or a child of the partner of the head of household living in the parents' household.

Jews. Jews and those of other faiths who are not Arab Israeli.

1. Higher Education

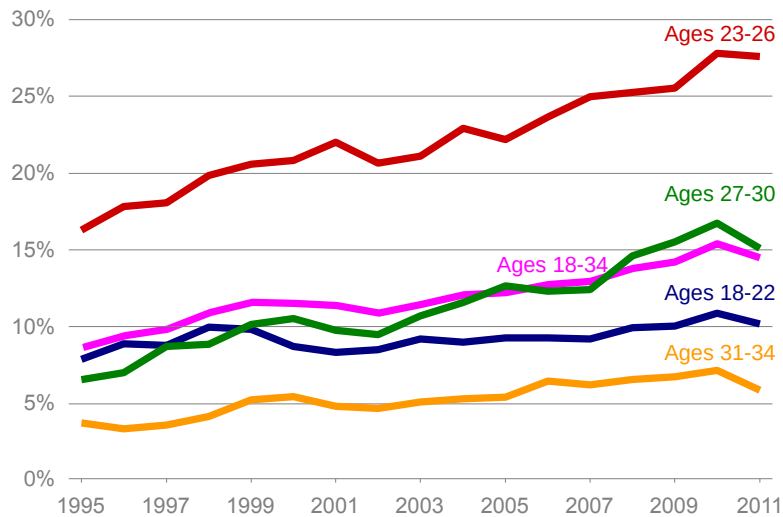
In the last two decades, there has been an increase in the share of young adults continuing on to higher education after concluding their secondary school studies. As such, there has also been a substantial rise in the share of students and academic degree holders among the younger population.

Relative to the past, the share of students rose in all of the age groups, especially among ages 23-30 where the share of students almost doubled between 1995 and 2011. Nonetheless, the extent of the change is uneven across the groups. In the 23-26-year-old age group – which has the largest share of students – the figure almost doubled: 28 percent attended institutions of higher education in 2011 (Figure 1) as opposed to 16 percent in 1995.²

The age group in which the student share was second highest in 1995 (after 23-26-year-olds) was 18-22-year-olds (about 8 percent of the entire group). Over the years, however, the share of students ages 27-30 grew faster, and stood at 15 percent in 2011 – much higher than the two remaining groups (about 10 percent among ages 18-22 and about 6 percent for ages 31-34). Some of the increase in the share of students ages 27-30 stems from the rise in the number of individuals pursuing advanced degrees although, over the years, there has also been an increase in the share of those studying towards a first degree in this age group. In 2011, more than half of all students in the 27-30-year-old age group were studying towards a first degree. By the ages of 31-34, the majority of students have concluded their studies.

² The share of those studying in this age group in 2011 is even higher, reaching 35 percent, if students at nonacademic institutions are also taken into account.

Figure 1
Share of students pursuing an academic degree, 1995-2011
 out of the age group

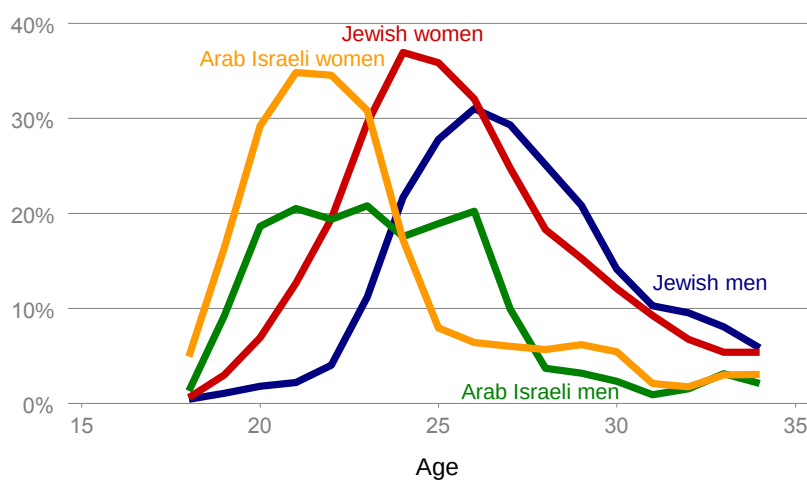


Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
 Data: Central Bureau of Statistics, *Labor Force Surveys*

Figure 2 shows the share of students by age in 2011, broken down by gender and sector. Generally, women are better educated than men, with a higher percentage of female students than male students. This phenomenon is even more striking among the Arab Israeli population. It is also important to note that women tend to begin their studies a year earlier than men.³ Jews in general and Jewish men, in particular, begin their studies later than Arab Israelis because of military and national service; most of the Arab Israelis who go on to academic studies do so at ages 20-22, whereas Jews begin at ages 23-26.

³ Military service for women is one year shorter than it is for men.

Figure 2
Share of students pursuing an academic degree
 by age,* gender and sector, 2011



* Two-year moving average

Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

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

A comparison over time reveals a delay by one year in the start of academic studies for all the sectors. The average age of Jewish students in their first year of study⁴ rose from 23 in 1995 to 24.5 in 2011 among men, and from 22 to 23 among women over the same years. Among Arab Israeli students, the average age in 2011 was 20.5 for men and 20 for women, also showing a year's delay relative to 1995 for both sexes. A possible explanation for this postponement may be the fact that more young adults prepare longer than in the past for the pre-university

⁴ Students in their first year of university studies were identified by calculating years of academic study, as described in the *Data* section.

psychometric exams.⁵ The delay may also reflect a change in social norms as young adults postpone starting their studies or work in favor of long trips abroad, for example.⁶

Most of the increase in the share of students and academic degree holders stems from the growth in the number of those studying and graduating from academic colleges (Figure 3). In 1990, there were only six academic colleges in Israel. Many more opened over the years, and in 2014, there were 36 academic colleges attended by 96,000 students. In contrast, the number of students attending the country's universities has been in decline since 2005 and, since 2008, it was lower than the number of students in academic colleges. Many colleges opened in the country's periphery, giving residents there access to higher education. These institutions especially impacted the share of students in the Arab Israeli population due, in part, to the close proximity of university supervised colleges⁷ and teacher training colleges to their places of residence. Consequently, the rate of academics in this group rose considerably over the last few decades (Shaviv, Ophir and Krol, 2015). In the 2013- 2014 academic school year, the share of Arab Israelis in university supervised

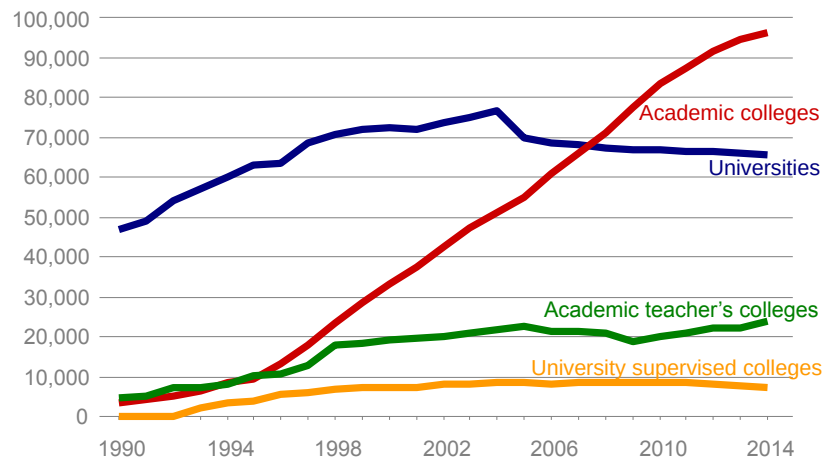
⁵ Psychometric exams are similar to the SAT exams in the US except that in Israel, most young adults do not complete them before the end of upper secondary school. Most commonly, the exams are taken after army or national service and after a preparatory course of anywhere from several months to a year.

⁶ It should be noted that the number of students attending academic preparatory schools has remained relatively constant since 2000 (Central Bureau of Statistics, 2013), so this cannot be the reason for the observed delay in beginning higher education. The number of young adults in pre-army *mechinot* (year-long experiential programs) has also substantially increased over the years and also leads to a year's delay in army service. The pre-army *mechinot*, however, are only attended by about 1 percent of the age group (Vurgan, 2008).

⁷ An example of such is the Western Galilee Academic College, in which an academic department opened in 1994 under the auspices of Bar-Ilan University.

colleges and teacher training colleges stood at 35.2 percent and 24.6 percent respectively, as opposed to 13.4 percent in the leading university campuses (Shaviv et al., 2015).

Figure 3
Number of students,* 1990-2014
 by type of academic institution



* Not including students in the Open University

Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

In addition to the change in the distribution of educational institutions, there has also been a change in the subjects that young adults choose to study. The share of those pursuing studies in the humanities (including education) has dropped while there has been a rise in the share of those studying business administration and management sciences, engineering and architecture (Central Bureau of Statistics, 2013).

Alongside the increase in the number of students, the share of first and higher degree holders has also risen. Among those ages 31-34, the share has almost doubled, from 22 percent in 1995 to 40 percent in 2011

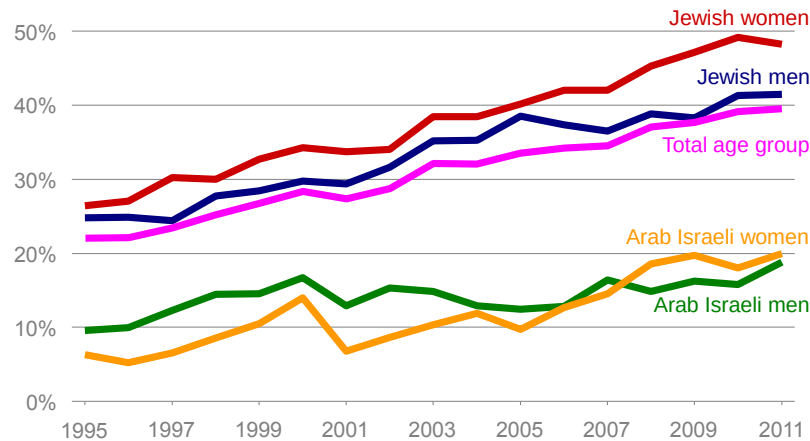
(Figure 4). The rise in education levels is greater for women than for men. Among Jews, the share of women with an academic education rose from about 26 percent in 1995 to 49 percent in 2011 while the rate went from 25 percent to 42 percent for men during the same period. Since 2005, the rise in the share of Jewish men with an academic degree has been more moderate than among women. Among Arab Israelis, the share of academic degree holders was higher for men in 1995 (about 10 percent as opposed to about 8 percent for women), but the growth in Arab Israeli women's education since then has been more substantial. In 2011, women were better educated among this population: 18 percent of the men and 21 percent of the women in the 31-34-year-old age group held an academic degree. The rise in the share of Arab Israeli female academics is evident across all age groups, and is even more prominent in the younger age groups. Overall, the share of women ages 23-30 with an academic education reached 27 percent in 2011.⁸

In contrast to the rise in the share of those receiving an academic degree, there has been almost no change in the overall share of individuals receiving some other post-secondary certificate, a figure which stood at 13 percent in 2011. A breakdown by sectors and ages shows that only among Arab Israeli men ages 31-34 was there an increase (from 9.5 percent in 2000⁹ to 12.6 percent in 2011), with a small decline in the other groups. Some of the decline in the rates of those receiving a post-secondary certificate may be due to a change in the classification of such programs into academic degree programs. For example, long-term nursing care went through an academization process, and from 2007 to 2014, nurses no longer trained in the practical nursing certificate program (Nirel, Yair, Samuel, Riba, Reicher, and Toren, 2010).

⁸ The calculation of this data was done directly from the survey and not using the definition of an academic degree that was used in the rest of the study as detailed in the *Data* section of this chapter.

⁹ The first year for which the data on post-secondary education were published.

Figure 4
Share of academic degree holders, ages 31-34
 by gender and sector, 1995-2011



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
 Data: Central Bureau of Statistics, *Labor Force Surveys*

It should be noted that the share of those eligible for a bagrut certificate (matriculation certificate)¹⁰ rose less than the share of academic degree holders. The share of those receiving a bagrut certificate that meets the minimum university requirements out of those completing 12th grade rose by only 7 percentage points between 1996 and 2011, from 40 percent to 47 percent¹¹ (CBS, 2013). As such, the increased

¹⁰ Bagrut or matriculation examinations assess knowledge on subjects studied in upper secondary school. They are frequently compared to the New York State Regents' Exams and ETS Advanced Placement (AP) tests. Bagrut scores represent an average of the test score and the grade received on that subject in school. Subjects are tested at study unit levels ranging from 1 to 5 units, calculated by the number of class hours devoted to the subject.

¹¹ The overall percentage of those entitled to a matriculation certificate out of those completing 12th grade is higher and was 58 percent in 2011. About 25 percent of those completing 12th grade without a bagrut certificate complete

accessibility of higher education led to the growth in the share of those pursuing a first degree among the eligible population. Following the large increase in the share of eligible students pursuing an academic degree, it is not surprising that a slow-down in the rate of those applying for higher education has been observed in the last few years.

2. Employment and Wages

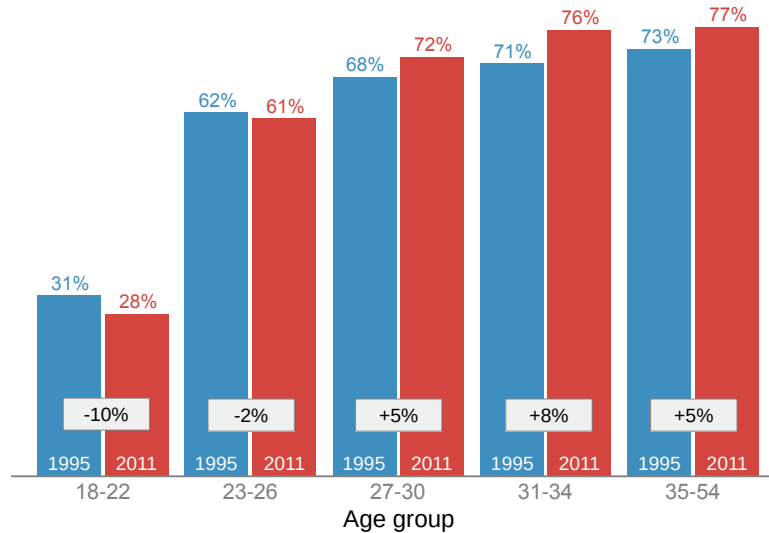
Military and national service in Israel, which as noted impact the age of students in Israel, also leaves its marks on the integration of young adults into the labor market. Among ages 18-22, when most Jewish young adults conclude their secondary school studies and are enlisted in military service, the employment rate is low.¹² With the rise in age, employment rates rise as well, reaching a maximum at around the age of 40.

With regard to the long-term trend, a mixed development is evident in the employment of young adults in Israel. Among young adults up to age 26, employment rates are in decline relative to 1995 (Figure 5). The biggest drop is in the youngest group (ages 18-22), in which there is also the sharpest decline in average number of work hours. Some of the decline stems from the rise in the share of students in this group, who, as will be shown, work less than young adults who do not attend studies. For young adults age 27 and above, employment rates increased, with the largest increase noted among those ages 31-34. During this period, overall employment rates in Israel were also on the rise.

one within eight years, so that the group of those who are eligible to continue on to higher education is actually larger.

¹² Employment rate throughout this chapter refers to the civilian labor force.

Figure 5
Employment rate by age group, 1995 and 2011



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

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

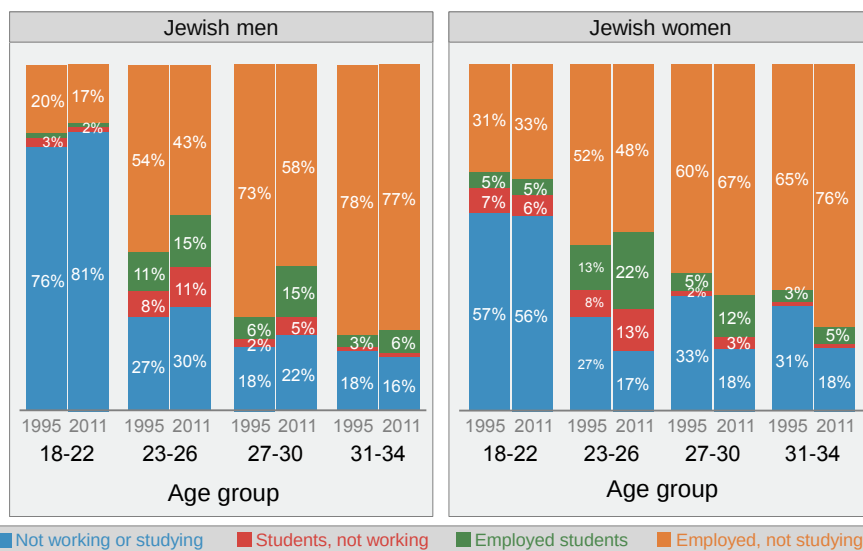
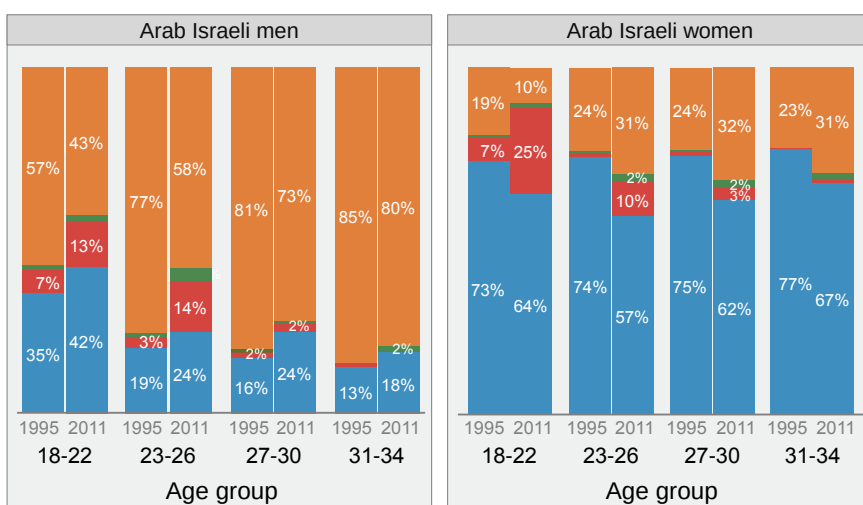
Combining work with academic studies is rather common among young adults and, as noted previously, academic studies have an effect on the employment rates in the various age groups. Figures 6A and 6B show the academic study and employment status for Jews (6A) and Arab Israelis (6B), broken down by age and gender, for the years 1995 and 2011. In general, there is an increase in the share of students, as noted previously. It is interesting to note that working while studying in higher education is widespread mainly among Jewish students. Arab Israeli students, who generally begin higher education at younger ages, are employed at very low rates; this is especially true for Arab Israeli women ages 18-22.

In the Jewish sector, there were no substantial changes in the employment and education distribution for ages 18-22 between 1995 and 2011, with the exception of a small increase in the number of men who

neither work nor study. As noted, the reason for the low employment rate is that most members of this group are engaged in military or national service. In contrast, among Arab Israelis in this age group, several developments occurred in the years under examination. Among Arab Israeli women ages 18 to 22, the rate of those employed (orange and green columns in the figure) declined by 9 percentage points, while the combined rate of those employed and those pursuing academic studies (orange, red and green columns in Figure 6A and 6B) increased by 9 percentage points. Among Arab Israeli men, there was a decline of 13 percentage points in the rate of those employed – from 58 percent to 45 percent – but the decrease in the combined rate of those employed and those studying was only half as large (7 percent).

The share of Arab Israeli men in this age group (18-22) who are not employed and are not studying has risen over the years, and it is even high relative to older ages (42 percent in 2011 as opposed to 24 percent at ages 23-26, for example), even though the great majority of Arab Israelis do not do military or national service. Eckstein and Dahan (2011) suggest that the reasons for this finding include early parenthood and differences in opportunities. However, the fact is that the age of marriage and childbearing is delayed, and at later ages these rates drop. The phenomenon may also be the result of unreported work occurring on a relatively large scale or from difficulties that young Arab Israeli men experience in integration into the labor market.

Figures 6A and 6B

Employment and education breakdown by sector, age and gender, 1995 and 2011**A. Jews****B. Arab Israelis**

Source for both: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
 Data for both: Central Bureau of Statistics, *Labor Force Surveys*

In the next age group, ages 23-26, the combined share of women employed and studying reaches its peak among both Jews and Arab Israelis. Among Jewish women, there is an increase in the employment rate (from 65 percent in 1995 to 70 percent in 2011), and double that increase in the rate of those employed or attending studies (from 73 percent to 83 percent). Among Arab Israeli women, the combined rate of those employed or studying rose by 17 percentage points.

In contrast, for men in the same age group, both Jews and Arab Israelis, the overall rate of those employed (among students and young adults who are not studying) has decreased. Although some of the decline in employment may be explained by the rise in the share of students who are not working, the decline in employment among Arab Israelis in particular, is greater than the change in the share of students in both this and older age groups. That is, the increase in the share of those studying is not sufficient to explain the drop in employment. The employment rate among men is lower until they reach their early thirties, and it seems that among men, and especially Jewish men, there is a delay in entry into the labor market that parallels the delay in the start of higher education.

Jewish women not only enter the labor market earlier than men, but also maintain higher employment rates than men until the age of 30. The rate of Jewish women who are employed (including working students) is higher by 13 percentage points than the rate of Jewish men employed at ages 23-26, and by 6 percentage points at ages 27-30.

Since Arab Israelis are exempt from military service and have lower rates of academic studies, the employment rates of Arab Israeli men until the age of 30 are higher than among Jews. Nonetheless, among Arab Israeli men the employment rate has decreased over the years for all ages, and the decline has been sharper at the younger ages though it lessens with age.

The following analysis examines characteristics of groups of young adults. The intention is not to analyze every possible group, but to highlight developments that can be discerned among the main groups.

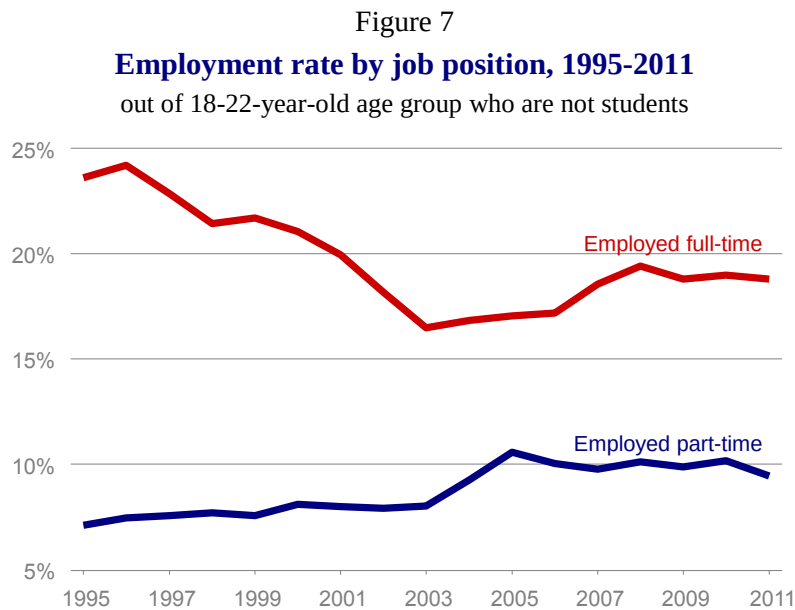
Non-Students Ages 18-22

As shown in Figure 5, in the youngest cohort, ages 18-22, the employment rate is low and has declined over the years. Figure 7 focuses on non-students in this age group and shows the rate of those employed out of the entire age group, divided by full-time and part-time employment.¹³ The rate of those employed full-time in this group decreased between 1997 and 2003, and has been increasing since then, although it has not returned to its level at the start of the period. In contrast, the share of those employed part-time at these ages shows an overall increase during these years. As such, the share of those employed part-time out of all those employed in the group grew considerably (from 23 percent in 1995 to 33 percent in 2011).

The rise in the share of those employed part-time is unique to the youngest age group, especially those without an academic education who are not students,¹⁴ and appears among Jews and Arab Israelis alike. While most of the decline in employment takes place among Arab Israelis (among Jewish women the employment rate rises), the increase in the rate of those employed on a part-time basis is greater among the Jewish population, where the rate of students is higher and the age of initiating studies is later.

¹³ Part-time employment is defined as less than 35 weekly work hours, in keeping with the CBS definition.

¹⁴ Among ages 23-26, there has also been a rise in the share of those employed part-time, but this stems from the high rate of students in this age group.



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics, *Labor Force Surveys*

Members of the 18-22 age group have not yet had time to acquire a post-secondary education, and 88 percent of them are employed in low-skill occupations.¹⁵ Among these occupations, there has been a rise in the rate of those employed in sales and service jobs, and a decline in the rate of those employed as skilled workers – the largest drop among all the age groups. Table 1 shows the occupations in which the greatest change has occurred in the employment rate among those who are not students in the age group between 1995 and 2011. In 2011, 22 percent of young adults ages 18-22 worked in sales, or as wait staff or bartenders, as opposed to 12 percent in 1995. On the other hand, there has been a relatively large

¹⁵ According to the CBS classification from 1994, this includes occupations ordered 3 to 9 – occupations for clerical workers, agents and sales and service workers, skilled and unskilled workers.

decline in the members of this age group working as builders and construction workers, tailors and seamstresses. The source of these changes may be developments in the labor market, as detailed in Madhala-Brik (2015) and Kimhi and Shraberman (2014). It may also be that the increase in those turning to academic education influences the types of jobs chosen at these ages: as noted previously, the highest rate of students is among ages 23-26, and young adults who plan to study may be seeking part-time jobs before beginning their academic studies.

Table 1. **Changes in occupations for ages 18-22, 1995-2011**

as a share of all of those employed who are not students

Occupation ¹⁶	Share out of all workers in the age group in 1995	Share out of all workers in the age group in 2011
Increase in workers		
Sales and shop assistant	7.3%	12.6%
Wait staff and bartenders	4.8%	9.7%
Decrease in workers		
Construction and building workers	6.6%	2.9%
Tailors and seamstresses	2.5%	0.4%

Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

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

¹⁶ According to the CBS classification from 1995: salespeople and sales assistants – classification numbers 420 and 421; wait staff and bartenders – number 444; construction and building workers – number 69; tailors and seamstresses – number 75.

Arab Israelis are employed in skilled occupations at a higher rate than Jews at these ages. On the assumption that the decline in the rate of those employed in skilled occupations stems also from a decline in demand for workers in these occupations, this may explain the relatively large decrease in the employment rate of Arab Israeli young adults.

In conclusion, ages 18-22 are employed at low rates (which have dropped even further over the years), and many are in part-time employment, often in sales and service occupations.

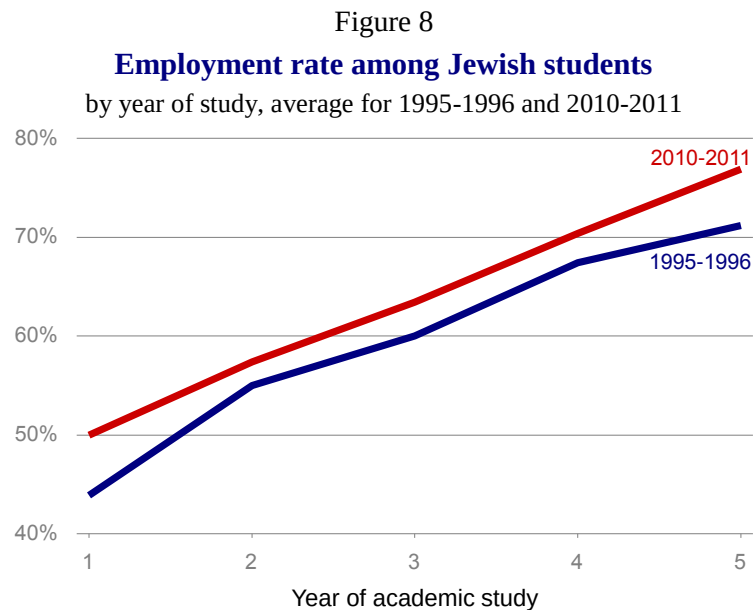
Students¹⁷

The employment rate among Jewish students, who as noted previously are for the most part ages 23-30, stands at 65 percent; the employment rate rises with years of study.¹⁸ Figure 8 shows that the employment rate for students in their first year of studies is about 50 percent and increases to 77 percent by the fifth year of studies (students at this stage are usually pursuing an advanced degree; undergraduate degrees generally take only three years to complete in Israel).¹⁹

¹⁷ Since the employment rate among Arab Israeli students is low, this section will focus on student employment among Jews.

¹⁸ Year of study was defined based on years of study for those attending academic studies, as detailed in the *Data* section of this chapter.

¹⁹ The years have been combined due to the low number of observations



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics, *Labor Force Surveys*

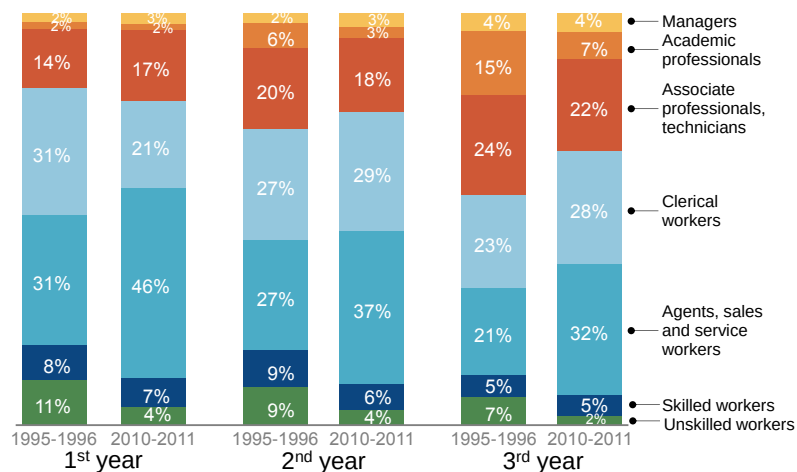
In general, the employment rate among Jewish students increases over their years of study. Several factors may be at play here from the previously noted year delay in the start of studies and the concomitant rise in the average age of students (since employment increases with age) to the expansion of the service sector to offer more part-time employment (Kimhi and Shraberman, 2014). The increase in the share of students attending academic colleges apparently also has an effect on the rise in the employment rate. Zussman, Tur-Sinai and Romanov (2007) find that students in academic colleges had higher employment rates than university students in the early 2000s, and it may be assumed that this trend continued in the following years. Another possibility is that the general economic situation of students has worsened, whether due to the rise in housing and food prices or due to the increase in students from lower socioeconomic backgrounds who are forced to work.

An examination of students' occupations (Figure 9) sheds additional light on the issue. For the most part, students are employed as clerical workers and in sales and services; and as they progress in their studies they also advance to more prestigious occupations. Over the years, there has been a decline in the share of students employed in clerical jobs, and a rise in the share of those employed in sales and service jobs. This trend of a decline in the employment rate in clerical jobs is seen throughout the market place but, among students, it is steeper, especially for first-year students; the rate of students in clerical and secretarial occupations in their first year of studies dropped by 10 percentage points, from 31 percent in 1995-1996 to 21 percent in 2010-2011. In effect, there has been an academization of clerical occupations; the rate of academic degree holders in clerical and secretarial occupations rose from 14 percent to 26 percent during the examined period and this trend has served to push students out of these occupations.

Figure 9

Distribution of occupations of Jewish students

by year of study, average for 1995-1996 and 2010-2011



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

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

The decline in the rate of those employed in clerical and secretarial occupations translates almost entirely into a rise in the rate of those working in service occupations. Here too, the increase is especially significant in the first year of studies: 46 percent of first-year students were employed in such jobs in 2010-2011 as opposed to 31 percent in 1995-1996. The rise is mainly concentrated in food services and sales and security jobs; 36 percent of first-year students were employed in this occupation 2010-2011 as opposed to 17 percent in 1995-1996. Nonetheless, students are employed in more prestigious occupations than those of the same age who do not have an academic education and are not students, with concomitant higher wages per work hour as well (Appendix Figure 1).

Another statistic that arises from this analysis is that students hardly work in academic occupations, especially not in their first few years of study. Among third-year degree students, there was a 50 percent drop in the share of those employed in academic occupations: from 15 percent at the beginning of the period to 7 percent at the end of it.

It seems, then, that at least in their initial years of study, greater numbers of students are working to support themselves than in the past and not necessarily to accumulate relevant occupational experience that will help them in their future careers. It may be the case that students choose to work in service jobs due to the flexibility that these jobs offer – fewer and more convenient hours – which suits the work-study combination; over 55 percent of students who are employed work in part-time jobs in their first three years of studies. This rate drops somewhat in more advanced years of study, but remains high at over 40 percent.

Ages 31-34

In the 31-34 age group, most of the young adults who pursued academic studies have concluded their studies and are at the start of their professional careers. As shown in Figure 5 previously, the employment rate for these ages rises at the highest rate among the age groups examined between 1995 and 2011. Some of the increase in the

employment rates is related to the rise in higher education over the years, since the well-educated are employed at a higher rate.

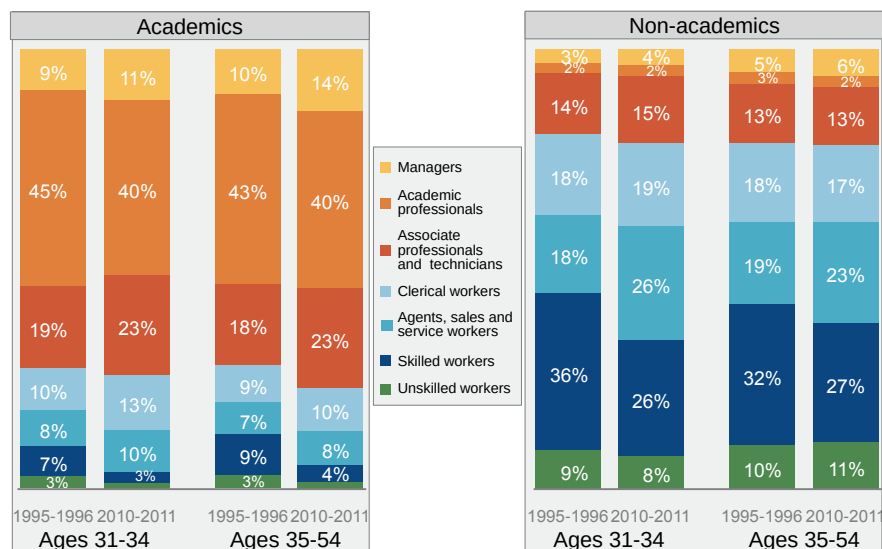
The employment rates for ages 31-34 approach the rates among ages 35-54, both when broken down by higher education (Appendix Figure 2) and when the rate of those in full-time employment is examined (Appendix Figure 3).²⁰ In other words, young adults at the start of their employment path integrate into the labor market, and are employed in full-time or part-time employment at rates that are similar to those with more experience.

A look at occupations among the group with an academic education shows no substantial differences between younger and older workers. Figure 10 shows the distribution of those employed by occupation and education level. It is evident that the occupations in which younger and older academics are employed are similar, and the changes that have occurred over the years are also similar – a small drop in the rate of those employed in academic occupations and a rise in the rate of those employed in managerial occupations and as self-employed and associate professionals and technicians. All together, the share of those employed in these three occupation groups, which include high-skill jobs requiring higher education, rose slightly.²¹

²⁰ The employment rate for those in full-time employment has essentially increased by 4 percentage points for young academics as opposed to a decrease of 1 percentage point among older academics. This is primarily due to a 9 percentage point rise in the share of women academics who are employed full-time.

²¹ Even upon examination of the changes that occurred in more detailed categories of occupations (at a two-digit level) no substantial difference was found between the changes among younger and older academics.

Figure 10
Distribution of occupations by education and age group
 average for 1995-1996 and 2010-2011



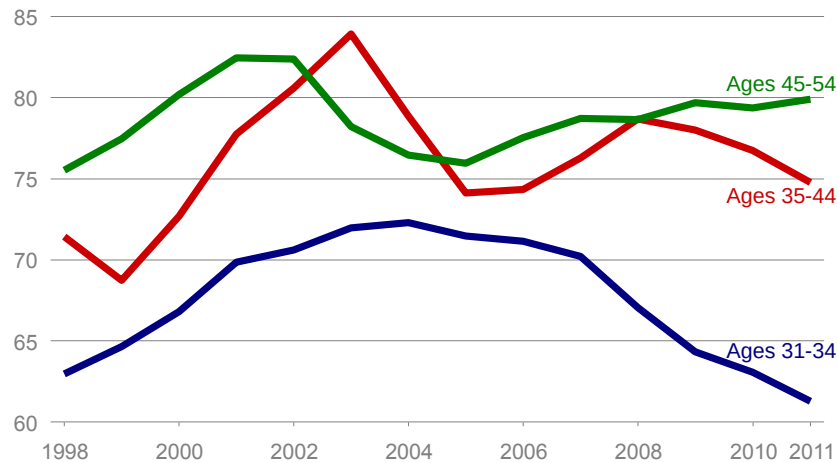
Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

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

Nonetheless, an examination of wages among younger versus older academics reveals a difference in trends. Figure 11 shows the real wage per work hour for academic workers by age groups, between 1997 and 2011.²² Among ages 35-54, wages fluctuate but have changed little since 2005. In contrast, among ages 31-34, wages were on the rise between 1997 and 2004, but declined since then, reaching a lower level in 2011 than their 1997 level. This decrease has taken place mostly among the Jewish population; for Jewish women it was strongest and began in 2003.

²² Pay data were calculated from the CBS Income Surveys for 1997 onwards, subject to the limitations of the data.

Figure 11
Real hourly wage for workers with an academic education
 by age group, in 2011 prices, in shekels, 1997-2011*



* Two-year moving average

Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics, *Income Surveys*

Some of the decline in wages can be explained by the lower level of experience of those aged 31-34 than in previous years, due to the delay in the start of advanced studies. The increase in the share of students who proceed to advanced degrees also accounts for the decline in the experience of young academics, even though the rise in the rate of second degree holders may actually serve to increase their pay. Another possible factor for the decline in wages is the change in institutions for higher education. As mentioned previously, the growth in the number of academics over the years stemmed mostly from the proliferation of graduates from the newly established academic colleges. Zussman, Furman, Caplan, and Romanov (2009) find that the wages of university graduates are higher than that of college graduates. Thus, the increase in

the share of college graduates out of young academics served to lower the average wage in this group. It may also be the case that the rise in the share of academics increased the supply of well-educated workers with no corresponding increase in demand, thus leading to a decline in their pay, especially for young academics at the start of their professional careers. The decline in young academics' wages occurred in high-skill occupations, whereas in low-skill occupations, in which only a small percentage of academics are employed, wages did not change, or have been trending upwards.

Among workers who are not academics, an examination of occupations reveals that there has been a rise in the share of those employed in service jobs. The increase is observed across all ages, but it was higher among ages 31-34. At the beginning of the period examined, the share of those employed in service jobs is slightly lower among this group than among those aged 35-54 (18 percent versus 19 percent, respectively). Over time, the share of young adults who are not academics in these jobs rose by 8 percentage points (in contrast to a rise of 4 percentage points among older workers) and reached 26 percent in 2011, versus 23 percent among those ages 35-54 (Figure 10). Unlike those between the ages 18-22, service workers in the 31-34 age group are employed full-time at a similar rate to workers in other occupation groups. At the same time, there is a drop of 10 percentage points in the rate of those employed as skilled workers among individual ages 31-34 without academic education, similar to the change among non-academics in the entire 18-34 age group.

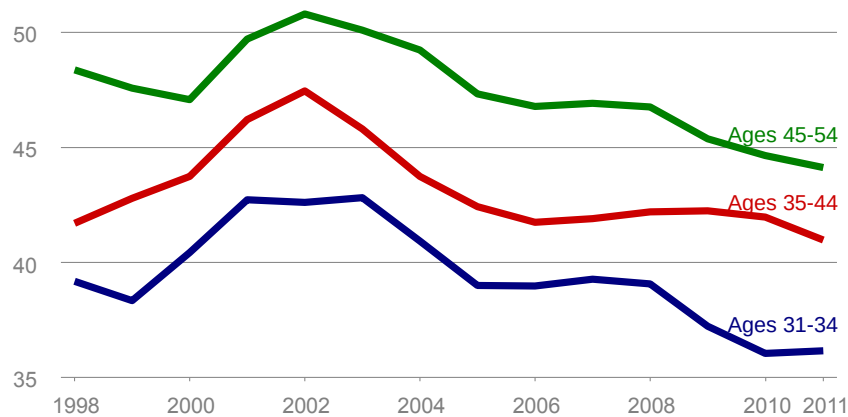
Among workers without an academic education there has been a decline in wages from 2002 for all the age groups and in all sectors, with no difference between younger and older workers (Figure 12). Some of the decline in wages occurred because of the entry of job seekers from weaker population groups into the labor force, following the reduction of social benefits which began in 2003. These groups, the majority of whom lack education appropriate to the more prestigious occupations in the labor market, integrated into low paying occupations. At the same time, the highest of the lower socioeconomic status groups, which in the past

did not have an academic education, has seen rising education levels along with the rise in the share of first degree holders; as such, there was a further decline in the average wages of those remaining in the lowest occupational groups (this shift also led to declining wages among academics). Likewise, as noted, there was a drop in the share of those employed as skilled workers and a rise in the share of those employed in service jobs, in which the average wage is lower.

Figure 12

Real hourly wage for workers without an academic education

by age group, in 2011 prices, in shekels, 1997-2011*



* Two-year moving average

Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics, *Income Surveys*

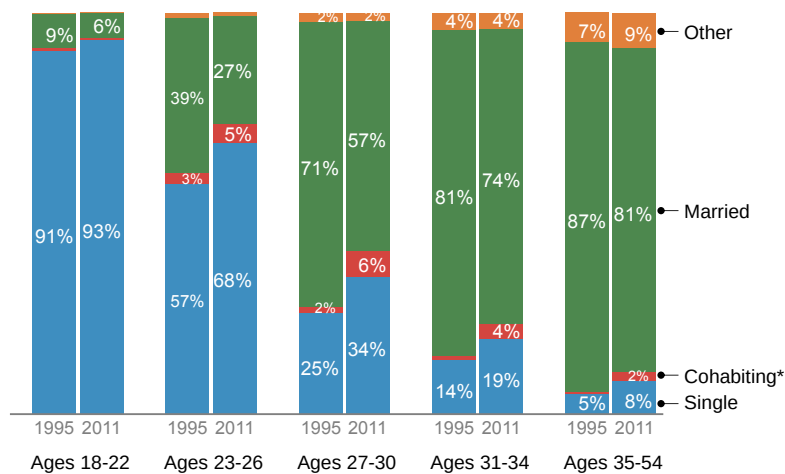
It is noteworthy that the wage gap between academics and non-academics has been growing over the years for all the age groups. In other words, despite the decline in the wages of young academics, the acquisition of higher education has become more worthwhile over the years among all the age groups, because the pay of those workers without higher education has dropped more steeply.

3. Housing

This section examines the changes that took place in the living arrangements of young adults in the years 1995 to 2011. In Israel, as in the rest of the developed world, socioeconomic changes have occurred that have also changed the demand for housing. In the years examined, the share of young adults either married or cohabiting dropped by 11 percentage points among ages 23-26, and by 9 percentage points among ages 27-30 (Figure 13). Along with the delay in marriage, there has been a similar delay in the age of childbearing. In addition to the effects of social changes, the sharp rise in housing prices that began in 2007 has made it difficult for young adults to leave their parents' homes and take up independent residence, or serves to drive them back to their parents' homes at the conclusion of academic studies (the boomerang generation).

Figure 13

Family status by age group, 1995 and 2011



* Using the CBS classification (2012), a cohabiting couple is a heterosexual couple living in a single household where at least one of the couple is not married

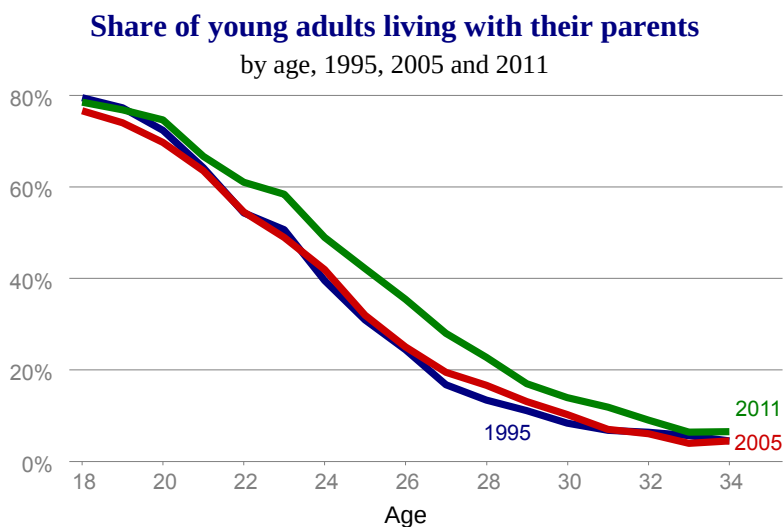
Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics, *Expenditure Surveys*

Living with Parents

The issue of living with parents preoccupies young and old alike. The impression from public sentiment and media coverage is that more young adults than in the past are continuing to live with their parents. As previously noted, two factors are frequently cited for this trend: the rise in housing prices relative to wages and the spoiled nature of Generation Y and their excessive reliance on their parents (Almog and Almog, 2015). The data indicate that since 2005 (and at an even faster rate since 2007 when housing prices rose sharply) there has been an increase in the share of young adults living with their parents. Figure 14 shows that in 2005, the share of young adults living with their parents was almost identical to the 1995 rate but, by 2011, the share had risen, especially for those ages 22-28. At the extremes of the age range (about age 18 at the bottom and about age 34 at the top), the share of those living with parents increased more moderately. It is evident, then, that there has been a certain delay in the age of leaving home but, after the age of 32, the share of young adults living with their parents is not much different than it was in 1995.

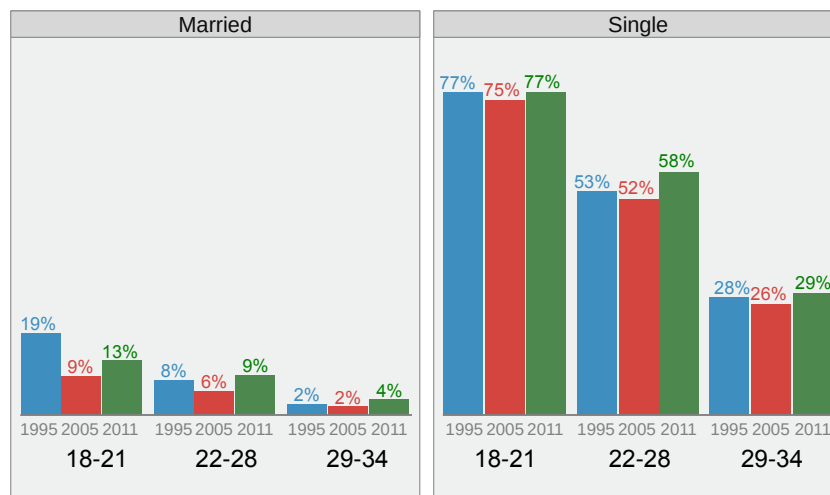
Figure 14



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics, *Labor Force Surveys*

It is also possible that the increase in the share of young adults living with their parents was affected by the later average age at marriage. In order to examine the effect on this variable, Figure 15 shows the share of young adults living with parents by age groups and family status.

Figure 15
Share of young adults living with their parents
 by age group and family status, 1995, 2005 and 2011



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

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

As expected, unmarried young adults live with their parents at higher rates than married people. Therefore, it is reasonable that the delay in marriage age has contributed to a rise in the share of young adults living with their parents in all the age groups. Nevertheless, the rise since 2005 is substantial even in an examination that includes only unmarried individuals. For example, the share of those ages 22-28 living with their parents rose by 8 percentage points between 2005 and 2011, whereas the share of unmarried individuals in this age group living with their parents

rose by 6 percentage points, from 52 percent in 2005 to 58 percent in 2011. Young married couples also live with their parents at a higher rate than in the past, although the rate remains rather low.

A breakdown of this young population by gender and sector shows that the trend among Jews was found to be similar to the overall trends. Arab Israelis live with their parents at lower rates (apparently due to the younger marriage age among them). Between 1995 and 2005, there was a drop in the share of those living with their parents among this group but afterwards, the rate rose and returned to a level similar to the 1995 level. Young adult women in general live with their parents less frequently, partly because of the younger age at marriage, although the trends for men and women are identical.

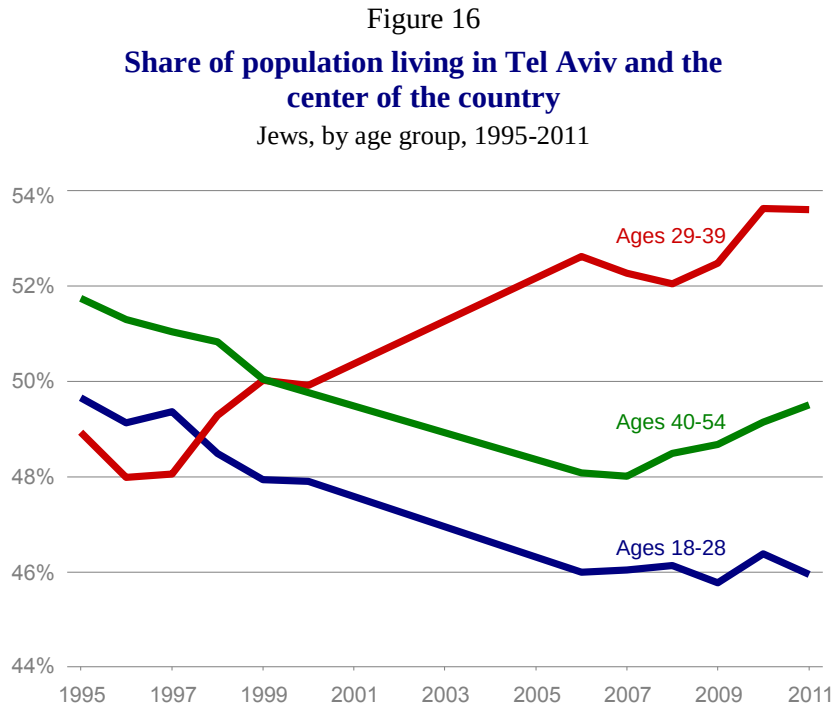
No substantial differences in trends were found in the rates of living with parents by educational status, except for a slightly higher rate of living with parents among students and young adults not studying as opposed to more educated young adults.

In summary, the share of young adults living with their parents has risen, and the increase is related to the rise in housing prices – although the influence of the later age at marriage is also evident. Since no increase was found in the rate of young adults living with their parents before 2005, it may be assumed that the trend regarding leaving home at a later age is not caused by social changes affecting young singles.

Residential Area

Another aspect of young adults' living arrangements is an increase in the share of those living in the geographic center of the country; this is in contrast to a decrease in this rate among older age groups. Among Arab Israelis there has been almost no change, so this section relates only to Jews. A relatively high share of young Jewish adults ages 29-39 have moved to live in Tel Aviv and central districts, and, in contrast, there has

been a decline in the share of those living in these districts among ages 18-28²³ and ages 40-54 (Figure 16).



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics, *Labor Force Surveys*

²³ In this group many young adults live with their parents, so they do not choose their residential area independently. Among members of this age group who do not live with their parents, there was also a decline in the share of those living in the country's center, but the decline was relatively small.

The increase in the share of young adults living in the country's center occurs over almost all of the years. It is interesting to note that the decline in the share of adults (ages 40-54) living in the country's center stopped with the rise in housing prices.

The move of young adults to the country's center has taken place mainly among those with an academic education who, even prior to the increase, lived in the area at higher rates (Appendix Figure 4). The employment rate of young adults living in the center are higher in all of the young age groups, as is the case in the 35 and older age groups, and the trends (as can be seen in Figure 5 previously) are also similar – a decline in employment for ages 18-26 and a rise among ages 27 and over.

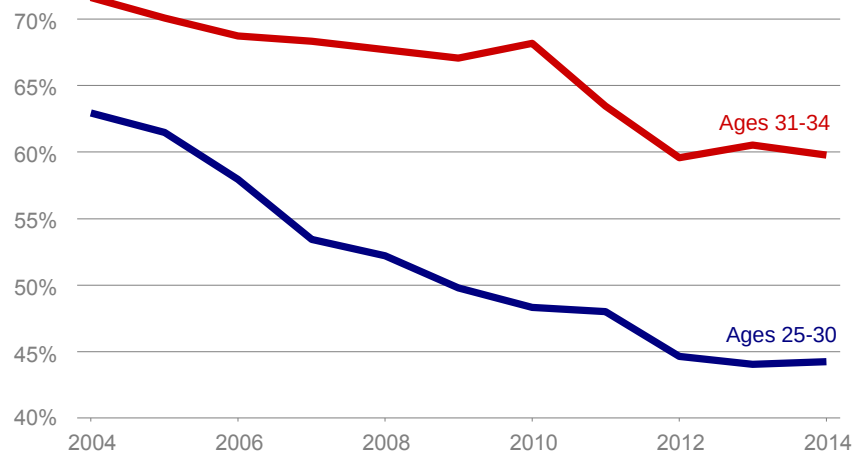
Home Ownership

In parallel with the rise in the share of young adults living with their parents, there has been a decline in home ownership rates. The precise share of home owners does not exist in the Expenditure Survey data, and the data that are measured – ownership of a residential property – is taken as a general measure of home ownership.

Unsurprisingly, the rate of home ownership at ages 18-24 is very low. Gruber (2014) has shown that the rate of home ownership among ages 25-34 experienced a downward trend since 2003, that is, even before the onset of the rise in housing prices. Out of the entire group, most of the decline occurred among ages 25-30. Focusing on married couples at these ages (Figure 17), from 2003 (the first year for which data are available) to 2014, home ownership rates fell by 19 percentage points (from 63 percent to 44 percent).²⁴ This decline took place throughout almost all the years, and was even sharper before the rise in housing prices.

²⁴ This is steeper than the drop in the overall rate of home ownership in the 25-30 age group, since among households headed by unmarried individuals the ownership rate declined by only 5 percentage points.

Figure 17
Home ownership among young married couples, 2003-2014*
 by age of head of household



* Two-year moving average

Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics, *Expenditure Surveys*

Among ages 31-34, the rate of home ownership is also in decline, but the drop is more moderate. The rate of home owners among married couples of this age group has decreased by 12 percentage points since 2003. In this age group, the largest decline occurred between 2010 and 2012, and it is interesting to see that between 2012 and 2014, the decline stopped. In other words, it appears that the rise in housing prices had only a temporary effect on home ownership for married couples at ages 31-34.

Thus, the decline in the rate of home ownership among young adults occurred mainly among married couples and mainly among ages 25-30. It appears that the reason for the decline is not only the rise in housing prices since, as noted, the trend began even earlier, but also changes in the preferences of young couples, who now prefer to postpone the

purchase of a home. It is also possible that the rise in the rate of young adults living in the country's center, which was on the rise especially between 2003 and 2007, had an effect on the postponement of purchasing a home, because of the higher housing prices in the center. In addition, the growth in the rate of those in higher education also impacted the decline in the home ownership rate for young adults until the age of 30, since the lowest rate of home ownership is among students.

4. Summary

This chapter examines the situation of young adults in the areas of higher education, employment and housing relative to the past. It is evident that, since the 1990s, there have been changes both in social norms and in the labor market that have prompted lifestyle changes among young adults.

In the area of higher education, there is a prominent and large increase in the share of those ages 18-34 pursuing a higher education, which coincided with the establishment of many colleges. At the same time that the avenue for higher education expanded, the average age for starting higher educational studies has shown a delay of a year. The source of the trend may be new norms, such as long trips abroad after military or national service as well as lengthy periods of study for the pre-university psychometric exams. As in 1995, most of the Jewish students belong to the 23-26 age group, but a growing share of those ages 27-30 are still attending studies as well.

The delay of studies is accompanied by a later age of entry into the labor market. The younger ages (18-22) have seen the largest decline in employment (about 3 percentage points). In addition, among these ages, there has been a rise in the rate of those employed in part-time jobs as wait staff and in sales positions.

The trends in student employment rates over the course of the examined period were mixed. Among Arab Israeli students, the rates were and remain very low – perhaps due in part to their relatively young age. In contrast, about 65 percent of Jewish students are employed, most

of them in part-time jobs. The employment rate rises as students progress through their studies, and it increased between 1995 and 2011. Students are mainly employed in clerical, sales and service jobs, and only a small percentage of them are employed in occupations that require post-secondary education; that is, they do not amass relevant work experience in the course of their studies.

Contrary to common arguments, young adults ages 31-34 successfully integrate into the labor market and in full-time or part-time employment at rates similar to the older population. Young academics even integrate into occupations in the same way as older academics. Nonetheless, from 2004 to 2011 their pay declined in real terms. This decline is explained by, among other things, the drop in young academics' work experience in the labor market due to the older age at which they begin their studies and enter the labor market as well as the growing number of students pursuing advanced degrees. Likewise, the lower wages may be an indication of the quality of studies at the educational institutions which opened in recent decades. Non-academic educated young adults are employed at a growing rate in service occupations, in which wage levels are low relative to most other occupations. Indeed, the wages of non-academics aged 31-34 has been in decline since 2002 – though this decline is not unique to young adults, and is seen at all ages.

Changes in trends over the years were also found in the area of housing. The share of young adults continuing to live with parents has risen since 2005, especially among those ages 22-28. This rise is evident even when only unmarried individuals are examined. In other words, the trend cannot be explained solely by the delay in age of marriage, and the increase that has occurred since 2005 hints that most of it stems from the rise in housing prices. The share of married couples ages 25-30 living in a home that they own declined by 19 percentage points from 2003 to 2014. However, the decline in the share of married couples ages 31-34 living in a home that they own was two-thirds that of the younger group (12 percentage points), and it primarily occurred after 2007.

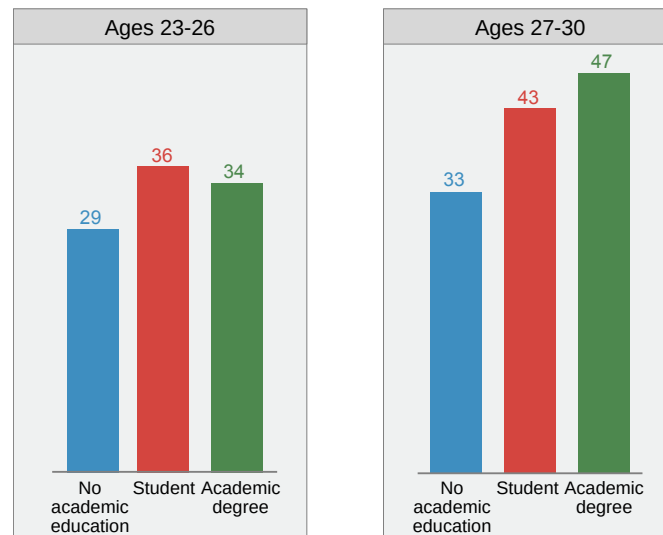
In summary, an overall delay was found in the start of independent adult life, which is reflected in the later age for initiating academic studies and entry into the labor market, in later marriage and childbearing ages, and in delays in moving out of parents' house and the purchase of a home. Despite these lags, by their early thirties most young adults conclude their studies (if they have pursued higher education), successfully find employment at rates similar to those ages 35-54, and leave their parents' homes.

Besides the changes in social norms, there are some external factors that may make life more difficult for young adults than in the past. These include the decline in wages for young academics, and, for those without an academic education, the rise in employment in occupations at relatively low wage levels. Aside from that, the sharp rise in housing prices left its mark in a decline in the home ownership rate among young adults, which has been accompanied by an increase in the share of young adults who continue to live with their parents for longer periods of time.

Appendix

Appendix Figure 1 examines data on wages by educational status according to the Population Census; the census is the only place with data on wages for the 23-26-year-old age group.²⁵ The data for ages 27-30 were also examined through the Central Bureau of Statistics, Expenditure Survey 2014; and similar results were obtained. The lower wages of those with an academic degree as compared to students among individuals in the 23-26-year-old age group is explained by the composition of academics in this age group, which includes more women and Arab Israelis whose wages are relatively low.

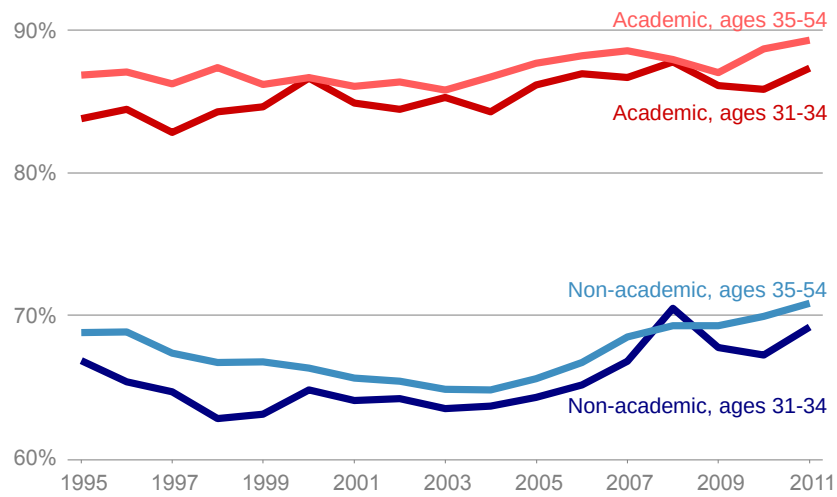
Appendix Figure 1
Hourly wage by educational status, 2008
 Jews, by age group, in shekels



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
 Data: Central Bureau of Statistics, *Population Census*

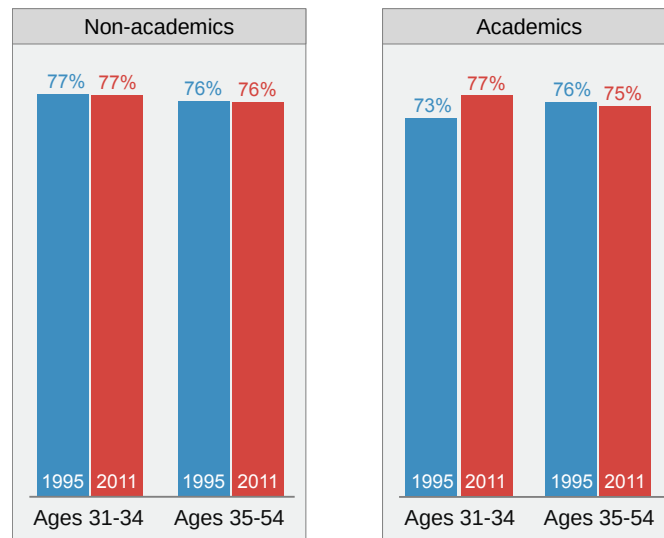
²⁵ The census allows identification of academics at all ages.

Appendix Figure 2
Employment rate by education level
as percent of age group, 1995-2011



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics, *Labor Force Surveys*

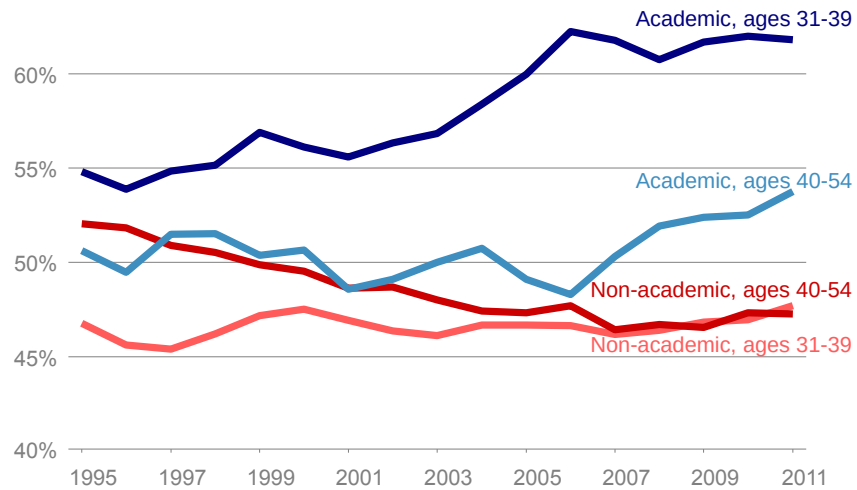
Appendix Figure 3
Full-time employment by education level
ages 31-34 compared to ages 35-54, 1995 and 2011



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics, *Labor Force Surveys*

Appendix Figure 4
**Share of population living in Tel Aviv and the
 center of the country, 1995-2011**

Jews, by education level and age group



Source: Hadas Fuchs, Taub Center for Social Policy Studies in Israel

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

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II. LABOR PRODUCTIVITY

The Dual Labor Market: Trends in Productivity, Wages and Human Capital in the Economy

Gilad Brand and Eitan Regev*

Abstract

The Israeli economy is characterized by a severe duality. At one end are the advanced high-tech industries, with high and quickly rising labor productivity. At the other end are industries characterized by low-productivity and minimal growth. This chapter examines the characteristics of this polarization in the labor market, which began in the second half of the previous century. The chapter examines why the success of the high-tech sector has not led to improvements and streamlining in the rest of the economy, and shows that, over the years, the two sectors have further diverged in terms of worker traits, college wage premiums and labor productivity. At the same time as employment mobility between sectors declined, the relationship between the wages in the high-productivity and low-productivity sectors also diminished. The chapter raises the possibility that by diversifying the Israeli export market, it may be possible to apply pressure on wages in industries with low-productivity and to encourage them to streamline their processes, ultimately leading to a narrowing of gaps within the Israeli labor market. The authors also recommend encouraging research and development in low-technology industries and creating avenues for vocational training that will enable better employment mobility between the various sectors.

* Gilad Brand and Eitan Regev, researchers, Taub Center for Social Policy Studies in Israel. We wish to thank Dr. Dmitri Romanov for his help over the course of this study and Prof. Avi Weiss for his helpful comments. A special thanks to Daniel Roash and Yair Ben Netanel from the Central Bureau of Statistics for their great help in preparation of the data.

Introduction

Productivity – the ratio of total GDP to total work hours – measures the total value of goods and services produced in an average work hour, expressing the economy's productive capacity considering all available inputs. Since a substantial rise in wages relies on an increase in productivity, an improved standard of living must be supported by growth in productivity.¹

This chapter presents a long-term comparison concentrating on the business sector and indicates that productivity has developed unevenly in different economic sectors. Productivity has risen rapidly in tradable industries (those that are engaged in the international market place) while in non-tradable industries (those that are primarily engaged in the local market), productivity has remained almost unchanged.

Existing economic literature has found that tradable industries have a greater growth potential, and that the ratio of productivity in tradable industries to that in non-tradable industries rises together with a country's income level. However, the present chapter shows that the stagnation in productivity in the non-tradable industries is quite unique even in comparison to other OECD countries. The Bank of Israel (2014) found that compared to other OECD countries, productivity in non-tradable industries was low, while the productivity in exporting industries was similar to that in other developed countries. It was also found that the negative correlation between an industry's export rate and the productivity gap relative to other countries is seemingly unique to Israel.

¹ The extent to which an increase in productivity results in a rise in wages is dependent, among other things, on the bargaining strength of workers facing their employers. An increase in labor productivity is a necessary, but not sufficient, requirement for a rise in wages. In theory, it is possible that productivity growth can lead to a rise in return on capital without a rise in wages. Evidence of this is presented by the Bank of Israel (2011) and Kimhi and Shraberman (2014). On the other hand, the Bank of Israel (2015) finds evidence for a mean reversion in the labor income share over long periods.

According to standard economic theory, any positive shock in productivity in a given sector, say tradable industries, raises the demand for workers in that sector, thereby increasing both wages and employment in that sector. Theoretically, if the workers in the non-tradable sector are perfect substitutes (fully identical) to workers in the tradable sector, and there is perfect mobility between the sectors, then employment in non-tradable industries would decrease, and wages would increase to the same degree as in the tradable sector. This increase results from decreasing marginal returns and from workers moving to sectors where wages are higher. Nonetheless, Lavi and Friedman (2007) show that increased productivity and wages in the tradable industries did not bring about wage pressures in the non-tradable industries in Israel. They raise the possibility of polarization in the labor market, with workers' traits, such as education and human capital, differing greatly between the tradable and non-tradable sectors and, as a result, wages in each sector develop differently and independently.

The present chapter examines Lavi and Friedman's hypothesis as one of the factors causing the differences in productivity development. The first section examines the relevant literature and presents the basic data. The second section presents the growth of productivity and wages, while dividing the economy into four sectors: an initial division into tradable and non-tradable industries, and a further division of each industry by productivity level (high or low). The third section sheds light on the development of the relationship between wages in different sectors. The fourth section focuses on the causes of the differences in productivity between the various sectors and shows that the deep differences in workers' traits in each sector and the decrease in mobility from one industry to another partly explain the polarized trends in productivity and wages between the sectors. The fifth section presents an empirical test of the productivity gaps, controlling for the differences in workers' traits, while addressing nominal and real differences in labor productivity development. The sixth section presents conclusions and recommendations, primarily increasing research and development in low-

technology industries and the creation of vocational training programs to increase occupational mobility between industries.

1. Labor Productivity in Israel

An extensive body of literature has been written in recent years on labor productivity in Israel. Publications have followed two approaches, each with a different focus. One approach examines the economy as a whole, while the other differentiates between various sectors of the labor market. This chapter takes the latter approach.

Generally, the studies find a growing gap between productivity abroad and productivity in the Israeli economy. They ascribe the gap to different characteristics of the Israeli economy, including: low competition in the local business environment; extensive bureaucracy; long work hours; a relatively young population with little labor market experience; a relatively low-quality education system;² low ratio of capital to GDP;³ and a sizable defense sector (Bank of Israel, 2013; Sarel, 2013).⁴

² Hanushek and Woessmann (2012) show that the quality of the early years of education is more related to economic growth than it is to human capital as measured in the number of years of schooling. According to this approach, it is possible that failures in the early stages of educational acquisition cannot be fixed by a college education, and, thus, the relatively high rates of higher education in Israel are not fully expressed in productivity terms.

³ Sarel (2013) shows that about 24 percent of the difference between labor productivity in Israel and the OECD average is linked to a lower level of worker capital, and the rest of the difference is the result of general differences in productivity.

⁴ It is possible that part of the gap in productivity is explained by Israel's geographic location. Boulhol, Serres and Molnar (2008) find that distance from the economic center explains part of the gap in per capita GDP between OECD countries. For example, in Australia and New Zealand, the distance reduces per capita GDP by 10 percent, and contributes about 6-7 percent to per capita GDP in Belgium and the Netherlands.

As already noted, when studies examine productivity by industry, it is found that productivity in Israel is low in international comparisons primarily in non-tradable industries. In the tradable industries, in contrast, productivity in Israel is higher than, or similar to, that of other developed countries (Bank of Israel, 2014; Regev and Brand, 2015).⁵

Figure 1 shows the growth of overall productivity starting in the mid-1970s in the commerce and services industries, which comprise a significant part of the non-tradable sector, compared with manufacturing sectors, representing the tradable sector. Until the 1990s, there was an almost perfect correlation between the two sectors, whereas after that period, as the economy was exposed to competitive imports, the overall growth in industrial productivity began to accelerate in the tradable industries, along with a certain decrease in productivity in the non-tradable industries.^{6,7} As noted, the economic literature indicates that

⁵ Rodrick (2011) finds that GDP per worker in the manufacturing sector tends to converge between countries as opposed to GDP per worker over all industries.

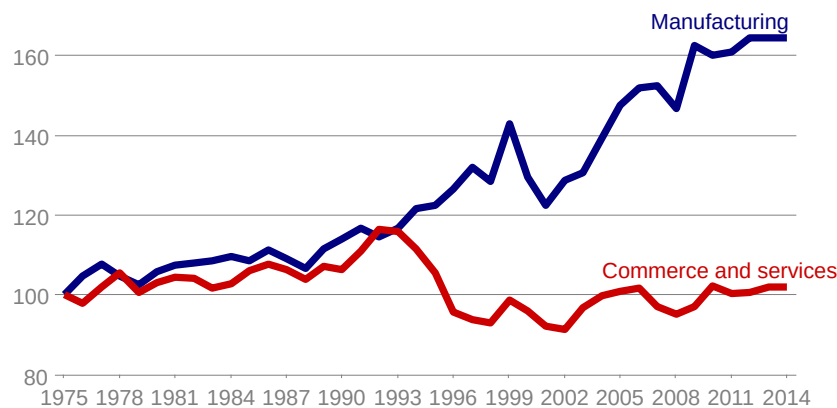
⁶ It is possible that the wave of immigration from the former Soviet Union in those years affected the overall productivity in the economic sectors in an uneven way. For example, Zussman and Friedman (2008) show that the immigration lowered the quality of the labor force in those years since the new immigrant human capital was not particularly suited to the labor market needs in Israel, and the process of integration into the market was accompanied, at least at the beginning, by workers being employed in work other than in their professions. Brezis and Krugman (1996) show that appropriate integration of immigrants from the former Soviet Union into the labor market can improve the quality of the labor force and lead to higher level wages in the market place in the long term, despite downward wage pressures at the beginning of the integration process.

⁷ It is possible that the opposing trends in overall productivity in the various industries beginning in the 1990s stems from, among other things, the diversion of labor from the industrial to the service sector. De Michelis, Estevao and Wilson (2013) find a negative relationship between labor force growth and overall growth in productivity. According to their study, a rise in

labor productivity in the non-tradable industries is less affected by innovation and technological advances than in tradable industries, so their growth potential is more limited. However, the slight decline in productivity in these sectors requires further explanation.

Figure 1
**Productivity in the manufacturing industry and
the commerce and services industry**

Index: 1975=100, 1975-2014



Source: Gilad Brand and Eitan Regev, Taub Center

Data: Bank of Israel

Many studies have indicated a positive correlation between exports and labor productivity, but the causality can go in either direction. On the one hand, high-productivity is expected to affect a company's decision to compete on international markets. On the other hand, the experience accumulated through exposure to new markets and technological developments worldwide, as well as the intensive competition on the

labor inputs diminishes the incentive for employers to streamline their work methods. A similar finding can be seen in the study by Junankar (2013).

international market, increases the company's innovation and the workers' productivity.⁸

Helpman, Itskhoki and Redding (2010) and Helpman, Itskhoki, Muendler, and Redding (2012) find that in equilibrium, trade liberalization shifts higher ability workers to exporting firms, which have higher productivity and pay higher wages. Such movement can indeed explain to some degree the difference in productivity development between the different sectors presented in Figure 1 above. Amiti and Davis (2012) find that tariff cuts reduce wages at companies that are oriented exclusively to the domestic market while raising wages at those that export a sufficient share of their output.

To compare the wages and labor productivity in the various sectors of the Israeli economy, the business sector will be divided into four relatively homogeneous groups, representing different levels of technological intensity and business environment:⁹

⁸ Gallo (2011) estimates the relationship between export and productivity in local companies in the years following trade liberalization in the Israeli market in the 1990s. The findings show that the productivity of exporting companies is higher than non-exporting companies, and that after a company begins to export, its productivity rises by 12 percent in five years.

⁹ Dividing the industries by productivity was determined by the average labor productivity in 2010 in industries in the sample. Industries that were below the average were classified as low-productivity industries; industries over the average were classified as high-productivity. The division in tradability sectors was determined using two criteria: the export rate and competing import rate in the industry. Industries that export more than 15 percent of their supply or in which the rate of competitive imports is more than 25 percent of their output were classified as tradable industries (according to the Input-Output Tables of the Central Bureau of Statistics, 2006). Further support for the criterion is found through a series of Chow tests. This division is similar to tradable industry classifications in the literature. For example, Zussman (1998) classifies tradable industries where the export rate is over 10 percent of the output.

Non-tradable low-productivity industries. Service and commerce industries (except computer services and research and development) and non-tradable low-technology industries (food, paper and print).

Tradable low-productivity industries. Low and medium-low industries and tradable manufacturing industries.

Non-tradable high-productivity industries. Banking and other financial institutions, telecommunications, beverages and tobacco.

Tradable high-productivity industries. Computer services and research and development, medium-high and high technology manufacturing industries, water and air transport, and auxiliary transport activities.¹⁰

This division is presented in detail in Appendix Table 3. This chapter focuses on the business sector alone,¹¹ excluding a few industries: agriculture and construction (characterized by a high rate of foreign labor employment); mining and quarrying; diamonds;¹² real estate activities; and rentals of machinery and equipment. As a result of these omissions, this analysis includes about 60 to 65 percent of all employees and 90 to 95 percent of all employees in the business sector in Israel.

Figures 2A and 2B show the labor force breakdown in these four groups in 1995 and 2010. The main development during this period was the steep decline in working hours in low-technology industries. Likewise, it can be seen that the vast majority of workers in the business sector are employed in non-tradable commerce, services and

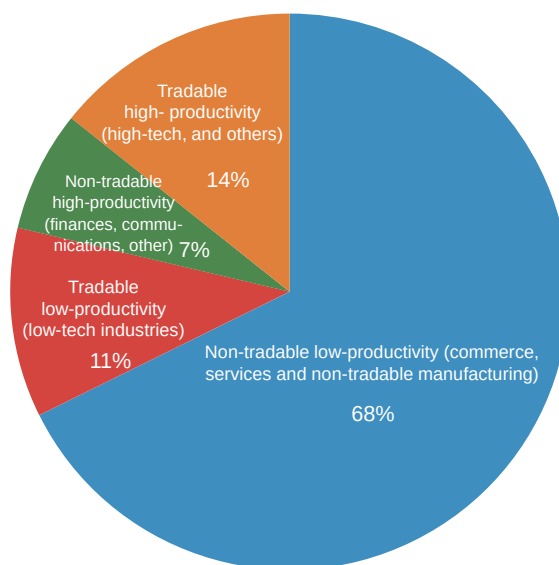
¹⁰ Transportation industry includes shipping agencies, air transport agencies, custom clearing agencies, and travel and tourist agencies.

¹¹ The business sector does not include the following industries: foreign agencies and organizations; community and social organizations; health, welfare and nursing care; electricity and water; local authorities; community centers; waste management and services; religious services; educational services.

¹² In international classifications, the diamond industry is combined with other industries; for this reason it is included in international comparisons (Figures 3 and 4).

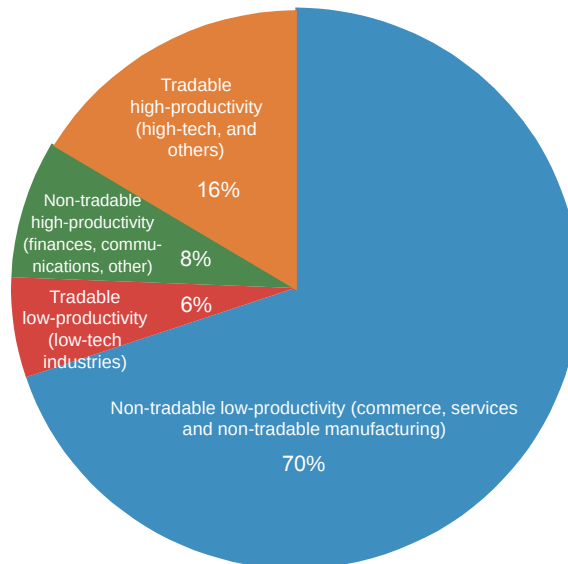
manufacturing. As such, some of the discussion in this chapter will be a comparison between this group (hereinafter: non-tradable low-productivity sector) and the three other groups combined into a single group (hereinafter: the combined sector).

Figure 2A
Distribution of work hours by industry sector, 1995
by sector



Source: Gilad Brand and Eitan Regev, Taub Center
Data: Central Bureau of Statistics

Figure 2B
Distribution of work hours in the business sector, 2010
 by sector



Source: Gilad Brand and Eitan Regev, Taub Center
 Data: Central Bureau of Statistics

2. Trends in Productivity and Wages by Business Sectors

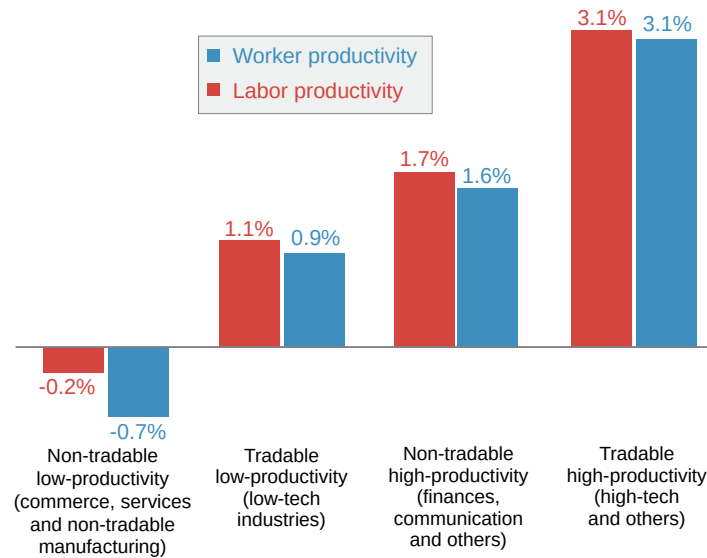
Figure 3 shows the annual growth rate in productivity per work hour and productivity per worker in the four groups defined above. From 1995 to 2010 there was growth in productivity across three of the four groups. Only in the non-tradable low-productivity sector was there a decline in

productivity per work hour and in productivity per worker at an average rate of 0.2 percent and 0.7 percent per year respectively.¹³

¹³ Measuring the real productivity growth in different economic industries ideally requires using appropriate price indices for each industry. In the service and commercial industries, though, inflation is more difficult to measure on an industry level, and fitting a price index to each industry is less accurate. Therefore, it is possible that the negative growth in the non-tradable industries is the result of, among other things, measurement bias. To test the extent of possible bias, prices were also deflated by the GDP business sector deflator. Since the prices in non-tradable sectors tend to rise faster than in tradable sectors, the development of productivity in the non-tradable sectors is most likely below this level. In other words, the price index for business sector product allows an evaluation of the upper boundary of non-tradable industry productivity development. The results using the index indicate an annual growth rate of 0.8 and 0.4 percent in labor productivity and productivity per worker, respectively. The conclusion is that the productivity in non-tradable industries rose at a lower rate and by the end of the previous decade was close to the level of the second half of the 1990s.

Figure 3
**Rate of annual growth in worker productivity and
labor productivity, 1995-2010**

in the 4 industry groups in the business sector
(using the Israeli classification)



Source: Gilad Brand and Eitan Regev, Taub Center

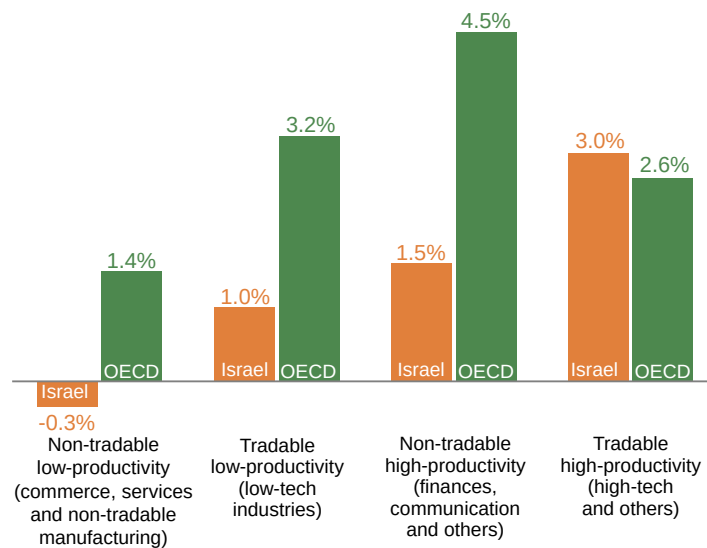
Data: Central Bureau of Statistics

Figure 4 presents a comparison of labor productivity in the examined sectors compared to a sample of the 12 OECD countries for which data exist for the period under study.¹⁴ The figure makes it clear that in other

¹⁴ The sample includes Austria, Canada, Czech Republic, Denmark, Finland, Greece, Hungary, Netherlands, Norway, Slovakia, Spain, and Sweden. Average labor productivity in these 12 countries is similar to the average of all the countries in the OECD. Thus, this sample represents a relatively good proxy (see Regev and Brand, 2015).

developed countries as well the non-tradable industries tend to exhibit slow growth compared to other industries, but the negative growth rate seen in Israel is exceptional.¹⁵

Figure 4
Rate of annual growth in labor productivity, 1995-2009
 Israel and 12 OECD countries (using the international classification),
 in the 4 industry groups in the business sector

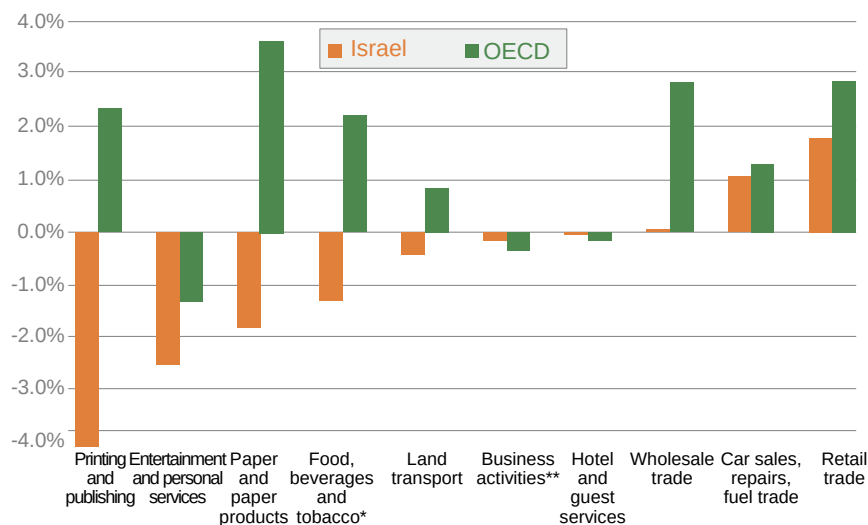


Source: Gilad Brand and Eitan Regev, Taub Center
 Data: Central Bureau of Statistics; OECD

¹⁵ There are differences between the classification of sectors by the Central Bureau of Statistics and the international classification systems. As such, there are certain differences in international groups presented here and the rest of the comparisons. Appendix Table 1 in Regev and Brand (2015) presents the groupings in Israel and the corresponding international classification.

Figure 5 examines in further detail the labor productivity in the industries comprising the non-tradable low-productivity sector in Israel and in the comparison countries. Most of the industries included in this sector in Israel are characterized by negative productivity growth; the growth rate in the sample OECD countries is faster in the majority of industries in the category.

Figure 5
Rate of annual growth in labor productivity in commerce, services and non-tradable manufacturing, 1995-2009
 Israel and 12 OECD countries (using the international classification)



* In Israel, beverages and alcoholic beverages are included in the food industry. In the OECD, they are in the tobacco industry. For comparison purposes, the two industries were combined for both Israel and the OECD classification.

** The OECD includes in this industry worker recruitment and employment services and guarding, security and cleaning services that are separate in the Israeli classification.

Source: Gilad Brand and Eitan Regev, Taub Center

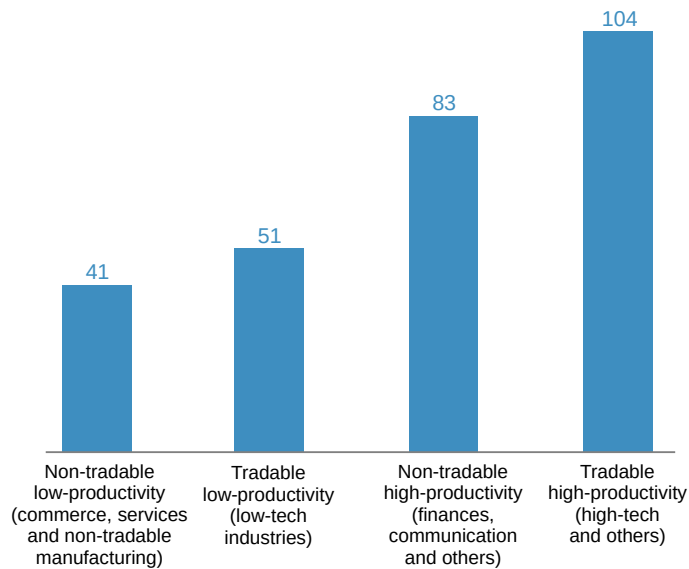
Data: Central Bureau of Statistics; OECD

To complete the picture, wages in each of the sectors were examined for 2010 (Figure 6A) as well as wage growth from 1995 to 2010 (Figure 6B). As can be seen in Figure 6A, the cost of an hour of labor in the non-tradable low-productivity sector was NIS 41 in 2010, substantially lower than in the other sectors, while wages in the high-tech industries were highest, at NIS 107 per hour.¹⁶ Figure 6B shows that wages in the tradable industries grew relatively quickly: 1.4 to 1.8 percent per annum (in real terms). However, in the non-tradable industries wages grew at a relatively slow rate.

Figure 6A

Wage costs per hour per worker, 2010

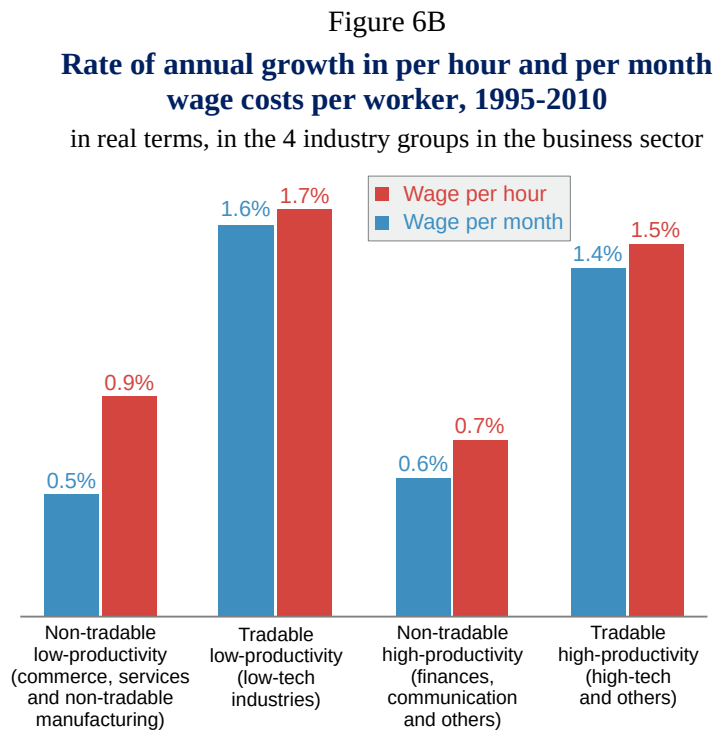
in the 4 industry groups in the business sector, in shekels



Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

¹⁶ Wage costs to the employer include payments such as social benefits and employer payments to the National Insurance Institute.



Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

3. Wage Development

The previous section presents the differences between sectors in productivity and wages, and the growth rates in each. In this section, the development of the correlation between wage trajectories in the various sectors will be examined.

As explained in the introduction, it may be expected that increased productivity in one sector will attract workers to that sector and cause wages to increase in all the other sectors as well. However, Lavi and Friedman (2007) show that increased productivity in the exporting industries does not affect wages in the non-tradable sector, and assume that the relationship between wages in the two sectors is weak.

Table 1 examines the relationship between wage development in the different sectors, and presents the Pearson Product-Moment Correlation coefficients for wage costs per hour in the different groups.¹⁷ Each cell shows the correlation coefficient between two sectors over 16 years (1995-2010). The groups are ranked from left to right and from top to bottom by average wages within the group (low to high). The comparison's notable findings are the close correlation between wages in different sectors, and in particular between tradable and non-tradable low-productivity industries (a correlation of over 96 percent).

Table 1. **The correlation between salary and the 4 industry groups in the business sector**

Pearson Product-Moment Correlation

	Tradable low-productivity	Non-tradable high-productivity	Tradable high-productivity
Non-tradable low-productivity	96.3%	76.7%	91.6%
Tradable low-productivity	--	70.5%	91.1%
Non-tradable high-productivity	--	--	86.9%

Source: Gilad Brand and Eitan Regev, Taub Center

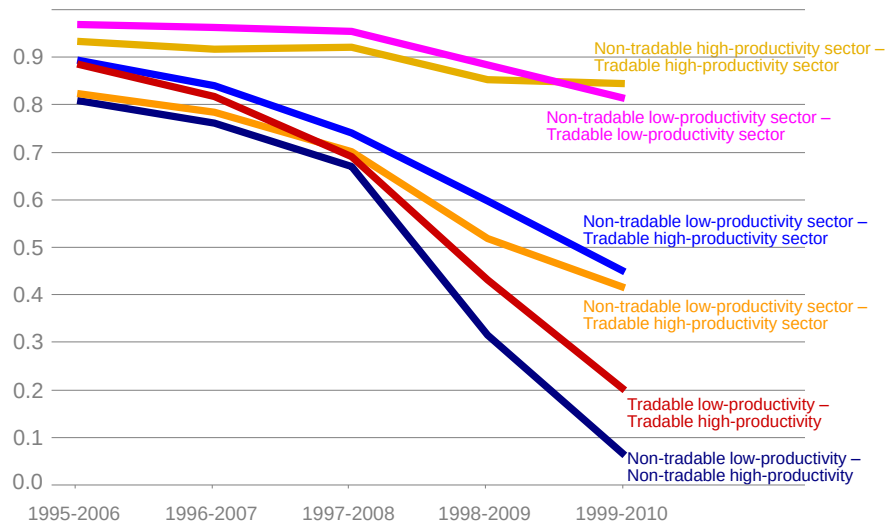
¹⁷ Pearson Product-Moment Correlation is an index of correlation between two groups of numbers which gives a value ranging from 1 (for a full correlation) to 0 (for no correlation). Results are similar even when the comparison is carried out for monthly wages.

To shed light on the development of the correlation over the years, the coefficients between wages in the different groups were calculated over only 12 years (rather than the 16 in Table 1), for five consecutive periods (start year: 1995 until 1999). The comparison is presented in Figure 7, and it indicates that the correlation between wages in the different sectors weakened over the years in all industries, but not to the same degree. The correlation between low-productivity industries and high-productivity industries weakened substantially, while the correlation between tradable and non-tradable high-productivity sectors remained relatively strong.¹⁸ This result may be due to higher worker mobility between sectors at similar productivity levels.

Another comparison, presented in Appendix Section 1, indicates that the combined sector is more dominant in determining wages, meaning companies in the non-tradable low-productivity sector react with a delay to the wage development in combined sector companies (and not vice versa), at least for skilled workers. This may support the assertion that productivity growth in some industries leads to wage pressures in other industries, as in the case of skilled workers, but perhaps to a lesser extent than in the past.

¹⁸ Sensitivity tests show this result is consistent and does not change with the selection of different years.

Figure 7
The Pearson Product-Moment Correlation coefficient for salaries*
in the 4 industry groups in the business sector
 by periods, 1995-2010



* Wage costs per work hour. Similar results are obtained for wage costs per month.

Source: Gilad Brand and Eitan Regev, Taub Center

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

4. The Causes of Gaps in the Growth Development of Productivity and Wages

It is reasonable to assume that differences in productivity growth and the weakening of the relationship between workers' wages in the different sectors are rooted in, among other things, the deep differences between worker traits. This section examines the differences between worker traits by following developments in human capital in each sector. Further on,

the uneven development of prices in the various industries and their effect on the productivity gaps will be examined.

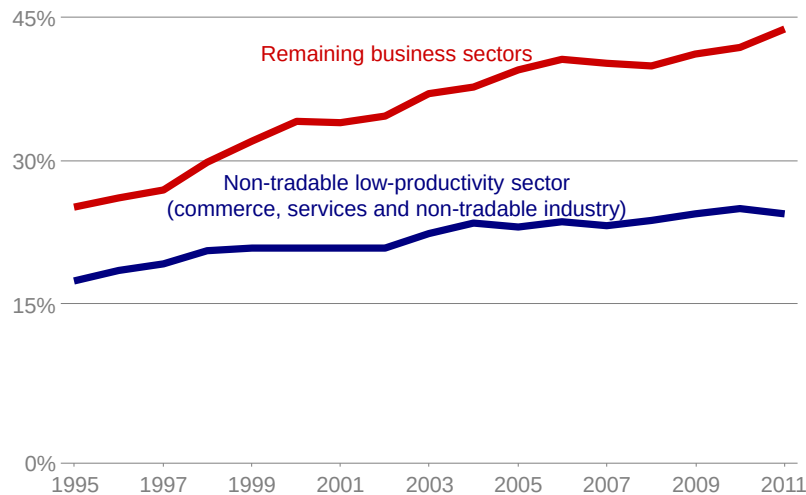
Differences in Worker Profiles

Figure 8 shows the share of college graduates in the non-tradable low-productivity sector and the combined sector.¹⁹ It is apparent that human capital has improved overall in the market industries, but the accumulation of human capital in the combined sector rose more quickly than in the non-tradable low-productivity sector.²⁰

¹⁹ Identification of academics was done by number of years of schooling (at least 15) and last place of schooling (academic) and not according to certificate or last degree, since data on the year of the degree are not available in the Central Bureau of Statistics *Income Survey* for the entire study period.

²⁰ Friedman (2013) shows that the rise in productivity and labor wages in information and communication technologies in the second half of the 1990s brought about a sharp increase in the quality of the labor force in the other industries. This rise strengthened the uniqueness of the human capital of workers in industries biased towards export.

Figure 8
Share of college educated workers, 1995-2010
 by sector



Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

Figure 9A shows the distribution of workers with no more than an upper secondary school education across the sectors in 1995 and 2011, and Figure 9B shows that of workers with a college education during those years. In addition to the usual division into four sectors by tradability and productivity, the non-tradable low-productivity sector was further divided along the median wage in that group (in 2010). The five groups are ranked descending from left to right by the average wage in each group.

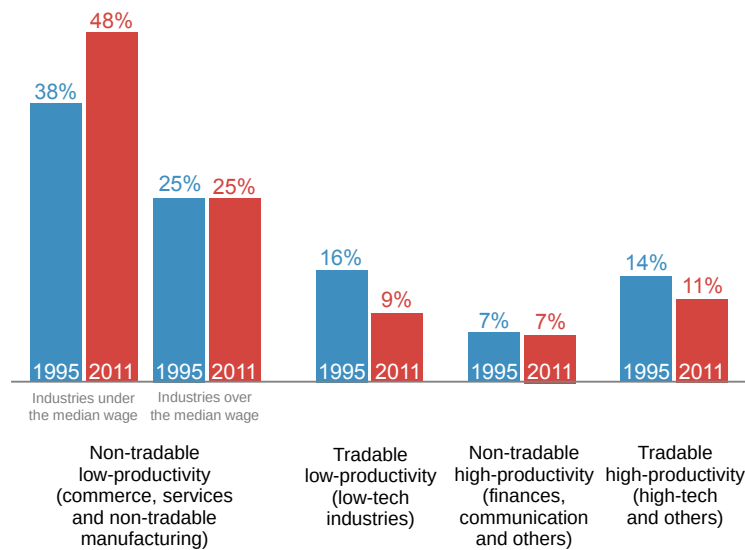
The distribution of workers indicates the portion of workers with no more than a high school education in each of the five groups presented. In Figure 9A, the decrease in the portion of those with an upper secondary education or less in employment in tradable low-technology industries, which were affected by market exposure to competitive imports in the

1990s, is especially striking. The probability of a worker with no more than an upper secondary education being employed in tradable low-technology industries declined over the period from 16 to 9 percent. A similar trend was found among workers with a college education.

Figure 9A

Employment distribution of workers with upper secondary education or lower, 1995 and 2011

in the 4 industry groups in the business sector, groups are arranged from left to right in order of ascending average group wage



Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

An interesting point indicated by this figure is that, in parallel with the overall decrease in employment in low-technology industries, there is an increase in the employment rate of less-educated workers in the lower wage tier of the non-tradable industries. That is, low-skilled workers, previously employed in the tradable low-technology industries, are now

employed in the lower tier of the non-tradable industries, where productivity and average wages are lower.²¹

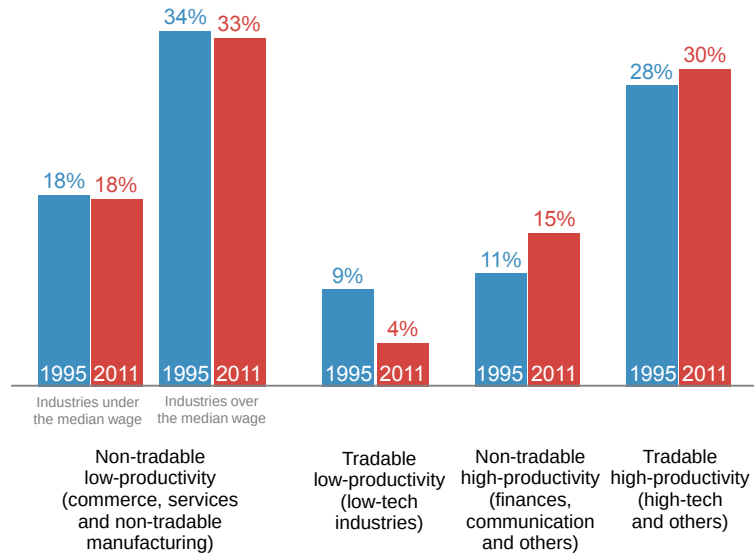
Among workers with a college education, the opposite is found; the employment shifts were to finance and advanced technology industries, where wages are higher (Figure 9B). This demonstrates the polarization that developed in the labor market following exposure to competitive imports, a phenomenon also documented in other countries that underwent similar processes.²²

²¹ Average hourly wage costs in tradable low-technology industries stood at NIS 39 per hour in 1995 while in the lower half of the non-tradable industries wage costs were on average NIS 20 per hour (in 2010 prices).

²² Kimhi and Shraberman (2014) present evidence of polarization in the distribution of wages and work hours by occupations. The researchers show that in occupations characterized by low wages and in those characterized by high wages, the number of work hours increased relative to the number of work hours in medium-wage occupations.

Figure 9B
**Employment distribution of workers with a college degree,
 1995 and 2011**

in the 4 industry groups in the business sector, groups are arranged from left to right in order of ascending average group wage



Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

Mobility Between Sectors in the Labor Market

As presented in the introduction, when workers' skills are not homogeneous and sectors in the labor market differ in the composition of their human capital, inter-sector mobility will be limited and wages in each sector will develop differently and independently.

A study by Endeweld (2012) shows that the level of mobility between wage deciles declined between 1990 and 2005. Since all four of the sectors examined in this chapter are characterized by a different wage

level, it can be assumed that the decline will also reflect a decrease in inter-sector mobility. This question is examined here. Ideally, mobility should be examined based on longitudinal panel data, but these data are not available in Israel, and there is no choice but to use the Central Bureau of Statistics *Labor Force Survey*, which is a short-term panel survey (subjects studied four times over one and a half years). Because the specific details of the labor force survey change over time, a pseudo-panel approach was taken by combining the details in categories characterized by certain observed properties, creating cells that are homogenous vis-à-vis those properties.

By this division, 50 groups were created, representing workers in five educational categories by years of education (less than 12, 12, 13-14, 15-16, and 17 or more) and 10 categories of potential experience²³ (multiples of 4 from 0 to 40).²⁴ Changes in the distribution of the groups among the sectors were used to evaluate the net mobility²⁵ of workers with different profiles between the four sectors in the labor market.

There are many ways to examine mobility in the labor market. The method used in this chapter examines the correlation between the distribution of workers over the various profiles in a given sector during a given period and the same distribution during a later period. The higher the correlation (on a scale of 0 to 1), the lower the mobility. The mobility index, as formulated using this method,²⁶ is affected by the transfer of

²³ Potential experience is computed according to the classification in Zussman and Friedman (2008): age minus years of schooling minus length of army service minus 6. For new immigrants the calculation is slightly different (see Appendix A in Zussman and Friedman).

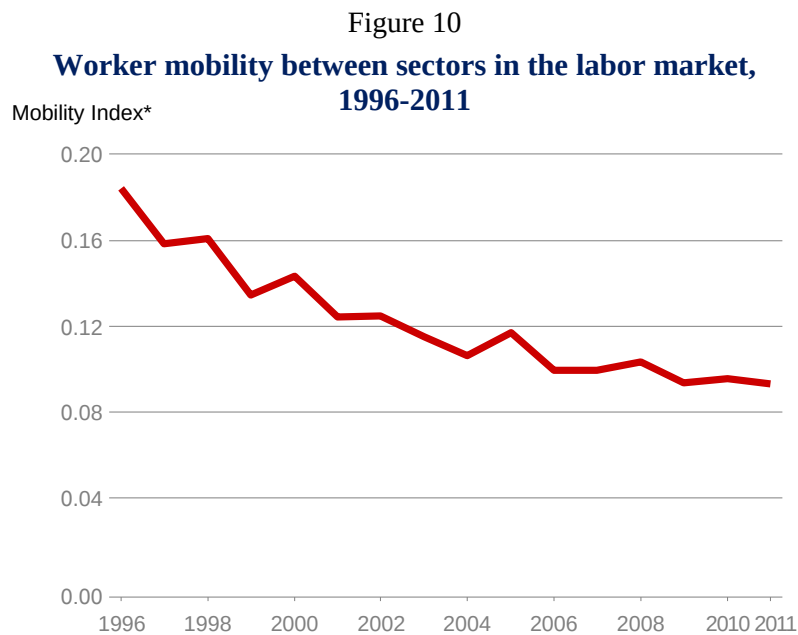
²⁴ The relevant population was limited to ages 18-64, not including immigrants.

²⁵ That is, the number of transfers after a reduction by temporary moves.

²⁶ Formally, the index is calculated as one minus the portion of the variance in the group's distribution in year t that is explained by the distribution in year $t-1$. A random cut-off of observations was performed so that the index was calculated over the same number of observations in each year.

workers between sectors as well as the changes in the distribution of new entrants to the labor market in the different industries.

Figure 10 presents the mobility indices from 1996 to 2011 and shows a decrease in the extent of mobility of work output between sectors in the labor market over the study period, along with a continuous slow-down in the rate of the decline.²⁷ This means that the changes in the distribution of human capital are happening less quickly than in the past, and there is a trend towards a certain level of stability by the end of the period.



* Transfers of labor output and human capital between sectors in the labor market.
Not including immigrants.

Source: Gilad Brand and Eitan Regev, Taub Center

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

²⁷ Since the index is based on a synthesized panel, there may be an undervaluation of the cases of simultaneous movement between groups that were not counted because they canceled each other out; nevertheless, it is unlikely that the undervaluation explains the change over the long term.

On the whole, high mobility of workers between sectors serves to narrow wage gaps, but at the beginning of the study period the mobility between sectors was relatively high, and despite this there was actually an increase in wage gaps in Israel. It would seem that this is explained by a rapid change in the human capital distribution across the different sectors at the beginning of period as a result of an external factor (like trade liberalization measures), that led, among other things, to a forced transfer of low skilled workers to non-tradable sectors at lower pay and to a further erosion in relative wages (which were already low) and an increase in gaps. During the second half of the 2000s, a level of stability in wage gaps is seen (Figure 11B below). In these years, the mobility between sectors slowed down. This is a further indication that the increased mobility at the beginning of the period led to growth in the wage gap and not to a narrowing of it.

Appendix Section 2 presents the changes in the distribution of human capital in another way, without tradable low-technology industries. The comparison shows that the polarization process does not end with just a shrinking of low-technology industries and a growth in the relative portion of commerce and services, but also in further polarization of the mix of human capital within the commerce and services sector themselves. This comparison also shows that the process of polarization continued until the second half of the previous decade from which point there was a certain level of stability.

Effects of the Differences in Worker Traits on Productivity Gaps: An Empirical Examination

Assuming there is a direct relationship between average wages and average marginal worker productivity (labor productivity), and given that there is a positive correlation between workers' education and their wages, it may be expected to find higher productivity in industries with a higher percentage of college graduates. Therefore, is no surprise that the segmentation process which human capital has undergone since 1995 is accompanied also by polarization in labor productivity.

In this section, the degree to which the productivity gap between sectors decreases when taking into account the different human capital makeup is examined. For this purpose, a regression was run in which the dependent variable was the natural log of the average output per work hour in the industry, and the explanatory variable was a dummy representing the combined sector.²⁸ This regression was then rerun with an additional explanatory variable for average worker education in the industry. In both cases the regression was run separately for each year in 40 industries.²⁹ As in the methodology presented by Mazar (2014), the gap between the dummy variables' coefficients represents the difference between the productivity gap dependent on worker education and the productivity gap that is independent of it, that is, the difference represents the part of the productivity gap rooted in the differences in worker education in each sector.

Figure 11A shows that the labor productivity gap between sectors has grown from about 30 percent at the beginning of the period to about 60 percent at the end of the first half of the 2000s and, when worker education is controlled for, the gap is about 10 percentage points less. Therefore, the differences in human capital explain part of the gap. It is interesting to note that the gap grew until 2004 and has since stabilized.

²⁸ Additional explanatory variables were initially included, but found to be insignificant.

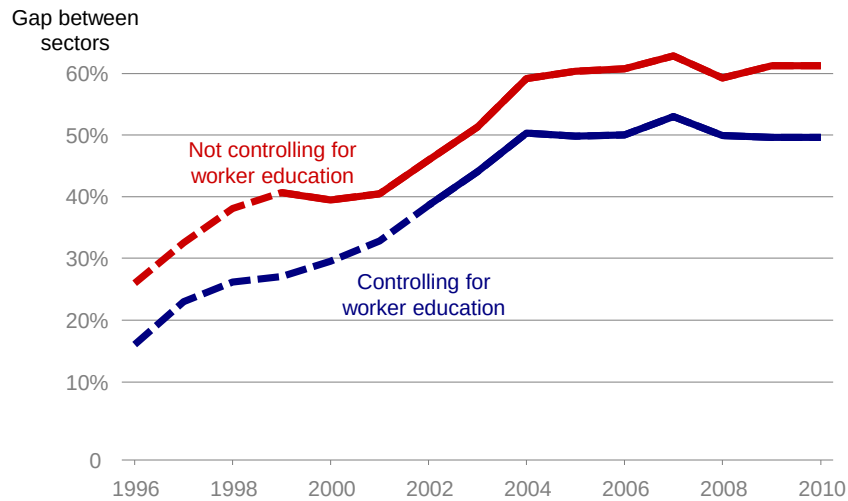
²⁹ Formally, this estimation is calculated from the following formula:

$$\ln(gdp\_per\_hour_{i,t}) = \beta_0 + \gamma_t \cdot D + \varepsilon_{it}$$

$$\ln(gdp\_per\_hour_{i,t}) = \beta_0 + \beta_1 x_{it} + \delta_t \cdot D + \varepsilon_{it}$$

x_{it} represents the average number of years of schooling in industry i in year t ; D is a dummy variable with a value of 1 for the combined sector and 0 for the non-tradable low-productivity sector; γ_t and δ_t represent coefficients of the dummy variable; $\gamma_t - \delta_t$ represent the difference between the unconditional productivity gap and the gap that accounts for differences in education.

Figure 11A
**Productivity gaps between the non-tradable low-productivity sector
 and the remaining business sectors**
 before and after controlling for worker education, 1995-2010*



* Two-year moving average. The broken line represents years when the gap between the sectors was not statistically significant.

Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

It should be noted that the test referred to differences in education only, and not differences in other, unobserved characteristics among workers – such as motivation, intelligence, and perseverance – and an additional part of the gap may be explained by differences in these traits.

Now that the effect of differences in workers' human capital on productivity gaps has been demonstrated, the trend in this effect over the years 1997 to 2011 will be examined. To this end, micro-data were collected on wages (from the Central Bureau of Statistics, *Income Survey*) and an additional test was conducted using the same methodology. Note, however, that this estimation procedure relies on the assumption that

wages reflect productivity. Due to the use of micro-data, additional explanatory variables, such as gender and experience, were added.³⁰

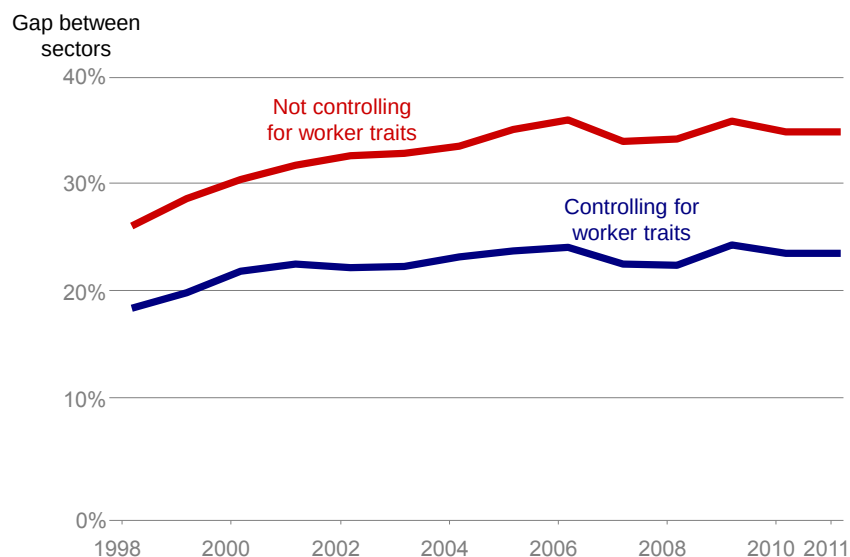
Figure 11B presents the difference between the raw wage gap and the gap that accounts for workers' traits. Figure 12 presents the difference between them. As can be seen, the difference between the gaps increases over most of the time period, becoming somewhat stable during the second half of the last decade. This means that the workers' different traits had a growing role in the process of divergence in productivity and wage trends in different sectors.

³⁰ This estimation was conducted using the standard Mincer equation with a dummy variable for the combined sector. The estimation is based on micro-data for working age individuals (ages 25-64) who work at least 10 hours a week. The previous regression analyses were based on averaged industry data, and as a result only average years of schooling for workers in the industry was found to be a significant explanatory variable.

Figure 11B

Wage gaps between the non-tradable low-productivity sector and the remaining business sectors

before and after controlling for worker education, 1995-2010*



* Two-year moving average

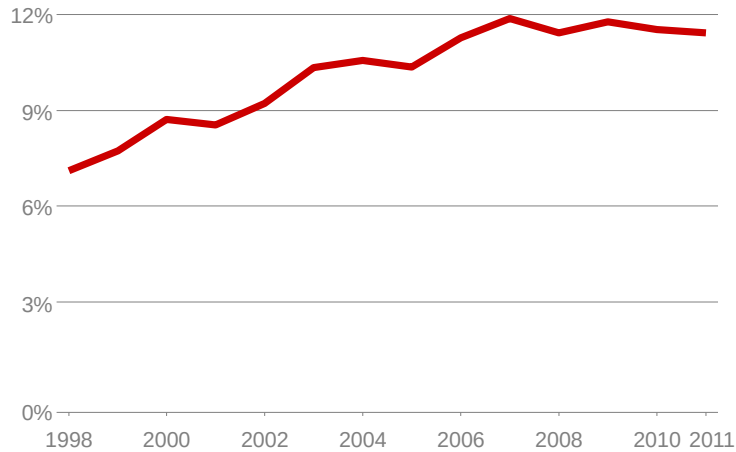
Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

The increased difference between the raw wage gap and the gap adjusted by worker traits can be attributed to two possible factors. The first is that the human capital of workers in the combined sector expanded more than in the non-tradable low-productivity industries. The second is that returns on human capital in the non-tradable low-productivity sector eroded compared with returns in the other industries (and, of course, a combination of both factors is possible).

Figure 12

Wage gaps between the non-tradable low-productivity sector and the remaining business sectors: the difference between the raw wage gap and the gap adjusted for worker traits
the difference between the correlation coefficients for wages, 1997-2011*



* Two-year moving average

Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

As it was found that accumulated human capital in the combined sector (tradable industries and high-productivity non-tradable industries) did indeed increase more rapidly (Figure 8 above), it remains to be seen whether a change also occurred in returns on human capital in each of the sectors under study. For this purpose, returns on a year of education were examined in the combined sector in comparison with the non-tradable low-productivity sector (Figure 13).³¹ College wage premiums are higher

³¹ The wage equation is calculated using the standard Mincer equation. The estimation is based on individual data (the most noteworthy explanatory variables are years of schooling, potential experience and gender) for working

in the combined sector, and over time the trends in the two industries are different; in the combined sector, returns per year of education have increased over the years, while returns remained almost unchanged in the non-tradable low-productivity sector. In other words, college wage premiums in the non-tradable low-productivity industries eroded over time compared to the combined sector.³²

In summary, the differences in the productivity trajectory also result from the widening disparities in the makeup of human capital in each sector. The changes in this area are rooted, among other things, in the movement of low skill workers from low-technology industries to the lower-wage tier of the non-tradable industries. An empirical assessment has shown that one part of the productivity gaps can be explained by differences in workers' human capital, and this part has grown over the years. This has occurred because, compared to high-productivity industries and the tradable sector, the human capital of workers in the non-tradable low-productivity sector has improved to a lesser degree, and returns on education have eroded.

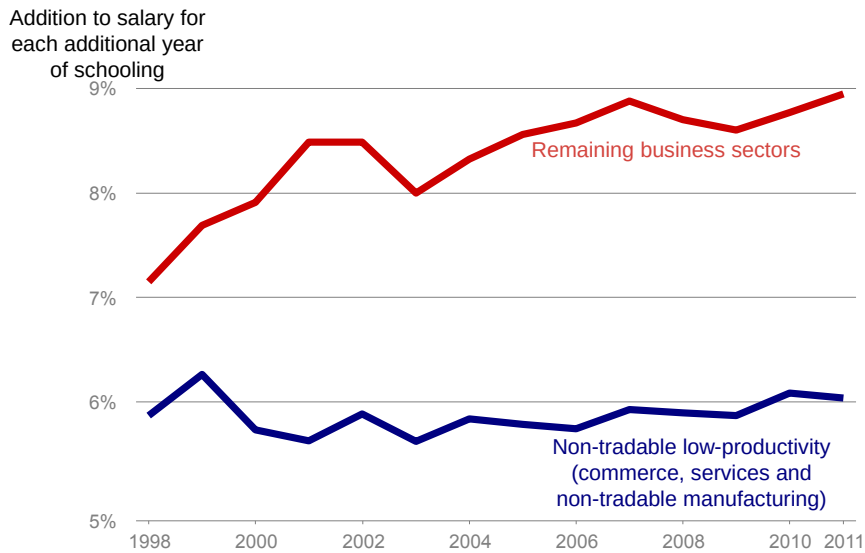
age individuals (ages 25-64) who work at least 10 hours a week. The equation is calculated for each year separately. The estimate of college wage premium does not take into consideration unexpected traits and so it is likely to be an overestimation. Nevertheless, Frish (2007) and Kriaf (2008) find that the causal relationship between education and wages that is found using an instrumental variable is not different from that found using OLS.

³² Brand (2014) shows that, in tradable industries, there is a co-integrative relationship (that indicates a causal relationship) between education and labor productivity, while in the non-tradable industries a correlation was not found between the variables. Evidence in this direction is also found in a study conducted by the Bank of Israel (2014). This is an indication of low college wage premiums in the non-tradable industries, when examined in GDP terms.

Figure 13

College wage premium, 1997-2011*

in non-tradable low-productivity sector relative to the remaining business sectors, in percent



* Two-year moving average

Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

5. Differences Between Price Increases in Various Sectors and Their Effects on the Productivity Gap

To this point, the developments of productivity and wages in the various industries were presented in real terms. This section will examine how productivity gaps developed in nominal terms. The basis for this comparison is rooted in the economic theory presented above which

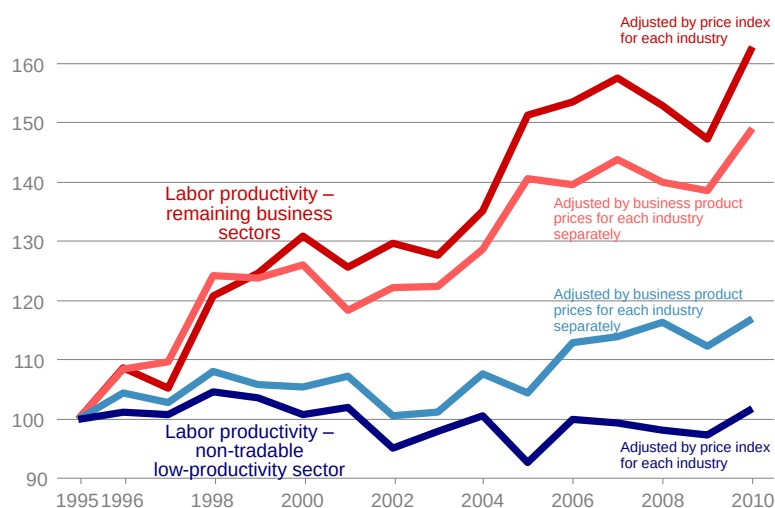
holds that increased productivity in one sector will bring about a transfer of workers to that sector and an increase in wages in all other industries as well (subject to certain assumptions). According to this scenario, because productivity in the other industries improves less, the result of long-term equilibrium would be increased prices, compensating for increased wages; the increased prices should lead to an increase in the value of marginal output for workers in these industries and, as a result, also increase productivity in nominal terms.³³

In addition, as noted in the introduction, labor productivity in the non-tradable industries is less affected by innovation and technological improvements compared with tradable industries, so that their growth potential in real terms is more limited. Therefore, it may be that the main influence on wages lies in indirect influence through real growth in tradable industries. With this in mind, it is interesting to examine whether the productivity gaps increased in nominal terms as well, irrespective of the different price trajectories in the various sectors.

Figure 14 presents the growth of labor productivity using the business sector GDP deflator for all industries, and for each industry separately using a separate deflator for each industry (deflating all industries by the same deflator yields a result that is equivalent to the nominal comparison). The figure includes non-tradable low-productivity industries relative to the rest of the business sector. As expected based on economic theory, prices rose unevenly. Nominal productivity gaps still widened but to a lesser degree than real productivity gaps.

³³ Baumol-Bowen (1966) describes the existence of this mechanism through an example from the field of the performing arts. This field is almost completely uninfluenced by technological developments, and so there is no expectation of a rise in their productivity. Nevertheless, the marginal output value of these workers rose over the years similar to the rise in wages in the overall labor market. The researchers explained this paradox by saying that an erosion of wages relative to the rest of the labor market causes a shortage of workers in the field and so a consequence of equilibrium causes a direct relationship between wages of workers in this field and the rest of the labor market.

Figure 14
Labor productivity development, 1995-2010
 non-tradable low-productivity sector relative to the remaining business sectors,
 Index: 1995=100



Source: Gilad Brand and Eitan Regev, Taub Center
 Data: Central Bureau of Statistics

6. Summary

Over the past two decades, two very different sectors have formed in the Israeli labor market. The first includes high-tech, finances and advanced industries, characterized by high-productivity and high wages, which increase rapidly as well. The other sector is the commerce and non-tradable service industries in which productivity is low, wages are low and growth is marginal.

The polarization in the labor market has developed against a backdrop of decreased employment rates and more rapid processes of reorganization and streamlining in those low-technology industries

exposed to imports. The study indicates that low-skilled workers previously employed in low-technology industries are now increasingly employed in occupations in the lower-wage tier of the service and commerce industries. In contrast, among skilled workers an opposite picture has emerged: increased movement to high-productivity industries, accompanied by higher wages. The regression analyses indicate that the deepening differences between workers' traits in the various sectors explain a growing part of the productivity gaps.

The study presents evidence of a decrease in worker mobility between different segments of the labor market and also shows that working in a high-productivity industry requires higher education than before – meaning that the probability that an individual with less education will move into an industry with high-productivity has decreased over time.

Examining the correlation between the different sectors' wage trajectories indicates a weakening over time, in particular between low-productivity and high-productivity industries. This situation, in which the wage trajectories of groups of industries grow apart, is made possible due to increasing differences in worker profiles and due to decreased mobility between different sectors. The evidence indicates that the divergence processes continued until the end of the first half of the 2000s, after which time a degree of stabilization was noted.

The findings presented in this chapter show that the industries left behind are non-tradable labor intensive services. Instead of using the increase in accumulated human capital in the economy and the technological advances that have taken place during this period, these industries have continued to rely on low-wage labor, among other things, due to decreased employment rates in the low-technology industries.

One possible course of action is to create vocational training programs to increase occupational mobility between sectors. In addition, policy makers should consider encouraging investment in innovation and research and development in low-technology industries – thereby encouraging diversification in the composition of exports. Policy measures in this direction will make it possible to create wage pressures in low-productivity industries and decrease gaps in the labor market.

Appendix

1. Wage Development in Different Sectors

In the third section of the chapter, evidence was presented of a weakening in the relationship between wages in different sectors and particularly between wages in the low-productivity industries and those in the high-productivity industries. In this section, this finding will be examined in more detail.

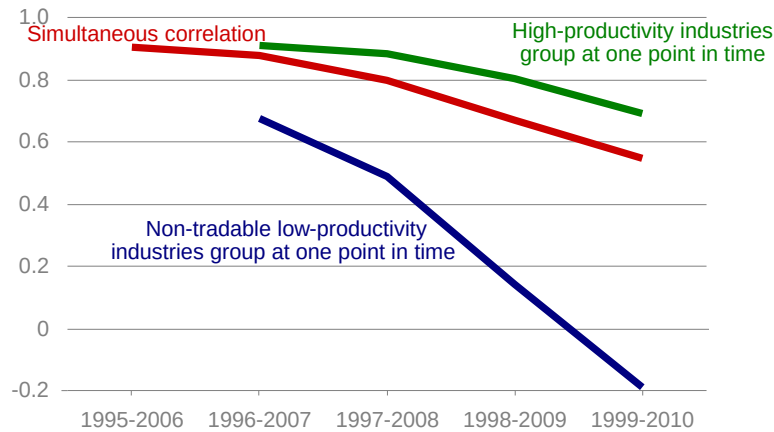
At the center of this study is the relationship between salaries in the non-tradable low-productivity industries and those in high-productivity industries. In order to compare between industries in which the salaries and worker traits are relatively the same, an additional comparison was performed between sectors without those industries where the salaries are low. The exclusion was done on the basis of the median wage in 2010: industries in which the average wage was lower than the median were excluded from this comparison.³⁴

Appendix Figure 1 presents the correlation coefficient between salaries in low-productivity industries included in the comparison and high-productivity industries (high-tech, finance and advanced technologies without tradable low-technology industries). As in the second section, here, too, the coefficients are presented in moving periods in three forms: a one-period lead or lag for each of the sectors and a simultaneous cross-correlation.

³⁴ Industries included in the comparison are: warehousing, parking lots and cargo terminals; post and courier services; motorized vehicles, motorcycles and bicycles, and trade of fuel; wholesale trade; other business activities; entertainment, culture and sports activities; paper and paper products; food products.

Appendix Figure 1
Pearson Product-Moment Correlation coefficient* of salaries,
1995-2010

in industries with high productivity** and
 non-tradable low-productivity industries***



* The comparison is presented for the correlation in the same period in the two groups (red line), as well as for productivity at given points in time for each group where one group leads (green and blue lines).

** Including high-tech, finance and advanced technologies

*** The comparison includes half of the industries included in the non-tradable low productivity group. Industries below the median wage level were not included in the comparison.

Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

The comparison shows the weakening of the relationship between the industries, and gives an indication that the high-productivity industries are more dominant in setting wages – that is, the non-tradable low-productivity industries may react to wage developments in the high-productivity industries and not vice versa.

To strengthen this indication, Granger-Causality tests were performed to examine the causal direction for all of the industries in the sample. These show that for workers with 15 years of schooling or more, wages are led by those in combined sectors in the non-tradable low-productivity sector and not vice versa. No evidence was found using the Granger Causality test of a causal relationship among workers with low education levels. Further research in this direction is required.

2. Changes in the Human Capital Mix in the Different Sectors

In order to shed light on the segmentation in the distribution of human capital in the various labor market sectors over the study period, this chapter used the Pearson χ^2 test that calculates the probability of differences in the distribution between two samples occurring randomly (under the null hypothesis that the two distributions are identical).³⁵ Using this test, the distribution of workers in five educational categories (represented by years of schooling – less than 12; 12; 13-14; 15-16; 17 or more) were examined to see if there is a difference between non-tradable low-productivity industries and high-productivity industries.³⁶

As expected, the result was positive. Of more interest, though, is the development over the study period. The sharp increase in the statistical value, presented in Appendix Figure 2, up until the second half of the previous decade means that the polarization became stronger over the period, along with a certain stabilization in the past few years.

³⁵ A random cut-off of observations was made so that the calculations for the number of observations were equal for each year.

³⁶ In this calculation, low-tech manufacturing industries were not included due to the rapid decline in the amount of employment in these industries.

Appendix Figure 2
**Pearson χ^2 * for the differences in the distribution of
human capital****

non-tradable low-productivity sector relative to the remaining
business sectors (without tradable low-tech industries),
1995-2011***



* For convenience, the coefficient is divided by 10.

** Excluding immigrants

*** Two-year moving average. A random cut-off of observations was performed so that the calculation has the same number of observations in each year.

Source: Gilad Brand and Eitan Regev, Taub Center

Data: Central Bureau of Statistics

3. *Division of the Business Sector*

Appendix Table 1. **Division of the business sector into groups according to tradability and productivity level**

(continued on next page)

Industry name*	Code
Tradable high-productivity industries	
Chemicals, chemical products, refined petroleum	23-24
Non-metallic mineral products	26
Machinery and equipment	29-30
Electric motors and electric distribution apparatus	31
Electronic components	32
Electronic communication equipment	33
Industrial equipment for control and supervision, medical and scientific	34
Transport equipment	35
Water and air transport	61-62
Auxiliary transport activities	63
Computer and related services, research and development	73-74
Non-tradable high-productivity industries	
Beverages (alcoholic and non-alcoholic) and tobacco products	16
Telecommunication	66
Banking and other financial institutions	67
Insurance and social insurance funds	68
Tradable low-productivity industries	
Textiles	17
Apparel (excluding knitted)	18
Footwear, leather and its products	19

Appendix Table 1. **Division of the business sector into groups according to tradability and productivity level**

(continued from previous page)

Industry name*	Code
Tradable low-productivity industries	
Wood and wood products (excluding furniture)	20
Plastic and rubber products	25
Basic metal	27
Metal products (excluding machinery and equipment)	28
Furniture	36
Not elsewhere specified	39
Non-tradable low-productivity industries	
Food products	14-15
Paper and paper products	21
Publishing and printing	22
Motor vehicles, motorcycles and bicycles, and trade of fuel	50
Wholesale trade (excluding motor vehicles and motorcycles)	51
Retail sale and repairs (excluding motor vehicles)	52-53
Hotels and guest houses	55
Restaurants and dining services	56
Land transport	60
Storage and parking lots	64
Post and courier activities	65
Labor recruitment and provision of personnel	74
Security and cleaning activities	75
Business activities not elsewhere classified	76
Recreational, cultural and sport services	94
Hairdressing and beauty salons	95

* According to the Central Bureau of Statistics Standard Industrial Classification 1993

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Causes of the Widening Productivity Gaps Between Israel and the OECD: A Multiyear Industry-Level Comparison

Eitan Regev and Gilad Brand*

Abstract

This chapter presents a novel detailed multiyear industry-level comparison of labor productivity growth in Israel and in 12 OECD countries (henceforth OECD12), and reveals the causes for the widening of productivity gaps from 1995 to 2009. The comparison shows that five large industries are responsible for 81 percent of the total widening of the productivity gap. These industries provide products and services mainly to the local market and are mostly dependent on the local business environment. A comparison of industry-level productivity growth rates in Israel and in the OECD12 over time reveals that the most significant factor affecting the ability of the different industries to reduce productivity gaps with the OECD12 is the degree of the industry's exposure to competitive imports. Differences in the average number of work hours per worker can explain at most half of the gap in productivity per work hour, and cannot explain the widening of this gap over the last two decades. Nor can differences in industry composition explain the widening of the gap; in fact, they narrow it, mainly due to the fact that the relative share of the high-tech and finance sectors in Israel is larger than the average in the OECD12. The study findings point to the non-tradable service industries as the main contributors to the widening of the productivity gap relative to the OECD. This is perhaps indicative of defects and obstacles to competition in the local business environment such as excessive centralization and structural and regulatory barriers.

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Introduction

“Productivity isn’t everything, but in the long run it is almost everything. A country’s ability to improve its standard of living over time depends almost entirely on its ability to raise its output per worker” (Krugman, 1994).

Labor productivity reflects the economy’s manufacturing capacity given the inputs at its disposal. Productivity is commonly measured both per work hour (labor productivity) and per worker (output per worker). Labor productivity is defined as the ratio between GDP and total hours worked, and output per worker is defined as the ratio between GDP and the total number of workers in the economy. Productivity levels depend, among other things, on the level of efficiency of the work force and on the scope of investment in productive capital (such as machines, infrastructures and technological improvements). The higher the country’s productivity, the higher the per capita income, and the faster the productivity growth is, the faster the rise in the standard of living.

Compared to most OECD countries productivity in Israel is low. Mainstream economic theory predicts that in the long run there should be a conditional convergence, i.e., a narrowing of productivity gaps between similar countries (subject to certain assumptions). However, in Israel’s case, there appears to be no convergence, but rather a widening of the productivity gaps with the OECD countries (Bank of Israel, 2013). This means that the growth of per capita income in Israel has been substantially lower than it could have been had labor productivity grown at a similar pace to that in the OECD.

Dr. Dmitri Romanov for his guidance and assistance in developing the study, Hadas Fuchs for her help with the data collection, and Daniel Roash and Yair Ben Netanel from the Central Bureau of Statistics for their helpful insights and for providing vital data.

This phenomenon might indicate structural defects in the Israeli business environment and labor market, and in recent years has been a cause of concern for decision makers involved in shaping Israel's economic policy. Various studies have attempted to get to the bottom of the problem and identify the root causes of the widening of the productivity gaps. Sarel (2013) analyzes the composition of industries (on the aggregate industry level) in Israel and in the OECD for 2008, and finds that the weight of the financial sector and social services in Israel is large relative to OECD countries, whereas the weight of manufacturing and commerce is relatively small. However, the analysis in this study is not detailed enough to accurately identify the problematic industries. The Bank of Israel (2014) presents a more detailed comparison of the productivity ratio between Israel and OECD countries in 23 industries, and shows that there is a correlation between the rate of exports from the Israeli industry's output and the ratio of productivity relative to the OECD; in industries with a high rate of exports the productivity level is closer to that of the OECD. Furthermore, the same study shows that there is no correlation between the level of competitive imports out of the industry's total supply and the productivity gap between Israel and the OECD in that industry. This comparison, which was conducted for 2007, did not examine the changes in productivity gaps over time, and thus the correlation found between productivity gaps and exports does not necessarily indicate causality or the direction of development of the gaps. Conversely, the Bank of Israel report for 2012 presents a comparison of productivity growth rates from 1996 to 2007 in Israel and in the OECD in six aggregate industries: agriculture, manufacturing, electricity and water, construction, commerce and hospitality services, and business and financial services. This comparison shows that only in agriculture, electricity and water were productivity growth rates in Israel higher than in the OECD, while in the other four industries productivity growth in the OECD was quicker. Due to low industry resolution, though, this comparison is not informative enough to identify the root of the problem of low productivity.

Unlike the studies cited above, this chapter presents a detailed multiyear comparison of productivity growth trends in the various industries in Israel and in 12 OECD countries for which consistent and reliable annual data were available. For this purpose a rich and comprehensive database was created, including productivity data for all industries in Israel and the OECD (at a detail level of two-digits in the international classification of industries), in fixed and current prices, over a period of 14-15 years (1995-2010 for Israel and 1995-2009 for the OECD). For consistency of the comparison, the Israeli industry classification system was adjusted to the industry classification used by the OECD countries.¹ In addition to the productivity data, the final database includes data about the number of workers in each industry, the number of hours worked, and the industry's added value in constant and current prices. Based on these data, value added per worker in each industry and the relative share of each industry in total GDP, hours worked and employment were also calculated.²

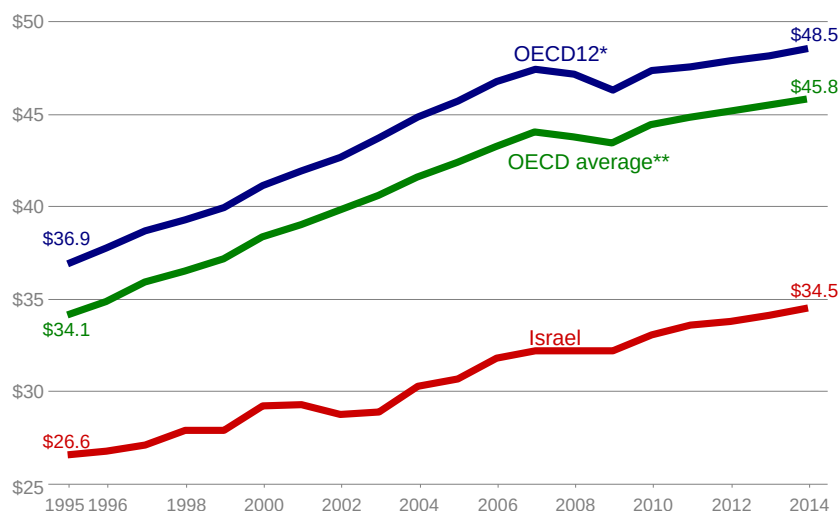
The 12 OECD countries for which data were collected for the years 1995 to 2009 are Austria, Canada, Czech Republic, Denmark, Finland, Greece, Hungary, Netherlands, Norway, Slovakia, Spain, and Sweden (henceforth: the OECD12). As can be seen in Figure 1, the average productivity level in these 12 countries is slightly higher than the average for all OECD countries (excluding Israel), but productivity growth trends in the OECD12 were very similar to average growth trends when accounting for all OECD countries together, and the widening of the productivity gap between Israel and each one of those two groups in the comparison period (1995-2009) was almost identical (about \$4 per work

¹ Despite the basic similarity, there are several significant differences between the Israeli and OECD definitions and thus adjustments were necessary (merging sub-industries) in order to create a common database with uniform definitions.

² The relative share of each industry in GDP, employment and hours worked in the OECD12 countries was calculated as a simple average of the relevant relative share in each country.

hour). Therefore, an examination of the widening of productivity gaps between Israel and these 12 countries provides a good proxy for the widening of productivity gaps between Israel and all OECD countries.

Figure 1
Productivity per work hour, 1995-2014
 2010 PPP and prices



* Austria, Canada, Czech Republic, Denmark, Finland, Greece, Holland, Hungary, Norway, Slovakia, Spain, Sweden

** Excluding Israel

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD

The analysis examines the widening of productivity gaps in the business sector in order to focus the discussion and address the problems directly related to the market structure and the business environment, and to exclude from the analysis gaps that arise from differences in the size and composition of the public sector in different countries. Therefore, the analysis of the causes for the widening of the productivity gaps on the

aggregate level will include only business sector industries; analyses of the growth of productivity gaps on the individual industry level, though, will also include other industries that, by definition, are not part of the business sector. In this context it is important to note that, in the comparison period, the widening of productivity gaps in the business sector (compared to the OECD12 countries) was almost identical to the widening of the productivity gaps in the entire economy, and therefore focusing solely on the business sector does not impair the analysis's explanatory value.

1. Sources of the Productivity Gaps

***Do the Productivity Gaps Stem from Differences in Industry Composition?*³**

When analyzing the causes of the productivity gap and its development over time, it is important to remember that the gap may arise from two main factors: productivity gaps on the industry level and differences in industry composition (i.e., the relative size of each industry in Israel and in the OECD12). These factors can also explain the change over time in

³ In the analysis of the business sector the following industries were excluded: housing services (an industry customarily excluded from the business sector), agriculture and construction (due to the high level of foreign employment in these industries), and mining and quarrying (where productivity depends to a large extent on the country's natural resources). The exclusion of the mining and quarrying industry from the business sector reduces the estimated productivity gap between Israel and the OECD12 because some of the comparison countries (especially Norway, Denmark and Netherlands) are endowed with significant natural resources (oil and gas from the North Sea), and therefore productivity levels in that industry were considerably higher than in Israel. The new natural gas discoveries in Israel are barely reflected in the data of the comparison period (ending in 2009), but since then there has been a substantial rise in the added value of the quarrying and mining industry in Israel.

the total productivity gap. The average level of productivity in the economy rises when there is a rise in the relative share of a high-productivity industry, as well as when there is a rise in productivity within a particular industry. Such changes occur simultaneously in all countries, therefore the change in the gap over time is a result of the different growth rates of productivity in each industry in the different countries and the changes in the industry composition of each country.

Understanding the relative significance of each of these two effects is key to understanding the fundamental reasons that labor productivity in Israel is low relative to the OECD and falling further behind.

Oaxaca (1973) presents a methodology that enables the decomposition of the productivity gap into the two basic components presented above: the gap arising from differences in industry composition (in Israel compared to the OECD12), and the gap arising from intra-industry productivity differences. The first component in Oaxaca's method shows the (hypothetical) size of the productivity gap had productivity levels in each Israeli industry been identical to productivity levels in the parallel industries in the OECD12, and the only difference (causing gaps) is the industry composition. The second component represents the (hypothetical) size of the gap had industry composition in Israel and the OECD12 been identical, so that the gap stems only from productivity differences on the industry level.

Figure 2 presents the productivity gap in the business sector between Israel and the OECD12 from 1995 to 2009 according to Oaxaca's decomposition (1973). As can be seen, differences in industry composition between Israel and the OECD12 do not contribute to the productivity gap; in fact, they even slightly reduce it.⁴ In 1995, these differences reduced the total productivity gap by \$0.83 and in 2009 by \$1.12. As seen, throughout the entire comparison period, differences in

⁴ Geva (2015) analyzes sectorial composition in Israel and the OECD and reaches similar conclusions: "If the industrial structure in Israel were identical to the average industrial structure in the OECD without changing sectorial efficiency, output per worker in Israel would drop by 5.2 percent" (p. 9).

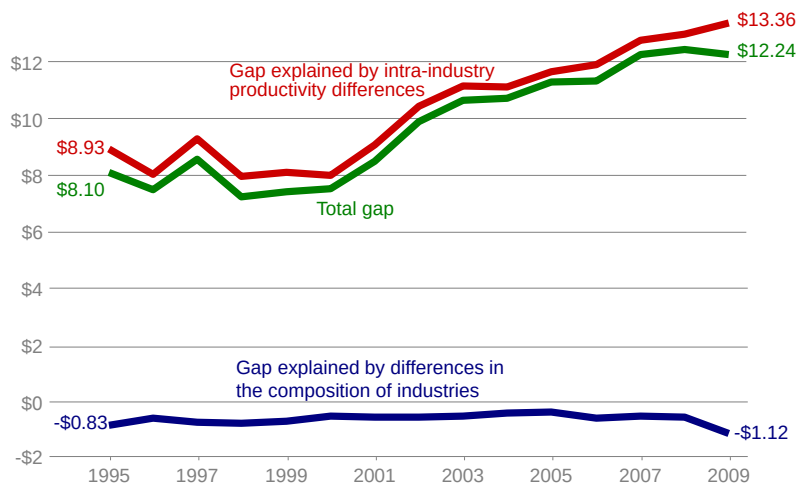
industry composition had a negative contribution to the productivity gap. This stems primarily from the fact that Israel has a very developed high-tech sector that has demonstrated significant growth in recent decades. Between 1995 and 2010, the number of Israelis employed in computing services and research and development grew by 354 percent, whereas the total work force in Israel during that period grew by only 44 percent.

It is evident that the widening of the productivity gaps, that began in 2000, stemmed from the widening of intra-industry productivity gaps. That is, productivity growth in many industries in Israel was slower than productivity growth in the parallel industries in the OECD12.

Figure 2

Contribution of composition differences to productivity gaps*

productivity gaps in the business sector,** in 2009 PPP dollars and prices, 1995-2009



* Decomposition of productivity gap using the Oaxaca method (1973)

** Excluding the following industries: electricity and water, housing services, construction, mining and quarrying, and agriculture

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD

The Impact of Differences in the Number of Work Hours on the Productivity Gaps

A common claim raised in the context of the productivity gap between Israel and the OECD is that most of it results from the high number of hours worked by Israeli workers. The Bank of Israel (2013) shows that the average number of work hours per worker in Israel (37.1 weekly hours) is indeed high relative to the OECD average (33.6 weekly hours). When the relationship between the number of work hours per employee and the level of productivity per work hour in OECD countries is examined, a high negative correlation is found (0.85). This finding is consistent with the assumption that a worker's marginal productivity drops as the number of work hours rises.

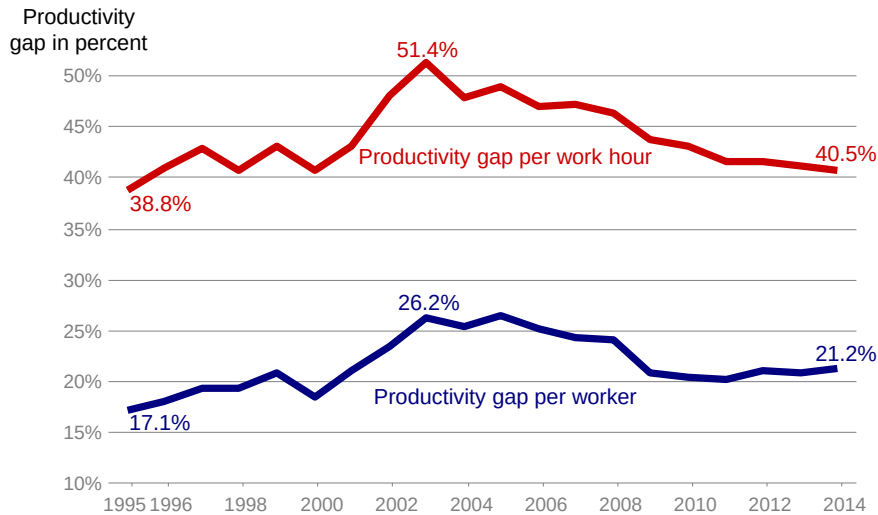
Indeed, as can be seen in Figure 3, the output per worker gap between Israel and the OECD12 is much lower than the labor productivity gap. In 1995, the labor productivity gap was 38.8 percent, but the output per worker gap was only 17.1 percent. However, differences in work hours do not explain the growth of that gap in the last two decades. Between 1995 and 2014, the output per worker gap grew by 4.1 percent, whereas the labor productivity gap grew by only 1.7 percent.

These differences are the result of a sharper reduction in the average number of work hours per worker in Israel during this period than in the OECD12. While the average number of work hours per worker in Israel is still considerably higher than in the OECD, the gap has narrowed slightly in the last decades. In 1995, differences in the average number of work hours per worker could explain 55.8 percent of the productivity gap per work hour at most,⁵ but by 2014 that figure dropped to only 47.7 percent – i.e., differences in the number of hours per worker can explain an increasingly smaller share of the productivity gaps (see Appendix Figure 1).⁶

⁵ In the extreme scenario where the increase in work hours does not increase output per worker at all.

⁶ When examining the productivity ratio between Israel and the OECD by industry, one finds that in all industries, without exception, the output per

Figure 3
Productivity gaps between OECD12 and Israel,* 1995-2014
 productivity gap per worker and per work hour



* In 2010 PPP dollars and prices

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD

It is important to note that, since 2004, the productivity gap actually narrowed (in percentage points), but, as can be seen in Figure 2 above, the gap in dollars per work hour continued to grow until 2008.⁷ With the

worker ratio is higher than the labor productivity ratio (Appendix Figure 2), i.e., in each and every industry, Israel's relative position looks better when output per worker is examined (rather than labor productivity). However, in some industries the difference is significant and in others it is not.

⁷ Such a situation is possible because productivity in Israel is lower than in the OECD12, and, therefore, when productivity per work hour grows by one dollar in both simultaneously, the gap in percentages shrinks – but the dollar gap per work hour remains unchanged.

advent of the subprime crisis, a reduction of the gap in dollars per work hour was also recorded, thanks to Israel's relative immunity to the effects of the crisis and the global recession. However, it appears that in recent years there has been a return to the trend of widening productivity gaps per worker. In labor productivity, the reduction of the number of work hours per worker in Israel contributed to a narrowing of the gap in recent years, but this does not indicate a structural change that will enable a continued narrowing of the gap over time.

2. Productivity Gaps Between Israel and the OECD12 in Four Distinct Industry Groups: An Overview

Before presenting an analysis of the productivity gaps on the individual industry level, a better understanding of the big picture and the main forces that contributed to the expansion of the productivity gap with the OECD12 in the comparison period is instructive.⁸ To this end, the business sector industries were divided into four relatively homogeneous groups, each characterized by a different level of technological intensity. The division of the business sector industries into these groups simplifies the understanding of their different characteristics and allows for a more intuitive analysis of the development of the productivity gap. The four groups are as follows:

Non-tradable low-productivity industries. Services and trade industries (excluding high-tech services) and low-technology and medium-low-technology non-tradable manufacturing industries.

Tradable low-productivity industries. Tradable industries with low-technology or medium-low-technology.

⁸ Appendix Table 2 presents the list of industries that were included in each group.

Non-tradable high-productivity industries. Telecommunications and finance.

Tradable high-productivity industries. High-tech, advanced manufacturing industries, air and water shipping industries, and supporting and auxiliary transport activities.⁹

In Israel, the group of industries with the highest average productivity is the non-tradable high-productivity services, namely the telecommunication and finance industries (Figure 4A). The average productivity in that group in 1995 was \$43, and, in 2009, it was \$50.9 (a rise of \$8 or 18.4 percent). However, when examining the productivity growth rate in the different groups, it is evident that it was faster in the high-productivity tradable industries (the high-tech industries). The average productivity level in that group rose from \$26.5 in 1995 to \$39.9 in 2009 (a rise of \$13.4, or 50.6 percent).

In the two groups characterized by high productivity there was a rise in productivity during the comparison period, while in the two typically low-productivity groups, productivity levels hardly changed – in fact, they dropped slightly.

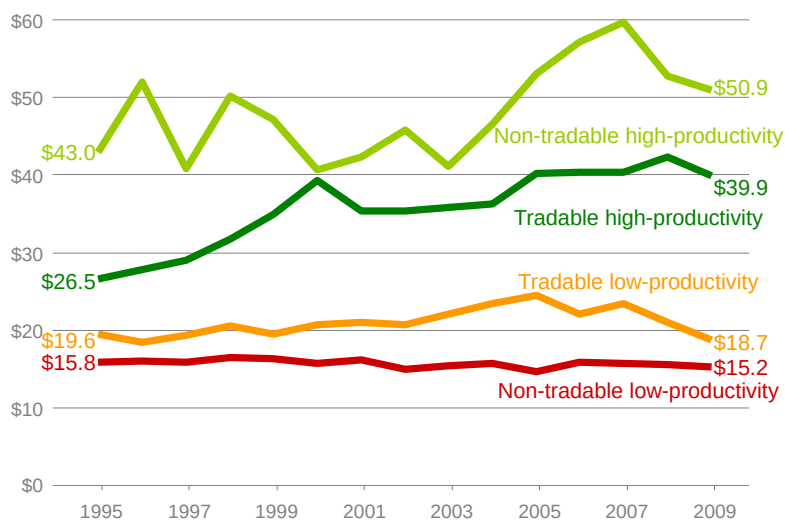
In the OECD12, there was substantially higher growth in the average productivity level of the finance and telecommunications industries from \$43.5 to \$75.6 – and a large gap opened between them and Israel in that field (Figure 4B). In contrast, in the high-tech industries, the productivity growth rate in the OECD12 was slower than in Israel, and the gaps narrowed. It is important to note that even though labor productivity in the high-tech industries in Israel is still slightly lower than in the OECD12, output per worker in that group is 13 percent higher than in the OECD12.

⁹ Supporting and auxiliary transport activities include, for instance, airport services, shipping, and airline agencies.

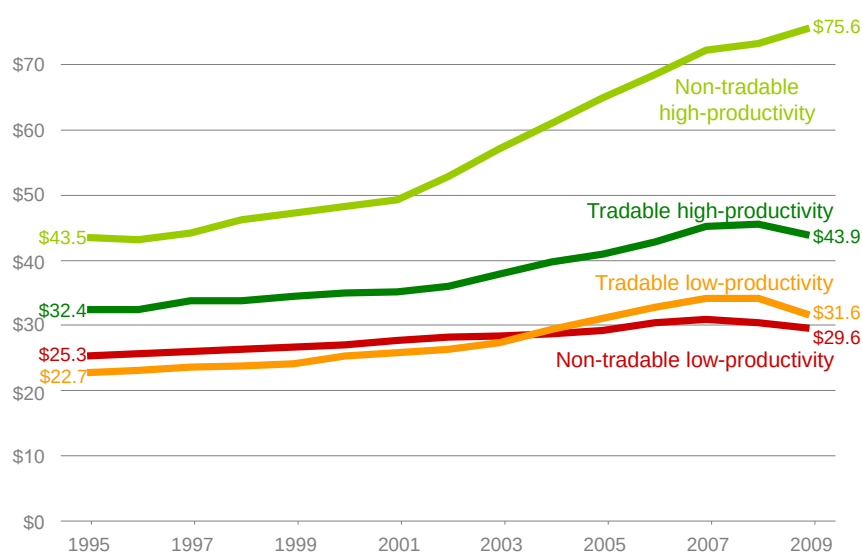
Figure 4A and 4B

A. Labor productivity in Israel, 1995-2009

by tradability and productivity level, in 2009 PPP dollars and prices

**B. Labor productivity in OECD12, 1995-2009**

by tradability and productivity level, in 2009 PPP dollars and prices



Source for both: Eitan Regev and Gilad Brand, Taub Center

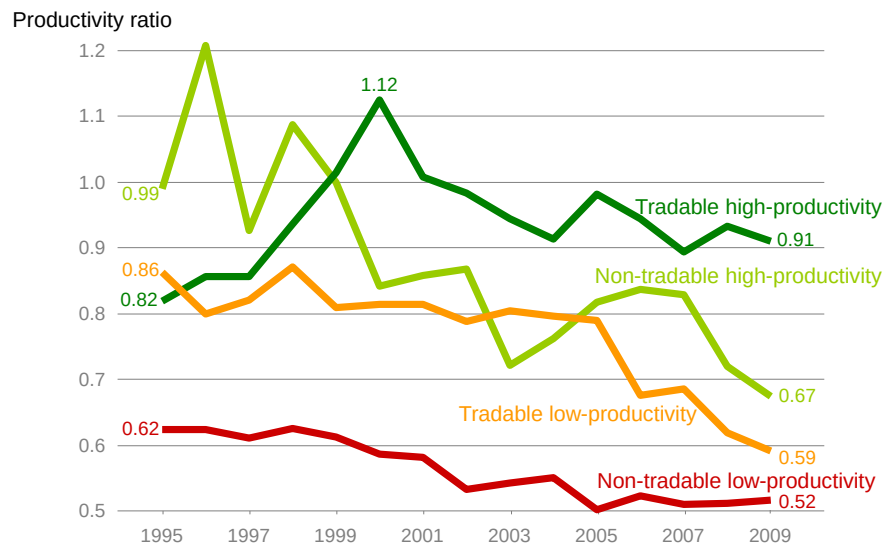
Data for both: OECD; Central Bureau of Statistics

An examination of the changes that occurred over the years in the ratio between labor productivity in each group of industries in Israel and its OECD12 counterpart (henceforth: the productivity ratio) shows that only in the high-tech industries was there an improvement in Israel's relative position. In the other three groups there was a widening of productivity gaps (Figure 5). As noted, the most significant widening of gaps occurred in the category of non-tradable high-productivity industries (telecommunications and finance). The productivity level in that group in Israel in 1995 was similar to that of the OECD12, but by 2009 it dropped (in relative terms) to about two-thirds of the OECD12 level. In the tradable low-technology industries (orange line) there was also a significant worsening of Israel's relative standing – a difference of 28 percentage points between the beginning of the period and its end.

Figure 5

Israel/OECD12 productivity ratio per work hour, 1995-2009

by tradability and productivity level, in 2009 PPP dollars and prices



Source: Eitan Regev and Gilad Brand, Taub Center

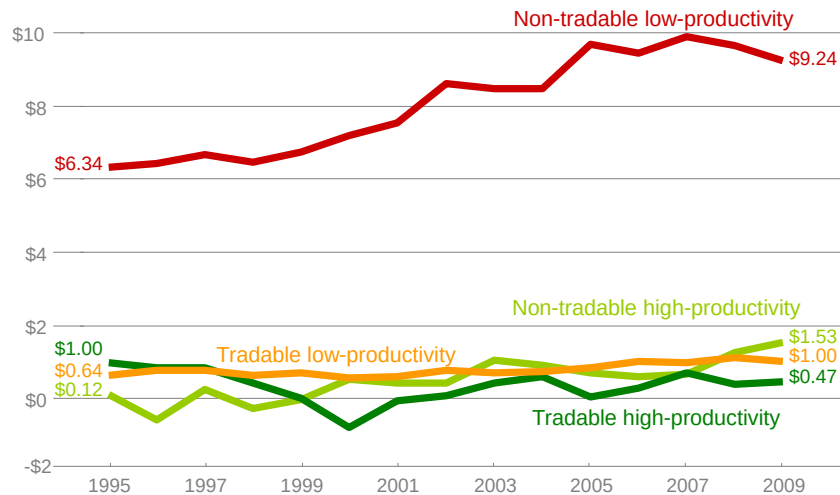
Data: OECD; Central Bureau of Statistics

When the output per worker ratio between Israel and the OECD12 in the different categories is examined (Appendix Figure 3), Israel's situation looks slightly better – especially in the high-tech industries, where output per worker in Israel rose from 95 percent of the OECD12 level in 1995 to 113 percent in 2009. However, in the three other groups the gaps widened even in output per worker, which is substantially lower than in the OECD12.¹⁰

Figure 6 shows the contribution of each of the four groups to the total labor productivity gap between 1995 and 2009. The contribution of non-tradable low-productivity services (the red line) to the productivity gap is the biggest (\$9.24 in 2009). This result is not surprising since it is the largest group in the economy (in terms of work hours), and accounts for more than two-thirds of total work hours in the business sector in Israel and the OECD12.

¹⁰ Brand and Regev (2015) study the causes for the variance in productivity growth rates in the different groups and find, inter alia, that the deepening differences in worker characteristics and education allowed productivity and wages to develop differently for each group.

Figure 6
Industry group's contribution to productivity gaps, 1995-2009
 by tradability and productivity level, in 2009 PPP dollars and prices



Source: Eitan Regev and Gilad Brand, Taub Center
 Data: OECD; Central Bureau of Statistics

Intertemporal Changes in the Output per Worker Gap and the Relative Size of the Groups¹¹

Figure 7 presents the changes in the productivity ratio between Israel and the OECD12 and in the relative size of the four groups discussed above between 1995 and 2008. This combination produces the core of the explanation for the growth of productivity gaps between Israel and the OECD12 during the comparison period. The X axis shows the change in

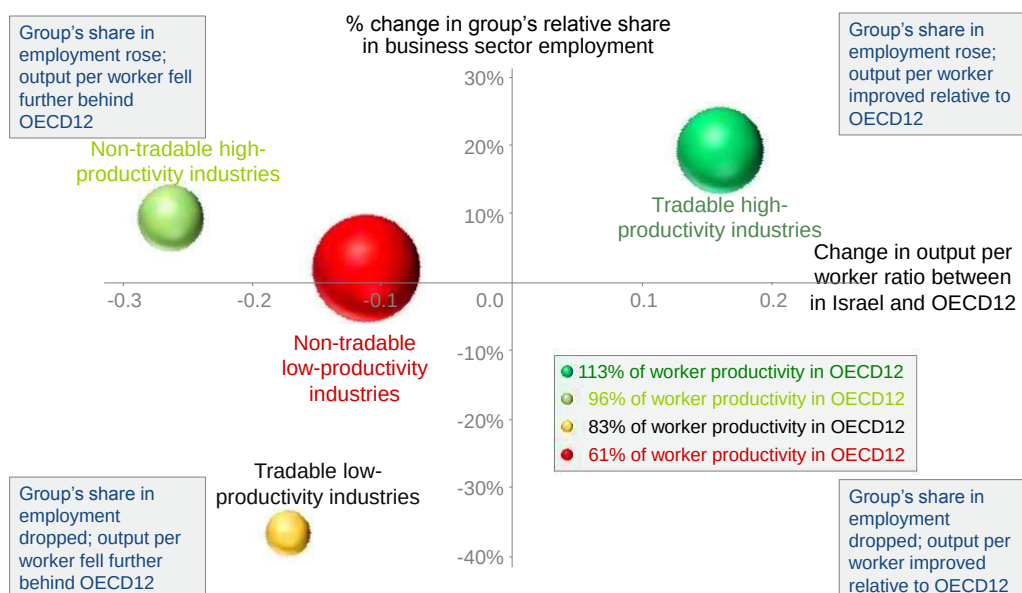
¹¹ For a graphic illustration of these trends on the micro-level (changes over time in the industry productivity gap and the relative size of the industries), see Appendix Figure 4 and the accompanying text.

the productivity ratio between Israel and the OECD12 (in percentage points) and the Y axis shows the change in the group's relative share of work hours in the business sector in Israel (in percentages). The sizes of the bubbles signify the relative share of the groups in value added, and their colors signify the productivity ratio in the different groups compared to the OECD12 at the end of the comparison period.

Figure 7

**Change in category's share in Israeli business sector employment
and in Israel/OECD12 output per worker ratio***

by tradability and productivity level,
between base period (1995-1997) and end period (2006-2008)**



* In 2009 PPP prices

** Bubble size represents group's share in GDP; bubble color represents Israel's productivity level per worker relative to the OECD

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

As can be seen, in the group of non-tradable low-productivity industries (in red), there was a decline of 13 percentage points in output per worker in Israel compared to the OECD12. This had a significant impact on the total productivity gap in that period because, as noted, this group constitutes more than two-thirds of the total work force in the business sector. Although there was no significant growth in the relative size of this group throughout the comparison period, its productivity level was already low relative to the OECD12 in the base period, and this situation worsened over the years.

The group for which there was the biggest decline in the productivity ratio, compared to the OECD12, is the telecommunications and finance industries (in light green). In the base period, output per worker in that group was higher than in the OECD12, but since then there was a deterioration of 28 percentage points in the productivity ratio; the group's contribution to the widening of the productivity gap was disproportionate to its share in total employment. At the same time, there was a 10 percent increase in this group's relative share of total work hours in the business sector in Israel, leading to a widening of the total productivity gap.

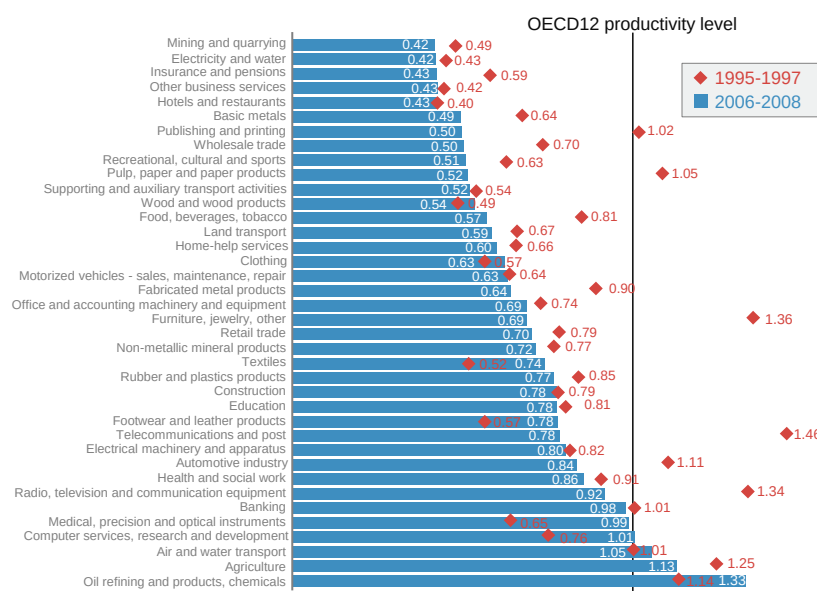
In the tradable low-technology industries as well (in orange) there was a significant decline of 19 percentage points in the output per worker ratio between Israel and the OECD12 during the comparison period, but this group's contribution to the widening of the productivity gap was relatively small because of the sharp drop in its share in total employment in Israel.

The only group that marked an improvement is the group of high-tech industries (in dark green). Its relative position improved by 18 percentage points over the comparison period, and output per worker rose to 113 percent of the OECD12 level. This group's relative share in employment also grew by 20 percent, and all of those factors contributed to narrowing the output per worker gap between Israel and the OECD12 (or to at least mitigated the widening of the gap).

3. Industry Productivity Gaps Between Israel and the OECD12: A Detailed Analysis

Taking a closer look at the industry level (Figure 8), it is evident that, in most industries, the productivity in Israel is lower than in the OECD12 (the ratio is below 1) both in the initial base period (1995-1997) and at its end (2006-2008). Furthermore, in most industries, Israel's relative position was better at the beginning of the period than at its end.

Figure 8
Israel/OECD12 productivity ratio
ratio of productivity per work hour,* by industry,
average for 1995-1997 and 2006-2008



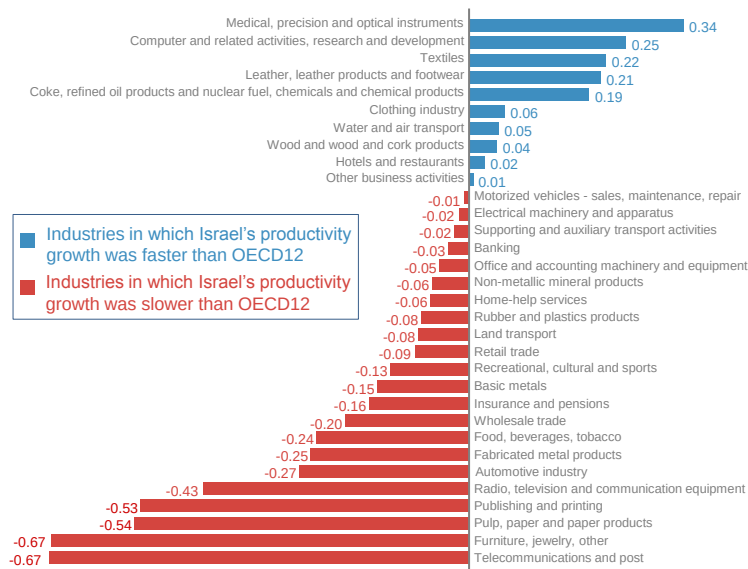
* In 2009 PPP dollars and prices

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

In only five industries was a significant improvement noted in comparison with the base period (Figure 9). Three of those are major and important industries: chemicals and refined petroleum; medical, precision, and optical instruments (high-tech industry); and computer services, research and development. The other two industries (textiles and footwear and leather products), are very small (in Israel) and their impact on the total productivity level is marginal.

Figure 9
**Change in Israel/OECD12 productivity ratio
 between 1995-1997 and 2006-2008***
 by industry**



* In 2009 PPP dollars and prices

** Excluding the following industries: electricity and water, housing services, construction, mining and quarrying, and agriculture

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

On the other hand, in five industries, a significant deterioration occurred in the productivity ratio between Israel and the OECD12 between the base period and the end period: telecommunications and post services,¹² paper, publishing and printing; radio, television and communication equipment (high-tech industry), and the furniture, and jewelry industries (that were grouped in order to match the OECD industry classification). The telecommunications industry is a relatively large industry (in terms of value added) and is characterized by high productivity, and, therefore, the widening of the productivity gap in this industry contributed significantly to the growth in the total productivity gap between Israel and the OECD12 over the comparison period.

Industry Contribution to the Productivity Gaps

In order to understand the contribution of each industry to the total productivity gap¹³ and identify the industries with the biggest contribution to the gap, we must take into account several factors: the size of the gap in each industry in monetary terms, the relative size of each industry in Israel and in the OECD12 (in terms of work hours), and the differences in industry composition (see Appendix Section 2 for details of the computational method).¹⁴

¹² In the OECD classification, the telecommunications and post industries are counted as a single industry so, for the sake of consistency in the comparison, the data were combined for Israel as well. The dominant of the two is the communications industry, whose added value is 20 times higher than the added value of the post services industry and whose employment is seven times higher.

¹³ In US dollars expressed in 2009 purchasing power parity (PPP) and in 2009 prices.

¹⁴ Oaxaca's methodology (1973) examines the impact of differences in industry composition on the productivity gap on the aggregate level, but does not examine the share of each industry in the total productivity gap.

As seen in Figure 10, the “other business services” industry¹⁵ contributed the most to the productivity gap, both in the base period (\$2.46 out of a gap of \$8.05, which accounts for 30.6 percent)¹⁶ and in the final period (\$3.32 out of \$12.00 in all of the industries together – 27.7 percent). Other industries that have a significant share in the total productivity gap (in the final period) are wholesale trade (16.3 percent), hotels and restaurants (9 percent), retail trade (5.8 percent), food and tobacco (5.4 percent)¹⁷ and land transport (5.4 percent).

Industry Contribution to the Widening of the Productivity Gaps

In order to determine the share of each industry in the widening of the total productivity gap in the comparison period, the contribution of each industry to the gap in the base period (1995-1997) must be compared to its contribution to the gap in the end period (2006-2008). As shown in Figures 10 and 11, the wholesale trade industry had the most significant contribution to the widening of the productivity gap between Israel and the OECD12.

¹⁵ A detailed explanation regarding the “other business services” industry appears at the end of the chapter, pp. 262-265.

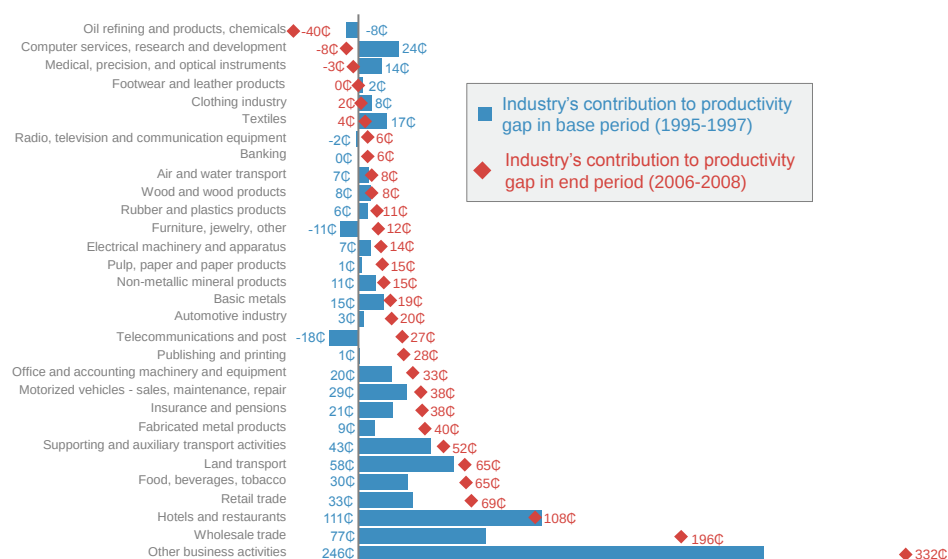
¹⁶ The productivity gap calculated for the business sector industries included in the comparison was a little lower than the productivity gap in the total industries in the economy. This outcome results largely from the exclusion of the quarrying and mining industry, where there is a major productivity gap between Israel and the OECD12, and its relative share in the product and employment in the OECD12 is significantly larger than in Israel (see also footnote 4). It is important to note that the widening of the gap was similar in the business sector and in the entire economy (about \$4 per work hour).

¹⁷ In the Israeli classification, the alcoholic beverage industry is included in the food industry, whereas in the OECD classification, it is part of the tobacco industry. For consistency in the comparison, the food and tobacco industries were combined, both in Israel and in the OECD.

Figure 10

Each industry's contribution to the productivity gaps

business sector industries,* base period (1995-1997) and end period (2006-2008),
in US cents, in 2009 PPP dollars and prices



* Excluding the following industries: electricity and water, housing services, construction, mining and quarrying, and agriculture

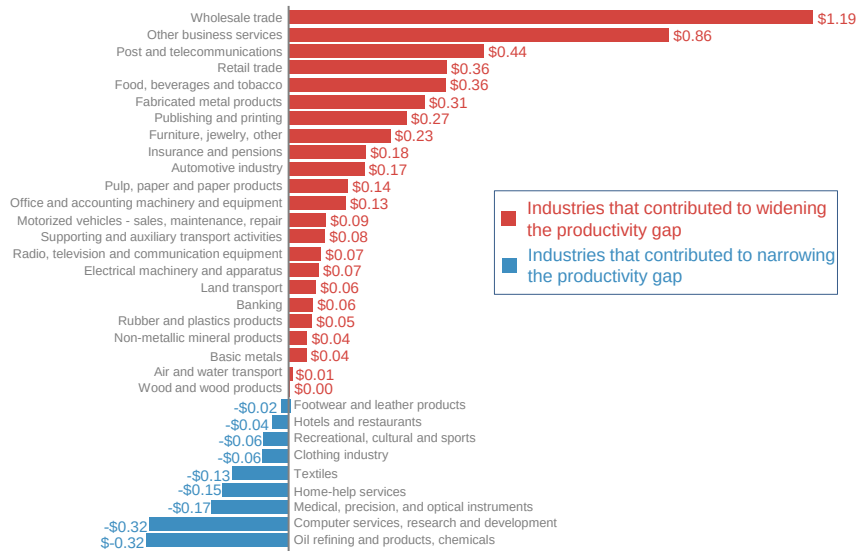
Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

During the base period, this industry contributed to the total gap of \$0.77 per work hour, in 2009 PPP and prices, while in the end period the industry contributed \$1.96 per work hour to the gap. In other words, the wholesale trade industry contributed \$1.19 to the widening productivity gaps between Israel and the OECD12, which is 30 percent of the total growth of the productivity gap (\$3.96) over the comparison period.¹⁸

¹⁸ It is important to remember that the figure regarding the total growth of the productivity gap between Israel and the OECD12 (\$3.96) includes industries

Figure 11
The contribution of each industry to the productivity gap's growth
 between the base period (1995-1997) and the end period (2006-2008),
 in 2009 PPP dollars and prices



Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

Other industries that contributed substantially to the widening of the productivity gap are: other business services (21.7 percent), telecommunications and post (11.1 percent), retail trade (9.1 percent),

in which Israel narrowed gaps, as seen in Figure 11. When taking into account only at the industries that contributed to the widening of the gaps (and ignoring industries in which the gaps were narrowed) the contribution of the wholesale trade industry to the widening of the gap is smaller (in percentages), because the aggregate contribution of those industries to the widening of the gap is larger than \$3.96.

food and tobacco (9.1 percent), fabricated metal products (7.1 percent), and publishing and printing (6.8 percent).

In contrast, there are industries in which Israel's position improved relative to the OECD12 and which contributed to narrowing the gap. The most prominent ones are the computing services and research and development; and oil refining and chemicals. Each one of these industries reduced the gap by 8.1 percent.

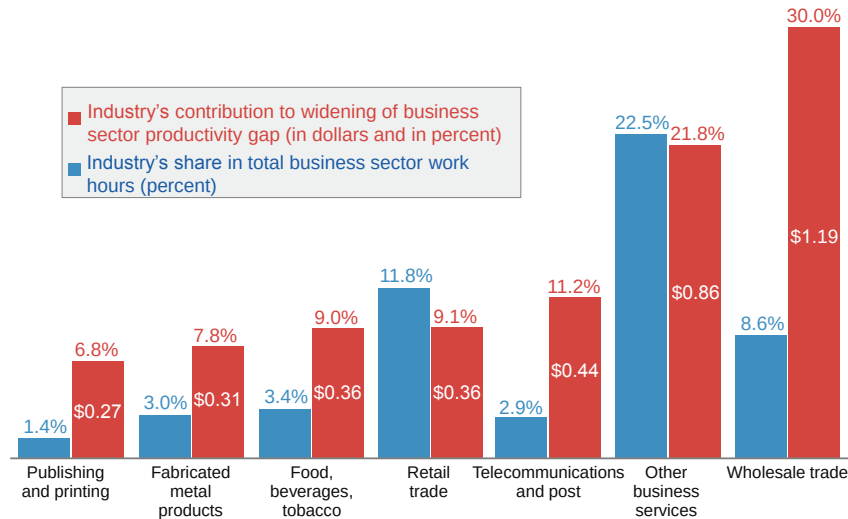
Industry Contribution to the Widening of the Gaps and Industry Size

In order to identify the industries in which the widening of the productivity gaps were especially problematic, one must compare the relative share of the industry in total employment with its relative contribution to the widening of the gap. In general, industries whose contribution to the widening of the gap is large relative to their share in employment in the business sector are more problematic than industries whose contribution was proportionate to their size.

Figure 12 presents the relative shares in employment and in the widening of the productivity gap for seven industries (which together account for 95.7 percent of the widening of the gap in the business sector). It is easy to see that the wholesale trade industry stands out for its disproportionately large contribution to the widening of the productivity gap – 30 percent – while its share in business sector work hours is only 8.6 percent. Thus, the contribution of this industry to the widening of the productivity gap is 3.5 times larger than its relative share in employment. The contribution of telecommunications and post, food and tobacco, fabricated metal products, and publishing and printing industries was also disproportionate relative to their share of employment. On the other hand, the contribution of the other business services industry to the widening of the productivity gap was indeed large (21.8 percent) yet proportionate to its size.

Figure 12

**Industry contribution to the widening productivity gap*
(between 1995-1997 and 2006-2008)
and the industry's share in work hours (2008)**
business sector*****



* In 2009 PPP dollars and prices

** The figure presents those industries with the most substantial contribution to the gap and as a result the columns do not sum to 100 percent

*** Excluding the following industries: electricity and water, housing services, construction, mining and quarrying, and agriculture

Source: Eitan Regev and Gilad Brand, Taub Center

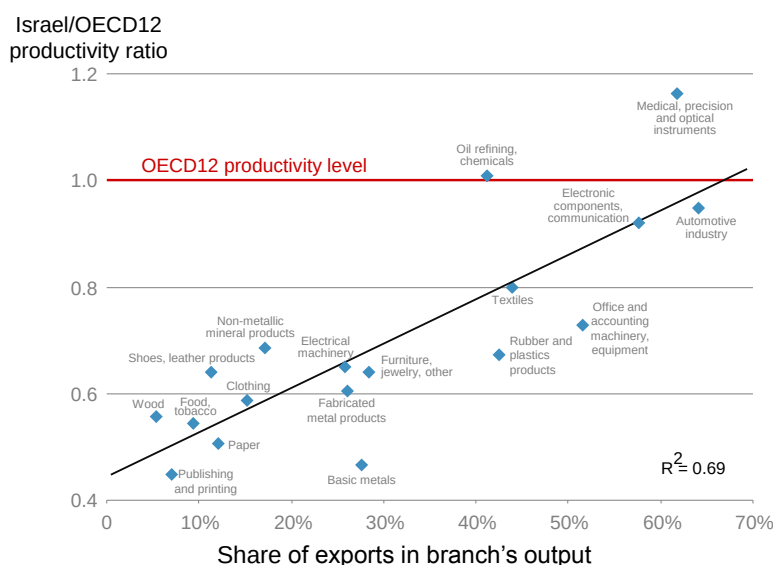
Data: OECD; Central Bureau of Statistics

The Causes for the Productivity Gaps in the Manufacturing Industries

What are the main causes that lead to the widening or narrowing of productivity gaps in the various manufacturing industries? The Bank of Israel (2013) shows that there is a correlation between the share of exports in each industry's output and the level of productivity in that

industry relative to OECD countries. An analysis of that correlation at a higher level of detail, including all industries, shows that the correlation exists only in the manufacturing industries and not in the trade and services industries. As shown in Figure 13, for the manufacturing industries the correlation coefficient is quite high (0.69).

Figure 13
**Israel/OECD12 industry productivity ratio in
 manufacturing industries***
 by export share in the Israeli industries, average ratio for 2006-2008



* In current PPP dollars and prices

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

However, this correlation is not sufficient evidence to argue that there is a causal relationship that enables exporting industries to reach higher productivity levels. The exporting industries must have high productivity in order to compete in the competitive global markets, but the direction of causality might be reversed: it is possible that firms in the exporting industries had high productivity to begin with, which enabled them to export. In order to determine the direction of the causality one must examine the changes over time in productivity gaps between Israel and the OECD12 in the manufacturing industries.

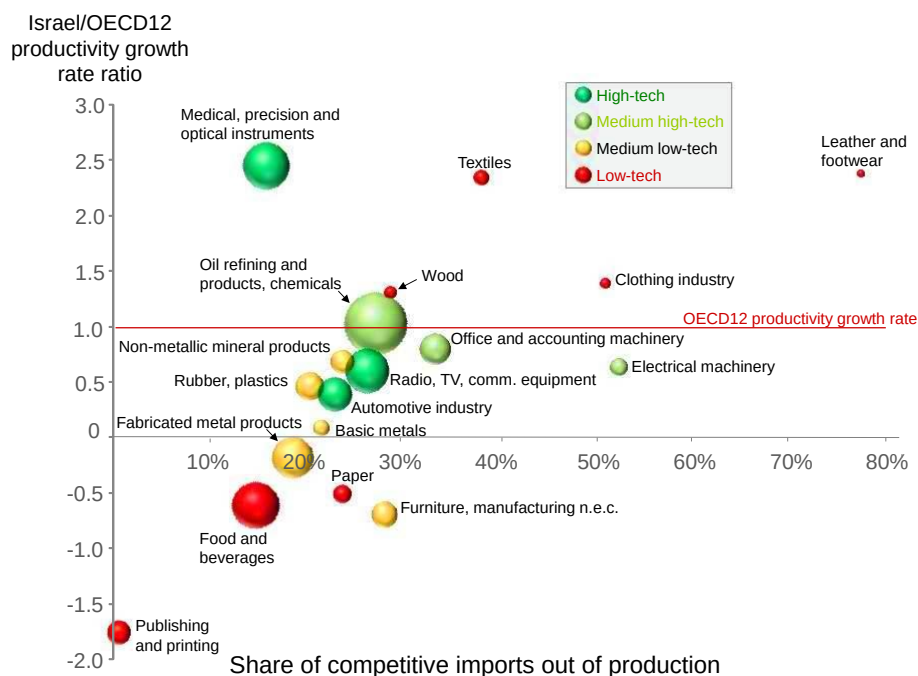
Intertemporal Differences in Productivity Growth Rates of Manufacturing Industries

A comparison of productivity growth rates in the various manufacturing industries in Israel and in the OECD12 over the period 1995-2009 shows that the most significant factor affecting the ability of the different industries to narrow productivity gaps is not the share of exports in the industry's output, but rather the industry's degree of exposure to competitive imports. Figure 14 shows that there is a high correlation between the Israel/OECD12 productivity growth rate ratio (the Y axis) and the Israeli industry's degree of exposure to imports (the X axis). In this case, as opposed to the case of exports, it is more likely that correlation indicates causality, namely that exposure to imports contributes to a rise in productivity (and not the other way around). Reverse causality fails because, the higher the productivity in the local industry, the harder it is for importers to compete with local firms, and thus import levels are actually expected to be lower. It would therefore be unreasonable to assume that high productivity leads to high levels of imports, and is much more reasonable to conclude that the exposure to imports induces an increase in domestic productivity. Furthermore, it is important to emphasize that exposure to imports is correlated with the change in productivity gaps over time, while the rate of exports is not correlated with that change. This result reinforces the causality assumption with respect to the rates of import.

Figure 14

Israel/OECD12 ratio of productivity growth rates 1995-2009*

by level of exposure to competitive imports in Israel, manufacturing industries**



* In 2009 PPP dollars and prices

** Bubble size represents the relative share of the industry in the GDP

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

It appears that industries opened to imports were exposed to substantial competition from abroad and had to increase efficiency in order to survive, and this was reflected in a rise in productivity levels. In the textile industry, for instance, the opening of the market to imports in the early 1990s exposed it to substantial competition from East Asian countries and led to the closure of many textile factories in Israel. At the

same time, it also forced the surviving factories to become more efficient and raise their productivity levels in order to be able to compete on the global market. Even though the productivity level in the textile industry in Israel today is still lower than in the OECD12, the gaps have substantially narrowed, and the current level is much closer to the OECD12 (Figure 10 above).

As evident in Figure 14, in most Israeli industries in which the level of technological intensity is low (low-technology and medium-low-technology industries – the red and orange bubbles in the figure, respectively), productivity growth rates are lower than in the OECD12 (the ratio between the productivity growth rates is less than 1). Another way to express this is that, in most industries where the level of technological intensity is low, there was little exposure to imports and the productivity gaps grew. These industries were not subject to competitive pressures from abroad, and as a result their productivity grew at a slower pace than in the OECD12.

In industries where the level of technological intensity is high (high and medium-high technology – the dark green and light green bubbles in the figure, respectively) there is more exposure to imports and productivity growth rates are closer to the OECD12, and in certain cases even higher. The Medical, precision, and optical instruments industry is the exception to this. Import levels in this industry are not high, but the productivity growth rate is significantly higher than in the OECD12. This is a high-tech industry in which Israel appears to particularly excel, independently of import levels. As shown in Figure 13, productivity in this industry in Israel is relatively high and, as mentioned, this might be reducing its import levels. The high productivity level of this industry also enables it to compete on international markets and export a large part of its output. But one must not conclude from this that exporting is what led to high productivity in the industry; the causality in this case may well be in the reverse direction. In other manufacturing industries the importance of exposure to imports is very evident.

It is interesting to note that, as opposed to most of the low-technology industries where gaps widened relative to the OECD12, in four of the low-technology industries in which there was substantial exposure to imports (footwear and leather products, textile, wood, and clothing) the gaps narrowed substantially. In these industries the ratio between the productivity growth rate in Israel and the OECD12 was high even compared to high-tech industries. The reason is that the initial productivity levels of these four industries were very low compared to the OECD12, whereas in the high-tech industries, the initial level was close to the OECD12.

The Service Industries that Lead in Productivity Gaps: A Closer Look

As shown in Figure 12 above, three industries are responsible for almost two-thirds of the total widening of the business sector productivity gaps relative to the OECD12 over the comparison period – wholesale trade, other business services, and telecommunications and post. Study of each of these industries tells a different story, which will be presented briefly and analyzed in-depth in a follow-up study (Regev, forthcoming).

The “other business services” industry

Labor productivity in the other business services industry in Israel was and remains very low (roughly \$15 an hour in the end period compared to \$30 in the OECD12). On the other hand, this industry’s share of the total work hours in the business sector in Israel is very high (more than 20 percent compared to only 13 percent in the OECD12). That share grew during the comparison period, which contributed greatly to the widening of the total productivity gap.

The other business services industry is comprised of three sub-industries,¹⁹ which are quite distinct from each other:

Labor recruitment and provision of personnel (henceforth: labor recruitment) (Industry 74) – accounted for 93,000 workers in 2010.

Security, guarding and cleaning services (henceforth: security) (Industry 75) – accounted for 118,000 workers in 2010.

Other business activities (henceforth: business) (Industry 76) – accounted for 207,000 workers in 2010.

The labor recruitment and security industries are characterized by low productivity and low wages. Most workers in the labor recruitment industry are clerks, secretaries and contract workers, and most workers in the security industry are security guards or cleaning workers, kitchen, and laundry workers. The business industry, on the other hand, is characterized by high productivity and high wages, and most of its workers are employed in financial (accountants and economists), legal (judges and lawyers), engineering and technical,²⁰ or managerial professions.

Part of the productivity gap in the other business services industry, as well as the relatively large share of this industry in total employment in Israel, arises from Israel's unique security needs, which require the employment of large numbers of guards and security personnel (at relatively low wages). Therefore, both the employee composition and the size of this industry in Israel are substantially different from those in the OECD12 in a way that contributes to the productivity gap. However, the growth in the number of security personnel is not the main reason for the growth in the industry's relative share. Most of the growth comes from

¹⁹ In the OECD classification, these three industries (74-76) are combined as a single industry; for consistency of the comparison, their data were combined for Israel as well.

²⁰ Engineers and architects, practical engineers, technicians, and equipment operators.

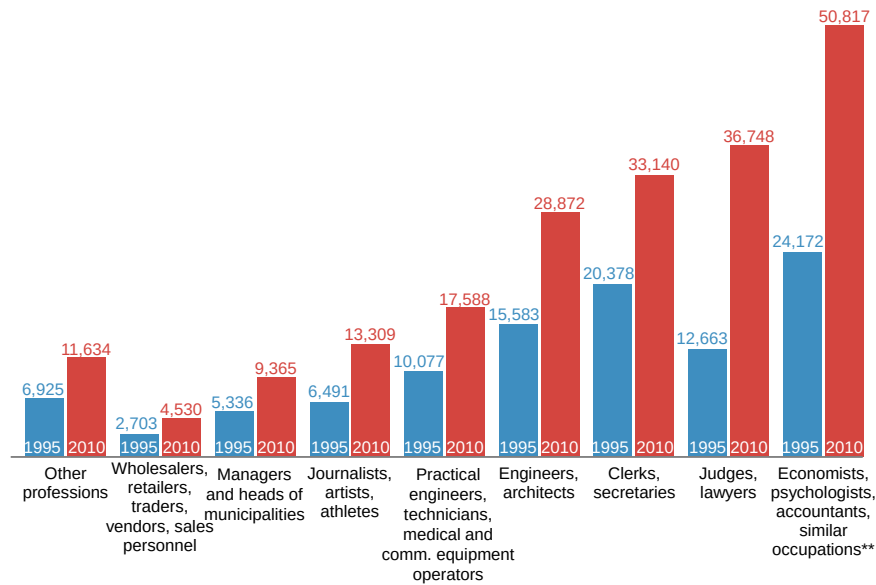
the expansion of other business activities. As seen in Figure 15, between 1995 and 2010 the number of workers in the financial professions doubled and the number of lawyers tripled.²¹ For comparison, in this period the total Israeli workforce grew by only 54 percent.

Since the business industry is characterized by the highest productivity of the three sub-industries comprising other business services, one could have expected that the rapid growth would lead to a rise in productivity in the aggregate industry. However, upon examination of the real wages of economists, psychologists, accountants, and similar occupations between 1995 and 2008,²² one discovers that they remained unchanged. This is an exceptional phenomenon compared to the rise in the entire economy during that period in average hourly real wages – 19 percent – and it may indicate a surplus of workers in these occupations, which slows down productivity growth in this industry.

²¹ A similar increase occurred during this period in the number of students for academic degrees in these professions. Between 1995 and 2009, the share of business and management students grew from 6.8 percent to 11.8 percent of the total number of students, and the number of law students rose from 5.8 percent to 9.8 percent (see Appendix Figure 5). This trend is attributed mainly to the opening of many new academic colleges in the early 1990s, which significantly increased the supply of degree programs in these fields.

²² Occupation 05 according to the Central Bureau of Statistics' classification from 1994 (economists, psychologists, accountants, and similar occupations). Credible wage data at the required level of detail were available for the years 1995-2008 in the population census files.

Figure 15
Number of workers in other business industries,* 1995 and 2010
 by occupation group



* Other business activities – Industry 76 of the Central Bureau of Statistics Standard Classification, 1993

** Includes accountants and similar financial occupations

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

The telecommunications and post industry

As opposed to the other business services industry, the telecommunications and post industry is characterized by high productivity and rapid productivity growth. However, the growth rate in Israel was slower than in the OECD12. At the start of the comparison period, labor productivity in the Israeli telecommunications and post

industry was slightly higher than in the OECD12 (Figure 8 above), but, as noted, productivity in the OECD12 grew at a faster pace, and by the end of the comparison period it was much higher than in Israel. Since this industry is characterized by very high productivity, this trend had a significant impact on the widening of the total productivity gap.

In this context, it is interesting to note that the share of the telecommunications and post industry in total work hours in the business sector in Israel increased from 1.7 percent in the base period to 2.9 percent in the end period (a 71 percent rise); whereas the relative share of this industry in the OECD12 fell from 3.0 percent in the base period to 2.3 percent in the end period (a 30 percent drop). As seen in Appendix Figure 2, in the telecommunications and post industry differences in the number of work hours per worker can explain nearly all of the productivity gap with the OECD12. It should be noted that the 2011 reform in the cellular industry is not reflected in the comparison data, which end in 2009. This reform has indeed induced a significant drop in prices and a substantial rise in the volumes of use and labor productivity. As a result, the price of the service for the Israeli consumer became low in international terms, the profits of the older firms in the industry shrank, and the number of employees dropped. The Bank of Israel notes that the positive outcomes of the cellular reform are further evidence that increasing competition leads to an increase in output and a rise in productivity (Bank of Israel, 2013).

The wholesale trade industry

As opposed to telecommunications and post, and to other business services, whose contribution to the widening of the productivity gap can be attributed to their being “inflated” industries that grew to excessive dimensions when compared to the OECD, and whose large number of workers slows down productivity growth, the wholesale trade industry is a different story.

The relative share of the industry in the total work hours in the Israeli business sector did not change significantly during the comparison period, and is very similar to the share in the OECD12 (about 9 percent).

However, between 1995 and 2009, there was an almost complete stagnation in labor productivity in the wholesale trade industry in Israel, with a downward trend since 2001. Conversely, in the OECD12, impressive growth of productivity in that industry was recorded (42 percent). Subsequently, the labor productivity gap in the industry grew from \$8 to \$20 per work hour. Since it is a relatively large industry in employment terms, this widening of the gap provided a major contribution to the widening of the total productivity gap between Israel and the OECD12. Possible factors such as the uncompetitive, local business environment, a centralized market structure, and structural and regulatory barriers to import and competition from abroad as well as to the development of domestic competition will all be discussed extensively in a follow-up study (Regev, forthcoming).

4. Summary and Conclusions

This chapter presents the development of labor productivity in the various industries in Israel and in twelve OECD countries at a level of detail not previously examined in a multiyear comparison. The main purpose of the study is to identify the most problematic industries responsible for the main part of the productivity gap with the OECD, as well as the industries responsible for the widening of the gap over time. The comparison indicates that the industries whose share in the productivity gap is the most significant are other business services (27.7 percent), wholesale trade (16.3 percent), and hotels and restaurants (9 percent). In addition, it was found that five major industries are responsible for 81 percent of the total widening of the productivity gap: wholesale trade (30 percent), other business services (21.8 percent), telecommunications and post (11.2 percent), retail trade (9.1 percent), and food and tobacco (9.1 percent). These industries provide products and services mainly to the local market and are mainly dependent on the local business environment.

A comparison between the productivity per worker (“output per worker”) ratio and the productivity per hour (“labor productivity”) ratio in Israel and the OECD12 shows that differences in the average number of work hours per worker can explain, at the very most, half of the productivity gap per work hour, but do not explain at all the widening of the productivity gaps during the comparison period. This is especially true in light of the fact that, during the comparison period, there was a sharper drop in the number of work hours per worker in Israel than in the OECD12. Similarly, differences in industry composition do not explain the widening of the gap, and, in fact, they slightly narrow it, mainly due to the fact that the relative share of the high-tech and finance sectors in Israel is larger than in the OECD12.

In keeping with the Bank of Israel (2013) findings, a correlation was found between the share of exports in the industries’ output and the industries’ level of productivity relative to the OECD12 countries. This correlation, however, exists (and is high) only in the manufacturing industries, and not in the trade and services industries. It is important to

note that even the existing correlation is insufficient evidence to argue that there is a causal relationship between exporting and higher productivity – it is quite possible that industries that are more export intensive had higher productivity levels to begin with, which enhanced their ability to export. A comparison of productivity growth rates in the various manufacturing industries in Israel and in the OECD12 between 1995 and 2009 shows that the most significant factor affecting an industry's ability to narrow the gaps with the OECD12 is not the share of exports in the industry's output, but, rather, the degree of the industry's exposure to competitive imports. The ratio between the growth rate of industry productivity in Israel and its rate in the OECD12 was found to be highly correlated with the degree of the Israeli industry's exposure to imports. It appears that industries that were opened to imports were exposed to significant competition from abroad and had to increase efficiency in order to survive, and, as a result, they also had to raise their productivity levels.

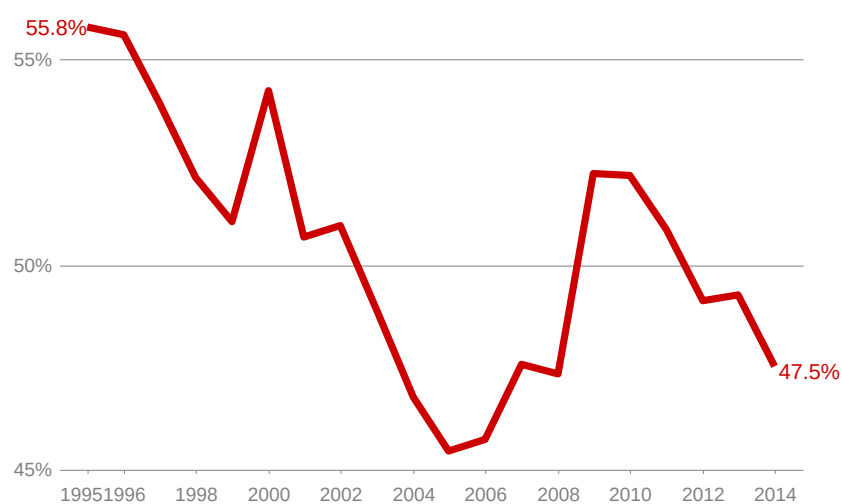
Compared to the OECD12, the share of the other business services industry in Israel is particularly large, and its productivity is particularly low. Part of this arises from Israel's unique security needs, which require the employment of large numbers of guards and security personnel at relatively low wages. The growth of the relative share of this industry in employment in Israel contributed considerably to the widening of the total productivity gap. Most of this growth actually stemmed from the spike in the number of skilled workers, such as accountants, economists and psychologists, in the industry. This could have been expected to increase productivity in this industry, but the wages of these workers stagnated for many years, which might indicate the existence of a surplus of workers in these occupations.²³

²³ For a further analysis of the factors that contributed to the widening of the productivity gaps in the trade and services industries, see Regev (forthcoming).

Appendix

1. Figures

Appendix Figure 1
**Maximum share of productivity gap that can be explained
 by differences in average work hours***

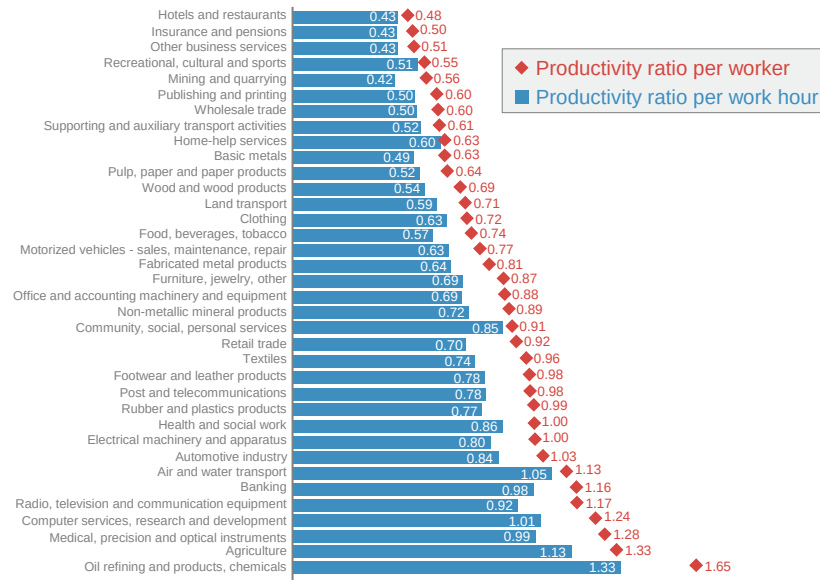


* In 2010 PPP dollars and prices

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

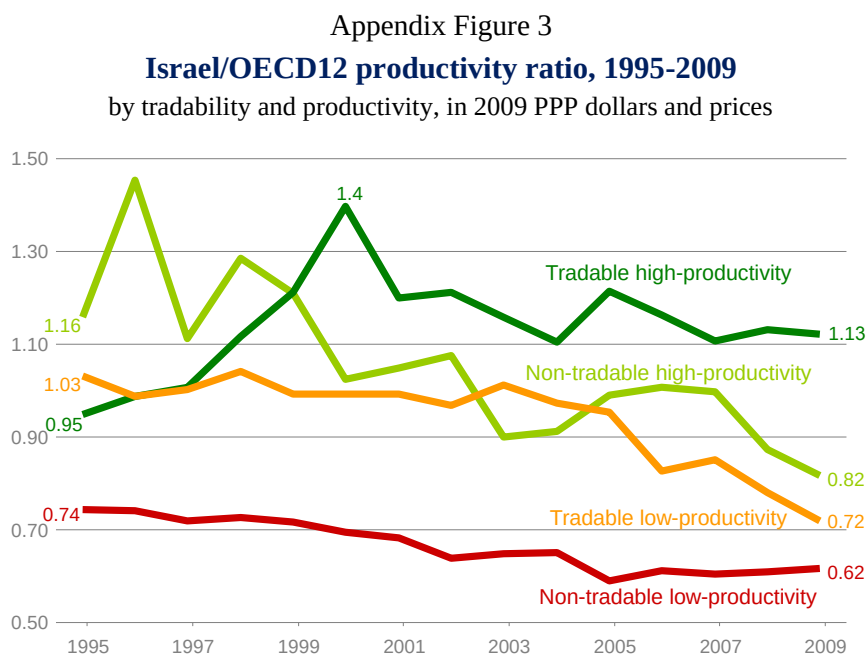
Appendix Figure 2
Israel/OECD12 productivity ratio per work hour*
 by industry, average ratio for 2006-2008



* In 2009 PPP dollars and prices

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics



Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

As presented in Figure 2 previously, the sum of the changes in industry composition in Israel and the OECD12 during the comparison period did not contribute to the widening of the productivity gap. This is an aggregate outcome, though, that does not represent the entire picture: it fails to show those industries in which the changes in relative size contributed to reducing the gap with the OECD12 and industries where these changes contributed to the widening of the gap.

Appendix Figure 4 presents a more detailed picture of the widening of the productivity gaps, and highlights the changes both in the industry productivity gaps relative to the OECD12 and the changes in the relative share of the industries in Israel over time. The Y axis presents the change in the relative share of the industry in total employment in Israel (in percentage points), and the X axis presents (for each industry) the change

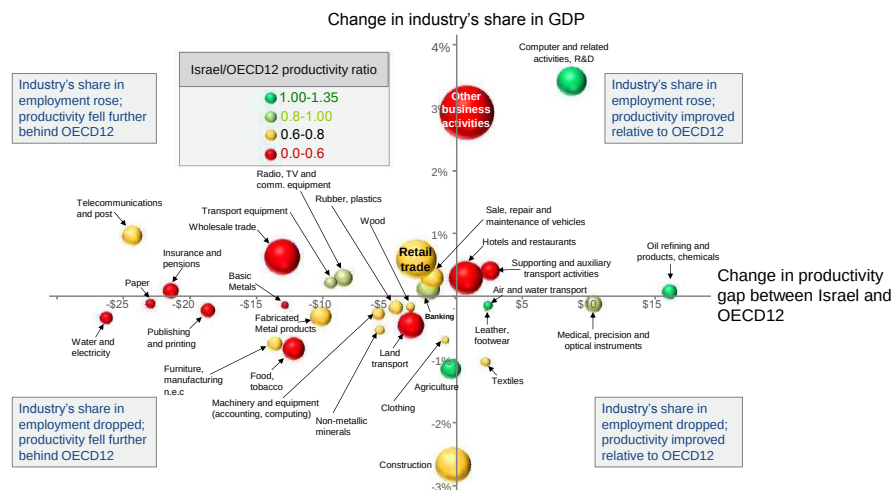
in the productivity gap between Israel and the OECD12 in the comparison period (in US dollars per work hour). The size of the bubbles represents the relative share of each industry in the total work hours in Israel, and the color of the bubbles represents the productivity ratio between Israel and the OECD12 at the end of the comparison period. As the figure shows clearly, the dominant colors are red and orange, which represent a lower productivity level in Israel; which is to say that, in most industries in the economy, productivity levels in Israel are substantially lower than in the OECD12. Likewise, most of the industries are located to the left of origin, meaning that, in most industries, the gaps widened.

Four large industries in which productivity levels are low relative to the OECD12 – wholesale trade, retail trade, hotels and restaurants, and other business services – increased their relative share in overall employment in Israel. The largest among them is the other business services industry, whose relative share grew by three percentage points throughout the comparison period, and whose productivity level is very low compared to the OECD12 (and represented in red). The growth in the relative share of this industry contributed substantially to the widening of the productivity gap. Conversely, in the computer services and research and development industry, whose productivity level is higher than the OECD12 (in dark green), the relative share of employment grew by 3.4 percentage points – and so, this industry contributed to a narrowing of the total productivity gap.

Appendix Figure 4

Change in Israeli industry's relative share in employment and in productivity gap with OECD12

change in employment share in percentage points, change in gap in 2009 PPP dollars and prices

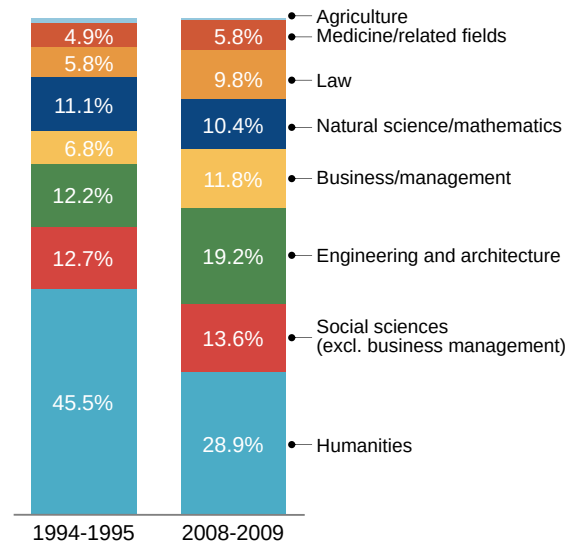


* Bubble size represents industry's share in work hours. Bubble color represents Israel's productivity level relative to OECD12

Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

Appendix Figure 5
Undergraduate students in universities and academic colleges
 by major, 1994-1995 and 2008-2009



Source: Eitan Regev and Gilad Brand, Taub Center

Data: OECD; Central Bureau of Statistics

2. *Method of Calculating the Relative Contribution of Each Industry to the Total Productivity Gap*

The computation of each industry's relative contribution to the productivity gap is not trivial. The main challenge of this computation arises from the existence of differences between the industry composition of Israel and the OECD, which makes it difficult to determine the respective share of each industry in the gap in situations in which the relative size of the Israeli industry is different from the relative size of the

equivalent industry in the OECD. A decomposition using Oaxaca's method (1973) makes it possible to compute on the aggregate level the share of the total productivity gap that stems from differences in industry composition and the share that stems from intra-industry productivity gaps. However, this decomposition is not sufficient for the computation of the separate contribution of each industry to the productivity gap when there are differences in industry composition. For example, using the Oaxaca (1973) methodology, when the relative share of Industry A in the OECD is larger than in Israel, this will cause an overestimate of the contribution of Industry A to the productivity gap. When the relative share of Industry B in Israel is larger than in the OECD, this will cause an underestimate of the contribution of Industry B to the productivity gap.

This issue can be addressed using a different breakdown on the industry level, which accounts for the following question: does the fact that the share of Industry A in the OECD is (for instance) larger than in Israel increase or reduce the total productivity gap? To test this, the contribution of each industry to the gap is broken down into two portions: the part for which there is an overlap between Israel and the OECD, and the part for which there is no overlap. The common part (marked by the letter C) is defined as the smaller between Industry i 's share in Israel and in the OECD12:

$$W_{C,i} = \min(W_{OECD,i}, W_{Israel,i})$$

The non-common part in each industry (NC) is defined as the gap between the share of Industry i (in Israel and in the OECD12) and the common part:

$$W_{NC,OECD,i} = W_{OECD,i} - W_{C,i}; W_{NC,Israel,i} = W_{Israel,i} - W_{C,i}$$

It is clear that when the relative share of a particular industry in Israel is smaller than in the OECD12, the part that is not common in that industry (in Israel) will be equal to 0, whereas in the OECD12 it will be equal to the difference between the share of the industry in the OECD12 and in Israel.

The contribution of the common part of each industry to the total productivity gap equals the product of the common part and the industry productivity gap $Gap_{C,i} = W_{C,i} \cdot \Delta X_i$, with $\Delta X_i = X_{OECD,i} - X_{Israel,i}$ being the gap between the OECD12 and Israel in labor productivity in Industry i . It is important to note that this part of the breakdown is identical to the parallel part in the Oaxaca methodology, and the difference between the methods stems from the treatment of the non-common part.

In order to compute the contribution of the non-common part of Industry A to the total gap, it is necessary to examine how the gap is affected by the fact that the share of Industry A in Israel is (say) larger than its share in the OECD. To this end, one must check whether productivity (in the non-common part) of Industry A in Israel is higher than the *average* productivity of all non-common parts in the OECD. If that is the case, then the fact that the share of Industry A in Israel is larger than its share in the OECD contributes to reducing the gap; but if productivity in Industry A in Israel is lower than the average productivity in the non-common parts in the OECD, then the fact that the share of Industry A in Israel is larger than its share in the OECD contributes to widening the gap. The contribution of the non-common part of Industry A to the total productivity gap will be half of the product of the non-common part of Industry A,²⁴ and the gap between the productivity of Industry A in Israel and the (weighted) average productivity in all non-common parts in the OECD. The average productivity of the non-common parts is defined as follows:

$$\bar{X}_{NC,OECD} = \frac{\sum_i^n X_{OECD,i} \cdot W_{NC,OECD,i}}{\sum_i^n W_{NC,OECD,i}}; \bar{X}_{NC,Israel} = \frac{\sum_i^n X_{Israel,i} \cdot W_{NC,Israel,i}}{\sum_i^n W_{NC,Israel,i}}$$

²⁴ The division by 2 is required because the part of the work hours in Israel that is in question is not common with the OECD, and therefore in the OECD there are different industries where there is a part that is not common with Israel – and which must be compared to the average productivity of the non-common parts in Israel. Therefore, the (necessary) computation procedure creates a duplicity of the non-common part: once by the OECD and once by Israel – and therefore the final result in each industry must be divided by 2.

Therefore, the contribution of the non-common part in each industry to the total productivity gap is:

$$Gap_{NC,i} = 0.5 \cdot [W_{NC,Israel,i} \cdot (\bar{X}_{NC,OECD} - X_{Israel,i}) + W_{NC,OECD,i} \cdot (X_{OECD,i} - \bar{X}_{NC,Israel})]$$

Now all that remains is only to add the contribution of the common part to that of the non-common part in order to arrive at the total contribution of the industry to the productivity gap (in US dollars):

$$Gap_i = Gap_{C,i} + Gap_{NC,i}$$

$$Gap_i = W_{C,i} \cdot \Delta X_i + 0.5 \cdot [W_{NC,Israel,i} \cdot (\bar{X}_{NC,OECD} - X_{Israel,i}) + W_{NC,OECD,i} \cdot (X_{OECD,i} - \bar{X}_{NC,Israel})]$$

Now it is easy to also compute the relative share of each industry in the total productivity gap:

$$S_i = \frac{Gap_i}{\sum_i^n Gap_i}$$

Method of calculating the relative contribution of each industry to the widening of the productivity gap

After calculating the contribution (in US dollars) of each industry to the total the productivity gap, it is easy to calculate the industry's contribution to the widening of the productivity gap between two periods, which is simply the difference between the industry's contribution in period t and its contribution in period $t-1$:

$$\Delta Gap_i = Gap_{i,t} - Gap_{i,t-1}$$

The relative share of each industry in the widening of the productivity gap is then given by:

$$S\Delta gap_i = \frac{\Delta Gap_i}{\sum_i^n \Delta Gap_i}$$

Proof of the completeness of the decomposition

We now demonstrate that the decomposition is complete. To this end, we show that the sum of the gaps as presented above over all industries yields the total gap.

$$Gap_i = W_{C,i} \cdot \Delta X_i + 0.5 \cdot [W_{NC,Israel,i} \cdot (\bar{X}_{NC,OECD} - X_{Israel,i}) + W_{NC,OECD,i} \cdot (X_{OECD,i} - \bar{X}_{NC,Israel})]$$

$$\sum_i^n Gap_i = \sum_i^n W_{C,i} \cdot \Delta X_i + 0.5 \sum_i^n [W_{NC,Israel,i} \cdot (\bar{X}_{NC,OECD} - X_{Israel,i}) + W_{NC,OECD,i} \cdot (X_{OECD,i} - \bar{X}_{NC,Israel})]$$

$$\text{Recall that: } \bar{X}_{NC,OECD} = \frac{\sum_i^n X_{OECD,i} \cdot W_{NC,OECD,i}}{\sum_i^n W_{NC,OECD,i}}$$

$$\text{And: } \bar{X}_{NC,Israel} = \frac{\sum_i^n X_{Israel,i} \cdot W_{NC,Israel,i}}{\sum_i^n W_{NC,Israel,i}}$$

$$\begin{aligned} \sum_i^n Gap_i &= \sum_i^n W_{C,i} \cdot \Delta X_i \\ &\quad + 0.5 \sum_i^n [W_{NC,Israel,i} \cdot \bar{X}_{NC,OECD} - W_{NC,OECD,i} \cdot \bar{X}_{NC,Israel} + W_{NC,OECD,i} \\ &\quad \cdot X_{OECD,i} - W_{NC,Israel,i} \cdot X_{Israel,i}] \end{aligned}$$

Recall that:

$$\begin{aligned} \bar{X}_{NC,OECD} &= \frac{\sum_i^n X_{OECD,i} \cdot W_{NC,OECD,i}}{\sum_i^n W_{NC,OECD,i}}; \bar{X}_{NC,Israel} = \frac{\sum_i^n X_{Israel,i} \cdot W_{NC,Israel,i}}{\sum_i^n W_{NC,Israel,i}} \\ \sum_i^n Gap_i &= \sum_i^n W_{C,i} \cdot \Delta X_i + 0.5 \bar{X}_{NC,OECD} \sum_i^n W_{NC,Israel,i} - 0.5 \bar{X}_{NC,Israel} \sum_i^n W_{NC,OECD,i} \\ &\quad + 0.5 \bar{X}_{NC,OECD} \sum_i^n W_{NC,OECD,i} - 0.5 \bar{X}_{NC,Israel} \sum_i^n W_{NC,Israel,i} \end{aligned}$$

The sum of the non-common parts in Israel equals that sum in the OECD, i.e.: $\sum_i^n W_{NC,i} = \sum_i^n W_{NC,Israel,i} = \sum_i^n W_{NC,OECD,i}$. Combining like terms yields:

$$\begin{aligned}\sum_i^n Gap_i &= \sum_i^n W_{C,i} \cdot \Delta X_i + \bar{X}_{NC,OECD} \sum_i^n W_{NC,OECD,i} - \bar{X}_{NC,Israel} \sum_i^n W_{NC,Israel,i} \\ \sum_i^n Gap_i &= \sum_i^n W_{C,i} \cdot \Delta X_i + \sum_i^n X_{OECD,i} \cdot W_{NC,OECD,i} - \sum_i^n X_{Israel,i} \cdot W_{NC,Israel,i} \\ \sum_i^n Gap_i &= \sum_i^n W_{C,i} \cdot X_{OECD,i} - \sum_i^n W_{C,i} \cdot X_{Israel,i} + \sum_i^n X_{OECD,i} \cdot W_{NC,OECD,i} - \sum_i^n X_{Israel,i} \cdot W_{NC,Israel,i} \\ \sum_i^n Gap_i &= \sum_i^n W_{OECD,i} \cdot X_{OECD,i} - \sum_i^n W_{Israel,i} \cdot X_{Israel,i}\end{aligned}$$

3. Tables

Appendix Table 1A. **Method for calculating price adjustments for agriculture and manufacturing industries**

(continued on next page)

OECD12 Code	Israeli Code	Industry name	Calculation method
1-5	1-9	Agriculture	Statistical appendix of Bank of Israel (fixed prices and CBS data (current prices))
10-14	10-13	Mining and quarrying	
15-16	14-16	Food, beverages and tobacco products	CBS Industry Survey 1995-2010
17	17	Textiles	
18	18	Clothing	
19	19	Footwear and leather products	
20	20	Wood and wood products	
21	21	Pulp, paper and paper products	
22	22	Publishing and printing	
23-24	23-24	Oil refining and products, chemicals	
25	25	Rubber and plastics products	
26	26	Non-metallic mineral products	
27	27	Basic metals	
28	28	Fabricated metal products (excl. machinery and equipment)	
29-30	29-30	Office and accounting machinery and equipment	
31	31	Electrical machinery and apparatus	
32	32-33	Radio, television and communication equipment	
33	34	Medical, precision, and optical instruments	

Appendix Table 1A. **Method for calculating price adjustments for agriculture and manufacturing industries**

(continued from previous page)

OECD12 Code	Israeli Code	Industry name	Calculation method
34-35 36	35 36-39	Automotive industry Furniture, jewelry, other classified	CBS <i>Industry Survey 1995-2010</i>
40-41	40-41	Electricity and water	
45	45-46	Construction	CBS central database, national accounts, GDP per economic industry in base prices - construction

Appendix Table 1B. **Method for calculating price adjustments for trade and service industries**

(continued on next page)

OECD12 Code	Israeli Code	Industry name	Calculation method
50	50	Motorized vehicles - sales, maintenance, repair	CBS central database, national accounts, GDP by economic industry and basic prices – sales, maintenance and repair of motor vehicles, retail sale of fuel
51	51	Wholesale trade (excl. motor vehicles and motorcycles)	CBS central database, commerce and business. Revenue indices of wholesale trade and services (VAT data)
52	52-53	Retail trade (excl. motor vehicles)	CBS central database, commerce and business. Revenue indices of retail trade and services (VAT data)
55	55-56	Hotels and Restaurants	CBS, Macro-Economic Division
55A	55	Hotels and guest houses	
55B	56	Restaurants and dining services	
64B	66	Telecommunications	
65, 67	67	Banking	
70	70	Real estate	
60	60	Land transport	CBS central database, transportation and communication, revenue indices for busses, trains in current and fixed prices
61-62	61-62	Air and water transport	CBS, <i>Statistical Abstract of Israel</i> (various years): “Transportation and Communication”
64A	65	Post and courier services	

Appendix Table 1B. **Method for calculating price adjustments for trade and service industries**

(continued from previous page)

OECD12 Code	Israeli Code	Industry name	Calculation method
63	63-64	Supporting and auxiliary transport activities	CBS, central database, transportation and communication. Data for volume of activity in airports and seaports
64	65-66	Telecommunications and post	Weighted average of adjusted price indices in telecommunication and post industries
66	68	Insurance and pensions	CBS, central database, national accounts, GDP by economic industry in base prices – insurance and financial services
71	71	Renting of machinery and equipment excl. personal and household goods	According to adjusted price index for real estate services, CBS Macro-Economic Division
72-73	72-73	Computer services, research and development	According to adjusted average price index for the industry in the 12 OECD countries of the OECD12
74	74-76	Business activities (excl. computer and research and development)	Extracted from adjusted average price index for the main industry and the sub-industry
80	80	Education	CBS database – revenue data for education (VAT data)
85	85-86	Health, and social work	CBS database – revenue data for health (VAT data)
90-93	90-96	Community, social, personal and other services	CBS central database – revenue data of community, social and personal services (VAT data)

Appendix Table 2. **Grouping of business sector industries by industry tradability and productivity levels**

(continued on next page)

Industry code	Industry name (<i>Standard Industrial Classification of All Economic Activities, 1993</i>)
Non-tradable high-productivity industries	
67	Banking
68	Insurance and pensions
65-66	Telecommunications and post
Tradable high-productivity industries	
23-24	Oil refining and products, chemicals
72-73	Computer services, research and development
34	Medical, precision, and optical instruments
26	Non-metallic mineral products
32-33	Radio, television and communication equipment
63-64	Supporting and auxiliary transport activities
35	Automotive industry
61-62	Air and water transport
29-30	Office and accounting machinery and equipment
31	Electrical machinery and apparatus
Non-tradable low-productivity industries	
14-16	Food, beverages and tobacco products
55-56	Hotels and restaurants
60	Land transport
74-76	Business activities (excl. computer and research and development)
95-97	Home help services
22	Publishing and printing
21	Pulp, paper and paper products

Appendix Table 2. **Grouping of business sector industries by industry tradability and productivity levels**

(continued from previous page)

Industry code	Industry name (<i>Standard Industrial Classification of All Economic Activities, 1993</i>)
Non-tradable low-productivity industries	
94	Recreational, cultural and sports
52-53	Retail trade (excl. motor vehicles)
50	Motorized vehicles - sales, maintenance, repair
51	Wholesale trade (excl. motor vehicles and motorcycles)
Tradable low-productivity industries	
27	Basic metals
28	Fabricated metal products (excl. machinery and equipment)
25	Rubber and plastics products
17	Textiles
18	Clothing (excl. knits)
36-39	Furniture, jewelry, other
19	Footwear and leather products

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III. MACRO-ECONOMIC DEVELOPMENTS

The Cost of Living in Israel: An International Comparison and Historical Perspective

Gilad Brand*

Abstract

Recently, there has been a lively public discussion surrounding the cost of living in Israel, and it is frequently claimed that the prices of consumer products are higher in Israel than abroad. Studies find partial evidence that compared to other developed countries, the price level of private consumption in Israel is relatively high considering that income per capita in Israel is relatively low. The findings in such international comparisons, however, are obfuscated by the influence of fluctuations in currency exchange rates, an issue not addressed properly in earlier studies. In this chapter, this issue is examined by conducting an international comparison of price rates over 25 years. This long-term comparison serves as a test to assess whether the high price level observed in recent years is temporary and can be explained by, for instance, the appreciation of the shekel in 2008, or whether it is a long-term process associated with structural facets of the economy. The study finds that fluctuations in the nominal exchange rate cannot account for the high price levels found in earlier studies and that high prices are a long-term phenomenon which are likely related to structural factors in the local market.

In addition, the chapter examines the price changes in the various consumption categories, focusing on the food industry where there was a rapid rise in prices concurrent with an increase in profits during the second half of the last decade. These findings indicate the importance of continuing to expose the economy to imported goods as a means of increasing competition, reducing prices and improving consumer welfare in Israel.

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Introduction

Since the outbreak of the social protests in July 2011, there has been an ongoing discussion about the level of prices in Israel, and the media and social networks carry frequent comparisons of a range of consumer products between Israel and other countries. Following these discussions, many attempts have been made to check whether consumer products in Israel are, in fact, more expensive compared to other developed countries. However, comparing the price of a typical consumer basket between Israel and other countries is not enough for a thorough comparison, though. The income level in each country must also be taken into account. The literature and empirical findings indicate that the higher the country's income level the higher the prices, and, therefore, the price of a typical consumer basket should not be assessed without considering the income level. In fact, the relationship between price level and income level (represented here by per capita GDP) is perceived as a key indicator of standard of living. Such a comparison, though, has a major problem: currency exchange rates fluctuate sharply, and these fluctuations are usually not fully reflected by the local price level. In order to reduce the influence of the exchange rate, this chapter presents a comparison of price levels in various countries over a period of 25 years, from 1990 to 2015. The long-term comparison minimizes the impact of exchange rate changes on the results and contributes to understanding the issue of the cost of living and the interaction between wage levels and price levels in international comparisons.

valuable comments. Special thanks to Dr. Noam Gruber for his assistance.

The first section of this chapter will examine the price levels in Israel compared to other developed countries in 2014, taking into account the per capita GDP in each country. This will be followed by a long-term comparison with reference to the exchange rate. Its results reinforce the claim that price levels in Israel are higher than would be expected compared to the rest of the developed world given the income level. The third section discusses the development of prices in Israel broken down by expenditure category, with an emphasis placed on the food industry, where there was a rapid and sharp price increase relative to other industries. This phenomenon was apparently the result of a change in the structure of competition in the industry in the second half of the last decade. The chapter concludes with a brief discussion of some of the policy implications from the findings.

1. The Price Levels in Israel Compared to Other Developed Countries

Figure 1 presents the consumption price level in OECD countries (the vertical axis) and per capita GDP, representing the standard of living in the country (the horizontal axis). As can be seen, there is a statistically significant positive relation between the variables: the richer the country, the higher its price levels. The high correlation between price levels and income levels in the country has been discussed extensively in the literature. The common explanation is the one offered by Balassa (1964) and Samuelson (1964) (henceforth: Balassa-Samuelson), according to which in the rich countries the productivity in the tradable industries tends to rise faster than in the non-tradable industries. Tradable products are products and services that can be traded on the international market, such as clothing and shoes, whereas non-tradable products are sold only on the local market, such as postal services. The rise in productivity in the tradable industries leads to a wage increase in these industries, resulting in a migration of workers from the non-tradable industries to the tradable ones as well as to a wage increase in the non-tradable industries. In turn,

productivity in the non-tradable industries improves to a lesser extent, thereby raising production costs in those industries. Due to all of these factors, firms in the non-tradable industries respond by raising their prices. Given free international trade, the price of imported products does not go up, resulting in the rate of price rise in the non-tradable industries being higher. As a result, the general price level, the relative productivity, and the price ratio between tradable and non-tradable products are all higher in rich economies.¹ Kravis and Lipsey (1983) and Bhagwat (1984) offer an alternative explanation, by which the capital-employee ratio in the rich countries is higher and, therefore, the workers' marginal productivity is higher – and so are wages, accordingly. Since the non-tradable products are labor-intensive, the result is that they are more expensive in the rich countries, where the employees' wages are higher.²

Many studies discuss the question of under what conditions price levels in the economy reflect the Balassa-Samuelson equilibrium. The literature finds that it depends to a large extent on the economy's openness to international trade, and to a certain extent also on the distance between the economy and its main trade partners. Countries that have trade restrictions, low local competition, no economies of scale, and are distant from additional potential markets, tend to be characterized by high price levels relative to income.³ So, for example, in many cases

¹ The existence of the Balassa-Samuelson effect is an important basis for many macroeconomic models, although the evidence for it is not conclusive. Balázs, Drine, Lommatzsch, and Rault (2003), and Tica and Druzic (2006) present a review of empirical findings on the subject.

² Recently, Frisch (in progress) examined the empirical validity of these hypotheses and did not find supporting evidence for them.

³ Alba and Papell (2007) show that low inflation rates and low fluctuation of the exchange rate are additional variables that influence the convergence of prices between countries to a similar level. Evans (2003) shows that transport costs can explain part of the price gap, depending on the substitution elasticity between local production and products from overseas. Andersson, Masuch and Schiffbauer (2009), who checked price gaps in Europe in the years following the transition to a uniform currency, found that the variance in price

international manufacturers adopt a strategy of price discrimination (differential pricing for different geographical areas) and adjust price levels to levels of local competition. A pro-free trade policy makes it difficult for manufacturers to adopt price discrimination and reduce the price gap between the local and foreign markets.⁴ The Israeli experience shows that exposing the economy to imports in the early 1990s led to a drop in prices and increased competition in industries exposed to imports, which resulted in an increase in the supply of products and an improvement in consumer welfare.⁵ On the other hand, countries characterized by large and competitive local markets, which are in close proximity to additional potential markets, tend to converge to a more comfortable price level relative to the per capita income.

Figure 1 shows a trendline that describes the expected price level in each country relative to its per capita GDP (using a log-linear quadratic equation⁶ – see Appendix Table 1). Israel's price level is 1.4 standard deviations above the trendline, which is to say that its price levels are

disparities that could not be explained by the level of per capita GDP could be explained, among other things, by differences in standards and regulations. Furthermore, they argued that part of the variance in price levels could also be explained by differences in the location of the countries in the business cycle.

⁴ See discussion on the subject by the Ministry of Economy (2014, p. 31). Balassa-Samuelson assume price equality between tradable products, but other studies have found that even the prices of those products were characterized by a relatively high variance. Alessandria and Kaboski (2011) show that a large part of the variance in the prices of tradable products derives from a policy of price discrimination and, to a lesser extent, from non-tradable components of the tradable products, such as marketing and distribution.

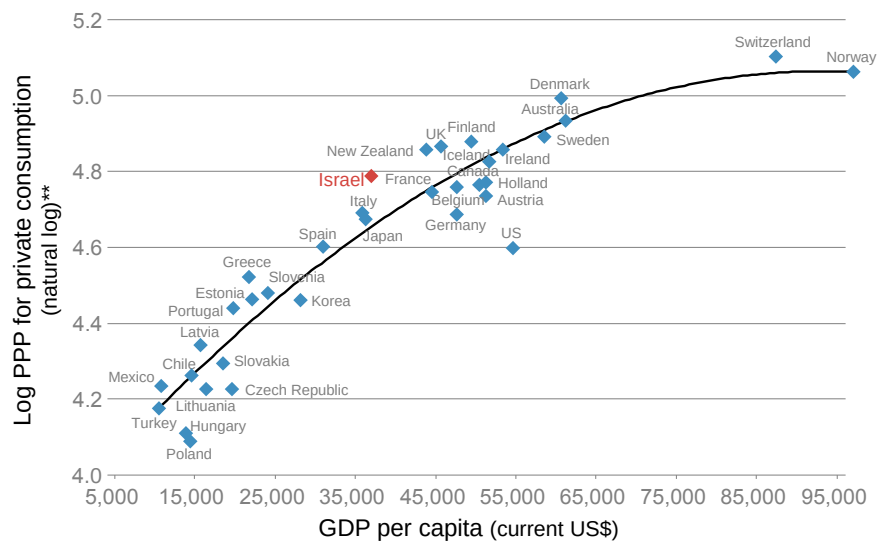
⁵ According to the Ministry of Finance (1997, Chapter 17), the Report of the Committee for Social Economic Change (2011), and Elbert (2003). Feenstra and Weinstein (2010) found that the rise in the level of competitive imports in the 1990s in the US led to a rise in the prices of a range of products, a 5.4 percent drop in industrial products, and an overall 1 percent drop in consumer prices.

⁶ Similar results are attained using a log-log regression.

higher than expected given per capita GDP. This is a high deviation compared to the rest of the countries included in the comparison, but it is not statistically significant. It is also notable that the price level in the United States is extremely low relative to its income. As a result, a regression analysis of a relatively small sample of countries including the US suffers from large standard deviations, and consequently from low statistical significance. Therefore, the comparisons presented from here on do not include the US.

Figure 1

**Consumer prices and per capita GDP in the OECD countries,*
2014**



* 35 OECD countries, including Lithuania and Latvia and excluding Luxembourg

** The regression estimate is calculated using an equation where the log of the price level is explained by the squared polynomial of per capita GDP. Similar results were found using a regression where the per capita GDP log was explained by the log of price levels.

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat; IMF

The picture that emerges from the figure is consistent with previous comparisons in this area. An examination by the Bank of Israel (2012) for 2010 found that consumer prices were almost 20 percent higher than expected by the trendline – a substantial deviation, according to the authors of the report.⁷ The Knesset Information and Research Center found a similar result using 2013 figures (Millard, 2014). In contrast, in a study by the Bank of Israel (2015) using 2013 figures, the researchers conclude that the consumer prices in Israel are not particularly high. According to these studies, consumer prices in Israel are comprised of particularly high prices for certain products (especially food, beverages and automobiles) and reasonable prices for other products.

2. Price Levels Compared Over Time

Currency exchange rates play a central role when conducting international comparisons of price levels. Consumer prices are calculated using the World Bank and IMF purchasing power parity (PPP) indices, which represent the number of local currency units needed for a fixed consumer basket in the local market. By converting the price of the basket in each country to a uniform currency, an international comparison of consumer prices can be made. Since currency rates fluctuate greatly, the price ratio between countries may change accordingly. It is clear, then, that a comparison of relative cost of living in a given year is extremely sensitive to exchange rate fluctuations.⁸ In the Israeli context,

⁷ The researchers qualify this, noting that the deviation is not statistically significant.

⁸ An appreciation of the currency rate may raise the relative price level, but it also raises the income level compared to overseas. Therefore, the consequences of that fluctuation on the price level standardized for per capita GDP are not unequivocal. In a competitive market, the strengthening of the currency is also reflected by a cheapening of imported products, and therefore there can theoretically be a situation where the strengthening of the local currency would actually lead to a drop in the relative consumer prices. This

the Bank of Israel (2015) points out that changes in the exchange rate hardly filter down to the local prices and, therefore, an appreciation of the shekel would contribute to a higher price level relative to other countries.

The comparison of local prices to prices in other countries is actually a test of the economy's real exchange rate.⁹ It is commonly assumed that the real exchange rate is determined in the long run by the country's per capita income level, and that a deviation from that connection reflects short and medium-term macroeconomic occurrences. Therefore, a deviation from the trend of the association between the two indices, as happens in Israel, can lead to one of the two possible following conclusions:

- A. Consumer products in Israel are expensive compared to countries with a similar level of development;
- B. The real exchange rate is overly appreciated, which is to say that the value of the shekel compared to other currencies diverges from long-run equilibrium.

This is not a simple issue and cannot be solved with econometric tools. It is an essential question: What is the exchange rate that reflects the fundamental factors of the economy that would allow a comparison whose results do not reflect transitory factors? To answer that question, the relation between price levels and per capita GDP in Israel over a longer period of time will be examined. If it turns out that the deviations from the expected trend fluctuate randomly around a long-run average, it

scenario could materialize when an appreciation of the currency leads to a lower rise in the relative price level than the curve of the regression line. In practice, the positive correlation between the location of the country relative to the regression line and the fluctuation of the exchange rate exists in all of the countries in the comparison.

⁹ By definition, the real exchange rate is the price ratio between the local economy and abroad. That comparison shows the price ratio of private consumption, whereas the real exchange rate is calculated by the price ratio of all of the components of the product.

may be assumed that that average represents a reasonable approximation of the price ratio that relies on long-run basic factors. This hypothesis relies, among other things, on the weak form of the law of one price.¹⁰

According to that hypothesis, the price ratio between developed countries tends to fluctuate around a permanent long-run average when prices are measured using a uniform currency. The hypothesis supposes that a change in the nominal exchange rate would open an arbitrage gap until the price ratio between the countries returns to its previous level. The literature finds that this hypothesis holds among developed countries, but is violated in countries that experience rapid and continuous growth.¹¹ The Bank of Israel (2015, p. 190) notes that, in keeping with the hypothesis, Israel's real exchange rate developed over the past decades without a trend of revaluation or depreciation.

Figures 2A and 2B show the distance of the consumer prices in Israel from the expected trendline based on per capita GDP in the country (the regression estimate is calculated separately for each year).¹² Figure 2A, which includes a sample of 25 OECD countries (without the countries that were members of the Soviet bloc and without Chile, for which there are no figures for the earlier years), indicates a drop in relative consumer prices in the first half of the 1990s. From 2004 until 2007, the price level

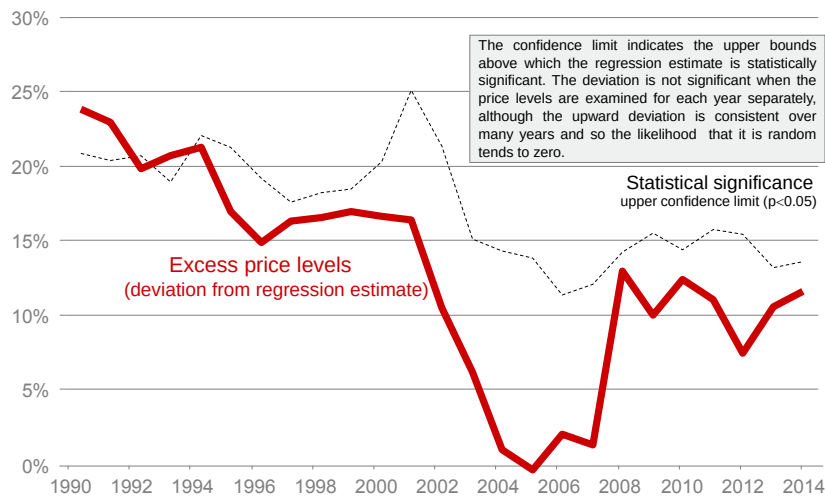
¹⁰ According to the strong form of the law of one price there should be absolute price equality of tradable products between countries. The literature tends to reject the strong form of the law and adopt the weak form, which does not require absolute price equality but maintains that the price ratio between developed countries tends to return consistently to the long-run average level (with certain restrictions). For discussion of the subject, see Rogoff (1996) and Engel and Rogers (2001).

¹¹ To be precise, it can be assumed that the weak form of the law of one price hypothesis will not hold for countries that experienced rapid growth compared to their trade partners, in keeping with the Balassa-Samuelson hypothesis.

¹² The effective nominal exchange rate represents a weighted average of the exchange rate vis-à-vis Israel's main trade partners, as calculated by the Bank for International Settlements (see link at <https://www.bis.org>).

was close to the trendline and, in 2008, there was a sharp rise in price levels compared to prices abroad, with some stabilization noted in the last few years.

Figure 2A
Excess price levels, 1990-2014
 Israel's deviation from the regression estimate, sample of 25 OECD countries*



* The regression estimate is calculated for each year separately; OECD countries excluding the US, Estonia, Hungary, Slovenia, Slovakia, Czech Republic, Chile, Poland, and Luxembourg

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat, IMF

Figure 2B presents a similar picture for the years 1995 to 2014 with a slightly wider sample, including 32 OECD countries. This figure adds a long-run average, and shows that the deviations from the trendline fluctuate around an average of about 12 percent. The figures do not include Lithuania and Latvia, which were included in Figure 1, the US,

where prices are especially low, and Luxembourg, where per capita income is double the OECD average.

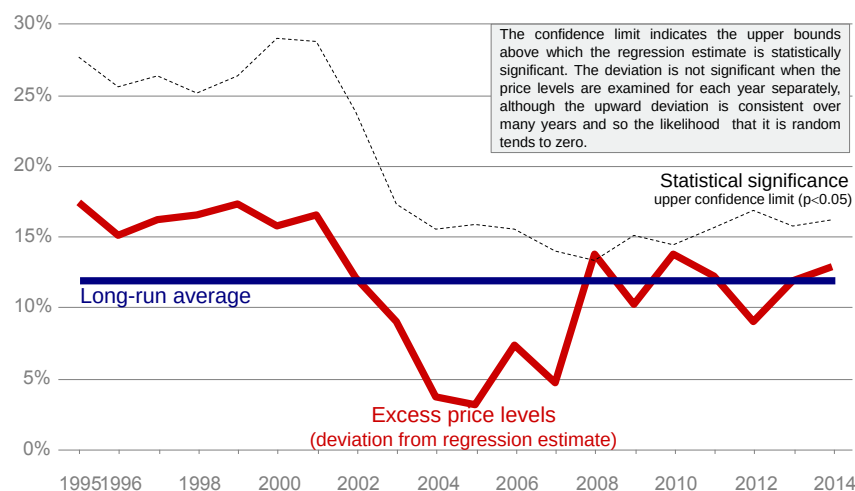
Another interesting finding from Figure 2A is the drop in relative consumer prices in the first half of the 1990s. In 1991, major trade liberalization measures were adopted. As a result, the prices of the products exposed to imports dropped and the total imports in the economy increased (Ministry of Finance, 1997). The rapid drop in consumer prices in Israel in those years compared to prices abroad can be explained, among other things, by these measures.¹³

¹³ Ricci, Milesi-Ferretti and Lee (2008) showed that opening a closed economy to international trade leads to a real devaluation of 12 percent; see also a discussion on this subject in Goldfajn and Valdes (1996). According to Misher (2003), in the early 1990s the volume of entry of foreign capital into Israel increased, and that increase might partially explain the high price level in Israel during that period. Broda (2006) showed that countries with permanent exchange rate regimes are characterized by high price levels compared to abroad, and it is reasonable to assume that the drop in price levels during that time is also the result of liberalization processes of the shekel. Additionally, during those years, there was rapid growth in countries at the bottom end of the per capita product distribution, and the observed drop might also derive from the changes in the distribution of per capita GDP in the comparison countries.

Figure 2B

Excess price levels, 1995-2014

Israel's deviation from the regression estimate, sample of 32 OECD countries*



* The regression estimate is calculated for each year separately; OECD countries excluding the US and Luxembourg

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat, IMF

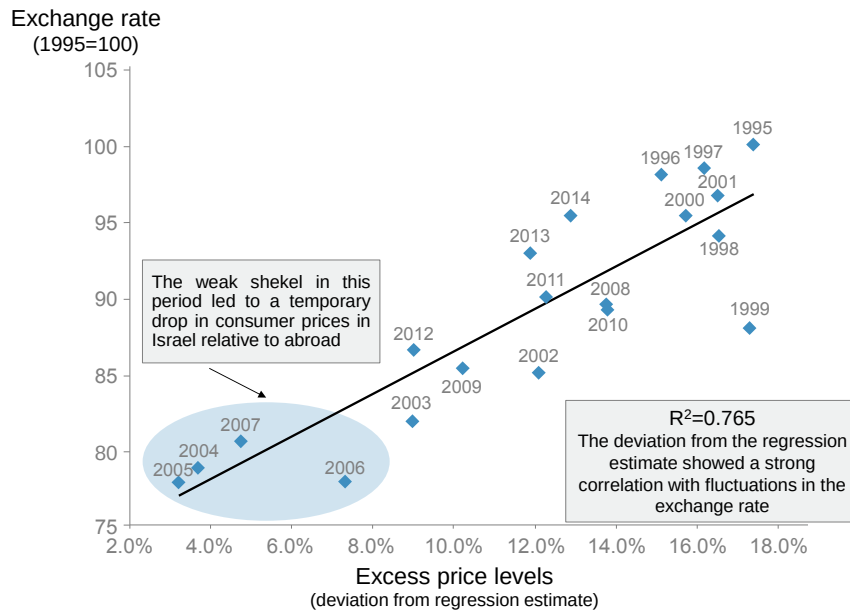
Figure 3 shows the relationship between the deviations from the trendline and the nominal effective exchange rate; it exhibits a close relationship over the years. The figure sheds light on two noteworthy developments of the past decade: the relatively comfortable level of prices from 2004 to 2007 when the shekel was weak, and the relative rise in prices in 2008 following the devaluation of the shekel. As seen, the fluctuations in consumer prices are explained well by the nominal exchange rate. The relationship between the two variables creates a paradox: in years in which the business cycle is high relative to abroad and the shekel gets stronger, the local consumer will find the cost of

living higher relative to abroad, while, in contrast, in periods when the shekel is weak, the cost of living eases relative to other countries.

Figure 3

Excess price levels and exchange rate*

distance of private consumption from regression estimate as a function of the nominal effective exchange rate, 1995-2014



* The regression estimate is calculated for each year separately; 32 OECD countries excluding the US and Luxembourg

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat, IMF

Are Consumer Prices High in Israel Due to Structural Factors?

Figures 2A and 2B show the upper bound of the 95 percent confidence interval of the forecast values. When the deviation from the trendline (the red curve) is above the confidence interval line, the difference is statistically significant during that year.¹⁴ As can be seen, the deviation from the trendline is within the confidence interval in most years, which is to say that it is not significant when the regression is run for each year separately. However, as will be shown, since the deviation occurs in all of the years examined, except during the years in which the shekel was devalued (2004 to 2007), the likelihood of finding that prices in Israel exceed the trendline randomly tends to zero. This strengthens the conclusion that consumer prices in Israel are high when they are examined over a long period of time.

In order to conduct comparative test of price long-run price levels, it is assumed that the standard deviation does not result from an omitted variable, but is “white noise,” such as the predicted cyclical fluctuation according to the weak form of the law of one price. With this assumption, consumer prices were examined for 1995 to 2014 using an additional statistical test.¹⁵ The test shows that, for 29 of the 32 countries in the

¹⁴ The lower confidence limit is not presented here for reasons of convenience, and it equals the negative value of the upper limit. For example, if the upper confidence limit is 15 percent above the trendline, the lower limit will be 15 percent below the trendline.

¹⁵ One method for analyzing this issue could be by running a single regression with fixed effects for country and year. The disadvantage of this is that there is a partial loss for the interaction with time. For this reason, there is an advantage to running the regression for each year separately and examining the regression residuals via a separate statistical test in the second stage. To this end, we assumed that the standard deviation does not derive from an omitted variable correlated with the error term, but rather that it is “white noise,” and tested this hypothesis by checking for the existence of a unit root in the panel data of the regression residuals (using first and second generation panel unit root test). The results support the assumption that the residuals are

comparison presented in Figure 2B, price levels in Israel are significantly higher at the 5 percent significance level (for Japan, Chile and Mexico the difference was not statistically significant).¹⁶

The results strengthen the hypothesis that price levels in Israel are structurally high compared to OECD countries. In accordance with the weak form of the law of one price hypothesis, relative consumer prices in Israel fluctuate around a long-run average resulting in the fact that at certain times Israel is significantly more expensive than other developed countries, and at other times its price levels are similar to that of developed countries, considering per capita income.

Figures 4A and 4B present this finding graphically and rank the comparison countries by the average standard deviation from the regression estimate. Israel's relative position indicates its long-term average of price levels (Figure 4A). The deviation from the regression is shown both for from the mid-1990s and for 2000 to 2014.¹⁷ As seen,

stationary. Thus, we find the assumption reasonable that the standard deviation does not derive from an omitted variable correlated with the error term.

To compare consumer prices over time, a Mann-Whitney non-parametric test was run to check whether the distribution of Israel's location in the various regressions was obtained by a distribution similar to that of another country in the sample. The test was run for each country separately. The basic hypothesis was that the location of the country in each regression was drawn from some distribution, and the test checks whether the distributions between two different countries are different. The null hypothesis is that there is no difference between the samples, and the test finds that the hypothesis can be rejected at a significance level of 5 percent for 29 of the 32 comparison countries presented in Figure 2B.

¹⁶ The only change from moving to a 1 percent significance level is that the null hypothesis is not rejected for Portugal.

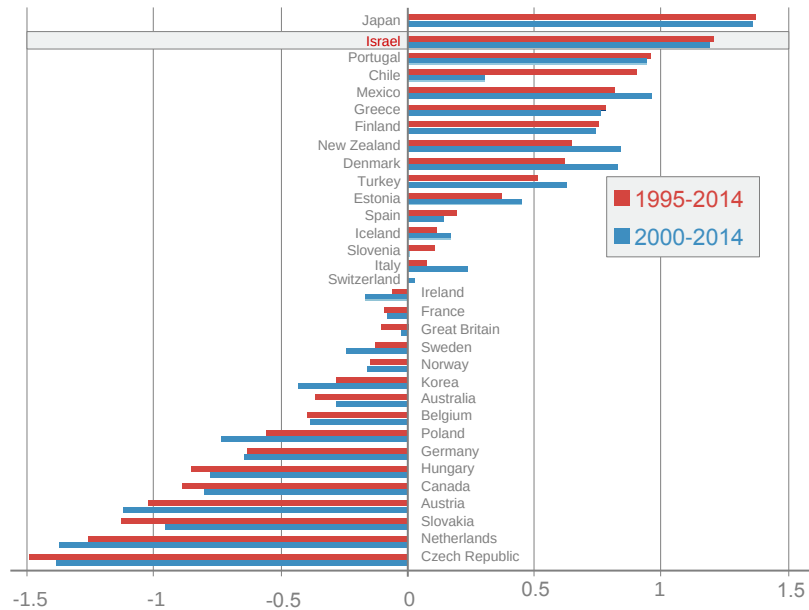
¹⁷ Another comparison was made from the start of the new millennium because during the earlier period, structural changes occurred in the Israeli economy and abroad, including the stabilization of inflation, increased flexibility in the exchange rate, completion of the plan to open the economy to competitive imports and founding of the Eurozone.

private consumption prices in Israel, taking account of the income level, are higher than in all of the other countries except for Japan.

Figure 4A

Ranking countries by excess price levels

ranking of deviation from regression estimate in standard deviation units, multiyear average*



* The regression estimate is calculated for each year separately; 32 OECD countries excluding the US and Luxembourg

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat; IMF

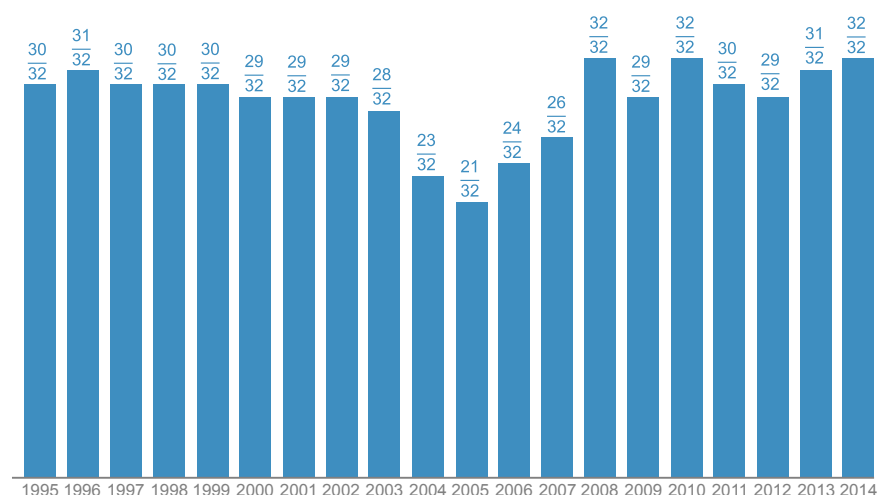
Figure 4B shows Israel's rating compared to the other countries for each year. Thus, for example, in 1995 Israel is ranked 30 out of 32 countries, which is to say that in a country comparison all but two countries are cheaper than Israel when controlling for per capita income.

The figure indicates that Israel is rated consistently at the upper end of the country ranking throughout the study period.

Figure 4B

Israel's relative position in an international ranking of price levels adjusted for income, 1995-2014*

ranking of the deviation from regression estimate for Israel relative to 32 other countries of comparison



* The regression estimate is calculated for each year separately; 32 OECD countries excluding the US and Luxembourg

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat, IMF

Another possible explanation for the drop in relative consumer prices between 2004 and 2007, aside from the devaluation of the shekel, is a change in the competitive structure of the local market. If such a change has occurred, this would result in a structural break in the connection between the effective nominal exchange rate and the deviations from the trendline. As is evident from Figure 3, the correlation between the nominal exchange rate and the price level does not seem to have changed

from 1995 to 2014, and there is no suggestion of a change in the years in question (2004-2007). This strengthens the possibility that the relatively low level of consumer prices during those years is explained by the temporary devaluation of the shekel. Furthermore, Eckstein and Friedman (2011) find that from 2005 to 2007, the real exchange rate deviated from the various definitions of equilibrium.¹⁸ Therefore, it is likely that the correlation between consumer prices and the income level during those years was not the result of a structural change in the local economy, but rather a temporary devaluation of the real exchange rate.

The argument that the high price levels in Israel in recent years when compared with other countries cannot be explained by an excessive appreciation of the real exchange rate can be supported in a similar manner. Eckstein and Friedman (2011) find that the strengthening of the currency in 2008 constituted a return to equilibrium after years in which the currency was excessively depreciated, and do not find evidence of an excessive revaluation in the years 2009 to 2010.¹⁹ Likewise, Figure 2 (above) indicates that price levels have exceeded the trendline in each of the last seven years, and it would be difficult to assume that there would be such a lengthy deviation of the real exchange rate from its level in a state of equilibrium.²⁰

Despite the fluctuation in the nominal exchange rate, in only four of the last 25 years was the price level located close to the trendline. Therefore, it is more likely that Israel's diversion from the trend of

¹⁸ There are several definitions for equilibrium of the real exchange rate. According to one approach, equilibrium is defined as a rate that balances the current account.

¹⁹ The researchers find that the shekel was overly appreciated in 2008, overly depreciated in 2009, and came close to equilibrium in 2010.

²⁰ According to Rogoff (1996), the length of time until the fading of half time of the deviation from long-run equilibrium is three to five years. Later studies indicate a shorter period of two and a half years. A study by the IMF found that about one-quarter of the deviation fades within a year (Ricci et al., 2008). Chortareas and Kapetanios (2009) present a review of empirical findings on the subject.

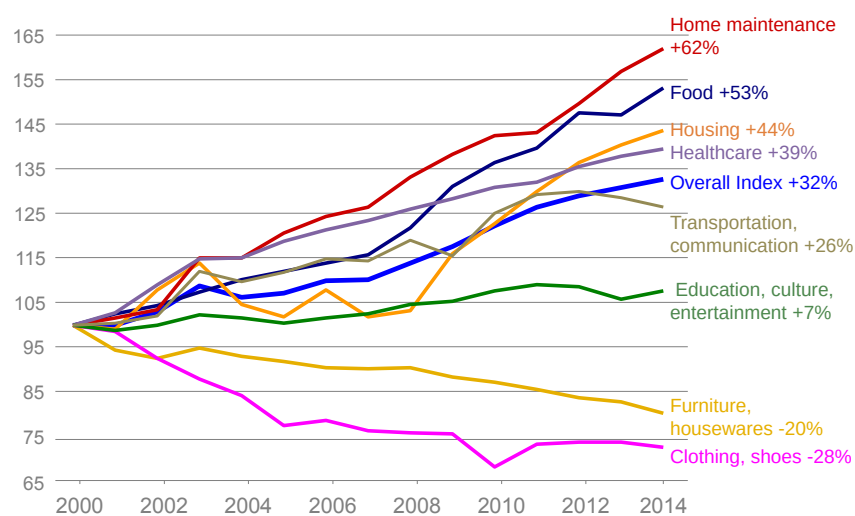
association between consumer prices and per capita income is rooted in a long-term phenomenon connected to structural aspects of the economy, and is not caused mainly by the appreciation of the shekel in 2008.

3. The Components of Private Consumption

The previous section reinforces the hypothesis that prices in Israel are high compared to other countries when taking income level into account. To complete the picture, this section will examine the changes in the prices of various elements of consumption over the past 15 years.

Figure 5 shows the development of the main categories of the Consumer Price Index from 2000 to 2015. Cumulative inflation is 32 percent from the beginning of the previous decade, which is an average of 2 percent a year – the center of the Bank of Israel's target for price stability, which is between 1 and 3 percent a year.

Figure 5
Change in components of the Consumer Price Index, 2000-2014
Index: 2000=100



Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics

The moderate rise in the Consumer Price Index is a result of a balance between products that appreciated at a relatively high level – especially in the categories of food, housing services and house maintenance – versus a moderate appreciation or reduction in other categories such as clothing and shoes, furniture and household goods. The main reason for the reduction is globalization and the exposure of those groups of products to imports over the 1990s.²¹

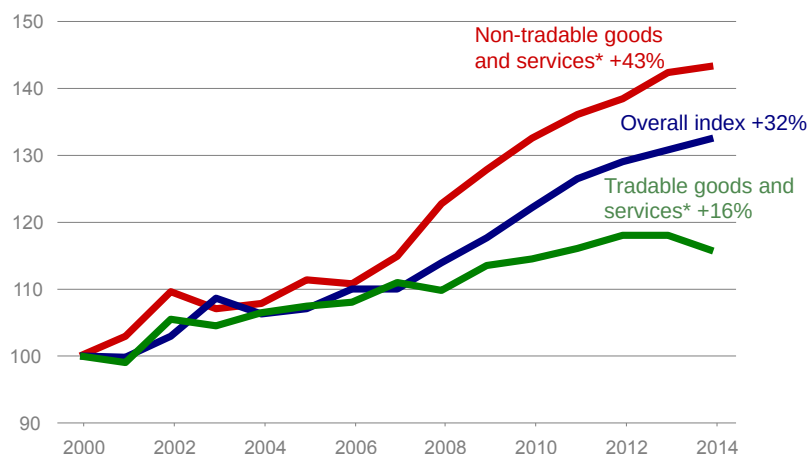
Figure 6 shows the changes in the Consumer Price Index according to the product's tradability.²² The figure shows that the prices of the non-tradable products rose at a higher rate than the general index: a cumulative rate of 43 percent, which is 2.6 percent a year. The prices of the tradable products rose at a lower rate: 16 percent cumulatively, which is about 1 percent a year. The conclusion that arises from these data is that a large part of the price rise derives from non-tradable products, and particularly from the categories of housing, house maintenance and food, which comprise nearly half of the average household expenditure. This trend seems to correspond to a certain extent with the appreciation of the shekel in the past years, which acted to reduce the prices of tradable products compared to non-tradable products.

²¹ The Bank of Israel (2015) found that the prices of these components also dropped in many other countries, but in Israel the drop was more significant.

²² The breakdown is made by the Bank of Israel and published frequently.

Figure 6
Change in price index by tradability group

Index: 2000=100



* Tradable goods and services are those with international trade, like clothing and shoes; non-tradable goods and services are from the local market only, like housing

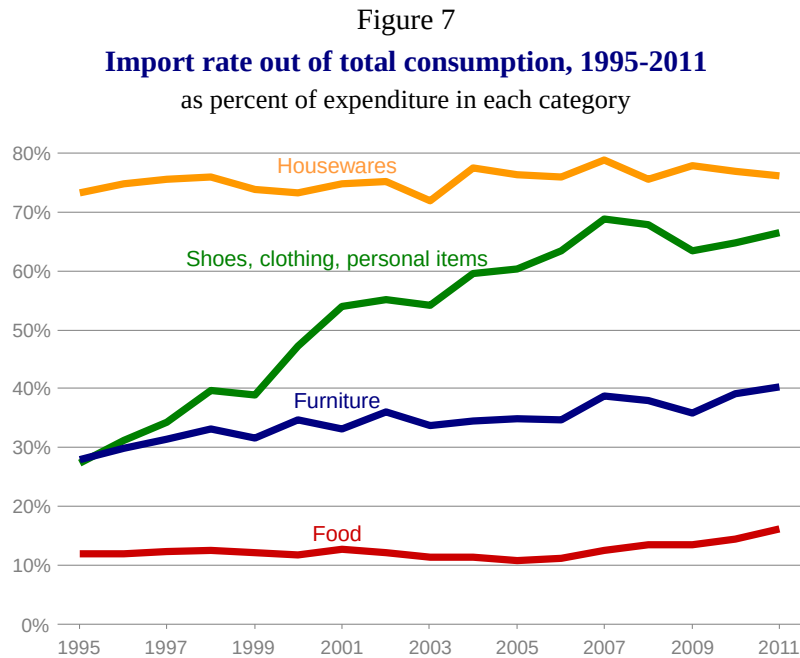
Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

Price Levels in the Food Industry as a Test Case

An examination of developments in the Israeli food industry in recent years can indicate the importance of competition for setting price levels in the Israeli economy compared to abroad. This industry is very centralized, and a small number of large local companies supply most of the food sold in Israel (Monitor, 2012). In the early 1990s, a plan to gradually introduce competitive imports was implemented in the Israeli economy, and it led to a significant rise in the imports of various products such as shoes, clothing and furniture. The import rate of food products remained extremely low, and even today, it is only 16 percent of total private expenditure on food (Figure 7). The low level of import is a result

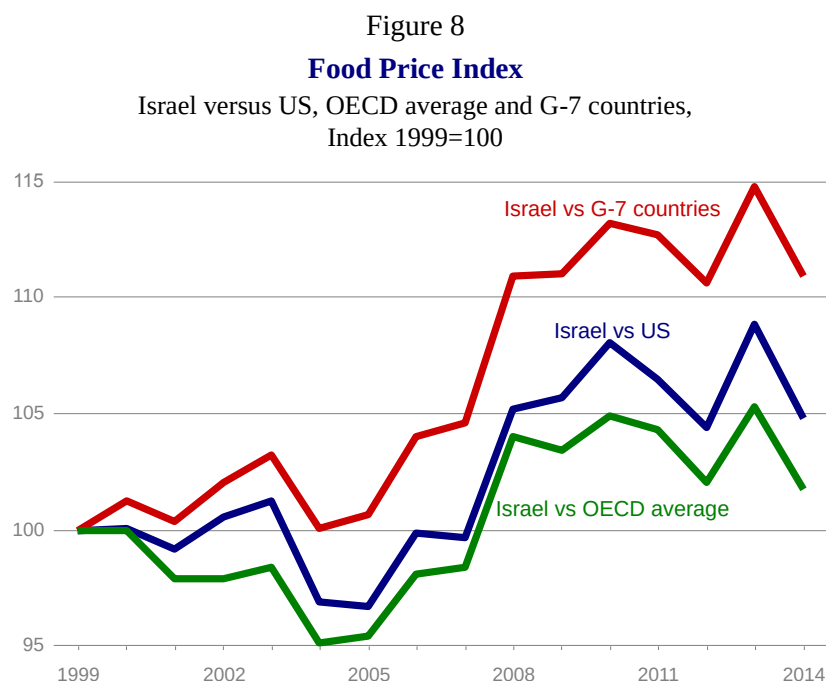
of the extent of customs protections, the proliferation of maximum quotas in the sectors of food products and agriculture, and the proliferation of standards and standards testing in the industry.²³



Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
Data: Central Bureau of Statistics

²³ A review by the State Comptroller's office in 2014 found that the official standards in the food industry originate in Israel and do not correspond to international standards (State Comptroller Report, 2014). The policy of creating original standards that differ from the standards in other large economies is also common in other areas, and constitutes a barrier for competitive imports.

The second half of the last decade saw a rapid rise in food prices – a relatively unique phenomenon for the Israeli economy (as opposed to the rise in housing prices, for example, shared by other countries that did not experience the financial crisis). Figure 8 shows the development of food prices in Israel compared to the rest of the developed countries, and indicates an exceptional rise in food prices in Israel beginning in 2006.



Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

Figure 9 shows that the rise in food prices was accompanied by a rise in return on capital, meaning a rise in the profit margins in the industry. A non-competitive market can explain a high price level, but cannot explain the continuous rise in price levels. Therefore, the rise in food prices along

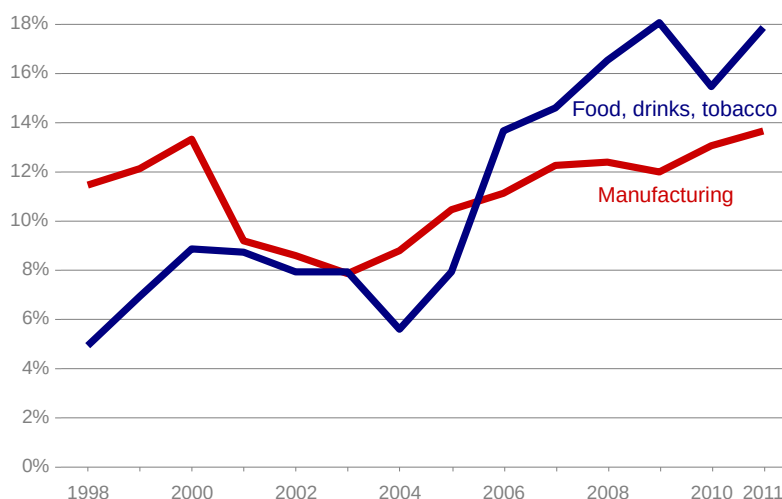
with the rise in profit margins indicates a change in the competitive structure of the industry, and there is indeed evidence to that effect. For instance, the Committee to Examine Competitiveness in the Food and Consumer Goods Market indicated the collapse of the Club Market chain and its purchase by Supersol in 2006 as a key factor that led to a drop in competitiveness and a rise in prices in the retail sector (Ministry of Economy, 2012). Likewise, that year the Ministry of Health toughened its procedures for the parallel import of food products, as part of the changes in the supervision regime following the “Remedia Affair.”²⁴ The import track by other than exclusive importers poses a competitive threat to the local food manufacturers and its restriction may have helped raise the profit margins in the industry.²⁵ According to another view, the sale of Tnuva to Apax Partners in 2008 led to a strategic change in the industry and a more aggressive policy of maximizing profits by the food corporation.²⁶ Friedman (2012) shows that in late 2008, a gap opened between consumer prices and wholesale prices in dairy products. The gap closed with the start of the social protests in the summer of 2011 (this comparison is presented in the appendix of this chapter).

²⁴ In 2003, the German Milchwerke Westfalen EG (Humana GmbH) company failed to include vitamin B1 (thiamine) in a new vegetarian baby formula it began manufacturing. Senior officials in Remedia knew of this and did nothing about it. Furthermore, it retained the old list of ingredients on the new formula stating that it contained vitamin B1. Five Israeli Health Ministry officials and the then-head of the Ministry’s National Food Service failed to properly check the documents and contents before releasing the Remedia baby formula for distribution. The new formula resulted in the deaths of three infants and the severe injury or potential severe injury of more than 20 others. This became known as the Remedia Affair.

²⁵ In 2014, the Locker Committee recommended allowing parallel import of non-sensitive dry food products (the Cornflakes Reform).

²⁶ That purchase yielded a high return for the Apax Partners when, in 2014, Tnuva was sold to the Bright Food Company.

Figure 9
Return on capital in manufacturing and food industries*
 as a percent of capital in the industry

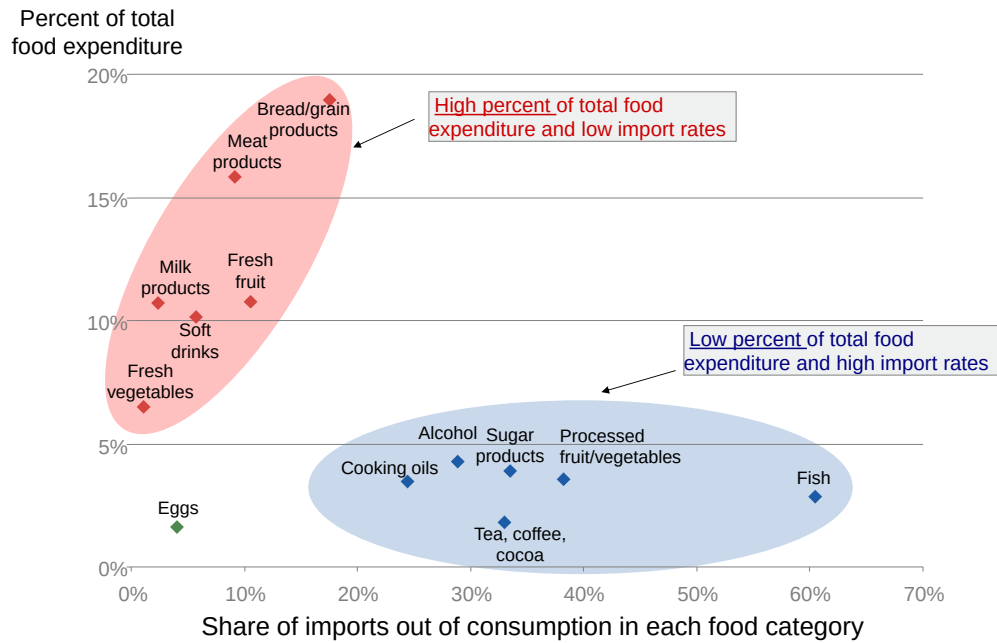


* With depreciation

Source and Data: *Bank of Israel Report 2014*

Figure 10 presents a comparison of food products by their share of total household expenditure on food (the vertical axis) compared to the rate of imported food in the group (the horizontal axis). As can be seen, in the food groups with higher consumption levels, import levels are relatively low. Most of the private expenditure on food in Israel is in the categories of flour and grains, meat and meat products, fresh fruit, milk and dairy products, and light beverages – groups for which import levels are very low. Conversely, food categories where import levels are higher, such as sugar and sugar products and fish, occupy a relatively small segment of the total private expenditure on food. This means that the majority of the food basket depends mainly on local manufacturers.

Figure 10
**Food category import rate and its share of total
 food expenditure, 2011**



Source: Eitan Regev, Taub Center for Social Policy Studies in Israel
 Data: Central Bureau of Statistics

4. Conclusions

A comparison of private consumer prices over time compared to per capita product produces supporting evidence to the finding that price levels in Israel have been high by international comparison for many years. Since high price levels not only characterize the years of the appreciation of the shekel after the outbreak of the world crisis in 2008, it

is apparently a phenomenon that is connected to structural factors of the economy and does not derive mainly from the appreciation of the shekel.

A look at the various components of consumption finds that a large part of the price rise that occurred in Israel in the early 2000s derived from the prices of non-tradable products, such as food and housing. The rise in the prices of the tradable products was more moderate, and in consumer categories that were exposed to imports – such as clothing and shoes, furniture and household goods – there was actually a significant price drop. However, in the food industry, where the levels of import are relatively low, there was a relatively rapid rise of prices, apparently because of a change in the structure of local competition. These findings, as well as those in previous studies on the subject, indicate the importance of continuing to expose the economy to imports as a means of increasing competition, reducing prices, and improving consumer welfare in Israel.

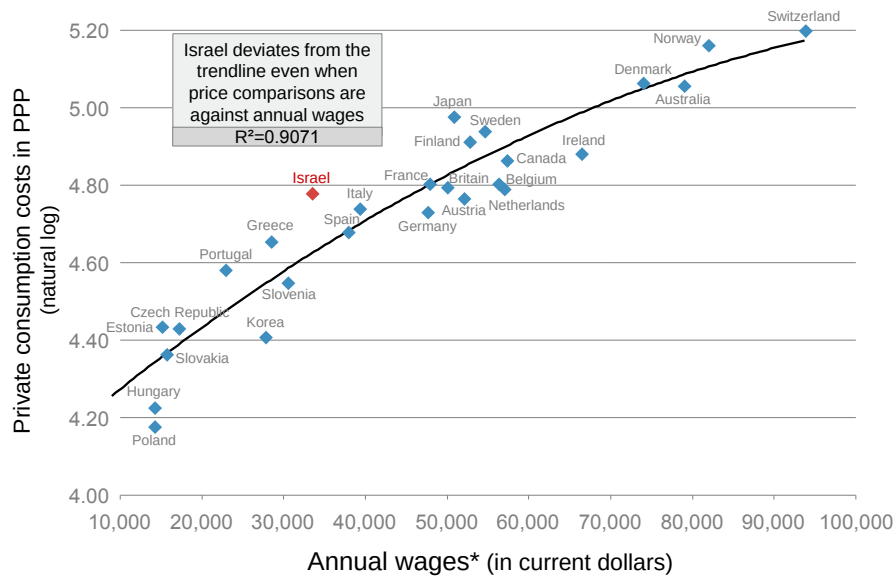
It is important to emphasize that the comparison of the consumer prices in Israel to prices abroad is not without methodological problems, and its results depend to a large extent on the level of the exchange rate. As a result, the development of consumer prices needs to be examined over a long time period rather than in a given year. The examination presented here is the first attempt, to the best of the author's knowledge, to look at price levels in Israel over many years, but even this examination relies on assumptions. This constitutes only supporting evidence, and there is still a need for further research on the subject. Likewise, the structural factors that weigh heavily on the cost of living should be examined. The committees established to examine competition in the food industry and in the import sector are examples of positive steps taken in that direction. At the same time, it should be noted that increasing competition in the local market is not limited to exposure to competitive imports, and it is necessary also to prevent the exploitation of market power by dominant producers and guarantee an adequate degree of competition in the marketing chains.

Appendix

Appendix Figure 1

Relation between private consumption costs and annual wages, 2011

28 OECD countries



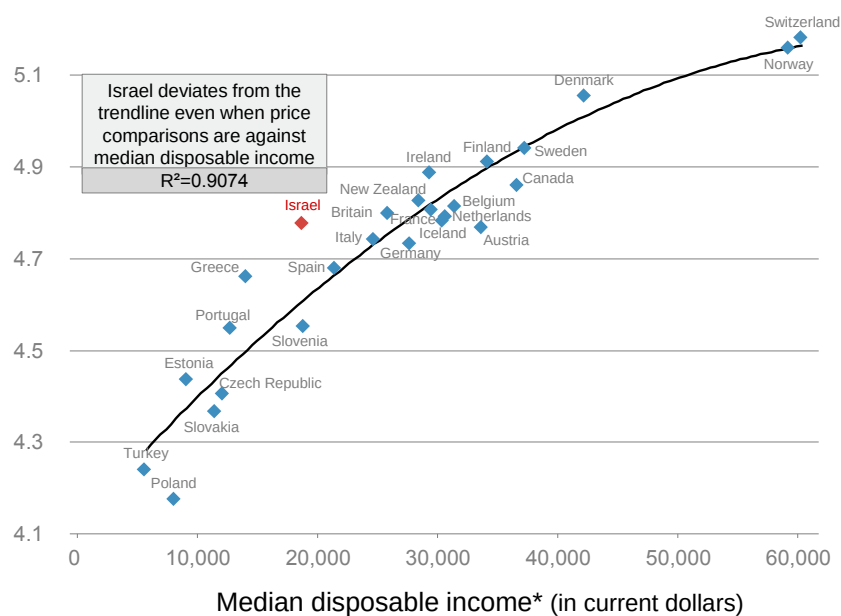
* Gross wages for employed person

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat

Appendix Figure 2
**Relation between private consumption costs and
 median disposable income, 2011**

26 OECD countries



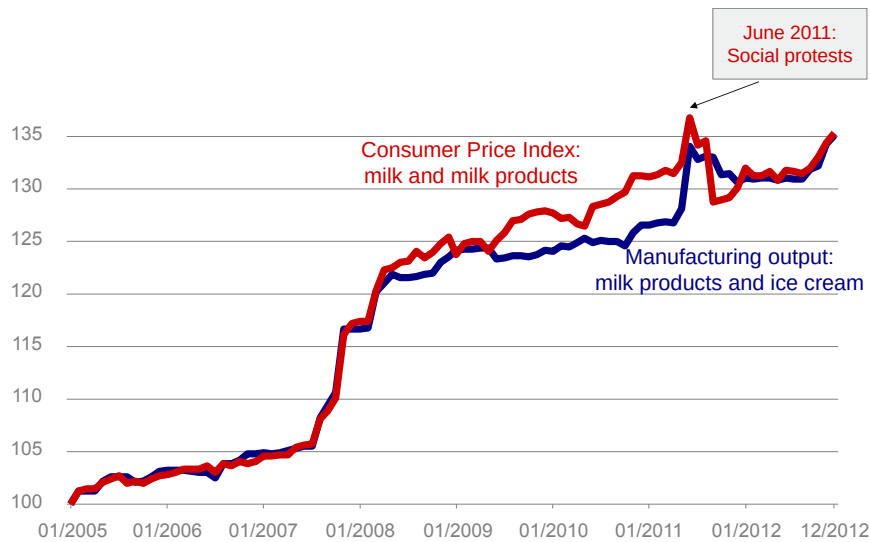
* Median disposable income according to OECD definition

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat

Appendix Figure 3 shows the development of consumer prices of milk and dairy products and the wholesale prices represented by the Industrial Production Index of dairy products and ice cream. It can be seen that from 2005 to 2008, the wholesale prices and the consumer prices developed in the same way. In 2009, a gap opened between the prices which closed with the start of the social protests in the summer of 2011. This comparison was first presented by Friedman (2012). The figures after 2013 are not presented here because of the change in the categorization of economic industries made that year.

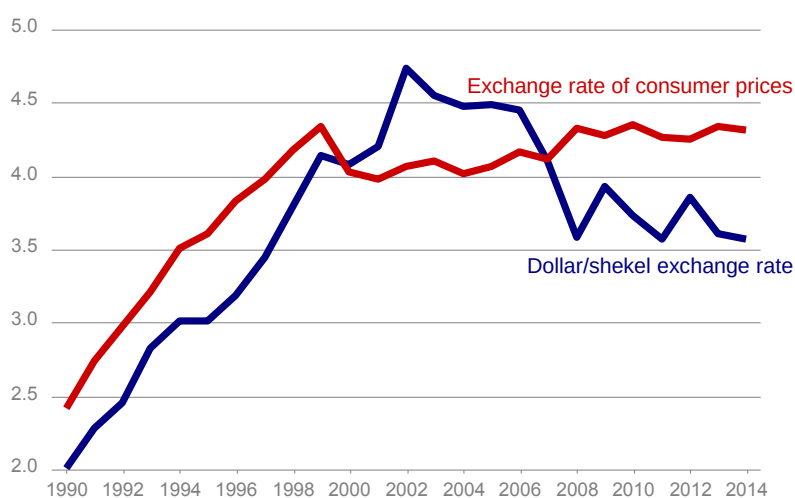
Appendix Figure 3
**Wholesale prices and consumer price of milk and milk products
 2005-2012**



Source: Gilad Brand, Taub Center for Social Policy Studies in Israel
 Data: Central Bureau of Statistics

Appendix Figure 4 presents the price ratio between a local consumer basket in shekels and a consumer basket in the US in dollars (the red curve), and the dollar/shekel exchange rate (the blue curve). The comparison of consumer prices between countries was made by division of the ratio of basket prices by the currency rate. When the blue curve is lower than the red one, Israel is more expensive than the US, and vice versa. As of 2014, an exchange rate of NIS 4.35 to the dollar was needed so that private consumer prices in Israel would be identical to consumer prices in the United States.

Appendix Figure 4
Exchange rate and exchange rate of consumer prices*
 US dollars, 1990-2014



* Ratio between price of local consumer goods basket in shekels and consumer basket in the US

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD Stat

Appendix Table 1. **Results of the estimate of the log consumer price using per capita GDP, 2014**

32 OECD countries (without the US and Luxembourg)

Category	Value
GDP per capita/10 ³	0.026
Standard deviation	(0.002)*
GDP per capita squared/10 ⁷	-0.001
Standard deviation	(0.000)*
Constant	3.91
Standard deviation	(0.049)*
Root MSE	0.079
Sample size	32
R-squared	0.923
Mean GDP per capita (in current US dollars, thousands)	39.29
Standard deviation GDP per capita	21.13
Mean PPP for private consumption	107.40
Standard deviation PPP for private consumption	28.96

* Statistical significance level of less than 1%

Source: Gilad Brand, Taub Center for Social Policy Studies in Israel

Data: OECD

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The Change in the Household Tax Burden Between 2003 and 2011

Moshe Hazan^{*}

Abstract

This chapter assesses the change in the tax burden on households across the various income deciles during the period between 2003, the fiscal policy “watershed” year, and 2011. In both 2003 and 2011, the direct tax burden, defined as the ratio of tax imposed on income to gross income, increases along with income. By contrast, the indirect tax burden, defined as the ratio of tax imposed on consumption to net income, declines along with income. Moreover, in the two years examined, the total tax burden, defined as the ratio of tax paid to gross household income, declines between the bottom decile and the second decile, remains almost unchanged up to Decile 7, and then rises. In 2011, the total tax burden on households in all income deciles was lower than in 2003, but the decline was uneven. The tax burden declined more substantially at the extremes of the income distribution, i.e., in the lowest and highest deciles – meaning that it became more uniform between households. In absolute terms, households in the lower deciles (Deciles 1 to 5) benefited from a tax burden reduction of NIS 130 to NIS 430 per month, while households in Deciles 8 to 10 had a reduction of NIS 800 to NIS 2,500 per month. The fact that direct taxes became less progressive between 2003 and 2011 and served to maintain, and in fact widen, net income disparities between households.

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Introduction

Public debate in Israel often centers on the erosion of the middle class and the argument that the economic status of the weaker groups in society has worsened. Government has a role to play in this and its policy can affect the welfare of all households and all population strata, primarily through government spending and the tax system. Earlier works have documented the steep decline in government spending in Israel since 2003 and pointed to the subsequent weakening of the lower income strata. This chapter will address the impact of taxation policy, that is, of government revenue, on Israeli households. The chapter looks at the change in the tax burden by household income deciles that occurred between 2003, the “watershed” year in terms of Israeli fiscal policy, and 2011. The main findings are that all households have benefited from a reduction in the tax burden, but that the three highest income deciles experienced a more substantial easing of the burden, in both relative and absolute terms.

Two earlier works examined the tax burden by income deciles. Bibi-Kersai (2005) looked at the total tax burden and its distribution between direct incidence (the ratio of tax imposed on income out of gross income) and indirect incidence (the ratio of tax imposed on consumption to net income); however, her study only examined data from 2003. Strawczynski (2015) also looks at the tax burden for the years 2001 and 2012, dividing households by income deciles; but his study focuses on the question of what type of tax policy is desirable for the coming decade through the prism of growth. This chapter seeks to complete the picture exploring the impact of taxation policy on households in the various income deciles.

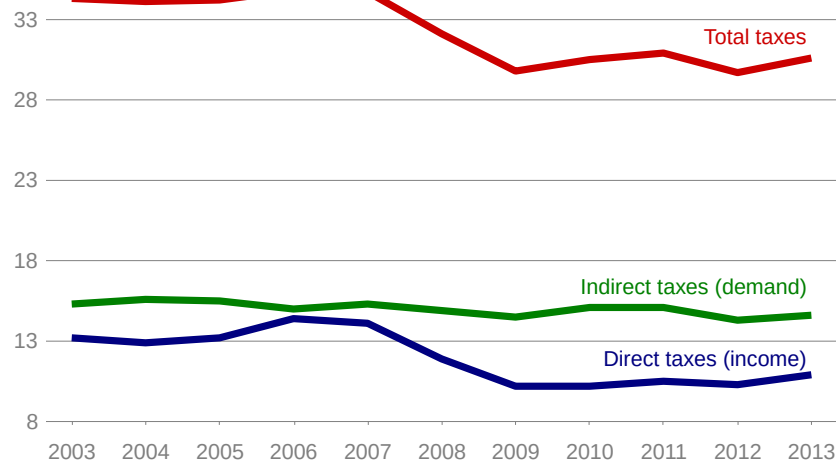
1. Development of the Tax Burden in Israel Between 2003 and 2013: A Macro Picture

As noted, government policy affects citizens' welfare in a number of ways. First, total government spending and its distribution affect the welfare of population groups differentially. Second, the government can affect the welfare of different groups through regulation. A third means of influence is that of tax rate and mix.

During the past decade, the state budget as a share of GDP has declined from 50.2 percent in 2003 to 41.3 percent in 2013. Hazan and Dahan (2014) performed an extensive analysis of the budget changes and of the change in government spending composition between 1995 and 2009. The picture that emerges from their study shows that the steep drop in the government's share of GDP started in 2003 and points to a major decline in the level of public service, with the harshest blow dealt to social service spending. This decrease had the greatest impact on the lower socioeconomic strata.

Alongside the decline in government spending, total tax revenues collected by the government decreased. Figure 1 shows that between 2003 and 2013 there was a decline in the tax incidence, defined as the ratio of tax collection as a share of gross domestic product (GDP) – from 34.3 percent in 2003 to 30.9 percent in 2011 and 30.6 percent in 2013.

Figure 1
Total revenue as percent of GDP
 by tax type,* 2003-2013



* Payments to the National Insurance Institute are not included in direct taxes, because of the OECD's calculation method, but they are taken into consideration as a part of total taxes

Source: Moshe Hazan, Tel Aviv University and Taub Center

Data: OECD

It is commonly believed that tax reductions favor society's more affluent, as they pay most of the taxes. Government spending favors the public at large with, perhaps, special emphasis on less affluent populations, given that some services, such as welfare payments and housing assistance, are intended specifically for them. Furthermore, tax composition also plays an important role in this context. Direct taxes on income are progressive, that is, the rates go up along with income. Thus, most of the direct tax burden falls on the higher-income levels. Indirect taxes, by contrast, are imposed on consumption. Given that the weaker socioeconomic groups spend most – and sometimes all – of their income on consumption, these taxes tend to be regressive: households in the lower income deciles bear a higher indirect tax burden than do the more

affluent. Therefore, to examine the impact on households by income deciles, a distinction between direct and indirect taxes must be made.

As can be seen in the figure, income tax rates declined in the 2000s, and their share of GDP dropped from 13.2 percent in 2003 to 10.9 percent in 2013. The average marginal tax rate on income from labor declined from 31 percent in 2003 to 19 percent in 2011 (Hercowitz and Lifschitz, 2015). Other changes in direct tax policy were made in accordance with recommendations of the Committee on Socioeconomic Change (the Trajtenberg Committee). In particular, a 2-percent surtax was imposed for the first time on the higher tax brackets – those with particularly high incomes (over NIS 800,000 in 2012) from all sources. Additional credit points were also given to fathers of children under age 3. Kimhi and Shraberman (2012) demonstrate the impact of these changes on the tax burden borne by the various income deciles. For example, the direct tax burden borne by the three lowest income deciles was not affected by the changes at all. By contrast, the direct tax burden on higher deciles rose slightly: less than 0.2 percentage points for the fifth decile and nearly 1.2 percentage points for the highest decile, due mainly to the surtax.

Alongside the taxes on income, Figure 1 displays the indirect taxes. The figure shows that even these taxes declined during the period in question, although the drop is more moderate: from 15.3 percent of GDP in 2003 to 15.1 percent in 2011 and 14.6 percent in 2013.¹

¹ The total tax is composed of income tax, indirect taxes and payments to the National Insurance Institute. National Insurance payments declined from 5.8 percent of GDP in 2003 to 5.1 percent in 2013. In calculating the household tax burden for this chapter, payments to the National Insurance Institute were added to income tax and together they constituted direct taxes.

Thus, the data presented in Figure 1 indicate an overall decline in the tax revenues collected, and an even larger reduction in direct tax compared with indirect tax revenues. This macro picture supports the argument that the decrease in the tax burden mainly benefited the socioeconomically stronger groups. However, these aggregate figures do not enable a clear identification of the primary beneficiaries of the change in the tax mix. Moreover, they do not allow a quantification of the change in the tax burden among population groups. The following section will address this issue in greater depth.

2. Distribution of the Tax Burden Among Income Deciles, 2003 and 2011

This section looks at how the tax burden on households in the various income deciles² changed between 2003 and 2011. The year 2003 was chosen because it marked the start of major cutbacks in government spending, while 2011 was chosen as representative of the present.³ This type of analysis poses a methodological problem: while the direct taxes that households pay are easy to determine through Central Bureau of Statistics' household income and expenditure surveys, estimating indirect tax payments is not a simple matter. The reason for this is that a distinction must be made between expenditures that are subject to value added tax (VAT) and those that are not, and it must be determined whether a given expenditure is subject to sales tax, and if so – at what

² Throughout this chapter, households are assigned to deciles based on gross income per standardized person (after deducting income from housing and vehicle). The weighting is that used by the Central Bureau of Statistics.

³ The latest spending survey available at the time this chapter was written was for 2012. However, the social justice protests that led to changes in government policy broke out in the summer of 2011, and an examination of the taxation situation a year before the protests reflects the policy that led up to them. Thus, the data chosen for comparison purposes are from 2011 and not from 2012.

rate. Moreover, the country of origin of the goods purchased is not known, and therefore it is also not known whether a given expenditure included import taxes or not.

In order to overcome these problems, the assessment of indirect tax incidence in this chapter employs a methodology that was developed by Bibi-Kersai (2005).⁴ The main goal of this chapter is to describe the change that occurred in the tax burden by income decile during this period, and to identify the primary beneficiaries of the change in Israeli tax policy.

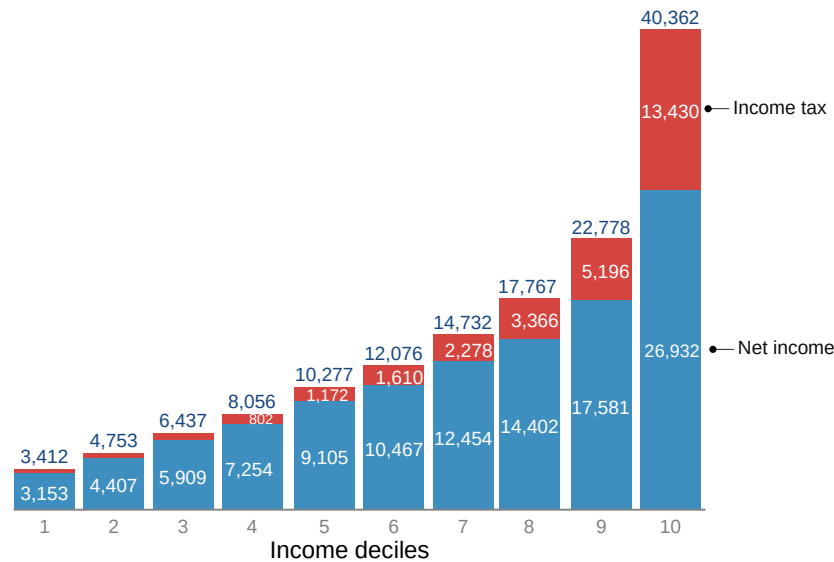
Direct Tax Burden

Figure 2 presents household income (gross and net) and total direct taxes by income deciles for 2003 (at 2011 prices).⁵ It can be seen that the direct tax increases sharply along with income. Up to Decile 5, the total direct tax ranges from NIS 250 to NIS 1,200, while from Deciles 6 to 10 it ranges from NIS 1,600 to NIS 13,000.

⁴ First, spending on goods and services subject to VAT was calculated, then multiplied by the statutory tax rate for each of the variables. Then spending on alcohol, tobacco, fuel, and motor vehicle purchases was calculated, and the result for each item multiplied by the mean tax rate for each category. The remaining indirect taxes, such as real estate and television taxes and fines, are calculated directly based on the survey.

⁵ Direct taxes include all mandatory payments on income, and overall consists of income tax, payments to the National Insurance Institute and Health Tax.

Figure 2
Monthly income and income tax, 2003
 by household income decile, shekels, 2011 prices



Source: Moshe Hazan, Tel Aviv University and Taub Center

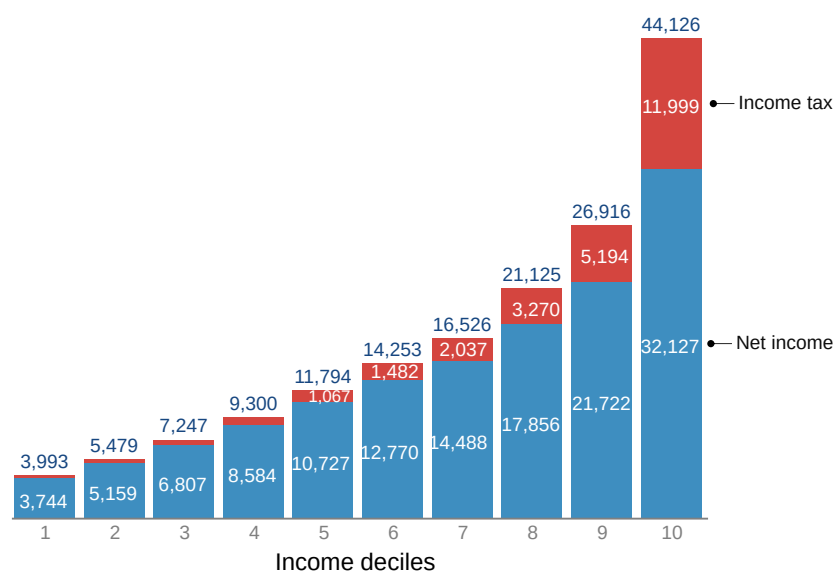
Data: Central Bureau of Statistics, *Household Expenditure Surveys*

As noted, the direct tax system is progressive. While the ratio between average gross income in the uppermost decile to average gross income in the lowest decile was nearly 12, the corresponding net income ratio was 8.5. Similarly, the ratio between the average gross income of the ninth decile to the average gross income of the second decile was almost 5, while the net income ratio between the two deciles was 4.

Figure 3 also presents total household income and direct taxes, but this time based on 2011 data. The gaps shown in Figure 2 are clearly visible in Figure 3 as well, but gross-income inequality declined compared with 2003; the ratio between the average gross income of the highest decile to that of the lowest decile dropped to 11, while the corresponding ratio

between the ninth and second deciles remained the same. However, the decline in the direct tax burden during this period left the net-income ratio between the highest and lowest deciles at 8.5, and actually increased the net-income ratio between Decile 9 and Decile 2 to 4.2.

Figure 3
Monthly income and income tax, 2011
 by household income decile, shekels, 2011 prices



Source: Moshe Hazan, Tel Aviv University and Taub Center

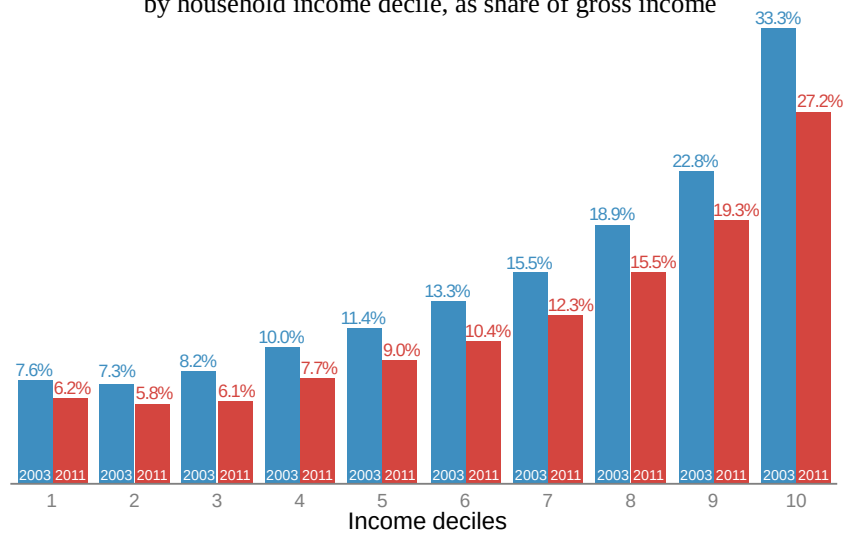
Data: Central Bureau of Statistics, *Household Expenditure Surveys*

Figure 4 presents the direct tax burden on households by income deciles for the years 2003 and 2011. As noted, tax incidence is calculated as the ratio between total taxes on income and household gross income. In both 2003 and 2011, the direct tax burden rose steadily and steeply between the different income deciles; the more affluent the household, the greater its tax burden. In 2003, the direct tax incidence was 7.6

percent of gross income for households in the lowest decile, rose to 11.4 percent of gross income for households in Decile 5 and reached 33.3 percent of gross income for families in the highest decile.

As can be seen in the figure, the direct tax incidence in 2011 is lower than in 2003 for all deciles. In 2011, the direct tax burden borne by households in the lowest decile was 6.2 percent of gross income (a decline of 1.4 percentage points compared with 2003), and rose to 9 percent of income for households in Decile 5 (a drop of 2.4 percentage points) and to 27.2 percent of gross income for households in the highest decile (a reduction of 6.1 percentage points in relation to 2003).

Figure 4
Direct tax burden, 2003 and 2011
by household income decile, as share of gross income



Source: Moshe Hazan, Tel Aviv University and Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

This being the case, the decline in direct tax incidence between 2003 and 2011 grows as the income decile increases; that is, the wealthier the household, the larger the reduction in the direct tax burden it enjoyed. Again, the fact that the direct tax became less progressive in 2011 compared with 2003 helped maintain, and even widen, the net income disparities between households.

Spotlight: *Potential Impact on Income Distribution of Changes in Direct Taxation*

Kyrill Shraberman

After an income tax reform was announced in 2003, Israeli citizens enjoyed a reduction in direct tax incidence. In 2009, when a new government took the reins, the policy of lowering income tax rates was maintained and, as noted, all of these tax policy changes had consequences for income distribution. This raises a question about the potential for income tax policy to reduce income inequality. In order to understand this potential, the Reynolds-Smolensky Index was used. This index expresses differences in income distribution inequality before and after the influence of direct taxation, that is, the decline in income inequality that results from direct taxation (Reynolds and Smolensky, 1977).

Figure 5 presents the difference between the Gini inequality coefficient for all income, including social benefits and allowances, and the Gini coefficient solely for income after taxes (income tax, National Insurance Institute and Health Tax payments) for the period 2003-2013. For example, the figure shows that in 2008, income inequality in Israel the taxation mechanism narrowed income inequality in Israel by 0.04 Gini points (from a Gini coefficient of 0.428 before tax payments to 0.388 after). Between 2003 and 2009, the ability of income tax to reduce inequality trended downward, due to a lowering of tax rates. Beginning in 2010, there was an improvement in the income tax system's potential to reduce inequality, although in 2014, that potential was still lower than in 2003.

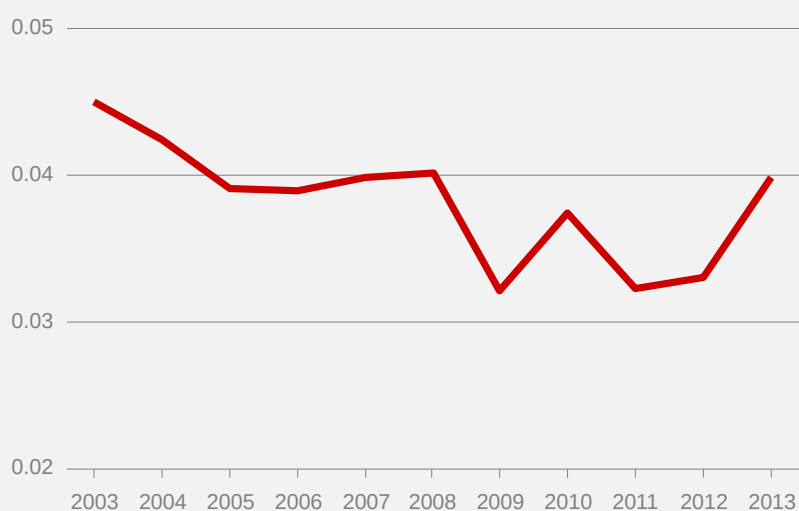
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Figure 5

The potential of direct tax to reduce inequality

the difference between the Gini coefficient on income*
before and after income tax (Reynolds-Smolensky Index)



* Including benefits and transfer allowances

Source: Kyrill Shraberman, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics, *Household Expenditure Surveys*, 2003-2014

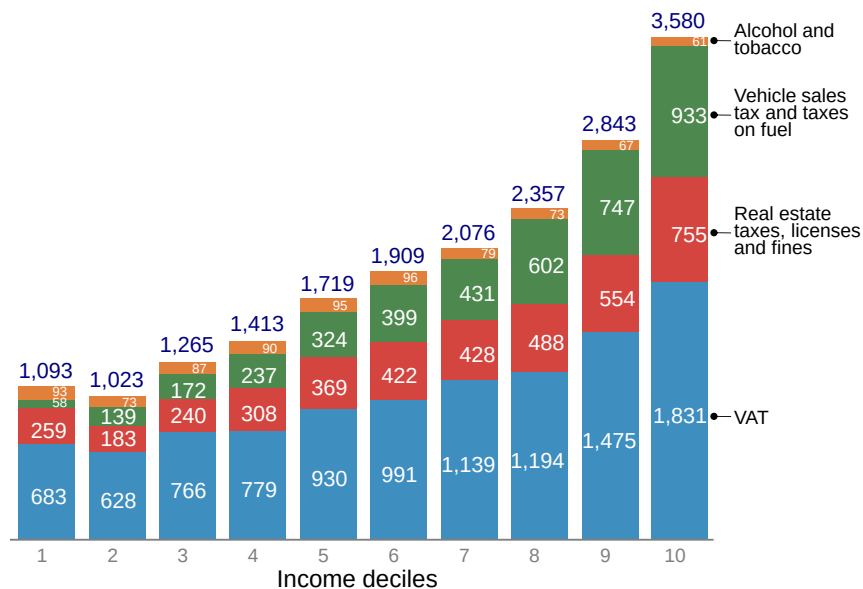
Indirect Tax Burden

Figure 6 presents the total indirect taxes paid by households in the various income deciles in 2003 (shown in 2011 prices), broken down by type of tax. A number of conclusions may be drawn from the data. First, total indirect taxes increase almost consistently with income: from the NIS 1,000 range in the two lowest deciles to NIS 3,600 in the highest. Second, VAT is the largest component of the four indirect taxes in each of the deciles. VAT accounts for about 63 percent of the indirect tax paid by the lowest decile and 50 percent of the indirect tax paid by the eighth, ninth and tenth deciles.

Figure 6

Indirect taxes, 2003

by household income decile, monthly payment in shekels, 2011 prices



Source: Moshe Hazan, Tel Aviv University and Taub Center

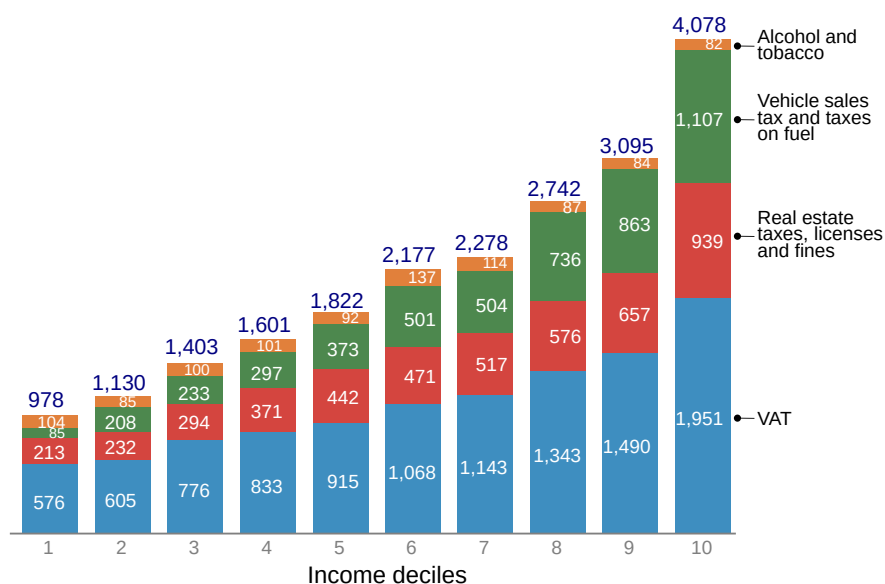
Data: Central Bureau of Statistics, *Household Expenditure Surveys*

Figure 7 also presents the indirect taxes paid by households, this time for 2011. All of the income deciles paid higher indirect taxes in 2011 than in 2003, except for the first decile. Moreover, VAT remains the largest component across all of the deciles, although its share of the total indirect tax in 2011 dropped relative to 2003. This decline is not surprising given that the VAT rate in 2003 was 18 percent and fell to 16 percent in 2011.

Figure 7

Indirect taxes, 2011

by household income deciles, monthly payment in shekels, 2011 prices

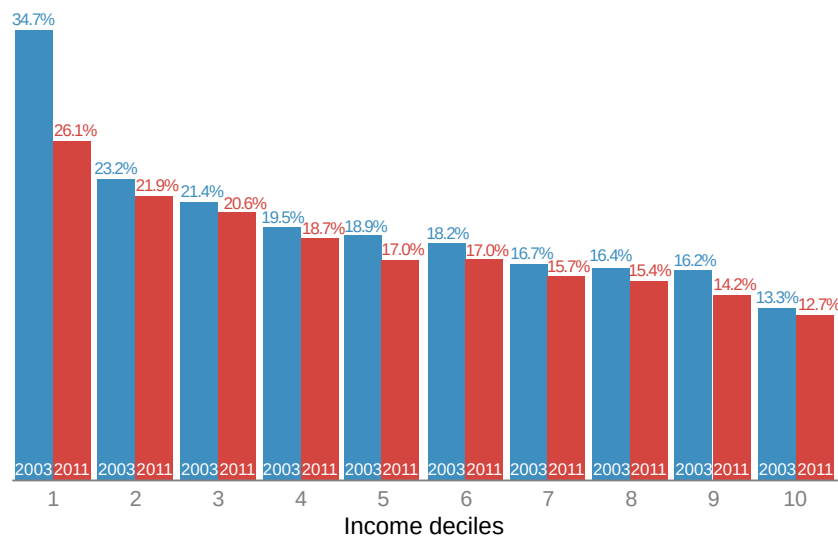


Source: Moshe Hazan, Tel Aviv University and Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

Figure 8 presents the indirect tax burden on households by income deciles for 2003 and 2011. The figure displays a mirror image of what was shown in Figure 4 (previously) regarding the direct tax burden. In both 2003 and 2011, indirect tax incidence declined steadily between income deciles: the poorer the household, the greater the indirect tax burden it bore. Moreover, it shows that the indirect tax incidence for 2011 was lower than that for 2003. In 2003, the indirect tax burden was 34.7 percent of net income for the lowest decile, versus 26.1 percent in 2011; for the fifth decile, indirect tax incidence declined sharply from 18.9 percent in 2003 to 17 percent in 2011; while for households in the highest decile the indirect tax burden dropped from 13.3 percent of net income to 12.7 percent in 2011.

Figure 8
Indirect tax burden, 2003 and 2011
 by household income decile, as share of net income



Source: Moshe Hazan, Tel Aviv University and Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

Total Tax Burden

Figure 9 describes the total tax burden – the ratio of all tax payments to gross household income – by income deciles for the years 2003 and 2011.⁶ A few outstanding points can be discerned in the figure. First, both in 2003 and in 2011, the total tax incidence borne by families in the lowest decile and families in the eighth, ninth and tenth deciles was higher than the burden falling on households in the second to seventh deciles. In 2003, the total tax incidence was nearly 40 percent of the gross income of households in the lowest decile. It declined to less than 30 percent of the income of households in the second decile, a level that remained nearly unchanged up to Decile 7. The 2003 tax burden rose to over 32 percent of income for Decile 8, while for the two highest deciles it amounted to 35 percent (Decile 9) and 42 percent (Decile 10) of household income.

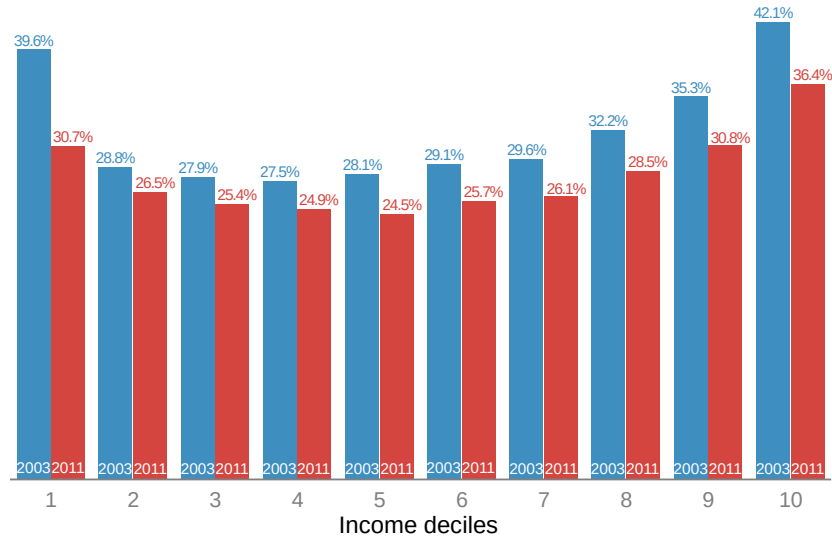
This high level of tax incidence borne by the lowest and the two highest deciles was seen in 2011 as well. The burden on households in the lowest decile was 30.7 percent of gross income, dropping to about 24–26 percent for the second to seventh deciles. The total tax burden rose along with income decile, reaching 28.5 percent of gross income for Decile 8, 30.8 percent for Decile 9 and 36.4 percent for households in Decile 10.

As the figure shows, the tax incidence was distributed much more equitably in 2011 than in 2003, as the main beneficiaries of the easing of the burden were the deciles at both extremes, that is, the lowest and highest deciles.⁷

⁶ Note that because direct tax incidence is customarily calculated against gross income while indirect tax incidence is calculated against net income, total tax incidence is **not** equal to the sum of direct and indirect tax incidence.

⁷ The findings in Strawczynski (2015) are similar to those described here, except for the tax burden borne by the first decile. While the figure in this chapter is 40 percent of the income of households in this decile, Strawczynski estimated it at 29 percent in 2001, giving a similar figure for 2012. Bibi-Kersai's findings (2005) are also similar to those reported here, except for the

Figure 9
Total tax burden, 2003 and 2011
 by household income decile, share of gross income



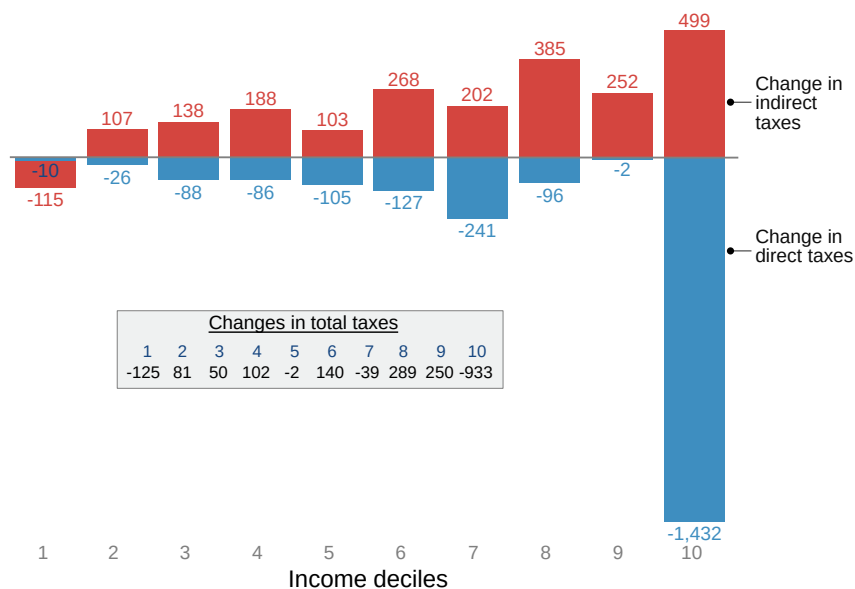
Source: Moshe Hazan, Tel Aviv University and Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

Figure 10 presents the difference in tax payments between 2003 and 2011. In absolute terms, the tax total changed only slightly between those years. Households in the eighth and ninth deciles paid NIS 250 in taxes per month in 2003 which increased to NIS 300 per month in 2011. Taxes for households in the first to seventh deciles went up or down by a maximum of NIS 140 per month in 2011 relative to 2003. Only households in the highest decile stood out by paying over NIS 900 less in taxes per month in 2011.

tax burden on Decile 1, which she estimates at 48 percent. Given these large differences, it appears that background data hinder the measurement of the tax burden borne by Decile 1, and that the estimates for this group need to be carefully examined.

Figure 10
Change in monthly tax payments, 2011 versus 2003
 by type of tax and household income decile, in 2011 shekels



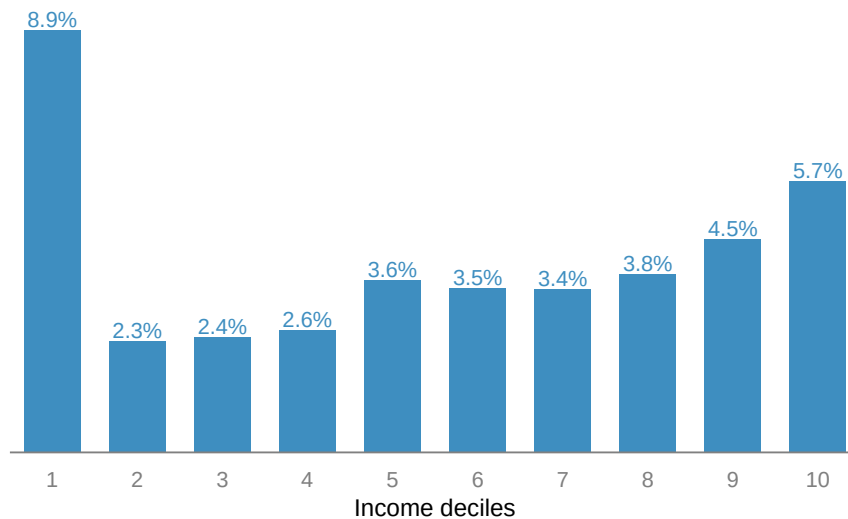
Source: Moshe Hazan, Tel Aviv University and Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

Figure 11 presents the decline in the total tax incidence by income deciles. Several conclusions may be drawn from this figure. First, all Israeli households enjoyed a reduction of the tax burden in 2011 compared with 2003. Second, it was actually households in the lowest decile that enjoyed the largest reduction in the tax burden on gross income, on the order of 8.9 percentage points. However, for households in the second decile upwards the reduction in the tax burden grew along with income. While households in Deciles 2, 3 and 4 enjoyed a tax burden reduction of about 2.5 percentage points of gross income, households in Deciles 5 to 8 enjoyed a reduction of 3.5 to 4 percentage

points of income, while the tax burden falling on households in the ninth and tenth deciles was eased by 4.5 to 5.7 percentage points of gross income, respectively.

Figure 11
Overall decrease in tax burden, from 2003 to 2011
by household income decile, as percentage points of gross income



Source: Moshe Hazan, Tel Aviv University and Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

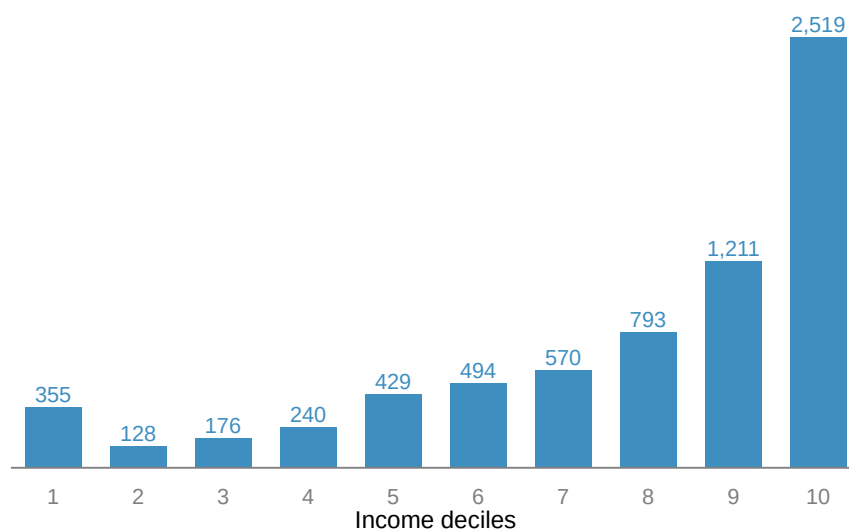
Figure 12 translates the tax burden decline that occurred between 2003 and 2011 into financial terms, that is: how much money each household would have saved had the 2011 tax rate been the same as that of 2003. It should be noted, of course, that this calculation carries with it the assumption that households' expenditures and income from labor would not have changed following changes in the consumption and income tax.

The figure shows that the value of the tax burden reduction between 2003 and 2011 rose substantially along with household wealth. Households belonging to the first six deciles “earned” NIS 130 to NIS 500 per month from the tax rate change; households in Decile 7 – NIS 570; households in Decile 8 – NIS 800; households in Decile 9 saved over NIS 1,200 per month; and households in the highest decile saved more than NIS 2,500 per month thanks to the decline in the tax burden that took place between 2003 and 2011.

Figure 12

Overall decrease in tax burden, from 2003 to 2011

by household income decile, monthly in shekels, 2011 prices



Source: Moshe Hazan, Tel Aviv University and Taub Center

Data: Central Bureau of Statistics, *Household Expenditure Surveys*

The findings presented above should be examined in light of some important changes since 2011. Firstly, they do not reflect the impact of the negative income tax. This tax was instituted in 2008 in the framework of the Earned Income Tax Credit (EITC) program and was initiated for low-wage workers. The tax credit related to their previous year's earnings. The program was implemented gradually; only from 2012 onwards has it applied to salaried employees and self-employed people regardless of their place of residence. Over the years, the program's coverage has expanded, as well as the rate at which those eligible have exercised their right to this entitlement: from 46 percent in 2007 to 52 percent in 2011.

The 2011 *Household Expenditures Survey* includes household incomes and compulsory tax payments; however, no households reported negative income tax. For this reason, the data presented in the survey should be treated with caution. In particular, due to the negative income tax, the data presented in Figure 4 show direct tax payments that are higher than the tax payments actually made by households belonging to the lower portion of the income distribution. In 2011, the average annual EITC was NIS 2,900, which is roughly NIS 242 per month. On the assumption that those eligible for the EITC belong to the two lowest deciles, and that this group's utilization rate was 50 percent, the net income of households in these two deciles would have been NIS 120 per month higher with the addition of the negative income tax. However, most of the analysis in this chapter would not have changed dramatically.

Another fundamental change that occurred after 2011 is the VAT increase. In 2011, VAT was 16 percent. During 2012, it was raised to 17 percent, and in 2013, to 18 percent. Given the fact that, the poorer the household, the greater the share of VAT in the indirect taxes that it pays (due to the higher consumption rate), this change was more harmful to households in the lower part of the income distribution. By way of illustration, assuming that household expenditures are unaffected by the VAT rate, households in Decile 2, which enjoyed a reduced indirect tax burden on the order of slightly more than a percentage point (Figure 8), would have borne an identical indirect tax burden if the VAT rate in 2011

had been 18 percent, as it is today. Furthermore, the data in Figure 8 show that a decline in the indirect tax burden borne by households in the upper portion of the income distribution in this hypothetical situation would have been even smaller subject to the assumptions that were presented regarding Decile 2. Households in the highest decile would not have enjoyed a reduced indirect tax burden had the VAT rate been 18 in 2011. It may be argued that, when looking at the impact of the VAT increase as percentages of income, it was not particularly significant in terms of the tax burden falling on Israeli households in the various income deciles.

3. Conclusion

This chapter analyzed the change that occurred in the tax burden by income decile between 2003, the “watershed” year in terms of Israeli fiscal policy, and 2011. The main findings point to a reduction in the direct and indirect tax burden borne by all Israeli households. However, this reduction was not uniform, and it primarily benefited households in the lowest decile and in the highest three deciles. It is important to note that while this chapter’s findings are consistent with those of other studies on the topic (Bibi-Kersai, 2005; Strawczynski, 2015), tax incidence findings for the lowest decile differ widely – which may indicate a major problem with estimating the tax burden borne by this decile. By contrast, one may confidently conclude that Israeli tax policy during the period 2003-2011 mainly benefited the three highest deciles, contributing to wider net income disparities and to a sense that Israeli is experiencing an erosion of its middle class.

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IV. SOCIAL WELFARE

Poverty and Inequality in Israel: An International Perspective

Haim Bleikh*

Abstract

This chapter examines the rates of poverty and inequality in Israel over time and in comparison with other OECD countries. It looks at two main groups: those aged 59 and under and those aged 66 and over. In the age 59 and under population, Israel's poverty and inequality rates are among the highest relative to other developed countries in both market income (household income from work, occupational pensions and capital, before taxes) and gross disposable income (including transfer payments) minus taxes. From 2002-2011, employment rates among the population in Israel rose, leading to a reduction in market income inequality (though this was not accompanied by a substantial decline in poverty rates). Disposable income inequality rates rose until 2006 and have since stabilized, while poverty rates have increased fairly consistently, especially among Arab Israelis and Haredim. Among the retirement-age population, disposable income poverty rates are substantially higher than in OECD countries. Nevertheless, the overall resources (public and private pension arrangements) that are available to the elderly, place Israel in a relatively good position among the developed countries. That is, the level of public and private pensions is not low compared to the rest of the world, but its distribution among the elderly is not equitable. The relative tax revenues in Israel are among the lowest in the Western world, and this is one of the reasons that the average overall public expenditure is relatively low. This inseparable relationship between tax revenues and public expenditure has critical implications for the closing of poverty gaps.

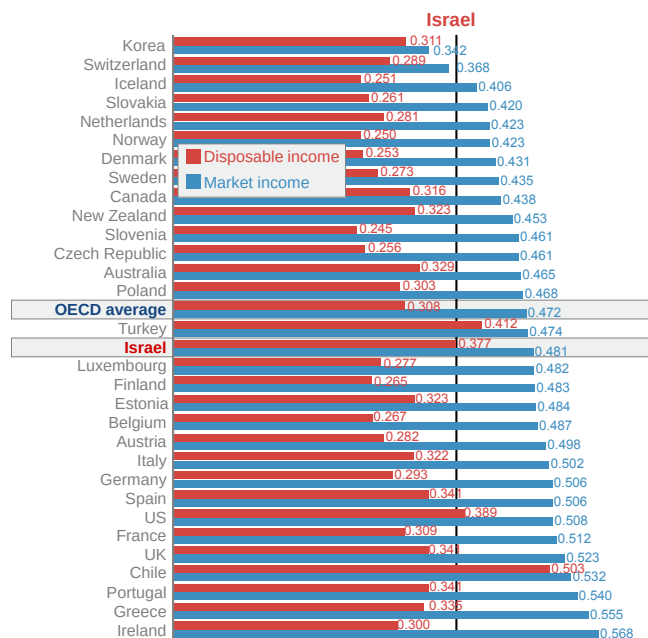
* Haim Bleikh, researcher, Taub Center for Social Policy Studies in Israel. I would like to thank Nachum Blass, Prof. Avi Weiss, Prof. John Gal, Prof. Dov Chernichovsky, Hadas Fuchs, Shavit Madhala-Brik, and Kyrill Shraberman who contributed to the design and progress of this work.

Introduction

The issue of poverty and income inequality is one of the most widely discussed subjects in Israeli public discourse. A comparison of inequality among different households in Israel with inequality in OECD countries shows an interesting picture. Looking at market income (that is, before transfer payments to households and direct taxes are taken into account), Israel is close to the average for developed countries according to the Gini inequality index.¹ In a comparison using disposable income (after transfer payments and taxes), Israel is one of the most unequal countries relative to other developed countries, as can be seen in Figure 1A.

¹ The Gini coefficient is a measure of income inequality with an index that ranges from 0 to 1. A Gini coefficient of zero expresses perfect equality where everyone has the same income; a coefficient of one expresses maximal inequality where only one person has all the income.

Figure 1A
Income inequality, 2011
 Gini coefficient in the OECD countries*



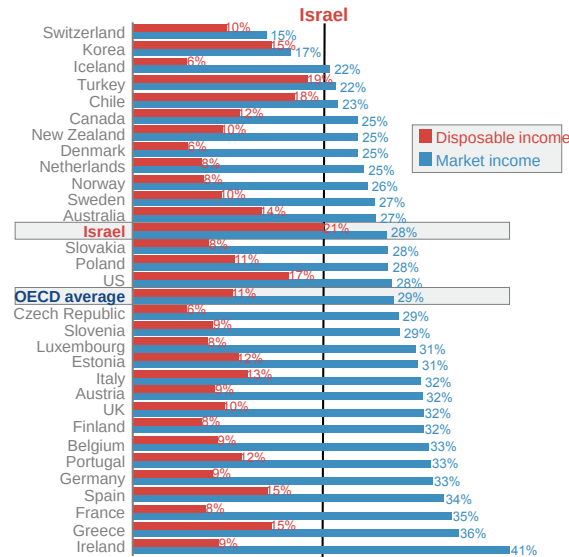
* 31 OECD countries. In a few cases, 2011 data are not available and data from 2010 or the average of 2010 and 2012 are used.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: OECD

Poverty figures for individuals show a similar picture. In Israel, 28 percent of individuals are below the poverty line according to market income, a rate similar to the OECD average of 29 percent. On the other hand, when it is measured by disposable income, about one-fifth of individuals in Israel are below the line, a rate almost double the average in other developed countries (Figure 1B).

Figure 1B
Share of individuals below the poverty line, 2011
 as percent of country population in OECD countries*



* 31 OECD countries. In a few cases, 2011 data are not available and data from 2010 or the average of 2010 and 2012 are used.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: OECD

The obvious question is: what are the main causes for the large difference between the rates according to market income and those according to disposable income? Part of the answer can be found in the differing tax and welfare policies in each country, which are influenced, among other things, by the population mix and, in particular, the percentage of individuals of retirement age, which varies between countries. To sharpen the comparison with OECD countries, poverty and inequality rates are measured by dividing the population into two main

age groups, working age and retirement age. This division allows a sharper focus on the causes of inequality and poverty in each group.

The studies on Israel indicate that among individuals of working age, labor force participation rates, educational disparities and demographic differences are the main reasons for the large variance in income and poverty rates among population groups (for example, Kimhi, 2011; Bank of Israel, 2014; National Insurance Institute, various years). In contrast, among Israelis of retirement age, entitlement or lack of entitlement to an occupational pension, along with the level of government support, are among the main and most influential factors in income disparities among population groups (Stier and Bleikh, 2014).

The purpose of this chapter is to present a picture of poverty and inequality rates in Israel and in other developed countries for these two age groups. The first part of the chapter discusses the working-age population in general and poverty among households with income earners in particular. The second part deals with the retirement-aged population, and the third will discuss several aspects of taxation and social security.

Statistics and Methodology

There are various methods for measuring poverty. The conventional approach is based on the disposable money income households have for consumption and saving, without taking into account the value of additional services of aid and support to various population groups.

Parts of this work are based on OECD data. For this reason, poverty will be measured according to OECD conventions,² which differ in several ways from the method of calculation in Israel.³ The OECD data have a major advantage in that they offer a broad sample of aggregate data in the areas of poverty and inequality for member countries. However, they also have disadvantages and, in particular, a lack of long-term data and microdata at the household level. Accordingly, microanalyses based on the database of the Luxembourg Income Study (LIS)⁴ have been incorporated into this work. While the sample of countries in the LIS is smaller than in the OECD analyses, the microanalyses included in it make a significant contribution to an understanding of the overall picture. It should be noted that, in order to match international data, most of the data for Israel are until 2011, even though more updated figures exist.

² Poverty line income is defined as half of the median disposable income per standardized person.

³ The OECD equivalence scale is equal to the square root of the number of persons in a household. Using this method, economies of scale are greater than with the National Insurance Institute's method, which is based on different equivalence scales. Consequently, as a result of the addition of one individual to a household, the relative marginal addition to household income required to reach a certain income level per standardized person (for example, a poverty-line income level) is lower according to the OECD equivalence scale. The result is that the proportion of large households below the poverty line according to the OECD equivalence scale will be lower than it would be according to the National Insurance Institute's calculation. Another difference is that the OECD household income ranking is based on persons while the National Insurance Institute's is based on households.

⁴ The LIS database is calibrated in such a way that data can be calculated for every country according to comparable rules and methodologies.

1. Poverty and Inequality Among Working-Age Households

Income Inequality

This section seeks to examine poverty and inequality among the working population. Today, the official retirement age in Israel is 62 for women and 67 for men. This age (as well as the average age of retirement in practice) differs from country to country in the OECD, a factor that may affect the validity of comparisons. Therefore, in this section, households in which the head of household is aged 59 or under, which is considered working age in all the OECD countries, as well as coupled households⁵ in which the partner's age is also 59 or under, will be examined.

Figure 2A shows market income inequality⁶ among this population over two decades for a sample of 21 countries. As the figure shows, Israel has been at the top of the rankings since the 1990s. However, the measured decline in rates of inequality, consistently evident since the start of the 2000s, should be noted. Factors like a reduction in government transfer payments and direct taxes for working-age individuals that might have contributed to a rise in employment rates were among the reasons for this decline.

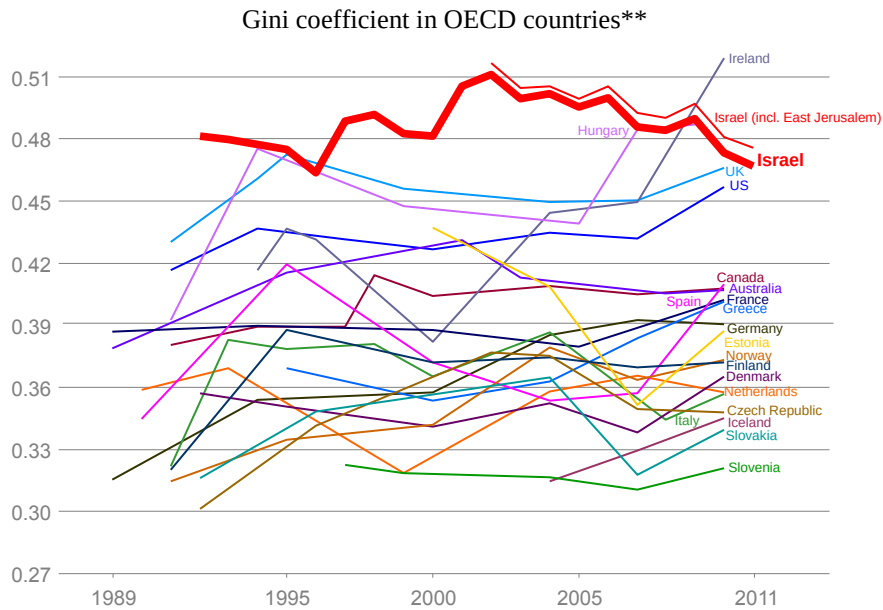
In general, in order to narrow overall market income disparities, monetary resources are required given that other variables, like employment rates and demographic characteristics, do not change. In the case of Israel, though, where the level of economic inequality is especially high in the working-age population, closing these gaps becomes even more complicated because increasing government assistance to a population that

⁵ Coupled households also include unmarried couples.

⁶ Market income for aged 59 and under in Israel is calculated on the basis of labor income and capital, which is the majority of household market income (as can be seen in Figure 3). For countries other than Israel, private transfers are also considered, as in the LIS calculations.

should be economically active can become a disincentive to participating in the labor force or can encourage partial employment in place of full employment.

Figure 2A
Market income inequality, ages 59 and under,*
1989-2011



* Head of household and partner (if there is one) age 59 or under

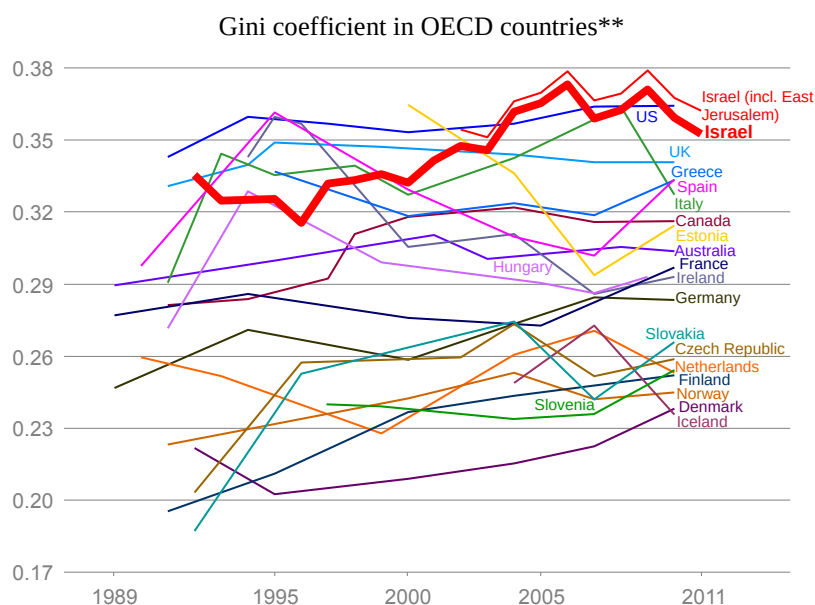
** Calculated using the OECD method for 21 countries with at least 3 observations over time, including for 2010. For Israel, there are no data for 1994.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Luxembourg Income Study; Central Bureau of Statistics

Figure 2B completes the picture and presents the Gini coefficient for this age group according to disposable income. In 2006, the rise in inequality in Israel stopped and after that, there was even a decline, although the level of inequality remains high compared to other developed countries surveyed.

Figure 2B
**Disposable income inequality, ages 59 and under,*
1989-2011**



* Head of household and partner (if there is one) age 59 or under

** Calculated using the OECD method for 21 countries with at least 3 observations over time, including for 2010. For Israel, there are no data for 1994.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Luxembourg Income Study; Central Bureau of Statistics

Developments in Income Components

As noted, in the period under examination there were significant changes in the mix of household income. Figure 3 presents the household income components (adjusted for household size) broken down by selected population groups. Appendix Figure 1 presents similar data without adjusting for household size. As can be seen, income from government benefits declined substantially while, on the other hand, income from labor increased. Thus, for example, among Haredim (ultra-Orthodox Jews),⁷ the proportion of income from work increased from 51 to 64 percent between the two periods. Among Arab Israelis, it rose from 75 to 82 percent while, among non-Haredi Jews, it remained stable between 85 and 86 percent. The change in real gross income per standardized person between the two periods totaled 3 percent among the Arab Israeli population, compared with 7 percent among non-Haredi Jews and 12 percent among the Haredim.

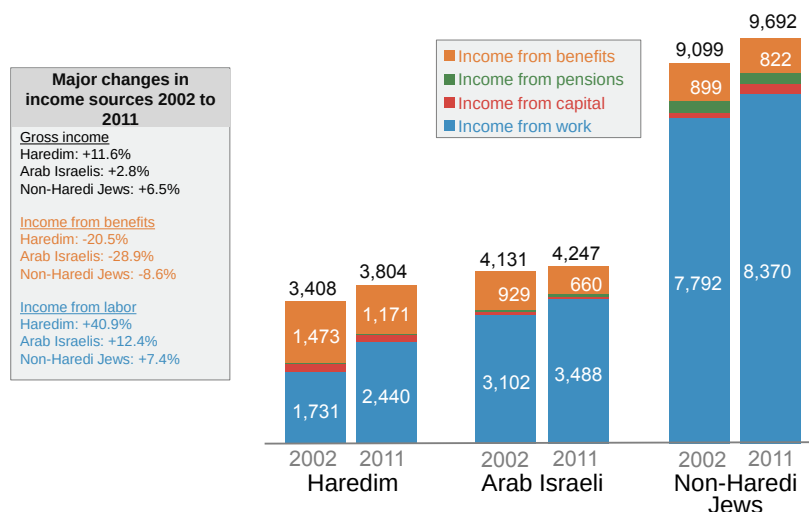
The most substantial increases in income from work rates were between 2002 and 2011 among Arab Israelis and Haredim (12 percent and 41 percent, respectively). This increase contributed to narrowing the market income disparities at the extreme low end of the distribution.

In terms of disposable income, the most substantial real increase was among the non-Haredi population. Among the reasons for this were a series of policy steps during those years including a reduction in direct taxes and in transfer allowances that primarily had a negative effect on the Arab Israeli and Haredi populations (see Appendix Figure 2B). The majority of increase in real disposable income occurred before 2007. That is, these changes contributed to a widening of disposable income gaps as can be seen in Figure 2B.

⁷ Haredim are defined as those living in a household in which the head of the household's last educational institution was a yeshiva or households headed by a woman whose husband's last educational institution was a yeshiva.

Figure 3
Gross monthly household income, ages 59 or under,*
2002 and 2011

monthly income per standardized person,** by source of income and population group, 2011 prices, in shekels



* Head of household and partner (if there is one) age 59 or under

** Calculated using the OECD method

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

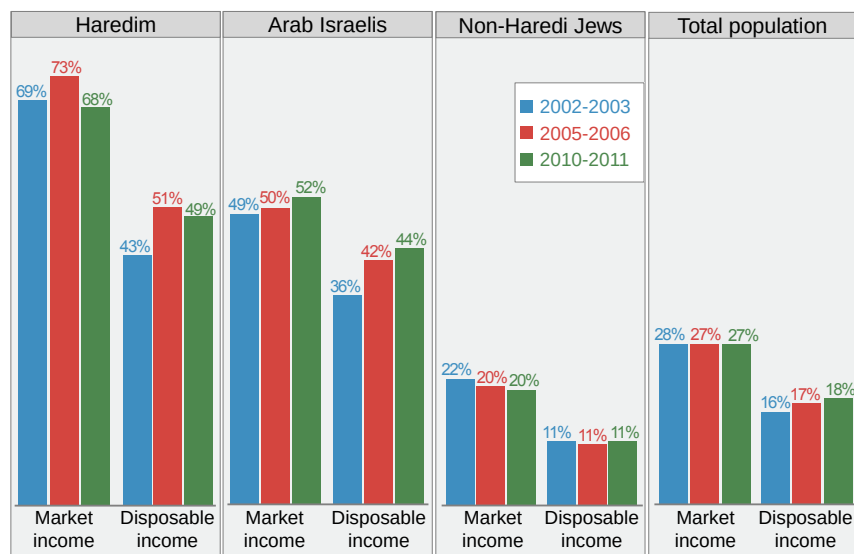
Poverty Rates

Poverty data for the 59 and under population in Israel are not distributed identically among the different population groups. Figure 4A presents poverty rates for selected periods during the previous decade (2002 and 2011). As can be seen, market income poverty rates among the non-Haredi Jewish population declined by 2 percentage points, especially between the first two periods, compared to a slight increase among the

Arab Israeli population. Among Haredim, poverty rates are significantly higher, at around 70 percent. It should be noted that this is a relatively small population⁸ and that there could therefore be fluctuations in poverty rates. On average, in the previous decade, rates of market income poverty for the total population aged 59 and under were relatively stable, ranging from 27 to 28 percent.

Figure 4A

Share of households below the poverty line,* ages 59 and under**
by population group, averages per period, 2002-2011



* Calculated using the OECD method

** Head of household and partner (if there is one) age 59 or under

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

⁸ In the last decade, the share of Haredi households grew from 3.9 to 4.4 percent out of all households whose members were aged 59 or under.

When measuring poverty rates according to disposable income, a notable increase of some 8 percentage points among the Arab Israeli population can be seen. Most of the increase took place before 2005-2006. Among the Haredi population, poverty statistics are higher and the majority of the increase took place up until 2005-2006 at which point a slight decline began. The rate among non-Haredi Jews remained stable during the decade at around 11 percent.

When comparing Israel to other countries, it is important to emphasize that the figures for developed countries were affected by the sub-prime crisis, which began in 2008, but that the crisis did not have a similar impact on Israel. In addition, in a large number of Western countries, there are long-term trends of population aging and a declining birth rate, while in Israel the population is aging but the birth rate is much higher⁹ a factor that influences the measures of poverty and inequality.

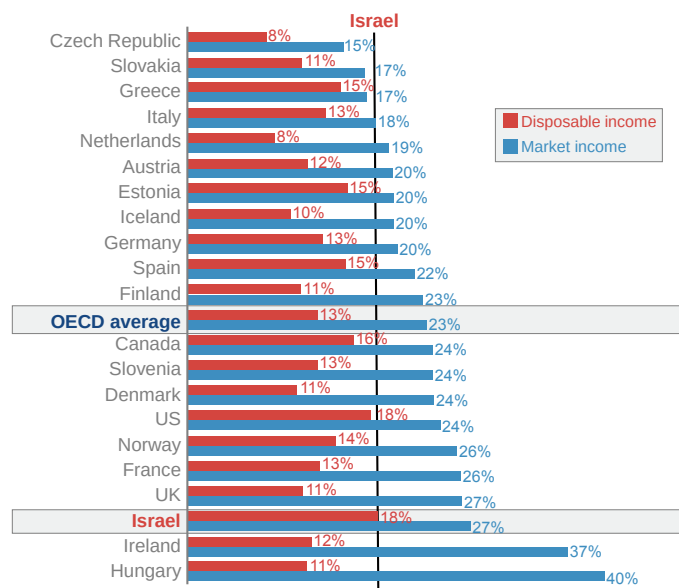
The comparison between households whose head is aged 59 or under in Israel and in other developed countries shows higher poverty rates for Israel. According to Figure 4B, rates of market income poverty in Israel are some 27 percent, compared with about 23 percent on average in other developed countries. Disposable income poverty rates are about 18 percent in Israel and about 13 percent on average in the other countries.¹⁰ In a comparison with Figure 1B, it can be seen that the market income poverty rates among working-age individuals in Israel are similar to those

⁹ According to OECD data for 2011, the overall fertility rate in Israel is 3 children per woman, while in other developed countries it is under 2.1 children per woman, less than the rate needed to maintain a stable population size (*Society at a Glance*, 2014).

¹⁰ An examination of poverty levels among individuals produces the following findings: in the developed countries, 21 and 10 percent of individuals respectively are below the poverty line according to market and disposable income. In Israel, the figures are 27 and 21 percent in market and disposable income, respectively. This means that in Israel, at least for disposable income, poverty is concentrated in larger families. In other developed countries, the picture is reversed – poverty is concentrated in smaller households (see Appendix Figure 3).

of the general population, while in the OECD market income poverty declines substantially among those of working age (excluding the elderly). From this it can be concluded that the market income poverty rates among the older population are substantially higher in OECD countries than in Israel. As will be explained further on, this difference is the result of gaps in population composition and income structure.

Figure 4B
Share of households below the poverty line,*
ages 59 and under**
 OECD countries, 2010



* Calculated using the OECD method

** Head of household and partner (if there is one) age 59 or under

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

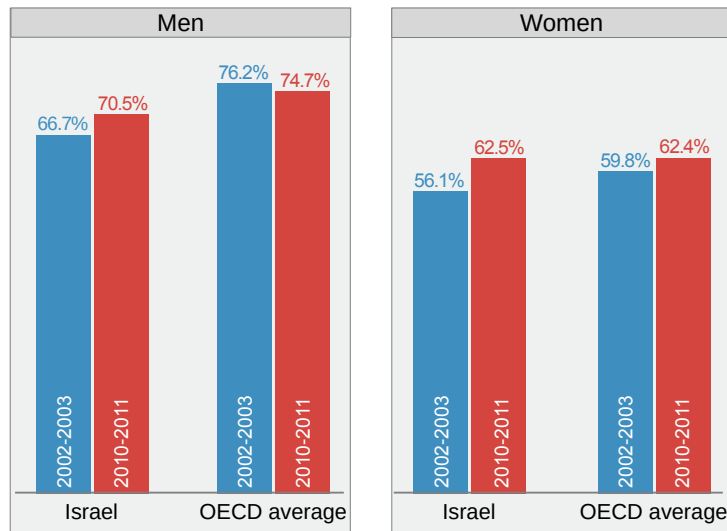
Data: Luxembourg Income Study; Central Bureau of Statistics

Employment Rates Among Ages 59 and Under

The data show that for poverty rates according to market income among the general population (Figure 1B previously), Israel is close to the OECD average. However, for households headed by persons aged 59 and under, that is, most of the working-age population, Israel is higher by about 4 percentage points. This suggests that the causes of the disparities in market income poverty should be sought out in developments in the labor market. Employment rates in Israel that are taken from the OECD data base include the overall population (including those in compulsory and permanent army service).

Figure 5A shows that in Israel, among men aged 15-59, the disparities in employment rates have narrowed. The percentage of those employed saw a moderate increase during the previous decade: from 67 percent at the start of the decade to about 70 percent at the end. The corresponding rates in OECD countries in the same years were much higher: from 76 percent at the beginning of the millennium to a high of 78 percent in 2008. Following the crisis that began that year, the rates stabilized at around 75 percent from 2010-2011.

Figure 5A
Employment rates, ages 15-59
 by gender, OECD average for 2002-2003 and 2010-2011



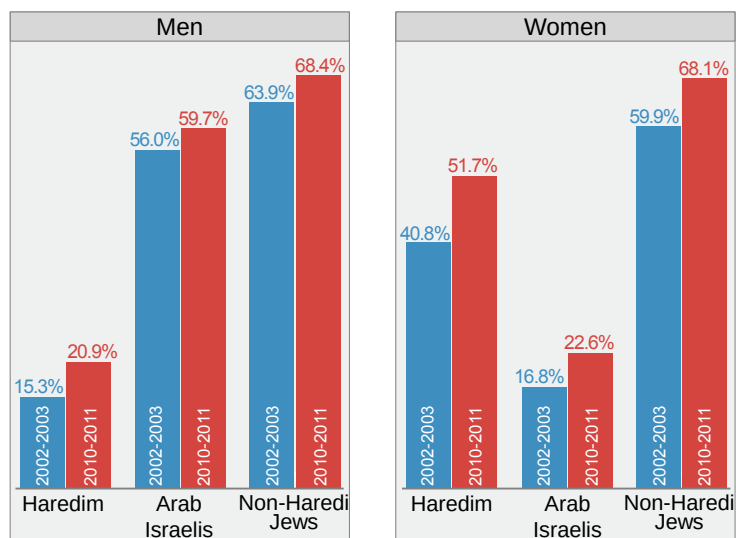
Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel
 Data: OECD

Among women in the same age group, employment rate disparities between Israel and the OECD average were fairly minor at the beginning of the period and closed over the decade. In Israel, employment rates for women in those age groups rose from 56 percent at the start of the 2000s to about 63 percent in 2011. The employment rate in OECD countries shows an increase from 60 percent at the start of the 2000s to 63 percent on the eve of the 2008 crisis, and since then, a slight decrease that stabilized at 62 percent.

Figure 5B

Employment rates,* ages 15-59

by gender and population group, average for 2002-2003 and 2010-2011



* Civilian labor force

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

In Israel, some of the disparities in employment result from relatively late entry of young adults into the civilian labor market as a result of their beginning higher education studies only after compulsory military service, or, in the case of Haredim, their studying in yeshivas, as well as due to other cultural and societal norms.

In order to give a broader perspective of employment differences between population groups in Israel, the Central Bureau of Statistics labor force surveys must be used. Until 2011, the data reflected only the civilian labor force, and so there is a downward bias in the employment

rates¹¹ relative to those figures reported by the OECD that are for the overall population. Among women, the most notable changes have taken place among the Haredim, whose employment rates rose from 41 percent at the start of the 2000s to 52 percent a decade later. Arab Israeli women have the lowest rates of employment of any of the groups, at about 23 percent in 2010-2011, following an increase of some 6 percentage points over 2002-2003. Among non-Haredi Jewish women, employment rates in 2010-2011 were about 68 percent on average, compared to some 60 percent in 2002 to 2003.

Developments among men were similar, but the changes between the start and end of the period were less extensive. As of 2010 to 2011, employment rates among Haredi men were about 21 percent, an increase of about 6 percentage points from 2002 to 2003. Among non-Haredi Jews, and Arab Israelis as well, employment rates rose in 2010 to 2011 by several percentage points to about 68 percent and 60 percent, respectively (as opposed to 64 percent among non-Haredi Jews and 56 percent among Arab Israelis at the start of the period). Along with growth in employment rates, the number of work hours is also important.¹²

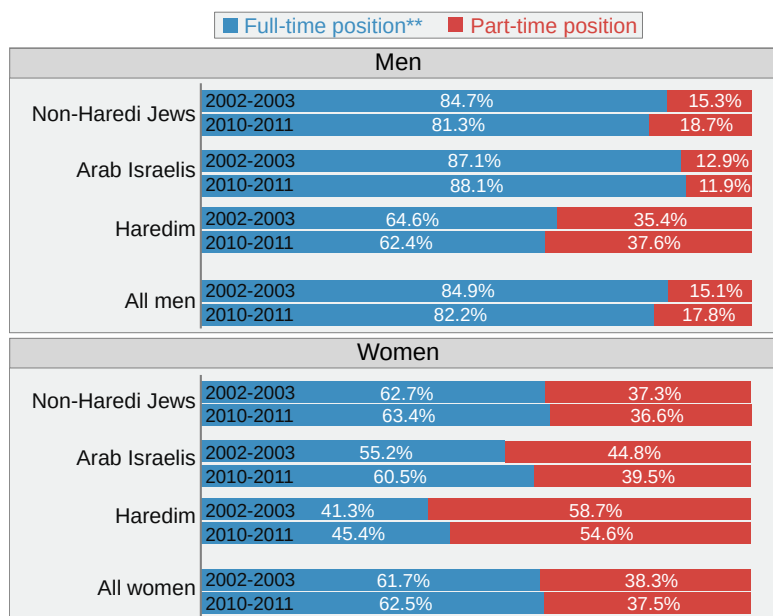
Figure 6 points to the changes that have taken place in the employment mix in Israel on the basis of work hours. The data show that among women in general, there has been a slight decline in those who are employed on a part-time basis. Haredi women are notable in this context. Even after the decline, more than half of the members of this group are in part-time employment. Among the men, there has been a slight increase in rates of part-time employment, and here, too, the disparities between Haredim and the rest of the population in work hours are prominent.

¹¹ The calculation is done by using the civilian labor force as the numerator and the general population as the denominator. The main downward bias is in the non-Haredi Jews because of their greater representation of army members (permanent and compulsory military service).

¹² A full-time position is defined as at least 35 hours per week.

Figure 6
**Employment distribution* by full-time or part-time position,
 ages 15-59**

by gender and population group, average for 2002-2003 and 2010-2011



* Civilian labor force

** Full-time position is 35 weekly hours

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

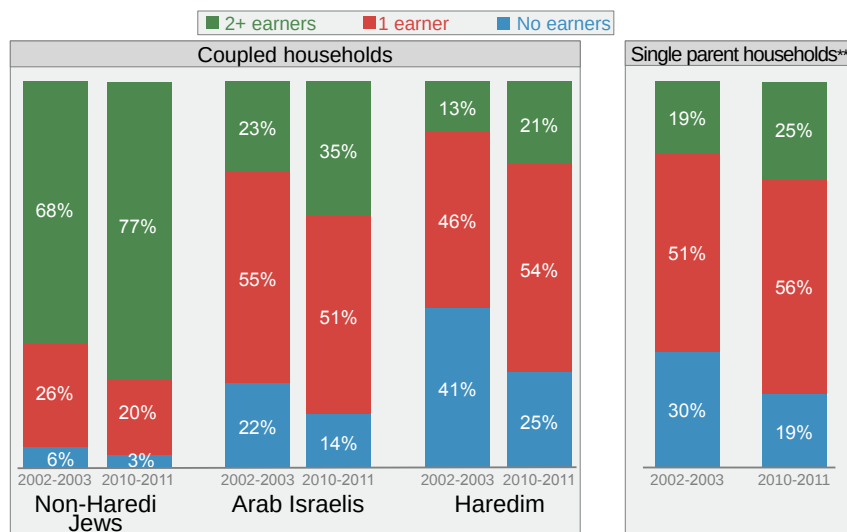
Data: Central Bureau of Statistics

The developments described previously in the area of employment are reflected in the number of income earners in coupled and single parent households (Figure 7A).¹³ Among all groups in the population, there has been an increase in the proportion of households with income earners,

¹³ According to the National Insurance Institute definition. By this definition, there may be single parent households with more than two adults and at least two income earners.

with the most striking increases among the Haredim and Arab Israelis. In addition, among all population groups there was an increase in the portion of households with two or more income earners.

Figure 7A
Household employment distribution, ages 59 and under*
 by household composition and population group,
 averages for 2002-2003 and 2010-2011



* Head of household and partner (if there is one) age 59 or under

** Households including children under age 18. The majority of such households are non-Haredi Jews and so a breakdown by population group was not done.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

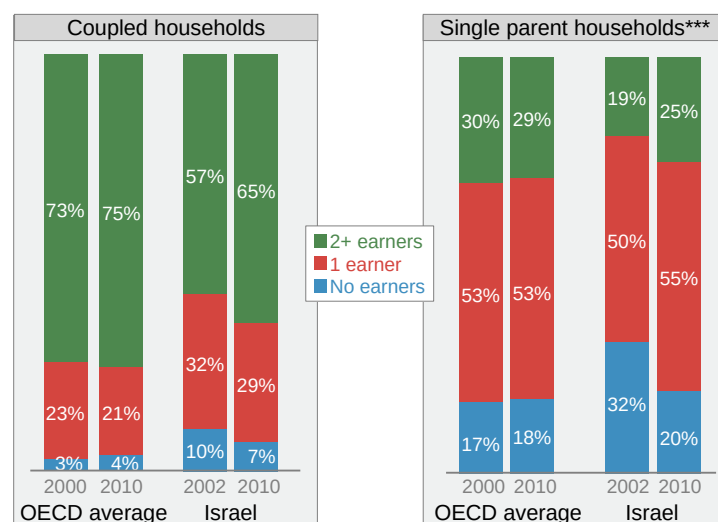
A comparison of developments in Israel and the OECD from the beginning to the end of the first decade of the 2000s points to a higher proportion of households with no income earners in Israel (Figure 7B). At the beginning of the millennium, the proportion of households with two

or more income earners among coupled households in the OECD was some 16 percentage points higher than in Israel. A decade later, the gap had narrowed slightly, but still remained high at 10 percentage points.

Figure 7B

Household employment distribution, ages 59 and under*

international comparison, by household composition, 2000 and 2010**



* Head of household and partner (if there is one) age 59 or under

** Average of 20 OECD countries with data available for the two time periods. Earlier data for Israel are from 2002 and include the population of East Jerusalem.

*** Including children under age 18

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Luxembourg Income Study; Central Bureau of Statistics

Despite the increased employment in these households, the rates of disposable income poverty among coupled and single parent households in Israel increased between the two points in time; this is in contrast to relative stability on average for other developed countries (Appendix

Figure 4). These figures have risen significantly in light of two demographic features¹⁴ of couples aged 59 and under: (1) the high percentage of couples aged 59 and under – who represent 74 percent of all households in this age group compared to 61 percent on average in other developed countries; (2) the greater number of young children – about 75 percent of all couples aged 59 or under in Israel have children under the age of 18 compared to an average in other developed countries of 58 percent. Likewise, the number of household members in these households is on average higher than in other countries (about 5 in Israel relative to an average of 4 in other countries).

Poverty Among Households with Income Earners

As discussed in previous sections, the increase in labor force participation and the reduction in transfer allowances brought about a rise in the portion of income from labor with a concomitant drop in government support. Nevertheless, poverty rates among families with income earners grew (Stier, 2011; Endeweld and Heller, 2014).¹⁵ Figure 8A presents a picture of poverty among these families in selected years between 2002 and 2011. During the decade, the percentage of those who were poor increased: in terms of market income poverty, rates stood at about 16 percent of all households examined in 2002 to 2003; a decade later, they had climbed to 20 percent. For disposable income, the figures for the corresponding periods were about 8 percent and about 12 percent, respectively.

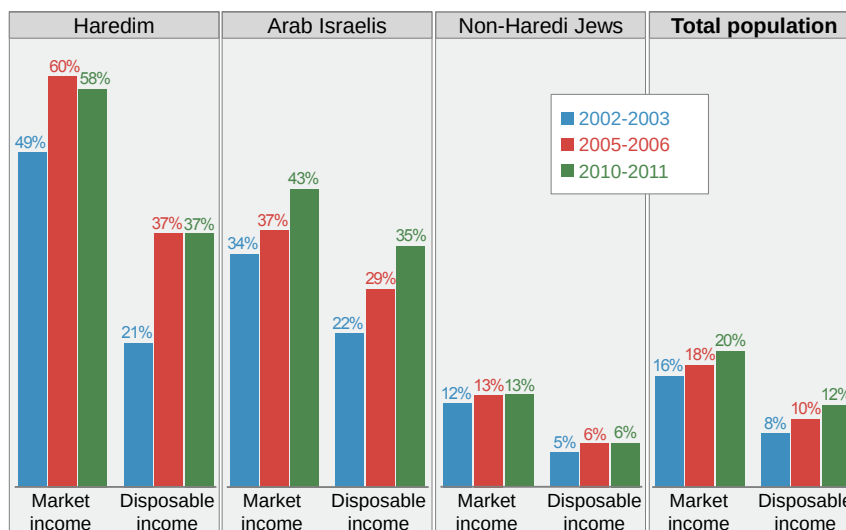
¹⁴ For more on these demographic features, see Appendix Figures 5 and 7.

¹⁵ It is also possible that the causality is in the opposite direction: the rise in the poverty rates and the lowering in the standard of living is what brought about the increase in the employment rate.

Figure 8A

Poverty rates* among households with income earners, 2002-2011

ages 59 and under,** by population group, averages per period



* Calculated using the OECD method

** Head of household and partner (if there is one) age 59 or under

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

A breakdown of households with income earners¹⁶ into population groups points to a noticeable increase in market income poverty among the Arab Israeli population, especially toward the end of the period. In disposable income poverty, a fairly consistent rise among this population is evident throughout the entire period. Among Haredi households, most of the increase in poverty rates took place up to 2005 to 2006. Since then, there has been a slight decrease in market income poverty and a stabilizing of disposable income poverty. Among non-Haredi Jews,

¹⁶ Over the years the share of Haredi households has increased from 2.7 to 3.7 percent out of all households with income earners aged 59 and under. Among Arab Israelis the figure have risen from 13.5 to 15.5 percent.

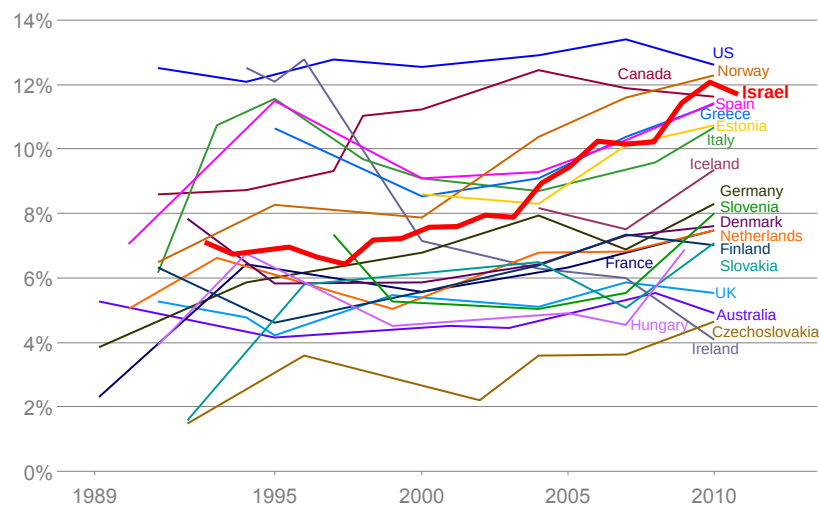
poverty rates are substantially lower relative to other population groups but, even for this group, there was a slight increase.

Figure 8B completes the picture, presenting an international comparison of poverty over time among families with income earners age 59 and younger. As can be seen, the percentage of poor households in this group in Israel was not especially high in the 1990s. However, throughout the period – and especially since the 2000s – poverty rates grew, becoming almost the highest among developed countries.

Figure 8B

Poverty rates* among households with income earners, 1989-2011

by disposable income, ages 59 and under,** OECD countries***



* Calculated using the OECD method. Before 2002, Israel data do not include East Jerusalem

** Head of household and partner (if there is one) age 59 or under; household includes children under 18

*** For 21 countries with at least 3 observations over time including 2010. For Israel, there are no data for 1994.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Luxembourg Income Study; Central Bureau of Statistics

As is well known, poverty rates are negatively correlated with the number of income earners and positively correlated with the number of persons in the household. In other words, the fewer the income earners and the more persons in the household, the greater the chances the household will be below the poverty line (see for example, Kimhi, 2011; National Insurance Institute, various years). Figure 9A presents poverty rates among coupled households according to the number of income earners and children in the household. As expected, in Israel and in other developed countries, households with a single earner have a greater likelihood of being below the poverty line.¹⁷ In Israel, however, the proportion of households with a single earner is greater: about 28 percent, as opposed to about 22 percent on average in the other countries surveyed (Figure 9B). In particular, the group of coupled households with one income earner and at least three children – that is, the group with the highest likelihood of being below the poverty line – comprises about 12 percent of the couples in Israel, as opposed to only about 3 percent on average in OECD countries.

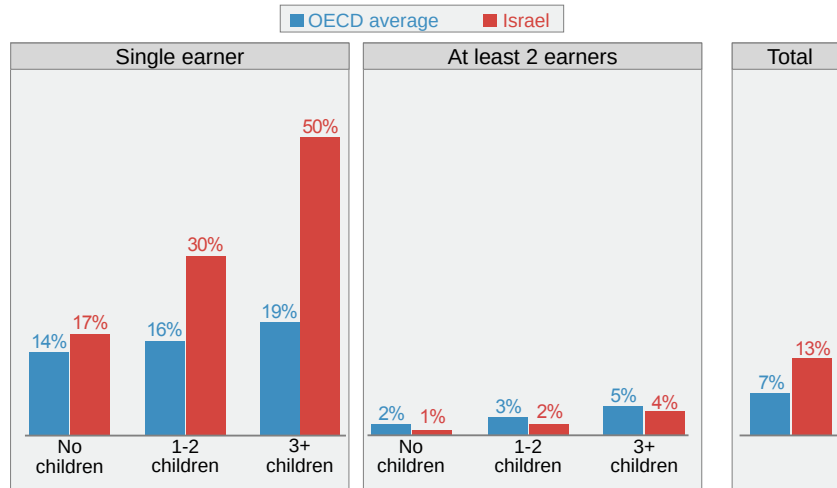
Among all families with two income earners in Israel, poverty rates are relatively low and are similar to those in other developed countries. A more noteworthy figure is the proportion of households with at least two income earners and at least three children: about 16 percent among couples in Israel versus about 6 percent on average in developed countries.¹⁸

¹⁷ In the case of households with no income earners, the poverty rates among couples under the age of 59 are estimated to be on average about 52 percent in developed countries compared to 82 percent in Israel. The proportion of this population is on average about 3 percent in developed countries compared to about 7 percent of the study population in Israel.

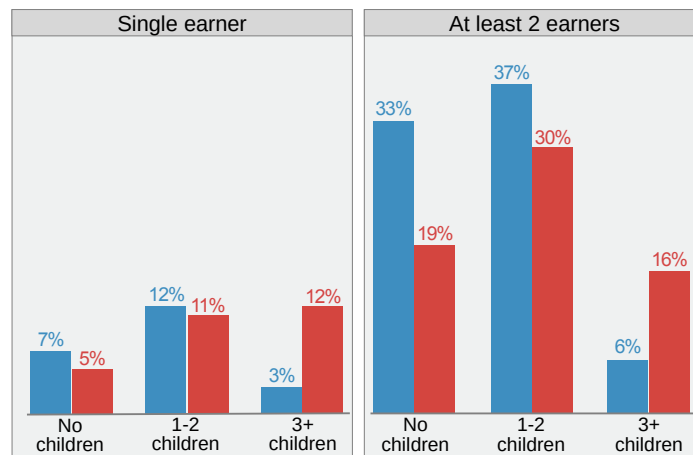
¹⁸ Appendix Figures 6A and 6B show in greater detail the proportion of coupled households aged 59 and under in Israel and the poverty rates among them, by population groups.

Figure 9A
Characteristics of coupled households, 2010
 ages 59 and under*

A. Poverty rates by disposable income**



B. Distribution by number of income earners***



* Head of household and partner (if there is one) age 59 or under

** Calculated using the OECD method

*** For 17 countries with sufficient observations in each grouping. Data do not sum to 100 percent since households with no income earners are not included.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Luxembourg Income Study; Central Bureau of Statistics

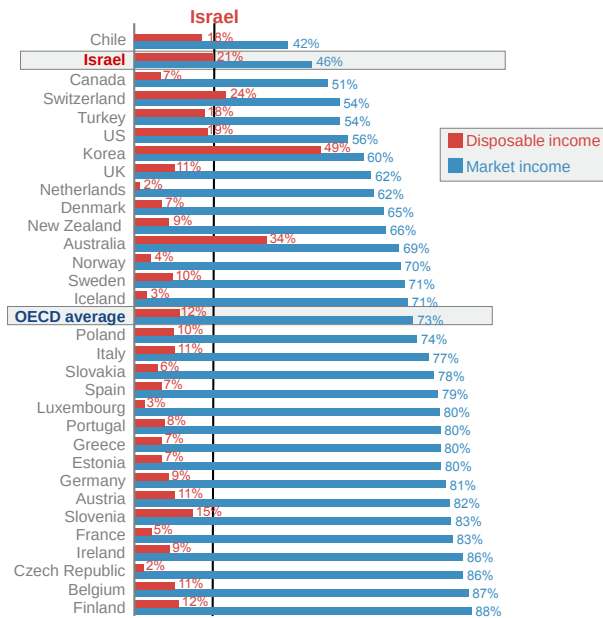
2. Poverty Among the Older Population: An International Comparison

In general, the share of the older population (aged 65 and over) in the general population is rising in developed countries as well as in Israel. In Israel, however, its share in the general population is lower than the OECD average: about 10 percent compared to about 16 percent on average, respectively.

As can be seen in Figure 10, market income poverty rates among those aged 66 and over¹⁹ stand at about 46 percent in Israel, as compared to 73 percent on average in other developed countries. In contrast, in terms of disposable income, about one-fifth of Israeli citizens aged 66 and over are below the poverty line, as opposed to some 12 percent on average in the OECD (and about 9 percent when the calculation is based on the median).

¹⁹ This is the age grouping used by the OECD.

Figure 10
**Share of individuals age 66 and over who are below
 the poverty line, 2011**
 OECD countries*



* 31 OECD countries. In a few cases, 2011 data are not available and data from 2010 or the average of 2010 and 2012 are used.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: OECD

When comparing poverty rates among retirement-aged individuals, it is important to consider the differences between pension plans. Since they are a main source of income for this population, they greatly influence the structure of income and, in particular, market income. In 2011, about 51 percent of retirement-age individuals in Israel were living in a household in which at least one individual was receiving an occupational pension, that is, in a household with a source of income that increases market

income (Stier and Bleikh, 2014). An extension of the mandatory pension law enacted in 2008 will increase the number of those eligible for an occupational pension in coming generations, but most of today's older population is affected by the law to a limited extent, if at all. For the older population, the main beneficiaries from occupational pensions today are those who worked in the public sector and are entitled to a budgetary pension²⁰ or to those who had pension arrangements as part of collective agreements in the private sector.

The pension situation in developed countries is complex and requires special consideration (OECD, *Pensions at a Glance*, 2013; Spivak, 2013). Figure 11 illustrates the fundamental differences in income structure among the older population in each country, which is composed of a combination of various pension plans, employment of older individuals, and differences in both retirement age and the proportion of retirement-age individuals in the entire population. As can be seen, the public funding component is dominant in the income of the elderly in most countries, and comprises an average of about 59 percent of total income. In contrast, in Israel, the proportion of income from a public source is only 34 percent. Accordingly, the proportion of income from work (27 percent) and income from capital (including private pensions – 39 percent) is higher than the OECD average. These figures may explain why market income poverty in most developed countries is significantly higher than in Israel.²¹ In disposable income poverty, the picture is reversed (Figure 10 above). Given this, the question is, to what extent does overall expenditure on the elderly (public and private) compensate for the loss of income from work after retirement? This will be discussed further on in the chapter.

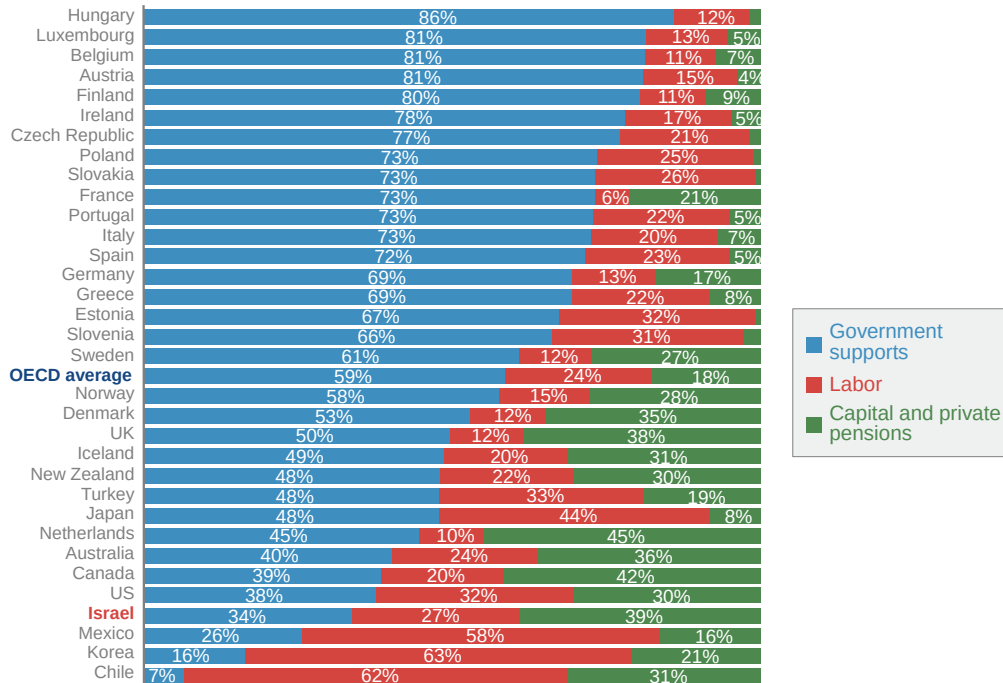
²⁰ Budgetary pension arrangements refer to the defined benefit pensions paid out of the state budget and provided to veteran state employees, such as teachers, military, police, and local authority employees.

²¹ Kimhi and Shraberman (2013) have pointed to employment disparities in Israel's favor among men aged 65-74, compared to OECD countries. This has also contributed to an increase in market income.

Figure 11

Income sources among the older population

as percent of household income in OECD countries, late 2000s

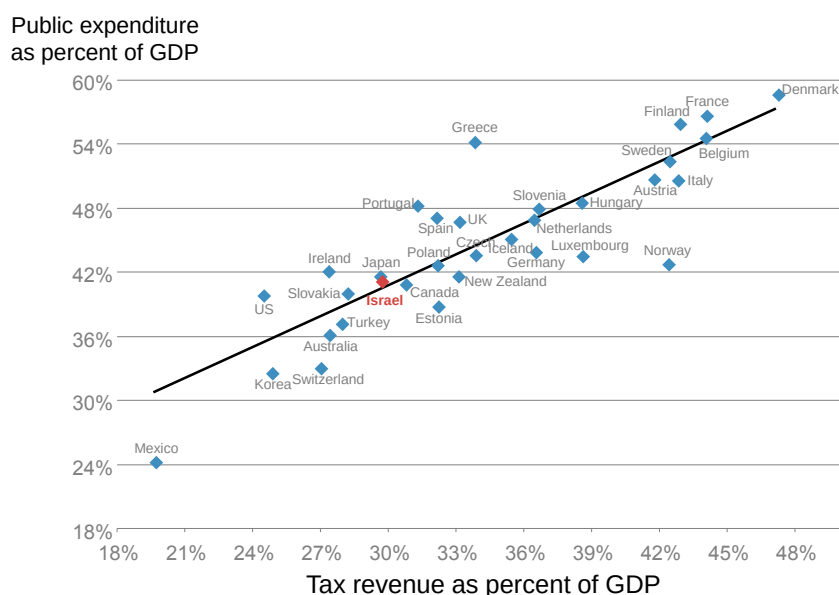
Source: OECD, *Pensions at a Glance 2013***3. Taxation and Welfare: Sources and Uses**

The government has several means by which to reduce disparities in cash income, including a mechanism for direct taxation on the one hand, and provision of transfer payments to those who are entitled on the other. The direct tax burden on household income in Israel is lower than the average in OECD countries. As the Bank of Israel has shown, most of the

disparity stems from lower direct tax rates for income quintiles 1 to 4 (Bank of Israel, 2014). Accordingly, in Israel, the proportion of indirect taxes as a percentage of all taxes is higher than in the developed countries (Bank of Israel, 2013).

From a more general perspective, the size of government expenditures is determined, among other things, on the basis of tax revenues that comprise about 81 percent of the overall public revenues in Israel and 82 percent on average in the OECD. Figure 12 presents an international comparison of the relation between the overall tax burden and the size of public expenditures (including defense spending).

Figure 12
Tax revenues and public expenditure
 as percent of GDP in OECD countries, 2012*



* 33 OECD countries. Data for Turkey are from 2011.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: OECD

As expected, a higher tax burden is correlated with higher public spending, but it is important to remember that correlation between two variables does not necessarily indicate causality. A high tax burden can be a result of greater demand for public services. For example, total spending on public pensions could be high if the proportion of individuals of retirement age in the overall population is high – a situation requiring a higher tax burden. The level of taxes can also be determined in light of supply, that is, a state may establish a policy of higher taxation in order to provide a higher level of services. Either way, the government of Israel has fewer resources at its disposal compared to other OECD countries, and, as a result, the share of public spending in GDP is also relatively low. When interest payments and defense spending in Israel are deducted (which are significantly higher than in other developed countries), the resources left for civilian spending are even more limited.

From 1995 to 2007, the tax burden in Israel ranged from 34 to about 36 percent of total GDP. Beginning in 2008, the overall tax burden declined, and in 2012, it stood at some 29.6 percent of GDP. The trends in the developed countries during those years differed greatly from country to country. Since the mid-1990s, on average, the tax burden ranged between 34 and 35 percent of GDP, and from 2009 to 2010 there was a slight decline, to about 33 percent of GDP, and afterwards, a return to a level of 34.2 percent of GDP. As of 2012, the total public revenues were an average of 41.8 percent of GDP in the developed countries and 36.4 percent in Israel – a gap in revenues of 5.4 percent of GDP where 85 percent of it is explained by gaps in the overall tax burden. By way of example, Israel's GDP for 2012 was about 1 trillion shekels; this means that if the overall tax burden was similar to the OECD average, some 46 billion shekels would have been added to state coffers. Clearly, such an amount would have enabled the state to meet higher spending targets.

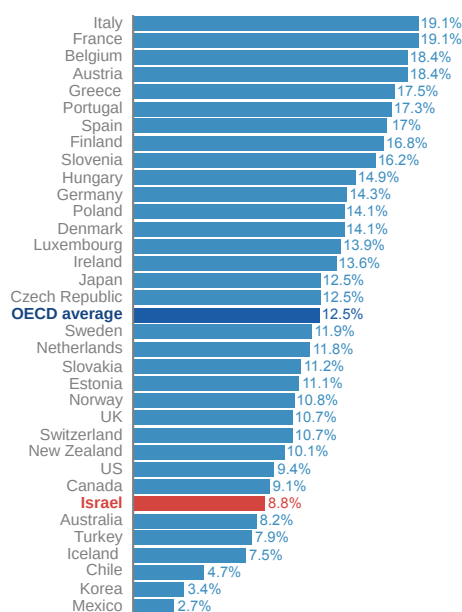
Figure 13 focuses on public social expenditure (cash benefits), which are intended to mitigate inequality and market income poverty. Israel's spending on these payments is about 8.8 percent of GDP, in contrast to an average of about 12.5 percent of GDP in the OECD. This difference could be due to several factors, such as: (A) different needs, derived from

demographic differences and pension arrangements (for example, privately funded pensions as opposed to publicly funded ones); (B) differences in the amounts of various government transfer allowances and accessibility or eligibility to these benefits; (C) a preference for provision of social services as opposed to cash payments for entitled individuals; (D) a shortage of sources of income from taxes in Israel.

Figure 13

Public social expenditure,* 2011

cash benefits, as percent of GDP in OECD countries



* Including pensions for civil service employees, old-age and survivors allowance, disability allowance, unemployment benefits, transfer allowances to families, and other social benefits according to OECD definitions

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: OECD

Figure 14A examines the average level of government financial assistance per individual²² as a percentage of per capita GDP of individuals who are not of retirement age,²³ including children. Spending on cash transfer payments for individuals in Israel totals about 4.4 percent of GDP per capita, compared with an average of 5.4 percent in the developed countries.²⁴ It should be noted that the level of government financial assistance is critically important, especially for reducing income disparities, in light of Israel's unique demographic characteristics (see, for example, Appendix Figures 5 and 7). For this reason, Israel's relatively low ranking in terms of resources allocated to the non-retirement age population is not surprising in view of the low tax burden and the low share of government transfer allowances out of GDP (Figures 12 and 13 above).

A similar examination of government monetary spending on the retirement-age population will not yield an accurate picture. In particular, it would not be correct to speak only about public monetary spending on pensions because there are countries where pension arrangements incorporate private elements that supplement income, like in Israel, the

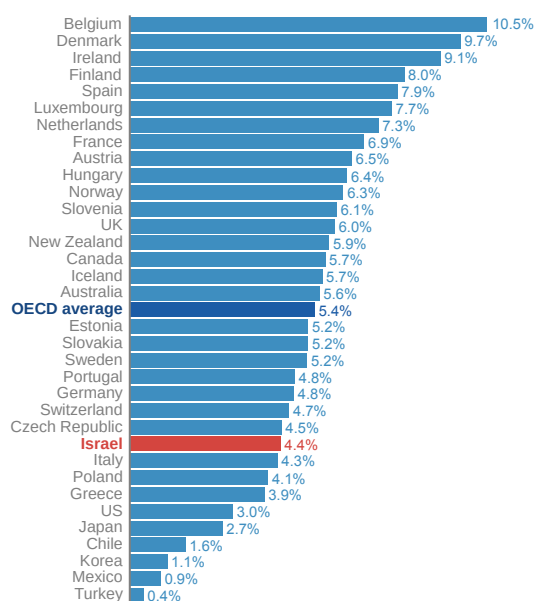
²² The average is not calculated by the number of users (number of recipients of actual cash assistance) since these data are not available. Rather it is based on the size of the population that is under retirement age.

²³ In order to obtain comparable figures, the total nominal expenditure on cash transfer payments should be divided by the number of potential users. As noted, retirement ages are not the same in all countries. Therefore, in order to give an estimate of individuals in this age group, the actual retirement age for men and women in each of the countries must be taken into account. Thus, for example, if the retirement age in a country is 63 for men and 61 for women, then all men over 63 and all women over 61 will be considered to be of retirement age. Individuals who are not at retirement age were calculated by subtracting individuals of retirement age from the total population.

²⁴ In 2009, cash benefits in developed countries to individuals who are not of retirement age reached its peak of about 5.7 percent of per capita GDP, partly because of an increase in unemployment payments. In Israel, the average for this age group was stable at about 4.5 percent of GDP.

US, Canada, and other countries. Therefore, the total monetary resources allocated to individuals of retirement age will also be composed of private and public pension components, including survivors' pensions.

Figure 14A
Cash benefits* to individuals under retirement age**
 as percent of per capita GDP in OECD countries, 2011



* Including disability allowance, unemployment benefits, transfer allowances to families, and other social benefits according to OECD definitions

** Calculation for the individual is based on an estimate of the population under the average retirement age in each country, including children.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: OECD

According to Figure 14B, total monetary resources for the elderly in Israel stand today at about 58 percent of per capita GDP, and is 5 percentage points higher than the average for other developed countries (and 7 percentage points higher than the median). On a more detailed level, the high ranking of Turkey, for example, is the result of public expenditure close to the OECD average relative to GDP and from a comparatively small retirement-age population. In other words, in relation to Turkey's resources, the national priorities place this population's needs relatively high. In Sweden, public expenditure for retirement age is similar to that in Turkey (with additional components of private pensions) and is slightly under the OECD average, since the share of retirement age individuals in the population is relatively high. An interesting point is that in 10 out of 14 countries (for example, Canada and Norway) where poverty rates among the retirement-age population are lower than the median (9.3 percent), overall resources for the elderly have not exceeded the median for all countries (52 percent of per capita GDP).²⁵ In contrast, there are countries (such as France and Italy) where poverty rates among the elderly are fairly low, but where expenditures for the elderly are higher than the median.

From the perspective of Israel, these findings probably suggest that it is not sufficient to look at the average amount of resources for the elderly, but rather the distribution of resources within the group of retirement-age individuals must be examined. When all of the resources available to the older population are taken into consideration, the Gini coefficient in disposable income among the older population in Israel was about 0.37, compared to an average of about 0.3 in the OECD countries (Appendix Figure 8). This figure reflects differences in income from occupational pensions among many older people in Israel. At the same time, low levels

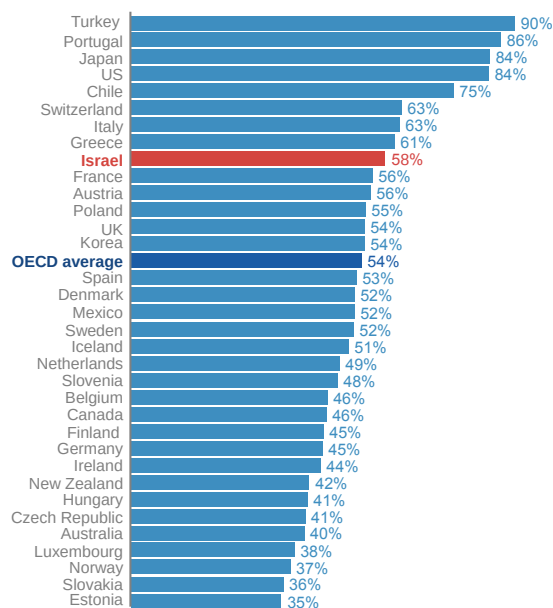
²⁵ An examination of the data show an increase in average overall pension expenditures in the developed countries between 2005 and 2009, from some 50 to about 54 percent of per capita GDP, while in the following years there was relative stability. In Israel, on the other hand, the numbers in the same period ranged from 58 to 60 percent of per capita GDP.

of inequality in OECD countries reflect a different pension structure that is based on the public sector (which is characteristically more universal) (Figure 10B).

Figure 14B

Pension income for individuals over retirement age,* 2011

old-age and survivors allowance and private pensions
as percent of per capita GDP, OECD countries



* Calculation for the individual is based on an estimate of the population over the average age of retirement in each country

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: OECD

4. Conclusion

An international comparison of market income poverty and inequality rates shows that for the general population in Israel, these are similar to the OECD average. However, differences in the demographic makeup and social welfare systems in the various countries have a significant impact on income structure. Therefore, in examining the data, the population was divided into two groups, one aged 59 and under and the other aged 66 and over.

Among the population group of those aged 59 and under, the findings point to poverty and inequality rates that are among the highest in the Western world in both market and disposable income. Differences in demographic characteristics play a substantial role in this, and especially the fact that, on average, households in Israel are larger than households in OECD countries. In addition, in this group, there were disparities between Israel and other countries in employment rates and in the number of income earners in coupled households. Even after some improvement over the decade, there is still a gap of about 10 percentage points to Israel's disadvantage in the share of households within the total group that have at least two income earners – 65 percent in Israel, compared with 75 percent on average in the OECD.

An examination of developments within Israel from 2002 to 2011 in the group aged 59 and under indicates an increase in employment rates among all population groups, along with a significant and real increase in market income, primarily among Arab Israelis and Haredim (who are for the most part in the lower part of the income distribution). This increase has helped to reduce the levels of market income inequality in recent years, although for the reason explained above there was no accompanying significant decrease in poverty rates. That is, the new entrants to the labor market earn low wages and although their position has improved somewhat, they remain below the poverty line in market income. On the other hand, Israel experienced an increase in disposable income inequality until 2006, since the real increase in disposable income among non-Haredim (the upper level of the income distribution) was

relatively high (Appendix Figure 2). Since 2007, there has been a decline in the index, that is, a narrowing of gaps among groups. Nevertheless, poverty rates in disposable income have also risen, especially among Arab Israelis and Haredim.

Along with income from work, an important factor in reducing income disparities among the working-age population is public social expenditure. In Israel, the percentage of per capita GDP dedicated to cash benefits to individuals is lower than the OECD average. In addition, the impact of these payments on reducing disparities could be even more limited in light of the fact that households in Israel are larger on average than in the OECD.

In addressing public spending, it is important to note that the tax burden in Israel, especially in recent years, is among the lowest in the Western world. This is one reason that total public spending is lower than the average in other developed countries – and after deducting defense expenditures and interest on debt, civilian expenditure is reduced even further. Given the integral connection between the level of taxes and public spending, it is of paramount importance that the public discussion focus on both the sources of the budget and its uses, and not on each component separately.

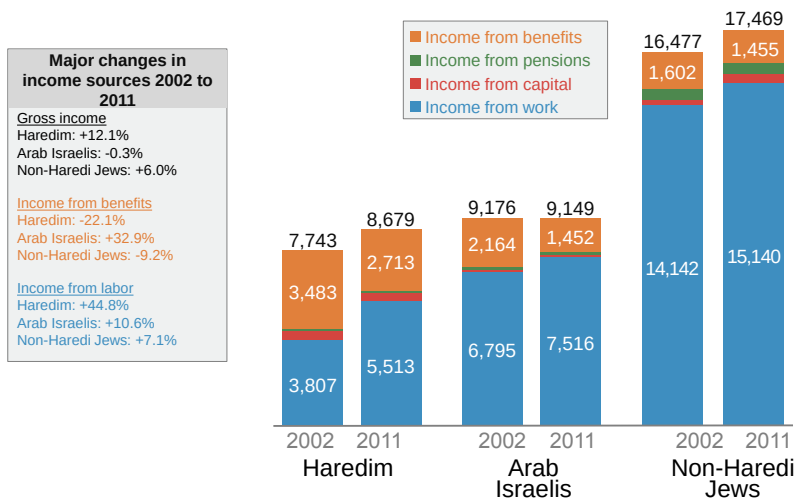
Among the population over age 66 in Israel, too, the rate of disposable income poverty is among the highest in the Western world, even though financial expenditures on the elderly per individual (both public and private) as a percentage of per capita GDP are no lower than the average in the developed countries. This indicates high levels of inequality within this population. Therefore, it is important to find the balance between, on the one hand, increasing economic incentives that will aid in widening employment circles and increasing income from work and, on the other hand, finding solutions and resources that will assist the population that is left behind – in particular those elderly who may not have a pension or others who may not have accumulated sufficient pension funds to ensure a reasonable standard of living.

Appendix

Appendix Figure 1

Gross monthly household income, ages 59 and under,* 2002 and 2011

by source of income and population group, 2011 prices, in shekels



* Head of household and partner (if there is one) age 59 or under

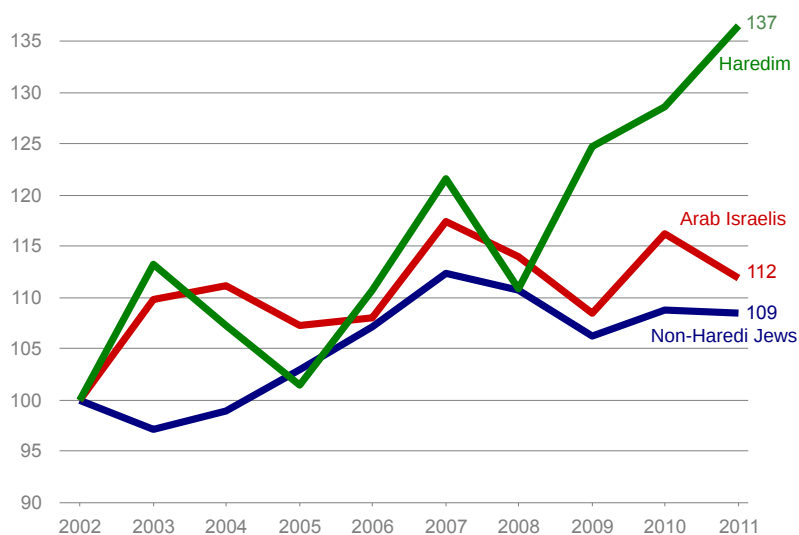
Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

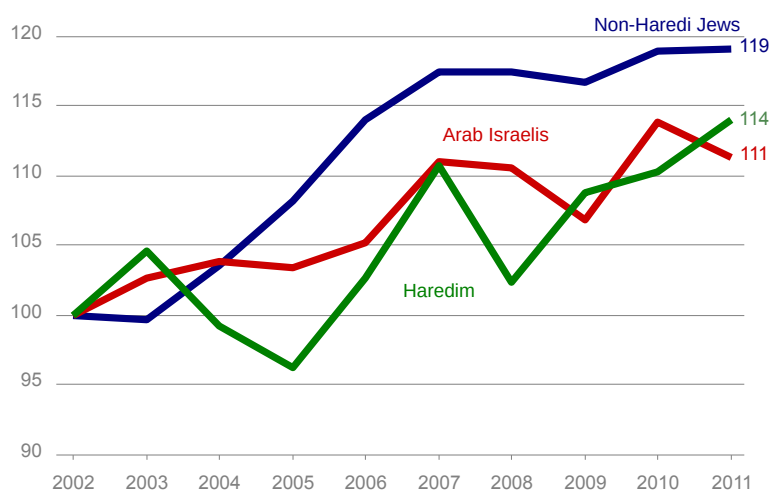
Appendix Figures 2A and 2B

A. Changes in market income per standardized person,* 2002-2011

ages 59 and under,** by population group, in shekels, Index: 2002=100

**B. Changes in disposable income per standardized person,* 2002-2011**

ages 59 and under,** by population group, in shekels, Index: 2002=100



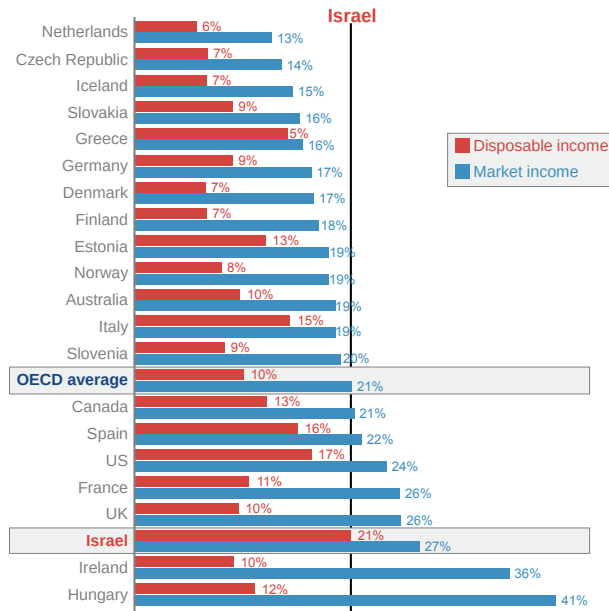
* Calculated using the OECD method

** Head of household and partner (if there is one) age 59 or under

Source for both: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data for both: Central Bureau of Statistics

Appendix Figure 3
Percent of individuals below the poverty line,* 2010
 ages 59 and under,** OECD countries



* Calculated using the OECD method

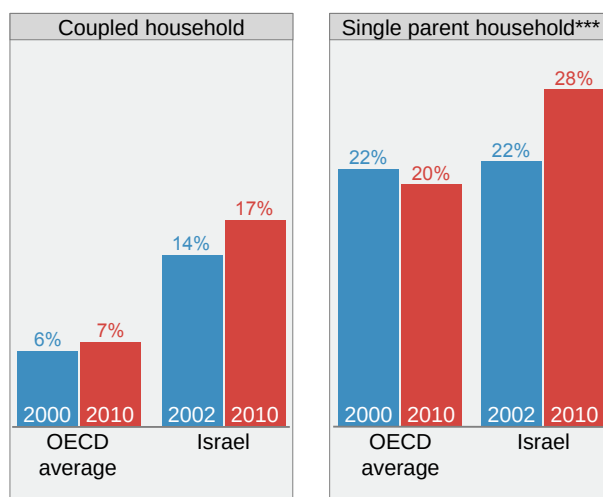
** Head of household and partner (if there is one) age 59 or under

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Luxembourg Income Study; Central Bureau of Statistics

Appendix Figure 4
**Share of households below the poverty line,*
 ages 59 and under****

international comparison, by household composition, 2000 and 2010



* Calculated using the OECD method; average of 20 countries with data available. Earlier data for Israel is from 2002, including the population of East Jerusalem

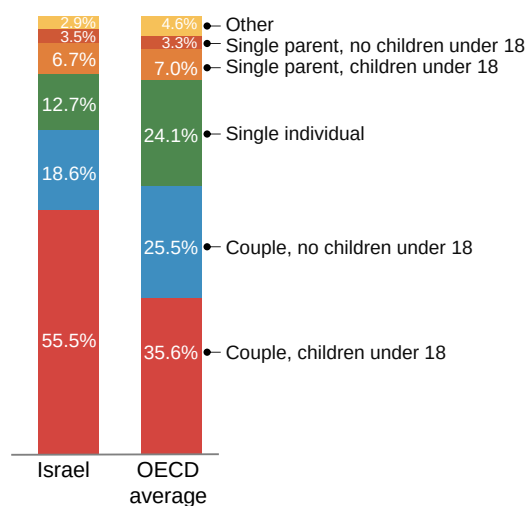
** Head of household and partner (if there is one) age 59 or under

*** Including children under 18

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Luxembourg Income Study; Central Bureau of Statistics

Appendix Figure 5
Household composition, ages 59 and under*
 international comparison,** 2010



* Head of household and partner (if there is one) age 59 or under

** Average of 20 OECD countries with data available

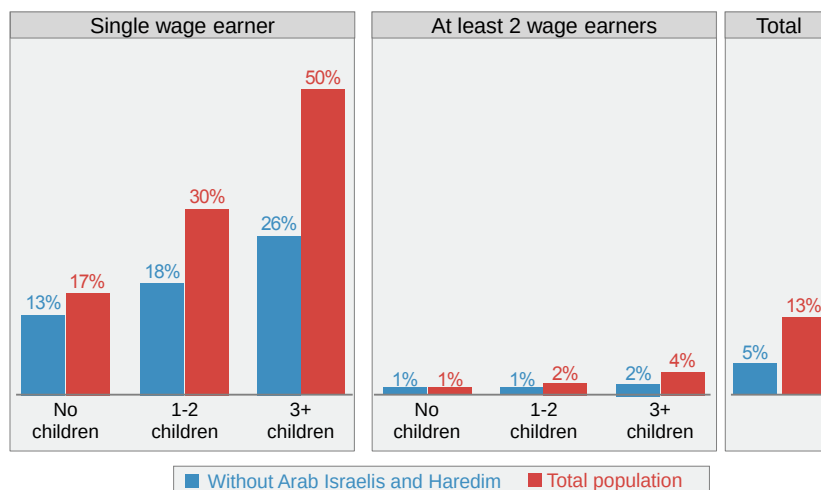
Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Luxembourg Income Study

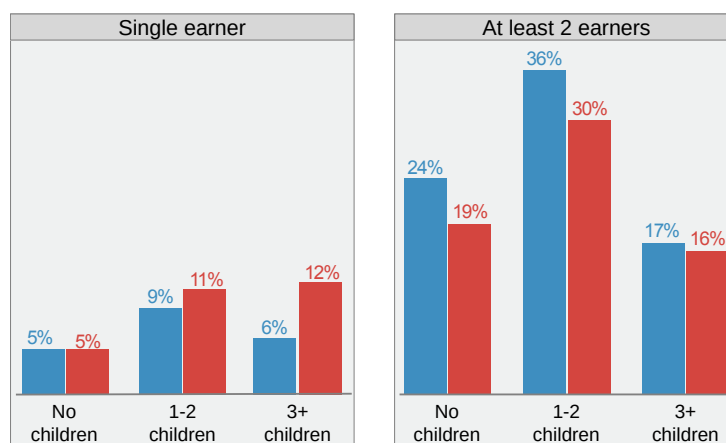
Appendix Figure 6A and 6B
Characteristics of coupled households, 2010

ages 59 and under,* by population group

A. Disposable income poverty rates**



B. Distribution by number of earners***



* Head of household and partner (if there is one) age 59 or under

** Calculated using the OECD method

*** Data do not sum to 100 percent since households with no income earners are not included

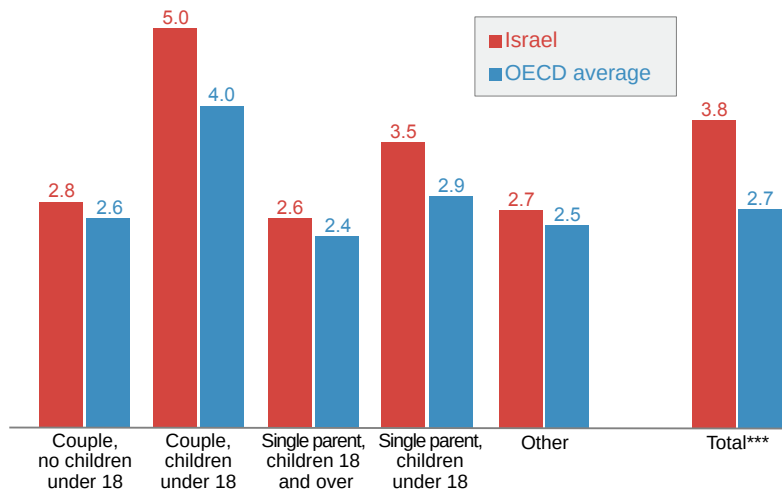
Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Central Bureau of Statistics

Appendix Figure 7

Average household size, ages 59 and under*

international comparison,** by household composition, 2010



* Head of household and partner (if there is one) age 59 or under

** Average of 20 OECD countries with data available

*** Estimate includes households of single individuals

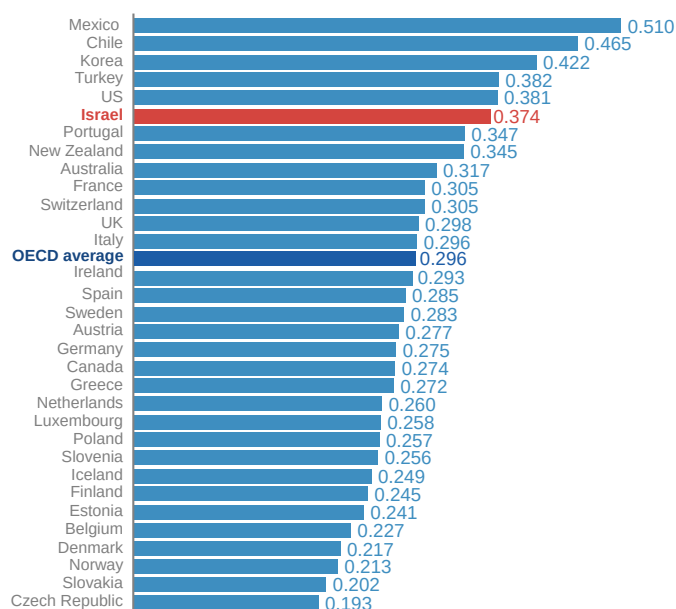
Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: Luxembourg Income Study; Central Bureau of Statistics

Appendix Figure 8

Income inequality, ages 66 and above, 2011

Gini coefficient for disposable income, OECD countries*



* 32 OECD countries. In a few cases, 2011 data are not available and data from 2010 or the average of 2010 and 2012 are used.

Source: Haim Bleikh, Taub Center for Social Policy Studies in Israel

Data: OECD

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Social Welfare Expenditure

John Gal and Shavit Madhala-Brik^{*}

Abstract

This chapter surveys developments in government allocations for social welfare since the beginning of the millennium, with an emphasis on the past year. Over the last year, housing and cost of living difficulties stood at the center of public political discourse. The Committee for the War on Poverty, established at the initiative of the previous government, released its recommendations, and these included a significant expansion of the social welfare system. Despite this, the government budget did not include the planned increase in social security and social services expenditures. In fact, recent years have seen either a continued decline in actual spending, or a stable low level of expenditure for a substantial portion of the social welfare system. Striking examples of this are National Insurance Institute expenditures for child allowances and income support, as well as the expenditure of the Ministry of Construction and Housing. In contrast, there has been a continuous increase in expenditures on social security for the elderly and for those with disabilities, on spending by the Ministry of Social Services and Social Affairs on households under its care, and on assistance to Holocaust survivors.

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Introduction

Social welfare expenditures are intended to ensure the social security of all residents of the state, and to enable disadvantaged and vulnerable populations access to Israel's diverse array of social services. This chapter will look at trends in government expenditure for the period 2000 to 2014, as a reflection of government social policy during those years.

The chapter's first section considers total expenditures on social welfare. The expenditure is then broken down into its two components: social security programs and social welfare services. Section 2 considers the social security system, which includes a wide range of programs aimed at providing a safety net for those with no (or little) income from labor, or for those with additional expenses caused by a variety of circumstances. The main form of support provided by Israel's social security programs is cash benefits.

Section 3 will focus on social services designed to further social objectives, such as assisting new immigrants or people with physical or mental disabilities. These programs offer diverse social services that are provided by the state, local authorities, or external entities, with state funding or supervision.

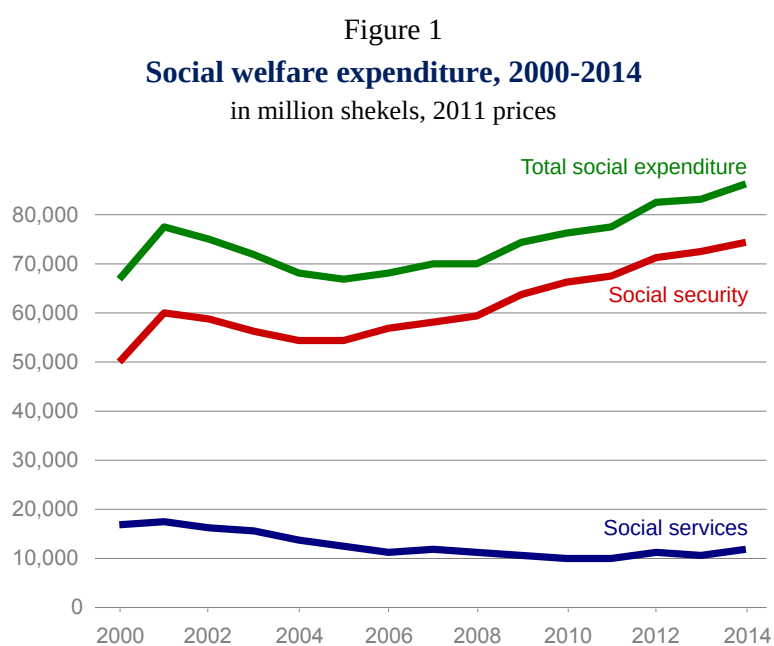
Definitions

Total government expenditure. The implemented state budget (regular and development) in net expenditure terms, including the Health Tax and National Insurance payments for transfer allowances (offset by budget transfers to the National Insurance Institute).

Government expenditure out of the state budget. Budget implementation data in net expenditure terms, that is, total government expenditures minus earmarked revenues from external sources.

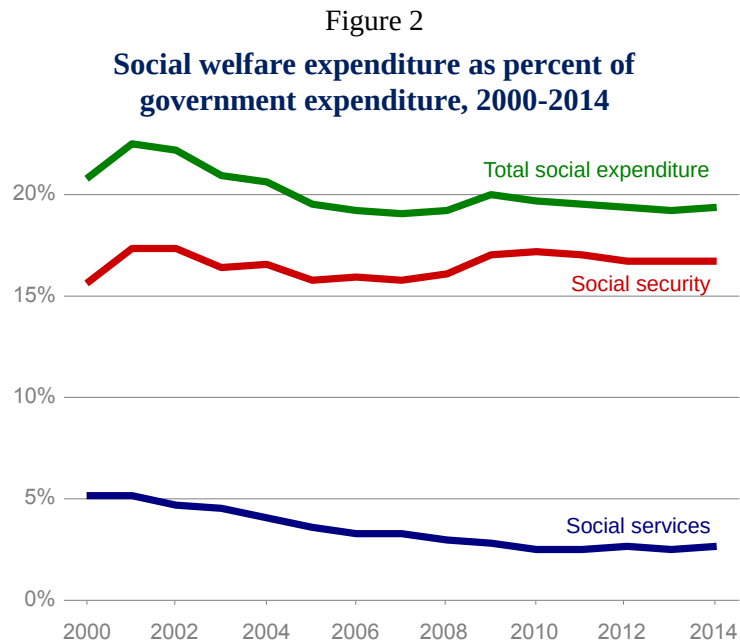
1. Public Social Welfare Expenditure

Israel's public expenditure on all social welfare components for 2014 amounted to NIS 86 billion (in 2011 prices, Figure 1). This sum is half of the government social expenditure, that is, government spending on education, health and social welfare combined. Although this figure has been trending upward since the middle of the last decade, the increased spending can be traced mainly to increases in state old-age pensions provided through Israel's social security programs. By contrast, the expenditure on other programs dropped slightly during the study period.



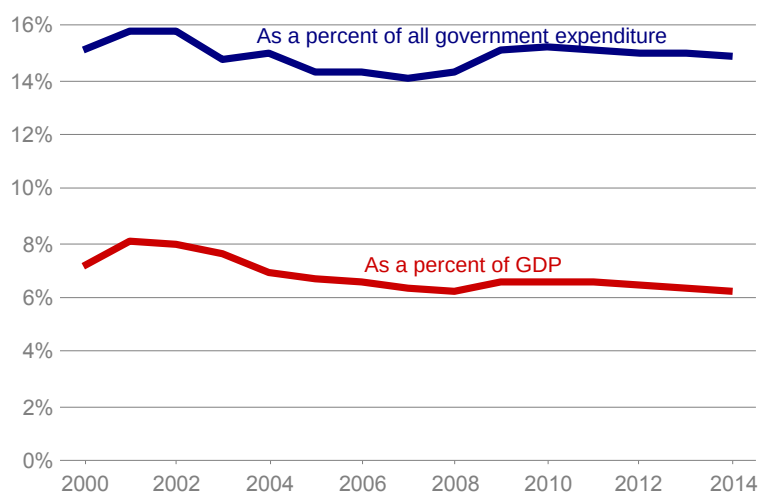
Source: John Gal and Shavit Madhala-Brik, Taub Center
Data: Ministry of Finance

In contrast to the increase in shekel terms, when the share of social welfare spending out of total government expenditure (Figure 2) and as a percent of total GDP (Figure 3) is examined, a trend toward stability can be seen in recent years. However, the stability in social welfare spending is at the lower level established during the middle of the 2000s.



Source: John Gal and Shavit Madhala-Brik, Taub Center
Data: Ministry of Finance

Figure 3
**National Insurance Institute benefits as
percent of GDP, 2000-2014**



Source: John Gal and Shavit Madhala-Brik, Taub Center
Data: National Insurance Institute; Central Bureau of Statistics

As the above figures clearly show, there is a substantial difference between the amount spent on social security programs and the amount channeled to social services, which is reflected in different trends that characterize these two areas. Over 80 percent of the total social welfare expenditure is devoted to social security programs, which increased until 2005 and then stabilized. As will be shown below, this process is being affected by demographic changes (primarily the aging of the population), and increased spending on specific target populations.

In contrast, the expenditure on social services has remained low at only 20 percent of total social welfare spending, and has declined somewhat over the years.

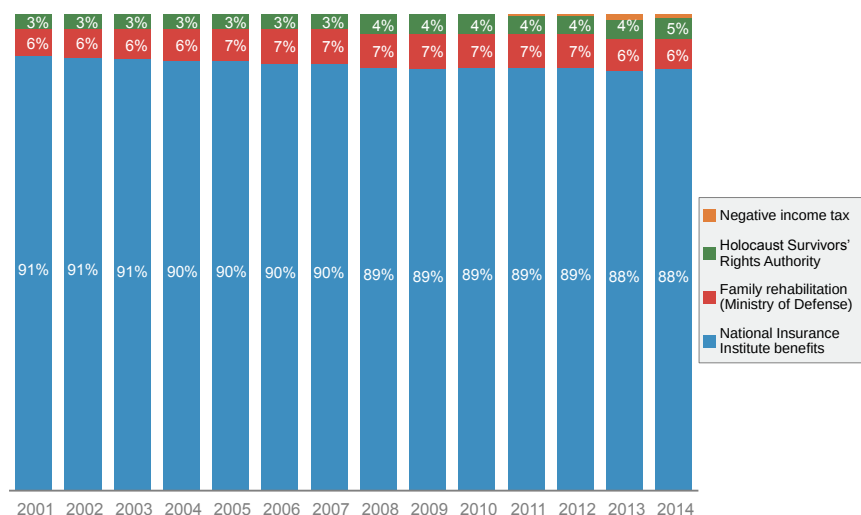
2. Social Security Expenditure

Social security is the biggest expenditure item in Israeli social spending (government expenditure on social welfare, education and health) – 43 percent. The source of this expenditure is the state budget and National Insurance payments collected from workers and employers. Public social security expenditure includes National Insurance Institute benefit payments in the following areas (listed by expenditure size): old-age and survivors (widow/er and orphan) pensions, general disability, maternity (maternity allowance and hospitalization payment), long-term care, children, work disability, unemployment, income support and alimony, benefits to victims of terror and former Prisoners of Zion. Social security spending also encompasses expenditures of the Holocaust Survivors' Rights Authority (in the Ministry of Finance), as well as Ministry of Defense expenditures on the rehabilitation of disabled veterans and payments to bereaved families.

Figure 4 shows that the vast majority – 90 percent – of social security expenditure is for National Insurance benefits. These benefits, both the universal ones and those targeted to low income individuals, reach a very large percentage of Israelis. In fact, there is hardly anyone who is not eligible for some benefit or other during the course of his/her life.

In contrast, two other expenditure areas that lie within the social security sphere – benefits for those affected by war (disabled IDF veterans and bereaved families) and Holocaust survivor pensions – focus exclusively on populations whose eligibility stems from specific circumstances. Accordingly, their share in total expenditure is quite small. Another area included in this expenditure is negative income tax payments (“work grants”), which were instituted in 2008. Although this expenditure has grown over the years, it has remained very small, amounting to NIS 600 million in 2014 – only 1 percent of total social security spending.

Figure 4
Expenditure on social security, 2001-2014
 by areas, as percent of overall social welfare expenditure



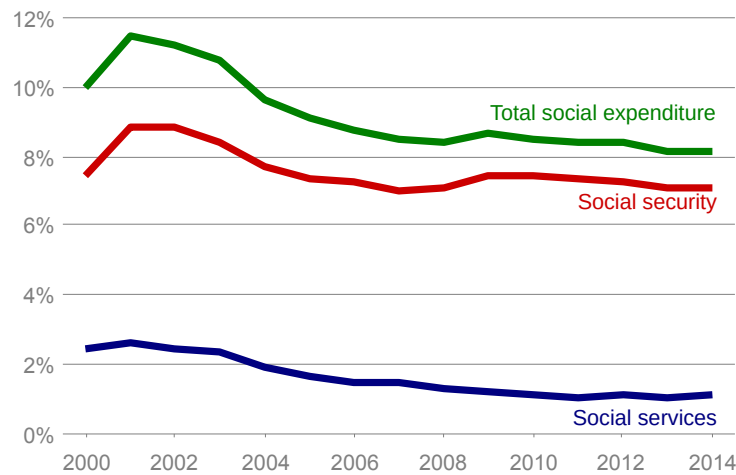
Source: John Gal and Shavit Madhala-Brik, Taub Center

Data: Ministry of Finance; National Insurance Institute

National Insurance Benefits

As shown in Figure 5, expenditure on benefits paid by the National Insurance Institute amounted to 6 percent of GDP and 15 percent of total government expenditure in 2014. An examination of the expenditure trend reveals stability over the past decade; however, compared with the early 2000s, expenditure is relatively low. This decline is due primarily to a steep reduction in the share of National Insurance benefits in the early 2000s, as well as a change in mechanisms for updating allowance values.

Figure 5
Social welfare expenditure
 as percent of GDP



Source: John Gal and Shavit Madhala-Brik, Taub Center

Data: Ministry of Finance; Central Bureau of Statistics

The impression of stability that emerges from looking at the National Insurance Institute benefits conceals a number of different trends that can be seen when the benefit types are examined separately. As in all welfare states, benefits intended for the elderly – old-age and survivor pensions, and long-term nursing care funding – account for the largest share of the expenditure: 48 percent of the National Insurance Institute’s total benefit expenditure in 2014 (Figure 6). Moreover, there is a clear upward trend in the share of spending channeled to this population, as shown in Figure 7. This increase is a reflection of the aging of the population. The number of old-age and survivor pension recipients rose from 657,000 in 2000 to 868,000 in 2014 (a 32 percent increase), while the number of long-term care benefit recipients rose during this period from 96,000 to 159,000 (a 66 percent increase) (Figure 8).

Figure 6
Distribution of National Insurance Institute benefits, 2014

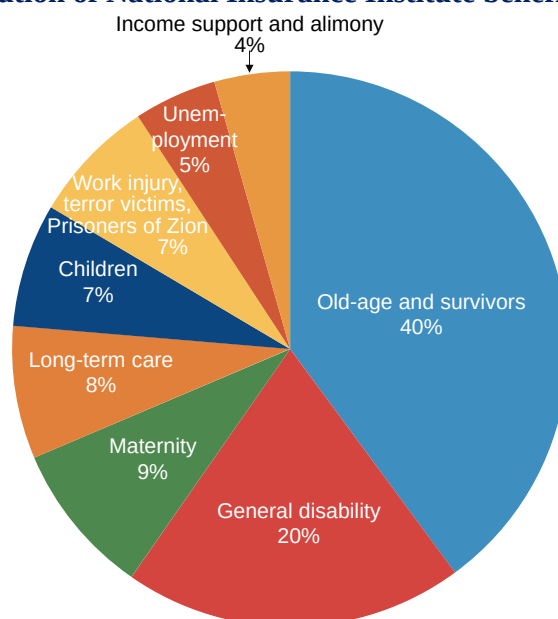
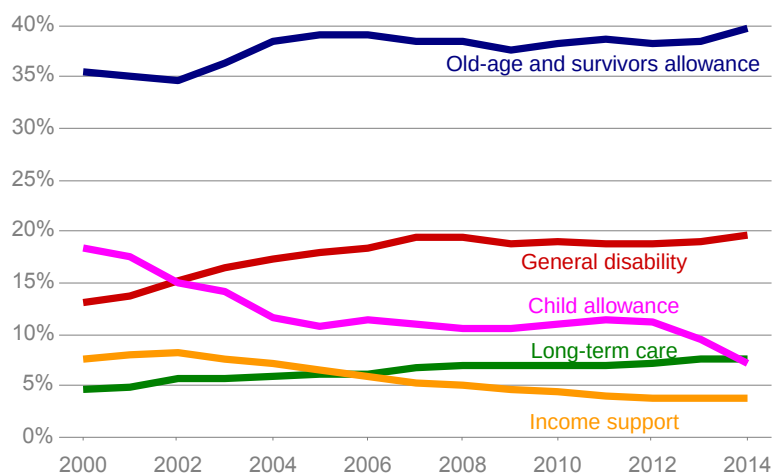


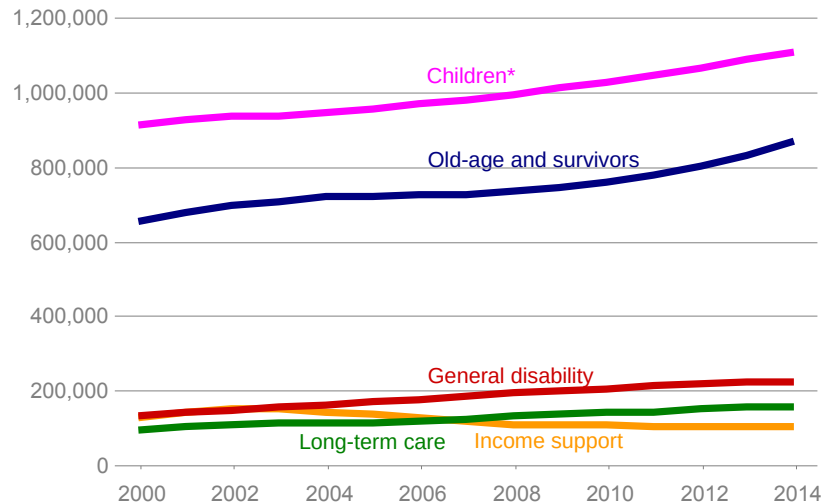
Figure 7
National Insurance Institute benefits, 2000-2014
 by type of benefit, as percent of all benefit spending



Source for both: John Gal and Shavit Madhala-Brik, Taub Center

Data for both: National Insurance Institute

Figure 8
Number of National Insurance Institute benefit recipients, 2000-2014
 by type of benefit



* Number of households

Source: John Gal and Shavit Madhala-Brik, Taub Center

Data: National Insurance Institute

In parallel with the rise in the number of old-age benefit recipients, the average pension amount paid to those eligible has increased by several hundred shekels (Figure 9).

A similar picture emerges regarding general disability benefits, which showed an increase both in recipient numbers (a 67 percent rise during the period 2000 to 2014) and in the average amount paid per recipient.

In contrast, a look at other National Insurance Institute activity areas indicates the opposite trend – fewer benefit recipients and lower benefits per recipient. One area where recipient numbers declined notably is in the income support program, which serves as a safety net of last resort for

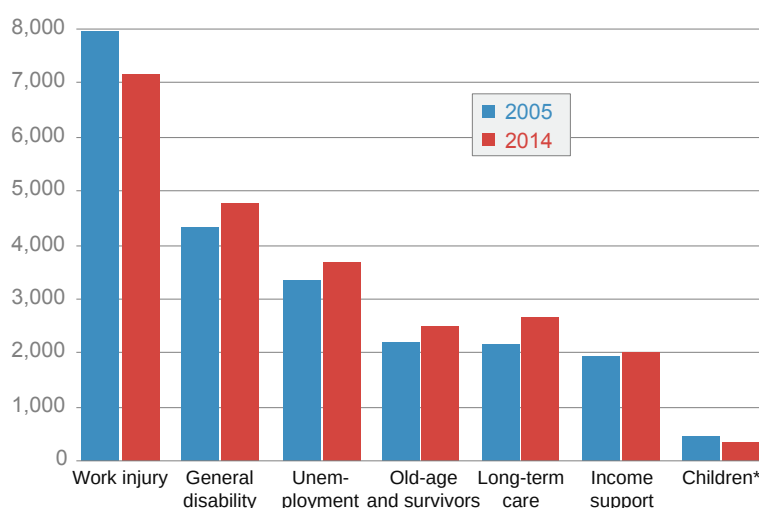
those who have no (or very low) income. Due to changes in the eligibility criteria for this program, along with a rise in the employment rate, the number of those receiving income support declined drastically: from a high of 158,000 families in 2003 to 103,000 families in 2014.

With regard to child allowances, the number of eligible families has risen substantially over time due to natural population increase, but the allowance's value decreased sharply. The benefit cut has meant that for some families, the benefit they currently receive amounts to half the previous amount. This is especially true in the case of large families.

Figure 9

National Insurance Institute benefit levels, 2005 and 2014

average monthly benefit per recipient, 2011 prices, in shekels



* Child allowances are paid to the family

Source: John Gal and Shavit Madhala-Brik, Taub Center

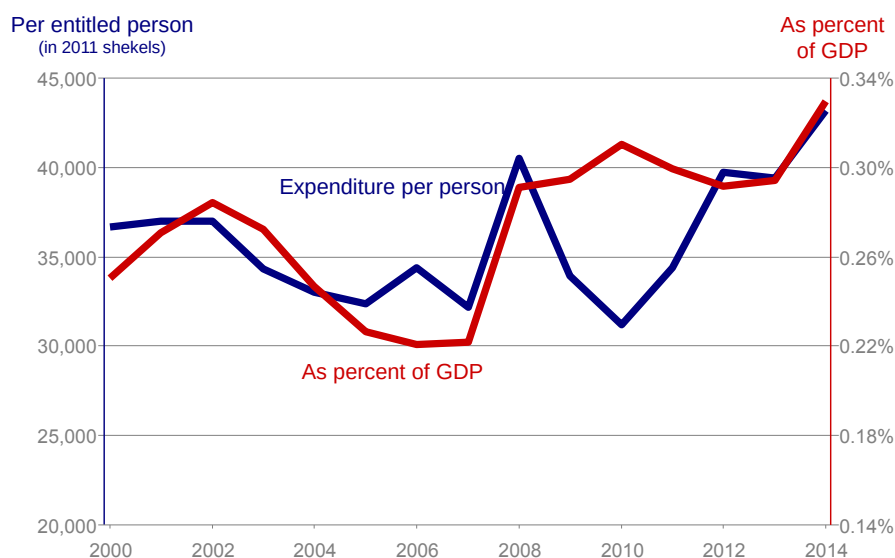
Data: National Insurance Institute

Holocaust Survivor Pensions

Another component of the social security system is assistance to Holocaust survivors. The Holocaust Survivors' Rights Authority was established in the mid-1950s, but over the past decade public outcry has resulted in greater efforts to ease the economic and social difficulties of this population (for an overview, see Kop, 2008). The Authority's budget includes government expenditures on a range of pensions and benefits that are set in several different laws: the Disabled Survivors of Nazi Persecution Law, the Disabled Veterans of the War against the Nazis Law, and the Holocaust Survivors' Benefits Law.

In 2008, a dramatic rise in spending on pensions and benefits for the Holocaust survivor population began (Figure 10). The increase was sparked by amendments to the law that allowed disabled Holocaust survivors who had not filed claims in the past to do so, and expanded eligibility to include those who were affected by the deportations in countries under German influence during World War II (Ministry of Finance, 2008; Knesset, 2011). Due to these changes, the expenditure on Holocaust survivors rose from 0.25 percent of GDP in 2000 to 0.33 percent in 2014, accounting today for 5 percent of all social security spending. From 2008 to 2010, the budget per eligible person decreased due to the substantial increase of 28,000 eligible survivors.

Figure 10
The budget of the Holocaust Survivors' Rights Authority,*
2000-2014
 per entitled person and as percent of GDP



* Calculated by the number of entitled persons according to the Holocaust Survivors' Rights Authority

Source: John Gal and Shavit Madhala-Brik, Taub Center

Data: National Insurance Institute

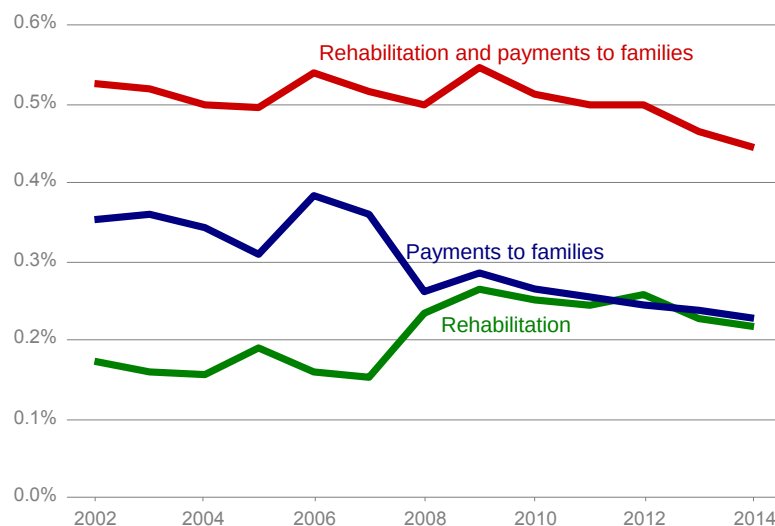
Benefits for Disabled IDF Veterans and Bereaved Families

The third component of social security spending is payments to soldiers injured during their military service, and to the bereaved families of soldiers who fell while serving in the IDF. This has been an expenditure area since the late 1940s that is administered and funded by the Ministry of Defense. Benefits and services provided to the disabled IDF veteran

population differ from those awarded to individuals injured in other circumstances, both in their scope and in the eligibility criteria.

Ministry of Defense data regarding expenditures for the rehabilitation of veterans with disabilities and on payments to bereaved families indicate an overall downturn in recent years: in 2013 the expenditure amounted to 0.44 percent of GDP in contrast to 0.51 percent in 2001 (Figure 11). At the same time, there has been a major increase in the number of veterans with disabilities who are being handled by the Ministry (Figure 12). These conflicting trends can be explained by a decline in Ministry of Defense spending on family payments – both a decrease in the number of eligible bereaved families and a reduction in the expenditure per eligible family.

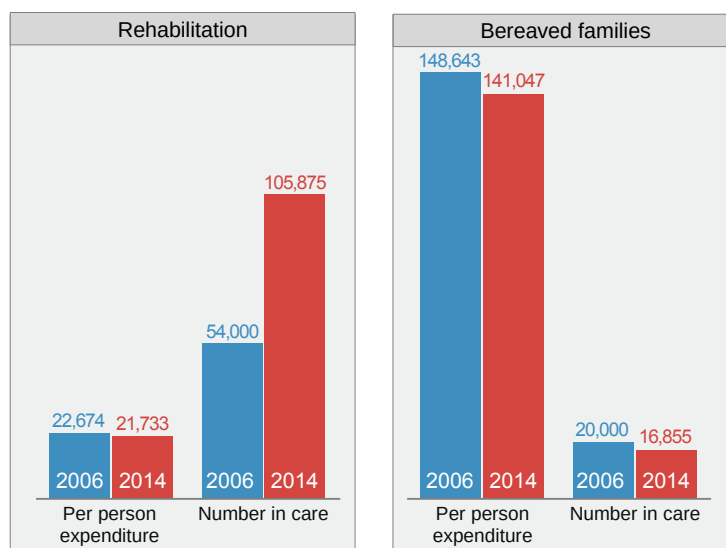
Figure 11
**Ministry of Defense expenditures on bereaved
family payments**
as percent of GDP, 2000-2014



Source: John Gal and Shavit Madhala-Brik, Taub Center

Data: Ministry of Finance

Figure 12
**Ministry of Defense expenditures on rehabilitation
 and benefits to bereaved families**
 number receiving care and annual per person expenditure,
 in 2011 shekels, 2006 and 2014



Source: John Gal and Shavit Madhala-Brik, Taub Center
 Data: Ministry of Finance; Ministry of Defense

Spotlight A: *The War on Poverty*

The War on Poverty Committee was established at the initiative of Social Affairs and Social Services Minister Meir Cohen in November 2013. The aim of the Committee, headed by Elie Elalouf, was to formulate a broad and comprehensive long-term plan to deal with the economic plight that

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affects a large swath of Israel's population, and to address growing inequality. The Committee's objectives were ambitious: to bring about a steep decline in the poverty rate, aiming for a figure close to the OECD average, within a decade. It proposed a 50 percent reduction in the poverty rate – from one-fifth to one-tenth of Israeli families.

The Committee was active for half a year. During this period, the 50 committee members drew up a long list of recommendations to be implemented at both the national and local levels. The Committee's across-the-board recommendations placed particular emphasis on the importance of enabling individuals to exercise their rights, and the need for accessibility mechanisms in state institutions to ensure that people living in poverty receive the services and benefits to which they are entitled. The Committee clearly sought to place the issue of poverty at the top of the public agenda and at the center of government activity, and to underscore the need for more extensive funding in this area. Some of the Committee recommendations were oriented toward making poverty a major focus of Israeli government efforts, and creating a cross-ministerial system for advancing poverty-related programs.

At the issue-specific level, the Committee formulated recommendations for each of the following areas: social security, social services, employment, housing, education, and health.

One of the Committee's main social security recommendations was to increase the income support benefit to a level that would ensure a decent standard of living for recipients who do not participate in the labor market. In the Committee's view, this level of support amounts to 67 percent of the poverty-line income (defined as half of the median household disposable income). Another proposal addressed the poverty trap that makes it difficult for benefit recipients to enter the labor market. It should be noted that the recommendation to raise the level of income

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support benefits was supported by a majority of the Committee members, but opposed by the Committee chair and by representatives of several government ministries.

Among the other Committee recommendations was establishing an "Empowerment Grant" program to encourage families living in poverty to open savings accounts for their children. The subcommittee on social security also recommended increasing child allowances. Regarding the elderly population, it was recommended that the pension for elderly people with no other means of support be increased to the poverty line income level. In the personal social services area, the Committee recommended significantly increasing the number of social workers treating families living in poverty, to ensure that the number of families assigned to each social worker does not exceed a maximum of 60. Another recommendation was to establish advocacy centers within local social services to help citizens exercise their rights.

The Committee recommendations regarding the labor market focused on a major expansion of the negative income tax program, especially for low wage-earning single mothers. It proposed that vocational training programs be expanded significantly. It also recommended instituting a nationwide program that, by means of focused, individualized effort, would encourage families living in poverty to enter the labor market. The Committee also emphasized the need to substantially increase the number of day care centers and employment programs for populations that suffer disadvantages in the labor market, such as Arabs, Haredim (ultra-Orthodox Jews) and people with disabilities.

Housing was identified as a major focal point for addressing poverty. Accordingly, the Committee recommended increasing rent subsidies for those eligible and expanding the public housing supply, primarily through the purchase of second-hand apartments. Regarding education, the Committee focused mainly on young children, recommending the

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establishment of early childhood centers and the institution of differential education budgeting. The Committee recommendations on health underscored the need to fund transportation to medical treatment for people living in poverty, and to increase state support for dental care.

The total annual cost of the Committee's recommendations was estimated by the Committee as NIS 7.2 billion. The larger expenditure items are those linked to providing benefit increases and to supporting, through the negative income tax, people transitioning to labor market participation. The figure constitutes a 4 percent increase in total social spending and 0.66 percent of the GDP.

After the recommendations were submitted in June 2014, lengthy discussions were held regarding their implementation. In October 2014, Minister Cohen announced that in the coming year, NIS 1.7 billion would be allocated to implement the recommendations. The funds would primarily be for pension increases for poor elderly and for the operation of community-based programs encouraging entry into the labor force.

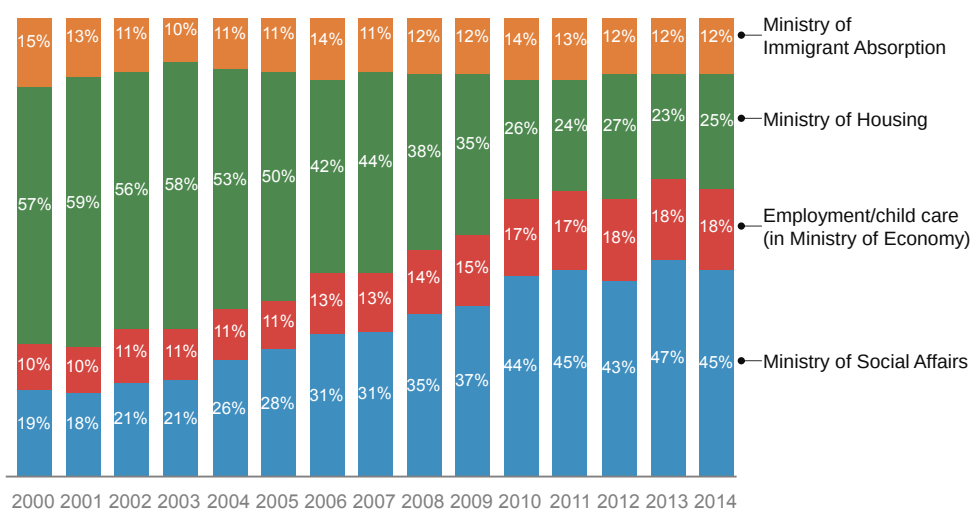
Shortly after that, the Knesset was dissolved and a new government formed. Funds have not been allocated to implement most of the Committee's recommendations. However, some recommendations in the sphere of social services were adopted in the framework of the "Breathing Easy" program established by the Ministry of Social Affairs and Social Services (see Spotlight B). The current government has also featured some of the Committee's recommendations in its work plans and in the state budget and Arrangements Law for 2015-2016. These include recommendations to increase the pensions of seniors lacking any other form of income; to increase child allowances and to institute savings plans for children (early 2017); to increase the supply of public housing; and to expand systems that care for families living in poverty and advocacy centers that help them exercise their rights.

3. Expenditure on Social Services

Public expenditure on social services encompasses Ministry of Social Affairs and Social Services expenditures, the Ministry of Construction and Housing budget, the Ministry of Immigrant Absorption budget, and those of the Ministry of Economy in the areas of employment and early childhood education.

In 2014, the largest portion of the public expenditure on social services (45 percent) was channeled to services provided by the Ministry of Social Affairs and Social Services, whether in local or nationwide frameworks (Figure 13). This is due to a significant increase in the Ministry's budgeting over the past decade.

Figure 13
Distribution of expenditure on social services, 2000-2014
by area of expenditure



Source: John Gal and Shavit Madhala-Brik, Taub Center

Data: Ministry of Finance

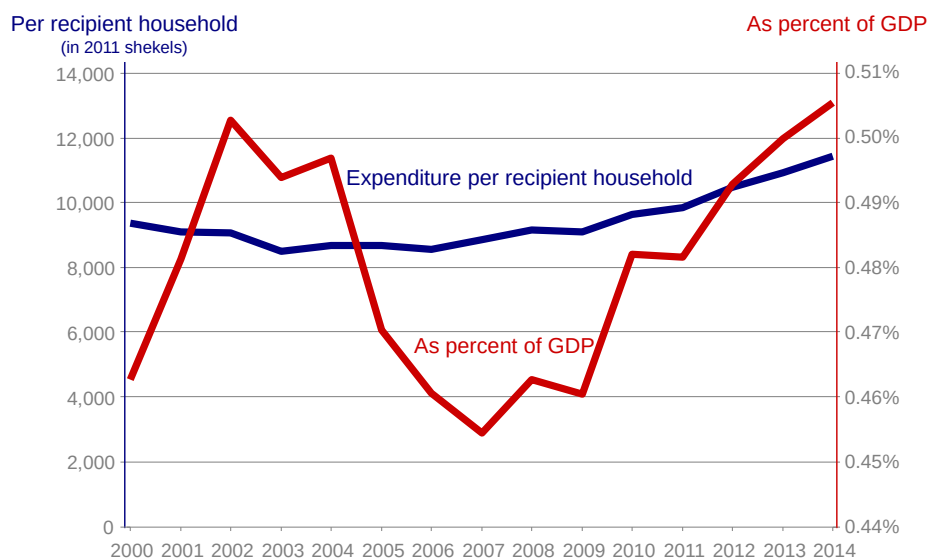
Ministry of Social Affairs and Social Services Expenditures

The Ministry of Social Affairs and Social Services provides services that are sometimes referred to as “personal social services.” These are services offered both in the community, under the authority of the local social services, and through institutional frameworks under the responsibility and supervision of the Ministry of Social Affairs and Social Services. Personal social services provide assistance to the weakest and most vulnerable population groups in Israeli society: children, adolescents and youth at risk, isolated seniors, families in crisis and distress – including single-parent families and immigrants – people with physical or mental disabilities, people coping with addiction, and the homeless. A great number of these people live in poverty and distress.

Although the total Ministry of Social Affairs and Social Services expenditure accounts for just 1.2 percent of total government expenditure, the Ministry’s budget as a percentage of GDP has increased in recent years (Figure 14). During this period, the expenditure to social services-recipient household ratio increased, after declining during the 2000s. Today, it is higher than it was at the beginning of the 2000s. This trend reflects a major increase in the Ministry budget, due, in particular, to an increase in the number of households served by the Ministry: 331,000 households served in 2000 compared to 464,000 in 2014 – 20 percent of all Israeli households.

Figure 14
Ministry of Social Affairs and Social Services budget,
2000-2014

as percent of GDP and per household for recipients



Source: John Gal and Shavit Madhala-Brik, Taub Center

Data: Ministry of Finance; Ministry of Social Affairs and Social Services; Central Bureau of Statistics

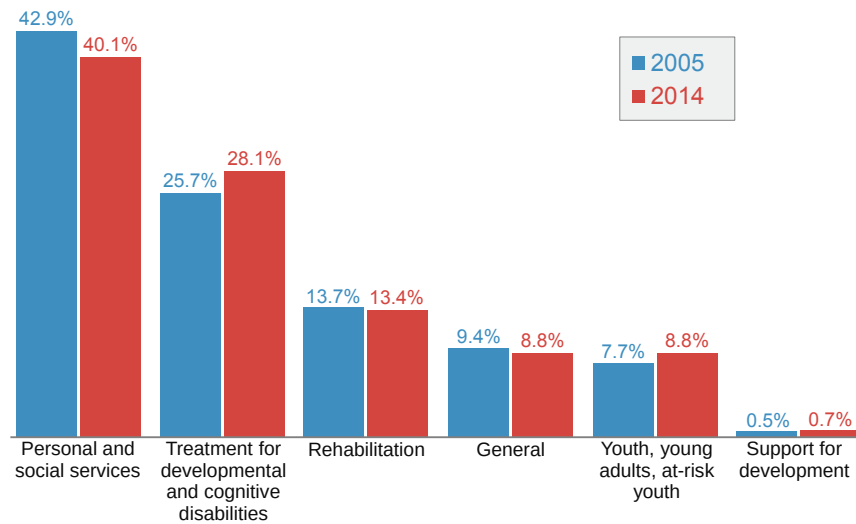
A look at the areas in which the Ministry of Social Affairs and Social Services is active (Figure 15) reveals that the Ministry's largest expenditure is on personal and social services. These services are intended primarily for families and are supplied by local authority social services and by a wide array of institutions.

A large portion of this expenditure is the Ministry's participation in funding social workers in the municipalities. According to the current funding formula, the Ministry funds 75 percent of the social services cost,

while municipalities cover the remaining 25 percent. The number of employees funded by the Ministry in local social services in 2014 was 6,450 (including 5,000 social workers). That is 50 more than the previous year and 9 percent more than in 2009 (Ministry of Welfare, *Social Services Survey*). Despite this positive trend, the increase constitutes only a partial response to ongoing demands to ease the burden borne by social workers whose caseloads are continually growing.

Figure 15
**Ministry of Social Affairs and Social Services budget,
 2005 and 2014**

by area, as percent of total Ministry budget



Source: John Gal and Shavit Madhala-Brik, Taub Center

Data: Ministry of Finance; Ministry of Social Affairs and Social Services

Spotlight B: *“The Breathing Easy and Otzma Advocacy Centers Program”*¹

The flagship program of the Ministry of Social Affairs and Social Services in 2015 is the “Breathing Easy” program operated by local social services in cooperation with JDC-Israel, the Rashi Foundation and other organizations. It aims to relieve the distress and social exclusion suffered by families living in poverty, to improve the status of these families, and to enhance their social mobility, through one-on-one interactions with social workers and family mentors, as well as by making diverse intensive services accessible to them for a limited time.

The program is innovative in that it applies the principles of poverty-aware social work practice. This approach emphasizes intensive and participatory work on the part of social workers with families living in poverty, the need to ensure these families’ access to the services for which they are eligible, and the possibility of advancing their social mobility through labor market participation.

One of the program's salient features is that a social worker specializing in family issues is assigned to work with 50 families living in poverty – rather than the average 200 families for which a municipality-employed social worker is currently responsible. Each family is assigned a mentor – a non-professional who works intensively with 20 families at a time and helps them implement the intervention plan. Each family that participates in the program is also allocated a flexible basket of services in the form of NIS 8,000 per year that the program team is authorized to use toward the family’s concrete and immediate needs.

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¹ The authors are grateful to Ayala Meir and to Nurit Weissbrod of the Ministry of Social Affairs and Social Services for their assistance in the preparation of this Spotlight.

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In addition to focused, individualized work with families, the program has another component: the establishment and operation of “Otzma” advocacy centers. These are centers specifically for people living in poverty who are clients of the participating municipality social services. The centers are managed by social workers who specialize in helping individuals exercise their rights, and they strive to ensure that services and benefits are accessible to those eligible. To this end, they offer programs and services, from information-provision to active advocacy, and operate a variety of programs to advance the rights of service recipients.

The centers also offer a range of group and community programs, with an emphasis on employment. Another major feature of the centers is their efforts to advance social policy change on behalf of their clients – what is referred to in social work as “policy practice.”

“Breathing Easy” was launched in March 2015, with a pilot program scheduled to run for a period of two years. It is being operated in 95 municipalities, with 3,020 families receiving intensive interventions. The Otzma centers will also be helping 12,000 families exercise their rights and participate in community-based programs.

As noted, the program targets families living in poverty, in municipalities ranked low on the socioeconomic scale and in disadvantaged big-city neighborhoods. Households participating in the program range in size from four to ten members and have all expressed a willingness to take part in the program.

“Breathing Easy” was allocated a budget of NIS 100 million for 2015-2016. Most of that money is being used to fund 109 new social work positions, to establish Otzma advocacy centers in 95 municipalities, to fund the flexible service basket, and to employ 250 family mentors.

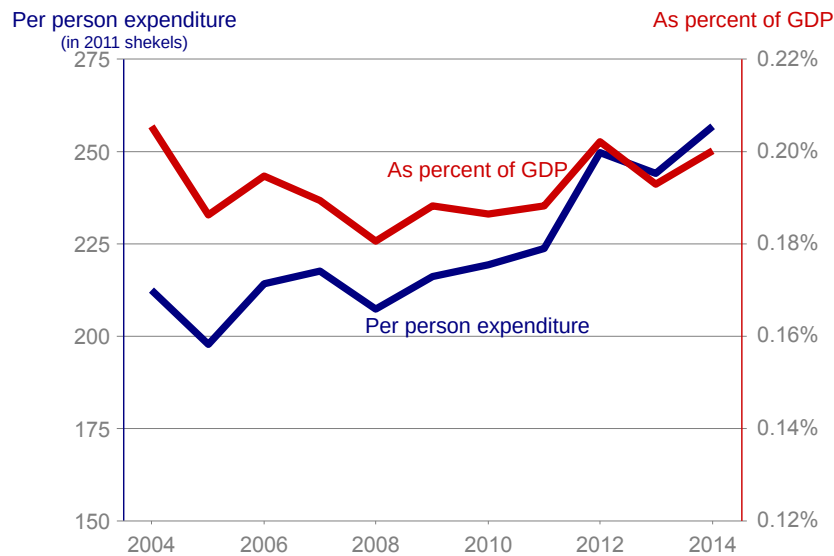
Ministry of Economy Expenditures on Employment and Early Childhood

The Ministry of Economy administers the state employment service that mediates between potential employers and jobseekers, provides vocational training, and enforces labor laws. In recent years, the Ministry has also been making a special effort to bring specific target populations into the labor market – Arabs, Haredim and people with disabilities. This activity takes place within the framework of the Ministry's employment department, which was created at the beginning of the current decade.

The data point to a substantial rise in labor force participation among some of these population groups. However, an examination of the labor market expenditure rates for the population as a whole (Figure 16) indicates that the expenditure is relatively small and has not risen significantly over the years. These data support the argument, raised in OECD reports on employment in Israel, that Israel's investment in this area is lower than that of other welfare states.

Day care centers and early childhood education are also under the Ministry of Economy's authority, reflecting a traditional view that the main goal of these services is to encourage women's, and particularly mothers', labor market participation. The Ministry is responsible for regulating this sphere, for building day care centers and overseeing family child care frameworks, and for subsidizing children's enrollment in these frameworks. Early childhood education was a focus of the 2011 social justice protests in Israel, and subsequently became the subject of one of the Trajtenberg Committee's principal recommendations (the committee was established in the wake of the social protests). Consequently, spending in this area has risen in recent years.

Figure 16
Expenditure on employment, 2004-2014
 per person expenditure and as percent of GDP



Source: John Gal and Shavit Madhala-Brik, Taub Center
 Data: Ministry of Finance; Central Bureau of Statistics

As Table 1 shows, the expenditure for the Day Care Centers Department amounted to a billion shekels in 2014. In particular, there was a 40 percent increase in expenditure related to subsidizing the fees paid by working parents for their children's afternoon programs, day care centers and family child care. Moreover, this period also witnessed a significant increase of hundreds of percentage points in spending on day care center construction and the repurposing of buildings as day care facilities. Total expenditure in these areas grew by 30 percent from 2010 to 2012, and by 50 percent from 2010 to 2014.

Table 1. **Ministry of Economy budget for day care centers and family child care for preschool children**

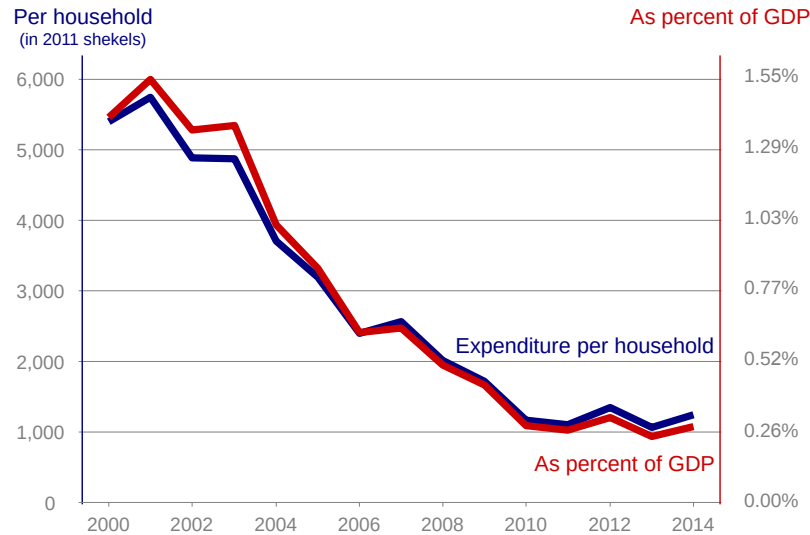
implementation budget, in thousand shekels, in 2011 prices, 2010-2014

Year	Expenditure	Annual change
2010	704,990	--
2011	823,815	17%
2012	960,967	17%
2013	1,023,173	6%
2014	1,107,742	8%

Ministry of Construction and Housing Expenditures

Despite intensive public preoccupation with the issue of housing in recent years, government housing expenditures have declined. This can be seen in the Ministry of Housing budget and in its construction and housing grants budget line item (Figure 17). In real terms, the Ministry's budget implementation declined by 70 percent between 2000 and 2014: from NIS 9.5 billion to NIS 2.9 billion.

Figure 17
Expenditure on housing, 2000-2014
 per household and as percent of GDP



Source: John Gal and Shavit Madhala-Brik, Taub Center

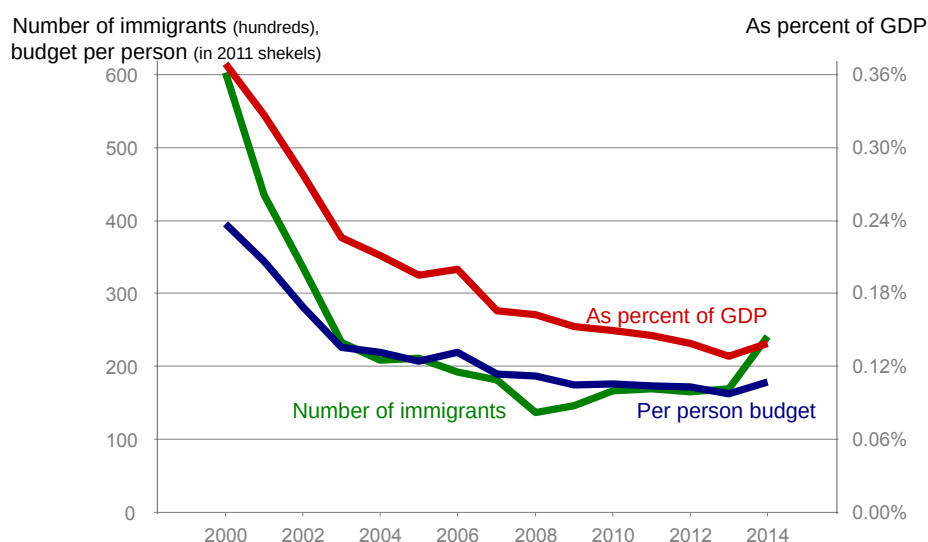
Data: Ministry of Finance; Central Bureau of Statistics

A look at trends in specific items within this budget reveals that spending on rent subsidies dropped by 21 percent between 2000 and 2014. Similar trends are seen in the Ministry's development budget. A dramatic contraction of the public housing supply (Bank of Israel, 2015), cutbacks in rent subsidies since the middle of the last decade, and the transfer of authority for planning and development measures to other agencies are all factors that may explain the downturn in this activity.

Ministry of Immigrant Absorption Expenditures

Traditionally, the budget of the Ministry of Immigrant Absorption, which is responsible for seeing to the needs of immigrants during their initial period of adjustment to life in Israel, has accounted for the smallest share of Israel's social welfare expenditure. This trend was reinforced over the past decade, when the number of immigrants who arrived in Israel declined sharply (Figure 18). Another factor behind the spending reduction is the government's decision to change the components of expenditure in this area.

Figure 18
**Number of immigrants and Ministry of Immigrant
 Absorption budget, 2000-2014**
 per person and as percent of GDP



Source: John Gal and Shavit Madhala-Brik, Taub Center

Data: Ministry of Finance; Central Bureau of Statistics

4. Conclusion

Israel's public expenditure on social welfare, which encompasses social security benefits and social services, amounted to NIS 86 billion in 2014 (in 2011 prices) – half of the government's social expenditure. This amount has been growing since the middle of the last decade. The rise is due mainly to increased social security spending, especially in the form of National Insurance benefits (disability, long-term care and old-age pensions). At the same time, there have been cutbacks on child allowances and income support.

Social welfare spending declined in the early 2000s by 30 percent, and since then has stabilized at rates that are considered low relative to the GDP and to total government spending. Among the various components of the decline in social welfare expenditure was a significant decrease (70 percent) in Ministry of Construction and Housing expenditures during the years 2000 to 2014. However, the same period saw an increase in Ministry of Social Affairs and Social Spending per client household expenditure, and in Ministry of Economy expenditures on day care centers and family child care.

Social welfare expenditure data, as surveyed in this chapter, show a trend toward stability with a moderate increase of state expenditure in the various social welfare spheres. Most of the rise stems from demographic changes, while a small portion is due to legislative change (spurred in part by social justice protests) and changing demand for services (e.g., declining immigrant numbers). When these trends are examined against the background of Israel's major social problems – beginning with poverty and inequality – and in comparison with the social investment made by other welfare states, the Israeli government does not appear to have made a concentrated effort over the past year to address the country's social ills.

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The Relationship Between Social Capital and Health in the Haredi Sector

Dov Chernichovsky and Chen Sharony*

Abstract

This chapter seeks to identify the possible reasons for the relatively good health status of Haredim (ultra-Orthodox Jews) in Israel. A comparison between Israeli cities shows that those cities characterized by large concentrations of Haredim also enjoy higher life expectancies than their socioeconomic rankings would predict. Moreover, a Central Bureau of Statistics survey found a substantially higher percentage of self-reported “very good” health status among Haredim than among other sectors. The chapter maintains that these data may be related to accepted parameters of social capital, that is, to attributes common among the Haredi sector that have a beneficial impact on individual and societal functioning. Some of these attributes are religious in nature, such as prayer and a faith-informed outlook on life, while others characterize Haredi society, i.e., close relationships with family and friends and a high degree of community involvement (as expressed through volunteering, for example). These hypotheses were examined in the chapter using regressions that test the influence of different factors on self-reported health status. It was found that religious observance has a significantly positive effect on the probability that a subject will report “very good” health status.

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Introduction

Israel's Haredi population (ultra-Orthodox Jews) constitutes an interesting test case in the social-welfare sphere. Their way of life has frequently been spotlighted in Israeli public debate, as it contradicts, to some degree, the secular Jewish-Israeli ideal of higher education in the sciences or humanities, social contribution through military service, and labor market participation. Haredi employment rates are particularly low, and a sizable share of Haredi males spend major portions of their lives studying in religious institutions. These attributes make Haredim a socioeconomically weak group whose reported household incomes are the lowest among all Israeli population groups (Regev, 2014).

Many studies have demonstrated a relationship between favorable socioeconomic conditions and good health (Kogevinas, Marmot, Fox, and Goldblatt, 1991; Kaplan, Pamuk, Lynch, Cohen, and Balfour, 1996; Wilkinson, 1996; Wilkinson, 1999; Marmot, Fuhrer, Ettner, Marks, Bumpass, and Ryff, 1998; Lynch 2000; Marmot, 2004; Shmueli, 2004; Marmot and Wilkinson, 2006; Marmot, 2006). As such, it might be expected that the low Haredi standard of living would be reflected in this group's health status and life expectancy data. However, this chapter will present evidence that Haredim actually enjoy better health and higher life expectancies than their socioeconomic status would suggest. The main hypothesis that this chapter undertakes to test is that this high level of good health is achieved through the social capital prevalent among them.

The first part of this chapter surveys Haredi health status in terms of two indices: life expectancy at birth and self-reported health status. Section 2 looks at the relationship between social capital and health. Section 3 examines features of the Haredi lifestyle, particularly social capital in the community. Section 4 looks at the relationship between ultra-Orthodoxy and health, and between social capital and health in Israel. Section 5 presents the study conclusions and proposes directions for future research.

1. Health Status of the Haredi Population

Life Expectancy Index

As noted in the *Introduction*, studies have shown that populations or communities living under favorable socioeconomic conditions have higher life expectancies than do socioeconomically weak populations. This finding has been corroborated by most Israeli research as well: a direct link has been observed between a city's socioeconomic ranking (according to ranking by the Central Bureau of Statistics) and the life expectancy of its residents (Figure 1).¹ However, several Israeli cities deviate from this trend and show relatively high life expectancies given their socioeconomic rankings. These cities are Beit Shemesh, Bnei Brak and Jerusalem – cities that all have a high share of Haredi residents.

Table 1. **Haredi residents of Jerusalem, Bnei Brak and Beit Shemesh, 2006**

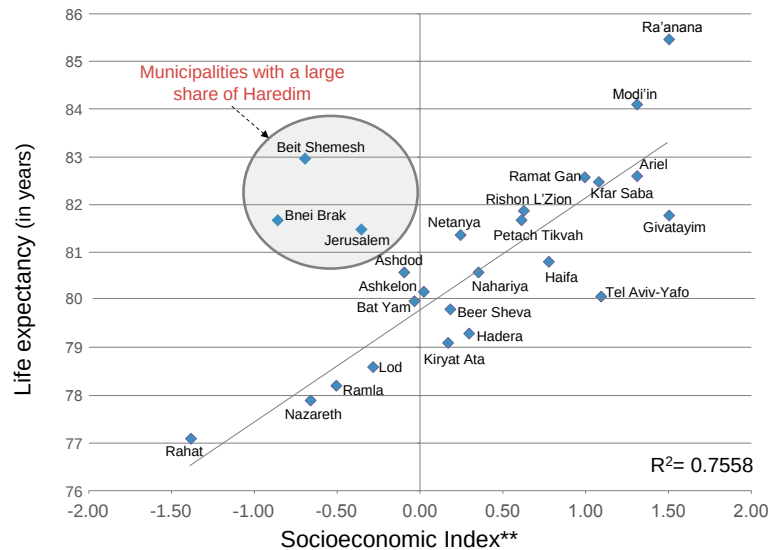
City	Number of Haredi residents	Haredim as a share of city's population	City's share of the Haredi population in Israel
Jerusalem	225,000	31%	35%
Bnei Brak	140,000	95%	22%
Beit Shemesh	32,000	46%	5%
Total			62%

Source: Dov Chernichovsky and Chen Sharony, Taub Center

Data: Cahaner, 2009

¹ The Appendix figures show this breakdown by gender. Although the gender breakdown weakens the significance of the correlation between socioeconomic ranking and life expectancy, the correlation remains nonetheless, with men showing a stronger statistical correlation – as shown in Appendix Figure 1A, which is similar to Figure 1.

Figure 1
Life expectancy at birth and the Socioeconomic Index*
 municipalities with over 50,000 residents



* Life expectancy at birth – average for 2005-2009; Socioeconomic Index – data for 2008

** The Index is calculated on the basis of 16 factors from the following areas: demography, education and schooling, employment, pensions, standard of living (cash income, mobility, housing factors).

Source: Dov Chernichovsky and Chen Sharony, Taub Center

Data: Central Bureau of Statistics, Ministry of Health

Another related finding – though one that pertains to the religious-Zionist public and not the Haredi sector – is noted in a study by Kark, Shemi, Friedlander, Martin, Manor, and Blondheim (1996). The study compared the standardized² mortality rates of 11 religious and 11 secular

² The standardized mortality rate estimates the study population's mortality rate (based on death reports for a given year) when the population's age

kibbutzim during the period 1970-1985, and found that the mortality rates in secular-kibbutzim were substantially higher than those of the religious kibbutzim. The age-standardized mortality rates of the religious kibbutzim were 5.67 for men and 2.33 for women, while those of the secular kibbutzim were 9.96 for men and 6.34 for women. The secular-religious differences were found to be statistically significant for both sexes and across different age groups and time periods. These findings indicate that, even in closed and highly-structured communities such as kibbutzim, level of religious observance has an impact on health status.

Self-Reported Health Status

Although the self-reported Health Status Index is not empirical in the same way as the Life Expectancy Index, it nevertheless provides an additional perspective on the health status of the Israeli population. The Health Status Index is based on the Central Bureau of Statistics' (CBS) *Social Survey 2012*, which included 7,500 respondents (CBS, 2014).

The vast majority of Haredim who participated in the survey (73.6 percent) characterized their health as "very good," compared with 50 percent in the other population groups (Table 2). Even when the population age was standardized (the Haredi population is relatively young), the differences between Haredim and other groups remained substantial: 64.6 percent of Haredim described their health as "very good" compared with 51-55 percent of (non-Haredi) religious, traditional and secular respondents. Accordingly, the percent of Haredim who reported a health problem of any kind was very low – 18.7 percent, compared with double that figure or more in the other groups. It is interesting to note that other religious groups (Muslims, Christians, and others) show no substantial differences in reported health status between the religious and the non-religious. Moreover, in response to the question about the existence of a health problem of any kind, an opposite trend to

distribution is identical to that of the standard population. The Index values are used for relative ranking and have no intrinsic meaning.

that of the Jewish respondents was observed: the very religious and religious reported a higher percentage of health problems – 33.8 percent, versus 25 percent for the less-religious and 28.2 percent for the non-religious respondents.

Table 2. **Self-reported health by religion and level of religious observance, as percent of the group total, 2012**

	Self-reported health assessment					Self-reported health or physical problem
	Very good	Good	Not so good	Not good at all	Very good (age adjusted)	
Jews						
Haredim	73.6%	20.4%	5.3%	--	64.6%	18.7%
Religious	52.9%	31.9%	10.1%	4.9%	55.1%	35.4%
Traditional	48.0%	31.5%	14.1%	6.3%	51.2%	39.4%
Not religious/secular	52.9%	34.0%	9.1%	3.7%	54.2%	33.7%
Other religion						
Very religious/religious	54.1%	21.7%	17.6%	6.7%	51.2%	33.8%
Not very religious	60.3%	24.8%	10.3%	4.6%	50.7%	25.0%
Not religious	56.4%	26.2%	12.3%	5.2%	48.5%	28.2%

Source: Dov Chernichovsky and Chen Sharony, Taub Center

Data: Central Bureau of Statistics, *Social Survey*

It is important to note that the relatively positive self-reports of Haredim may also be due to a social norm that frowns on complaining, and would particularly disapprove of “airing one’s dirty laundry” in the context of a secular survey. In general, there are problematic aspects to using self-reported information, as the reports reflect subjective attitudes that are also affected by factors such as social norms – meaning that societies with certain attributes (such as the ultra-Orthodox) might show considerable bias in their reporting. In order to address this problem, a comparison was conducted between the (subjective) self-reported data and age-standardized death rates (an objective health index). This comparison found a high degree of statistical correlation between subjective health status and objective measures.³

2. The Relationship Between Health and Social Capital

The basic definition of social capital as formulated by Putman, Leonardi and Nannety (1993) is: “features of social organization such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated actions.” The professional literature offers additional definitions of social capital which generally include such elements as trust, civil-society involvement and social integration between members of a given community or social network.

Studies on the topic distinguish between individual-level and community-level social capital. **Individual-level social capital (ISC)** is the degree of trust that an individual has in his environment; for example, how much he relies on his neighbors. **Community-level social capital**

³ The correlation between the indices at the group level (16 groups – geographic sub-districts) was analyzed. The correlation between “health status and age-standardized mortality rate” at the sub-district level was -0.707 (P value = 0.002). The correlation between “No health problems” and “age-standardized mortality rate” at the sub-district level was -0.600 (P value = 0.014).

(CSC) is the social capital that exists in the community. A possible measure of CSC is the number of organizations that are active within a community (e.g., religious organizations, civil organizations, labor unions, and the like). The assumption is that even a person who does not actively participate in these organizations nevertheless benefits from and is influenced by the social capital that exists within his surroundings. The tendency in today's research is to focus on community-level social capital (Scheffler and Brown, 2008). This chapter relies mainly on measured variables of social activity and connection to the surrounding environment, that is, individual-level parameters – but to a certain degree these also represent community-level social capital.

Earlier studies have also distinguished between **“bridging” social capital** and **“bonding” social capital**. Bridging social capital has to do with the individual's social network, or with relations between groups. Bonding social capital refers to the social relationships that exist within an organization or group, that is, the factors that lead to group cohesion and to the attainment of shared goals (Kim, Subramanian and Kawachi, 2006). In this study, the focus will be on bonding social capital. In the case of ultra-Orthodox Jews, there is a high level of bonding social capital, which may actually hurt the level of bridging social capital. This means that most of their trust and civic participation is within the community. While this may be a problem in many other aspects of public policy, it may not affect health outcomes.

In the public health field there is a very broad consensus that social capital affects health status (Wolf and Bruhn, 1993; Veenstra, 2002; Klinenberg, 2003; Szreter and Woolcock, 2004; Kim et al., 2006; Ronconi, Brown and Scheffler, 2012; Folland and Rocco, 2013). Various explanations have been offered for this connection:

- A. Social capital enables people to acquire knowledge about health-promoting behavior;
- B. Social capital can provide psycho-social support that reduces stress, thereby promoting people's health;

- C. By means of social capital, political activities can be organized that secure resources for the community and expand the health services provided to it;
- D. Social norms may foster healthier behaviors;
- E. Social capital may be linked to organizations that promote healthy behaviors (Miller, Scheffler, Lam, Rosenberg, and Rupp, 2006; Scheffler, Brown and Rice, 2007; Scheffler and Brown, 2008; Scheffler, Brown, Syme, Kawachi, Tolstikh, and Iribarren, 2008).

Alongside this consensus, some argue that the relationship between good health and social capital also reflects the availability of better health services in those communities that enjoy high social capital levels (Scheffler et al., 2007). Studies on the topic suggest that social capital may moderate the negative impact of unfavorable socioeconomic conditions on health status (Scheffler et al., 2007; Scheffler et al., 2008). Scheffler et al. (2007) examine the relationship between social capital and mental health, and finds that social capital is negatively correlated with psychological stress among families of below-average income, meaning that social capital reduces the stress suffered by poor people. No such effect was found for those of above-median income. As such, the authors argue that, above a certain income level, adding social capital has no effect on mental health status. A study that looked at the relationship between social capital and health status among those with coronary disease also found that social capital has an effect only on those whose income is below the median – a 1-unit rise on the social capital scale led to a 9 percent reduction in morbidity. For those with above-median income, no effect was found for social capital (Scheffler et al., 2008).

Additionally, many studies have established that religion has a positive impact on health (Jenkins, 1971; Comstock and Partridge, 1972; Jarvis and Northcott, 1987; Levin and Schiller, 1987; Levin and Vanderpool, 1989). Levin (1994) offers several explanations for this positive impact: health-promoting behavior within religious circles, environmental and genetic factors, psycho-social factors, and the sense of

security and serenity that faith and religious rituals provide. Scheffler and Brown (2008) also argue that the religious outlook itself, which posits that man's purpose in life is not merely pleasure but something larger, is health-promoting. However, no causal relationship can be proven between religion and health.

Kark et al. (1996) who, as noted, conducted their research on Israeli kibbutzim, also conclude that religious affiliation is a protective factor with regard to premature mortality. One of the authors' hypotheses was that a religious lifestyle reduces stress through a number of means: (A) a coherent worldview and sense of belonging to the community that give rise to emotional wellbeing. According to the authors, religious rituals – e.g., daily prayer – reinforce the sense of engagement with a collective to a degree not found even on secular kibbutzim; (B) the tranquility that is a byproduct of prayer; (C) faith in an external power; (D) repetitive behaviors (rituals) that leave less room for personal doubt. Also, the emphasis on Sabbath rest may also play a role; (E) marital stability.

Support for the link between Haredi social capital and health, with an emphasis on the material dimension, can be found in a study that was conducted in Jerusalem hospitals (Rosen, Ofer, Greenstein, Birnbaum, and Halevy, 2006). The study found that residents of Haredi neighborhoods made considerable use of private health services despite their characteristically low socioeconomic status. The authors offered two possible explanations for the phenomenon. One is the existence of mutual aid organizations (known by the Hebrew acronym *gamachim*), which cover the high costs of private health care for members of the Haredi community. The other is a Haredi cultural norm that supports health care expenditure, even when the costs are high.

It can be argued that the relatively good health of Haredim is due to other factors besides social capital – such as a greater access to healthcare or the prevalence of health-promoting behaviors. There are no data on healthcare access broken down by population subgroup but, because many Haredim are of lower socioeconomic status, it is reasonable to assume that they have no advantage in this sphere over other groups. With regard to behavior, a study in Israel on the topic found a reverse

correlation between health-promoting behavior and level of religious observance: the more devout a person is, the less health-promoting his behavior will be (Ministry of Health, 2013). A multi-year analysis presented within this study found that religious people are 60 percent more likely than secular people to be overweight. The study also found a reverse correlation between level of religious observance and the consumption of fruits and vegetables. The explanation for this finding may have to do with the Haredi population's low income level, which makes it hard to purchase relatively more expensive food items; alternatively, the outcome may be related to relatively low awareness of the need for a varied and healthy diet.

3. Attributes of Israel's Haredi Community

Israel's Haredi population numbers 750,000, and constitutes 9.5 percent of the total Israeli population (CBS, 2012). Haredim reside mainly in Haredi-only cities or in separate neighborhoods in mixed cities, where various *hatzerot* or Hassidic "courts" may be found. Haredim are a minority group in Israeli society and, according to studies on the topic, the Haredi sector is characterized by an ongoing perception of external threat from the surrounding society and a constant need to react to, and defend itself from, that threat. This translates into segregation from the rest of Israeli society through the establishment of separate social institutions in various areas of life (Caplan and Sivan, 2003). The *hatzer* is a society within a society – a kind of autonomous entity that provides its members with most of their needs. When, for example, a woman gives birth, other community women come and cook for the new mother during the first post-partum weeks, and there are organizations that visit and assist the ill. According to Levy (1998), among the *hassiduyot* (Hassidic groups, which are ultra-Orthodox branches that emphasize Jewish mysticism), whose structure is particularly communal, all members enjoy communal services. This includes *heder*, or religious preschool, for toddlers, and the entire education system is, of course, owned by the

community. The community also offers its members housing, and will even have a designated community burial area. Everyday needs are also met within the community; for example, some *hassiduyot* operate their own supermarkets and sell products at a discount thanks to cost savings and community subsidies.

The demographic, economic and social attributes of Haredim differ significantly from those of the rest of the Israeli population in nearly all areas (Table 3). The average age in the Haredi sector is 38.6, while that of the rest of the Jewish population is 47.6. About 85.1 percent of Haredim are married, versus 60.0 percent of other Jews. The average number of children per Haredi family is 3.86, compared with 1.99 for the rest of the Jewish population.

Table 3. **Demographic, economic and social characteristics, Haredim and the rest of the Jewish population,* 2012**

	Haredim	Other Jews
Average age	38.6	47.6
Married individuals	85.1%	60.0%
Average number of children per family	3.86	1.99
Academic education	19.6%	41.8%
Labor force participation rate	61.6%	71.4%
Residential crowding: more than 2 people per room	25.8%	2.1%
Car ownership rate	37.7%	74.4%
Net monthly household income	NIS 7,506	NIS 11,698
Made a charitable contribution in the past year	88.0%	66.1%
Served in the army	20.3%	65.3%

* For individuals 20-years-old and over (except for average age)

Source: Dov Chernichovsky and Chen Sharony, Taub Center

Data: Central Bureau of Statistics, *Social Survey* and *Income Survey*

Many Haredim have little formal schooling: only 19.6 percent have academic degrees, compared with 41.8 percent of other Jews. The Haredi labor market participation rate is relatively low – 61.6 percent, compared with 71.4 percent for the rest of the Jewish population.

The average Haredi total net income is NIS 7,500 per household, versus NIS 11,700 for other Jews. The Haredi household's primary source of income is generally the wife's salary. In recent years, more Haredi men have been working, but the numbers are still fairly small, and women remain the main wage earners (Caplan, 2007). Additionally, Haredi society is strongly associated with the shadow economy, i.e., jobs or entire businesses in which incomes are not reported and taxes are not paid. The main reason why unreported employment is so prevalent in Haredi society is not an unwillingness to pay taxes, but rather the fear of losing allowances and benefits that are given to *avreichim* (full-time students in *kollels*, or advanced Talmud study institutes) or of having one's military service exemption (which is conditional on yeshiva study) revoked (Levine, 2009; Ministry of Industry, Trade and Labor, 2010; Cahaner, Yozgof-Orbach and Soffer, 2012). No data are available regarding the scope of unreported Haredi employment, but it is thought to be large (Ministry of Industry, Trade and Labor, 2010). A high percentage of Haredim are employed within the community, at workplaces where they are the dominant group. This enables them to overcome their educational limitations and to work in an environment that suits their way of life (Sofer Furman, 2012).

The size of the typical Haredi family, along with the relatively low income level, forces the average Haredi family to live frugally and to rely on welfare institutions and the support they offer. Haredi mutual aid institutions include charity funds, soup kitchens, and more. There are also educational institution stipends and government benefits and grants, such as a guaranteed minimum income, child allowances and more (Cohen, 2005; Gottlieb, 2007; Sofer Furman, 2007; Taub Center, 2010; Cahaner et al., 2012).

The reform initiated by Prime Minister Netanyahu in 2003, which featured sharp cutbacks in social benefits (including child allowances), hurt Haredi families financially. The global economic crisis of 2008 also reduced foreign donations, including those earmarked for supporting *avreichim*. Many *avreichim* lost their living stipends, and some *kollelim* closed their doors. These processes led many Haredim to vocational study and employment. Over the past decade, a Haredi middle class has emerged; one whose attributes resemble those of Haredi communities in the United States, Canada and Western Europe – educated, involved in “secular” occupations, employed in mixed workplaces, and with lower birthrates. These Haredim also have contact with secular culture, though they retain Haredi patterns of communal behavior (Zicherman and Cahaner, 2012).

4. Haredi Social Capital

Religious involvement has been identified by researchers as a major element of social capital (Putnam, 2000). The Central Bureau of Statistics *Social Survey* findings point to a high degree of satisfaction on the part of Haredim with aspects of their lives that, to some extent, reflect high levels of social capital (Table 4). Relatively high percentages of Haredim attest to being very happy with their relationships with family members: 80.2 percent versus 62.7 percent or less in other population groups. A high percentage of Haredim reported daily or near-daily encounters with friends – 57.0 percent, compared with 49-51 percent for other groups.

In accordance with these findings, a relatively low percentage of Haredim report feelings of loneliness. Only 11.4 percent of Haredim said that they were lonely, compared with at least twice that amount among other groups. In this area, as with self-reported health status, a rise in satisfaction levels moving up the religiosity scale does not appear among non-Jews. About 37.7 percent of non-Jewish respondents in the study who identified as very religious or religious felt lonely – more than the not very religious (30.7 percent) and the non-religious (30.0 percent).

Table 4. Variables showing social capital by religion and level of religious observance, 2012

	Satisfied with family relations	Has friends	Meets or phones friends		Feels lonely	Volunteers		
	Very satisfied	Satisfied	Daily or almost daily	Once to twice weekly	Twice monthly or less often			
Jews	Percent out of total		Percent out of those with friends			Percent out of total		
Haredim	80.2	16.4	93.1	57.0	31.4	10.9	11.4	43.4
Religious	62.7	32.5	88.9	49.3	35.1	15.3	25.9	32.2
Traditional	62.1	32.7	89.8	50.4	36.0	13.2	27.7	17.4
Not religious/secular	60.0	34.1	94.9	51.5	36.8	11.4	24.5	20.8
Other religions	Percent out of total		Percent out of those with friends			Percent out of total		
Very religious/religious	68.7	26.3	83.1	29.9	41.0	29.1	37.7	
Not very religious	62.1	32.0	86.3	39.2	37.3	23.5	30.7	
Not religious	67.4	28.2	91.0	42.3	38.4	19.3	30.0	

Source: Dov Chernichovsky and Chen Sharony, Taub Center
Data: Central Bureau of Statistics, *Social Survey*

Haredim exhibit yet another feature of high social capital – high volunteerism rates. About 43.4 percent of Haredim report involvement in voluntary activity, compared with 32.2 percent or less among other non-Haredi groups.

5. Findings

In the previous sections, three findings were presented: (A) Haredim enjoy relatively good health (according to life expectancy rates and self-reported health status); (B) Haredi social capital levels are relatively high; (C) High social capital and health indices are positively correlated. Based on these findings, this section will test the study's main hypothesis: the relatively good health status of Haredim is linked to high levels of social capital – in the sense that social capital is a mediating factor between ultra-Orthodoxy and health status. As discussed previously, there is a tendency in the literature to see causality in this link: social capital affects health. However, the causal relationship is not self-evident and has not been proven – especially given the issue's psychological dimension, whose impact on health is not entirely understood. Even less self-evident is the causal relationship between ultra-Orthodoxy and social capital; it is possible that other factors contribute to both ultra-Orthodoxy and to social capital.⁴

⁴ A follow-up study will examine the issue of individual choice and the ultra-Orthodox lifestyle. At this point the hypothesis is that most Haredim were born to Haredi parents. According to the survey data, 70.3 percent of Haredim were also Haredi at age 15; as such, ultra-Orthodoxy is generally not a matter of choice, and the social capital in question is derived from being Haredi and from the Haredi lifestyle.

The investigation was conducted by means of a logistic regression analysis in which the dependent variable was self-reported health status, as reported in the Central Bureau of Statistics *Social Survey 2012* (CBS, 2014). Two regression equations were performed for two dependent (“explained”) variables: “Very good health status” and “No health problems” (the assumption is that the second answer is more objective). In other words, the probability of a respondent reporting “Very good health status” (Regression 1) or “No health problems” (Regression 2) was examined. Although the form of the regression estimation indicates causality between the variables, this is not to be considered explicit evidence of causality.

One model estimated the strength of the relationship between the variables representing religiosity level and reported health status, with other variables held constant (for the Jewish population only), while the other model estimated the strength of the relationship between the variables representing social capital and reported health status. The assumption underlying this approach is that if social capital is indeed a feature of religiosity or ultra-Orthodoxy, then the strength of the relationship between the social capital/religiosity variables and the dependent variable will be similar. The group that responded “good health status” was excluded from the analysis in order to strengthen the estimate’s reliability (by removing an intermediate group that could represent a “grey area” in the responses; when this group is included in the analysis, the findings are actually reinforced).

The original database comprises a population of 7,500 subjects aged 20 and over. From this database, as noted, respondents who answered that their health status was “good” were excluded, as were respondents from the non-Jewish population and incomplete observations. Thus, the database used to perform the regression includes 3,119 observations.

The complete regression results are provided in Appendix Tables 1 and 2. An analysis of the findings is given below.

Respondent age has, as expected, a negative effect on self-reported health status: older people report less good health. Marriage has a positive coefficient in the “No health problems” regression, meaning that married people’s likelihood of suffering from health problems is lower. However, no significant effect was found for marriage on the “Very good health” variable.

Marriage is a clear expression of high social capital, compared with other family status categories. It is interesting to see its impact here in the more “objective” question regarding “No health problems.”

As expected, a higher socioeconomic level – manifested, for example, in higher education and income – has a positive effect on both health variables (Grossman, 1972). Labor market participation rates are also positively correlated with health status in both regressions. However, it is hard to trace the direction of the causal relationship, given the impact of health on one’s ability to participate in the labor market.

The negative effect of the number of household wage earners may also point to opposite causality: an income reduction due to respondent health problems could force other family members into the labor market. That is, labor market participation is an option in situations where the family has no savings to draw on (Mincer, 1962).

In accordance with the research hypothesis, ultra-Orthodoxy has a strong positive correlation with the health variables. Moreover, most of the variables representing social capital are positively and significantly correlated with both health variables. The relative absence of a sense of loneliness, satisfaction with familial and neighbor relationships, and volunteering are all factors linked to health-status reports of “Very good” and “No health problems.” Furthermore, replacing the religiosity variable (the first model) with the social capital variable (the second model) does not alter the direction of the other independent variables’ relationship with the health variables, or even their significance. This finding, along with the data presented in Appendix Tables 1 and 2, support the hypothesis that Israeli Haredim possess a high level of social capital and a positive approach to personal health, which contribute to longevity.

6. Conclusion

The findings regarding the unexpectedly good health status of Israeli Haredim, given their socioeconomic standing, provide additional support for the hypothesis that there is a positive correlation between high social capital and good health. This relationship is likely due to psycho-social support in the Haredi community, which reduces emotional stress, and to the availability of community aid. On the other hand, Haredim do not appear to enjoy greater access to healthcare or to organizations that either promote positive health or that address public health issues. In fact, the opposite is the case. Further study is required to gain a deeper understanding of the factors underlying the positive correlation between social capital and good health in the Haredi community.

Appendix

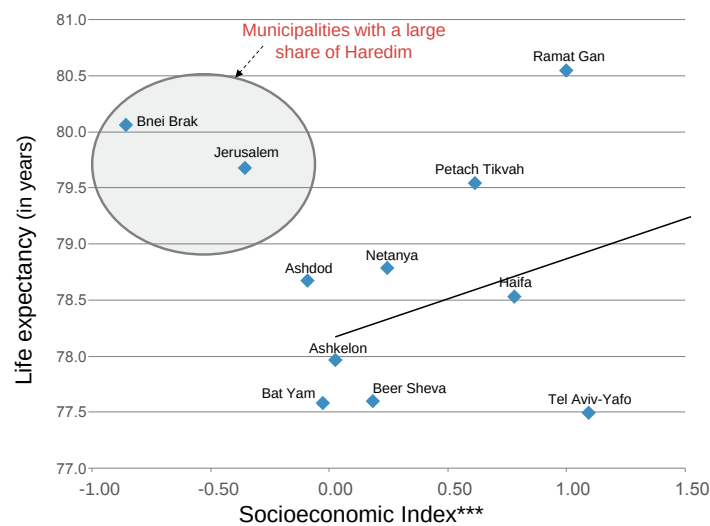
Figures

Appendix Figures 1A and 1B present the relationship between life expectancy and socioeconomic status (as in Figure 1 previously), broken down by gender (gender specific data was not available for all municipalities shown in Figure 1). Among women, the correlation found within the population at large is preserved, but somewhat weakened. For men, a more significant statistical relationship is found. This finding reinforces the argument that social capital has a health impact, as men are more involved in public activities such as prayer, and are thus likely to be more strongly affected by the advantages of social capital.

Appendix Figure 1A

Life expectancy at birth and the Socioeconomic Index* - men

municipalities with over 50,000 residents**



* Life expectancy at birth – average for 2005-2009; Socioeconomic Index – data for 2008

** Municipalities with over 50,000 residents where separate data for men and women were available

*** The Index is calculated on the basis of 16 factors from the following areas: demography, education and schooling, employment, pensions, standard of living (cash income, mobility, housing factors).

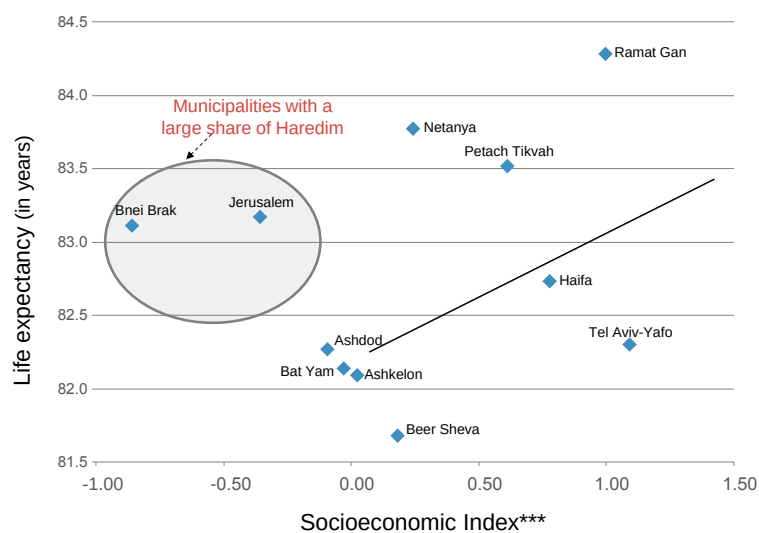
Source: Dov Chernichovsky and Chen Sharony, Taub Center

Data: Central Bureau of Statistics, Ministry of Health

Appendix Figure 1B

Life expectancy at birth and the Socioeconomic Index* - women

municipalities with over 50,000 residents**



* Life expectancy at birth – average for 2005-2009; Socioeconomic Index – data for 2008

** Municipalities with over 50,000 residents where separate data for men and women were available

*** The Index is calculated on the basis of 16 factors from the following areas: demography, education and schooling, employment, pensions, standard of living (cash income, mobility, housing factors).

Source: Dov Chernichovsky and Chen Sharony, Taub Center

Data: Central Bureau of Statistics, Ministry of Health

Results of the Regression Analysis (in Section 5 – Findings)

The statistical models:

1. $HS = \alpha_1 + \alpha_2 \cdot R + \alpha_3 \cdot S + \alpha_4 \cdot X + \varepsilon$
2. $HS = \alpha_1 + \alpha_2 \cdot K + \alpha_3 \cdot S + \alpha_4 \cdot X + \varepsilon$

HS = Model A: “Very good” health status=1; Other=0

Model B: No health problems=1; Problems=0

R = Dummy variable: Traditional (=1, Other=0), Religious (=1, Other=0), Haredi (=1, Other=0), Not religious (=0)

K = Vector of variables that represent social capital

S = Vector of socioeconomic indices (household income, education, number of wage earners, labor force participation)

X = Vector of demographic variables (age, gender, family status)

Appendix Table 1. **Influence of variables in areas of religion, demography and social capital on the likelihood of reporting "Very good health" in the Social Survey**

marginal effects (Z test score in parentheses) (continued on next page)

Independent variable - Religiosity model	Coefficient	Independent variable – Social Capital model	Coefficient
Demographic variables			
Age	-0.007*** (-24.49)	Age	-0.007*** (-25.50)
Gender of respondent (Male=1)	0.011 (1.12)	Gender of respondent (Male=1)	0.015 (1.56)
Family status (Married=1)	-0.004 (-0.34)	Family status (Married=1)	-0.011 (-0.96)
Socioeconomic variables			
Schooling: 1-10 years (=1)	0.133 (1.60)	Schooling: 1-10 years (=1)	0.135* (1.69)
Schooling: 11+ years (=1)	0.201** (2.43)	Schooling: 11+ years (=1)	0.194** (2.45)
Labor force participation (=1)	0.078*** (6.23)	Labor force participation (=1)	0.072*** (5.76)
Number of wage earners	-0.013* (-1.94)	Number of wage earners	-0.015** (-2.29)
Net household income	0.00001*** (11.78)	Net household income	0.00001*** (9.84)
Religiosity variables (Not religious=0)		Social capital indicators	
Traditional (=1)	-0.012 (-0.87)	Feeling lonely: Never (=1)	0.054*** (5.24)
Religious (=1)	0.024 (1.39)	Talks to friends/family daily (=1)	0.015 (1.16)
Haredi (=1)	0.101*** (4.86)	Talks to friends/family 1-2x wk(=1)	0.006 (0.49)
		Very satisfied with family relations	0.067*** (3.46)
		Satisfied with family relations	0.038* (1.89)
		Participates in social activities	0.056*** (4.23)
		Very satisfied with relations with neighbors	0.063*** (4.06)
		Satisfied with relations with neighbors	0.021 (1.56)

Appendix Table 1. **Influence of variables in areas of religion, demography and social capital on the likelihood of reporting “Very good health” in the Social Survey,**

marginal effects (Z test score in parentheses) (continued from previous page)

Number of observations	3,119	Number of observations	3,119
Pseudo R ²	0.5291	Pseudo R ²	0.5518
Ln chi ²	1,851.53	Ln chi ²	1,931.17

* Statistically significant at the 10% level

** Statistically significant at the 5% level

*** Statistically significant at the 1% level

Appendix Table 2. **Influence of variables in the areas of religion, demographic and social capital on the likelihood of reporting “No health problems” in the Social Survey,**

marginal effects (Z test score in parentheses) (continued on next page)

Independent variable – Religiosity model	Coefficient	Independent variable – Social capital model	Coefficient
Demographic variables			
Age	-0.009*** (-22.54)	Age	-0.009*** (-23.71)
Gender of respondent (Male=1)	-0.012 (-0.89)	Gender of respondent (Male=1)	-0.008 (-0.60)
Family status (Married=1)	0.029* (1.87)	Family status (Married=1)	0.034** (2.24)
Socioeconomic variables			
Schooling: 1-10 years (=1)	0.152 (1.50)	Schooling: 1-10 years (=1)	0.153** (2.07)
Schooling: 11+ years (=1)	0.211** (2.12)	Schooling: 11+ years (=1)	0.208** (2.07)
Labor force participation (=1)	0.110*** (6.43)	Labor force participation (=1)	0.100*** (5.88)
Number of wage earners	-0.017* (-1.92)	Number of wage earners	-0.022** (-2.55)
Net household income	0.00001*** (9.09)	Net household income	0.00001*** (7.33)
Religiosity variables (Not religious=0)		Social capital indicators	
Traditional (=1)	-0.014 (-0.73)	Feeling lonely: Never (=1)	0.059*** (4.37)
Religious (=1)	0.028 (1.23)	Talks to friends/family daily (=1)	0.014 (0.75)
Haredi (=1)	0.159*** (5.86)	Talks to friends/family 1-2x wk(=1)	0.005 (0.29)
		Very satisfied with family relations	0.082*** (2.88)
		Satisfied with family relations	0.052* (1.79)
		Participates in social activities	0.032** (1.99)
		Very satisfied with relations with neighbors	0.067*** (3.35)
		Satisfied with relations with neighbors	0.043** (2.34)

Appendix Table 2. **Influence of variables in the areas of religion, demographic and social capital on the likelihood of reporting “No health problems” in the Social Survey,**

marginal effects (Z test score in parentheses) (continued from previous page)

Number of observations	3,119	Number of observations	3,119
Pseudo R ²	0.3312	Pseudo R ²	0.3356
Ln chi ²	1,292.57	Ln chi ²	1,309.80

* Statistically significant at the 10% level

** Statistically significant at the 5% level

*** Statistically significant at the 1% level

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V. THE EDUCATION SYSTEM IN ISRAEL

Tracking and Attainment in Israeli Secondary Education

Carmel Blank, Yossi Shavit and Meir Yaish *

Abstract

The debate in Israel over the role of educational tracking and particularly technological/vocational education is related to socioeconomic and ethnic gaps as well as to educational and employment achievement. Despite the public discourse, discussions rely on research from the past that is not necessarily relevant to today's system. This chapter intends to fill in some of those gaps and has as its base three empirical questions. (1) What are the factors that affect a pupil's assignment to the various educational tracks in secondary school? (2) To what extent do pupils change educational tracks? (3) Does the educational track affect a pupil's likelihood of finishing secondary school and qualifying for a bagrut (matriculation certificate)? The findings show that despite changes in technological/vocational education, socioeconomic factors still relate to tracking assignments, even when the effects of previous pupil achievement are controlled. Mobility between tracks is quite low and the educational track affects chances of completing secondary school and attaining bagrut qualification. Changes over time were also identified. First, bagrut qualification rates have increased substantially in all tracks. Second, the main transfers between tracks today are from technological to academic tracks, which are considered more prestigious. Third, while in the past most Arab Israeli secondary school pupils were in the academic track, today more than half of them are learning in the technological tracks – with many pupils in the engineering track where the bagrut qualification rates are the highest.

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Introduction

Every few months, there is renewed public debate surrounding vocational education in Israel. Many remember the now infamous debate between the Mizrahi¹ ministers in the Israeli government (Silvan Shalom and Amir Peretz) and the (Ashkenazi) Prime Minister (Benjamin Netanyahu). This is how *Ynet* reported the incident:

There was a stormy debate in the government session on the topic of vocational schools. An angry Minister Silvan Shalom said, "Wanna fight?" And Meir Cohen and Amir Peretz were at his side. The Prime Minister replied: "You are living in the past. Metal workers and welders earn a lot of money. Your stance is based on trauma." Shalom shouted back: "I have no trauma, I was in the academic track. You didn't grow up here, and you don't know how things work" (Azoulay, 2014).

This outburst within the government highlights the deep divide on the issue of vocational education in Israel. On the one hand, there are those who believe that vocational training in education is intended primarily for weaker pupils, the majority of whom are of Mizrahi origins, and that this track directs pupils away from bagrut² preparation (matriculation qualification) and destines them to low-pay low-status jobs. On the other hand, there are those who claim (like Netanyahu) that vocational training equips its graduates with skills that help them earn a reasonable income. This debate has refused to go away and comes up time and again because

¹ Mizrahi Jews are those who trace their roots back to Muslim majority countries. Ashkenazi Jews trace their roots back to Central and Eastern Europe.

² Bagrut or matriculation examinations assess knowledge on subjects studied in upper secondary school. They are frequently compared to the New York State Regents' Exams and ETS Advanced Placement (AP) tests. Bagrut scores represent an average of the test score and the grade received on that subject in school. Subjects are tested at study unit levels ranging from 1 to 5 units, calculated by the number of class hours devoted to the subject.

educational tracking, separating pupils to academic or vocational tracks, is a common structural characteristic of education systems in general and is particularly common in Israel.

Even though it is a hot topic socially, economically and politically, there is no current data on this subject in Israel. Most previous studies on tracking and other forms of segmentation in secondary education in Israel rely on data from the 1970s. Since then, there have been many reforms in the education system and among them many changes in the way pupils are tracked. As a result, there is definitely room for a reexamination of the subject.

This chapter explores the extent to which segmentation in secondary education affects subsequent educational attainment. It is based on the most recently available data from the Ministry of Education. The analysis in this chapter is guided by three research questions:

1. Which factors affect pupils' assignment to the different educational tracks in secondary education?
2. Is this initial assignment permanent? That is, to what extent are pupils able to transfer between tracks?
3. What are the consequences of educational track placement on drop-out rates and bagrut achievement?

1. Vocational Education: Background and Context

In the 1960s and 1970s, vocational training in Israel expanded substantially and was attended by nearly 60 percent of all secondary school pupils. It was intended for those pupils who were not considered suitable in terms of their prior achievements for academic studies. Academic high schools were fashioned after the Gymnasias of Central Europe – they were selective schools that integrated studies in the humanities and sciences at a relatively high level and prepared pupils for higher education and more prestigious professions. In fact, the schools, which were established based on this model in the early Yishuv period

(pre-State) were called by their European name – Gymnasia. Most children of immigrants who arrived from Middle Eastern countries in the 1950s and 1960s, as well as many Ashkenzi pupils, were considered unsuitable according to the decision makers in the education system to meet the high requirements of these secondary schools and were subsequently tracked to vocational schools where the academic requirements were relatively low.

Expanding the vocational tracks was justified also by its apparent consistency with the requirements of economic development in the early years of Israeli statehood. This was a time of rapid industrialization that created a demand for skilled and semi-skilled workers, which the vocational schools were said to supply. Thus, the vocational schools served several functions: they provided a skilled labor force for industry; presented educational opportunities for what was considered a weak population; and allowed the academic schools to retain their social selectivity and adhere to their values of “excellence.”

Since then, and primarily in the 1990s, the proportion of pupils attending vocational schools has declined, reaching between 30 and 40 percent in the last decade. In addition, since the 1990s, the name of these tracks has changed from “vocational” to “technological” in an attempt to add some prestige to them.

Currently, Israel's secondary education consists of the following four educational tracks: (A) academic track which is intended to prepare pupils for academic studies; (B) engineering, which is thought of as the “high” technological track, designed to prepare pupils for the bagrut and higher education in engineering, computer science or bio-technology; (C) the technological track, which is designed to prepare pupils for the bagrut qualification and further education in technological fields of study or as practical engineers or technicians, and (D) the vocational track, which is the “low” technological track, designed to provide vocational training alongside academic courses. All of these tracks prepare pupils for bagrut exams, though they have different emphases and, as will be shown further on, different success rates.

In addition to these tracks, the Ministry of Economy maintains several industrial schools that are intended for pupils requiring remedial or a second chance education. These schools, which are attended by about 5 percent of the pupil population, combine some academic education with practical and on-the-job training. Unfortunately, industrial school pupils are not included in Ministry of Education data and are, therefore, not included in this study.

Of all pupils in the technological tracks, about one-third attend the engineering track where bagrut certification rates are even higher than in the academic track. An additional third attend the technological track where bagrut rates have improved substantially in the past decades. Another third attend vocational tracks and industrial schools where the bagrut rates are low relative to the other tracks.

As mentioned, there is a basic disagreement about the role of technological education. On the one hand, there are researchers who see the tracking mechanism as maintaining inequalities in opportunities, education and employment. They claim that children in the lower classes have a higher chances of attending technological tracks which point them away from bagrut certification and therefore away from higher education (e.g., Shavit, 1984; Zussman and Tsur, 2010). These researchers attribute the negative results to a number of factors – primarily to a lack of sufficient academic preparation and to the negative stigma that is attached to the technological tracks. According to these claims, vocational graduates are perceived as having lower abilities than graduates of academic tracks.

On the other hand, there are those who claim that the vocational tracks provide, under certain circumstances, an economic safety-net for their graduates and that they are not simply a mechanism of social exclusion. First, there are a number of pupils, primarily boys, who have difficulty concentrating in academic classes and prefer more practical studies. Vocational education is there to lessen the drop-out rate for these pupils. In other cases, there are those who remain in school because of their interest in technology and in this way, they also get a bagrut qualification. According to this view, technological training lessens the drop-out rate

and even improves the chances of bagrut qualification among pupils who are not drawn to an academic education. Second, proponents argue that the skills learned in vocational tracks are in demand in the labor market and offer reasonable compensation. Thus, vocational training is perceived to be limiting the future chances of unemployment and poverty among pupils who are not considered to be academically strong.

Data and Variables

Data for this chapter come from four administrative files that were provided by the Ministry of Education and were merged, at the pupil level, using the identification number given to each pupil by the Central Bureau of Statistics. The resultant database includes information on a large nationally representative sample of pupils who were born in 1993 and 1994 and who would have completed their secondary education in 2011 to 2012. Pupils in Haredi (ultra-Orthodox Jewish) schools and those in special education were not included. The files include information on pupils' 5th grade scholastic achievement (the Meitzav exam), their socioeconomic background, track placement in grades ten through twelve and bagrut examination results. More details regarding these files and the overall data appear in the Appendix.

The files were combined in the following way. In the school year 1993-1994, about 92,000 5th graders were tested in the Meitzav exam (about half of all Israeli schools are tested each year). For each pupil in the two age cohorts examined, the Meitzav test scores from the 5th grade were combined with the pupil and school data from 10th to 12th grades. After this, bagrut exam results were added to this database.

The final database includes data on pupils who did not drop out of school prior to 10th grade (the grade where tracking begins), and for whom there was Meitzav information from 5th grade. The final file that was analyzed includes 81,500 pupils.

Background variables

There are three independent variables that relate to pupil background information:

Socio-demographic variables. This includes parental education (the higher of either parent's years of schooling); dichotomous variables for gender (girls=1, boys=0); migration status (immigrant=1; native-born=0); birth cohort (born in 1994=1, born in 1993=0).

Fifth grade Meitzav achievement in mathematics, science, English, and language skills (native language – Hebrew or Arabic). All test scores were standardized within subjects and then averaged for each pupil across all four subjects.

School attributes. The Ministry of Education uses a 10 point scale of socioeconomic status, where the highest ranking represents the lowest socioeconomic status. The scale is a weighted average of parental education and income of pupils in the school, whether the school is in the center or periphery of the country, and the ethnic composition of pupils in the school. For ease of use, the scale is reversed so that the highest ranking represents the schools with the highest socioeconomic ranking. In addition, dichotomous variables were used to represent Jewish education, Arab Israeli education and state-religious schools.³

Dependent variables

The following dependent variables were studied:

Academic track. This was measured in 10th and 12th grade and divided into the following categories: academic, engineering, technological, and vocational (VET) track.

³ Since the vast majority of pupils in Arab Israeli schools are Arab, there was no need to test both the effect of Arab Israeli ethnicity and that of attending an Arab Israeli school.

Mobility between tracks. A variable that represents remaining in the track or changing tracks between 10th and 12th grade.

Drop-out. A variable that represents if the pupil dropped out of school between 10th and 12th grade.

Bagrut qualification. A variable that represents pupil bagrut certification. Bagrut qualification is given after the pupil has been tested in seven mandatory subjects (English, mathematics, Torah or religious studies for non-Jewish pupils, literature, history, civics, and language skills), as well as at least one elective subject. One of these eight subjects has to be at an advanced level of study.⁴

2. Distribution of Pupils Among Academic Tracks

To put this analysis in a context, it should be noted that about 60 percent of 10th grade pupils in Israel are enrolled in the academic track. The technological and vocational tracks account for 40 percent of all Israeli pupils, as follows: about 10 percent are enrolled in the lowest vocational track, and the remaining 30 percent are distributed about equally between the engineering and technological tracks.

Figure 1 shows the socioeconomic profile of pupils in the four tracks. Several points are noteworthy: first, girls are generally overrepresented in the academic track (about 56 percent of all those in the track), but are

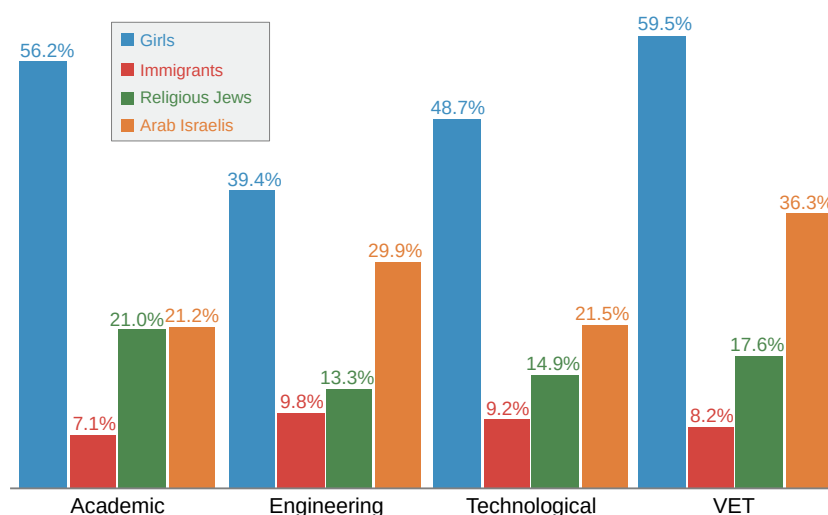
⁴ Under certain conditions, a pupil might be eligible for the certificate even if the pupils failed in one subject (except for language skills). Eligibility for the certificate, however, is defined by the accumulation of 20 units, where each subject can be studied at a number of levels. The seven mandatory subjects yield no fewer than 16 units and together with as little as one advanced elective subject, the pupil can reach the minimum 20 units. That said, advanced English (4-5 units) is a mandatory requirement for admission to a university in Israel (while most colleges do not require advanced English), thus a “university” matriculation certificate would include no fewer than 21 units.

relatively underrepresented in the engineering and technological tracks (about 39 percent and 49 percent respectively). This is not surprising given the greater preference of boys for mathematics and the sciences which are taught in these two tracks (Gabay-Egozi, Shavit and Yaish, 2015). In contrast, girls are overrepresented in VET; they are about 60 percent of the pupils in this track. This may seem surprising at first glance, because girls are better pupils on average than boys (see for example, DiPrete and Buchmann, 2013). However, it may be due to the prevalence of programs in VET for feminized occupations, such as pre-school teacher's assistants and beauticians.

Figure 1

Distribution of pupils by educational track

10th grade pupils, by gender, country of origin and ethnicity,
average for 2011-2012



Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

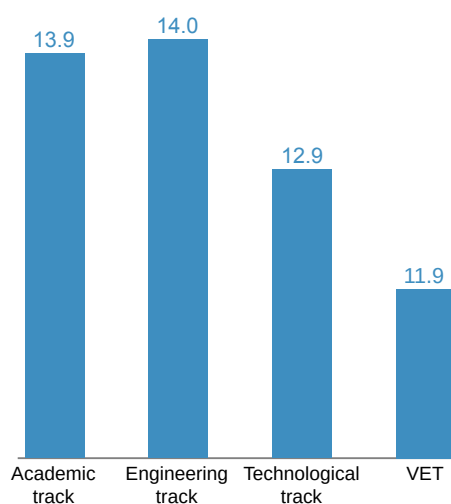
Second, immigrants – who make up 8 percent of the sample – are relatively underrepresented in the academic track and overrepresented in the vocational tracks, particularly in the engineering and technological tracks. This fits nicely with previous findings on the educational preferences of immigrants, particularly those from the former Soviet Union, who prefer a more practical education for their children (Chachashvili-Bolotin, Shavit and Ayalon, 2011).

A particularly interesting finding that has not been previously documented previously is that Arab Israelis, who make up 24 percent of the total sample, are overrepresented in the engineering and vocational tracks. Previous research in Israel has highlighted the paucity of vocational education and training programs within Arab schools that was attributed to the reluctance of the State to invest in these relatively expensive programs in the Arab sector. The cost per pupil in vocational tracks is about 50 percent higher than the average cost in the academic track (Shavit, 1989). Paradoxically, the near absence of vocational education for many years worked to the advantage of the Arab Israeli population, as many of them remained in the academic track and thus their rates of bagrut qualification increased substantially.

The new finding regarding the rate of Arab Israelis in non-academic tracks reflects an important change in the provision of vocational education since the 1990s that seems to have gone largely unnoticed. Until then, the choice of vocational education was largely preset among the Jewish population of low socioeconomic status. However, as public criticism of these programs mounted, parents preferred academic education for their children and many school principals dismantled technological/vocational education programs in schools. In contrast, in the Arab Israeli sector, demand for these programs increased because, as had been the case in the Jewish sector decades before, they are perceived as suitable programs for the many pupils, mostly males, who may drop out of secondary school prematurely. The Ministry of Education, which had become more equal in its resource allocations to Arab Israeli and Jewish education, accommodated this demand.

Figures 2 to 4 show that the academic and engineering tracks attract relatively strong pupils compared to the other tracks: more pupils in these tracks have educated parents (Figure 2), higher scores on the Meitzav exams (Figure 3) and attend schools of higher socioeconomic status (Figure 4).

Figure 2
**Parental education by pupil educational track,
average for 2011-2012**
10th grade pupils, average number of years of schooling
for parent with higher level of education



Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center
Data: Ministry of Education

Figure 3
Relative Meitzav scores of pupils by educational track
 10th grade pupils, pupils' 5th grade standardized Meitzav scores,*
 average for 2011-2012

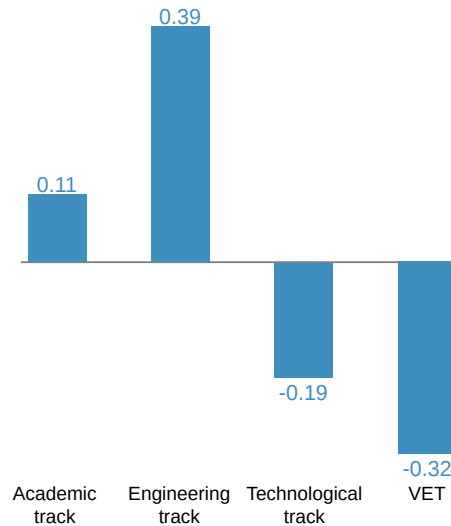
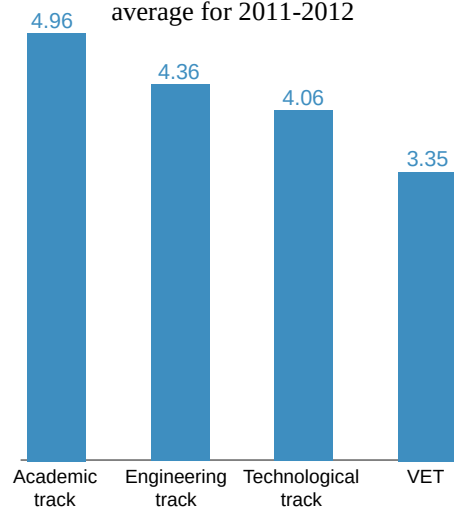


Figure 4
School socioeconomic status by educational track**
 average for 2011-2012



* Standardized to a scale score of 0-1. The value represents the ranking of the score relative to other pupils.

** The scale goes from 1 (the lowest socioeconomic ranking) to 10. This is the reverse of the Strauss Socioeconomic Index.

Source for both: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data for both: Ministry of Education

3. Multivariate Analysis

The Effect of Socio-demographic Variables on Educational Track

The data presented in the previous section indicate differences among socioeconomic groups in the distribution of pupils in the various academic tracks. The question arises whether these differences are the result of socioeconomic differences or prior scholastic achievement. That is, is it that pupils from stronger socioeconomic backgrounds tend to show higher achievement already in primary school, and on the basis of their higher achievements are assigned to more prestigious educational tracks? Or, is there some selection mechanism that assigns pupils based on their socioeconomic status, regardless of their previous achievements? To check this, a multinomial regression was used that statistically controls for parental education (as a proxy for socioeconomic status), for previous achievements and for several additional variables (gender, migration status, school sector and school socioeconomic status).

In most cases, there was no difference in the results when these variables were controlled for and when they were not. The regression model (presented in Appendix Table 1) shows that the engineering track is the most selective track in terms of socioeconomic background, and that pupils in the technological and vocational tracks come from less privileged social backgrounds relative to those in the academic track.

The regression analysis raises another noteworthy point. In contrast to the data in Figure 1 which shows that Arab Israelis are overrepresented in the engineering and vocational tracks, when the other variables are controlled – and primarily controlling for the low socioeconomic status that characterizes most Arab Israelis – it seems that they prefer the engineering track over the academic track. Furthermore, they prefer the academic track over either the technological or vocational track. This would suggest that the overrepresentation of Arab Israelis in the vocational track is related to their relatively low socioeconomic status.

The Effect of Socio-demographic Variables on Mobility Between Educational Tracks

The multivariate analysis also serves to examine the mobility between education tracks in 10th to 12th grade. The data show that about 12 percent of pupils change tracks between 10th and 12th grade. The highest rates of mobility are seen in transfers out of the engineering track (about 17 percent), and the lowest mobility is in transfers out of the academic track (8.5 percent).

Table 1 presents the shifts between educational tracks for these pupils. The majority of the mobility is into the academic track from each of the other tracks, with about equal proportions (10-13 percent of all pupils in the other tracks). Mobility between the technological, vocational and engineering tracks is minimal, as is the move out of the academic track.

Table 1. **Mobility between education tracks**

share of pupils staying in the same track or changing tracks between 10th and 12th grade, as percent of all pupils in that track

Track in 10 th grade	Track in 12 th grade					
	Stayed in track	Moved to academic track	Moved to engineering track	Moved to technological track	Moved to vocational track	Dropped out
Academic	91.5%	--	1.3%	2.2%	2.1%	2.9%
Engineering	83.3%	12.5%	--	1.8%	1.0%	1.4%
Technological	80.6%	10.4%	0.9%	--	2.5%	5.5%
Vocational	80.2%	10.5%	0.5%	3.7%	--	5.2%

Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

The drop-out rate from the “lower” two tracks (technological and vocational) is two to three times higher than the drop-out rate in the academic or the engineering track (about 5 percent versus about 1.4 to 2.9 percent, respectively).

To test the effect of pupil socio-demographic characteristics on the move to the academic track (most mobility is into this track), logistic regression models were conducted (Appendix Table 2). The regression tested the effect of 5th grade educational achievement, gender, country of birth, migration status, age group (born in 1993 or 1994), school sector and school socioeconomic status on the likelihood of moving to the academic track from each of the other tracks.

Among those pupils in the engineering track in 10th grade, the model indicates that high achieving pupils are less likely to make such a move. Mobility was higher among girls and lower for pupils attending state-religious or Arab Israeli schools. There was also a decline in the likelihood of moving to the academic track for those in the 1994 cohort versus those born in 1993.

Among pupils transferring from the technological track to the academic track, there was a different picture. For those pupils with high achievement in the 5th grade, there was a higher tendency to move to the academic track than for those with low achievement. Girls had less of a tendency to transfer than boys, and immigrants had less of a tendency than Israel-born pupils. In addition, the likelihood of a transfer was low for pupils in Arab Israeli schools as well as for those in schools with high socioeconomic status. Among pupils who began in the vocational track, the likelihood of moving to the academic track was highest among the most capable pupils (as reflected in their 5th grade test scores), boys, and immigrants.

The only substantial track mobility was from the three technological/vocational tracks to the academic track. Capable pupils and boys are relatively less likely to move from the most selective engineering track to the academic track. However, the opposite pattern was noted for mobility to the academic track from the two lower tracks (technological and vocational tracks): capable pupils and boys are more

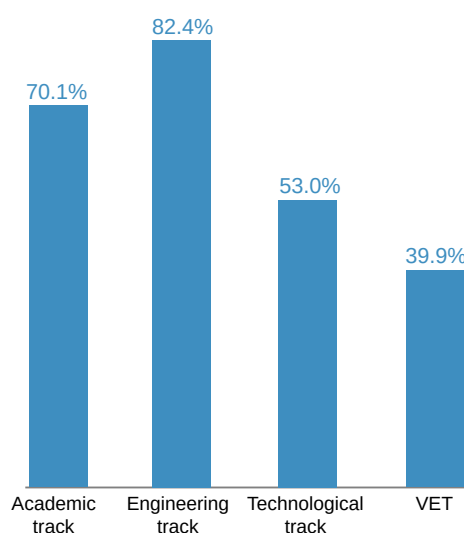
likely to make these shifts. Thus, it would seem that mobility accentuates, rather than attenuates, the initial scholastic and gender differences between tracks. Interestingly, pupil socioeconomic status (as reflected in parental education) does not directly affect track mobility when the other variables are controlled.

4. The Effect of Educational Track on Educational Attainment

In the next and final part of the analysis, the focus is on two aspects of educational attainment: dropping out and eligibility for bagrut certification.

With regard to bagrut certification, Figure 5 shows the disadvantage of pupils in the technological and vocational tracks relative to those in the academic track, as well as the advantage of pupils in the engineering track. To distinguish between the effects of the different variables on these rates, a logistic regression model was used (see Appendix Table 3). The results clearly show that the differences in the likelihood of bagrut certification in the different tracks is to a large extent the result of the control variables (like socioeconomic background), although the differences remain substantial after controlling for these factors. This means that the advantages with regard to bagrut qualification associated with the academic and the engineering tracks is not only the result of a selection process of more capable pupils or those with stronger social backgrounds for these tracks, since even after controlling for these variables, the rate of bagrut qualification remains high. Rather, the data suggest that both the academic and the engineering tracks better prepare their pupils for the matriculation exams.

Figure 5
Rate of bagrut qualification by educational track
out of all pupils in the educational track, average for 2011-2012



Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

The logistic regression models produce additional noteworthy findings. First, social origin has an important effect on the likelihood of bagrut qualification. Simply put, those from stronger socioeconomic backgrounds who are in schools with populations from stronger socioeconomic backgrounds, have a higher likelihood of attaining bagrut certification regardless of their track assignment.

Second, immigrants, pupils attending state-religious (Jewish) schools, and Arab Israelis are less likely to qualify for a bagrut certificate. Third, and not surprising, girls are more likely to qualify for a bagrut certificate than boys.

The results of logistic regressions models to predict the probability of dropping out between 10th and 12th grade largely confirm the findings presented in Table 1. Those pupils who were assigned to the technological and vocational tracks in 10th grade were almost twice as likely to drop out along the way compared to pupils in the academic track. The likelihood of pupils in the academic track dropping out of school was almost twice as high as those in the engineering track. These results are only slightly changed (reduced) when controls are added.

5. Summary and Conclusions

The distinction between academic and vocational or technological education relates to two main theoretical and policy concerns: equality of opportunity between social strata and the formation of human capital. On the one hand, sociologists agree that the differentiation between academic and technological tracks has a role in the creation of social inequalities in access to further education (for example, Shavit, 1984), in the chances of attaining prestigious employment (Shavit, 1990), and on earnings (Zussman and Tsur, 2010). Vocational tracks are typically attended by pupils from lower social strata, and this tends to lessen their chances of attaining a higher education. On the other hand, some sociologists and economists argue that vocational education provides pupils with skills that help them find employment, thereby reducing their chances of unemployment and poverty (for example, Arum and Shavit, 1995).

In Israel, there are at least three vocational tracks that differ in the socioeconomic profile of their pupils and in their expected educational achievements. A sizeable minority of pupils (about 15 percent), attend the engineering track which is selective, demanding, and, as this chapter shows, has pupils with the highest likelihood of bagrut qualification and the lowest likelihood of dropping out. The remaining two technological and vocational tracks are much less selective both relative to the engineering and academic track. As has been shown, pupils from social

strata that are considered weak are assigned to these tracks: girls, Arab Israelis and those from weak socioeconomic backgrounds.

In addition to the characteristics of pupils in each of the different educational tracks, pupil mobility between tracks was also examined. The results paint a picture that is not very encouraging. The number of pupils who change educational tracks is about 12 percent of those in the study, and this low rate testifies to a pre-determined nearly permanent tracking system ("sponsored mobility" according to Turner's 1960 model).

This chapter also examined the effect of tracking on bagrut qualification and the likelihood of dropping out of school. Not surprisingly, engineering and academic track pupils have the highest likelihood of qualifying for a bagrut and the lowest likelihood – less than half that of technological or vocational track pupils – of dropping out. All of these findings remain the same when controlling for sociodemographic variables.

The study's findings show that the relationship between a pupil's social background, previous scholastic achievement, educational tracking, and bagrut qualification are similar to findings from the 1970s and 1980s. As in the past, socioeconomic status still affects pupil education track and the track still has a substantial effect on the likelihood of completing high school and receiving a bagrut certificate.

Alongside the similarities, comparing the current results to those of earlier studies suggests three important differences in the state of educational tracking in Israel between earlier decades and the present. First, as found, by Ayalon and Shavit (2004), matriculation rates in the technological/vocational tracks are now higher than they were in the 1970s and 1980s.

Second, mobility patterns between tracks has changed: while in the past the majority of moves were downward – from the higher to the lower tracks (Shavit-Streifler, 1983), today the majority of moves are into the academic track. This should be seen as an encouraging finding which can help in correcting inequalities that accompany assigning pupils to educational tracks in 10th grade.

Third, in earlier decades, secondary education in Arab schools was predominantly academic while nowadays it is split about equally between academic and technological/vocational tracks. Over the past decades, most educational systems in countries with advanced economies have been undergoing a process of dismantling educational tracking, and changing technological/vocational tracks to largely academic ones (the same process that is happening in Israel). In view of this, the shift of Arab Israeli education towards more vocational education is an interesting exception worthy of a more focused investigation, particularly in light of its implications for Arab Israeli society.

This study has an important shortcoming. As noted throughout, the Israeli discourse concerning technological/vocational education largely centers on equality of opportunity between Ashkenazim and Mizrahim. These two ethnic groups within the Jewish community are defined by ancestral countries of origin (Europe and the Arab world respectively). The data sets that were available contain information on ethnicity (Arab Israeli or Jewish) but not on ancestral country of origin. Datasets are available that contain information on both, but they do not include measures of scholastic achievement. In this study, the authors opted for the former at the cost of ignoring ethnicity among Jews. Finally, due to data limitations, a study of the effects of tracking on the future occupational and economic attainments of pupils could not be conducted.

Appendix

Details of the Files Used as Databases for the Study

Meitzav Files – The National Authority for Measurement and Evaluation (RAMA) has held nationally standardized tests (Meitzav in Hebrew) for 5th and 8th grade pupils since 2002. All elementary schools in Israel (excluding special education schools and Haredi schools) are grouped into four clusters, and each year pupils in two alternating clusters are tested in English, mathematics, science, and language skills (native language, Arabic or Hebrew). For this study, data was pooled for two cohorts of 5th graders (in 2004 and 2005). The participation rate in these tests was 90 to 92 percent among the relevant pupils.

Pupil Files - The Ministry of Education collects annual data on all pupils who attend schools that are supervised by the Ministry. The files contain information on pupils' background (such as country of birth of the pupil and parents, nationality, parents' years of schooling, etc.) as well as whether the pupil dropped out and, for high school pupils, educational track and field of study.

School Files –These files include information collected annually on all schools under Ministry supervision, such as school sector (Arab, Jewish non-religious or religious) and a socioeconomic score based on an aggregation of pupils' family characteristics.

Bagrut Files – This file records detailed outcomes of matriculation examinations for each pupil.

Appendix Table 1. **Effects of pupil and school characteristics on various educational tracks**

coefficients of multinomial regression for 10th grade pupils, 2011-2012
(standard deviation is in parentheses)

Independent variables	Educational track in 10 th grade**		
	Vocational	Technological	Engineering
Parents' education	-0.090* (0.005)	-0.035* (0.004)	0.030* (0.004)
Cohort	0.187* (0.026)	0.200* (0.021)	0.135* (0.021)
5 th grade Meitzav test score	-0.414* (0.017)	-0.365* (0.014)	0.806* (0.018)
Girls	0.136* (0.026)	-0.232* (0.021)	-0.785* (0.021)
Immigrants	0.168* (0.049)	0.096* (0.038)	0.3894* (0.038)
State-religious schools	-0.205* (0.037)	-0.614* (0.030)	-0.462* (0.032)
Arab Israeli schools	-0.456* (0.036)	-0.979* (0.032)	0.232* (0.031)
School socioeconomic status	-0.265* (0.008)	-0.205* (0.006)	-0.173* (0.006)
Intercept	0.261* (0.079)	0.639* (0.063)	-0.076 (0.062)

* Standard deviation is less than 0.05

** The academic track is the comparison category

Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

Appendix Table 2. **The effect of pupil and school characteristics on likelihood of changing from technological/vocational track to academic track between 10th and 12th grade**

coefficients of multinomial logistic regressions of mobility for 12th graders, 2011-2012
(standard deviation is in parentheses)

Independent variables	10 th grade track		
	Vocational	Technological	Engineering
Parents' education	0.019 (0.014)	0.004 (0.011)	-0.006 (0.010)
Cohort	0.011 (0.077)	-0.502* (0.059)	-0.129* (0.055)
5 th grade Meitzav test score	0.149* (0.050)	0.138* (0.041)	-0.294* (0.046)
Girls	-0.377* (0.076)	-0.226* (0.061)	0.320* (0.057)
Immigrants	0.263* (0.134)	-0.250* (0.106)	-0.177 (0.095)
State-religious schools	0.039 (0.113)	-0.118 (0.087)	-0.250* (0.086)
Arab Israeli schools	0.010 (0.109)	-1.280* (0.110)	-0.838* (0.081)
School socioeconomic status	0.038 (0.024)	-0.079* (0.016)	0.015 (0.015)
Intercept	-1.787* (0.235)	-0.946* (0.166)	-1.899* (0.164)

* Standard deviation is less than 0.05

Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

Appendix Table 3. **The effect of pupil and school characteristics on the likelihood of bagrut qualification and dropping-out of school**

coefficient of logistic regression, for 12th grade pupils, 2011-2012

(standard deviation is in parentheses)

Independent variables	Likelihood of bagrut qualification	Likelihood of dropping-out
Engineering track**	0.625* (0.028)	-0.738* (0.086)
Technological track**	-0.411* (0.024)	0.262* (0.054)
Vocational track**	-0.769* (0.028)	0.268* (0.063)
Cohort	-0.073* (0.018)	1.521* (0.056)
Parents' education	0.090* (0.003)	-0.094* (0.008)
5 th grade Meitzav test score	0.869* (0.003)	-0.441* (0.026)
Girls	0.529* (0.018)	-0.972* (0.046)
Immigrants	-0.263* (0.033)	0.452* (0.071)
State-religious schools	-0.399* (0.024)	0.543* (0.055)
Arab Israeli schools	-0.069* (0.026)	-0.401* (0.064)
School socioeconomic status	0.129* (0.005)	-0.152* (0.013)
Intercept	-1.628* (0.056)	-1.451* (0.136)

* Standard deviation is less than 0.05

** The academic track is the comparison category

Source: Carmel Blank, Yossi Shavit and Meir Yaish, Taub Center

Data: Ministry of Education

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Inequality in the Education System: Who Opposes It and Who Benefits from It?

Nachum Blass*

Abstract

As early as the 1960s, the struggle for equality and narrowing gaps in the education system has been one of the most widely discussed subjects in Israeli educational discourse. In recent years, the Ministry of Education has had to contend with issues that have had a direct or indirect impact on the realization of equality in education, and in all cases it has chosen to address them in ways that reflect a tendency to cancel, reduce or slow down equality-promoting policies that had been pursued in previous administrations. This chapter examines these developments and their consequences as test cases of the system's willingness to actually invest in reducing educational gaps. The measures that will be reviewed in this chapter are: (1) the return to the weighted pupil formula in primary and lower secondary schools; (2) implementation of the Compulsory Education Law for Ages 3-4 and the decision to add a second assistant in the preschools for these children; (3) implementation of the government decision to reduce class size; (4) the toughening of budgetary policy towards the recognized but unofficial schools, as reflected in the conflict involving the Hebrew Reali School in Haifa and the Christian schools.

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Introduction

Almost everyone in Israel, regardless of political and ethnic lines, agrees on the importance of equal opportunity in the education system and on finding ways to achieve it. In international tests, Israeli pupils frequently top the list in terms of large educational gaps between pupils from different classes and backgrounds, and, over the years, several committees have been established to discuss solutions to this problem. The heads of the education system use a variety of methods to combat inequality, primarily by changing the budgeting method, offering priority terms to educators working in the geographic periphery, unique curricula, and specially adapted frameworks for pupils from disadvantaged backgrounds.

However, along with these considerable efforts, the picture behind the scenes appears to be somewhat different. In her book *Who's Afraid of Equality?* former Minister of Education Yuli Tamir writes about the difficulties she faced when she wanted to promote measures to reduce gaps between pupil populations from different socioeconomic backgrounds. These difficulties are apparently the fate of every education minister who has tried to do so in the past or who will try to do so in the future. Tamir points out that groups who usually speak out in support of equal opportunity act to undermine steps aimed to achieve that goal when they think their own interests are at risk (Tamir, 2015).

This chapter takes an in-depth look at several measures recently implemented in the education system and presents the history that preceded them and their impact on equality in education. The first section examines the changes in the budgeting methods over the years, with an emphasis on the most recent changes. The second section reviews the implementation of the Compulsory Education Law for Ages 3-4 and the budget for a second teaching assistant in preschools for these children. The third section takes a look at the issue of reducing class size in primary schools, and the fourth deals with the struggle of the Christian schools – as an example of institutions with the status of “recognized but unofficial” – to increase the government funding allocated to them. The

overall picture reveals that, even though everyone espouses the value of equality, in practice it is very difficult to promote changes that advance disempowered groups because policy decisions are most often made on the basis of the opinions and interests of the privileged groups that have a greater impact on the public discourse.

1. The School Budgeting System

The Israeli education system is budgeted in different ways at each level of education. In preschool and upper secondary school, the state has rarely applied a policy of affirmative action. However, in primary and lower secondary education, the state has used three main budgeting methods in recent years, each of which includes elements of affirmative action: (1) per class budget with the addition of “baskets” of supplements; (2) differential per pupil budget (pupil-weighted formula); and, (3) the combined budget method.¹

Per class budget with supplementary “baskets.” This method was used in primary education from the establishment of the state until 2004 and in lower secondary schools until 1994. Under this method, the bulk of the budget was allocated equally to all schools through a basic budget per class, which was supposed to cover the operation of a basic curriculum. Various additions were added to this standard budget (supplementary “baskets”), whose purpose was to address unique problems per school or to invest in agendas or programs the state wished to promote.

The system was convenient to operate administratively, easy to explain to the public, and contained elements of basic fairness and equality that prevented discrimination against schools that served small populations – whether due to their location or their philosophy (mostly their religious orientation). It also made it possible to encourage and incentivize programs in specific subjects relatively easily. However, the

¹ Parallel to these, there are different budgeting methods for Haredi education and for the recognized but unofficial education.

method had several shortcomings: first, it created a clear preference (at least in terms of allocation of resources per pupil) for small schools or institutions with small classes regardless of the reasons for those small classes (for example, due to separating boys and girls).² Second, the system left an opening for decisions based on ideological and political motives of the heads of the system, and enabled them to give preferential treatment to schools and populations that they wanted to advance. Third, the proliferation of “baskets,” which at certain times reached the level of over 20 percent of the entire teaching budget – some with hazy allocation criteria – also created an unjust distribution of resources. In this way, schools headed by enterprising principals (which usually serve already strong populations) managed to raise more resources than other schools.

The pupil-weighted formula. Using this method, which was used between 2004 and 2007, budgeting was based on only two criteria: the number of pupils in the school and the pupils’ socioeconomic profiles. The major beneficiaries from this system were the large schools whose pupils came from disadvantaged population groups, which were mainly the Arab Israeli schools and some of the Haredi (Jewish ultra-Orthodox) schools.³ The main losers from this system were small schools whose pupils came from more affluent socioeconomic backgrounds. Most of the schools fell in the middle. Some of them were large enough to receive a budget that sufficed to support the full curriculum, even though they served stronger populations. Others that were small could not receive an

² The state-religious education system has many small classes, both because of being a minority in many localities and because of the separation of boys and girls. In agrarian communities, many of the classes are small because of the low population density.

³ The Haredi schools in the Independent Education and Maayan Hinuch Torani networks enjoyed the transition to this budgeting method because, for the first time since the establishment of the state, the “Deprivation Index” was applied to them. Thus, they could enjoy a higher budget per pupil since their pupil population was socioeconomically weaker.

adequate budget according to the criteria, and were compensated by a supplement that enabled them to teach the prescribed curriculum.

The combined-budget method. Under this method, which has been used in lower secondary schools since 1995 and in primary schools since 2008, the budget allocated to each class is comprised of two parts. The first and main part is the basic budget, which is given to each class and school uniformly and equally.⁴ The second part is comprised of two main supplements to the teaching-hour budget: (1) a supplement derived from the class size, given on the basis of the number of pupils over 20 per class, regardless of the pupil socioeconomic profiles; and, (2) a supplement derived from the school's socioeconomic profile. There are additional supplements for prayer time in the state-religious schools and teaching weekly work hours⁵ for long school days in relevant schools.

From the perspective of affirmative action, the results of this budgeting method depend on the relative size of the basic budget compared to the supplements, and, of even more significance, is the amount of budget that is left for nurturing affirmative action after the basic budget and its supplements are allocated. The reality is that, since 2009, the teaching budget that is left for nurturing affirmative action has been only around 6 percent of the total teaching budget. As a

⁴ Since 2009-2010, a change was made in the formula. In the new formula, the class size for the purpose of budget calculations changes according to the school's Deprivation Index. This means that if the most affluent school has 80 pupils per grade level it will be permitted to have two 40-pupil classes, and each class will receive the basic budget and the additional supplements according to the number of its pupils. In the case of the weakest school with 80 pupils in the grade, two 27-pupil classes and one 26-pupil class will be approved, and then the school will receive three basic budget allocations plus supplements.

⁵ "Teaching weekly working hours" is a budgetary term that denotes the price of "one yearly working hour of a teacher." It does not relate necessarily to the number of hours that the pupils receive in the classroom or the number of lessons that the teacher teaches.

consequence, this system mainly benefits schools where the classes are very large or schools with very small classes (because of the guarantee of a minimum of teaching hours, which is divided between fewer pupils). Most of the institutions in these categories are: state-religious schools, which divide classes into boys and girls; some of the schools in regional councils; Jewish state schools in the big cities; and, schools in the Arab Israeli sector.

The major advantage of this system is that it provides significant compensation for large classes. Its major disadvantage is that when the portion of the total budget devoted to affirmative action is small, it cannot possibly be sufficient to enable real change.

Changes in the Budgeting Methods over the Years

As noted previously, since the founding of Israel and until 1994, the per class budget with the supplementary “baskets” method was used in lower secondary schools, and in primary education until 2004. The pupil-weighted formula was tried in lower secondary schools for only one year, but the experiment was stopped prematurely,⁶ and instead the combined per class budget method was introduced.

In primary education, the development was a little different. In response to a demand by the Supreme Court (HCJ 1614/00, 1994), then-Education Minister Limor Livnat appointed a committee headed by Dr. Shimshon Shoshani (the Shoshani Committee) at the end of 2001 to review the existing budgeting method in the three kinds of institutions in primary education: official institutions, recognized but unofficial institutions and exempt institutions. After extensive deliberations, the Committee submitted its recommendations to the Minister of Education in August 2002. Its main recommendation was to change the budgeting method fundamentally, and to adopt instead the pupil-weighted formula.

⁶ Full disclosure: the author of this chapter also authored the document that was the basis for this short attempt to change the budgeting system in the lower secondary schools.

The Committee was guided by the principle that primary education institutions in Israel should be budgeted according to equal, fair, effective, applicable, transparent, and uniform criteria for all pupils.

The Shoshani Committee's recommendations bore significant resemblance to the budgeting method that had been tried in lower secondary schools,⁷ but it included two important components that did not exist in the initial experiment:

- A. The Ministry of Finance promised supplemental funding in the amount of 80,000 teaching weekly work hours.⁸
- B. A new socioeconomic "Deprivation Index" was developed.⁹ The new index differed significantly from the previous one in several aspects. It related to the entire pupil population (non-Haredi Jews, Arab Israelis and Haredim) and included several elements that had not appeared in previous indexes, such as the school's location in a national priority area, the pupils' or parents' status as immigrants, and the pupils' or

⁷ Possibly, inter alia, because the author of this chapter was also one of the committee's economic advisors, as well as being involved in the attempted reform in lower secondary schools.

⁸ The consultants demanded a supplement of 120,000 teaching weekly work hours so that it would not be necessary to reduce hours in the schools, particularly in state-religious schools and some of the Jewish state schools with relatively small classes (mainly in the periphery and regional councils).

⁹ In light of the frequent confusion between the terms, it is important to emphasize the essential difference between the Deprivation Index and the budgeting method. The Deprivation Index is a statistical tool to measure the relative ability of the pupil, a group of pupils or the school to achieve scholastic achievements compared to others. A budgeting method is the formula according to which the ministry's budgetary resources are allocated. It is possible to have a defective Deprivation Index in service of a progressive and good budgeting method (such as the Deprivation Index developed by the Shoshani Committee, which applied to the pupil-weighted formula), and, alternatively, an excellent Deprivation Index combined with a regressive budgeting method (as in the case of the Strauss Index and the combined per pupil budgeting method).

parents' place of birth being in a developing country. These elements were included in the index in order to prevent the likely possibility that, should the new budgeting method be adopted, it would be implemented by reassigning massive resources from the state sector – especially state-religious – to the Arab Israeli sector and Haredi schools and, if any new resources were budgeted, they would almost all be allocated to those sectors as well.

Even before the new method was introduced, it was criticized by various public groups. Members of the state-religious education system claimed the sector's education system, which has small classes, would be harmed.¹⁰ On the other hand, people from the left side of the political spectrum pointed to the discrimination embodied in the new socioeconomic index in the form of the disproportionate weight given to the components of national priority area and country of origin for immigrants – indexes that are irrelevant to the Arab Israeli population.¹¹

Contrary to the criticism leveled at the pupil-weighted formula method before its implementation, studies of its outcomes found that it actually led to a substantial reduction in educational gaps (Blass 2007; Blass, Zussman and Tsur, 2010; Klinov, 2010).¹² Furthermore, these studies indicated a clear success in achieving the main goal of this

¹⁰ Chairperson of the Knesset Education Committee Zevulun Hammer was quoted by Arutz 7 as saying: "The National Religious Party rejects the report whose implementation will reduce the religious-Zionist education system by 20,000 teaching weekly work hours, estimated at NIS 100 million" (August 27 2002), <http://www.inn.co.il/News/Flash.aspx/33195>.

¹¹ See for example MK Yuli Tamir at the Knesset Education Committee: "I think that the Shoshani Report is terribly unfair towards the Arabs because in its socioeconomic index it gives tremendous weight to immigration. Up to 40 percent is taken from the Arabs in the absence of indexes they can meet [...] We cannot accept the Shoshani Report as is because of the Deprivation Index" (Knesset, 2003).

¹² To maintain full disclosure, the author of this chapter, who participated in those studies, was also one of the Shoshani Committee's consultants.

budgeting method: creating a situation in which schools serving disempowered pupil populations would benefit from higher budgets than schools serving stronger populations.

Despite the proven success of the pupil-weighted formula in promoting an affirmative action policy (or perhaps because of it), the combination of all of the forces opposing this method led Minister of Education Yuli Tamir to decide four years later to cancel it. The cancellation was pursuant to conditions created after a Supreme Court decision on a completely different subject,¹³ based on the argument that the pupil-weighted formula did not allow many schools to maintain an adequate education program. Pursuant to this, the combined per class budget method was introduced.

In 2015, the Ministry of Education published figures about resource allocation in the education system. The data indicate that in 2014, affirmative action in the form of per pupil compensation for a pupil from the weakest background compared to a pupil from the most affluent background, as reflected in the cost of teaching hours per pupil, was 23 percent higher for pupils from a weak background. Per class compensation in a school with the weakest background profile was only 5 percent higher than in classes with affluent background profiles (Ministry of Education, 2015a). In contrast, at the height of the implementation of the Shoshani Report in 2008 – which was ended before its full implementation – affirmative action compensation was 25 percent higher per pupil from a weaker background and 19 percent per class from weaker populations (Blass, Zussman and Tsur, 2010). Since the only significant change at that time was in the budgeting method, it is reasonable to hypothesize that the worsening was due to the transition from the pupil-weighted formula to the current budgeting method.

¹³ The Supreme Court ruling in H CJ 11163/03, given in a petition by the Adalah organization to prevent discrimination against the Arab Israeli sector on the basis of its non-inclusion in the definitions of national priority areas in 2003.

The Budgeting Method Planned for the Coming Years

In 2013, a new government was elected and a new Minister of Education took office – Shai Piron, educator par excellence. Piron was a member of the Dovrat Committee, which, among other things, recommended introducing the pupil-weighted formula into the entire education system, and extending it to all education expenditures by establishing a “pupil expenditure basket” (Ministry of Education, Dovrat Committee Report, 2005). Therefore, it is no wonder that immediately upon his appointment he established a committee that was to develop a proposal to re-adopt the pupil-weighted formula. The committee purposely worked under a full cover of secrecy.¹⁴ In one of the first hearings of the Knesset Transparency Committee, Piron addressed this issue, saying:

To the Ministry of Education there is no real way to publicize the data, because the education budget has tremendous political implications. Ministers of Education through the ages have not wanted to display the problematic data. Publication of the data containing evidence of the educational gaps might even lead to the dissolution of the government (Knesset, 2015).

At the same hearing, Piron also admitted that he had personally withheld the publication of the Ministry of Education budget for political reasons (Yosef, 2015).

A Ministry of Education press release (2014) indicated that once the planned process of implementing the pupil-weighted formula budget in primary education was complete, there would be three impact levels. Among schools in the strongest third in socioeconomic terms there would be no significant change in budgeting teaching hours per class (meaning no pupil would be harmed relative to the current situation); in the middle third, the supplement would constitute an addition of about three teaching weekly work hours per class; while in schools from the

¹⁴ Thus, for instance, the composition of the committee, what its letter of appointment included, with whom it met and who was consulted, and on exactly what data it based its findings were not publicized.

socioeconomically weakest third, there would be a supplement of seven teaching weekly work hours. Lower secondary schools in the strongest socioeconomic third would receive a supplement of 1.5 hours, the middle third would receive 3 hours, and the weakest third would receive 14 hours.

Assuming that the change of government in 2015 and other future developments will not undermine the implementation process (which requires a few years), the new use of the pupil-weighted formula should be examined closely to see what it includes and what it does not. The most important positive element of this process is adding a substantial number of teaching weekly work hours to the deprivation basket in primary education. Although the very announcement of returning to the pupil-weighted formula is positive, the process is still partial and limited in scope and does not apply to all of the country's preschools and upper secondary schools, or to other expenses that are not allocated in terms of teaching weekly work hours.

Furthermore, the main shortcoming of this process is that the new program does not change the existing budgeting method – the combined budget method – and the proposed supplement is not big enough. After five years, the number of hours allocated for affirmative action is supposed to be 240,000 hours, which is an addition of 140,000 to the current quota of 100,000 hours. Out of this supplement, 70,000 hours will be funded by the Ministry of Education's current budget and the Ministry of Finance will only pay for an additional 70,000 hours.

To understand the significance of these data, this must be viewed in the context of the fact that in the year 2000 (before the transition to a pupil-weighted formula) the number of teaching hours in the deprivation basket was 91,000, and another 19,000 hours were allocated as part of the national priority basket (a total of 110,000 hours). At that time, the number of pupils was 25 percent less than their number today and 30 percent less than the number of pupils expected in five years. Therefore, it appears that to merely maintain the level of compensation from the year 2000 there should have been an addition of 40,000 teaching weekly work hours (10,000 to cover the difference between the current budget which is

100,000 hours and the budgeting of 110,000 hours in 2000, plus another 30,000 hours for natural growth).

In light of these figures, it is quite clear that the supplement included in the new budget method is smaller than the amount required to reduce achievement gaps between population groups in any serious way. If the current theoretical outline of the pupil-weighted formula is compared to the theoretical outline of differential budgeting according to the Shoshani Report, it is clear that the previous outline provided a much larger compensation to the schools serving weak populations. Appendix Table 1A and 1B show unequivocally that, assuming that Piron's proposed outline is carried out in full, it is better than the Shoshani Report outline (had it been carried out in full) for schools that serve affluent populations but is much less beneficial for weak populations. Table 1 illustrates the main differences between the budgeting formulas in a class selected as an example: a third grade class in a state school.

Table 1. **Comparison between weekly budgeted teaching hours according to the new formula of pupil-weighted formula and the Shoshani Committee method**

for third grade pupils in state education

Number of pupils per class	Number of teaching hours per class, new method		Number of teaching hours per class, Shoshani method		Ratio of weakest pupils to strongest pupils	
	Pupils from strong background	Pupils from weak background	Pupils from strong background	Pupils from weak background	Current method	Shoshani method
20	31.00	38.00	36	40	1.23	1.1
25	32.00	39.00	36	50	1.22	1.4
30	33.00	40.00	38	60	1.21	1.6
35	34.00	46.40	44	70	1.36	1.6
40	39.00	56.40	50	80	1.45	1.6

Source: Nachum Blass, Taub Center for Social Policy Studies in Israel

Data: Ministry of Education

Ultimately, it can be said that the committee's recommendations, and the subsequent decisions made, were a disappointment to anyone who was hoping for an announcement of the return to the pupil-weighted formula and its expansion to additional education and spending levels.

However, it may be important to note that if a decision is made to make a more concerted effort to promote differential budgeting, the work agreements in the Ofek Hadash (New Horizon) and Oz Letmura (Courage to Change) reforms, which include, among other things, an increase in work hours per teacher, make it possible to redistribute the resources with little to no harm to the affluent schools since the current budgeting per class provides 61.2 teaching weekly work hours – the equivalent of 1.7 full-time teacher positions (FTEs) – which is enough to pursue a meaningful pupil-weighted formula (Central Bureau of Statistics, 2015). As an illustration, we will compare hypothetical schools with 10 classes: the first has a Deprivation Index of 10, the highest (weakest socioeconomic background), and the second has an index of 1 (the strongest population). Table 2 presents the teaching weekly work hours that will be allocated to each institution in three situations: without affirmative action compensation, after a compensatory supplement of 27 percent of all budgeted hours for institutions with a high Deprivation Index, and after a supplement of 42 percent in budgeted hours. As can be seen, even in the case of compensation by 42 percent, normal teaching of the curriculum can continue to be provided even in the strongest schools – meaning without additional teaching costs and classes – because each class will receive 36.5 frontal teaching hours (this is more than the required allotment for the curriculum which is 32 hours) and an additional 14 teaching weekly work hours.¹⁵

¹⁵ The levels of affirmative action compensation are for demonstration only, in order to use 10 FTEs.

Table 2. **Comparison of budgeted resources allocated to schools at different affirmative action levels**

according to the school Deprivation Index, on the basis of the current allocation method, 2015

School Deprivation Index score (10=the weakest)	School teaching hours			Full-time teachers
	Total teaching working hours	Hours of frontal teaching	Other teaching hours	
No affirmative action				
10	612	442	170	17
1	612	442	170	17
Addition of 27 percent in teaching hours				
10	684	494	190	19
1	540	390	150	15
Addition of 42 percent in teaching hours				
10	720	520	200	20
1	504	364	140	14

Source: Nachum Blass, Taub Center for Social Policy Studies in Israel

Data: Ministry of Education

2. Implementation of the Compulsory Education Law for Ages 3-4 and the Addition of a Second Teaching Assistant in Compulsory Preschools

One of the prominent outcomes of the social protests that swept Israel in 2011 was the decision to implement immediately and fully the Compulsory Education Law for Ages 3-4. The full implementation of the

law had been postponed repeatedly due to budgetary difficulties. Instead of fulfilling the requirements of the law, the Ministries of Education and Finance agreed between themselves to implement the law gradually, beginning with socioeconomically weak communities and neighborhoods. As a result of these decisions, most of the population of the socioeconomically weak communities and neighborhoods did not pay tuition for preschool in 2011, including for ages 3-4. The social protests, which won broad public support and primarily expressed the distress of the middle class, led to a decision to fully implement the law beginning in 2013, which meant applying it to the population of children of the more affluent communities and neighborhoods as well. This decision actually took close to NIS 1 billion from the budget that was earmarked for subsidizing only the weak population (as of 2013, the budget did not give any priority to the weaker population groups) and added NIS 2 billion to decreasing the burden on the family budgets of the middle and upper classes.¹⁶ Without entering into a discussion about the justification and feasibility of a universal subsidy system as an effective method for reducing gaps, it is clear that the decision, which won very wide public support, was regressive.

The Ministry of Education took on the task with admirable vigor and efficiency and the number of children in the public preschools grew impressively – with part of the increase rooted in a transfer of children from private to public preschools. However, this raised a set of new problems. Since the personnel standards in the preschools did not change, the preschool teachers and assistants in places that previously served mainly 4-5-year-olds now had to deal with large numbers of 3-year-olds, some of whom were not yet out of diapers and required more care. This

¹⁶ The preschool education budget grew by about NIS 2 billion after the decision to implement the law. Whether the increase came at the expense of other items in the Ministry of Education budget or was added in full to the Ministry's budget, it does not change the fact that in essence it constituted a budget of NIS 2 billion that benefited stronger populations.

caused a great deal of distress among parents and even led to demonstrations throughout the country.

When the new Minister of Education Naftali Bennett took office, one of his first measures was to sign an agreement with the Ministry of Finance to subsidize a second teaching assistant for preschools serving 3-4-year-olds with more than 30 children in a class. This was undoubtedly an important step towards improving conditions in the preschools, but was it affirmative action? That is another question.

Surely the present measure will not make the conditions in preschools serving weak populations better than those serving more affluent populations. The new minister declared, “we will invest more, especially in the weak populations. A 3-year-old in Israel will receive the same opportunity whether he lives in Herzliya, Nahariya or Rahat. In the State of Israel, the quality of a child’s education will not be determined by his parents’ pay slip – be seen in the measures that were pursued (Ministry of Education, 2015b).” Unfortunately, this attitude is not reflected in the measures pursued by the Ministry of Education. The number of children per preschool class, the number of workers, the equipment, the size of the preschool room, and so on, will all be identical in all preschools, regardless of the population’s characteristics. Affirmative action would have been achieved were it determined, for example, that the maximum number of children in preschools that serve weak communities, would be 25 rather than 30. Although there was an intention to give more help to the weak municipalities by lowering their copayment for the second assistant, that intention was almost completely abandoned following the fierce objections by the more affluent municipalities.

Thus, as long as most of the 3-4-year-olds in the municipal preschools were children living in socioeconomically weak communities, no one complained about class size and no one demanded supplemental staffing. In fact, the public discourse did not deal with these issues at all. Only when the service became universal did the forces demanding its

improvement coalesce.¹⁷ Which is not to say that the plan to implement the Compulsory Education Law for Ages 3-4 and the addition of a second teaching assistant to the preschools are not important or positive programs, but this is another noteworthy example of the fact that in order to implement real reforms requiring a large budgetary supplement, there needs to be wide public support from the more affluent classes of society.

3. Reducing the Number of Pupils Per Class and the "Sardine Protest"

Unlike the crowding in preschools, the subject of class size has come up for public discussion periodically over the past years, with teachers' organizations and parent unions applying strong pressure to reduce the number of pupils per class. In the past year, parental pressure increased and turned into a widespread protest movement called the "sardine protest." The steps and missteps to reduce class size are another example of an educational reform continuously postponed due to a combination of a lack of resources and will. Nevertheless, the same reform reappeared on the government agenda and was pursued when pressure from the stronger population groups was felt.

The government's first decision to reduce the number of pupils per class to 32 was made after the teachers' union cited this demand as one of its main conditions for ending its long strike in 2007. At the end of the strike, the Ministers of Education and Finance declared at the National Labor Court: "The government of Israel views reducing the number of pupils per class as an important step for the promotion of the education

¹⁷ Beyond the fact that, following the implementation of the law, tens of thousands of children who had previously not gone to preschool or who went to private preschools joined the public preschool system, the need to put the plan into action quickly before adding all the necessary preschool classrooms apparently contributed to the higher density in the existing preschools.

system” (National Labor Court, 2007). In 2008, the government made a resolution to reduce the number of pupils per class to 32 in primary, lower secondary and upper secondary education (Government Secretariat, 2008a). It is important to note that, according to the wording of the resolution, it was an all-encompassing decision that class size would not exceed 32 in all age groups and all classes. To examine modes of implementation, a public committee headed by Prof. Yitzhak Friedman was appointed.

The Friedman Committee submitted its recommendations in August 2008,¹⁸ and the principle of a maximum of 32 pupils per class at all age levels was one of its central tenets. In November 2008, a third government resolution was made on the subject. The resolution adopted the principles of the Friedman Committee but introduced a significant change. Instead of determining that the maximum threshold for the number of pupils per class would be 32, it decided that:

*In the 2008-2009 school year, the number of schools that will enter the program will be determined by the budget framework approved for this subject for this school year. Schools selected for the program this year will be schools defined as the weakest according to Ministry of Education’s socioeconomic index in the primary, lower secondary and upper secondary schools. The program will be implemented in such a way that in these schools the number of pupils **for class budgeting** will be reduced to 32 (Government Secretariat, 2008b. Emphasis not in the original – NB).*

¹⁸ These recommendations were very similar in substance to those of the Taub Center for Social Policy in Israel on the same subject (Blass, 2008).

The cabinet also adopted the committee's recommendations to accompany the first stage of the process to reduce the number of pupils per class with a follow-up study to monitor pupil educational outcomes. This study would be conducted by the National Authority for Measurement and Evaluation.¹⁹

The significance of this "minor" change of wording is that whenever the number of pupils per class exceeds 32, instead of breaking the class up, the school can be compensated for the large class size with additional teaching weekly work hours. In other words, the schools may continue to have large classes but they will receive a supplement of teaching weekly work hours that can be used either to break the class up for some of the lessons or to add a second teacher or to use the compensation in any other way the school faculty sees fit. This can be illustrated using the example of a state school with 80 pupils in the third grade. According to the previous budgeting rules, the school had to divide the class into two 40-pupil classes, regardless of its socioeconomic index. The addition of a single pupil would require the Ministry of Education to approve dividing the grade into three classes, or else face the risk of a teacher strike. According to the current rules, such a school – assuming it does not operate as part of the "long school day" program – will be budgeted according to two classes of 40, with a budget of 39.6 teaching weekly work hours per class, for a total of 79.2 teaching weekly work hours, if it is classified in socioeconomic decile 1. On the other hand, if it is in decile 5 or 10, it will be budgeted according to three classes (two 27-pupil classes and one with 26 pupils) at 32.4 teaching weekly work hours per class, for a total of 97.2 teaching weekly work hours. The essential difference between the cabinet decision and the recommendations of the Friedman Committee is that schools from decile 5 and upward are not required to divide the grade into three classes. They can continue functioning with two classes of 40, without risking a teacher's strike supported by the teachers union, and use the extra hours however the school management sees fit.

¹⁹ No such study was ever conducted.

The Budgetary Significance of Reducing Class Size

The program to reduce the class size was budgeted through two different budgetary items. One is in the section dealing with primary education, which appeared for the first time in 2008 and disappeared after 2013. The second belongs to the section of secondary education that was first introduced in 2010 and continued to appear in 2014 (regulation number 270925). All in all, for the purpose of reducing class size, NIS 900 million was budgeted between 2008 and 2013, and the amount that was used – according to the Accountant General's Report – was only NIS 360 million.

When these figures were first presented by the Taub Center to the public, Ministry of Education officials claimed that they did not accurately reflect the situation. Apparently, they meant that part of the budget, and especially that part in the primary education regulations, was transferred to the general teaching weekly work hours regulation, but in practice was still used in order to reduce the number of pupils per class. This explanation cannot be seen in the budget books or in the budget notes, nor is it substantiated by the protocols of the Finance Committee for budgetary changes during those years. However, even if all of the amounts dedicated in the original budget to reducing class size were used for that purpose, the amount made available since 2008 is still significantly lower than the amount needed to realize that goal, which by the most cautious estimate in 2008 was NIS 5.7 billion (Blass, 2008).²⁰

The Outcomes of the Investment in Reducing Class Size

What are the outcomes of five years of Ministry of Education activity to reduce class size? Tables 3 and 4 provide the answer.

Table 3 shows that the changes in class size in primary education in the Jewish sector were minimal. In the Arab Israeli sector, on the other

²⁰ These amounts were calculated without taking into account the new wage agreements, which considerably increased the cost of teaching.

hand, there was substantial progress and the reduction reached an average of three pupils per class, which is about 10 percent.

Table 3. **Average number of pupils per class in primary education**
by sector and type of school supervision,* 2006-2013

Supervision type	2006	2008	2010	2012	2013
Jewish education					
Haredi	22.9	23.0	23.1	23.3	23.3
State	28.9	29.0	29.1	28.8	28.7
State-religious	25.1	24.9	24.9	24.7	24.5
Arab Israeli education					
Bedouin	31.0	30.9	29.4	28.0	27.3
Druze	29.8	29.5	28.4	27.5	27.0
Arab Israeli	31.4	31.5	30.7	28.8	28.2

* Excluding special education

Source: Nachum Blass, Taub Center for Social Policy Studies in Israel

Data: Ministry of Education

Table 4 shows the changes in the lower secondary schools. In state and state-religious education in the Jewish sector,²¹ there is a small change (4 percent), although, it appears that this downward trend actually began in 2006, before the agreement on reducing class size was reached. In the Arab Israeli sector, the change is quite significant and, as in primary education, is on the scale of 9-10 percent. After that point, the average number of pupils per class begins to resemble the number in the Jewish state education system.

²¹ Haredi education is not specified here because it has very few lower secondary schools.

Table 4. **Average number of pupils per class in lower secondary schools**

by sector and type of school supervision,* (2006-2013)

Type of supervision	2006	2008	2010	2012	2013
Jewish education					
State	27.2	27.0	26.6	26.2	26.1
State-religious	24.7	24.6	24.3	24.0	23.8
Arab Israeli education					
Bedouin	29.1	29.3	28.2	27.1	26.6
Druze	27.9	27.8	26.7	25.6	25.4
Arab Israeli	29.7	29.5	28.4	27.0	26.7

* Excluding special education

Source: Nachum Blass, Taub Center for Social Policy Studies in Israel

Data: Ministry of Education

Despite the improvement in the Arab Israeli sector, the overall drop in the average number of pupils per class is not substantial. However, in order to evaluate success in achieving the goal, it is worth looking not only at averages, but also at the share of classes exceeding the standard of 32 pupils per class over the years. Table 5 compares the distribution of classes by size in 2008, 2013 and 2015.²²

²² The group of very small classes (up to 10 pupils) includes mainly special education classes, whereas the group of classes with 40+ pupils includes mainly classes for which the reporting is erroneous. Therefore, we shall focus mainly on the groups in the middle. The examination was based on pupil data files for the relevant years.

Table 5. **Distribution of classes by number of pupils, 2008, 2013 and 2015**

grades 1-6 and grades 7-9, as percent of all classes in that age group, including special education

Number of pupils per class	2008	2013	2015
Grades 1-6			
10 or fewer pupils	7.7%	9.0%	9.4%
11-15	5.4%	5.9%	5.5%
16-20	7.4%	7.9%	7.5%
21-25	18.5%	22.8%	22.8%
26-30	26.4%	28.2%	28.0%
31-35	23.4%	19.1%	20.0%
36-40	10.5%	6.3%	6.3%
40+	0.7%	0.7%	0.6%
32 or fewer pupils	75.9%	83.0%	81.2%
Grades 7-9			
10 or fewer pupils	10.9%	12.2%	12.9%
11-15	6.9%	7.7%	7.3%
16-20	5.8%	7.0%	7.0%
21-25	10.3%	13.9%	14.3%
26-30	15.7%	21.0%	21.9%
31-35	24.4%	25.7%	24.5%
36-40	23.0%	11.3%	10.6%
40+	3.0%	1.3%	1.5%
32 or fewer pupils	58.8%	73.4%	74.4%

Source: Nachum Blass, Taub Center for Social Policy Studies in Israel

Data: Ministry of Education

In grades 1-6, there was a drop of 3-4 percent in the number of classes with 33 pupils or more (from 24.1 percent in 2008 to 18.7 percent in 2015). This was reflected by the reduction in the number of classes with 31 to 40 pupils and the simultaneous increase in classes with 20 to 30 pupils. It is interesting that the share of classes with 11 to 20 pupils hardly changed at all. All in all, the number of classes with up to 32 pupils grew over seven years by 5.4 percent (of which 1.7 percent were in very small classes, most of which belong to special education).

On the other hand, in grades 7-9, the picture changed dramatically: the share of classes with more than 32 pupils dropped from 41.2 percent in 2008 to 25.6 percent in 2015. However, the fact that more than a quarter of all classes in those grade levels are still larger than required indicates that there is still a long way to go to reach the goal.

What Is Needed to Complete the Process and Does the Current Plan Meet the Needs?

Given the current situation, the main question is how many classes need to be added in order to reach the goal of no more than 32 pupils per class?²³ To address this question, a committee was appointed headed by the director of the Ministry of Education's Northern District, Dr. Orna Simchon. The committee's deliberations were held under absolute secrecy, and its final report was published only after numerous delays.

The report's title, the *Committee to Examine the Pupil-Teacher Ratio in Classes*, strongly indicates that the committee was intended to explore alternatives to reducing the number of pupils per class (such as adding a teacher or intern to large classes).²⁴ Indeed, the Simchon Committee examined various possibilities for resolving the problem of classroom

²³ It is important to distinguish between an additional class in the sense of study unit and an additional class in the sense of construction. The former requires many more "classes," of course.

²⁴ There is often confusion between "class size" and "pupil-teacher ratio." This issue was clarified in a number of publications, for example, in Blass (2010).

crowding, including differential reduction depending on cohorts and adding a teacher in training or an intern to particularly large classes.

The first of the various options included in the Committee's report was an across-the-board reduction in the number of pupils per class in primary and lower secondary schools to 32 pupils.²⁵ According to the Committee's report, which does not include details of its calculation methods, this option involves an addition of 2,673 classes and 5,111 teachers, at a cost of NIS 3.6 billion (Ministry of Education, 2015c). It is not clear what these figures are based on, but our calculations done for this chapter yield substantially different figures than the Committee's estimate. Our calculations are based on the number of pupils in regular education in each institution and in each cohort. Based on these figures, the number of classes needed in each cohort if the maximum number of pupils per class were 40 was compared to the number needed with a maximum of 32 pupils per class. The difference between the existing number of classes and the required number of classes is the number of classes to be added. The calculation did not take into account needs arising from natural growth and internal migration, so the final figure is an underestimate.²⁶ Nevertheless, it turns out that when looking at all cohorts from grades 1-12, the number of additional classes needed in order to implement the process today is higher than in 2008. While, in 2008, an addition of 8,200 classes was needed in order to achieve a maximum of 32 pupils per class, in 2013, nearly 9,000 classes are needed (an average of 750 classes per grade) or 6,750 classes for grades 1-9. The budget needed to add a class includes the following components:

²⁵ It is noteworthy that even this option contradicts the initial government decision to apply reduction of the number of pupils per class to the entire education system, including upper secondary schools.

²⁶ Usually, the natural growth of the education system is 1.5 to 2 percent a year and means an addition of 1,200 preschool and school classes. Many hundreds of classes must be added to respond to internal migration (Blass, 1983).

- A. The cost of teaching and operating new classes.** The average teaching cost of a class in primary education is NIS 402,000. In lower secondary school, the cost is NIS 508,000, and, in upper secondary school, it is more than NIS 600,000 (Ministry of Education, 2015). Assuming that only 6,750 classes need to be added (750 classes per grade in grades 1-9), at an average teaching cost of NIS 430,000 per class, the total cost will be around NIS 3 billion.
- B. The cost of building a classroom.** The cost of building a classroom is estimated at NIS 750,000.²⁷ Even if only 3,000 classrooms need to be built (on the assumption that other classes will be combined or existing buildings will be used), the expense will be NIS 2.25 billion.
- C. The cost of training teachers.** The cost of training a new teacher today is at least NIS 250,000.²⁸ The addition of 6,750 classes requires an addition of 10,000 FTEs, and since most teachers do not work full-time, there will be a need to add at least 13,000 teachers, whose training cost is estimated at NIS 3 billion.²⁹
- D. The cost of additional auxiliary services.** Along with the addition of classes there will be a need to add services such as secretaries and janitors, but the additional cost of this item is not large relative to the other extra costs.

²⁷ The Ministry of Education (2013) said that the cost of building classrooms in 2012 was NIS 711,000 and, therefore, the estimate of NIS 750,000 per classroom in 2015 seemed reasonable.

²⁸ According to the Simchon Report, the cost of training a teacher is NIS 120,000. This figure ignores the fact that, in light of the dropout rate during training and in the first few years of employment, between two and three teachers must be trained in order to bring a single long-term teacher into the system. These figures were checked by the Central Bureau of Statistics and are, of course, known to the Ministry of Education.

²⁹ It is very likely that the cost of this item can be reduced in light of the recent growth in the number of graduates of teacher training institutions.

Thus, a very rough estimate of the costs of completing the process to reduce class size to no more than 32 pupils reaches about NIS 8.25 billion – based on very lenient assumptions as to construction needs, and without including the upper secondary classes in the process. These figures are, of course, an initial estimate, and there are a number of ways to reduce costs (see Blass, 2008). Even after all possible measures are taken, there is no doubt that a very large budget will be needed to complete the process.

Table 6. **Estimate of the costs of completing the process of reducing the number of pupils per class to a maximum of 32**

recommendations of the Simchon Committee and Taub Center data, in millions of shekels

Budget line	Education level	Simchon Committee	Taub Center calculations
Teaching	Primary	703	1,809
	Lower secondary	255	1,143
	Total	958	2,952
Construction	Primary	1,532	1,500
	Lower secondary	473	750
	Total	2,005	2,250
Teacher training	Primary	470	2,160
	Lower secondary	143	1,069
	Total	613	3,229
Other	Primary	64	64
	Lower secondary	16	16
	Total	80	80
Total		3,656	8,510

Source: Nachum Blass, Taub Center for Social Policy Studies in Israel

Data: Simchon Committee Report (Ministry of Education, 2015); Ministry of Education

This leads to some skepticism regarding the Ministry of Education's announcement about reducing class size in grades 1-2; the Minister of Education announced that within five years all Israeli pupils in primary education would study in small classes with only 32-34 pupils (Dattel, 2015). The process in question concerns only 321 classes, whereas the first grade cohort in the 2015-2016 school year includes more than 4,500 classes. Clearly this is a positive move, but its impact is very limited. The NIS 1 billion allocated for the next five years to reduce class size and improve the pupil-teacher ratio in the preschools and schools, according to the Ministry of Education's declarations, will in no way be sufficient to achieve the goal of reducing class size to 32 pupils in the entire primary education system, and certainly not in both primary and lower secondary schools (not to mention upper secondary schools).

Back to the "sardine protest." The protest occurred mainly in the affluent neighborhoods in central Israel, following a Ministry of Education decision not to allow parents to pay for extra teachers from their own pockets in order to facilitate breaking up particularly large classes. Undoubtedly, the parents' demand that the Ministry of Education keep its commitment to reducing class size to 32 is justified and logical. The problem is that realizing that commitment is very expensive, and the obvious question is who will be the main beneficiaries of such a massive investment? Apparently, the main beneficiaries will be the Arab Israeli pupils, and justifiably so, because of the particularly crowded classes in that sector. To a lesser extent, pupils in the Jewish state school system, who are rated next after them in classroom crowding per sector, will benefit. The fact remains, though, that a large part of the Arab Israeli pupils would have benefited from a reduction in class size under the existing budgeting method as well, since those schools with high socioeconomic ratings on the Deprivation Index were slated for class reductions regardless. Thus, those who will enjoy the latest move, just as in the case of the second teaching assistant, will mainly be the more affluent populations.

4. The Protest of the Christian Schools: The Story of Recognized but Unofficial Education³⁰

At the beginning of the 2015-2016 school year, the Christian schools went on strike for almost one month demanding to make their terms of funding equal to those of the Haredi schools.³¹ The strike put two separate issues on the public agenda. One is the issue of discriminating against the Arab Israeli education system, and the other is the issue of private education and its positioning vis-à-vis public education. The desire to contend with both issues successfully creates, at least *prima facie*, a conflict of interest.

The first issue – the discrimination against Arab Israeli education – is reflected in numerous ways: from budgeting, through the ability to express their unique national character in a separate administrative framework, and all the way to the possibility of maintaining a separate religious system within the Jewish education system.³² The public and media treatment of the strike also indicates the marginalization of Arab Israeli education: it is clear that if 33,000 Jewish pupils were on strike from school for such a long time the whole country would be up in arms. All the more so if it involved elitist schools such as the Hebrew Reali School in Haifa, Gymnasia Herzliya, or the University High School in Jerusalem. Yet, dozens of schools in the Arab Israeli sector, including some of the best schools in the country – judging not only by

³⁰ A portion of this section is based on commentaries written by an internet forum led by the author of this chapter, even if they are not specifically cited as such.

³¹ The strike ended after promising an immediate addition of NIS 50 million to their budget and establishing a committee that is supposed to examine the issue in depth.

³² In some towns, the most prominent example being Jerusalem, there are not enough public schools at an adequate level to provide education in the Arabic language to all of the pupils.

matriculation results but also by their graduates' achievements at later stages of life – went on strike, and no one seemed to pay much attention.

This discriminatory treatment requires immediate rectification. A demand to apply the compromise signed with the Jewish sector Hebrew Reali School in Haifa to the Christian schools – a very gradual reduction of the tuition collected from the parents, in exchange for accepting the reduction of government copayment – was also justified. However, the Christian schools did not demand to be considered comparable to the Hebrew Reali School but, rather to Haredi schools. In this demand, the Christian schools combined the Independent Education System and Maayan Hinuch Torani, (both are Haredi although they are affiliated with different political parties) with the rest of the Haredi recognized but unofficial schools. They were also careful not to make a distinction between the budgeting of primary and lower secondary education on the one hand and upper secondary education, on the other – and for good reason, as shall be explained below.

The National Aspect and the Class Aspect

Before discussing the systemic implications of the struggle of the Christian schools, it is worth noting an aspect that was not sufficiently emphasized during the strike, namely the national aspect. The Christian schools, some of which were established before the state, have, from their inception, served the elite of the Christian Arab community in Israel, and they cultivate and ensure that it continues to exist and thrive. In recent years, they have gradually been losing their religious character and becoming a very popular alternative for the growing middle class in the Arab Israeli community at large. Thousands of doctors, lawyers, engineers, and business people have been educated in these schools.³³ In

³³ An interesting historic footnote by Prof. Amnon Rubenstein: "In the past, the Christian schools did not receive a cent from the State, and I decided to follow constitutional principles and to recognize them as 'recognized but unofficial.' Minister Yuli Tamir and I were also willing to recognize them as official schools, as long as they did not select pupils. Some of the schools were

contrast to the public Arab Israeli schools, the private Christian schools enjoy full freedom to appoint teachers and principals,³⁴ and at least partial freedom to set their curricula.³⁵ The existence of such schools provides an alternative for parents who seek religious education for their children – an option provided to Jewish parents as part of the public education system. Sometimes, they are also the only option to provide excellent education to Arab pupils in their communities.

In light of this, it is plainly evident why the vast majority of the Arab Israeli public united behind the struggle of the Christian schools, even though it helps increase class polarization within that community. In this case, the nationalist ideological element outweighs the class ideological element, even among political party leaders and organizations that might be expected to prioritize the social universal aspect.

This political-educational reality causes wide circles that on various occasions represent uncompromising positions against “privatizing education” when it comes to the Jewish sector to be fully accepting of the growth of a thriving private education system in the Arab Israeli sector, even though it is no less selective and discriminatory. Their answer to this internal contradiction in their positions is usually that the basic discrimination against the Arab Israeli sector must be treated, and members of a national minority must not be required to spearhead the struggle for social equality.

willing to do so but did not agree to transfer their land to the state, as the legal advisors had demanded. Personally, I don't think that demand is objectively justified and I suggested to Minister Yuli Tamir to initiate a legal amendment, if one was indeed needed” (personal correspondence).

³⁴ It should be recalled that for many years, and some say even today, the Israel Security Agency had a say in choosing school principals, and attempts to stop this practice were unsuccessful.

³⁵ The institutions own the land on which the schools are built, and have no desire to transfer that ownership to the State.

Budgeting Primary and Lower Secondary Schools and Privatization

The struggle of the Christian schools (as well as the struggle of the Hebrew Reali School in Haifa a few months earlier) must be viewed in the context of the legal, organizational and budgetary reality of the education system. Legally speaking, schools in Israel are divided into three categories depending on the level of state supervision to which they are subject: official schools, recognized but unofficial schools, and exempt institutions.³⁶ Some of the recognized but unofficial schools (especially in upper secondary education) are public institutions in every aspect except ownership. They teach according to the national curriculum, employ their teachers based on national labor agreements, accept all applicants, and so on. Some of these schools abide by only some of these criteria, and some do not abide by most of them.³⁷ All of the Christian schools are legally defined as “recognized,” and are therefore supposed to be budgeted similarly to Jewish schools with the same status.

The primary schools with the status of recognized but unofficial are budgeted at the level of 75 percent of the budgeting of the official schools, and the exempt institutions at the level of 55 percent. This is the maximum level, but it can and should be reduced if they fail to teach the

³⁶ This section discusses primary schools, where there is a difference in budgeting between the official schools and the recognized but unofficial schools. In upper secondary education, most of which is defined as recognized but unofficial, the problem does not exist because the budgeting is identical and determined based on the grade, academic track, profile of the teaching staff, and level of service at the school. There are hardly any recognized but unofficial lower secondary schools (in 2014 they had 614 pupils).

³⁷ The same is true for all of the recognized but unofficial primary schools, whether they are Jewish or Arab Israeli. Pupils in the upper secondary grades are budgeted by the state equally to public schools (perhaps except for municipality copayment), and they supplement their budgets by collecting tuition and, in the case of the the Christian institutions, with church support.

core curriculum, or have pupil admission criteria, and if the socioeconomic profile of the pupil population indicates that they bar the admission of pupils from weak socioeconomic backgrounds. The reason for these restrictions is the desire to strengthen the public education system, which complies with a long list of rules and regulations from which the fully or semi-private school systems are exempt.

These budgeting rules apply only to the so-called “basic teaching budget.”³⁸ The budgeting of other expenditure elements, which can be numerous and whose weight can be very significant in the school budget (such as transportation, the deprivation basket, additional school staff, and so on), is not set forth in the regulations and is at the exclusive discretion of the Ministry of Education. This is how, in 2012-2013, the recognized but unofficial schools received supplements for incentives and culture, which were then canceled in 2013-2014.³⁹

In a document based on figures provided by the recognized but unofficial schools and the exempt institutions, there are various assessments that indicate that the level of government contribution to these budgets is much lower than 75 percent and 55 percent, respectively (Knesset Research and Information Center, 2013). However, the authors of the document doubt its accuracy and, in any case, most of the gap arises from the fact that the criteria for subsidy are not fully upheld, as well as from large differences in the cost of the teaching staff, arising

³⁸ In the Ministry of Education parlance, this refers mainly to the basic teaching weekly work hours. In the official institutions, salaries are paid directly to the employees and they are considered state employees. In the recognized but unofficial schools the teaching weekly work hours are transferred to the institution owners, and are budgeted according to the profile of the school’s teaching staff. Since the profile of the teaching staff in the Haredi schools is substantially different in terms of tenure, education and in-service training credits (all of which are usually much lower), even when the number of teaching weekly work hours is identical, their shekel value is lower.

³⁹ Furthermore, the Haredi educational institutions that belong to the large networks received supplements for prayer, dividing classes by gender in grades 1-2, and a few other items.

from the teacher profiles as well as their failure to join the Ofek Hadash agreement on the grounds that this agreement applies only to state employees who commit to all of the rules of training and promotion.

In 2013-2014, the Ministry of Education canceled the budget supplements given to the recognized but unofficial institutions the previous year. Furthermore, it imposed restrictions on collecting tuition from the pupils of those institutions, and allowed the schools to collect only the difference between the budget it transferred and the budget received by schools in official education, with an additional 15 percent. With this decision, the Ministry created a severe budget crunch for these schools, making it difficult for them to continue providing their previous level of educational services, and some of them may have to close down.

This is fair enough. The State of Israel wants to encourage public education and discourage private education, and it does so by increasing the budgetary advantage for those who follow the rules it dictates. Since the Christian schools are defined as recognized but unofficial, they seemingly have no legal grounds – and as long as they fail to fulfill the terms for official schools, no moral grounds either – to make budgetary demands on the state, as long as the same applies to the other recognized but unofficial schools as well.

The problem is that these rules have an exception, which makes the state and the Ministry of Education's budgeting policy problematic. The schools in the Haredi networks, Maayan Hinuch Torani and Independent Education, are budgeted at the same level as the state schools.⁴⁰ In light of this fact, the Christian schools claim discrimination and demand equal budgeting to those institutions (but not to the Haredi schools operating outside of these systems). Their argument is reinforced by the fact that in the Jewish education system parents can choose their child's educational institution in line with their religious orientation, without harming the funding their child's education receives and without having to add

⁴⁰ Under the Budget Foundations Law, passed under pressure of the Haredi parties in 1985. It may be a discriminatory law, but it is still the law.

anything from their private pockets, while this possibility does not exist in the Arab Israeli education system, which is all public.

Many people, especially leaders of the Arab Israeli sector but also the Secondary School Teachers Association, for example, reach a clear conclusion from this situation: the struggle of the Christian schools is justified and their demands must be met. This is a hasty conclusion, though, which could cause public education as a whole to face some very serious problems.

The main risk in recognizing the demand of the Christian schools is setting a precedent. According to the Christian schools, their total number of pupils is 33,000. It is likely that less than half of them are in grades 1-6, which is to say that the number of pupils involved is probably around 17,000 pupils. If the struggle of the Christian schools is successful, it will be unjust and impossible to leave it within those limits and it will have to be applied to all of the recognized but unofficial schools.

In 2013-2014, there were 195,000 pupils in the recognized but unofficial primary schools, including 116,000 in the Maayan Hinuch Torani and Independent Education systems. This means that the issue is relevant not to 17,000 pupils but to 80,000 pupils, half of whom are Arab Israelis (23,000 East Jerusalem pupils who did not participate in the strike, and the rest in the church schools), 32,000 other Haredim, and about 9,000 Jews in state and state-religious schools. The struggle of the Christian schools is, in effect, a struggle of all of the recognized but unofficial primary schools, and can undermine all of the Ministry of Education's efforts to strengthen the public schools by increasing their budgetary advantage relative to the recognized but unofficial schools.

The cost of increasing the funding of all of the recognized but unofficial primary schools from 75 percent to 100 percent is the least damaging option. The real damage is paving the way and removing most of the obstacles to opening private schools – which would increase polarization in the entire education system. The damage to Arab Israeli education, where the tendency to seek private education has increased

significantly in recent years,⁴¹ could be particularly severe. Furthermore, equal funding for public and private schools, which are not subject to the Ministry of Education's content and administrative demands, and consequently manage to provide better service to their clients, will also have extremely harsh consequences for Jewish public education. The number of children currently attending recognized but unofficial schools under state and state-religious supervision may be negligible, but there are a substantial number of children in various "unique," "experimental" and "supra-regional" schools, who enjoy full public funding even though they violate many of the binding rules of public education (especially those rules regarding admission criteria and tuition fees). It is highly likely that making the funding terms for recognized but unofficial education comparable to those of official education will instigate a mass exodus from official education so institutions can enjoy the greater freedom provided by the status of recognized but unofficial schools.

Therefore, it seems that if the desire is to strengthen public education as part of the struggle for equality in education, the Ministry of Education's position is justified and correct, and the fact that it is facing a group of elitist schools, whether in the Arab Israeli or Jewish sectors, makes it no less justified. Anyone who is truly interested in raising the level of achievements of the entire population, not only of its more affluent sectors, does not have to be impressed by the arguments of those who run elitist schools and their graduates. These institutions attain their achievements largely thanks to their ability to operate in more lenient environments than public schools. If the private schools, both Jewish and Arab Israeli, are willing to give up the privilege of selecting pupils, collecting as much money as they want, and employing teachers under different terms than those set by the government, then we can talk about comparing the funding they receive to that of the public schools. As long as that does not happen, the Ministry of Education should stick to its

⁴¹ The share of the recognized but unofficial schools (not only Christian) in the Arab Israeli sector is currently 22.9 percent. In 2004, it was 14.3 percent, and in 2000, it was 11.7 percent.

principled position and apply it not only to the Christian schools but also to the recognized but unofficial Jewish schools, including the Hebrew Reali School in Haifa.

5. Conclusion

This chapter reviewed four current issues in the education system, each of which is related to reducing educational and social gaps between pupils from different social classes. A review of the education system's budgeting method showed that after many changes, the method that is supposed to be applied in the coming years is less advantageous to the disempowered classes than previous methods. The review of both the implementation of the Compulsory Education Law for Ages 3-4 and the addition of a teaching assistant showed that the main beneficiaries from changing the policy will probably be the relatively affluent classes, and furthermore, the problem of a personnel shortage in the preschools appeared on the public agenda only when it affected those classes.

On the matter of reducing class size, the data in this chapter showed that the implementation of previous government decisions to reduce the class size to a maximum of 32 pupils will require greater resources than the Ministry of Education's predictions indicate. In addition, pupils from low socioeconomic classes will not derive any greater benefit than they could have expected based on the previous policy.

In the final section, which analyzed the protest of the Christian schools and budgeting for recognized but unofficial institutions, the chapter argues that the trends arising from that struggle, as from the struggle of the Hebrew Reali School in Haifa, could potentially jeopardize the status of Israeli public education.

In general, this chapter provides an overview of the direction the education system is heading. The issues raised show that, despite the declarations by various parties regarding the importance of equality in education, the various ministry administrations ultimately support measures that serve to work against affirmative action. Usually,

resistance by the privileged groups manages to completely offset, or at least to dull and reduce, the distributional consequences of the processes designated to reduce inequality. These difficulties remain even though the budget allocated to the education system has grown and there are opportunities to reduce gaps.

As a counterweight to the argument in favor of universal services, which are insensitive to the pupils' and parents' socioeconomic profiles, one can argue that excellent public education, from which even the weakest social classes can derive maximum benefit, can exist only if the entire public, including the stronger social classes, support it. This is a very strong argument based on the model used in Scandinavian countries, and seems to also be substantiated by the Israeli situation.

In light of this, it is clear that the massive transfer of resources between different sectors of Israeli society, and especially from the Jewish to the Arab Israeli sector or from the state to the Haredi sector, can be expected to meet fierce resistance. However, that this is a difficult task does not absolve the heads of the education system and policy makers from their duty to carry it out.

Appendix

Appendix Table 1A. **A comparison of teaching hour by the Shoshani Committee outline and the new differential budgeting method**

hours per third grade, by Deprivation Index level

Number of pupils per class	Deprivation Index level					Ratio of weakest to strongest, new budget method
	Strong	Average, Shoshani	Average, new budget method	Weak, Shoshani	Weak, new budget method	
20	31.00	31.00	34.00	31.00	38.00	1.23
21	31.20	31.20	34.20	31.20	38.20	1.22
22	31.40	31.40	34.40	31.40	38.40	1.22
23	31.60	31.60	34.60	31.60	38.60	1.22
24	31.80	31.80	34.80	31.80	38.80	1.22
25	32.00	32.00	35.00	32.00	39.00	1.22
26	32.20	32.20	35.20	32.20	39.20	1.22
27	32.40	32.40	35.40	32.40	39.40	1.22
28	32.60	32.60	35.60	32.60	39.60	1.21
29	32.80	32.80	35.80	32.80	39.80	1.21
30	33.00	33.00	36.00	33.00	40.00	1.21
31	33.20	33.20	36.20	33.20	40.20	1.21
32	33.40	33.40	36.40	33.40	40.40	1.21
33	33.60	33.60	36.60	35.40	42.40	1.26
34	33.80	33.80	36.80	37.40	44.40	1.31
35	34.00	34.00	37.00	39.40	46.40	1.36
36	34.20	34.20	37.20	41.40	48.40	1.42
37	35.40	35.40	38.40	43.40	50.40	1.42
38	36.60	37.40	40.40	45.40	52.40	1.43
39	37.80	39.40	42.40	47.40	54.40	1.44
40	39.00	41.40	44.40	49.40	56.40	1.45

Appendix Table 1B. **A comparison of teaching hour by the Shoshani Committee outline and the new differential budgeting method**

hours per pupil, by Deprivation Index level

Number of pupils per class	Deprivation Index level					Ratio of weakest to strongest, new budget method
	Strong	Average, Shoshani	Average, new budget method	Weak, Shoshani	Weak, new budget method	
20	1.55	1.55	1.70	1.55	1.90	1.23
21	1.49	1.49	1.63	1.49	1.82	1.22
22	1.43	1.43	1.56	1.43	1.75	1.22
23	1.37	1.37	1.50	1.37	1.68	1.22
24	1.33	1.33	1.45	1.33	1.62	1.22
25	1.28	1.28	1.40	1.28	1.56	1.22
26	1.24	1.24	1.35	1.24	1.51	1.22
27	1.20	1.20	1.31	1.20	1.46	1.22
28	1.16	1.16	1.27	1.16	1.41	1.21
29	1.13	1.13	1.23	1.13	1.37	1.21
30	1.10	1.10	1.20	1.10	1.33	1.21
31	1.07	1.07	1.17	1.07	1.30	1.21
32	1.04	1.04	1.14	1.04	1.26	1.21
33	1.02	1.02	1.11	1.07	1.28	1.26
34	0.99	0.99	1.08	1.10	1.31	1.31
35	0.97	0.97	1.06	1.13	1.33	1.36
36	0.95	0.95	1.03	1.15	1.34	1.42
37	0.96	0.96	1.04	1.17	1.36	1.42
38	0.96	0.98	1.06	1.19	1.38	1.43
39	0.97	1.01	1.09	1.22	1.39	1.44
40	0.98	1.04	1.11	1.24	1.41	1.45

Source: Nachum Blass, Taub Center for Social Policy Studies in Israel
Data: Ministry of Education

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